

I. PROJECT IDENTIFICATION

1. PROJECT TITLE Onchocerciasis Control in the Volta River Basin <i>625-11-510-908</i>		APPENDIX ATTACHED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
3. RECIPIENT (Specify) <input type="checkbox"/> COUNTRY _____ <input checked="" type="checkbox"/> REGIONAL _____ <input type="checkbox"/> INTERREGIONAL _____		2. PROJECT NO. (M.O. 1025.2)
4. LIFE OF PROJECT BEGIN FY <u>1974</u> ENDS FY <u>1979</u>		5. SUBMISSION <input checked="" type="checkbox"/> ORIGINAL <u>Jan. 10, 1975</u> DATE <input type="checkbox"/> REV. NO. _____ DATE CONTR. PASA NO. _____

II. FUNDING (\$000) AND MAN MONTHS (MM) REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE: \$ US (U.S. OWNED)			
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COOP COUNTRY (a) JOINT (b) BUDGET		
1. FROM THRU ACTUAL FY	2000						2000						
2. BUDGET FY 75	0						0						
3. BUDGET FY 76	1500						1500						
4. BUDGET FY 77	1000						1000						
5. BUDGET FY 78	1000						1000						
6. BUDGET FY 79	500						500						
7. GRAND TOTAL	6000						6000						

1. OTHER DONOR CONTRIBUTIONS Canada, France, Germany, Netherlands, UK, World Bank Group, FED, Iraq, et al.		(b) KIND OF GOODS/SERVICES Untied contributions for operational and capital costs (See budget P. 2)	(c) AMOUNT \$47.67 mil
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III. ORIGINATING OFFICE CLEARANCE

AFR/DS: Stockard (draft)	Communicable Disease Specialist	DATE: 1/10/75
AFR/DS: J. Pielenker / AFR/CWR: Marshall	Project Design Officer	DATE: 1/10/75
AFR/CWR: David Shear	Director	DATE: 1/10/75

IV. PROJECT AUTHORIZATION

CONDITIONS OF APPROVAL
A.I.D. contributions to the program are subject to: (1) annual Congressional approval, and (2) evaluation at the end of the third year of program operation. A shortfall, if any, incurred by the program is subject to negotiation among the donors, including A.I.D., and the program.

FUNCTION	SIGNATURE	DATE	BUR./OFF.	SIGNATURE	DATE
AFR/DS	Princeton Lyman	1/29/75	GC/AFR	Edward Dragon	1/29/75
AFR/DP	Robert Huesmann	1/29/75	AA/AFR	Donald Brown	1/29/75
AFR/DP	Arthur Gardiner	1/29/75	GC	Arthur Gardiner	1/29/75
1. APPROVAL A/AID (See M.O. 1025.1 VI C)			4. APPROVAL A/AID (See M.O. 1025.1 VI C)		
DATE: 1/29/75			DATE: 2/11/75		
Assistant Administrator for Africa			ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT		

Title: Onchocerciasis Control in the Volta River Basin

Part I. Summary and Recommendations

Project Development Team

Edward Donoghue: Deputy Director, AFR/DP
Herman Marshall: Health Officer, AFR/CWR
Joe Stockard : Communicable Disease Specialist, TA/H
John Pielemeier: Project Design Officer, AFR/DS
Bob Gee : Desk Officer, AFR/CWR
Timothy Bork : Lawyer, AFR/GC
John Welty : Project Review Officer, PPG/DPR

1. Grantee: Onchocerciasis Trust Fund to be administered by the World Bank.

The executing agency for the program will be the World Health Organization.

2. Grant

- a. Total Program Cost

The total cost of the twenty year Onchocerciasis control program is estimated at \$120 million. Costs of the first operational phase of the program (1974-1979), revised in 1974, are estimated at \$53,673,142. Table I indicates the projected expenditure schedule for the 6-year program (see Table I).

An advance Fund for financing the first-year costs of the program has already been established under the Onchocerciasis 1974 Fund Agreement. Several donor governments, including the United States (March 1, 1974) have signed this document and provided monies to the Fund. Grant commitments to the Fund, totaling \$7.5 million, have been received from eight donors (Canada, France, Germany, the Netherlands, U.K., U.S., UNDP and IBRD).

At the June 1974 meeting of parties interested in the Onchocerciasis program, the IBRD circulated the following rough estimate of possible donor contributions for the first 6-year phase of the program. The Bank breakdown did not lead to any specific objections and can be considered a reliable estimate of planned donor contributions.

TABLE 1: INCHONCHIATIAS CONTROL PROGRAMME : SUMMARY
1974/1979 BUDGET
(In Current US \$) *

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	Total
Annual Costs								
Programme Headquarters Staff	540 830	546 830	539 310	504 025	622 735	637 685	700 410	3 681 145
Vector Control Operations	1 211 462	1 211 462	2 763 470	4 401 440	6 023 520	6 648 015	7 680 195	28 128 102
Epidemiological Evaluation	150 000	150 000	415 525	523 540	531 285	514 845	523 165	2 658 460
Technical Support and Liaison:								
WHO HQ and Regional Office	510 610	510 610	508 220	541 290	581 510	610 385	664 775	3 425 800
FAO HQ and Regional Office	45 460	45 460	67 800	74 100	80 600	87 100	93 600	448 660
Research Contracts	863 103	107 500	1 085 700	1 074 800	828 500	795 000	688 000	3 401 500
Training	74 880							
Total Annual Costs	3 402 555	3 372 072	5 410 025	7 208 185	8 668 200	8 322 050	9 761 145	43 743 717
Capital Items								
Buildings	386 870	386 870	355 600	337 500	-	-	-	1 280 070
Furniture	55 280	55 280	-	-	20 000	-	20 000	95 280
Vehicles	353 430	353 430	138 150	207 270	428 070	147 460	333 720	1 716 100
Technical Equipment	222 380	222 380	85 720	207 060	33 330	88 760	115 430	794 480
Total Capital Items	1 218 070	1 218 070	580 470	602 430	481 400	217 220	489 150	3 888 740
Contingency			844 205	1 136 075	1 248 340	1 360 750	1 449 705	6 010 635
Commitments								
Staff Termination Liabilities	275 730							
Aerial Treatment Contract	1 686 747							
Insecticides	318 000							
Buildings	372 380							
Furniture	14 700							
Vehicles	136 500							
Technical Equipment	84 500							
Total Commitments	2 808 557							
TOTAL	7 330 182	4 590 142	6 834 700	8 248 300	10 400 000	10 000 000	11 700 000	53 673 142

*Inflation contingency included at 9-10%/yr.

	U.S. \$ Million
Canada	3.00
France (10 percent)	5.40
Germany (DM 13 million)	5.40
Netherlands	6.00
U.K. (10 percent)	5.40
U.S.A.	6.00
World Bank Group (10 percent)	5.40
F.E.D. (10 percent)	5.40
Iraq	0.05
	<u>42.05</u>

It is also anticipated that UNDP will provide \$2.4 million for training and research costs, of which \$1.2 million is already firmly programmed for 1974-77

Japan, Belgium, Iraq and the African Development Bank indicated their intent to seek authorization for further pledges this calendar year. Some \$8-\$9 million of external assistance remains to be mobilized by the IBRD from these and other possible sources, for a Phase I total of \$53.67 million.

b. Amount of AID Assistance

In FY 74, AID obligated \$2.0 million in grant funds to support the Onchocerciasis program. In March and June 1974, two installments of \$500,000 each were transferred to the Onchocerciasis Fund. This document authorizes an additional \$4.0 million in grant funds to the program.**These monies will be released to the Onchocerciasis Fund according to the following tentative schedule; the amount of funding in FYs 1977-1979 will depend on the outcome of A.I.D.'s evaluation of the program at the end of the third year of operation.

<u>FY 74</u>	<u>FY 75</u>	<u>FY 76</u>	<u>FY 77</u>	<u>FY 78</u>	<u>FY 79</u>	<u>Total</u>
\$2.0	Pipeline	\$1.5	\$1.0	1.0	\$0.5	\$6.0

The timing of the release of AID funds will be modified if delays occur in disbursements from the Onchocerciasis Fund or if program evaluation reveals that project implementation is not proceeding as projected.

**It is anticipated that an Onchocerciasis Fund Agreement for the full 6-years of the initial phase of the control program will be presented for donor endorsement at the meeting of the project's Joint Committee in Abidjan, February, 1975.

AID funds will be comingled with contributions from other donors. All contributions will be untied and procurement of goods and services for the program will be accomplished through worldwide bidding.

c. Host country contribution

As a multi-lateral program, a 25% recipient country contribution is not required by AID legislation. All participating governments have, however, pledged substantial local cost contributions as well as personnel and buildings, etc. to the program. Due to important dissimilarities in financial availabilities in each country, program management will establish separate protocols on local cost contributions with each participating African government.

3. Description and Justification of Project

a. INTRODUCTION

Onchocerciasis is an infection by a parasitic filarial (threadlike) worm transmitted by the bite of an infected female blackfly of the species Simulium damnosum. The fly becomes infected by biting an infected human host. The larvae of the insect vector develop in fast-flowing rivers, hence the common name "river blindness" for the disease.

The clinical manifestations of onchocerciasis include intensely itching rashes, wrinkling, thickening and depigmentation of the skin, skin nodules in which adult worms are to be found, and eye lesions leading to blindness. Those heavily infected often lose weight and suffer from debilitation. In the Volta River Basin approximately one million of ten million inhabitants over 700,000km² are infected by onchocerciasis and of these at least 70,000 are totally or partially blind.

The Onchocerciasis Control program in the Volta River Basin area (hereinafter referred to as "the program"), is planned as a collaborative undertaking among the participating Governments (of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo, and Upper Volta) to be carried out with agencies of the United Nations system and the support of the international community.

The program will be executed through management structures proposed by the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), and the International Bank for Reconstruction and Development (IBRD), hereinafter referred to collectively as "the sponsoring agencies."

The overall strategy for the program is set out in the Report of the Preparatory Assistance Mission to Governments (PAG).

b. PROGRAM OBJECTIVES

The general objective of the Onchocerciasis Control Program is to eliminate the disease as an obstacle to socio-economic development in the region concerned. More specifically, the objectives of the program will be as follows:

i. Immediate objectives

The immediate objectives of the program will be to interrupt transmission of the disease by eliminating the vector through periodic aerial applications of larvicides involving no risk of lasting contamination of the environment, to implement the applied research and training programs required for pursuing the long-term objectives, and to help the participating Governments in preparing requests to multilateral and bilateral sources for the

subsequent socio-economic development of the fertile areas freed from the disease. The interruption of transmission of the disease will involve:

- (a) organization of aerial larvicide operations
- (b) entomological surveillance of the treated areas
- (c) epidemiological evaluation of the results of the program
- (d) permanent monitoring of the long-term safety of the operations relative to the environment
- (e) preparation of treatment schedules for onchocerciasis patients, so that the parasite Onchocerca volvulus can be eliminated from subjects already infected and threatened with blindness
- (f) mass treatment campaigns if suitable new chemotherapeutic agents become available

ii. Long-term objectives

In the progressive elimination of the endemic conditions of the disease and the development of the reclaimed areas, the program will comprise applied research and manpower training components guaranteeing a high level of operational effectiveness and the training of the national personnel necessary for the proper execution of the program and subsequent maintenance operations.

While covering the continuation of control operations against the vector, the program will provide for substantial research and development in the field of onchocerciasis chemotherapy, and, hopefully, the development of suitable new drugs for mass treatment of the afflicted. The interruption of transmission of the disease, combined with the systematic treatment of inhabitants infested by the parasite, will thus permit the development of the reclaimed fertile valleys while decreasing the recurrent cost of disease control to be borne by the participating Governments.

The program will provide training for personnel at all levels in vector control, in the epidemiology and chemotherapy of the disease, in aerial treatment, and in environmental protection.

iii. Anticipated socio-economic benefits in the areas freed from onchocerciasis

The damaging effects of onchocerciasis on the social and economic life of the program area are as follows:

(a) the effects on the population due to the reduction of its productive capacity and the direct cost of supporting the sick (over a million people are affected by onchocerciasis in the program area, of whom 70,000 are blind).

(b) the loss of agricultural production resulting from the desertion of fertile valleys and the reduction of crop yields because of overcropping in the uplands where people have settled; the total area of the deserted valleys is estimated to be 65,000 km².

The socio-economic benefits of the program will follow both directly through effects on existing projects and the feasibility of starting new rural development projects.

(a) Direct effects: an improvement in the cost-effectiveness of the development projects prepared independently of the program; the implementation of new projects, made possible by onchocerciasis control in the valleys that are at present deserted; the repopulation and/or settlement of these valleys will have the effect of improving the land:man ratio in the overpopulated regions.

(b) Indirect effects: dependent on the achievement of the direct effects; improvement in the productive capacity of the population;

induced effects on the various sectors of the economy. The PAG Report (No. OCP/73.1 and Annexes VI/1-5) describes the anticipated socio-economic benefits and proposals for the economic development of the areas freed from onchocerciasis.

While the overall program is described in terms of immediate, long-term and ultimate socio-economic objectives in a straight line continuum over time, the operational objective is to work towards achieving progress via the "oil slick" approach, whereby economic development projects will be introduced as pockets of areas are cleared; this is both practical and realistic for a program as comprehensive and long in duration as the vector control program. In addition, flexibility must be provided to take into account new developments in research and the actual operations during the early years.

The actual economic and social development of the cleared areas will be the primary responsibility of the African host governments. Apart from the coordinating and advisory mechanisms, the international bodies charged with control operations have no financial responsibilities for post-clearance activities. Rather, the development of these areas will be a separate but related activity for which additional support will be provided on a bilateral basis or through other regional arrangements.

Planning for the development of onchocerciasis-cleared areas is scheduled to begin at the same time as the vector control operations themselves. Implementation of the development programs can commence 18 months after the start of spraying, and international donor interest in the development effort is considerable. To facilitate information exchange between donors and host governments, an Economic Development Unit is

included in the structure being established in Ouagadougou. An Economic Development Advisory Committee will serve as the key advisory group to the Joint Coordinating Committee of the vector control program and will establish general guidelines for the development of the sanitized areas. The World Bank and FAO will work closely with these bodies. The UNDP, meanwhile, is providing \$500,000 to each of the seven host countries to assist in project development. A.I.D. is prepared to respond to their requests for assistance in economic and social development of cleared areas. Separate project papers will be prepared to provide selected technical and capital assistance towards project planning and implementation.

LOGICAL FRAMEWORK (See Logframe for "Means of Verification")

A.1 Goal

The goal of the program is "the socio-economic development of a 655,000 km² area in the Volta River Basin" of which approximately 65,000 km² are abandoned valley. The area has an estimated total population of 10 million people.

A.2 Goal Indicators

FAO studies indicate that population pressures can be greatly relieved in the densely populated areas by the transfer of 800,000 people into the deserted valleys of ten major economic development project areas, approximately 12,000 km². (See Annexes IV/1-5.) Potential agricultural production from new farms in these ten major project areas is estimated annually at 355,000 tons of sorghum, millet, maize, rice, cotton, groundnuts and sesame, valued at \$30 million. The combined internal rate of return for economic development of these ten project areas is estimated at 10% by FAO. While ten major project zones have been identified based on criteria including fertile soils, proximity to large population clusters, higher prevalence of onchocerciasis, etc., it is likely that settlement will occur in additional areas cleared of onchocerciasis and additional benefits will result. With donor assistance, the participating African governments are presently engaged in planning development programs, including integrated rural development programs for some areas.

A.3 Goal Assumption

- a. Onchocerciasis is the relevant factor in abandonment of fertile river valleys in the Volta Basin.
- b. Families can be induced to occupy the fertile river valleys and tribal conflicts, which could significantly deter agricultural development efforts, would not develop.
- c. Climate conditions which have been used in calculating the agricultural production levels will continue to be equally favorable in the future.
- d. Sufficient donor and participant government monies will be available to fund development projects.

B.1 Project Purpose

The project purpose is "to interrupt the transmission of onchocerciasis for a sufficiently long period (twenty years) to permit the disappearance of the parasite from the human population in the program area and to allow for reoccupation of river valleys in the Volta Basin".

- b. A secondary purpose of the project is, through applied research, to advance the state of our knowledge of onchocerciasis and to refine methodologies for controlling the disease.

B.2 End-of-Project Status

- a. By the end of the twenty-year control operation there should be no active onchocerciasis infection in the program area population from which disease transmission could be reinstated even should the area again become reinfested by Simulium Damnosum.
- b. Within three to six years after the start of vector control operations (depending on when spraying begins in a particular zone), vast areas will be permanently freed from the vector.

c. Through applied research, increased knowledge will be gained of the epidemiology, transmission and chemotherapy of onchocerciasis, research on the effects of larvicides on aquatic environment, new insecticides, sensitivity of the vector to insecticides and equipment to best implement control programs.

B.3 Assumptions

a. Maturation of S. damnosum larvae in less than seven days will not invalidate the plan to larvicide on a seven-day schedule.

b. All breeding sites will have been identified at least by the end of three full years of larviciding operations.

c. A sufficiently large number of larvicides with appropriate ecological characteristics can be developed and brought to bear upon the insect as to overwhelm its capacity to develop resistance or tolerance. Virtually total destruction of larvae in the program area can be achieved within 18 months after initiation of the campaign and the area thereafter kept free of S. damnosum in order that there will be no surviving adult worms by the twentieth year.

d. Transmission cannot be maintained by migrant flies coming from beyond the program area boundaries.

e. After a successful conclusion of the planned 20-year program, the simultaneous reintroduction of S. damnosum and infected humans can be prevented.

C.1-2 Outputs and output targets

a. Treatment with larvicides of all S. damnosum breeding sites throughout the program is at sufficiently frequent intervals as to achieve the total interruption in the transmission of onchocerciasis infection.

Target

Control operations will be phased in over a period of three years from 1974 to 1976. Phase I operational area will cover the Black Volta, Comoa-Leraba, Bandama and Banifing Basins, as well as the isolated onchocerciasis foci of Bandiagara. Phase II control operations will include the Red Volta, the White Volta and Daka Basins. Phase III which will begin in 1976 incorporates the Basin of the Oti-Pendjari, and the southern tributaries of Niger River flowing into Dahomey, Ivory Coast, Niger and Upper Volta.

b. Location of all S. damnosum sites ascertained and characteristics analyzed by entomological surveillance teams.

Target

Mapping of S. damnosum sites should be completed in each of the three operational areas by the conclusion of the 6-month pre-larviciding period. Surveillance will be carried out every 15 days by the 55 sector and sub-sector surveillance teams.

c. Periodic evaluation of the effectiveness of larvicidal treatment and modifications of larvicidal procedures as necessary.

Targets

Surveillance every 15 days by the 55 sector and sub-sector surveillance teams.

d. Epidemiological studies of the human population of the program area so as to be able to detect continued disease transmission.

Targets

Following completion of a baseline study to determine pre-project prevalence of infection and to grade clinical severity of the disease, follow-up studies in a sample population of approximately 3,000 people throughout the program area will be conducted every three years. Secondly, intensive epidemiological and clinical studies will be conducted in a small sub-sample annually beginning no later than 1976.

e. Definition of the behavioral characteristics and vector capacity of various genetic types of S. damnosum.

Target

The distribution of the various genetic types of S. damnosum, which comprise the S. Damnosum complex, will have been defined. Based upon these studies, the behavioral characteristics and vector capacity of each of the forms present in the program area will have been sufficiently well-determined that entomological surveillance can be limited to those members of the complex which actually represent a threat with respect to the transmission of onchocerciasis.

f. Additional larvicides developed to be used in case insect resistance or tolerance to Abate occurs.

Target

An adequate number of effective insecticides will be available for the operational larviciding campaign throughout the planned 20-year program, the use of which will not have produced detrimental effects upon the environment. It is not possible at this point to state how many different insecticides may be required. This depends solely upon the capacity for S. damnosum.

larvae to develop tolerance or resistance to those insecticides which may be employed.

g. Development of effective drugs for treatment of onchocercal infections.

Target

Chemotherapeutic research, it is hoped, may be concluded by the demonstration of at least one new drug for the treatment of onchocercal infections which will be fully effective and so safe that it can be used in mass treatment campaigns. Failing accomplishment of this ideal objective, the end of this project may be marked by a clear definition of the value or absence of value which a number of existing drugs, that heretofore have never been used in onchocerciasis treatment, may have in the control of this disease.

h. Manufacture and field evaluation of prototypes of equipment for the accurate delivery of specified dosages of larvicides by aircraft.

Target

The number of such prototypes that are to be developed has not been specified but it would seem reasonable to expect that systems employed on fixed-wing aircraft would differ from those employed on helicopters.

i. Trained African personnel to assist in implementing the program, conducting research, and maintaining surveillance activities in the program area.

Target

A large-scale, long-term project, such as the Onchocerciasis Control Program in the Volta River Basin area, usually devotes an appreciable part of its budget to personnel training. This is not clearly apparent in the budget of the present program, although training problems are relatively

important, because some of the operations have been planned and costed on the basis of sub-contracting. The cost of the training and re-orientation of the necessary qualified staff thus becomes one of the items in the management costs of the sub-contractor, estimated to total 20% of the basic cost of the sub-contracted activity. Sub-Targets are described below.

(1) Biology, Vectorial Importance and Control of Simulium damnosum:

The training program for the three main categories of personnel: entomologists, technicians and laboratory assistants, should deal essentially with the biology, vectorial importance and control of Simulium damnosum. However, the vectors of the other major diseases in the Volta River Basin area, such as malaria, trypanosomiasis, yellow fever, etc., cannot be completely neglected.

(2) Parasitology and Clinical Features of Onchocerciasis:

Training programs can also be envisaged for the two categories of staff, physicians and nurses, who will work for the Onchocerciasis Control Program by evaluating the results and perhaps later on organizing chemotherapeutic treatment of onchocerciasis sufferers.

(3) Operational Staff:

The training of radio operators, aircraft mechanics, engineers and pilots, could be planned along the same lines as that of specialists on the vector and the disease. If aerial treatment is carried out by a private company, the latter will certainly reserve to itself the right to recruit and possibly train its flying staff, although it might be invited to help in the training of similar staff of regional origin.

For the time being, training has been systematically planned to take place in Europe, where facilities are greater than in West Africa. Consequently, the cost of such training periods will vary more according to their duration (six months for radio operator and mechanics, two years for engineers and pilots) than to the level of recruitment. However, the WHO centre in Lome, training specialists for the maintenance of medical equipment, might be requested to extend its training activities to cover radio operators; this would considerably reduce expenses.

In the fields of vector biology and control and aerial treatment, it is proposed to train - between 1974 and 1977 - a number of specialists in proportion to the long-term requirements of the program, allowing for a replacement ratio ^{of} / 5 to 10% per year for the higher grades and 10 to 12% for the junior grades.

In the medical fields, the training plans are more ambitious, so as to take into account needs closely linked with the Onchocerciasis Control Program in the Volta River basin area, but not costed, namely those required by probable mass chemotherapy and those arising from the epidemiological surveillance of population groups moving as a consequence of operations for the economic reclamation of abandoned and uninhabited land. Training can therefore be planned from 1974 onwards throughout the duration of the program, with the aim of one physician to every 20,000 onchocerciasis sufferers registered and one public health specialist to every 66,000. These estimates exceed the strict needs of the regional program, so that a zero annual replacement rate has been allowed for.

C.3 Output Assumptions

a. No major change in flow rates in the program area. Suitable conditions for the breeding of Simulium damnosum are provided by rapidly flowing turbulent water which contains rocks or vegetation to which the larvae can attach. Development of the present operational plan has relied heavily not only upon field entomological surveys but also upon the collection of hydrological data from many of the waterways throughout the rainy and dry seasons. The latter data of course are essential for the calculation of the quantities of insecticides that will be required. A number of changes therefore could alter the magnitude of the output levels. For example, the turbulence downstream of dams provides an ideal setting for Simulium breeding. The construction of such dams throughout the now abandoned fertile valleys as the agricultural development program progresses could significantly alter the level of output required. Significant changes in flow rates such as might occur during a prolonged rainy or dry season would also alter the required output levels.

b. All S. damnosum breeding sites will be identified. It is assumed that since rapids provide favorite breeding places for Simulium damnosum, it will not be possible to conduct direct inspections of all the breeding sites. Under these circumstances, the discovery of all treatment failures may prove impossible.

It is, therefore, necessary to assume that a number of indirect measures will prove suitable for the elimination of the larval stage of S. damnosum in breeding sites which are not accessible for direct inspection. Such measures employ trapping of adult flies as an indicator that some breeding may be continuing in a treated area. Another indirect measure is the recording of hydrological data and the direct aerial inspection of inaccessible stretches of water in an effort to

spot those situations which provide the appropriate conditions of water flow rates and turbulence that are the favored breeding sites of S. damnosum.

c. Epidemiological sample studies can be successfully implemented over time. The paramount assumption with respect to planned epidemiological studies is that the people in the sample will be prepared to submit themselves to the examinations in the proposed studies.

Since it is expected that there will be considerable movement of people from their present locations back into the fertile river valleys, it is assumed that those individuals selected for inclusion in the longitudinal study can be found each year for their scheduled follow-up examination.

D.1-2 Inputs and Implementation/Budget Schedule

In accordance with WHO program budgeting techniques, program inputs for the initial six-year phase of the project are broken down by functional category: a) Program Headquarters Staff; b) Vector Control Operations; c) Epidemiological Evaluation; d) Technical Support and Liaison; e) Research and Training.

a. Program Headquarters, Ouagadougou

Program headquarters comprises: (a) the office of the Director with a program director, information officer, an administrative services officer, a secretary and a driver; (b) an economic development liaison unit with an economist, a secretary and a driver; and (c) the supporting administrative services with a senior administrative officer, a budget and finance officer, a personnel officer, a supply officer, an assistant administrative services officer, together with 49 locally recruited staff (administrative assistance, clerks, typists, mechanics, drivers, messengers, skilled laborers) - a total staff of 62, of which 9 are professional and 53 general service staff. Consultant services have also been provided for 24 man-months each year.

Travel is foreseen not only within the area of operation, but also for visits to Geneva, Washington and the Regional/^{WHO}Office for Africa (Brazzaville).

It is envisaged that a building be constructed to house the headquarters in Ouagadougou and appropriate provision is made for this purpose in 1975 and 1976 Pending Construction; the estimates include rent for 1975 and 1976 which is expected to be required in addition to the office space acquired in 1974.

Six vehicles were purchased in 1974 and provision made for their replacement in 1977. Three motorcycles, purchased in 1974, will be replaced over two years (1976 and 1978).

The estimates also include provision for office stationery, supplies, equipment, office furniture, maintenance and running costs of vehicles and motor supplies.

b. Vector Control Operations

The vector control operations comprise the following staff:

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Professional	9	9	12	12	12	12
General Service	<u>192</u>	<u>321</u>	<u>491</u>	<u>491</u>	<u>491</u>	<u>491</u>
	<u>201</u>	<u>330</u>	<u>503</u>	<u>503</u>	<u>503</u>	<u>503</u>

The operation and staff under this heading are subdivided into vector control operations and entomological surveillance operations. The latter will extend into the Bobo Dioulasso, Korhogo, Tamale, Sikasso, Sokode, Natitingou and Niamey sectors.

The teams operating in the sectors will usually be composed of an entomologist, internationally recruited, and of locally recruited assistant entomologists, technicians, senior clerks, mechanics, drivers, laboratory auxiliaries, storemen, skilled and unskilled laborers, as well as radio operators.

Provision has been made for travel of the various teams within the area.

The estimates include the rental and operation of aircraft service for the aerial treatment in the following estimated number of hours:

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Hours	2000	3230	4940	6120	6120

It is envisaged that for the operation an initial 80,000 liters of insecticides will be required in 1975, increasing to 150,000 for 1976 and 200,000 for each of the years 1977 through 1979.

It is expected that by 1975 and 1976 office construction will be required in three sectors and ^{storage} construction for / in four sectors.

For purposes of the vector control operation, provision has been made for the following vehicles:

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Land rover station wagons	4	1	5	6	1	3
Land rover pick ups	27	19	33	27	19	33
Trucks	4	1	3	-	-	4
Boats	11	7	13	-	-	-
Outboard motors	16	9	18	-	-	16
Bicycles	48	36	66	48	36	66
Minibus Camping Volkswagen	2	-	-	2	-	-
Minibus Ordinaire Volkswagen	11	-	-	11	-	-
Break Peugeot 504	2	-	-	2	-	-

The estimate includes provision for rent/in some ten sub-sectors, as well as for the cost of utilities in some 19 where operations will take place.

The technical equipment provision will cover the cost of optical equipment, generating sets, vacuum flasks, equipment for camping and tools of inspection, isothermic containers, fixed radio station and mobile radio station.

c. Epidemiological Evaluation.

The epidemiological evaluation consisted in 1974 of: (a) an epidemiology and public health unit comprising an internationally recruited epidemiologist, an operations officer, and locally recruited secretary, clerk-stenographer, clerk-typist and driver; and (b) an epidemiological evaluation unit with an ophthalmologist, parasitologist and sociologist, internationally recruited, and a statistician, a nurse and a census officer, a laboratory assistant, two drivers and an unskilled laborer, locally recruited.

The personnel establishment for the period 1975-1979 is as follows:

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Professional posts	9	9	9	8	7
General Service	<u>17</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>17</u>
	26	26	26	25	24
	—	—	—	—	—

Travel to the various sectors has been foreseen for the epidemiological evaluation personnel.

Nine vehicles were purchased in 1974 and provision has been made for their replacement in 1977.

In addition to the provision made for running costs under Operations and Maintenance, the estimates include the purchase of various supplies (laboratory supplies, drugs for treatment, office supplies) and for technical equipment (field camping equipment, microscopes, ophthalmoscopes etc).

d. Technical Support and Liaison.

WHO HEADQUARTERS AND REGIONAL OFFICE

Strengthening of certain supporting services will be required at WHO Headquarters in Geneva and in the Regional Office for Africa in Brazzaville, as follows:

(a) at Headquarters

Onchocerciasis Control Program

Senior officer

Epidemiologist/Biologist

Administrative assistant

2 Secretaries

Personnel

3 Clerk-stenographers

Supply

1 Administrative assistant

Conference and Office Services

1 Administrative assistant

Finance and Accounts

3 Clerks

(b) at Brazzaville

Public health advisor
Clerk

In addition to the support personnel, provision is made in each year for 24 consultant man-months.

Travel is provided for visits from Geneva to Ouagadougou and Brazzaville and from Brazzaville to Ouagadougou.

Under this heading are also provided the estimates for two meetings, site visits for twelve members of the Technical Advisory Committee, and participation in other meetings.

FAO HEADQUARTERS AND REGIONAL OFFICE

The provision under this heading consists of 21 consultant man-months through for each of the years 1975 / 1979, for travel in an amount of approximately \$4,000 per annum and for minor items of supplies in an amount of \$1,000 per annum.

e. Research and Training

It is envisaged that research will be undertaken in vector ecology, vector control, environment protection, chemotherapy and epidemiology, particularly with regard to research for new drugs.

Training will be mostly in vector ecology and control and to a minor extent in epidemiology and chemotherapy

Input Assumptions

The most significant assumptions applicable to these inputs are:

1. The required professional and technical personnel can be recruited and begin their work in accordance with the total program schedule.
2. Construction of necessary facilities can be completed on schedule.
3. Once the field work begins, essential supplies, especially of vehicle fuel, lubricants, and spare parts, will be available continuously and equipment maintenance will be performed satisfactorily.
4. The technical equipment required for this project will be received in good condition and be ready for use of the teams.
5. The WHO headquarters, which has the responsibility for data processing, will be able to receive and analyze material from the field in a timely fashion.
6. It will be possible to maintain the planned larviciding operations despite mechanical failures of equipment, inclement weather, etc.

Part II.

1. Project Background

The first steps

In 1968 the World Health Organization (WHO) in joint sponsorship with the United States Agency for International Development (USAID) and the Organisation de Coordination et de Cooperation pour la Lutte Contre les Grandes Endemies (OCCGE) convened a technical conference in Tunis to consider the problem of onchocerciasis due to increased awareness of the extent of the problem, particularly in the minds of the national authorities concerned. The Tunis meeting brought together the world's leading experts on onchocerciasis and its insect vectors, and its major objective was to assess whether the control of onchocerciasis is possible with currently available methods.¹

The conference concluded that control is technically feasible, and that the chances of obtaining successful and lasting effects would be greatest if the control were carried out in ecological zones sufficiently large to obviate the need for continuous protection of the whole area against reinvasion by the blackfly vector.

The possibility of launching a large-scale control program led the meeting to recommend that priority should be accorded to onchocerciasis in Africa, and specifically to an initial campaign in the severely affected area of the Volta River Basin involving adjoining parts of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta. The delineation of the area was dictated not only by the high prevalence of onchocercal infection there but also by reason of the severity of the disease and the manifestly high rates of blindness. Moreover, certain field operations were already underway in the area,

¹World Health Organization (1969) Report of a joint USAID/OCCGE/WHO technical meeting on the feasibility of onchocerciasis control, Tunis, 1-8 July 1968, WHO/OCCGE/69.75, 60 pp., 4 maps.

some success had already been achieved, and significant entomological, epidemiological and economic data had been accumulated. Above all, the recommendation regarding the area reflected the determination of the interested Governments, supported by public opinion, to cooperate in a control program that was recognized to be a prerequisite for economic development, as well as for the health of future generations.

In April 1969 a further meeting was organized in Brazzaville by the WHO Regional Office for Africa to further refine the approach needed to secure technical assistance for the proposed campaign.² Experts from the Government of Ghana, OCCGE and USAID, in addition to WHO representatives, attended these discussions.

Requests from Governments

Shortly thereafter, in 1969 and 1970, several of the interested countries submitted formal requests - emanating from the highest authorities - to international and bilateral sources of assistance liable to be interested in supporting the undertaking which was taking practical shape. Among these organizations were the Fonds Europeen de Developpement (FED), the Food and Agricultural Organization of the United Nations (FAO), the International Bank for Reconstruction and Development (IBRD), the United States Agency for International Development (USAID) and the World Health Organization (WHO). Simultaneously the United Nations Development Program (UNDP) manifested its interest in the subject, particularly as it was already financing a WHO onchocerciasis project in West Africa.³

²World Health Organization (1969) Report of a preliminary meeting on the extended onchocerciasis control project in the Volta River Basin, Brazzaville, 30 April - 2 May 1969, AFR/ORCH/11, 16 pp.

³The Onchocerciasis Advisory Team (EAF/72/188) assigned to Northern Ghana, Volta, and Upper Volta and operating from Zolghatanga, Ghana.

Preparatory Assistance to the Governments (PAG Mission)

On the basis of the requests received and at the suggestion of IBRD, WHO and UNDP sponsored a planning meeting in Geneva in July 1970 which brought together representatives of the Conseil de l'Entente⁴, the Government of Ghana, and OCCGE, FAO, FED, IBRD, UNDP, USAID and WHO. At this meeting terms of reference were drawn up for a mission designed to carry forward, on behalf of the seven Governments concerned, the essential preparatory work required for the definition of an overall strategy for the proposed onchocerciasis control program. The Mission was scheduled to start in mid-1971 and initially programmed for one year - this was later extended to cover the whole of the year 1972. The Administrator of UNDP agreed to provide the necessary funds and accordingly nearly US \$0.2 million was allocated to WHO as the Executing Agency in association with FAO, which accepted responsibility for certain aspects of the work.

The PAG Mission received as its mandate a major two-fold objective. In the health sector, it was requested to prepare a plan of work to achieve control of onchocerciasis over the entire recommended project zone, taking into account economic development of reclaimed areas; to work out the expected costs and benefits of the scheme; and to analyze the possible financial resources available. In the economic sector, the Mission was later called upon to identify areas within the project zone which, owing to their economic potential and location in relation to centers of population density, offered development possibilities; it was requested also to draft preliminary terms of reference for feasibility studies to be conducted later in these areas.

⁴A consultative body in which the Governments of Dahomey, Ivory Coast, Niger, Togo and Upper Volta participate.

The Government of Upper Volta agreed to act as host to the PAG Mission and to place at its disposal premises at Ouagadougou for its headquarters which were set up in August 1971. Operating from Ouagadougou, the Mission has benefited from the full collaboration and encouragement of the Government of Upper Volta and the Governments of the other six countries in which it has carried out its activities.

The staff of the Mission ^{was} comprised of a Chief of Mission, an entomologist, a general economist and an administrative officer, supplemented by short-term consultants on aerial larviciding operations, a project planning (costing) expert, a statistician, two human geographers, an agricultural production economist, an agricultural (costing) economist, an agriculturalist, a sociologist, a veterinarian and two development economists. In addition, the Mission received considerable support from the WHO 'regular research programs, including operational research conducted with funds provided by the Governments of the Federal Republic of Germany and the United States of America.

Research undertaken by the Onchocerciasis Unit of the Ministry of Health of Ghana, by the Centre Muraz and Ophthalmological Institute of OCCGE, and by ORSTOM⁵ proved helpful in the study of the disease and its vector and in the development of an appropriate methodology for epidemiological evaluation. The collection of data was made possible through the cooperation of the departments of health, agriculture, economics and planning and their related bodies in all the countries concerned. During its assignment the PAG Mission reinforced its affiliations with ancillary work in progress, such as the entomological studies being performed in northern Ghana, the FED campaign

⁵Office de la Recherche Scientifique et Technique Outre Mer supported by the Government of France.

in the Comoe-Leraba region, OCCGE's Onchocerciasis Section, and hydro-biological work on Lake Volta.

Apart from the continuous technical contacts maintained by the PAG Mission with local and international bodies, a series of meetings took place during the PAG Mission's assignment to review the progress and advise on future work. Discussions of current problems, particularly in logistics, took place in Ouagadougou in September 1971 between the Upper Volta authorities and representatives of WHO and FAO, with the participation of an IBRD representative. A review meeting was held at WHO headquarters in Geneva in February 1972, and this was followed by a full project review meeting in Geneva in July 1972. In October of the same year a planning meeting between the regional and field representatives of UNDP, FAO, IBRD, and WHO was organized in Accra, Ghana.

The Steering Committee

Meanwhile, in April 1972, the Director-General of FAO, the President of IBRD, the Administrator of UNDP and the Director-General of WHO decided, in view of the importance and complexity of the scheme envisaged, to set up a Steering Committee for Onchocerciasis Control comprising a representative from each of the four agencies. The Steering Committee had a general mandate to ensure coordination of the action taken by the four agencies in the planning and implementation of the program.

The Committee held its first session in July 1972 in Geneva and has held seven subsequent meetings to date. The Steering Committee has thus been able to monitor the progress of work during the various preparatory phases, discuss technical, administrative, financial and logistic matters and review the form and content of the present report.

Extension of the work in 1973

Among the major recommendations made by the Steering Committee at its first session was that the preparatory work phase should extend through 1973. Accordingly, an interim project was formulated to allow operational research to proceed in the form of field trials in a pilot zone, to adjust the aerial spraying technique and refine its costing; the interim project also included the initiation of field trials with established drugs. Another important part of the work was establishing firm baseline data to enable progress to be continuously checked during the proposed Onchocerciasis Control Program. In addition the interim project was requested to review the possible ecological changes that might ensue and suggest precautions that should be taken; and also to plan and launch the training program for national staff.

On August 20, 1973 the Report of the PAG Mission was released accompanied by technical annexes.* Shortly thereafter a joint IBRD/WHO mission discussed the proposed program strategy in detail with the seven participating African governments. The PAG Mission Report was endorsed by the African governments at the Accra Inter-governmental Meeting held October 30-November 1, 1973 and an agreement governing the operations of the program was signed by the seven countries and WHO. Concurrently the sponsoring agencies (WHO, IBRD, FAO, UNDP) met in Paris with perspective donor countries and organizations and with participating African governments to discuss the PAG Report, a proposed management structure for the program and donor contributions to a Special Fund to be,

*Technical Annexes listed in Annex II.

established to cover costs of the first year's operation of the program. At this meeting AID representatives, while indicating general support of the proposed management structure, recommended the establishment of additional management units - an independent technical advisory group on vector control evaluation, and an economic advisory panel. These and other concerns were satisfactorily complied with in the management structure proposed by the Steering Committee at the June 1974 Paris meeting. (The Program management structure will be more fully discussed in Section III of this document.)

Following the June 1973 Paris meeting, the Steering Committee drafted the Onchocerciasis 1974 Fund Agreement which was signed by the participating UN agencies and several donors and which became effective March 1, 1974. The Fund Agreement describes the operations of the Onchocerciasis Special Account and the undertakings of the members of the Steering Committee during the first year of the program. Donor contributions of \$7.5 million were pledged to cover the first-year operations of the projected six-year initial phase of the onchocerciasis control program.

The program director, Dr. Ziegler, formally assumed his functions in Ouagadougou as of January 1, 1974. Additional staff has been and is being recruited for program headquarters in Ouagadougou and other assignments. Aerial spraying operations began October 15, 1974 in the Zone I project area (See Annex III for detailed progress report on program operations.)

AID and Other Donor Experience in Similar Programs

Although instrumental in sponsoring the 1968 technical meeting in Tunis which first focused donor and African attention on the problem of onchocerciasis

in Africa as a major regional restraint to economic development, AID participation in onchocerciasis control activities in the past has been limited to a grant of \$80,000 to WHO to fund aerial insecticide field trials under the PAG Mission's feasibility studies. Extensive onchocerciasis research activities have been carried out in West Africa by the Office de Recherche Scientifique de Terres d'Outre Mer (ORSTOM) and Organisation de Coordination et de Cooperation pour la Lutte Contre les Grandes Endemies (OCCGE). FED/WHO-supported programs in the Comoe-Leraba region of Upper Volta, Togo, and Ghana, which tested the various means of controlling onchocerciasis as well as some other projects in East Africa and Nigeria which had different epidemiological characteristics, did not achieve lasting success. This was due in part to the small areas of the programs and the difficulties in protecting against reinfestation from untreated infested neighboring regions. However, the Comoe-Leraba experience led interested parties to consider onchocerciasis control programs on a much larger scale, such as the Volta Basin program, covering total geographic areas where S. damnosum are found.

2. Project analysis

I. Technical analysis

The technical feasibility of the proposed onchocerciasis control program was investigated by the PAG (Preparatory Assistance to Governments) team. Their findings have been made available in exhaustive detail in the following annexes to the PAG Report:

- Annex II - 1 : Chemotherapy of onchocerciasis: practice, prospects, and needs.
- Annex III - 1 : The distribution and biology of the vector and transmission of onchocerciasis.
- Annex III - 2 : Principles and methods of Simulium damnosum control in the Volta River basin area.
- Annex III - 3 : The control of Simulium damnosum and the prevention of environment contamination; technical criteria for the selection of insecticide.

- Annex III-4 : Recent and ongoing evaluations of insecticides and equipment for controlling Simulium damnosum in the Volta River basin area.
- Annex IV-1 : Epidemiological aspects of onchocerciasis in the Volta River basin area.
- Annex IV-2 : Prevalence of onchocerciasis and blindness in the Program area, baseline data and data sources.
- Annex IV-3 : Atlas of onchocerciasis (prevalence and blindness) in the Volta River basin area.
- Annex V-2 : Plan of operation and estimated cost of Simulium damnosum control campaign in the Volta River basin area.

The findings of the PAG team have been reviewed by TA/H specialists and by health specialists from other participating donor agencies. The findings have been discussed by these specialists on at least two occasions and have been accepted by the health specialists with reservations. Although certain difficulties do exist in the technical formulation and planned implementation of the program - such as the potential for development of insect resistance to Abate; difficulties in locating all S. damnosum breeding areas in the program area; difficulties in preventing S. damnosum reinfestation of treated areas - these problems have been recognized by the PAG team and donor experts and extensive efforts have been incorporated into control program operations to guard against technical failure.

In this document we will limit the analysis of technical considerations to certain basic considerations. We refer the reader to the above-mentioned annexes for more detailed technical explanations of the program.

Onchocerciasis is an infection by a parasitic filarial (threadlike) worm, Onchocerca volvulus, transmitted in the program area by the bite of an infected female blackfly of the species Simulium damnosum. The fly itself becomes infected by biting an infected human host. Both man and fly are therefore essential elements in the life cycle of the parasite.

The clinical manifestations of onchocerciasis include intensely itching rashes, wrinkling, thickening and depigmentation of the skin, the characteristic skin nodules in which the adult worms are to be found, and eye lesions leading to blindness as the most serious consequences of the disease. Heavily-infected patients often lose weight and suffer from debilitation.

The larvae of the insect vector S. damnosum, develop in the fast-flowing turbulent water of rivers and below the spillways of dams. Onchocerciasis is therefore a disease of the fertile areas flanking the rapids of rivers, hence its common name "river blindness". Moreover, apart from its role as a vector of disease, the blackfly constitutes an intolerable nuisance; the average number of bites per man per day sometimes amounts to several thousand, although only a small proportion of these result in infections.

The savanna area of the Volta River basin is one of the worst endemic onchocerciasis zones in the world. On the basis of surveys carried out by the national health services, it is estimated that over one million of the ten million inhabitants of the area covered by the program (nearly 700,000 km²) are infected by onchocerciasis, and that of these at least 70,000 are blind or have a serious impairment of sight.

Control Procedures

Among the measures to control onchocerciasis that have been considered are:

(a) Mass chemotherapy. Unfortunately, the two available drugs of proved value - suramin and diethylcarbamazine - may have dangerous side effects, and can therefore be administered only under close medical supervision. This precludes their use for mass chemotherapy in populations whose access to medical care is minimal. Research to find safer onchocercicidal drugs is underway, but has not yet resulted in a definite solution.

(b) Biological control of the vector, using known predators, parasites, and pathogens of S. damnosum. This method is under study, but as yet is far from being of practical significance.

(c) Protection of the potential human host by chemical or physical barriers. The vector usually bites below the knee, and in theory the use of an effective insect repellent or protective clothing would interrupt the transmission of onchocerciasis. While such measures have a limited value in special circumstances, their mass application in the program area would be quite impracticable.

Elimination of the insect vector by chemicals offers the sole means at present available for preventing the disease. This cannot be achieved by an attack on the adult fly because an immense area would have to be treated with insecticides - the flight-range of the fly may, in favorable circumstances, extend to as much as 150 km.

Only one line of attack remains: namely, to destroy the blackfly larvae in the circumscribed sites in which they mature. Fortunately, the physiological requirements of the larvae are such as to make such a method of control eminently feasible. Attached to their submerged supports, they depend on the fast-flowing water to bring them oxygen for their respiration and particulate matter, for their nutrition. Particles suspended in the water are ingested indiscriminately, whether or not they are of nutritive value, and ingestion of

a chemical larvicide in adequate concentration results in the destruction of the larvae.

The desiderata for a chemical compound lethal to the larvae are:

(a) that it should not unduly affect other forms of life ("non-target fauna"), especially fish that are of economic importance; (b) that it should soon be decomposed in the biological environment (biodegradability); and (c) that it should be possible to apply it to rivers in such formulations as will result in its ingestion by the larvae together with other suspended particulate matter. The two compounds that best meet these requirements are Abate⁶ and methoxychlor. Although DDT is also effective against the Simulium larvae, its chemical stability and consequent persistence preclude its use.

Because of the inaccessibility by land of many of the breeding sites of Simulium, the only feasible method of applying the larvicide is from the air. In the case of large rivers that are sufficiently straight, light planes can be used, but narrow twisting waterways and those overhung by forest require the use of helicopters. In the rainy season, when the rivers flow swiftly, a single application may eliminate the Simulium larvae for up to 50 km downstream. In the dry season, relatively fast-flowing stretches of river may be interrupted by areas of still water, in which case each of these stretches must be treated separately.

Because of the long life of the adult worm in the human host, sufferers from onchocerciasis may remain infective for as long as 15-18 years even if not re-infected. The duration of a campaign to prevent the disease by eliminating its insect vector must therefore be not less than this length of time after the last new case in the program area.

⁶This is a proprietary name. "Temephos" is under consideration by the International Organization for Standardization as a non-proprietary name for this compound.

The objective of the Simulium damnosum control campaign in the Volta River Basin is to interrupt the transmission of onchocerciasis for a sufficiently long period to permit the disappearance of the parasite from the human population in the program area. Since onchocercal worms survive up to approximately 13 years, a 20-year control campaign has been planned. This campaign will need to be highly effective, since in this area low densities of S. damnosum are sufficient to insure the persistence of onchocerciasis transmission. It is proposed that the point of attack for interrupting transmission of this disease be the larval stage of the vector fly, S. damnosum, which it is generally believed matures only in rapidly flowing turbulent water in the Volta River basin area. The aim of the larvicide campaigns is to control S. damnosum, by treating breeding places of the species at intervals of time less than that required for larval development, since both eggs and the pupae show very little susceptibility to insecticides. Under the average conditions encountered in the Volta River Basin, this implies weekly treatment.

It is intended that all S. damnosum breeding sites will be subjected to larvicide treatments at weekly intervals during an initial phase of several weeks.

Program Area

The 700,000 km² control program area has been selected because in the past campaigns that were conducted in much more limited areas, reinfestation quickly occurred with the consequence that disease transmission was rapidly reinstated. Lack of permanent surface access routes prevented treatment of all breeding sites over a large area such as the one proposed in this program. The present program will solve the problem of access routes

through the use of helicopters and fixed-wing aircraft and, by covering all of the Volta River Basin, will reduce the risks of reinfestation to which smaller project areas would be susceptible.

Insecticide

Applied research on insecticides is a continuing effort, and it should be noted that this subject has received considerable attention during the project planning period. This large preliminary effort included a review of the characteristics of 1400 insecticides that previously had been studied by WHO with respect to safety for mammals, toxicity to mosquito larvae, residual larviciding action in polluted water, and commercial availability. From this large number of insecticides, five that have been selected are considered to possess the most suitable attributes for the S. damnosum control campaign. These are methoxychlorf, Abate[®], methyl-Dursban[®], phoxim and chlorphoxim. Some of these previously had been evaluated against S. damnosum. Samples of those which have not yet been so evaluated were requested from the producers in the form of emulsion concentrates and were submitted to the WHO International Reference Center at Bobo-Dioulasso, Upper Volta for field study, and to hydrobiological laboratories for evaluation against non-target fauna. At the outset, a DDT emulsion concentrate used for many years against S. damnosum served as reference substance; it was replaced later by the best substitute formulation available. Most of the evaluations were made following ground application from planes and helicopters, both in the rainy season and at the beginning of the dry season. During the final planning stage, the evaluation of emulsion concentrates of those insecticides, whose performance in the field seemed sufficiently satisfactory, was undertaken by a team of hydrobiologists from the ORSTOM Center at N'Djamena, Chad. These studies comprised

on the one hand, laboratory determination of the effects of a whole range of concentrations of each compound on characteristic West African fresh water zoological groups and on the other, field observation of the action on non-target fauna of applications to water courses of operational doses (0.05 and 0.1 ppm during 10 minutes) as well as of the highest dose liable to be used accidentally in large scale operations following an unexpected drop in the flow rate of the river treated (0.5 ppm during 10 minutes). During simultaneous laboratory studies a known quantity of labeled molecules of several promising insecticides were introduced into model ecosystems, in an enclosed space, so as to determine their degree of biodegradability according to a method developed by the WHO International Reference Center in Urbana, Illinois, for the study of compounds of the DDT family. These studies have been supplemented by an analysis of all accessible published documents concerning the persistence on nature and the action upon non-target fauna of the insecticides being investigated, so as better to determine the conditions under which they might be used.

Based upon all of these observations, Abate[®] has been selected for use in the operational control effort.

Techniques for application of insecticides

Field trials which were completed earlier in the program area revealed that fixed-wing aircraft, which always travel at a considerable speed, are not able to apply insecticide accurately in water courses that are winding, narrow, or covered partially by a forest canopy. On the other hand, the helicopter can carry out these applications much more efficiently and, if necessary, it is always possible to land near the treatment site and apply the insecticide by hand. Moreover, with the helicopter it is easier to adjust

the way in which the insecticide is applied; it may either be sprayed in a dense mass to obtain long-range larval kills downstream when the river is in spate or it may be sprayed over a wide area to give effective coverage, at low water, to the downstream breeding sites that are the closest to the treatment point.

The earlier comparative study of the characteristics of these types of aircraft and of the corresponding plans of operation in actual field trials have been supplemented by a large number of simulation exercises on charts supported by cost-effectiveness studies. As previously described, the solution which has been adopted up to this point is based upon the simultaneous use of medium-sized airplanes and helicopters, the fixed-wing planes being used for large, strong flowing rivers that are open to the air, while the helicopter will be used for smaller water courses that are frequently concealed by vegetation and require only small or moderate amounts of insecticide. It should be noted however that simulation exercises and economic analyses are continuing in an effort to find out whether it would be possible to work out a plan of operations at the same cost, using only one type of aircraft. This would have considerable advantage with regard to the maintenance of the machines and the subcontracting of treatment.

HF radio communication network, if possible using a frequency especially assigned to the program, will permit the rapid exchange of information between air crews, the entomological surveillance sectors, and the program headquarters. It is planned that fixed radio stations will be established at the headquarters of each sector and in surveillance centers of strategic importance that are a long way from the headquarters of the corresponding sector. The fixed network would be supplemented by Landrovers equipped with both HF and VHF transmitter-receivers which will make it possible to maintain contact with the aircraft whenever the situation requires, particularly during geographical reconnaissance

and the evaluations of equipment and formulations.

Entomological surveillance

The multiple objectives of the entomological surveillance component of the total program vary at different stages in the campaign to eliminate S. damnosum by means of larviciding. Before larviciding operations actually begin, it is the responsibility of the entomological surveillance teams to ensure that all potential S. damnosum breeding sites have been located, and that their characteristics have been analyzed. Throughout the remainder of the twenty-year control program, the entomology teams will have responsibility for evaluating the effectiveness of larvicidal treatment and of instituting any changes which may be required in the application of insecticides to insure that complete interruption of onchocerciasis transmission is achieved as planned. In discharging these responsibilities, the teams will undertake the collection of hydrological data to determine those points which need to be treated and the doses of insecticide which are to be applied. Under special conditions, they will also undertake the ground application of insecticides to those breeding sites which cannot be treated by aircraft.

Special efforts are to be made to identify those routes by which migrant flies most frequently reinfest the area and to identify specific sectors in which breeding is most likely to be renewed by migrant flies. If reinfestation occurs only by means of a limited number of routes and if breeding can be shown to become reestablished only in limited areas, then it may be possible to reduce the surveillance network an appreciable degree after completion of the initial attack phase.

Measurement of the intensity of onchocerciasis transmission at selected points will be undertaken by the entomology teams during the initial years of the program in order to collect baseline information for the epidemiology component which is not scheduled for activation until three to six years after the control program has started.

Provision has been made in the design of this component of the program to employ two methods for verifying the efficacy of entomological surveillance in guiding a successful larvicide operational campaign. The two verification methods incorporated in the design are supervision of entomological surveillance by project personnel and epidemiological field studies to determine whether or not interruption of disease transmission has in fact been achieved.

Epidemiological surveillance

Epidemiological field studies that are incorporated in the program will be conducted for the purpose of identifying continuing disease transmission. This component of the project is described in more detail in the Outputs section of the Project Paper. It is sufficient here to point out that any time the epidemiologist finds a continuing transmission of disease such a result will signal the high probability that some active Simulium damnosum breeding sites either have not been found or have not been treated. This activity then serves as a very important double check upon the field supervisory staff of the entomology surveillance component.

The appearance of new infections among individuals who no longer should be at risk of infection as a consequence of the operational control program will signify a failure that demands an explanation and very probably a change in operational larviciding procedures or schedules. In assessing the operational program, therefore, concurrent examinations should be conducted of the epidemiological reports, entomological surveillance records and the

operational larviciding flight schedules.

II. Social Analysis

The socio-cultural factors relevant to the program are largely limited to the correlation between the incidence of onchocerciasis and out-migration from relatively fertile valleys in Volta basin, resultant over-population and over-cropping of highland regions in the program area and the potential for re-population and settlement in the valleys once onchocerciasis is controlled.

These factors are fully discussed in the following annexes to the PAG report: I-1 Physical, human and economic geography of the Volta River basin area.

VI-1 Rural development repopulation and settlement in areas of West Africa cleared by onchocerciasis.

The major ethnic groups in the program area belong to the Mande and Voltaic families, while Fulani are scattered through the program area and representatives of the Hausa family are found in the NE part of the area. Among the main Mande family groups are the Bambara of Mali, the Malinke of Mali and the Ivory Coast, the Bwaba of Upper Volta and Mali, the Dioula of the Ivory Coast, Mali and Upper Volta. To the Voltaic family belong the Mossi of Mali, Ivory Coast, Upper Volta, among others. Traders of the Mande and Hausa families and nomadic Fulani have always been widely scattered over the whole area.

Agricultural crops follow the familiar north-south pattern of millet and sorghum in the north to root crops in wetter areas. The area west of Bobo-Dioulasso is better watered and has a denser network of permanent water courses allowing for crops with a longer marketing chain such as cotton, rice, groundnuts, etc. East of Bobo-Dioulasso, the land has lower inherent fertility,

Water is less frequently available and crops are generally food crops, although some islands of relative fertility exist (such as NE Dahomey)

Livestock raising is discouraged in much of the area by the presence of trypanosomiasis, rinderpest and pleuropneumonia.

Fishing is an important occupation along some of the major water courses.

What little industry exists in the area is concentrated in Mali, Bobo-Dioulasso, Korofo, Ivory Coast and in N. Ghana.

The road infrastructure includes major international routes such as the Abidjan-Bobo-Ouaga-Niamey route, the Cotonou-Malanville route and major N-S trunk lines in Ghana and Togo. A new route linking Mali to the new port of San Pedro in the Ivory Coast via Odieme is being developed. The local road system serving onchocerciasis areas in Togo, Dahomey and Ghana are particularly weak.

Major facilities for provision of health, education, social services, governmental administration, extension, communication, etc. are inadequate throughout the region, with urban facilities much more common than rural facilities.

Soils are generally good to average quality in the river valleys. In the plateau areas where population pressure is intense, soils are rather poor lateritic soils mixed with some more fertile soils, both of which are rapidly being degraded through over-use and erosion.

Population Distribution

Population is unevenly distributed with almost uninhabited river valleys contrasting with overpopulated plateau areas, such as the Mossi Plateau, located often quite near the river valleys.

In Upper Volta, the high population densities of the central and northern parts of the Mossi plateau are explained in part by the political stability of the Mossi empire over centuries. However, in recent decades population has increased in certain areas such as around Ouagadougou and the combination of overpopulation, low soil fertility, erratic rainfall, and the impossibility of allowing adequate fallow periods in the agricultural pattern have resulted in serious food deficits. Crop production has fallen well below the minimum subsistence needs of the population. Consequently, temporary and permanent emigration are now increasing. In the valleys of the Boubouriba and the Black, Red, and White Voltas, entirely uninhabited fertile valleys are situated in the immediate vicinity of overpopulated eroded plateaus.

The pattern is repeated elsewhere. Densely populated areas of Northern Ghana are juxtaposed with almost uninhabited valleys along the Red and White Volta rivers. In the Ivory Coast, a large population cluster exists at Korhogo while the valleys of the Bandama, Bou and other rivers are almost uninhabited.

In Togo and Dahomey again very densely populated areas are intermingled with almost empty ones. In southern Mali the overpopulated areas are not as conspicuous as in the other countries but the abandonment of large valleys such as the Baoule, Bagoé and Banifing rivers, is nevertheless noticeable while relatively dense populations occur further north in areas with lower and very uneven rainfall.

In southern Niger, the population is relatively dense but some areas are so sparsely inhabited that they have been transformed into a national game park.

PAG studies have examined the correlations between the size of village and prevalence of blindness, patterns of population movements within the project area, and age/sex ratios in areas with different prevalence levels of onchocerciasis.

They have found an exponential association between village population and prevalence of blindness (correlation coefficient $r = -0.523$).

In one analysis, a total of 1,757 communities were grouped according to population as follows: group one - 40 to 199 inhabitants, group two - 200 to 699 persons and the remainder having 700 or more residents. Onchocerciasis prevalence rates in excess of 50% were found in 22% of the smallest communities as compared with 10% of those in group two and only 2% in the group-three towns. Although this striking association supports the hypothesis of a causal relationship between onchocerciasis and emigration, it is also compatible with an hypothesis that villages with high frequencies of onchocerciasis are located "at the end of the road" where difficult subsistence is coincidental with high exposure to infected black flies with a consequent high prevalence of blindness.

The retreat from the river valleys has placed on the plateau lands a burden of human occupation that cannot be supported. Due in part to disease (onchocerciasis) there is now a marked contrast between the plateau and valley areas across the program area. Severe population pressure in the plateau areas - those with poor lateritic soils as well as those with more fertile soils - has, as a result of overcropping, led to serious degradation of the upland soils. In many densely populated areas there is abundant evidence of sheet wash and even gully erosion and with the loss of nutrients, crop yields in crowded watershed areas have declined markedly. This is in contrast in many cases to the situation in neighboring valleys where the soils have a much higher inherent fertility level and therefore a much greater yield potential, given proper management.

One result is increased emigration to the coastal states of Ivory Coast and Ghana. Age/sex ratio calculations suggest that young males in the economically active age group of 15-44 years are tending to leave the project area because insufficient land is available even to support a family at subsistence levels. In the hyperendemic and densely populated area of northeast Ghana, for example, the ratio averages 65 males per 100 females and falls to 55-60 males per 100 females in some districts in comparison with the ratio of 93 males per 100 females for the whole of Ghana.

Potential for re-population and settlement in onchocerciasis-freed areas

As part of the PAG studies, sociological investigations were carried out to explore, in a preliminary fashion, the possibilities, problems and limitations of human settlement in selected areas to be cleared of onchocerciasis. Studies were carried out in five proposed pilot zones and three densely populated areas which were presumed to be departure zones for potential settlers. The studies were carried out in Ghana, Upper Volta, Ivory Coast, and Togo. In general the studies revealed that the local population was very receptive to re-population of the river valleys - that is, groups that had once inhabited the valleys would be willing to return to those areas once the threat of onchocerciasis had been eliminated. Because of the failure of past settlement schemes, especially in Northern Ghana (in areas other than onchocerciasis infected zones), attitudes toward settlement - locating groups in areas that they had not previously inhabited and which in some cases have never been inhabited - were generally negative.

Major problems which must be dealt with in the economic development phase of the program (to be funded through other mechanisms) include the overall compatibility of different ethnic groups which might move into river valley areas, the rights of "strangers" to land and land tenure, and the fear of

contracting onchocerciasis when returning to the river valleys. However, in general, the prospects for the planned migration of approximately 800,000 people from the crowded plateaux to the fertile river valleys look bright.

III. Economic Analysis

Due to the broad geographical nature of the onchocerciasis control program an analysis of the economic ramifications of the program was carried out under the assumption that follow-on economic development projects would take place in areas freed from onchocerciasis. Ten major project zones were identified by the PAG team for priority development with the recognition that additional zones could be settled and developed as well.

I. Recommended Project Zones

<u>Area</u>	<u>Spraying Phase</u>	<u>Country</u>
1. Red Volta: north and east of Po	II	Upper Volta
White Volta: north and NW of Bawku	II	"
2. Diebougou-Gaoua: west bank of Black Volta	I	Upper Volta
3. Bandama-Bou: west of Niakaramandougou	I	Ivory Coast
4. Bolgatanga-Bawku: south of #1 above	II	Ghana
5. Sansanne-Mango: along Oti River	III	Togo

II. Suggested Project Zones

6. Dedougou: Black Volta north of Bobo-Dioulasso	I	Upper Volta
7. Boromo: Black Volta north of #2 above	I	"
8. Sissili: between Po and Leo	II	Upper Volta
9. Pama: south of Fada, Eastern O.R.D.	III	"
10. Comoe-Leraba: just north of Ivory Coast border	I	Upper Volta

The criteria for selection of priority project zones included: 1) heavy infestation of onchocerciasis; 2) proximity to densely populated areas; 3) soils of good to average quality. Based upon the benefits which could be generated in

these ten project zones (at an additional cost of \$120 million for economic development projects), plus certain area-wide benefits such as decreased cost of maintaining the blind, the combined IRR for the program over a 35-year life was estimated roughly at 10%. Details on the methodology used for economic analysis can be found in Annex VI-5 to the PAG report, "The Methodology of the Economic Analysis".

Factors considered in ascertaining the present socioeconomic effects of onchocerciasis include: 1) the decrease in productive capacity due to onchocerciasis (lost working days, etc.) ; 2) loss of revenue due to: a) the cost of maintaining the blind; b) underemployment; c) decrease in the active population (out-migration); 3) the loss of productive potential: a) non-exploitation of the valleys; b) falls in yield in densely populated areas; 4) the cost of onchocerciasis in national budgets. Additional information on proposed economic development of the program area can be found in the following annexes:

- VI - 1 Rural development, repopulation and settlement in areas of West Africa cleared of onchocerciasis
- VI- 2.A Background data and proposed integrated rural development projects in Upper Volta
- VI-2.B Background data and proposed integrated rural development project in north eastern Ghana
- VI-2.C Background data and rural development project in northeastern Ghana
- VI-2.D Background data and proposed integrated rural development project in Togo
- VI-2.E Background data and socio-economic development aspects of onchocerciasis control in Dahomey
- VI-2.F Background data and socio-economic development aspects of onchocerciasis control in Mali

- VI-2.G Background data and socio-economic development aspects of onchocerciasis control in Niger
- VI-3 Concise study of supplementary economic development projects
- VI-4 The establishment of handicrafts and commerce and the provision of credit in the repopulation zones

Briefly summarizing the economic analysis, it is estimated that 65,000 km² of now-deserted land can be occupied after clearance of the vector. Potential annual agricultural production from the land is placed at \$30 million. It is further estimated that 800,000 people can be transferred onto 12,000 km² of deserted valleys in the ten major project zones with an increased annual agricultural production of 355,000 tons of sorghum, millet, maize, rice, cotton, groundnuts and sesame.

With the concurrence of the participating African governments, the PAG team assumed that the now-deserted valleys would be developed as small family holdings and not as large farm or ranch schemes. Under these circumstances, one can reasonably assume that between 1-1.5 million people will re-locate in the total project area. Other project beneficiaries will include thousands of people who, without the onchocerciasis program, might have been rendered partially or totally blind by the disease as well as those already stricken who may benefit from breakthroughs in chemotherapy research.

The development of presently uninhabited fertile valleys should lead to major increases in food and cash crop production in countries where cereal production has faltered ⁱⁿ recent years and where prices to consumers have risen correspondingly.

IV. Administrative Analysis

A rather elaborate administrative structure has been created to supervise and administer this large, multination, multidonor program. Although certain elements within the structure are yet to be finalized, the following description of the administrative structure of the program, based upon the results of the June 1974 Onchocerciasis meeting in Paris, will most likely mirror the final structure. Where differences of opinion exist among agencies or elements of the administrative structure, these differences are described below.

1. Executing Agency

WHO, as the Executing Agency, will, in consultation with the participating Governments, appoint a Program Director and assign other international staff and other personnel to the program as specified in the plans of work. It will provide the program with permanent technical and administrative assistance, and will be responsible for the implementation of the program as approved by the Steering Committee.

2. UNDP and Associate Agencies

The UNDP, through FAO as Associate Agency or through other agencies or directly, will consider financing, with resources available in UNDP regional or national country programs, complementary activities as may be requested by the participating Governments in the field of economic development. Within these arrangements and in close liaison with the National Committees, UNDP and the Associate Agencies will study the technical problems presented by the economic development of the areas that have been or are to be freed from the disease and will also give technical assistance to the program's Economic Development Unit.

3. Office of the Program Director

The Program Director will be responsible for field operations. He will be stationed at the headquarters of the program, which will be situated at Ouagadougou, Upper Volta. He will receive permanent technical and administrative assistance from WHO (Regional Office for Africa and Headquarters) as Executing Agency, and from FAO, as Associate Agency. Operational problems submitted to the Executing Agency by the National Committees will be channelled through the office of the Program Director. Within his own office there will be a unit responsible for external relations and information and he will be assisted by the following specialized sections as well as an Economic Development Unit.

a. Simulium Control Operations Section

This section will plan, carry out and supervise the control operations against the vectors of onchocerciasis and will be responsible for studies on the protection of the environment. It will define the associated applied research and personnel training activities that are necessary for the effective implementation of these operations.

b. Epidemiology Section

The Onchocerciasis Epidemiology and Public Health Section will plan, carry out and supervise the epidemiological evaluation of the program and define the associated applied research and personnel training activities in connection with the chemotherapy of onchocerciasis and the parasitological and clinical evaluation of the control operations. At the request of national authorities, this section will define the specific health problems of the areas to be reclaimed and provide technical advice on the measures to be taken to provide effective medical protection for the populations to be settled there.

c. Economic Development Unit

The Economic Development Unit will serve as the focal point for the exchange of information with respect to national actions in the development aspects of the program, for which purpose it will maintain close liaison with the National Committees. This unit will assist the Program Director in identifying economic development projects which might be the object of further study and consideration by the Governments and institutions responsible for the financing and carrying out of the necessary pre-investment studies.

d. Administrative Section

The Administrative Support Services Section will provide the necessary administrative support for the implementation of the program in the field and will manage the joint technical and logistic services. In liaison with the appropriate services of the agencies sponsoring the program, this section will prepare the documents concerning the recruitment, supplies, and contractual services for the program or will provide the basic data so that these documents can be prepared.

4. National Onchocerciasis Committees

As the major coordinating element at government level, a National Onchocerciasis Committee was set up in each country by summer 1974, when the first entomological surveillance networks were due to start operating. Each Committee, comprising qualified representatives of the main national service concerned, is invested with authority enabling it to act at the highest level and to command appropriate resources for:

- a. coordinating the action of all national services involved in the program and in the subsequent economic development projects
- b. ensuring liaison with program headquarters and with other

National Committees

- c. preparing and organizing a large-scale campaign to inform the population of the existence, methods and aims of the program
- d. preparing the legislation and regulations required for the smooth running of the program, settlement, plans and economic development projects in reclaimed areas.

Consultations between the participating Governments, the sponsoring agencies and other parties may be held as appropriate at the request of the Steering Committee .

5. Steering Committee

The Steering Committee set up in April 1972 by the executive heads of UNDP, FAO, IBRD and WHO, and composed of representatives of the executives of these sponsoring agencies, will continue to act as the organ for the guidance and coordination of action by the sponsoring agencies with respect to the program. Its duties will be, inter alia, to study and approve the work plans and budgets prepared by the Executing Agency. It will supervise the implementation of the program and provide advice on its execution. The Steering Committee will meet at least three times a year in the initial phase of the program.

6. Joint Coordinating Committee (JCC)

This body will exercise general supervision over the program and the executing agent (WHO). It will be informal in nature and will consist of representatives of the seven participating Governments, all external donors (whether countries or organizations) and the four sponsoring agencies (IBRD, WHO, FAO, UNDP). This Committee will have an independent chairman of international stature who would be assisted by a secretariat provided jointly

by IBRD and WHO. This secretariat will function in close collaboration with the Steering Committee, which will continue to act as the organ for the guidance and coordination of action by the sponsoring agencies with respect to program. The Joint Coordinating Committee will determine its own rules of procedure, and will normally meet once a year to consider reports from the Steering Committee (and the Ecological, Economic Development and Technical Advisory Panels) on the progress of the program, to review the budget for the coming year, and to discuss matters relating to the conduct of the program. WHO, as executing agency, will retain full responsibility for the management of the program subject to the general guidance of the Joint Coordinating Committee.

Ecological Panel, Economic Development Advisory Panel,
Technical Advisory Committee

While all parties agree that these organizations are necessary to ensure proper evaluation of program implementation, there is some disagreement over whether they will report directly to the JCC or ^{to} the JCC through the Steering Committee.

a. Ecological Panel

The Ecological Panel will comprise a small group of experts with wide experience in river basin ecology, the effects of development processes on river basins, in the epidemiology of diseases in river basins and the ecological effects of pesticides; e.g. biodegradable insecticides have been developed which have no residual effect and cause no harm to non-target aquatic fauna. Periodic hydro-biological studies will be made throughout the program.

The Panel will study and provide surveillance assistance on ecological problems connected with the program and with the associated

economic development projects. It will propose to the JCC and the Steering Committee such measures^{as}/may be needed to supplement the ecological studies undertaken under the program and will make recommendations to ensure effective protection of the environment.

b. Technical Advisory Committee

To provide for the continuous evaluation of the program by experts who are not directly engaged in its implementation, a Technical Advisory Committee composed of 6-12 individuals recognized as authorities in their particular fields and representing a broad range of nationalities will be appointed. Members of the Committee will be chosen for a period of two years and would appoint their own chairman. A secretariat will be provided by WHO; costs will be covered from the Special Fund. The Committee will meet twice a year and arrangements will be made for members to visit the program area as necessary. The Committee will examine all technical and scientific aspects of the program and submit an annual report to the JCC and the Steering Committee. WHO will then make comments on the report for the consideration of the Steering Committee and the JCC.

c. Economic Development Advisory Panel

This panel will be established to advise and report on the economic development aspects of the program. It will be organized under the general guidance of the World Bank and will consist of economists and specialists in agriculture and rural development. The Panel will be appointed by the sponsoring agencies and be headed by an independent economist of international repute. Its principal task in the initial

stages of the program will be to evaluate and assist in coordinating the identification and preparatory work for specific projects being done at the national level, with the assistance of the external donors. The Panel will make an annual report to the Steering Committee and JCC.

III. Project Implementation

The first phase, 1974-1979:

The first year will focus on (1) establishment of the organizational infrastructure, and (2) assuring the continuity of control operations, and making use of the knowledge of the terrain already available, primarily in the area covered by the FED/OCCGE (European Development Fund/Organization for Coordination and Cooperation in the Control of the Major Endemic Diseases) onchocerciasis control campaign. The vector control operations will have begun in all program areas by the third year and will include aerial treatments and insecticiding. The first phase will see the establishment of radio communications and hydrological stations and expanded recruitment of staff. In addition, there will be simultaneously, entomological surveillance, epidemiological evaluations, and research and training.

Economic development activities per se, associated with the program, will not be financed during Phase I. Funding arrangements for specific development projects will be the responsibility of the participating Governments under bilateral or multilateral arrangements with various donors. A necessary pre-condition for any such initiation will be the successful carrying out of control operations in the proposed project areas.

Institutional Framework

FAO, IBRD, UNDP and WHO comprise the Steering Committee for Onchocerciasis Control in the Volta River Basin Area. The Committee comprises the personal

representatives of the heads of these four organizations and has the general mandate of ensuring coordination of action, mobilizing support, and advising on and endorsing forward planning for the work.

The project's headquarters is located in Ouagadougou (Upper Volta) from where operations in the various sectors foreseen will be managed by a Project Manager assisted by experts and consultants in entomology, parasitology, ophthalmology, hydrobiology, medical statistics, economics, etc.; the project will also have an administrative officer and sufficient support personnel.

In order to effect the progressive integration of other elements and projects engaged in the area on onchocerciasis control work, the Steering Committee has called for the merging into the major project of the UNDP-assisted Onchocerciasis Advisory Team (RAF/68/758) assigned as a regional project, to Ghana, Togo and Upper Volta and operating from Bolgatanga, Ghana.

The present regional project therefore integrates the functions of the former Onchocerciasis Advisory Team whose work henceforward will be directed from the operational headquarters at Ouagadougou. Bolgatanga will thus act as one of the project's sub-centers for operational research.

At the field level, the regional project will maintain close working relations with OCCGE and the WHO International Reference Center on Insecticides at Bobo-Dioulasso, Upper Volta. Links will also be continued, as during the PAG Mission's operations, with the offices of the seven UNDP Resident Representatives, and the FAO Regional Office, senior agricultural advisors and country representatives.

At the country level, the government cooperating agencies primarily concerned with the 1974 work are the Ministries of Health of the seven countries. During the year, however, the other Ministries and government departments which will be involved in the campaign itself, the resettlement program and the economic

development projects, will be brought into the picture.

As anticipated, the national authorities for onchocerciasis control have been established by the participating governments in accordance with the recommendations of the Steering Committee.

Provision is made under the project for technical contacts at the inter-country level to facilitate consultations between the national counterpart elements entrusted with the respective country responsibilities in preparing for the campaign

Within the Executing Agency, a special program team is being entrusted with the overall duties of planning, implementation and monitoring of the project and of carrying forward the detailed planning of the campaign itself. This program team is located in WHO headquarters and maintains direct contact with project headquarters of the Associate Agency, FAO. In addition, the program team will serve as secretariat to the Steering Committee and maintain policy and implementation with UNDP links and IBRD.

Special arrangements have been made with the WHO network of collaborating laboratories and international and/or regional reference centers, especially those dealing with insecticide formulations and screening and with drug evaluation.

Provisions for Government follow-up

The main responsibility of each participating Government and its national authorities will of course be their full and active role in the Onchocerciasis Control Campaign which started on a phased basis, in 1974 and ^{will} last for nearly two decades; during this period each Government will accord a major priority to the control of the vector, the development of the reclaimed areas and resettlement.

To this end, and as said above under the description of the institutional context of the scheme, each Government will be encouraged to establish appropriate

structures at the country level to contribute to the implementation of the future basin-wide campaign. Such entities should have the necessary authority to mobilize the national inputs needed and each may be headed by a National Director for Onchocerciasis Control

Medical field units and national and/or federal research institutions of the seven countries involved will contribute to the investigations and field trials as well as to the training of the national specialists required by the future campaign.

After an attack phase of three years and a surveillance phase (the duration of which has yet to be determined), each national authority will be invited to assume full responsibility for the maintenance of the control program within its borders and in unison with the progress of the general campaign. As to the development programs, it is anticipated that these may, for the most part, be run from the outset with multilateral or bilateral assistance.

The attack phase of the program commenced in October 1974 in Zone I Part I and will commence (see page 14/ for areas to be covered each year);/October 1975 in Zone II, and October 1976 in Zone III.

Progress as of June 1974

The WHO program director, Dr. Ziegler, assumed his functions in Ouagadougou as of January 1, 1974. Dr. Marcus Candau will be invited to assume the chairmanship of the Joint Coordinating Committee. The JCC will hold its first meeting in Abidjan, February, 1975. The most recent Executing Agency progress report for the program is attached as Annex 3.

General financial procedures:

The grants that were made during 1974 by the six donor Governments and by the UNDP and the Bank were paid into a separate account administered by the Bank under the Onchocerciasis 1974 Fund Agreement concluded in March 1974. Financial procedures are described in the Agreement, attached as Annex 5. It is anticipated that a similar fund will be utilized for the remainder of the six-year program under guidelines established through an agreement similar to the Onchocerciasis 1974 Fund Agreement. As Executing Agent for the program, WHO will submit applications for withdrawal of funds quarterly based upon estimated payments to be made during the following quarter.

Contributions of the participating Governments

Each of the participating Governments concerned has agreed to give high priority throughout the duration of the program to onchocerciasis control and to the development and settlement of the reclaimed areas. The health services and the national and/or federal research institutes of these countries will contribute to the basic and applied research that is necessary for the proper execution of the program and will help to train the required numbers of national specialists. Each of the Governments has agreed to cooperate unreservedly with the Executing and Associate Agencies so that the program can be carried out under optimum conditions.

Protocols with each of the seven participating African governments establish regulations regarding legal arrangements, sub-contractors and their personnel, customs and tax exemption, documentation, technical information and reports, overflight and landing rights, assistance from aviation services, telecommunications network, sites and construction, water, electricity, postal services, and disposition of equipment and supplies.

Interest

The Bank has confirmed to AID that neither it nor WHO will earn interest on the U.S. contribution, or if either does earn such interest, it will be returned to the USG (IBRD, Acting Regional Vice President for Western Africa, E. Peter Wright, letter of March 1, 1974, to the AA/Africa).

Procurement

Untied grants are being made to the Onchocerciasis Trust Fund by the multi-donors. While some donors would prefer tied grants, the Steering Committee has been able to convince the donors that untied grants are imperative for a program of this size and scope. Procurement of goods and services will be through worldwide bidding. SER/Commodity Management confirms that U.S. businesses would be in a position to compete, particularly in the areas of aircraft contracts and larvicides. A substantial part of the expenditures, however, will consist of personnel costs, the acquisition of buildings and commodities, and local operational costs.

Evaluation Plan

Three panels or committees have been created within the administrative structure of the program, which will ensure timely, independent, evaluation of the total Onchocerciasis Control Program (See Sec. II, Administrative Analysis, Page 55). Each of these structures will submit annual reports to the Joint Coordinating Committee directly or through the Steering Committee on technical, economic development, and ecological aspects of the program. For this reason, A.I.D. and other donors will not carry out separate evaluations of the program, which would be administratively unwieldy. However, any of the donors, including the U.S., will have the opportunity to analyze these reports and to submit their comments and recommendations to the JCC. It is expected that all donors

will base their future contributions on the overall performance and direction of the program. In order to assure A.I.D.'s responsibilities to ourselves and to the Congress, we will undertake a thorough examination of the program at the end of the third year, based on the trend of annual reports to the JCC, and the informal input of our A.I.D. field staff in the control areas (the Entente States plus Mali and Ghana). It is on this basis that the Agency can fulfill its evaluative responsibilities and make recommendations to the Administrator regarding the continued participation of the Agency in the program.

The Ecological Panel has already submitted its first report to the JCC after examining the larvicide to be used in the program and considering WHO plans for monitoring the environmental and associated health consequences of the program.

The Technical Advisory Group will meet independently to evaluate technical progress at least twice a year, and more often as necessary. While the TAG will evaluate the program primarily on the basis of technical considerations, management considerations will be an important element.

The baseline data for the evaluations will be derived from FED/FAC pilot studies gathered for what has been incorporated into the program rationale. The Annexes and numerous Sub-Annexes to the PAG Report provide the baseline data for the entire program, and are the summary documents for the functional sections and/or geographical areas. The complete list is attached at Tab C. Every section will utilize this data, continuously update and expand this data, and evaluate performance and progress against program benchmarks, both vertically in terms of the functional sections, and horizontally by geographic areas (country, departments/regions, selected villages, selected population clusters, etc.).

The Economic Development Advisory Panel inter alia will monitor and evaluate progress concerning the planning and implementation of socio-economic development activities in the program area.

page 65 deleted)

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ANNEXES

1. Environmental Impact
2. PAG Report: List of Technical Annexes
3. June 1974 Progress Report - Onchocerciasis Control
Program in the Volta River Basin Area
4. Proposed Management Structures - Organogram
5. Onchocerciasis 1974 Fund Agreement
6. Detailed Program Budget
7. Logical Framework Matrix
8. Map: Onchocerciasis Program Area

ANNEX 1 Environmental Impact Statement

In 1973 an Ecological Panel composed of internationally-known specialists was appointed by the Steering Committee to study ecological problems connected with the onchocerciasis program, monitor program results and make recommendations to ensure effective protection of the environment in the program area.

The Panel, headed by Dr. James A. Lee, a noted public health expert, is composed of individuals with wide experience in river basin ecology, the epidemiology of diseases in river basins and the ecological effects of pesticides.

After the Panel meetings and an in-depth review of WHO plans for carrying out the Control Program, the Panel issued its first report (June 1974). The Panel's finding which we will report below indicates that the program should not lead to any serious untoward consequences for the environment, the biota, or human health. The Panel's continued surveillance of the program should ensure that any unforeseen environment-degrading effects of the program will be spotted quickly and necessary program modifications made.

Statement of the Ecological Panel (June 26, 1974)

The Panel has examined the pesticide to be used; its formulation, nature and rate of application, and toxic properties, and has indicated its approval of it on all counts. The Panel is of the opinion that, on the basis of information previously developed, including laboratory and field tests, it does not expect any serious, untoward consequences for the environment, the biota, or human health.

Realizing, however, that predictions relating to natural systems can be risky, the Panel has carefully considered the WHO program and plans for monitoring the environmental and associated health consequences of the Control Program. With few minor modifications, it has found the proposed monitoring efforts to be both

adequate and sufficient. Such efforts are designed to signal any unexpected, serious threats to the environment, acting much as an "early warning system", thus allowing time for appropriate remedial action to be taken before irreversible, unwanted effects set in. Also, by utilizing untreated control sites for monitoring purposes, changes occurring in the treated areas can be both qualitatively and quantitatively correlated - thereby providing information on the nature, scope, severity and timing of the impacts on the environment.

The Panel is pleased with the approach taken by the WHO in this regard, and it will work closely with WHO in evaluating the effectiveness of the monitoring program, and in recommending any changes or modifications believed needed.

Suffice to say, Mr. Chairman, that this large-scale program is to be carried out with a conscious regard and concern for the ecology of the treated area; that appropriate safeguards have been incorporated, and these will be systematically monitored to determine their efficacy; and the Panel serves in an overview capacity to ensure that both the nature and level of ecological changes resulting from the Control Program are acceptable, and not prejudicial to the long-term environmental and human ecological welfare of the affected nations and their peoples.

LIST OF TECHNICAL ANNEXES

ANNEXES TO INTRODUCTION

- O-1 Terms of Reference of the Preparatory Assistance Mission to the Governments of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta
- O-2 Terms of Reference of the Steering Committee for Onchocerciasis Control in the Volta River Basin Area
- O-3 Operational Research, Field Investigations and Training Programme (1973)

ANNEX TO CHAPTER I - THE PROGRAMME AREA: PHYSICAL, HUMAN AND ECONOMIC GEOGRAPHY

- I-1 Physical, human and economic geography of the Volta River basin area

ANNEX TO CHAPTER II - ONCHOCERCIASIS: PARASITE AND DISEASE

- II-1 Chemotherapy of onchocerciasis; practice, prospects and needs

ANNEXES TO CHAPTER III - ONCHOCERCIASIS: VECTORS AND TRANSMISSION

- III-1 The distribution and biology of the vector and transmission of onchocerciasis
- III-2 Principles and methods of Simulium damnosum control in the Volta River basin area
- III-3 The control of Simulium damnosum and the prevention of environment contamination; technical criteria for the selection of insecticides
- III-4 Recent and ongoing evaluations of insecticides and equipment for controlling Simulium damnosum in the Volta River basin area

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- IV-1 Epidemiological aspects of onchocerciasis in the Volta River basin area
- IV-2 Prevalence of onchocerciasis and blindness in the Programme area, baseline data and data sources
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ANNEXES TO CHAPTER V - PROGRAMME FOR THE CONTROL OF ONCHOCERCIASIS AND PLAN OF OPERATION

- V-1 Report on Informal Consultation on Simulium damnosum Control in the Volta River basin area, West Africa
- V-2 Plan of operations and estimated cost of Simulium damnosum control campaign in the Volta River basin area
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- VI-2.A Background data and proposed integrated rural development projects in Upper Volta
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- VI-2.D Background data and proposed integrated rural development project in Togo
- VI-2.E Background data and socio-economic development aspects of onchocerciasis control in Dahomey
- VI-2.F Background data and socio-economic development aspects of onchocerciasis control in Mali
- VI-2.G Background data and socio-economic development aspects of onchocerciasis control in Niger
- VI-3 Concise study of supplementary economic development projects
- VI-4 The establishment of handicrafts and commerce and the provision of credit in the repopulation zones
- VI-5 The methodology of the economic analysis



WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTÉ

ONCHOCERCIASIS CONTROL PROGRAMME
IN THE VOLTA RIVER BASIN AREA

PROGRESS REPORT

Submitted by the World Health Organization as
Executing Agency for the Programme

A. INTRODUCTION

1. This progress report covers the initial months of the Programme itself which started in January 1974.
2. During 1973 preparations were completed for the launching of the Programme. Among these measures was the release on 20 August 1973 of the Report of the PAG Mission together with its technical annexes. Soon after its general release, the strategy of the Programme as proposed in the Report was presented by a joint IBRD/WHO Mission to each of the seven Participating Governments and its implications were discussed, including the timing of the control operations, the future economic development, Government contributions in cash or kind, the establishment of National Onchocerciasis Committees and the Agreements for the Programme.
3. This was followed by the Accra Inter-governmental Meeting of the seven Participating Governments and the sponsoring agencies held from 30 October to 1 November 1973 which endorsed the PAG Mission Report. An Agreement governing the operations of the Programme was signed by the seven countries and WHO.
4. A further preparatory step consisted in a WHO mission to the seven countries to determine in detail the contribution of each Government to the Programme. This resulted in individual Country Protocols which constitute supplements to the Operational Agreement and which reflect contributions by the countries in staff, infrastructure, cash, etc. The Protocols relevant to the four countries (Ghana, Ivory Coast, Mali and Upper Volta) involved in Phase I of the Programme have been submitted for signature.
5. In October 1973 a WHC/UNDP mission of information officers visited the Programme area to collect background and photographic material depicting the effects of the disease and the scope of the Programme envisaged. This mission has provided valuable material, together with the IBRD film, "A Plague on the Land", for use by press, radio and TV in both a number of developed countries and the countries of the Programme area. The Executing Agency, in collaboration with the other sponsoring agencies and with the Information/Communications Officer assigned to Programme Headquarters, will continue to give close attention to the information needs of the Programme.

Towards the end of 1973, the four sponsoring agencies entered into an Administrative Agreement for the management of the Programme which specifies the role of the various component parts including the Steering Committee, the Ecological Panel, the Executing Agency, the Associate Agency, the Special Fund for Onchocerciasis and the National Onchocerciasis Committees.

1. The Steering Committee for Onchocerciasis Control in the Volta river basin area which was established by the Executive heads of UNDP, FAO, IDRD and WHO in 1972 has continued to review progress and coordinate action for the Programme as a whole. It has so far held nine sessions. The Secretariat for the Steering Committee is provided by WHO Headquarters.

2. As recommended by the Steering Committee, the Ecological Panel, consisting of experts designated by the sponsoring agencies to monitor ecological problems connected with the Programme and report thereon to the Committee, was set up and two meetings have so far taken place. The Ecological Panel will continue to meet periodically.

3. With regard to the Scientific Advisory Panel which is being set up to advise the Executing Agency on technical aspects of the Programme, WHO has contacted leading scientists working in all aspects of onchocerciasis epidemiology, vector biology and control and is analysing the 200 positive replies received.

4. From the outset the concept of National Onchocerciasis Committees has been accepted as the most positive way of providing a coordinating machinery for the Programme at the national level and a link between each Government and the Headquarters of the Programme itself. It is a matter of gratification that each of the Participating Governments has established its National Onchocerciasis Committee in which the various ministries involved in the control campaign and the future economic development of the freed areas are represented.

3. 1973 INTERIM PROJECT

11. The activities of the 1973 Interim Project form a separate report submitted by the Executing Agency. This report includes the results of the aerial spraying trials in the Comoé-Léraba river basin.

3. FINANCIAL ARRANGEMENTS

12. The Bank group undertook to provide \$ 750 000 under the Interim Special Fund Agreement as its contribution to the first year (1974) operations of the Programme. In response to the Executing Agency's request for funds to enter into firm commitments for essential personnel, transport and supplies needed for the launching of the Programme, IDRD made available on 9 January 1974 an advance allocation of \$ 375 000.

13. The Interim Special Fund Agreement involving \$ 7.5 million for the first year became effective on 1-March-1974 making possible disbursements and commitments for the whole year 1974, estimated at \$ 4.6 million and \$ 2.9 million respectively. During the first four months of operations total obligations amounted to over \$ 600 000 and an additional \$ 400 000 approximately were under commitment against the Special Fund. It is certain that the rate of disbursement will accelerate

significantly during the second half of 1974 with the award of the contracts for insecticide and aerial operations, the increased recruitment of General Service staff needed for Programme Headquarters and for the various sectors, the start of entomological surveillance in sectors and subsectors, and the implementation of research work for which the agreements are presently in preparation.

14. Parallel with this UNDP approved in February 1974 the Applied Research (Epidemiology and Chemotherapy) and Training component of the Programme with a provision of \$ 1.2 million for the years 1974-76 and an allocation of \$ 317 000 for 1974. This contribution is made under UNDP's regional programme for Africa and constitutes a continuation of the support provided in 1971-73 towards the preparatory work which permitted the development of the strategy for the Programme.

D. IMPLEMENTATION OF THE PROGRAMME

15. Office of the Programme Director. The advance allocation permitted the Executing Agency, after consultation with the other sponsoring agencies, to appoint the Programme Director who, after initial secondment to the Programme in November 1973, formally assumed his functions as of 1 January 1974 in Ouagadougou.

16. The post of Director's assistant will probably be filled by the transfer of an experienced WHO staff member.

17. The post of Information/Communications Officer in the Office of the Director, the terms of reference for which were prepared in consultation with the Steering Committee at its ninth session (April-May 1974) will be filled, as planned, during the second half of 1974.

18. Simulium Control Operations Unit. The Project Manager of the 1973 Interim Project located in Ouagadougou continued his activities as a WHO consultant (pending release from ORSTOM), filling as from 1 January 1974 the post of Chief of the Simulium Control Operations Unit of the Programme. Two further posts, namely the Entomologist in charge of Aerial Operations who also participated in the 1973 Interim Project and the Entomologist responsible for Ecology were also appointed, the first from 1 January 1974 and the second from 22 April 1974. The Executing Agency is in the process of approaching possible candidates for the third Entomologist post as well as for the two Operations Officers, one for entomological surveillance and the other for the aerial operations. With the filling of these posts this key unit will have its full complement of professional staff.

19. Three of the four entomologists to act as chiefs of the sectors to become operational in 1974 have also been recruited by WHO; the fourth is completing his studies at the Onchocerciasis Entomology Centre of OCCGE at Bouaké, Ivory Coast. The incumbents of these posts are nationals of the participating countries.

20. Ancillary staff for the unit has been recruited or is under recruitment. For the Sikasso (Mali) Subsector an assistant entomologist was recruited on 1 May 1974 and the Subsector is operational.

11. Administrative Services Unit. While arrangements were being made for the recruitment of the senior administrative staff for this unit, to ensure continuity the functions were discharged by the WHO administrative officer who had served with the 1973 Interim Project. He was subsequently joined by senior administrative and financial staff detached from WHO Headquarters to organize local personnel recruitment and training; to prepare office accommodation and facilities; to make financial and budgetary control arrangements; and to establish local procurement and other facilities. In the meantime WHO recruited a Senior Administrative Officer who joined the Programme in April. The Supply Officer, the Administrative Services Officer and a Personnel Officer have also been assigned and will take up their positions in the near future. They will be supported on a temporary basis, until the unit is fully established, by the secondment of specialized staff from WHO Headquarters.
12. Junior administrative, clerical and secretarial personnel, as well as ancillary staff, are recruited as required locally and within the Programme area.
13. It should be pointed out that a certain amount of in-service training is being organized for these staff. As stipulated in the Operational Agreement, all staff including those engaged within the Programme area will have the status of WHO employees with contracts issued in accordance with the WHO Staff Regulations and Rules.
14. Onchocerciasis Epidemiology and Public Health. Recruitment for the posts of Chief Epidemiologist and the evaluation teams is under way so that they can be filled in the latter part of 1974 as planned.
15. Economic Development Unit. The terms of reference for the Economist to head this unit were agreed upon by the Steering Committee at its eighth session (February 1974) and recruitment is being undertaken by FAO against funds made available from the Special Fund by WHO.
16. Buildings. Programme Headquarters is installed in two villas that have been rented in Ouagadougou and fitted out as offices; the former offices of the PAG Mission, made available to the Programme by the Government of Upper Volta, continue also to be used to house the Simulium Control Operations Unit.
17. Negotiations are under way for the Programme to acquire a group of three villas to replace the present accommodation; these will be converted and extended so that by the end of 1974 the Headquarters services will be together at a single location.
18. Programme staff have visited the seven countries to inspect buildings that might be used as bases for sectors and subsectors. Some of these buildings, which are Government property, will be made available to the Programme free of charge; others are private buildings that will be rented by the Governments for the needs of the Programme; yet other buildings will be rented or built at the expense of the Programme. In all cases where construction is necessary, the Governments will provide the Programme with land free of charge.
19. Supplies and equipment. The equipment and furniture needed for the various units of the Programme Headquarters and for the entomological surveillance sectors and subsectors have been obtained or are on order. The transport pool is being established and vehicles of different types have been already purchased or are on order.

30. The necessary action has been taken for the procurement of the insecticide for the 1974 spraying operations and for its distribution to three operational centres by 1 October 1974.

31. Contract for aerial operations. The aerial operations will start on 15 October 1974. In preparation for this, a circular letter setting out the requirements of the Programme and inviting aerial spraying companies to provide information regarding the number and type of aircraft they operate, previous work undertaken, and details of their staff, was sent by the Executing Agency to about 700 companies. The replies were examined by a technical committee of aviation and spraying experts which drew up a short list of companies whose equipment and staff met the requirements of the Programme. These companies were then sent an invitation to tender and a draft contract. The tenders will be examined by a selection committee and the contract concluded in good time.

32. Telecommunications. Following preliminary discussions with the International Telecommunications Union (ITU) towards setting up a radio network, it was decided to hold a meeting in Abidjan of telecommunications specialists of the seven countries of the Programme as a together with ITU and the Programme representatives. It is expected that as a result of the meeting two frequencies from among those allocated to the seven countries can be made available for technical and logistic needs of the Programme.

33. Applied research. The following research activities of the Programme are under preparation:

(a) Research on epidemiology and chemotherapy. A research programme on the epidemiology, transmission and chemotherapy of onchocerciasis has been developed and will be submitted to the Royal Commonwealth Society for the Blind so that the Society may make available to the Programme one of its ophthalmologists stationed in Ghana.

(b) Research on environmental protection. During May 1974 WHO organized a meeting of specialists in hydrology, ecology and insecticide chemistry in order to draw up a protocol for monitoring the effects of the campaign on the aquatic environment for submission to the Ecological Panel. The corresponding research will be subcontracted to specialist bodies in the Programme area or elsewhere.

(c) Research on insecticides. Research protocols on new insecticides, their formulations, and their biodegradability are being prepared.

(d) Research on the sensitivity of the vector to insecticides. Preparations have been made to study from September onwards the development of simple techniques applicable under field conditions for evaluating the sensitivity of blackfly larvae to insecticides. Systematic control of this sensitivity using currently available techniques will be undertaken throughout the Programme area before insecticide treatment begins.

(e) Research on equipment. A contract has been signed for the improvement of the "rapid release" system developed in 1973 for insecticide spraying from aircraft. The modified prototype will be made available to the company that is awarded the contract for the aerial work so that this spraying system can be fitted to its own aircraft.

.. Training. An agreement has been signed between the OCCGE, ORSTOM and WHO for the specialist training of entomologists who are to work for the Programme and the training of assistant entomologists and entomology technicians. This training - financed under UNDP - will be provided by the OCCGE Onchocerciasis Entomology Centre in Douaké and will last up to six months for entomologists, four months for assistant entomologists and technicians. At present five technicians from Ivory Coast and two from Upper Volta, and one Ivory Coast entomologist are undergoing training at the Bouaké Entomology Centre.

E. WHO HEADQUARTERS SUPPORT UNIT

35. The special unit charged with the coordination of all activities related to the Programme has been functioning for over a year at WHO Headquarters. The staff of this unit consists of two entomologists, an administrative assistant, and secretaries. The unit maintains close contact with the Programme Director at Ouagadougou for which purpose a diplomatic pouch and telex service have recently been established. It has special working links with the WHO Regional Office at Brazzaville and collaborates closely with the other technical and specialized units and divisions at WHC Headquarters. Contacts with the headquarters of the other sponsoring agencies are also channelled through WHO Headquarters.

36. During the first quarter of 1974, most of the unit's activities were devoted to administrative backstopping of the field Programme - selection and recruitment of Programme personnel, ordering of supplies and equipment, etc.

37. In addition, this unit was responsible for the preparation, in consultation with the Governments concerned, of the Country Protocols of the four countries concerned in Phase I of the Programme; the Protocol for monitoring of the aquatic environment; the agreement for the training of entomological surveillance personnel; the invitation to bid for the aerial operations; the telecommunications meeting at Abidjan, and the document on the Programme presented to the World Health Assembly that took place in Geneva in May 1974.

38. Other work presently under way includes the setting up of the Scientific Advisory Panel and the preparation of the agreements for research on entomology, ecology, epidemiology and chemotherapy.

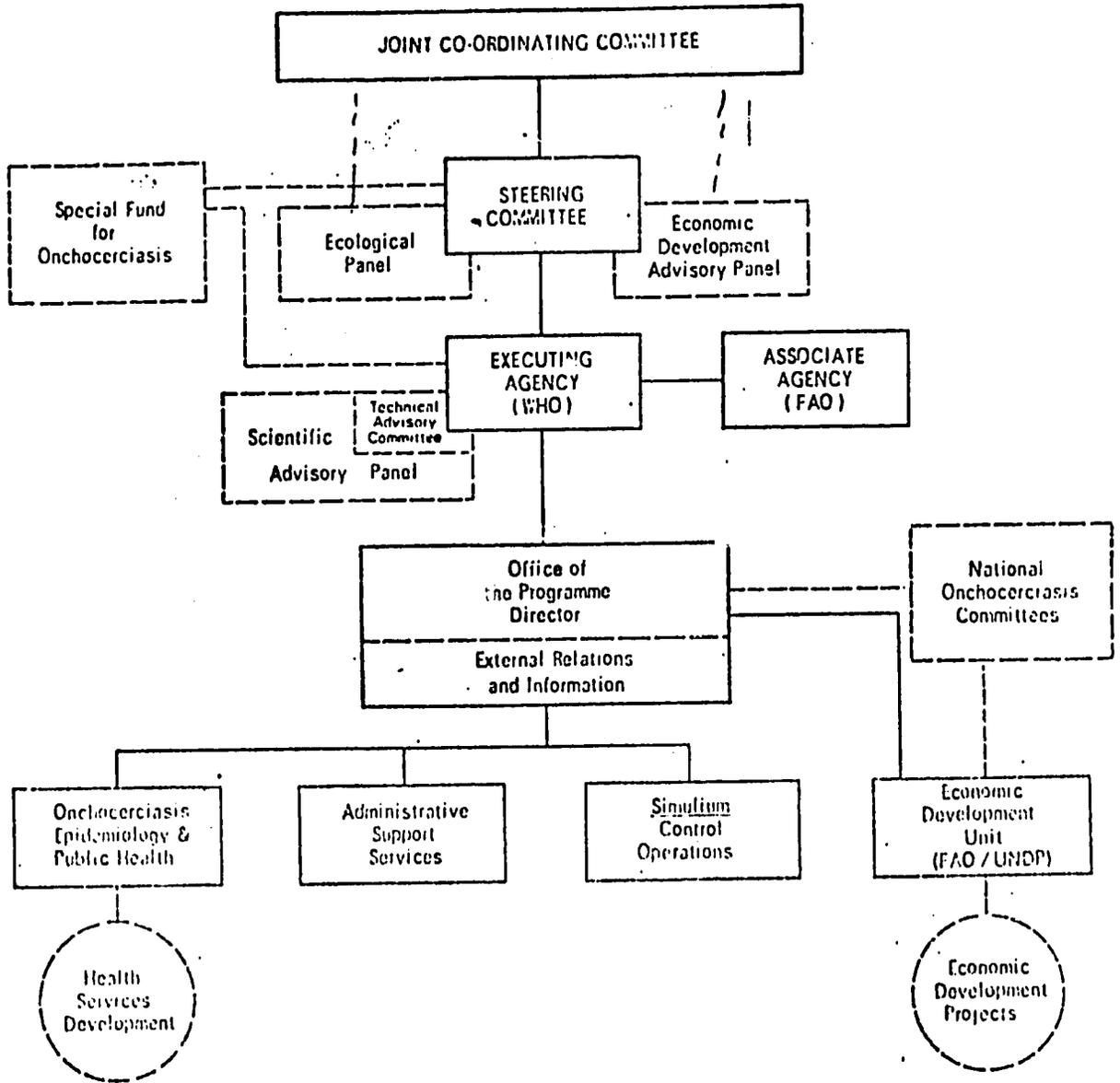
39. Technical assistance was given in the preparation of the 1974-79 budget and the Project Document for the UNDP component of the Programme (Applied Research and Training).

F. PROSPECTS FOR THE REST OF 1974

40. Now that the necessary funds are available the Executing Agency can accelerate all measures to ensure that the Programme is given a firm basis of operation as soon as possible. Above all, the recruitment and training of personnel will be speeded up and it is anticipated that the entire staff of the Programme Headquarters will be in place by October. All sectors and subsectors involved in Phase I of the Programme will be operational from July onwards; arrangements are under way for the preparation or construction of all buildings required for this Phase including storage facilities for fuel and insecticide.

41. Larviciding operations are scheduled to start on 1 November 1974 after a fortnight of aerial reconnaissance to finalize the entomological surveys and for the briefing of pilots on flight plans.
42. Preparations are being made to order equipment and supplies for 1975 having long delivery dates so that a smooth delivery pattern can be maintained.

ONCHOCERCIASIS CONTROL PROGRAMME IN THE VOLTA RIVER BASIN AREA: PROPOSED MANAGEMENT STRUCTURES



Onchocerciasis 1974
Fund Agreement

DATED *March 1, 1974*

ONCHOCERCIASIS 1974 FUND AGREEMENT

AGREEMENT between the Governments of CANADA, the REPUBLIC OF FRANCE, the KINGDOM OF THE NETHERLANDS, the UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND, the UNITED STATES OF AMERICA, the INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (the Bank), the INTERNATIONAL DEVELOPMENT ASSOCIATION (the Association), the UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) and the WORLD HEALTH ORGANIZATION (WHO).

WHEREAS (A) the Report of the Mission for Preparatory Assistance to the Governments of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta (hereinafter referred to collectively as the Participating Governments) proposes a strategy for Onchocerciasis Control in the Volta River Basin Area and for the future economic development of reclaimed areas (hereinafter called the Programme);

(B) on November 1, 1973, the Participating Governments entered into an Agreement Governing the Operations of the Onchocerciasis Control Programme in the Volta River Basin Area (attached as Annex I hereto) to which WHO is also a Party and, pursuant to such Agreement have endorsed the role of (i) the Bank to assist in finding external assistance to finance the cost of the Programme and (ii) WHO to act as the Executing Agency for the carrying out of the Programme;

(C) it is expected that certain governments and organizations will soon consider the means to contribute to the financing of the first six year phase of the Programme but that some time may lapse before arrangements to that effect will be agreed upon;

(D) it is essential that before the arrangements referred to in (C) above are concluded, work on operations forming part of the first phase of the Programme, which have so far been financed by a number of contributors, including the United Nations Development Programme, the European Development Fund, the Republic of France and the Federal Republic of Germany, be not interrupted for lack of funds;

(E) each of the Governments of Canada, the Republic of France, the Kingdom of the Netherlands, the United Kingdom of Great Britain and Northern Ireland and the United States of America, and the Bank and/or the Association have agreed to assist in the financing of the cost, at present evaluated at about seven million five hundred thousand dollars (US\$7,500,000), of services, buildings and equipment relating to the operations for the calendar year 1974 thereafter called the Initial Stage of the Programme) described in Annex II to this Agreement, by contributing the amount specified opposite its name below:

Canada	Can\$	500,000	
France	F	1,000,000	
Netherlands	US\$	1,000,000	
United Kingdom	£	425,000	
United States	US\$	1,000,000	
The Bank	US\$	375,000	} 750
The Bank and/or the Association	US\$	375,000	

(F) each of the Governments of the Federal Republic of Germany and the United States of America (hereinafter, collectively with the Governments listed in (E) above and any government which would accede to this Agreement, called the Donors) has indicated its intention, subject to legislative approval or other action, to contribute additional amounts for the financing of the Initial Stage of the Programme.

(G) (i) WHO has agreed to act as Executing Agency in carrying out the Programme, including its Initial Stage, and (ii) the Bank has agreed at the request of the Donors to establish and administer an Onchocerciasis Special Account (hereinafter called the Account) consisting of the contributions set forth in (E) above;

NOW THEREFORE, the parties hereto agree as follows:

ARTICLE I

The Account; Contributions to the Account; Disbursements from the Account

Section 1.01. The Bank shall open the Account on its books and shall, on the date of entry into force of this Agreement, pay and credit thereto an amount in various currencies equivalent to United States dollars three hundred and seventy five thousand (US\$375,000). The Bank shall credit to the Account: (i) the amount of each Donor's contribution as the same shall from time to time be transferred to the Bank for the purposes of this Agreement, and (ii) out of its own funds and/or funds contributed by the Association such additional amounts in various currencies not to exceed in the aggregate the equivalent of United States dollars three hundred seventy-five thousand (US\$375,000) between July 1 and December 31, 1974. All monies credited to the Account shall be used only for the purposes and in accordance with the provisions of this Agreement.

Section 1.02. (a) Upon the entry into force of this Agreement the Bank shall promptly notify each of the Donors referred to in paragraph (a) of Section 4.01 of this Agreement of the amounts required to be paid by it by a specified date as part of its contribution to the Account to cover the estimated payments to be made by WHO during the quarterly periods referred to in Section 1.05 of this Agreement.

(b) Upon the date on which this Agreement shall, in accordance with the provisions of paragraph (b) of Section 4.01 of this Agreement, take effect in respect of any Donor other than those referred to in the preceding paragraph of this Section, the Bank shall promptly notify each such Donor of the amount required to be paid by it by a specified date as part of its contribution to cover the estimated payments to be made by WHO during the quarterly period, or the remaining balance thereof, referred to in Section 1.05 of this Agreement.

(c) To the extent possible over the nine month period ending September 30, 1974, the Bank shall request the Donors to pay the amounts referred to in this Section substantially *pro rata* to the respective amounts of their total contributions to the Account.

Section 1.03. The Account and all monies credited thereto shall be held in trust and kept separate and apart from all other accounts and assets of the Bank.

Section 1.04. The Bank shall pay to, or on the order of, WHO out of the monies in the Account for payments to be made by WHO pursuant to this Agreement after the date of its entry into force (and payments made by WHO before that date but after January 1, 1974).

Section 1.05. When WHO shall desire to withdraw any amount from the Account, WHO shall deliver to the Bank a written application therefor. Except as the Bank and WHO shall otherwise agree, any such application shall be submitted on a quarterly basis on account of estimated payments to be made during the following quarter; provided, however, that WHO shall be entitled to include in the first application amounts paid by it between January 1, 1974 and the date of such application.

Section 1.06. The Bank shall send to each of the Donors a quarterly report containing appropriate information with respect to disbursements of, and balances in, the Account.

ARTICLE II.

undertakings of UNDP

Section 2.01. UNDP shall, subject to its internal policies and procedures and pursuant to an agreement to be concluded with the Participating Governments, provide and bear the cost of expenditures for training and chemotherapeutic research during the initial stage of the Programme at present evaluated at about three hundred thousand dollars (US\$300,000).

ARTICLE III

Undertakings of WHO

Section 3.01. (a) Amounts disbursed from the Account shall be used by WHO exclusively to finance the cost of goods and services required to carry out the Initial Stage of the Programme.

(b) WHO shall furnish to the Bank all such information as the Bank shall reasonably request concerning the expenditure of the monies disbursed from the Account.

Section 3.02. WHO shall not incur obligations against the Account in excess of the amount of funds committed to the Account.

Section 3.03. WHO shall prepare for the Donors a semi-annual report containing appropriate information concerning the progress made in carrying out the Initial Stage of the Programme.

ARTICLE IV

Effective Date; Termination

Section 4.01. (a) This Agreement shall remain open for signature until July 1, 1974, or such other date as the Bank and/or the Association and WHO may determine and shall enter into force and effect on the date on which it shall have been signed without reservation by the Bank, the Association, UNDP, WHO and Donors indicating contributions in an amount of not less than the equivalent of United States dollars three million seven hundred fifty thousand (US\$3,750,000). The Bank shall, on such date, notify all the other Parties named in the Preamble to this Agreement that it has opened the Account in accordance with the provisions of Section 1.01 of this Agreement.

(b) This Agreement shall take effect in respect of each of the Donors other than those referred to in paragraph (a) of this Section on: (i) the date on which each such Donor shall sign it without reservation, or (ii) if such Donor has signed it with reservation as to acceptance, on the date on which such Donor shall have notified the Bank of its acceptance. The Bank shall promptly after such date notify each of the other Parties to this Agreement.

Section 4.02. (a) This Agreement may be terminated by the Bank and/or WHO, after consultation with the Donors, by at least 90 days' notice in writing to the other Parties to this Agreement.

(b) Without any limitation upon the provisions of paragraph (a) of this Section this Agreement shall terminate: (i) upon the completion of the Initial Stage of the

GENERAL FUNCTIONS OF COUNCIL HONORARY
AND NON-HONORARY MEMBERS

By *Arthur Keith*
Arthur Keith
Honorary Representative

Dec 12-25-44, 1944

GENERAL STATUS OF THE ICA

Arthur Keith
Arthur Keith
Honorary Representative

Dec 12-25-44, 1944

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

By *E. Peter Wright*
E. Peter Wright

Dec 12-25-44, 1944

INTERNATIONAL INVESTMENT ASSOCIATION

By *E. Peter Wright*
E. Peter Wright

Dec 12-25-44, 1944

UNITED NATIONS DEVELOPMENT PROGRAMME

9 - *Pisces*

DATE 1 March 61

WORLD HEALTH ORGANIZATION

W. H. O.

DATE February 61

SECRET
Classified Information
Distribution Control
(Subject to change)
Classification
December 1, 1974

NOT A USE CLASSIFICATION

COMMERCIALSIS 1974 FUND
AGREEMENT

NOT A USE CLASSIFICATION

11/30/73

ONCHOCERCIASIS 1974 FUND
AGREEMENT

AGREEMENT between [List the Donor Governments], the INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (the Bank), the INTERNATIONAL DEVELOPMENT ASSOCIATION (the Association), the UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP) and the WORLD HEALTH ORGANIZATION (WHO).

WHEREAS (A) the Report of the Mission for Preparatory Assistance to the Governments of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta (hereinafter referred to collectively as the Participating Governments) proposes a strategy for Onchocerciasis Control in the Volta River Basin Area and for the future economic development of reclaimed areas (hereinafter called the Programme);

(B) on November 1, 1973, the Participating Governments have entered into an Agreement Governing the Operations of the Onchocerciasis Control Programme in the Volta River Basin Area (attached as Annex I hereto) to which WHO is also a Party and, pursuant to such Agreement have endorsed the role of (i) the Bank to assist in finding external assistance to finance the cost of the Programme and (ii) WHO to act as the Executing Agency for the carrying out of the Programme;

(C) it is expected that a consultative group on Onchocerciasis Control composed of certain governments and organizations will soon consider the means to contribute to the financing of the first six years phase of the Programme but that some time may lapse before arrangements to that effect will be agreed upon;

(D) it is essential that before the arrangements referred to in (C) above are concluded, work on operations forming part of the first phase of the Programme, which have so far been financed by a number of contributors,

11/30/73

including the United Nations Development Programme, the European Development Fund, the Republic of France and the Federal Republic of Germany, be not interrupted for lack of funds;

(E) the Governments Parties to this Agreement (hereinafter called the Donors) and the Bank, and/or the Association have agreed to assist in the financing of the cost, at present evaluated at about seven million five hundred thousand dollars (US\$7,500,000), of the operations to be carried out during the year 1974 (hereinafter called the Initial Stage of the Programme) described in Annex II to this Agreement;

(F) each of the Donors and the Bank, and/or the Association have agreed to contribute for the carrying out of the Initial Stage of the Programme the amount specified opposite its name below:

	US\$ equivalent
A	_____
B	_____
.....
The Bank	375,000
The Bank and/or the Association	375,000

(G) (i) WHO has agreed to act as Executing Agency in carrying out the Programme, including its Initial Stage, and (ii) the Bank has agreed at the request of the Donors to establish and administer an Onchocerciasis Special Account (hereinafter called the Account) consisting of the contributions set forth in (F) above;

NOW THEREFORE, the parties hereto agree as follows:

ARTICLE I

The Account: Contributions to the Account:
Disbursements from the Account

Section 1.01. The Bank shall open the Account on its books and shall, on the date of entry into force of this Agreement, pay and credit thereto an amount in various currencies equivalent to United States dollars three hundred and seventy five thousand (US\$375,000). The Bank shall credit to the Account: (i) the amount of each Donor's contribution as the same shall from time to time be transferred to the Bank for the purposes of this Agreement, and (ii) out of its own funds and/or funds contributed by the Association an amount in various currencies equivalent to United States dollars three hundred and seventy five thousand (US\$375,000) between July 1 and December 31, 1974. All monies credited to the Account shall be used only for the purposes and in accordance with the provisions of this Agreement.

Section 1.02. (a) Each of the Donors referred to in paragraph (a) of Section 4.01 of this Agreement shall transfer to the Bank the amount of its contribution within 90 days from the date of entry into force of this Agreement or such other date as may be agreed upon by the Bank and each such Donor.

(b) Each of the Donors other than those referred to in the preceding paragraph of this Section shall transfer to the Bank the amount of its contribution within 90 days from the date on which this Agreement shall, in accordance with the provisions of paragraph (b) of Section 4.01 of this Agreement, take effect in respect of such Donor or such other date as may be agreed by the Bank and each such Donor.

12-5-73

Section 1.03. The Account and all monies credited thereto shall be held in trust and kept separate and apart from all other accounts and assets of the Bank.

Section 1.04. The Bank shall pay to, or on the order of, WHO out of the monies in the Account for payments to be made by WHO pursuant to this Agreement after the date of its entry into force (and payments made by WHO before that date but after January 1, 1974).

Section 1.05. When WHO shall desire to withdraw any amount from the Account, WHO shall deliver to the Bank a written application therefor. Except as the Bank and WHO shall otherwise agree, any such application shall be submitted on a quarterly basis on account of payments to be made during the following quarter; provided, however, that WHO shall be entitled to include in the first application amounts paid by it between January 1, 1974 and the date of such application.

Section 1.06. The Bank shall send to each of the Donors a quarterly report containing appropriate information with respect to disbursements of, and balances in, the Account.

ARTICLE II

Undertakings of UNDP

Section 2.01. UNDP shall, pursuant to an agreement to be concluded with the Participating Governments, provide and bear the cost of expenditures for training and research during the Initial Stage of the Programme [at present evaluated at about _____ dollars (\$ _____)].

ARTICLE III

Undertakings of WIO

Section 3.01. (a) Amounts disbursed from the Account shall be used by WIO exclusively to finance the cost of goods and services required to carry out the Initial Stage of the Programme.

(b) WIO shall furnish to the Bank all such information as the Bank shall reasonably request concerning the expenditure of the monies disbursed from the Account.

Section 3.02. WIO shall not incur obligations against the Account in excess of the amount of funds committed to the Account.

Section 3.03. WIO shall send to the Bank for transmittal to the Donors a semi-annual report containing appropriate information concerning the progress made in carrying out the Initial Stage of the Programme.

ARTICLE IV

Effective Date: Termination

Section 4.01. (a) This Agreement shall remain open for signature until _____ 1974 or such other date as the Bank and/or the Association and WHO may determine and shall enter into force and effect on the date on which it shall have been signed without reservation by the Bank, the Association, UNDP, WHO and Donors contributing an amount of not less than the equivalent of United States dollars _____ (US\$ _____). The Bank shall, on such date, notify all the other Parties named in the Preamble to this Agreement that it has opened the Account in accordance with the provisions of Section 1.01 of this Agreement.

(b) This Agreement shall take effect in respect of each of the Donors other than those referred to in paragraph (a) of this Section on: (i) the date on which each such Donor shall sign it without reservation, or (ii) if such Donor has signed it with reservation as to acceptance, on the date on which such Donor shall have notified the Bank of its acceptance. The Bank shall promptly after such date notify each of the other Parties to this Agreement.

Section 4.02. (a) This Agreement may be terminated by the Bank and/or WHO, after consultation with the Donors, by at least 90 days' notice in writing to the other Parties to this Agreement.

(b). Without any limitation upon the provisions of paragraph (a) of this Section, this Agreement shall terminate: (i) upon the completion of the Initial Stage of the Programme or (ii) upon disbursement from the Account of all amounts due to be disbursed from it under the provisions of this Agreement or (iii) upon the

11/30/73

entry into force of new arrangements satisfactory to the parties hereto for the financing of the Programme, whichever is earlier.

Section 4.03. Any monies remaining in the Account upon the completion of the Initial State of the Programme shall, to the extent that new arrangements shall have been made for the financing of the Programme and the Donors are in agreement therewith, be disposed of in accordance with the provisions of such arrangements. Failing such agreement by any Donor or termination of this Agreement pursuant to Section 4.02(a) of this Agreement, the Parties shall consult together as to the disposal of any monies remaining in the Account or goods purchased with the proceeds thereof.

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IN WITNESS WHEREOF, the parties hereto, acting through their representatives therunto duly authorized, have caused this Agreement to be signed in their respective names upon the dates below indicated.

FOR /DONOR GOVERNMENTS/

By _____
Authorized Representative

Date

INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

By _____

Date

INTERNATIONAL DEVELOPMENT ASSOCIATION

By _____

Date

UNITED NATIONAL DEVELOPMENT PROGRAMME

By _____

Date

WORLD HEALTH ORGANIZATION

By _____

Date

11/30/73

ANNEX I

Reproduction of the Agreement Governing
the Operations of the Onchocerciasis Control Programme
in the Volta River Basin Area dated November 1, 1973
between the Participating Governments and WHO

Amex 6

TABLE 1: REQUIREMENTS & TOTAL PROGRAMS
1976/1978 BUDGET
(in Current US \$)

ANNEX VI

	1976	1977 including impacts and contingency	1978	1979	1977	1978	1979	Total
General Costs								
Equipment Maintenance	500 000	510 000	520 000	530 000	622 750	637 675	700 410	3 641 115
Utility Services Operations	1 200 000	1 200 000	2 700 000	4 000 000	6 023 500	6 648 015	7 640 175	24 124 142
Administrative Expenses	120 000	120 000	400 000	520 000	370 000	510 000	523 165	2 616 460
Technical Support and Training								
HR HC and Related Office	510 000	530 000	550 000	560 000	671 500	610 305	664 775	3 423 880
HR TC and Related Office	80 000	80 000	87 000	70 000	80 000	87 100	83 600	418 600
Support Contracts	800 000	800 000	1 000 000	1 070 000	820 000	785 000	670 000	3 401 300
Training	70 000							
Total General Costs	3 400 000	3 372 000	4 220 000	7 200 000	8 627 250	9 322 090	9 761 145	43 743 717
Capital Costs								
Buildings	500 000	500 000	300 000	320 000	=	=	=	1 320 000
Furniture	50 000	50 000	=	=	30 000	=	30 000	100 000
Vehicles	300 000	300 000	100 000	200 000	400 000	147 400	353 700	1 711 100
Technical Equipment	200 000	200 000	80 000	200 000	13 000	60 000	115 000	751 000
Total Capital Costs	1 050 000	1 050 000	680 000	820 000	443 000	217 400	499 100	3 659 700
Contingencies								
Staff Contingency			500 000	1 100 000	1 200 000	1 200 000	1 400 000	6 000 000
Material Contingency								
Equipment Contingency								
Buildings	270 000							
Furniture	50 000							
Vehicles	200 000							
Technical Equipment	80 000							
Total Contingencies	500 000	=	=	=	=	=	=	=
TOTAL	7 250 000	5 000 000	6 820 000	9 200 000	10 400 000	10 900 000	11 700 000	53 673 417

TABLE 2: ΠΡΟΣΩΠΙΚΟ ΠΙΣΤΩΛΟΓΙΟΥ ΣΤΑΦ - ΟΥΑΓΑΔΟΥΣΟΥ

1974/1978 Budget
(in current US\$)

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	TOTAL
<u>Annual Costs</u>								
Personal Services	345 200	345 200	366 410	388 035	417 840	441 075	471 870	2 431 430
Operational Travel	66 010	66 010	64 880	65 790	66 380	67 280	68 180	300 310
Consultants	62 400	62 400	72 000	70 200	86 400	93 600	100 800	491 400
Office rent	14 420	14 420	22 800	25 100	13 100	14 500	15 000	105 320
Supplies	23 520	23 520	15 000	15 000	17 000	17 000	17 000	101 520
Operations and Maintenance	34 440	34 440	18 100	20 010	22 035	24 240	26 600	115 575
<u>Total Annual Costs</u>	546 050	546 050	559 310	594 025	622 755	657 695	700 410	3 681 115
<u>Capital Items</u>								
Buildings	150 000	150 000	250 000	250 000	-	-	-	650 000
Furniture	17 010	17 010	-	-	20 000 2)	-	20 000 2)	57 010
Vehicles	38 850	38 850	-	630	20 000	1 170	2 370	72 520
Technical Equipment	31 080	31 080	5 000	5 000	3 000	5 000	5 000	56 080
<u>Total Capital Items</u>	245 940	245 940	255 000	255 630	54 000	6 170	27 370	811 110
<u>Contingency</u>	-	-	126 005	127 605	67 740	60 035	108 210	550 585
<u>Commitments</u>								
Staff Termination Liabilities	68 100	-	-	-	-	-	-	68 100
Buildings	150 000	-	-	-	-	-	-	150 000
<u>Total Commitments</u>	227 100	-	-	-	-	-	-	227 100
<u>TOTAL</u>	1 020 000	792 890	810 315	877 350	774 415	763 800	835 980	5 034 415

1) Includes travel to technical meetings (\$ 30 350) previously shown under Contractual Services

2) Global provision of furniture for: Programme HQ (Ouagadougou),
Vector Control Operations, and
Epidemiological Evaluation.

TABLE 3: VICTOR CHEMICAL OPERATIONS

1974/1979 Budget
(in Current US\$)

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	TOTAL
Annual Costs								
Personal Services	464 660	464 660	828 090	1 212 330	1 470 185	1 573 310	1 604 415	7 213
Operational Travel	148 200	148 200	212 810	400 210	528 345	528 545	528 745	2 346
Aerial treatment Services	227 602	221 602	737 340	1 211 710	1 961 630	2 423 250	2 541 610	9 135
Office Rent	10 880	10 880	70 600	54 400	66 800	73 600	81 000	375
Operations and Maintenance	178 660	178 660	203 320	404 710	610 030	678 150	740 100	3 031
Supplies (including insecticides) a)	158 460	158 460	512 210	160 000	1 376 230	1 366 160	1 470 415	5 852
Total Annual Costs	1 211 462	1 211 462	2 763 470	4 401 440	6 023 520	6 648 015	7 080 195	28 124
Capital Items								
Buildings	388 220	388 220	105 600	87 500	-	-	-	581
Furniture	20 500	20 500	-	-	-	-	-	20
Vehicles	253 680	253 680	130 150	206 640	317 440	146 200	251 250	1 324
Technical Equipment	156 140	156 140	64 620	246 360	11 030	48 050	03 430	620
Total Capital Items	827 540	827 540	300 370	630 500	328 470	194 250	441 780	2 735
Contingency Commitments								
Staff Liabilities	112 370	-	460 005	741 210	903 035	1 014 153	1 103 070	4 223
Aerial Treatment Contract	1 600 747	-	-	-	-	-	-	-
Insecticides	310 000	-	-	-	-	-	-	-
Buildings	173 630	-	-	-	-	-	-	-
Furniture	14 700	-	-	-	-	-	-	-
Vehicles	136 500	-	-	-	-	-	-	-
Technical Equipment	14 500	-	-	-	-	-	-	-
Total Commitments	2 547 347	-	-	-	-	-	-	-
TOTAL:	1 580 340	2 039 002	3 532 815	5 773 150	7 255 825	7 857 330	8 625 915	30 047

a) Includes for insecticides: \$ 132 000 in 1974; \$ 404 000 in 1975; \$ 107 000 in 1976; \$ 1 320 000 in 1977 and 1978, and \$ 1 430 000 in 1979.

TABLE 4: ECONOMIC EVALUATION

1974/1977 Budget
(in current US\$)

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979
Annual Costs							
Personal Services	102 500	102 500	257 500	340 070	348 400	327 475	327 155
Operational Travel	13 050 1)	13 050	65 785	82 460	80 535	76 230	74 320
Office Rent	3 710	3 710	10 000	11 000	6 600	7 200	6 000
Operations and Maintenance	25 040	25 040	30 480	43 410	47 760	52 540	57 710
Supplies	3 000	3 000	41 800	44 800	48 000	51 400	55 100
Total Annual Costs	150 000	150 000	415 525	523 540	531 295	514 845	523 165
Capital Items							
Buildings	30 750	30 750	-	-	-	-	-
Furniture	8 770	8 770	-	-	-	-	-
Vehicles	60 000	60 000	-	-	81 630	-	-
Technical Equipment	22 570	22 570	11 100	11 300	11 500	11 700	12 000
Total Capital Items	131 990	131 990	11 100	11 300	93 130	11 700	12 000
Contingency	-	-	66 015	80 380	90 180	70 265	70 570
Commitments							
Staff Termination Liabilities	36 460						
Buildings	30 750						
Total Commitments	76 210	-	-	-	-	-	-
TOTAL:	358 210	282 000	492 640	615 220	714 605	665 810	614 735

1) including Flight Hours (\$ 1 050) previously included under contractual services.

(In Current U.S. \$)

FAO HQ AND REGIONAL OFFICE

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	Total
<u>Annual Costs</u>								
Personal services	356 070	356 070	292 380	316 850	343 530	372 535	404 065	2 083 820
Consultants and advisors	83 620	83 620	72 000	78 200	86 400	93 600	100 800	515 620
Operational travel	50 130	50 130	27 810	28 240	30 670	32 260	33 880	201 020
Supplies and services	20 780	20 780	16 000	16 000	16 000	16 000	16 000	102 780
Meetings	-	-	100 000	100 000	105 000	105 000	110 000	520 000
<u>Total Annual Costs</u>	510 610	510 610	508 220	541 290	581 500	619 395	664 775	3 423 240
<u>Capital Items</u>								
Technical equipment	12 600	12 600	5 000	5 000	5 000	5 000	5 000	37 600
<u>Total Capital Items</u>	12 600	12 600	5 000	5 000	5 000	5 000	5 000	37 600
<u>Contingency</u>								
Staff Termination Liabilities	58 810	-	78 410	82 100	84 715	93 905	99 565	498 505
<u>Total Commitments</u>	58 810	-	-	-	-	-	-	-
TOTAL	582 020	523 210	592 630	628 390	671 305	718 300	769 365	3 969 345

FAO HQ AND REGIONAL OFFICE

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	Total
<u>Annual Costs</u>								
Consultants/Advisors	41 280	41 280	63 000	68 300	73 600	81 900	88 200	416 280
Operational travel	3 120	3 120	3 800	3 800	4 000	4 200	4 400	23 240
Supplies and services	1 050	1 050	1 000	1 000	1 000	1 000	1 000	6 100
<u>Total Annual Costs</u>	45 460	45 460	67 800	74 100	80 600	87 100	93 600	445 620
<u>Contingency</u>								
TOTAL	45 460	45 460	78 200	85 235	92 240	100 210	107 315	508 805

TABLE 6: RESEARCH AND TRAINING
1974/1979 BUDGET
(In Current US \$)

	1974	Revised 1974 excluding long-term commitments and liabilities	1975	1976	1977	1978	1979	Total
RESEARCH								
<u>Vector Ecology</u>								
S. Damosum Complex	95 928	91 360	102 000	102 000	102 000	102 000	51 000	530 360
S. Damosum Sampling	83 300	79 410	89 000	89 000	89 000	89 000	44 000	478 710
<u>Sub-total</u>	179 308	170 770	191 000	191 000	191 000	191 000	95 000	1 029 770
<u>Vector Control</u>								
S. Damosum susceptibility to insecticides	38 724	36 880	41 000	41 000	8 000	8 000	8 000	142 860
Biodegradability of insecticides	41 422	39 450	44 000	44 000	11 000	11 000	11 000	169 450
Insecticide safety for manimals	6 489	6 180	7 000	7 000	7 000	7 000	7 000	41 160
Insecticide evaluation	132 801	126 480	141 000	141 000	35 000	35 000	35 000	513 180
Equipment for insecticide application	63 808	60 770	60 000	34 500	34 500	-	-	196 770
<u>Sub-total</u>	283 247	269 760	302 000	267 500	95 500	61 000	61 000	1 056 760
<u>Environment Protection</u>								
Acute effects of insecticide formulations on non-target species	30 502	29 030	33 000	33 000	8 000	8 000	8 000	119 000
Long-term effects of insecticides	126 968	120 920	135 000	135 000	135 000	135 000	135 000	795 920
<u>Sub-total</u>	157 468	149 950	168 000	168 000	143 000	143 000	143 000	914 920
<u>Contingency</u>								
<u>Chemotherapy and Epidemiology</u>								
Dynamics of Onchocerciasis transmission	61 800		102 280	104 155	62 030	59 460	44 435	264 360
Drug trials	53 560							
Search for new drugs	127 720							
<u>Sub-total</u>	243 080							
		317 000	134 700	448 300	400 000	400 000	400 000	2 400 000
TRAINING								
Vector ecology and control	61 400							
Epidemiology and chemotherapy	13 000							
<u>Sub-total</u>	74 400							
TOTAL	837 803	807 500	1 107 000	1 168 055	801 530	854 460	743 435	5 760 450

ANNEX 7

AID 102-20 (1-77)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN ADD TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project:
From FY 76 to FY 79
Total U.S. Funding \$8.0 million
Date Prepared: October 15, 1976

Project Title & Number: Onchocerciasis Control in the Volta River Basin

PAGE 1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>The socio-economic development of a 655,000 km² area in the Volta River Basin.</p>	<p>Measures of Goal Achievement: (A-2)</p> <ol style="list-style-type: none"> 1. Annual agricultural production increased by approximately 355,000 tons valued at \$30 million. 2. Settlement of between 1-1.5 million people in areas freed of onchocerciasis. 	<p>(A-3)</p> <p>National ag. statistics</p> <p>Government reports</p>	<p>Assumptions for achieving goal targets: (A-4)</p> <ol style="list-style-type: none"> 1. Onchocerciasis is the relevant factor in abandonment of fertile river valleys in the Volta Basin. 2. Families can be induced to occupy the fertile river valleys without major tribal conflict. 3. Climatic conditions have been used in calculating the agricultural production levels will continue to be equally favorable in the future.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

AND 1982-20 11-720
SUPPLEMENT 1

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Onchocerciasis Control in the Volta River Basin

PAGE 2

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose: (B-1)</p> <p>1. To interrupt the transmission of onchocerciasis for a sufficiently long period (20 years) to permit the disappearance of the parasite from the human population in the program area and to allow for reoccupation of river valleys in the Volta Basin.</p> <p>2. Through applied research, to advance the state of knowledge of onchocerciasis and to refine methodologies for controlling the disease.</p>	<p>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</p> <p>1. After 20 years: no active onchocerciasis infection in the program area population from which disease transmission could be reinstated even should the area again become reinfested by <u>S. Damnosum</u>.</p> <p>2. After 6 years: Vast areas will be permanently freed from the vector.</p> <p>3. Increased knowledge gained of the epidemiology, transmission, and chemotherapy of onchocerciasis, the effects of larvicides on aquatic environments, new insecticides, sensitivity of the vector to insecticides, and equipment to best implement control programs.</p>	<p>(B-3)</p> <p>1. Program epidemiological and entomological reports.</p> <p>2. Program research reports</p>	<p>Assumptions for achieving purpose: (B-4)</p> <p>1. Maturation of <u>S. Damnosum</u> larvae in less than 7 days will not invalidate the plan to larvicide on a 7 day schedule.</p> <p>2. Virtually total destruction of larvae in the program area can be achieved within 18 months after initiation of the campaign and the area thereafter kept free of <u>S. Damnosum</u> in order that there will be no surviving adult worms by the 20th year.</p> <p>3. Transmission cannot be maintained by migrant flies coming from beyond the program area boundaries.</p> <p>4. After a successful conclusion of the planned 20-year program, the simultaneous re-introduction of <u>S. Damnosum</u> and infected humans can be prevented.</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Oncocerciasis Control in the Volta River Basin

PAGE 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Outputs: (C-1)</p> <ol style="list-style-type: none"> 1. Treatment with larvicides of all <u>S. Danosum</u> breeding sites throughout the program area. 2. Location of all <u>S. Danosum</u> sites ascertained and characteristics analyzed. 3. Periodic evaluation of effectiveness of larvicidal treatment and modification of larvicidal procedures made as needed. 4. Epidemiological studies of the human population of the program area. 5. Definition of behavioral characteristics and vector capacity of various genetic types of <u>S. Danosum</u>. 6. Additional larvicides developed to be used in case insect resistance to Abate occurs. 7. Development of effective drugs for treatment of oncocercal infections. 	<p>Magnitude of Outputs: (C-2)</p> <ol style="list-style-type: none"> 1. 1974-Phase I area; 1975-Phase II area; 1976-Phase III area 2. Mapping completed by conclusion of 6-month pre-larviciding period. Surveillance every 15 days by 55 sector and sub-sector surveillance teams. 3. Surveillance every 15 days by 55 sector and sub-sector teams. 4. Base-line study. Follow-up studies of 3,000 people every 3 years. Intensive studies on sub-sample annually. 5. All genetic types in program area studied. 6. A number adequate to overwhelm <u>S. Danosum</u> resistance capacity. 7. At least one new drug which will be fully effective. 8. Prototypes of fixed wing aircraft and helicopters. 9. See p. 20 for details. 	<p>(C-3)</p> <ol style="list-style-type: none"> 1. Program sector records 2. Epidemiological reports 3. Epidemiological and entomological surveillance 4. Epidemiological reports 5-9 Research reports 	<p>Assumptions for achieving outputs: (C-4)</p> <ol style="list-style-type: none"> 1. No major change in flow rate in the program area. 2. All <u>S. Danosum</u> breeding sites can be identified. 3. Epidemiological sample studies can be successfully implemented over time.
<ol style="list-style-type: none"> 3. Manufacture and field evaluation of prototypes of equipment for the accurate delivery of specified dosages of larvicides 	<ol style="list-style-type: none"> 9. Trained Af. personnel to assist in implementing program, conducting research and maintaining surveillance. 		

AFD 7227-20 11-72
SUPPLEMENT 1

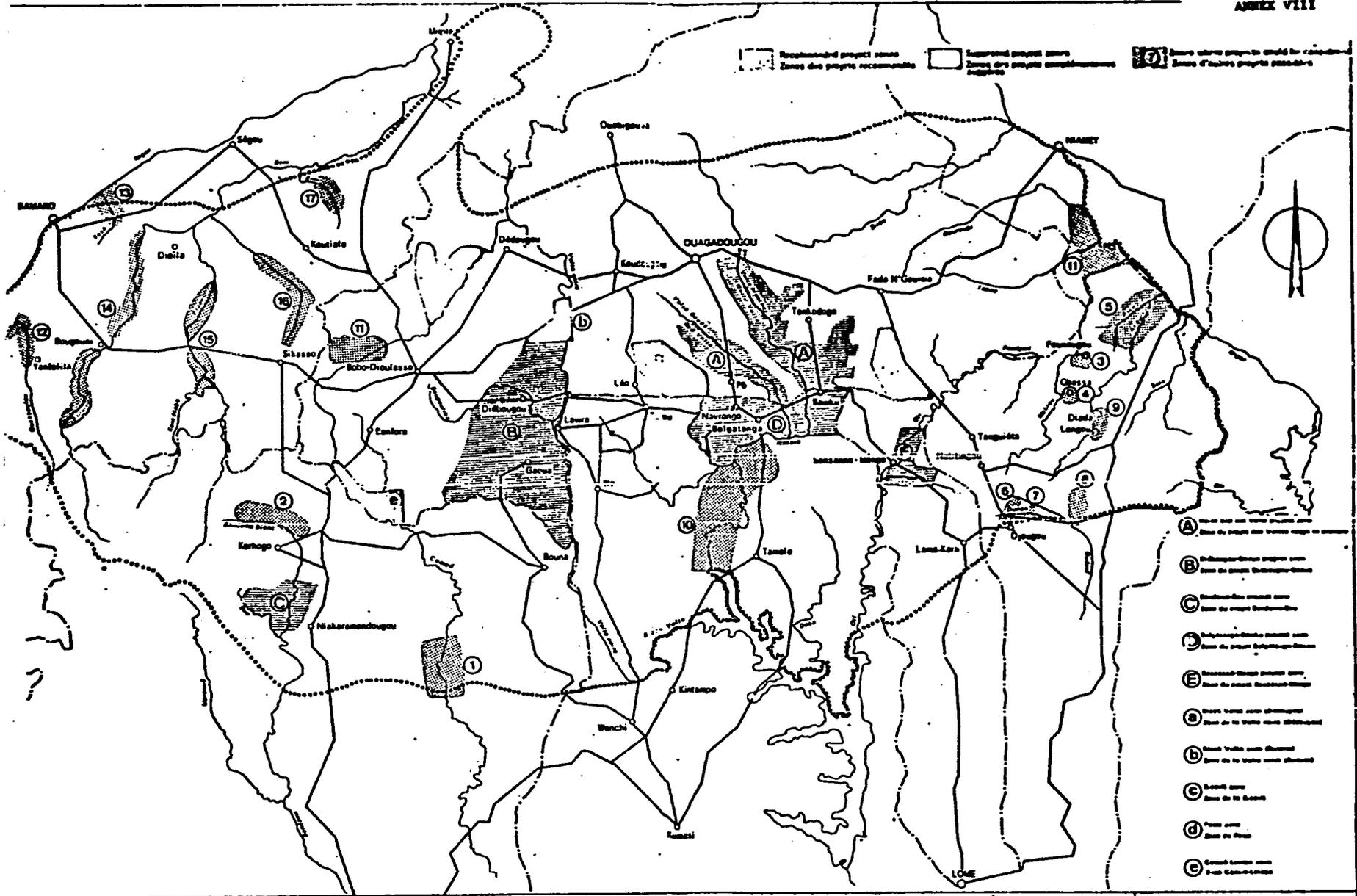
PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding: _____
Date Prepared: _____

Project Title & Number: Onchocerciasis Control in the Volta River Basin

PAGE 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Inputs: (D-1)</p> <ol style="list-style-type: none"> 1. Personnel services 2. Aerial spraying 3. Insecticide 4. Research and training 5. Rental, supplies and maintenance 6. Capital items, including vehicles and buildings 7. Operational travel 8. Consultants including FAO support 9. Meetings. 10. Provision for contingencies 	<p>Implementation Target (Type (D-2) and Quantity) See PP for details</p>	<p>(D-3) Program records</p>	<p>Assumptions for (D-4) providing inputs:</p> <ol style="list-style-type: none"> 1. Required professional and technical personnel can be recruited. 2. Construction of facilities can be completed on schedule. 3. Supplies of vehicle fuel, lubricants and spare parts are available. 4. Technical equipment will be received in good condition. 5. WHO headquarters, which has the responsibility for data processing will be able to receive and analyze material from the field in a timely fashion. 6. It will be possible to maintain the planned larviciding operations despite mechanical failures of equipment, inclement weather, etc.



ONCHOCERCIASIS CONTROL PROGRAMME IN THE VOLTA RIVER BASIN AREA
 REGION DU PROGRAMME DE LUTTE CONTRE L'ONCHOCERCOSE DANS LE BASSIN DES VOLTAS

FIGURE : L.1.33

D I S T R I B U T I O N L I S T

PROP - ONCHOCERCIASIS CONTROL IN THE VOLTA RIVER BASIN (Co

↘ AID Reference Center

HEW/OIH - Miss Janet Anderson

Dr. Hildrus Poindexter, Howard University Medical School

Dr. David M. French, Dept. of Community Medicine, Boston Un
Medical Center

Dr. George Lythcott, Associate Vice Chancellor for Health S
University of Wisconsin

Dr. Pascal Imperato, First Deputy Health Commissioner, New
of Health

Dr. Herbert Sacks, Associate Professor, Yale University Sch

Dr. Emil Kotcher, Professor and Head, Dept. of Microbiology
Louisiana University Medical Center, School of Medicin

Mr. Bill Griggs, Center for Disease Control, Atlanta, Georg

Dr. Quenum, WHO Regional Office for Africa, Brazzaville

*HD Marshall
AFR/CWR
Tel- 21762*

D I S T R I B U T I O N L I S T

PROP - ONCHOCERCIASIS CONTROL IN THE VOLTA RIVER BASIN

AFR/DP (Original and 4)

AA/AFR - Dr. Adams
 Mr. Brown

AFR/GWR - Mr. Shear
 - Mr. Coker
 - Mr. Stacy
 - Mr. Patterson
 - Mr. Gilbert
 - Mr. McLaughlin

AFR/DS - Mr. Lyman
 - Mrs. Pinder
 - Dr. Cross

GC/AFR - Mr. Dragon

PPC/DPR - Mr. Handly

TA/H - Dr. Stockard
 - Dr. Howard

AFR/CWA - Mrs. Coe

AF/W - Mr. McGuire
 - Mr. Rehfuss
 - Mr. Ramsey
 - Mr. Walter
 - Mr. Wygant

REDSO/Abidjan (2)

RDO/Niamey
RDO/Dakar
RDO/Yaounde

CDO/Bamako
CDO/Ouagadougou
CDO/Ndjamena
CDO/Nouakchott

USAID/Ghana

PARIS - Mr. Helman

U.S. MISSION GENEVA - Mr. Klein (2) (1 to be passed to WHO)

IO/HDC - Mr. Noziglia