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ETHIOPIA - MALARIA ERADICATION - PHASE I

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DECONTROLLED PER MEMORANDUM TO
REFERENCE CENTER FROM FLOYD R.
SPEARS, AFR/EMS DATED AUG. 2,
1977. (SEE ENCLOSED MEMO.)

UNITED STATES GOVERNMENT

Memorandum

TO : Reference Center, Ms. Joanne Paskar

DATE: August 2, 1977

FROM : AFR/EMS, *Floyd R. Spears*
Floyd R. Spears

SUBJECT: Declassification of A.I.D. Documents

This memorandum addresses the following A.I.D. documents:

- a. Measles Control and Smallpox Eradication Program dated Jan. 5, 1970
- b. CAP on Trans-Cameroon Railroad (Phase II)
- c. Mali -- Proposal and Recommendations on Veterinary Laboratory
- d. CAP -- Liberia -- Improvements of Roberts International Airport, Phase II (Construction)
- e. CAP -- Swaziland -- Agricultural Development Loan
- f. CAP -- Ethiopia -- Malaria Eradication -- Phase I
- g. CAP -- Somalia -- Mogadiscio Water Supply
- h. CAP -- Tanzania -- Agricultural Projects Support
- i. CAP -- TANZAM Highway Phase III
- j. CAP -- Uganda -- Livestock Development

The above listed documents have been reviewed by appropriate staff personnel assigned to Africa Bureau to determine if these documents should be declassified. Based on this review, no justifications have been identified for the continued classification of these documents. Therefore, this memorandum hereby authorizes the declassification of all documents listed.



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

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

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AID-DLC/P-570
May 22, 1967

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Ethiopia - Malaria Eradication - Phase I

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed \$5,800,000 to the Government of Ethiopia to assist in financing the foreign exchange costs and local costs of a malaria eradication program in Ethiopia.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at a meeting on Friday, May 26, 1967.

Rachel C. Rogers
Assistant Secretary
Development Loan Committee

Attachments:
Summary and Recommendations
Project Analysis
ANNEXES I-V

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ETHIOPIA - MALARIA ERADICATION - PHASE I

TABLE OF CONTENT

	<u>Page</u>
SUMMARY AND RECOMMENDATIONS	i-ii
I. Introduction	1
A. Background	1
B. Relationship of Project to U.S. Assistance Strategy and Policy in Ethiopia	2
II. The Borrower	2
III. Malaria Eradication	4
A. Characteristics of Malaria Eradication	4
B. Eradication Strategy in Ethiopia	5
C. History of the Anti-Malaria Effort in Ethiopia	6
IV. Nature of Economic Benefits	8
V. Technical Plan for Eradication	10
A. Technique	10
B. Resources Required	11
C. Implementation Actions	12
VI. Financial Analysis	13
A. Total Cost of Eradicating Malaria in Ethiopia	13
B. Financial Plan	14
C. Financial Plan for Phase I	15
D. Prospects for Continued A.I.D. Participation	15
E. Other Sources of Financing	16
F. Ability of the Ethiopian Government to Repay the Loan	16
G. Effect on the U.S. Private Sector and on the U.S. Balance of Payments Situation	17

TABLE OF CONTENT

	<u>Page</u>
VII. Special Conditions and Covenants	18
VIII. Issues	19

ANNEXES

- I. Statutory Check List
- II. Capital Assistance Loan Authorization
- III. Organization Chart
- IV. Map of Ethiopia
- V. Cost of Imported Commodities

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SUMMARY AND RECOMMENDATIONS

May 22, 1967

ETHIOPIA - MALARIA ERADICATION - PHASE I

1. APPLICANT: Imperial Ethiopian Government (IEG)
2. AMOUNT OF LOAN: \$5,800,000*
3. TERMS: A. Maturity - 40 years, including a 10-year grace period
B. Interest - 1% per annum during the grace period; 2 1/2% per annum thereafter.
C. Currency - Interest and principal payable in U.S. dollars.

4. FINANCIAL PLAN:

	<u>U.S. Costs</u>	<u>Local Costs</u>	<u>Total</u>
A.I.D. Loan	\$3,200,000	\$2,600,000	\$ 5,800,000
A.I.D. Grant	400,000	-	400,000
IEG Contribution	-	5,600,000	5,600,000
	<u>\$3,600,000</u>	<u>\$8,200,000</u>	<u>\$11,800,000</u>

5. DESCRIPTION OF THE PROJECT: The Project consists of the first two years (Phase I) of a 14-year program to eradicate malaria in Ethiopia. The Project will be carried out by the Ethiopian Malaria Eradication Service (MES) with the assistance of A.I.D. and the World Health Organization (WHO).
6. PURPOSE OF THE LOAN: To finance the U.S. costs and a portion of the local costs of the FY 1968-1969 tranche of the Malaria Eradication Program.
7. BACKGROUND OF THE PROJECT: Various studies and pilot projects in the field of malaria eradication were undertaken in Ethiopia over the period 1952-1965. The MES itself was established in 1959. A thorough reassessment of anti-malaria activities in 1965 led to the MES-WHO Plan for a comprehensive 1966-1980 malaria eradication program. The program began in early 1966, and is now under way. A.I.D. has grant-financed U.S. commodities valued at approximately \$1 million for 1966-67 and has provided considerable technical assistance to the MES through a U.S. Public Health Service (PHS) PASA.

* All dollar amounts in this paper are expressed in U.S. dollars (U.S. \$1.00 = Ethiopian \$2.50).

8. EX-IM BANK CLEARANCE: Received April 10, 1967.
9. STATUTORY CRITERIA: Satisfied; see Annex I.
10. COUNTRY TEAM VIEWS: The CT strongly endorses this project.
11. ISSUES: None.
12. RECOMMENDATION: Authorization of a loan to the Imperial Ethiopian Government for an amount not to exceed \$5,800,000 subject to the terms and conditions contained in the draft authorization attached as Annex II.

CAPITAL ASSISTANCE COMMITTEE

Capital Development Officer: T.W. Curran
Counsel: C. Stephenson
Desk Officer: L. Ramey
Technical Adviser: A. C. Curtis

AFR/CDF:TWCurran:cmm:mac:5/17/67

CAPITAL ASSISTANCE PAPER
ETHIOPIA - MALARIA ERADICATION - PHASE I

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AID-DLC/P-570
May 22, 1967

I. INTRODUCTION

A. Background. The Ethiopian Malaria Eradication Project originated in 1955, with the initiation of preliminary survey activities based on the use of U.S. technicians with minor local support. These surveys established the need for pilot projects to determine more fully the feasibility of eradication techniques under Ethiopian rural conditions. Pilot projects established at Dembia Plain (1956) and Kobo-Chercher (1955), together with the WHO Awash Valley pilot project, indicated the technical feasibility of eradication in areas of Ethiopia above 3,500 feet elevation. To establish the technical feasibility for lower altitude endemic areas, a pilot project was initiated at Gambella on the Sudanese border in 1959. Although results of this study are not totally conclusive, the favorable results achieved on the neighboring WHO Blue Nile pilot project in the Sudan, and in other similar areas in Africa, leave little cause for doubt as to the effectiveness of residual insecticidal house spraying techniques. Meanwhile, the areas protected by the three pilot projects have been expanded to include surrounding malarious areas.

A.I.D. assistance, primarily in the form of personnel and commodities, has played a key role in advancing anti-malaria activity to its present position. Obligations of TC funds for the years 1955-1967, inclusive, amount to approximately \$4.8 million.

While past U.S. assistance to the various control programs and the first year of the eradication program has been made available from TC funds, in 1966 the future scope of malaria eradication operations extending over 12 years became too extensive to permit continued use of this type of funding for purposes other than advisory personnel costs. Accordingly, Ethiopian and U.S. officials engaged in a series of discussions to explore the possibility of effecting a transition to loan financed assistance. Informal agreement was reached in early 1967 during discussions between Ambassador Korry and the Minister of Public Health. This understanding was confirmed by the Ethiopian Government's formal request for loan assistance, dated May 15, 1967.

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B. Relationship of Project to U.S. Assistance Strategy and Policy in Ethiopia. The revised U.S. economic assistance policy for Africa provides that, in the future, the U.S. will furnish aid on a country basis only to certain countries which have the best development prospects on a national scale and that such aid will be planned and administered to the greatest extent possible in a strengthened multilateral country framework under international agency leadership.

Ethiopia is one of the countries which will continue to receive U.S. development support on a country basis under the revised policy with which this loan is compatible.

II. THE BORROWER

The Borrower will be the Imperial Ethiopian Government, with the responsibility for the execution of the project residing in the Malaria Eradication Service, a semi-autonomous agency of the Ministry of Public Health. The Director General of the MES, who is directly responsible to the Minister of Public Health (see organizational chart, Annex III) will direct the program and execute policies. As the Senior Officer of the MES, he will develop, implement and evaluate the program with the assistance of senior national and international advisors. The Director General is responsible for the recruitment of necessary personnel, with power to create or abolish posts, establish emoluments, allowances, and conditions of employment. He has full control of MES equipment and supplies and is authorized to incur all expenditures as provided for in the MES approved budget. He is responsible for coordination between the IEG and the participating agencies.

Advice on the major policies of the malaria eradication effort will be given through an Inter-Ministerial Malaria Eradication Board which has been established by Imperial Order to ensure cooperation and understanding among the various ministries and to advise on policy.

Since the direction of the MES requires undivided attention both for technical and administrative matters, a full-time technical Deputy Director General and a full-time administrative Deputy Director General will be delegated executive authority from the Director General.

At the National Headquarters of MES, there are six divisions. Each division is headed by qualified personnel who are graduates in science at the university level and who have received training in malaria eradication at various international training centers. Under the Division Chiefs are the divisional Field Supervisors who are experienced senior malaria technicians and who have undergone at least four months supervisory training at the Malaria Eradication Training Center (METC) at Nazareth.

At the field level, the zones are headed by Zone Chiefs who are college graduates. Currently, the Zone Chiefs in two of the areas are science graduates and health officers who have received training in malaria eradication at international Malaria Training Centers under WHO Fellowships or USAID Participant Grants. The Zone Chief, who is in charge of all technical and administrative matters of the zone, is assisted by four senior technicians called Zone Supervisors, each a specialist in one of the following fields: Operations, Evaluation, Entomology, and Health Education and Administration. The Sector Chief, who is responsible for coordinating technical and administrative activities, is a qualified technician. Under the Sector Chiefs are Operations and Evaluation Technicians, and administrative personnel. And under each Technician are Squad Chiefs and Evaluators.

The entomology work is carried out at present at the zonal level. The zone entomology personnel are attached to either of two teams. One team consists of four Insect Collectors headed by a Supervisor. The other team consists of two Insect Collectors headed by a Technician. There is an Entomological Laboratory at Headquarters which is responsible for the identification and dissection of mosquitoes.

The Parasitology Laboratory at Headquarters consists of a Laboratory Supervisor, Assistant Supervisor (Technician) and seven Microscopists, and is charged with the review of blood slides examined by the peripheral or zone laboratories. Each of these zone laboratories is staffed by one technician, four microscopists and a laboratory helper.

The Parasitology Division and Entomology Division now operate separately, but it is planned to consolidate them into an Epidemiology Division comprised of Parasitology, Surveillance, Entomology and Statistical Sections as soon as a capable person is available to head this Division.

The Malaria Eradication Training Center, run jointly by the Government and WHO, trains sub-professional personnel (i.e., technicians, intermediary level supervisors and microscopists). It is staffed by one WHO Senior Malariologist, one WHO Sanitarian, one WHO Entomology Technician and one WHO Parasitology Technician; it is planned to provide Ethiopian counterparts to each of these advisors. Although it has been established initially as a separate entity within the Ministry of Public Health, the METC will eventually become a part of the MES.

The USAID, USPHS and WHO are in agreement regarding the efficacy of the MES organizational features. It is quite similar to agencies created for the same purpose in other countries, and it is the collective opinion of the foreign malaria experts present in Ethiopia that the MES is realistically structured and that it will serve as an adequate management instrument.

III. MALARIA ERADICATION

A. Characteristics of Malaria Eradication. The World Health Organization has stated the following:

"Malaria Eradication means the ending of the transmission of malaria and the elimination of the reservoir of infective cases, in a campaign limited in time and carried to such a degree of perfection that, when it comes to an end, there is no resumption of transmission." (World Health Organization, 1957).

The advent of the residual insecticides like DDT and dieldrin has permitted the application of a principle based upon the elimination of the parasite reservoir in humans and not upon the control of the mosquito in its outdoor breeding locations. The strategy is to spray all houses in malarious areas for the purpose of preventing the carrier mosquitoes ("vectors") from transmitting malaria parasites from infected to non-infected people. The residual insecticide is not intended to eradicate the total population of mosquitoes, but to maintain it for four years below the level necessary for the continued transmission of malaria, thus allowing time for the virtual disappearance of the malaria "parasite reservoir" from the human community. This method is supported by location and treatment of all malaria cases. In the absence of parasites, the abundance of mosquitoes thereafter is no longer significant; however, it is essential to understand that the potential for an outbreak always exists if an undetected case of malaria is introduced in an area where the breeding of a vector mosquito is plentiful.

It is a world-wide phenomenon both that anopheline mosquitoes are developing resistance to DDT and other residual sprays and that drug resistant strains of the malaria parasite are appearing in many areas. Although neither mosquito nor parasite resistance has yet been observed in Ethiopia, the threat does exist there as elsewhere. This consideration lends urgency to the need to eradicate malaria now, while the epidemiological situation is apparently favorable. If the program is postponed to the future the required effort will probably be much greater, and may even be technically impossible.

B. Eradication Strategy in Ethiopia. The project is designed to eradicate malaria completely wherever it exists in Ethiopia. It is planned to achieve this objective by implementing a detailed malaria eradication plan which has been developed by the Ethiopian Government with the assistance of personnel provided by the World Health Organization.

The inherent need for almost perfect attainment of the eradication objective imposes the need for systematic implementation within a rigidly prescribed timetable. The extent of the malarious areas in Ethiopia, the complexity of the project, and the limited number of skilled personnel available have combined to dictate a division of the country into four major geographic areas, each to be treated as a separate sub-project (see map, Annex IV). Eradication activity in each of these areas, (designated as areas A-D) will be begun in sequence (e.g., work in area B will follow the commencement of work in area A by two years; work in area C will follow the commencement of work in area B by two years, etc.).

The eradication technique to be used has been developed by WHO on the basis of its world-wide experience in malaria eradication programs. It treats the total operation in any given geographic area as being divisible into four discrete phases -- preparation, attack, consolidation and maintenance. Each of the first three phases has a clearly identifiable beginning and ending. The last phase, maintenance does not terminate as clearly as do the preceding phases because its monitoring activity must be thought of as an on-going function. The technical characteristics of the four phases are explained in Section V-A below.

C. History of the Anti-Malaria Effort in Ethiopia. In the autumn of 1952, Sir Gordon Covell, an eminent malarialogist, visited Ethiopia and conducted malaria surveys of the southern region of Lake Tana at the request of the IEG. Dr. Covell visited Ethiopia again in 1955 and collected baseline data at a number of sites. Subsequently, as a result of his investigations and recommendations, a WHO/UNICEF Malaria Pilot Project was initiated in the Upper Awash Valley in 1956.

In 1955, 1956, and 1957, pilot malaria projects were started with USAID assistance at Kobo Chercher, Dembian Plain and Gambella, respectively. The results indicated that a reduction of malaria parasite rates could be obtained through the application of residual insecticides and that malaria transmission could be interrupted, provided that spraying was conducted so as to adequately cover inhabited structures.

In 1959, the Malaria Eradication Training Center was established under joint WHO/IEG sponsorship to train sub-professional field staff; it has graduated approximately 250-sub-professional personnel to date.

As a result of the WHO and USAID pilot projects, the Imperial Ethiopian Government, under Imperial Order No. 22 of 1959, established a Malaria Eradication Service (MES) as a semi-autonomous organization under the Ministry of Public Health.

As one of its first measures, the MES expanded two of the on-going pilot projects and reclassified them as prototype malaria schemes. Spray operations were expanded in each year following 1959, through and including 1964. However, geographical reconnaissance activity failed to keep pace with the spraying operations in many areas, resulting in random spraying without benefit of reconnaissance information. The limited reconnaissance that was performed was of poor quality due in large measure to the lack of trained field personnel and inadequate supervision. Finally, all spraying activity was stopped in 1965 and geographic reconnaissance was begun in a methodical manner for the first time. This phase of the program has progressed reasonably well since that time, despite a low rate of individual productivity.

In Area A, the first of the four planning areas, the preparatory phase has been completed and the attack phase is under way. The preparatory activity included a complete census and mapping of the malarious areas, training of staff, health education efforts, and the establishment of administration facilities and organization. Together, these activities have provided information relating to mosquitoes and the extent to which malaria is found in the population living in different areas and at varying altitudes.

Area A entered the attack phase in March 1966 with a large scale spraying operation, employing 1800 temporary operational employees during each of the two spray rounds completed this past year. In addition to the spraying operations, the MES is evaluating parasitological results obtained following the application of the insecticides. Laboratories have been established at the field operation centers for the purpose of conducting examinations of human blood smears collected by the evaluation teams.

In the second of the four major areas, Area B, the preparatory phase is just getting under way. The training of the geographic reconnaissance teams is complete and the task of mapping the area for the spray operations is beginning. A health education campaign and a public relations program are being conducted in the hope that the people of the various districts involved will understand and support the program. Entomological and parasitological surveys are under way with teams of trained technicians in the field gathering data in an attempt to evaluate the malaria pattern of Area B. The Malaria Eradication Training Center is engaged in full-time training of technicians and supervisory staff, aiming at a target date of June 1967 for completion of the preparatory phase activities.

IV. NATURE OF ECONOMIC BENEFITS

It is difficult to make a precise estimate of the benefits to be derived as a direct result of a malaria eradication program. It is safe to say that this type of program does bring about verifiable results in specific areas of a country's economic activity. For purposes of discussion this paper will restrict itself to a brief consideration of the program's effects on Ethiopia's agricultural productivity and on those aspects of general health conditions which influence productivity.

Malaria is predominantly a rural disease, and the periods during which it poses the most serious threat coincide with those periods during which sowing, planting and harvesting activities must be performed. The disease produces chronic invalidism and medical experts estimate the losses from debility and disability to be greater from malaria than from those caused by other comparable disease. It reduces alertness and initiative and its victims are loathe to accept changes in working and living conditions because of their lethargy. In a word, work capacity of the labor force is seriously impaired, with a concomitant reduction in productivity.

The opening of new lands for settlement and production is one of the IEG's prime developmental goals. Toward this end, the Awash Valley was selected some years ago as an area of significant agricultural potential in which the effectiveness of malaria eradication could be tested. The technique used at that time must be classified as malaria control rather than malaria eradication due to the limited scope and thoroughness of the activity. Nevertheless, substantial results were obtained and serve as a graphic illustration of results which can be obtained using broader and more intensive techniques.

The Awash river is fed by six main tributaries running off the eastern escarpment. The available arable land is approximately 1,000,000 acres, with an additional 500,000 to 750,000 acres available for pasture. This area's human population in 1960 was estimated at 450,000, largely concentrated on the crest of the escarpment, on the watershed and around the headwaters. Initial investigation revealed this area to be highly malarious. The ensuing control project demonstrated that the transmission of malaria in this region could be interrupted most effectively through the use of spraying programs covering all human dwellings and proximate animal shelters. Due in part to the removal of malaria as a serious threat to life, large sections of land which formerly were not cultivated are being opened up to agriculture and development. A prime example is the Wonji Sugar Plantation.

The Wonji Sugar Plantation authorities realized in the initial stages of the project's development, that their work would not prosper unless malaria was controlled to the point where laborers and staff could carry out their assigned duties. The Awash Valley control project has removed this obstacle effectively. The investment in this sugar plantation is presently over \$24 million. The plantation covers approximately 14,500 acres and has a population within its area of some 25,000 people. The gross average production of the plantation is estimated at 35 tons of sugar per acre and the refinery produces over 25,000 tons of sugar a year, meeting the entire domestic requirement. Due to the successful outcome of this venture the company is now preparing a similar plantation at Mitehara in the Awash Valley in which it is estimated that some \$20 million will be invested by its target date for completion of 1969.

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V. TECHNICAL PLAN FOR ERADICATION

A. Technique. The Preparatory Phase of the project will consist of the following two technical activities:

1. Geographic Reconnaissance, which includes: a census of houses, related structures and population; gathering of general community information; numbering of sprayable structures; estimating sprayable surface; preparation of individual house tags to be affixed on each house; preparation of sketch maps; and development of itineraries for spray operation and surveillance.
2. Epidemiological Assessment, which includes: delineation of malarious areas; determination of the basic endemicity level of malaria; determination of the malaria transmission seasons; incrimination of the mosquito vector; and establishment of its biological habits, distribution, seasonal prevalence and susceptibility levels to various insecticides.

The Attack Phase is sub-divided into Early Attack and Late Attack. In both the Early and Late Attack Phases, residual insecticide spraying operations are conducted by spraying all human dwellings and proximate animal shelters with one, two or three rounds per year, as appropriate. Evaluation work is performed to assess the efficacy of the spraying operation, to confirm the interruption of malaria transmission and to gather evidence for use in determining the area's eligibility to pass into the Consolidation Phase.

In the Late Attack Phase an additional activity, Active Case Detection (ACD), will be initiated, provided the parasite rates have fallen to a predetermined level. It is estimated that from 12-18 months will be required to establish the ACD mechanism. ACD activities are to be planned on a total coverage basis, and will consist of:

1. Home visits by MES personnel trained in surveillance procedures, on at least a month-to-month basis.
2. Collection of blood film from every discovered fever case and from persons having a history during the last 30 days..
3. Presumptive drug treatment of every person from whom a blood smear is collected.
4. Radical drug treatment of all detected positive malaria cases.

During the Attack Phase a determined effort will be made to establish Passive Case Detection activities (PCD) in hospitals, clinics, rural health posts and other medical institutions. One of the major objectives of this investigation will be to classify cases according to source. During the last year of the Attack Phase, complete investigations are to be carried out, including an exhaustive history of each case, history of malaria in the locality, contact history, mass blood surveys and entomological investigations where necessary. Each positive case will be followed up by MES contact every month for the first six-months, and thereafter at three-month intervals, for a total period of a year.

The major purpose of the Consolidation Phase is to eliminate the reservoir of infective cases and malaria foci and to confirm that malaria eradication has been achieved. No area will be allowed to pass into the Consolidation Phase until an independent assessment team, following the recommendations of the WHO Expert Committee on Malaria has ascertained that a surveillance mechanism exists and provides total coverage, is effective, well administered and meets international technical criteria. The smallest unit to be passed into the Consolidation Phase will be one encompassing approximately 100,000-150,000 people.

The Maintenance Phase is reached when malaria has been eradicated from the area, a determination made by an independent assessment team following the strict WHO criteria.

The most noteworthy administrative characteristic of the Maintenance Phase is that the MES will be dissolved as a semi-autonomous organizational structure, with most of the MES staff being integrated into the basic health services of Ethiopia. The orthodox health services will then be responsible for the on-going protection of the country from any renewal of malaria transmission, taking specific remedial action in the event of a discovered focus of malaria. This requires continuing vigilance for any sign of importation or reappearance of malaria.

B. Resources Required. The project will require a substantial amount of A.I.D.-financed U.S. source materials (i.e., DDT, vehicles, spray pumps, drugs, laboratory supplies, and office equipment) and timely and adequate funding from the IEG for local cost components of the program. Annual funding requirements for U.S. source commodities are listed by category in section VI-A. The DDT required for the program is estimated at 8,000 short tons and will be consumed throughout most of the life of the program due to the phased schedule. Approximately 3,000 spray pumps of a type which meets the physical and performance standards of A.I.D.

and the USPHS Communicable Disease Center will be required over the life of the project. Anti-malaria drugs will be required in large amounts during the late Attack and Consolidation Phases and must be imported, along with microscopes and other laboratory equipment and supplies. Vehicles and a number of small boats will be required to transport men and equipment to work sites to carry out entomological, parasitological, operational, surveillance and supervisory activities. The maintenance of the vehicle fleet will require substantial quantities of spares and replacement parts.

In addition to loan funding required for imported commodities and local cost components, the project will require the advisory services of seven U.S. PHS malaria technicians to assist in the major technical aspects of the program (e.g. operations, entomology, epidemiology) and to provide assistance in the fields of supply and vehicle maintenance. This assistance will remain on a grant basis.

Funding for participant training and other costs such as secretarial help and technician travel in direct support of the U.S. technicians is to be made available under TC funding. The foreseeable participant training will be for 6-8 Zone Chiefs, 2-4 Epidemiological or Surveillance Section Heads, 3-4 METC Instructors, 4-5 administrative personnel and limited refresher training for professional technical personnel. All but 2-3 of the participants will receive short-term training or observation experience. Major emphasis will be placed on in-country training and on strengthening and improving the existing METC facility in Nazareth.

C. <u>Implementation Actions</u>	<u>Elapsed Time (Months)</u>
Authorization	0
Execution	2
Ratification by IEG	5
Satisfaction of Conditions Precedent	6
First Disbursement	7

VI. FINANCIAL ANALYSIS

A. Total Cost of Eradicating Malaria in Ethiopia. The total estimated cost of the Malaria Eradication Program is as follows:

<u>Fiscal Year</u>	<u>Foreign Exchange Costs</u>	<u>Local Costs</u>	<u>Total</u>
1968	\$1,802,000	\$ 3,000,000	\$ 4,802,000
1969	1,400,000	5,189,200	6,589,200
1970	1,200,000	4,621,600	5,821,600
1971	1,568,000	6,266,000	7,834,000
1972	1,220,000	4,802,800	6,022,800
1973	813,000	6,410,000	7,223,000
1974	392,000	3,966,800	4,358,800
1975	608,000	3,912,400	4,520,400
1976	597,000	2,612,400	3,209,400
1977	-*	2,315,200	2,315,200
1978	-*	1,310,000	1,310,000
1979	-*	1,308,400	1,308,400
1980	-*	1,418,000	1,418,000
	<u>\$9,600,000</u>	<u>\$47,132,800</u>	<u>\$56,732,800</u>

The details of import commodities required from FY 1968 through FY 1976 are shown in Annex V.

*Under \$100,000; exact amount unknown.

B. Financial Plan. The following table presents the planned division of costs for the life of the ME program:

FY 1968 - FY 1976 Malaria Eradication Financing
(in US \$ Millions)

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1964</u>	<u>1975</u>	<u>1976</u>
Externally-Financed									
Local Costs	.5	2.1	.8	1.5	0	0.4	0	0	0
IEG-Financed									
Local Costs	<u>2.5</u>	<u>3.1</u>	<u>3.8</u>	<u>4.8</u>	<u>4.8</u>	<u>6.0</u>	<u>4.0</u>	<u>3.9</u>	<u>2.6</u>
Total Local Costs	<u>3.0</u>	<u>5.2</u>	<u>4.6</u>	<u>6.3</u>	<u>4.8</u>	<u>6.4</u>	<u>4.0</u>	<u>3.9</u>	<u>2.6</u>
Externally-Financed									
Import Costs	<u>1.8</u>	<u>1.4</u>	<u>1.2</u>	<u>1.6</u>	<u>1.2</u>	<u>.8</u>	<u>.4</u>	<u>.6</u>	<u>.6</u>
Total	<u>4.8</u>	<u>6.6</u>	<u>5.8</u>	<u>7.9</u>	<u>6.0</u>	<u>7.2</u>	<u>4.4</u>	<u>4.5</u>	<u>3.2</u>

Eradication financing would be phased as summarized in the following tables (US \$ Millions):

	<u>External Sources</u>	<u>IEG</u>	<u>Total</u>
<u>Phase I (FY 1968-69 Requirements)</u>			
Local Costs	\$2.6	\$5.6	\$ 8.2
External Commodity Costs	<u>3.2</u>	<u>-</u>	<u>3.2</u>
	<u>\$5.8</u>	<u>\$5.6</u>	<u>\$11.4</u>
<u>Phase II (FY 1970-71 Requirements)</u>			
Local Costs	\$2.3	\$8.6	\$10.9
External Commodity Costs	<u>2.8</u>	<u>-</u>	<u>2.8</u>
	<u>\$5.1</u>	<u>\$8.6</u>	<u>\$13.7</u>
<u>Phase III (FY 1972-73 Requirements)</u>			
Local Costs	\$0.4	\$10.8	\$11.2
External Commodity Costs	<u>2.0</u>	<u>-</u>	<u>2.0</u>
	<u>\$2.4</u>	<u>\$10.8</u>	<u>\$13.2</u>
<u>Phase IV (FY 1974-76 Requirements)</u>			
Local Costs	\$ -	\$10.5	\$10.5
External Commodity Costs	<u>1.6</u>	<u>-</u>	<u>1.6</u>
	<u>\$1.6</u>	<u>\$10.5</u>	<u>\$12.1</u>

C. Financial Plan for Phase I

	<u>U.S. Costs</u>	<u>Local Costs</u>	<u>Total</u>	
A.I.D. Loan	\$3,200,000 (89%)	\$2,600,000 (32%)	\$ 5,800,000	49%
A.I.D. Grant	400,000 (11%)	-	400,000	4%
IEG Contribution	-	5,600,000 (68%)	5,600,000	47%
	<u>\$3,600,000</u>	<u>\$8,200,000</u>	<u>\$11,800,000</u>	<u>100%</u>

The proposed A.I.D. loan would cover all U.S. costs of insecticides, vehicles, and ancillary equipment. The loan would be for 40 years including a ten-year grace period, with interest at one percent (1%) during the grace period and two and one-half percent (2½%) thereafter.

The Ministry of Health has been able to provide a large increase in its contribution to the project, from \$1.2 million in FY 1966, to \$2.0 million in FY 1967. Despite the Ethiopian contributions of \$2.5 million and \$3.1 million which have been budgeted for FY 1968 and 1969, respectively, the project's local cost requirements will rise so rapidly that some extraordinary external assistance in meeting the local costs is necessary to assure its successful implementation. In future phases the local costs will be increasing less rapidly and the IEG will be able to provide greater proportions of the local currency requirements.

D. Prospects for Continued A.I.D. Participation. While A.I.D. is not committed by the proposed approval of the present loan to finance any future non-advisory costs of the eradication program, it can expect to be called upon for continued support, and will doubtless wish to render such support as long as the program is being properly carried out, subject to the availability of funds.

A loan to assist the IEG in its malaria eradication activities during the next two years will provide A.I.D. with the opportunity to observe the government's performance without creating an unnecessarily large and awkward pipeline.

E. Other Sources of Financing. Availability of other foreign assistance is limited at present to the World Health Organization (WHO) which provides four technicians, a modest amount of specialized commodities and from two to six training fellowships per year. The WHO also is actively engaged in the operation of the Malaria Eradication Training Center (METC) at Nazareth. There are four WHO technician-instructors operating the schedule of training. Each year the WHO provides approximately U.S. \$1,000 in direct commodity support of this school. The IEG is responsible for all other costs of operation.

F. Ability of the Ethiopian Government to Repay the Loan. Ethiopia's external debt and debt servicing burden are proportionally less than in most African countries. The external debt as of June 30, 1966 (latest date available) totalled U.S. \$109.05 million, distributed by creditor as follows:

U.S.	U.S. \$ 44.45 million
IBRD/IDA	38.18
USSR	10.27
Yugoslavia	7.73
Netherlands	2.68
West Germany	2.21
Czechoslovakia	1.02
Sweden	0.80
Italy	0.63
France	0.37
Israel	0.33
U.K.	0.21
Belgium	0.17
Total	<u>\$109.05 million</u>

This debt amounted to 9% of the GNP and 83% of revenues during FY 1966. External debt servicing during the past two fiscal years and budgeted for FY 1967 are as follows:

FY 65	U.S. \$ 6.31 million
FY 66	4.08
FY 67	9.80 (budget)

The above figure for FY 67 constitutes 6% of the expected total domestic revenues and 8% of expected export earnings. Debt servicing on loans now outstanding is estimated to reach 11% of export earnings in 1970. Loans to be contracted for in the future will raise this proportion somewhat. However, built-in obstacles to development, such as the socio/political structure, administrative limitations, the limited IEG funds available to cover local costs of development projects, and slow progress in developing finalized project proposals ready for implementation within a meaningful national development plan, can be expected to limit additional loans, if made on concessionary terms, to a total amount consistent with reasonable debt management at least over the next several years.

The IEG's holdings of gold and foreign exchange totalled U.S. \$88.1 million on October 30, 1966. This reserve is equivalent to seven months imports at the estimated 1966 rate, and equals approximately 59% of the Ethiopian money supply (compared with the legal requirement of 25%). The exceptional concern of the IEG for maintaining Ethiopia's traditionally high international credit standing suggests strongly that the IEG would use this reserve if necessary rather than default on foreign debt payments. For these reasons, the prospects of repayment of this loan are considered reasonable.

G. Economic Effects of the Loan.

1. Effect on the U.S. Private Sector and on the U.S. Balance of Payments Situation. Approximately \$3.2 million will be used to purchase goods and services, primarily vehicles and insecticides, from private U.S. suppliers. These goods and services will not displace any U.S. exports to Ethiopia through customary commercial channels. Hence this portion of the loan constitutes no impact upon the U.S. balance of payments. The \$2.6 million of the loan to be used for local currency costs will be made available through the Special Letter of Credit procedure. Even though the Special Letter of Credit procedure will be utilized, coupled with efforts to optimize additionality in its usage, it is clear that some displacement of the dollar transfer than normally results from U.S. commercial exports will take place, resulting in an indirect negative impact on the balance of payments. However, it is felt that the magnitude of this impact is outweighed by the benefits envisioned by the project.

2. Benefits to the Ethiopian Private Sector. About \$500,000 of the local currency funds provided by the loan will be used for purchase of goods and services from local private enterprise.

VII. SPECIAL CONDITIONS AND COVENANTS

The Malaria Eradication Program described in this paper is a very large, complex, highly technical endeavor requiring great skill, precise timing of inputs, and a high level of funding for a number of years. A lack of funds for any particular year, or a shortage of trained personnel, or an administrative hitch causing implementation delays would have far-reaching adverse effects and could threaten the basis of the program.

During AFR review of the project, these considerations were carefully weighed in the light of known Ethiopian capabilities, past performance of the IEG in this and other fields, and the advance planning which has gone into the Malaria Eradication Program and its Plan of Operations. On balance, it was felt that the project had reasonable chances of success and that A.I.D. should proceed with the loan.

None the less, the large expenditures required and the eradication program's complexity dictate the need for special measures to insure that adequate financial resources are available when needed and that the implementation of the approved Plan of Operations is within the IEG's institutional capabilities. Early identification of deficiencies and impediments will increase the prospects of completing project activities on schedule and within cost estimates.

Accordingly, the Loan Agreement will be drafted to contain various provisions designed to increase A.I.D.'s ability to identify project impediments, and to improve the project's chances for success. Among these provisions will be clauses providing that:

A. The IEG furnish A.I.D. a schedule of the expected amounts of its contributions to the project, together with evidence satisfactory to A.I.D. that arrangements have been made for deposit, in a special account, of the IEG contribution to the project prior to disbursement of any loan funds.

B. The IEG covenant to provide the resources in addition to the A.I.D. loan necessary to achieve the eradication of malaria within Ethiopia and to use its best efforts to prevent the reappearance of malaria in the country.

C. The IEG covenant to carry out the Plan of Operations and to obtain the approval of A.I.D. and WHO before modifying the Plan.

D. The IEG maintain, for the full life of the project, the MES as a separate administrative and technical entity reporting directly to the Minister of State for Health for the specific purpose of implementing the Malaria Eradication Program.

E. The Minister of Finance submit to A.I.D. a statement for the record in which the long range nature of the project and its budgetary implications for the IEG are identified and acknowledged.

F. The IEG agree to participate in an intensive review of the program's progress at a time to be specified by A.I.D. for the purpose of comparing actual implementation against the schedule contained in the Plan of Operations and of judging the success of the program to that date.

VIII. ISSUES

None.

May 22, 1967

CHECK LIST OF STATUTORY CRITERIA

(Development Loan Fund)

1. FAA §.102. Precautions that have been or are being taken to assure that loan proceeds are not diverted to short-term emergency purposes (such as budgetary, balance of payments, or military purposes) or any other purpose not essential to the country's long-range economic development. To be covered in Loan Agreement thru restriction on use of funds.
2. FAA §.102. Information on measures taken to utilize U.S. Government excess personal property in lieu of procurement of new items. To be covered in Loan Agreement.
3. FAA §.102. Information whether the country permits or fails to take adequate measures to prevent the damage or destruction by mob action of U.S. property. No knowledge of any such situation.
4. FAA §.201(b). Manner in which loan will promote country's economic development, emphasizing help for long-range plans and programs designed to develop economic resources and increase productive capacities. Satisfied.
See Section IV.
5. FAA §.201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States. Satisfied: Section VI-E.
6. FAA §.201(b)(2). Information and conclusion on activity's economic and technical soundness, including the capacity of the recipient country to repay the loan at a reasonable rate of interest. Satisfied: Sections IV, V, and VI-F.
7. FAA §.201(b)(3). Information and conclusion on existence of reasonable promise activity will contribute to development of economic resources or increase of productive capacities. Satisfied: Section IV.
8. FAA §.201(b)(4). Information and conclusion on activity's relationship to other development activities, and its contribution to realizable long-range objectives. Satisfied: Section IV.

The following abbreviations are used:

FAA - Foreign Assistance Act of 1961, as amended by the Foreign Assistance Act of 1966.

App. - Foreign Assistance and Related Agencies Appropriations Act, 1967.

9. FAA §.201(b)(5). Country's self-help measures, including institution of Foreign Assistance Act investment guaranty programs. Satisfied: Section VI-B. An investment guaranty program has been instituted in Ethiopia.
10. FAA §.201(b)(6). Information and conclusion on possible effects on U.S. economy, with special reference to areas of substantial labor surplus. Satisfied: Section VI-G.
11. FAA §.201(b)(7). Information and conclusion on the degree to which the country is making progress toward respect for the rule of law, freedom of expression and of the press, and recognition of the importance of individual freedom, initiative, and private enterprise. Ethiopia is making progress in these respects.
12. FAA §.201(b)(8). Information and conclusion on the degree to which the country is taking steps to improve its climate for private investment. Appropriate steps to this end are being taken. See 9 above, also.
13. FAA §.201(b)(9). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth. Satisfied: Section IV.
14. FAA §.201(b). Information and conclusion on reasonable prospects of repayment. Satisfied: Section VI-F.
15. FAA §.201(b). Information on applicability of the ten country ceiling. Satisfied: Section I.B.
16. FAA §.201(d). Information and conclusion on legality (under laws of the country and the U.S.) and reasonableness of lending and relending terms. Satisfied. Terms are legal for country and U.S.; no relending.
17. FAA §.201(e). Information and conclusion on availability of an application together with sufficient information and assurances to indicate reasonably that funds will be used in an economically and technically sound manner. Satisfied: Sections I-A, IV and V.
18. FAA §.201(f). If a project, information and conclusion whether it will promote the economic development of the requesting country, taking into account the country's human and material resource requirements and the relationship between the ultimate objectives of the project and the country's overall economic development. Satisfied: Section IV.
19. FAA §.201(f). If a project, information and conclusion whether it specifically provides for appropriate participation by private enterprise. Satisfied: Section VI-G.
20. FAA §.202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports

from private sources, or is otherwise being used to finance procurements from private sources. Satisfied: Section VI-G.

21. FAA §. 81. Extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the developing countries, through the encouragement of democratic private and local governmental institutions. No direct effect, but will raise general health level.
22. FAA §. 601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; (f) strengthen free labor unions. (a)-proceeds will be reflected in trade; (b),(c)(d),(f), no direct effect; (e), see Section IV.
23. FAA §. 601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad, and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). Satisfied: Section VI-G.
24. FAA §. 601(d). Conclusion and supporting information on compliance with the Congressional policy that engineering and professional services of U.S. firms and their affiliates are to be used in connection with capital projects to the maximum extent consistent with the national interest. NA.
25. FAA §. 602. Information and conclusions whether loan will permit American small business to participate equitably in the furnishing of goods and services financed by it. Satisfied: Section VI-G. Also to be covered in Loan Agreement.
26. FAA §. 604(a); Add. §. 108. Compliance with restriction of commodity procurement to U.S. except as otherwise determined by the President and subject to statutory reporting requirements. Satisfied: Section VI-G, and to be covered in Loan Agreement.
27. FAA §. 604(b). Compliance with bulk commodity procurement restriction to prices no higher than the market price prevailing in the U.S. at time of purchase. To be covered in Loan Agreement.
28. FAA §. 604(d). Compliance with requirement that marine insurance be purchased on commodities if the participating country discriminates, and that insurance be placed in the U.S. To be covered in Loan Agreement

29. FAA §.611(a)(1). Information and conclusion on availability of engineering, financial, and other plans necessary to carry out the assistance and of a reasonably firm estimate of the cost of the assistance to the United States. Satisfied: Sections V and VI-A.
30. FAA §.611(a)(2). Necessary legislative action required within recipient country and basis for reasonable anticipation such action will be completed in time to permit orderly accomplishment of purposes of loan. Loan must be ratified by Parliament; this will be condition present in Loan Agreement.
31. FAA §.611(b); App. §.101. If water or water-related land resource construction project or program, information and conclusion on a benefit-cost computation. NA.
32. FAA §.611(c). Compliance with requirement that contracts for construction be let on competitive basis to maximum extent practicable. NA.
33. FAA §.612(b); §636(h). Appropriate steps that have been taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services. Satisfied: Section VI-B.
34. FAA §.619. Compliance with requirement that assistance to newly independent countries be furnished through multilateral organizations or plans to maximum extent appropriate. World Health Organization (WHO) will be participating in the malaria eradication program.
35. FAA §.620(a); App. §.107(a); App. §.107(b). Compliance with prohibitions against assistance to Cuba and any country (a) which furnishes assistance to Cuba or failed to take appropriate steps by February 14, 1964, to prevent ships or aircraft under its registry from carrying equipment, materials, or supplies from or to Cuba; or (b) which sells, furnishes, or permits any ships under its registry from carrying items of primary strategic significance, or items of economic assistance. Ethiopia is not in violation of these prohibitions.
36. FAA §.620(b). If assistance to the government of a country, existence of determination it is not controlled by the international Communist movement. The Secretary signed a determination on October 11, 1961.
37. FAA §.620(c). If assistance to the government of a country, existence of indebtedness to a U.S. citizen for goods or services furnished or ordered where such citizen has exhausted available legal remedies or where the debt

is not denied or contested by such government or the indebtedness arises under an unconditional guaranty of payment given by such government. No knowledge of any such situation.

38. FAA §.620(d). If assistance for any productive enterprise which will compete with U.S. enterprise, existence of agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan. NA
39. FAA §.620(e)(1). If assistance to the government of a country, extent to which it (including government agencies or subdivisions) has, after January 1, 1962, taken steps to repudiate or nullify contracts or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking appropriate steps to discharge its obligations. No knowledge of any such situation.
40. FAA §.620(f); App. §.109. Compliance with prohibitions against assistance to any Communist country. Ethiopia is not a Communist country.
41. FAA §.620(g). Compliance with prohibition against use of assistance to compensate owners for expropriated or nationalized property. To be covered in Loan Agreement through restrictions on use of funds.
42. FAA §.620(h). Compliance with regulations and procedures adopted to insure against use of assistance in a manner which, contrary to the best interests of the U.S., promotes or assists the foreign aid projects or activities of the Communist-bloc countries. To be covered in Loan Agreement.
43. FAA §.620(i). Existence of determination that the country is engaging in or preparing for aggressive military efforts. No such determination has been made.
44. FAA §.620(i). Information on representation of the country at any international conference when that representation includes the planning of activities involving insurrection or subversion against the U.S. or countries receiving U.S. assistance. No knowledge of any such situation.
45. FAA §.620(j). Indonesia restriction. NA.
46. FAA §.620(k). If construction of productive enterprise where aggregate value of assistance to be furnished by U.S. will exceed \$100 million, identification of statutory authority. NA.

47. FAA §.620(1). Consideration which has been given to denying assistance to the government of a country which after December 31, 1966, has failed to institute the investment guaranty program for the specific risks of convertibility and expropriation or confiscation. Ethiopia has not so failed.
48. FAA §.620(n); App. §.107(b); App. §.116. Compliance with prohibitions against assistance to countries which traffic or permit trafficking with North Vietnam. Ethiopia is in compliance.
49. FAA §.620(o). If country has seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters, information on the consideration which has been given to excluding the country from assistance. No knowledge of any such situation.
50. FAA §.620(p); App. §.117. U.A.R. restriction. NA
51. FAA §.620(q). Existence of default under any Foreign Assistance Act loan to the country. No such default exists.
52. App. §.102. Compliance with requirement that payments in excess of \$25,000 for architectural and engineering services on any one project be reported to Congress. NA
53. App. §.104. Compliance with bar against funds to pay pensions, etc., for military personnel. To be covered in Loan Agreement through restrictions on use of funds.
54. App. §.106. If country attempts to create distinctions because of their race or religion among Americans in granting personal or commercial access or other rights otherwise available to U.S. citizens generally, application which will be made in negotiations of contrary principles as expressed by Congress. No such situation known to exist.
55. App. §.111. Compliance with existing requirements for security clearance of personnel. NA
56. App. §.112. Compliance with requirement for approval of contractors and contract terms for capital projects. NA
57. App. §.114. Compliance with bar against use of funds to pay assessments, etc., of U.N. member. To be covered in Loan Agreement through restrictions on use of funds.

58. App. §.115. Compliance with regulations on employment of U.S. and local personnel for funds obligated after April 30, 1964, (Regulation 7).
NA
59. App. §.118. Vietnam iron and steel restrictions. NA
60. App. §.401. Compliance with bar against use of funds for publicity or propaganda purposes within U.S. not heretofore authorized by Congress.
To be covered in Loan Agreement through restrictions on use of funds.

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Development Loan Funds
(Ethiopia - Malaria Eradication)

Pursuant to the authority vested in the Assistant Administrator, Bureau for Africa, of the Agency for International Development (hereinafter called "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the delegations of authority issued thereunder, I hereby authorize the establishment of a Loan pursuant to Part I, Chapter 2, Title I, the Development Loan Fund, to the Government of Ethiopia, of not to exceed Five Million Eight Hundred Thousand Dollars (\$5,800,000), to assist in financing the foreign exchange costs and local costs of a malaria eradication program in Ethiopia. This Loan is to be subject to the following terms and conditions:

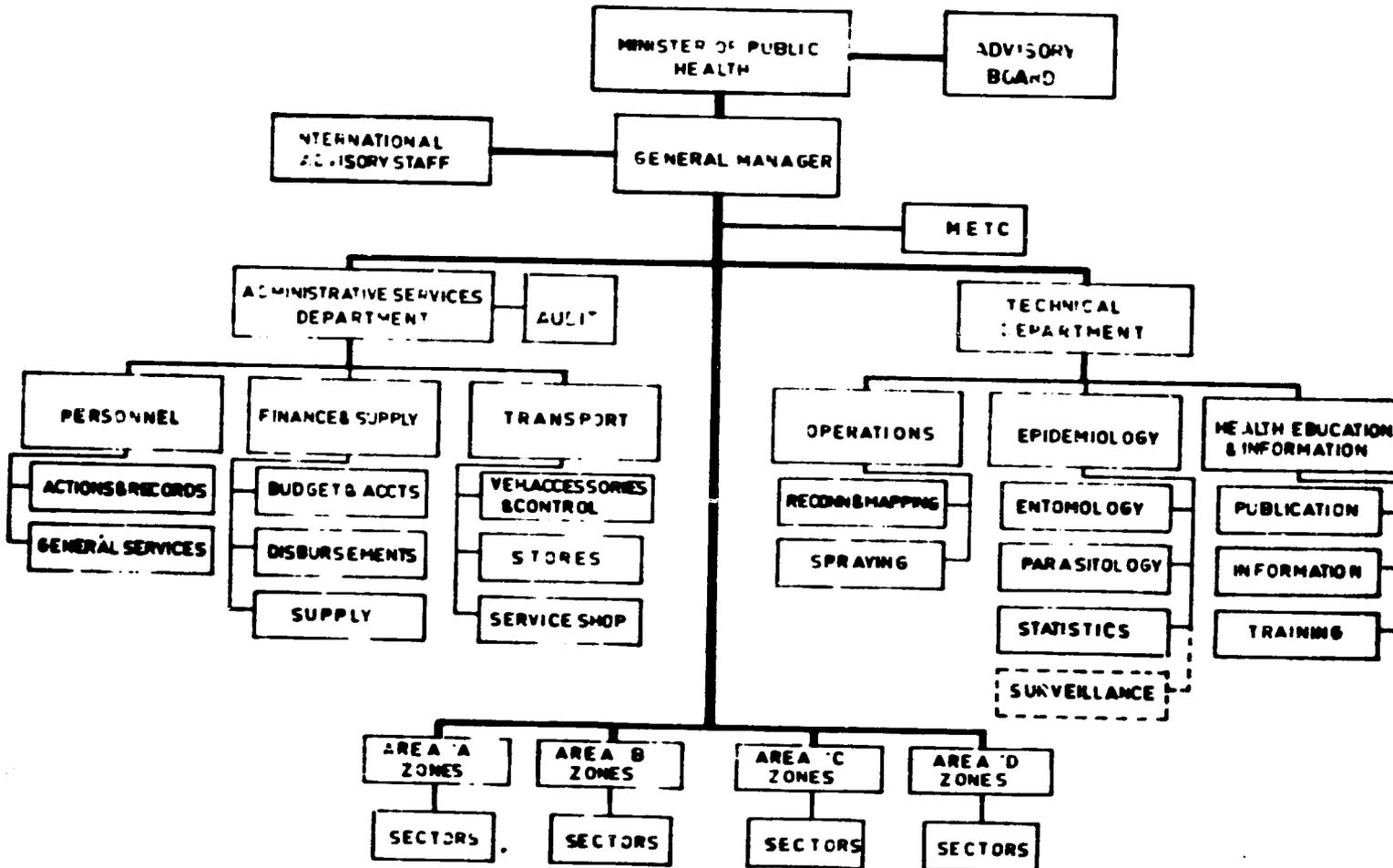
1. Interest Rate and Terms of Repayment. The Loan shall be repaid by the Government of Ethiopia within forty (40) years after the first disbursement thereunder, including a grace period of not to exceed ten (10) years. The interest on the disbursed balance of the Loan shall be at the rate of one percent (1%) per annum during the ten (10) year grace period and at the rate of two and one-half percent (2 1/2%) per annum thereafter.
2. Currency of Repayment. Provision shall be made for repayment of the Loan and payment of interest in United States Dollars.
3. Other Terms and Conditions.
 - (a) Commodities and services financed under the Loan shall be procured from the United States or Ethiopia.
 - (b) Local Currency (Ethiopian) costs financed under the Loan shall not exceed the equivalent of Two Million Six Hundred Thousand Dollars (\$2,600,000).
 - (c) All dollars used to finance local costs shall be subject to a Special Letter of Credit to limit their use to United States procurement.

- (d) The Loan shall be subject to such other terms and conditions as AID may deem advisable.

Assistant Administrator for Africa

Date

IMPERIAL ETHIOPIAN GOVERNMENT
 MINISTRY of PUBLIC HEALTH
MALARIA ERADICATION SERVICE
 ORGANIZATION CHART

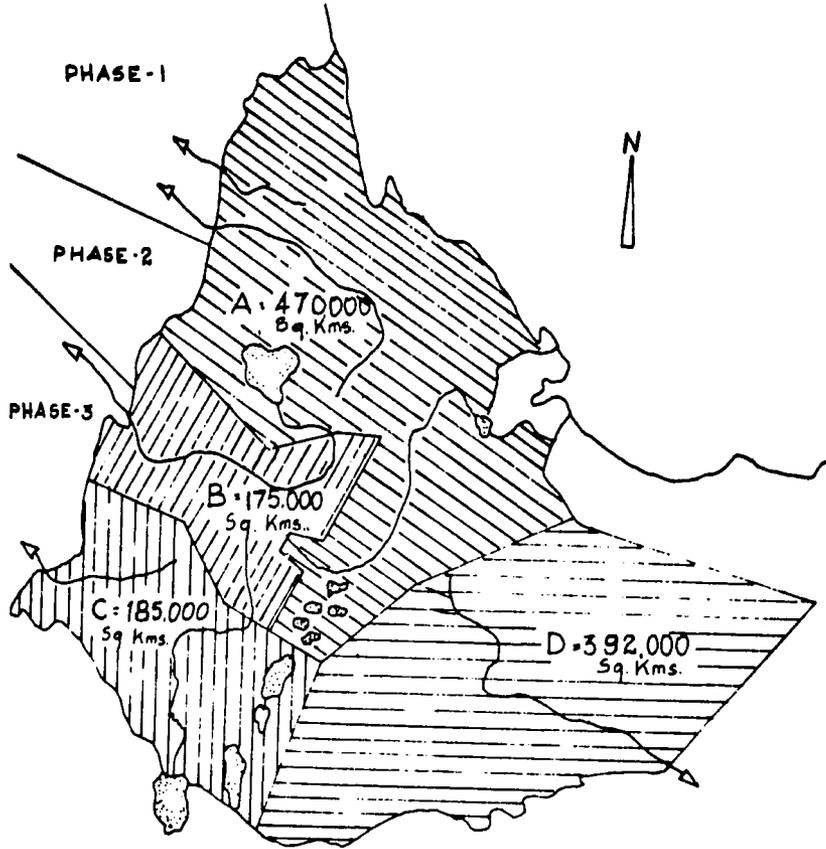


ALB-5647-570

ANNEX III

MAP OF ETHIOPIA

Showing various divisions according to which
 MALARIA-ERADICATION-program
 has been planned to expand.



Scale: 1:12,000,000.

1		Region - A - 470,000 Sq. Kms.
2		Region - B - 175,000 Sq. Kms.
3		Region - C - 185,000 Sq. Kms.
4		Region - D - 392,000 Sq. Kms.
5		River
6		Lake

UNCLASSIFIED

AID-ILC/P-570

ANNEX V

May 22, 1967

COST OF IMPORTED COMMODITIES
(in US \$000)

<u>Fiscal Years</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
<u>Type of Commodity</u>									
a. DDT, 75%, wdp	650	695	570	630	252	315	160	160	-
b. Sprayers, parts	39	46	38	30	24	28	15	-	-
c. Vehicle, parts, tools	1,057	548	500	823	886	416	172	414	577
d. Microscope, Lab.	25	40	38	47	32	32	25	25	15
e. Drugs	19	21	24	26	15	15	10	9	4
f. Oper. Supplies, Office Supply	12	50	30	12	11	7	10	-	1
<u>Total Cost</u>	<u>1,802</u>	<u>1,400</u>	<u>1,200</u>	<u>1,568</u>	<u>1,220</u>	<u>813</u>	<u>392</u>	<u>608</u>	<u>597</u>

UNCLASSIFIED

Summary Description *

Since approximately 65% of Ethiopia's GNP is expected to come from agriculture for at least the next generation, one of USAID's objectives in Ethiopia is to improve this segment of the economy. One of the major requirements for reaching this objective is malaria eradication. In the lowlands, the constant threat of malaria prevents farmers from cultivating the rich river valleys; on the plateaus, occasional malaria epidemics, which may kill 20% of an affected population, severely curtail agricultural production.

The specific targets of the ME Program are to control the disease by 1976, that is to stop the occurrence of new cases, and to eliminate all residual cases by 1980. Progress towards these targets will be determined by a decrease in the prevalence of malaria as measured by the epidemiology division of the program.

In 1962, the Imperial Ethiopian Government created the Malaria Eradication Service, a semi-autonomous division of the Ministry of Public Health. During 1963 and 1964 pilot projects were continued and the organization began to train people in the techniques and skills of malaria eradication. In 1965 all residual spray activities were stopped and every effort was made during this year to complete the Geographical Reconnaissance activities preparatory to the beginning of the attack phase early in 1966. The plan of action will follow the guidelines established by WHO's Expert Committees on Malaria Eradication. The total costs of the program will be \$62.4 million U.S. dollars, of which USAID has provided \$4.3 million in grant funds to date. In addition in FY 1967 USAID authorized a Development Loan of \$5.8 million and continuation on successful execution of the program will give sympathetic consideration to extending additional Development Loans in the future. Most of the USAID funds will be used to buy U.S. source commodities; the balance will be used to meet local currency requirements. The IEG will provide the major portion of local currency requirements up to the level required for successful implementation of the program. WHO and USAID have provided technicians to act as advisors for the program; in addition, Ethiopian technicians needed to run the program have been trained abroad through WHO and USAID scholarships and at the MEPC in Ethiopia.

* For further details and full elaboration of the program see:

1. Plan of Operations for Malaria Eradication of Ethiopia, 1967-1980.
2. The Malaria Eradication Development Loan Application and papers on file in AID/W and MDCG.
3. WHO Expert Committee Reports, Nos. 6, 7 and 8.

Setting of the Malaria Eradication Program

There are no accurate figures on the morbidity and mortality of malaria in Ethiopia. From 1957-1962, the average number of malaria cases per year seen in all the health facilities in the country was 116,000, or 21% of the most common diseases seen. A mobile health team traveling through Ethiopia detected malaria in 40% of the patients it examined in one year. Surveys by the MES in selected parts of Ethiopia have found up to 50% of the population infected at one time. On the basis of these latter surveys, the MES has estimated that 10 million people, or slightly under half the total population of Ethiopia, live in areas where malaria transmission occurs. However, "the malarious area" includes more than half the total land of Ethiopia since the people avoid the lowlands where malaria thrives.

In some of the inhabited lowland areas, where virtually everyone is infected with malaria during the year, the common sequelae of the disease, anemia, emaciation, physical weakness and mental disturbances, lower the effectiveness of the agricultural workers. Furthermore, high abortion and infant mortality rates, combined with low migration into these areas, make it impossible to increase the population. The low population density in the lowlands and the decreased effectiveness of the labor force in these areas are two major factors in the underdevelopment of agriculture in Ethiopia. For example, the Awash River Valley was sparsely inhabited and largely uncultivated until malaria control and eradication projects were started. Now the valley has many small farming communities and several large plantations. As malaria eradication progresses, the Government plans to develop more fully the rich farmland in this valley and others in the malarious area.

If malaria eradication eliminates the devastating epidemics in the highlands and strengthens the labor force in the lowlands, a basic condition will be satisfied toward the exploitation of the full potential of agricultural production in Ethiopia. Since only 15% of the arable land is under cultivation at the present, this potential is enormous.

In the highlands of Ethiopia where malaria is less prevalent, occasional large epidemics may spread through an area, killing up to 20% of the population. Such epidemics have been reported in 1951, 1958 and 1964. Former malaria specialists in Ethiopia have reported in greater detail the epidemic in 1958 which affected 2-3 million people and caused an estimated 150,000 deaths. These epidemics usually occur during the harvest season when the demand for manpower is highest. Since according to a 1962 IEG survey, even during normal times, the people of Ethiopia are on the borderline of malnutrition, an epidemic may threaten the survivors with starvation during the following year.

In addition to the elimination of malaria, another of the major public health objectives of USAID is the eventual establishment by the IEG of health centers throughout the country. The MEP is a major stimulus to their development since they must take over the MES activities in the final stages of the malaria program. Furthermore, when the MES is dissolved, it will be able to provide many of the laboratory technicians, administrators, health educators, epidemiologists and surveillance workers needed to staff the health centers.

In common with MEP's in other countries, a goal of the Ethiopian MEP is the eradication of malaria from the world. Until this goal has been reached, no country where malaria has previously existed can be safe from the disease. Even in the U.S. there have been several well documented small epidemics of malaria which have arisen from the great influx of malaria cases in the past few years.

Although malaria experts in USAID and WHO agree that the goal of malaria eradication is feasible in Ethiopia, there are many technical and administrative problems to overcome. Perhaps the most important is the efficiency of the major vector of malaria in Ethiopia, Anopheles gambiae. This mosquito has a long life span, breeds rapidly, in high numbers and is considered to be one of the most efficient malaria vectors of the world. Thus, the ability of one infected mosquito to bite many humans before it dies and the high mosquito density favor persistent transmission of the disease. Fortunately, A. gambiae is vulnerable to the method of malaria eradication being used in Ethiopia. Since it prefers to take its blood meals from humans at night while they are sleeping indoors, the mosquito, following its meal, will rest on a wall. If the houses have been sprayed with DDT, the mosquito will receive a lethal dose of insecticide and die before it has a chance to carry the infection to another person.

In 1956-1959, WHO and USAID carried out four pilot projects to show the effectiveness of a residual insecticide campaign in eradicating malaria from Ethiopia. Although the disease was not completely eliminated, the pilot projects proved that this method could produce a decline in the prevalence of malaria. Administrative difficulties (i.e., not all the houses were sprayed with DDT), and the introduction of malaria cases from neighboring unsprayed areas, pointed to problems a MEP would encounter, but malaria experts from WHO and USAID agreed that these problems could be overcome and that ME through the use of a residual insecticide was technically feasible.

The administrative problems which the program must overcome are due partly to inadequate supervision of the work and partly to the difficulties in communication. Until recently, there has not been a good system of supervision to ensure that the spraying operations are properly done. Therefore, as in the pilot projects, many of the houses are not being sprayed with insecticide. Similarly, according to the NCDC Evaluation Report of Ethiopia, 1967, inadequate supervision in the laboratory and surveillance divisions has resulted in poor work. However, as the MES gains experience and hires more technically skilled people, these problems will be resolved. There has already been considerable improvement in the supervision of the spraying operations. For example, in one zone the percentage of unsprayed houses has dropped from 30% to 14%.

The difficulties in communication are due to the lack of good roads in many parts of the country, and the large number of small isolated communities. To overcome these difficulties, more manpower is needed than would be necessary in a country where there are better roads and a more consolidated population. Since there are not enough technicians to stage a MEP throughout the entire country at the same time, the country has been divided into four areas where the program will start at different times. Although this allows greater consolidation of manpower, there is the danger of malaria spreading from Area D, where the program is just beginning, to Area A where malaria has been eradicated. A similar problem exists along the borders of the

country, where no malaria eradication programs are underway. However, if a buffer zone around each area where malaria has been eradicated is sprayed with insecticide and if a good surveillance is established which can detect imported cases of malaria, the problem of re-infecting "clean" areas can be minimized. ✓

The additional problems which the Ethiopian MEP may encounter are the large number of nomads and the existence of vectors in certain parts of Ethiopia which prefer to bite humans outdoors. Because the nomads never build permanent homes, it is difficult to find and spray all their temporary homes 2 times per year. Furthermore, the nomads may carry the infection from one part of the country to another. However, if the MES periodically gives the nomads antimalarial drugs in addition to spraying their houses as often as possible, the transmission cycle can presumably be broken and the disease thus eradicated from this group. The second problem, that is of mosquitoes biting humans outdoors, is obviously not solved by spraying houses with insecticide since the infected mosquito would not land on house walls. However, by treating the population with drugs, in places where the problem of outdoor transmission exists, and spraying the mosquito breeding places with an insecticide, malaria can be eradicated in these areas.

Strategy

The strategy of a malaria eradication program is to break the cycle of transmission of the disease between man and mosquito and to eliminate all human reservoirs of the infection. A mosquito, after feeding on a human sleeping indoors, will rest on the walls of the room and receive a lethal dose of insecticide if the house has been sprayed with DDT. Thus, an infected mosquito will die before it is able to infect other humans. If 95-97% of the houses have been sprayed in an area, there should be no transmission of malaria at the end of three to four years of insecticide spraying. Since the infection cannot be passed from one generation of mosquitoes to the next, the only reservoir of infection will be the human host who in some instances may harbor the infection for many years. Therefore, success in eradicating malaria depends upon complete and simultaneous coverage with insecticide of all houses in a given area as well as the detection and treatment of all residual human infections to prevent the re-establishment of the transmission cycle. When the last indigenous cases of malaria have been eliminated, the basic health services will continue the surveillance work of the Malaria Eradication Service to make sure that no new cases of malaria are brought into the country.

To carry out this strategy a large output of resources and manpower is required over approximately 10 years, but if the program is successful very little input will be necessary to keep the country free of malaria after this time. An alternative strategy is a malaria control program. Though the input would be less per year, the program would continue indefinitely since ME would never be achieved. In addition to being ultimately expensive, a malaria control program does not prevent the danger of severe epidemics since many areas of the country are left unprotected. Furthermore, such an endless program introduces the serious risks of mosquito resistance to insecticide and of parasite resistance to chemotherapy. As a result of these two factors, the longer a control program continues the more difficult it becomes eventually to eradicate the disease.

Because malaria eradication is essential to the growth of the country as well as the health of half of the population, Ethiopians at all levels have supported the program. Certainly the most enthusiastic supporters of the program, usually and at least initially, are the rural people who have heard that DDT drives out not only malaria but also bedbugs and fleas from their homes. Unfortunately, their enthusiasm often diminishes as the bedbugs and fleas become resistant to the insecticide, but with very few exceptions they continue to cooperate with the malaria workers. The Government has given its full support to the program not only by passing all the necessary legislation to implement the program but also by allotting increasing amounts of money to support local costs. Since 1963, the government has paid all of the local costs, which amounted to US\$1,200,000 in 1966. However, with the full implementation of malaria eradication it became evident that the IEG was not in a financial position to carry the full load of costs without external assistance both financial and technical. In the past USAID has provided considerable assistance in the procurement of commodities and of technical assistance and has authorized a Development Loan for two years and will in the future consider making additional loans. The technical assistance since FY 1967 has been provided by the U.S. Public Health Service under a PASA arrangement with AID/W financed with grant funds. WHO also contributes to the technical assistance with a limited amount of commodities and fellowships. In addition, the Program has come more and more under Ethiopian leadership. In 1963, the Program had only 376 employees, under the direction of an international staff. However, today there are 1500 employees, under the administrative and technical direction of Ethiopians.

Course of Action and Planned Targets

In accordance with guidelines established by WHO, a detailed Plan of Operations for the Malaria Eradication Program in Ethiopia has been drawn up by MES, WHO and USAID. For a more detailed description of the plan, the reader should consult this document: "Plan of Operations for the National Malaria Eradication Service of the Ministry of Public Health, Imperial Ethiopian Government 1967-1980".

The country has been divided into four geographical areas (A, B, C and D) to minimize the logistic problems presented by Ethiopia's large size and difficult terrain. The eradication program will be started at different times in each area out phased in such a way that the danger of one area re-infecting another will be minimized. The plan of action is the same in each area; two years of preparatory work (Preparatory Phase), four years of spraying with a residual insecticide (Attack Phase), four years of malaria case detection (Consolidation Phase) and an undefined period (Maintenance Phase) during which time the MES is merged with the basic health services.

During the Preparatory Phase, the area is carefully mapped, the houses numbered and administrative units established. Baseline parasitological and entomological data are gathered in order to measure the effect of the spraying operations.

In the Attack Phase all the houses in the area are sprayed 2 times a year with water dispersable DDT, a residual insecticide, at a dosage of 2 gr. technical grade DDT per square meter usually for 4 years. Entomological and parasitological data

gathered continuously throughout this phase not only give an index of the progress of the spraying operations but also point to areas where efforts need to be increased to halt the transmission of malaria. During the last two years of the Attack Phase, a surveillance system is established to detect all the cases of malaria which have not disappeared during the Attack Phase. The surveillance system is based upon monthly house visits by malaria workers who take blood slides from anyone who has had symptoms of malaria in the previous month.

When the parasitological and entomological data indicate that the chain of transmission has been broken (this usually occurs after 4 years of the Attack Phase), spraying operations are stopped but the search for residual malaria cases continues. Not only is each person with malaria given medical treatment to completely eliminate the infection but also an intensive search is made for possible asymptomatic cases around the "index case". In addition, all the houses in the community are sprayed with DDT if there is any evidence that transmission of malaria is still occurring. These activities continue for 2 to 4 years until no more cases of malaria are detected.

During the last phase of the MEP, all MES work can be taken over by the basic health services, provided the latter are well distributed over the country. The health services establish a modified surveillance system and continue to look for malaria cases which may have been imported or which may have been missed in the Consolidation Phase. When no indigenous cases have occurred in 3 consecutive years, the country is declared free of malaria.

Disruptions in the orderly progression of the program from one phase to the next are anticipated. The problems alluded to above will certainly make it difficult to break the cycle of transmission in many parts of the country within the 4 years allotted to the Attack Phase. However, the program is flexible enough to allow for these disruptions without affecting the goal of malaria eradication. "Problem areas" where transmission is still occurring may be kept in the Attack Phase for an additional few years while the rest of the area moves into the next phase. Special teams of malaria experts from WHO and NCDC in Atlanta, Georgia who visit the program periodically not only evaluate the progress of the program but also assist in solving problems.

Throughout the entire program, health educators play an important role. Traveling through the country, they contact important local officials and give lectures on malaria eradication. Their most important function in gaining the cooperation of the people is to find out how MES's public image can be improved. Already the health educators have made changes in MES practices which previously offended certain communities in the country.

MES operates its transport service, consisting of 246 vehicles, in cooperation with the Ministry of Public Health. Vehicles are serviced in the main garage in Addis Ababa and in zone garages or by mobile repair units which travel throughout the country. In addition, drivers are trained in a special driver education course given at MES headquarters.

Finally, except for a few top technicians and administrators, all the MES

personnel are trained in a METC run by MES. This Center gives courses, which last approximately 3 months, in laboratory techniques, spraying operations, surveillance, entomology and administration. Since it opened in 1959, the Center has trained 444 MES workers.

Since the beginning of the MES, considerable progress has been made towards the goal of malaria eradication. Some of the most important dates in the history of the program are as follows:

- 1956-1959: Three USAID and 1 WHO pilot projects carried out.
- 1959: METC established by WHO.
- 1960-1962: Expansion of spraying operations around the pilot projects.
- 1962: MES firmly established by Ethiopian Legislature, Preparatory Phase in Area A begun.
- 1966: (March) The Emperor officially started Attack Phase in Area A.
- 1967: Spraying operations continued and surveillance activities in Area A were begun.

The program will continue in each of the four areas according to the outline given above. By 1971, Area A will be expected to have completed the Attack Phase and the last Area, "D", will have started spraying operations carrying unforeseen problems. Five years later, transmission should have been halted in the entire country as Area D moves into the Consolidation Phase. During the next 4 years, the basic health services will gradually assume responsibility for the entire program.

The maximum yearly budget for the MEP occurs in 1973 when all the areas are either in the Attack or Consolidation Phases, but during the next few years the yearly cost decreases to approximately U.S.\$1.5 million. The largest external input, mostly in the form of loans, would be required in 1969 when there is the greatest demand for vehicles, equipment and insecticide. After 1969, the yearly external input decreases to approximately U.S.\$0.5 million until 1980 when the Ethiopian Government finances the program alone.

It is anticipated that during the life of the project that NCDC malaria advisors in various disciplines will be needed to assist the MES in achieving its goal. Besides the Chief Malaria Advisor there are in FY 1968 specialists in Field Operations, Epidemiology, Entomology, Supply Management, and Equipment Maintenance. These various disciplines will be changed from time to time as the needs of the program change, and WHO will provide technical advisors in differing disciplines as the need arises.

DONIAUSTR

AGENCY FOR INTERNATIONAL DEVELOPMENT (AID)
PROJECT AUTHORIZATION

*Proj 6630006
owl*

PROJECT NUMBER 663-51-511-006	COUNTRY ETHIOPIA	0103
PROJECT TITLE MALARIA ERADICATION		3. AUTHORIZATION DATE July 8, 1970
		6. PROP DATED August 28, 1967

a. Number of Years of Funding: 17
Starting FY 1969; Terminal FY 1976

b. Estimated Duration of Physical Work
After Last Year of Funding (in Months): 18

FUNDING BY FISCAL YEAR (in U.S. \$000 or \$ equivalent)	DOLLARS		P.L. 430 CCC + FREIGHT	LOCAL CURRENCY Exchange Rate: \$1 = Eth 22.50			
	GRANT	LOAN		U.S. OWNED		HOST COUNTRY	
				GRANT	LOAN	JOINTLY PROGRAMMED	OTHER
Prior through Actual FY 1969	4,510	8,800				2,521	
Operational FY 1970	146	-				1,600	
Budget FY 1971	54	4,500				1,600	
S. 1 FY 1972	75	-				1,600	
S. 2 FY 1973	75	4,500				1,600	
S. 3 FY 1974	75	-				1,600	
All Subsequent FY's	150	4,500				3,200	
TOTAL	5,085	22,300				13,821	

9. DESCRIBE SPECIAL FUNDING CONDITIONS OR RECOMMENDATIONS FOR IMPLEMENTATION, AND LIST KINDS AND QUANTITIES OF ANY P.L. 430 COMMODITIES

None

10. CONDITIONS OF APPROVAL OF PROJECT

Project Authorization is for the period of FY 1971 only. Future year approval dependent upon receipt of revised PROP early in FY 1971.

(Use continuation sheet if necessary)

11. Approved in substance for the life of the project as described in the PROP, subject to the conditions cited in Block 10 above, and the availability of funds. Detailed planning with cooperating country and drafting of implementation documents is authorized.

This authorization is contingent upon timely completion of the self-help and other conditions listed in the PROP or attached thereto.

This authorization will be reviewed at such time as the objectives, scope and nature of the project and/or the magnitudes and scheduling of any inputs or outputs deviate so significantly from the project as originally authorized as to warrant submission of a new or revised PROP.

A.I.D. APPROVAL	CLEARANCES	DATE
<i>Samuel C. Adams, Jr.</i> Samuel C. Adams, Jr. SIGNATURE	AFR/ESA: JKnoll	7/8/70
Assistant Administrator for Africa	AFR/DP: DShear	7/7/70
	DAA/AFR: PBirnbau	7/8/70
	A/CONT	7/11/70
		7/8/70

AGENCY FOR INTERNATIONAL DEVELOPMENT (A.I.D.)

PPC/RS
 A.I.D.
 Reference Center
 Room 1656 VA

PROJECT AUTHORIZATION

1. PROJECT NUMBER 663-51-511-006		3. COUNTRY Ethiopia		4. AUTHORIZATION NUMBER 0103-R-1	
2. PROJECT TITLE MALARIA CONTROL (Formerly Malaria Eradication)				5. AUTHORIZATION DATE 10/15/71	
7. LIFE OF PROJECT				6. PROP DATED August 28, 1967	

a. Number of Years of Funding: 20
 Starting FY 19 60; Terminal FY 19 79

b. Estimated Duration of Physical Work
 After Last Year of Funding (in Months): 6

8. FUNDING BY FISCAL YEAR (in U.S. \$ or \$ equivalent)	DOLLARS		P.L. 480 CCC + FREIGHT	LOCAL CURRENCY Exchange Rate: \$1 =			
	GRANT	LOAN		U.S. OWNED		HOST COUNTRY	
				GRANT	LOAN	JOINTLY PROGRAMMED	OTHER
Prior through Actual FY 71	4,692	13,700				5,140	
Operational FY 72	50					1,550	
Budget FY 73	50	3,000				1,950	
B + 1 FY 74	50					2,500	
B + 2 FY 75	50					3,200	
B + 3 FY 76	50	3,000				4,000	
All Subsequent FY's	150					16,400	
TOTAL	5,092	19,700				34,740	

9. DESCRIBE SPECIAL FUNDING CONDITIONS OR RECOMMENDATIONS FOR IMPLEMENTATION, AND LIST KINDS AND QUANTITIES OF ANY P.L. 480 COMMODITIES

Technical assistance under this Project Authorization will be provided in conjunction with development loans for commodities and equipment.

10. CONDITIONS OF APPROVAL OF PROJECT

Project approval beyond FY 1973 is subject to the approval and authorization of two proposed additional development loans in FY 1973 and FY 1976.

(Use continuation sheet if necessary)

11. Approved in substance for the life of the project as described in the PROP, subject to the conditions cited in Block 10 above, and the availability of funds. Detailed planning with cooperating country and drafting of implementation documents is authorized.

This authorization is contingent upon timely completion of the self-help and other conditions listed in the PROP or attached thereto.

This authorization will be reviewed at such time as the objectives, scope and nature of the project and/or the magnitudes and scheduling of any inputs or outputs deviate so significantly from the project as originally authorized as to warrant submission of a new or revised PROP.

A.I.D. APPROVAL		CLEARANCES		DATE
 Samuel C. Adams, Jr. SIGNATURE		AFR/EAF:EDConroy	<i>EDConroy</i>	10/4/71
		AFR/DP :EHogan	<i>EHogan</i>	10/13/71
		DAA/AFR:PBirnbaum	<i>PB</i>	10/15/71
Assistant Administrator for Africa		A/CONT		
TITLE		DATE		