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PROGRAMMATIC AND RESEARCH STRATEGY FOR THE CONTROL OF MAJOR ENDEMIC DISEASES IN AFRICA

HEALTH AND NUTRITION DIVISION
OFFICE OF DEVELOPMENT RESOURCES
BUREAU FOR AFRICA
AGENCY FOR INTERNATIONAL DEVELOPMENT

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INTRODUCTION

The Bureau for Africa recognizing the need for a more specific strategy for endemic disease control than is contained in existing health strategy statements (Health in Africa, and Strategy for Health as a Component of the Sahel Development Program) undertook the development of such a strategy early in 1977. Onchocerciasis, schistosomiasis and trypanosomiasis were selected as an initial focus of attention because of their particular relevance to the Bureau's priority economic and social development goals.

The Bureau first convened a working conference of international experts and carried out epidemiological and environmental assessments in selected countries to define more adequately the complex control problems facing the African countries. Taking the results an ad hoc study group drafted recommendations which have been further refined in this document. Following AID/W and African missions' review and recommendations a final document will be prepared and will serve as the Africa Bureau's strategy for support of the following:

1) Research on operational problems of programs for the control of selected tropical diseases which critically impede social and economic development; and

2) Programmatic assistance to African governments in planning and implementation of endemic disease control programs.

Nature of the Problem in Africa

Dr. Jacques Hamon, Director, Division of Vector Biology and Control, WHO/Geneva, succinctly presented the problem at the working conference:

> "Schistosomiasis, a chronic helminthic disease, is probably by far the most prevalent of these three diseases considered by the conference. In Africa, where it is almost exclusively a human disease, most of the rural population and even part of the urban population is at risk and the number of infected people might be close to 100 million. The most widespread is the vesical schistosomiasis,

due to S. haematobium. The most serious is the intestinal schistosomiasis, due to S. mansoni, which has often a spotty distribution. The less widespread is that due to S. intercalatium which is mostly localized in some parts of the equatorial zone of the African continent. Until recently drugs available for the treatment of schistosomiasis had great limitations, due to their incomplete effectiveness and frequent side effects. This situation is improving and some new drugs under advanced field screening will probably completely change this picture and enable the carrying out of larger scale operations. However, the treatment of parasitized people is of limited epidemiological significance if cured people are reinfected soon afterwards, which implies the need to act also against the snails constituting the intermediate hosts of the disease. For similar reasons the use of molluscicides has side effects on non-target organisms, including fish, and more studies are definitely required on that aspect. While immunization appears as a remote possibility, there is an obvious need to develop an improved control strategy which within the framework of the local epidemiology of schistosomiasis would aim to limit its prevalence and the wormload in infected people by a sound association of chemotherapy, molluscicides, decrease of man-infected water contact, and decreased contamination of the water by Schistosoma eggs. One of the main characteristics of schistosomiasis is its tendency to spread with any economic development involving irrigation, impoundments, man-made lakes, etc. and one of the greatest priorities might be to prevent this spread of disease.

Onchocerciasis is a chronic filarial disease said to affect more than 200 million people in tropical Africa, but this is only an order of magnitude as in most endemic countries outside the Volta River Basin area there are very few solid data. Even in the Volta River Basin area one country reported some years ago only a few cases of onchocerciasis in the Annual Report of the Health Department, while the number of infected people in that country exceeds probably half a million. This indicates the degree

of accuracy of the statistical data available at the continent level. Onchocerciasis, although mostly known because of the severe ocular lesions, culminating in the blindness that it causes in certain endemic areas, is also a systemic disease affecting the skin and many other organs, but the socio-economic significance of its non-ocular aspects is imperfectly known. The drugs currently available for onchocerciasis control either have very limited effectiveness or give very serious side effects, or both, and recent chemotherapeutical investigations have not yet screened many promising alternatives, although some improvements are anticipated. There is no immunization and prospects of developing it do not seem bright. Control operations are presently mostly based on vector control, but they require large resources as the blackfly vectors breed in streams and rivers, have a short reproduction cycle and sometimes a considerable flight range, reaching or exceeding 100 kilometers. In the absence of any effective and safe chemotherapy, control programmes should interrupt transmission in about 20 years - the anticipated maximum life span of the adult parasite - to be fully effective. This is what has been planned for the Onchocerciasis Control Programme in the Volta River Basin area, but securing such long-term resources is not easy nowadays and it is imperative to find short cuts to control this disease. The main economic importance of onchocerciasis resides in the fact that in hyperendemic areas of the savanna zone it prevents the settlement and economic development of fertile valleys, inducing people to live far away from the waters where the vectors breed.

Trypanosomiasis is an acute protozoal disease which has a very low prevalence in human populations, and thus differs considerably from schistosomiasis and onchocerciasis. But is can be a relatively rapidly spreading disease, prone to cause dramatic outbreaks. Furthermore, in areas where it is caused by Trypanosoma b. rhodesiense it is a zoonosis, with natural reservoirs constituted by wild game and cattle. The evidence of the existence of an animal reservoir of epidemiological significance is not as great where the disease is caused by T. b. gambiense, although

experimentally the parasite can be maintained for long periods on certain domestic animals. Immunization is not available and the search for immunizing methods progresses very slowly, due to the great antigenic variability of these parasites. Chemotherapy is available and chemoprophylaxis was extensively used in the past, but all drugs in current use are prone to cause serious side effects in some of the treated people, and mortality from the treatment is not uncommon. Any relaxation of the efforts made to control the disease usually results in localized (or even generalized) outbreaks and the main economic cost of human trypanosomiasis is not so much that associated with the disease itself as the cost of the surveillance system needed to keep the disease absent, or at very low incidence. Vector control, when successful, constitutes an absolute answer to sleeping sickness. It is relatively easy to eradicate human trypanosomiasis vectors from their limited habitats in the dry savanna belt of West Africa where the transmission is due to riverine tsetse flies, but it becomes extremely difficult to eliminate the vectors from the humid savanna zone where their breeding places are widespread, and it is out of the question to eradicate them from the forest belt. The situation is even more difficult with *T. b. rhodesiense* areas where the vectors are savannah tsetse flies widespread over enormous areas. From an economic viewpoint human *Trypanosoma* and their vectors do not constitute a suitable target for those developing drugs and pesticides, because the market is too limited. Fortunately similar problems occur with animal trypanosomiasis, the presence of which considerably hinders cattle husbandry and meat production in most tsetse fly-haunted areas of Africa. The size of the veterinary market is much larger, and the problem of human and animal trypanosomiasis should be considered as a whole, with specific facets for each of its components. It must be stressed that cattle trypanosomiasis is not exclusively transmitted by tsetse flies but that the worst epizootiological situations occur where *Glossina* are present.

> Thus, the general characteristics of the three groups of diseases selected for this conference is their close relationship with water resources and agricultural development, as well as the lack of appropriate tools which might facilitate the implementation of control operations when and where required in the poor endemic countries of tropical Africa."

Deficiences in programming and operations present obstacles as critical to control as the limitations in current technology. Experienced experts point out that control programs in Africa depend heavily on external financial support and foreign technical personnel. Suitable current and emerging technology cannot be fully applied due to lack of infrastructure and trained personnel. Sound national policies incorporating intersectoral implications of endemic disease control are sorely lacking.

STRATEGY FOR ENDEMIC DISEASE CONTROL

I. Endemic Disease Control

A. Areas of Assistance

There are three major areas in which AID can provide assistance in control of major endemic diseases. They are:

1. National Control Programs

AID can provide assistance to African governments in the design, planning, implementation and evaluation of national endemic disease control programs. Specific types of assistance could include such categories as technical assistance, commodities, supplies, manpower training, and development of information and data systems.

2. Endemic Disease Control Components of Integrated Rural Health Delivery Systems

The concept being proposed under this heading would involve the planning and design of an endemic disease control component into integrated rural health delivery systems projects programs. Consideration is given to building into the health services program an endemic disease control component based on whatever endemic diseases that pose priority health problems. Such undertakings should result in cost-savings and more comprehensive health care in terms of utilization of existing health facilities and resource to the

maximum feasible extent. Assistance for the most part would be related to an AID supported rural health delivery system project. The types of assistance provided would be the same as for support of development and implementation of a national control program, however would probably be more limited (geographically) in scope.

3. Endemic Disease Control Components of Integrated Rural Development Projects/Programs

The concept proposed here involves the planning and design into integrated rural development schemes/projects an endemic disease control component. The endemic disease control component should address those diseases which will be aggravated in the project area and will pose constraints to production. Similar to the proposal for integrating endemic disease control components into health delivery systems as previously noted, all attempts should be made to integrate these control efforts into the local health plans/structures. In considering this approach to endemic disease control program/activities thoughts should be given to physical and/or engineering measures which may be designed into projects for control of certain diseases, e.g., schistosomiasis in irrigation projects.

B. Strategy Recommendations

The following are recommendations for strategy development in the areas of Endemic Disease Control.

1. The Bureau should provide assistance, upon request from African governments, for the planning, design and implementation of National Endemic Disease Control Programs for selected diseases (e.g., schistosomiasis, onchocerciasis, and trypanosomiasis) in countries which have demonstrated commitment and willingness to support cost-effective/affordable programs.

a. Rationale.--

The three endemic diseases under consideration (onchocerciasis, schistosomiasis and trypanosomiasis) collectively affect more than 100 million people in Africa. The overwhelming majority affected are the rural poor, the group of primary interest to AID. Although the major effects from these disease are not due to increased mortality, however the severe morbidity caused by these diseases result in serious negative effects on the labor force and productivity. Continued high prevalence of these diseases pose major problems which must be dealt with by the Bureau in its overall development assistance approach in Africa. It

also must be kept in mind that we do not have totally satisfactory and cost-effective technology for the control of these diseases, however it is incumbent upon AID, other donors and host African governments to do our best efforts until better technology is available. In a similar light fashion we must continually strive to design and support programs which the African government must be willing to commit a significant amount of its development budget to this activity, in concert with its health budget. In a similar fashion the individual within the government (MOH, etc.) responsible for this program should be highly placed and have appropriate authority for carrying out the control program.

In addition to the planning commitment of the government, and appointment of a high level official for implementation of the endemic disease control program, an adequate staff of well trained professionals and paramedical workers will be needed. In view of the shortage of such personnel in the majority of African countries many of these personnel will have to be trained. During the training and development

phase of the program technical assistance will have to be provided in most cases by external assistance agencies.

Logistics support, supplies and equipment must be provided for the workers in the program. In order to insure successful implementation and continuity of control program activities it is highly desirable that the responsibility for the planning and implementation of national endemic disease control programs/activities should be at a high level in the host government structure. This individual should be able to relate effectively across ministerial lines, inasmuch as the effective control of endemic diseases requires at least three ministries (health, agriculture, and public works). In addition, programs planned should be done in a fashion that host country governments stand some likelihood of supporting after external assistance resources have been withdrawn.

b. Essential Elements of National Control Programs. Perhaps the most important elements in development and implementation of endemic control programs are rational planning and commitment by the national government to support of such

programs. Planning for endemic disease control programs, as for health delivery system programs, must be an interministerial undertaking. In this joint effort it must be decided and agreed to the role which each department and/or division of government must play in the implementation of the control program. In view of limited resources for control of these diseases, with many complexities associated therewith, it is highly important that integrated activities, pooling of resources, and coordination of effort be planned for and carried out to the maximum feasible extent possible. The national importance that these and all other activities be integrated with other services/programs to the fullest extent possible. For example, budgetary allocations for this purpose should be made from Ministry of Agriculture, Ministry of Rural Development, Ministry of Waterworks or Water Resources Development, etc.

c. Available Technology.--

The technology for control of the three diseases under consideration is by no means fully satisfactory and/or cost effective for the most part. In some instances, however, there are

some bright spots. In terms of onchocerciasis we have less to offer in control of the disease than in the other two, i.e., schistosomiasis and trypanosomiasis.

(1) Onchocerciasis

In regards to onchocerciasis, at present larviciding (destroying the larvae) against the vector (i.e., the "black fly") of the disease is the only effective onchocerciasis control method in Africa. There are chemotherapeutic agents available which kill the adult worm and the microfilariae in humans, however the side effects are so severe that they can not be used except under unusual circumstances. The three drugs available for treatment of the disease are Suramin (adult worm), Diethylcarbamazine (microfilariae) and Metrifonate (microfilariae), however because of their side effects they can only be used in extreme cases (blindness prevention, elephantiasis, leg ulcers, etc.), and even then under the close supervision of physicians. In addition to chemotherapy, multiple nodulectomy (removal of nodules) has proven to be

effective in preventing blindness and rapid progression of the disease.

Inasmuch as the adult worm lives in the human host for 15-20 years and because of the long distances which the "black fly" vector may travel, vector control measures must be applied with diligence and over an equally long period. The best control efforts should be a strong vector control program combined with the judicious use of chemotherapeutic agents.

(2) Schistosomiasis

For the control of schistosomiasis there is more pragmatic technology available than for the other two diseases. There are four principal areas of control of schistosomiasis, namely: 1) environmental sanitation, 2) provision of safe water supply, 3) chemotherapy, and 4) vector control measures.

Environmental sanitation measures serve as effective means for control and prevention of the disease through preventing excreta (stool and urine) of infected humans from coming into contact with snail vectors. Provision of safe water supply to the people

in the endemic area assist in preventing and controlling the disease through keeping both the individual and excreta from contact with the snail vector. Chemotherapeutic agents available for schistosomiasis include the antimony compounds, niridazole, metrifonate, bycanthone and oxamenoquine. These drugs require supervision by a physician for their administration. Technology available for vector control (snails) include chemical molluscucides, biologicals, predator snails, and engineering measures, particulary in connection with irrigation schemes. The first two control measures, namely environmental sanitation and provision of safe water supply are very pragmatic and cost-effective in view of the fact that the people are actively involved in carrying out these control measures, abetted by a sound health education program. Several self-help and labor intensive efforts may be used in carrying out cost-effective vector control activities, such as maintaining irrigation canals, constructing foot-bridges over canals, and manually picking snails (e.g., Mainland China).

(3) Trypanosomiasis

The primary methods for control of trypanosomiasis are vector control and chemotherapy for individuals with the disease. Inasmuch as there is a common vector (Glossira or Tsetse fly) for both animal and human form of the disease, control of the common vector is perhaps the single most important factor in control of the disease. Also the Rhodesian form of trypanosomiasis is a zoonoses which affects both animals and man. This latter form of the disease is the acute malignant variety in humans. In view of the common vector for this disease and due to the major economic problem it causes by its attack on cattle, interest in its control can be generated rather easily among agriculturists and livestock breeders and growers. The chemotherapeutic agents available for treatment of trypanosomiasis in humans include Mel B and Mel W Suramin alone or in combination with Lomidine for the Gambian variety, and for the Rhodesian variety Suramin is used alone or followed by the previously mentioned drugs. Drugs effective

in animals are quinafyramine, demamogine, homidiam, and isometamidium. The most effective means for control of the vectors (Tsetse Fly) is through insecticide applications such as organochlorine compounds (DDT or Dieldrin) and the new synthetic pyrethroids. The insecticides may be applied from the ground or from the air, using either fixed wing aircraft for blanket application of non-residual acting insecticides and residual acting insecticides by helicopters. An experimental measure for Tsetse control is by means of the sterile male tsetse fly. Attacks on the vector may be facilitated by modification of its habitat through such means as clearing tree covers on a total, selective or discriminatory basis.

d. Types of Assistance from AID.--

AID can provide technical assistance in assessing the magnitude of the endemic disease problem, design and implementation of control programs/projects, and for program/project evaluation within limits. In addition AID can support manpower training and development of information

data systems. Also AID can provide certain commodities, supplies and equipment needed for control of endemic diseases.

e. Interrelationships in Country.--

Perhaps the most important interrelationships at the country level are those between relevant ministries. Joint planning and implementation of endemic disease control programs is essential for any measure of success. Next in importance is the need for coordination of inputs of external assistance agencies. In view of the limited resources and complexities of problems in controlling endemic diseases, it is of utmost importance to pool all available resources and take all possible steps for their effective use. In diseases such as onchocerciasis, which transcend national boundaries, it is important that governments develop interrelationships in the control of such endemic diseases.

f. Actions by AID (Missions and AID/W).--

The Bureau will request that missions assess the level of interest and commitment on the part of African governments requesting assistance for endemic disease control programs/projects. In judging the level of interest the Bureau will look favorably toward providing assistance to

those countries which are prepared to:

(1) Establish an Office of Endemic and Communicable Disease Control, under the leadership of a top level government official;

(2) Develop within the MOH an organizational structure for the control program, including establishing and budgeting for professional and subprofessional positions;

(3) Enunciate that it is government policy to continue the control effort on a long-term basis, including assuming full responsibility for its operation after external assistance resources are no longer available; and

(4) Establish and implement policy to the effect that all relevant ministries and departments of the government will work together in planning and implementation of the endemic disease control program.

As in response to request for assistance in other program areas, AID/W will provide assistance to the field for assessment of the problem, project design and review, and for project implementation as may be necessary.

In view of relative shortages in personnel

resources for such undertakings at both the U.S. and host country levels, some time for tooling up is required. As a consequence our programmatic efforts must initially be on a low scale, with gradual and progressive build-up. In spite of this we must move forward as rapidly as feasible in this area.

2. The Bureau should encourage and promote the concept of designing relevant and feasible major endemic disease control components into rural health delivery systems projects/programs, as appropriate, and provide support for AID assisted projects of this type.

a. Rationale.--

The rationale is the same as noted under 1.a. above, except the approach or integrating endemic disease control program/activities into rural health delivery systems should enhance possibility of continuity and more cost-effective control programs. This approach also will usually imply more discrete control efforts initially which can later be expanded to involve larger and larger target areas.

b. Program Requirements.--

The program requirements are the same in types and nature. In view of the scope of geographic coverages initially the numbers of the various types of manpower and magnitude of logistics support required will be less in most cases. In addition, the amount of supplies and commodities will be less. In view of the tradeoffs in this approach, i.e., health personnel, health educators, sanitarians, and local self-help efforts reciprocally carry out endemic disease control efforts, while at the same time providing basic health services. Interests, commitment and support by the national government is equally important in either case.

c. Available Technology.--

The available technology for the control of the three endemic diseases under consideration (i.e., onchocerciasis, schistosomiasis and trypanosomiasis) is the same regardless of the approach used.

d. Types of Assistance from AID.--

As for the control effort the same types of assistance can be provided, however in providing simultaneous assistance to the rural health program there will be increased total inputs resulting from this joint approach. In a similar vein the total impact from AID's input should be correspondingly greater.

e. Actions by AID (AID/W and Field).--

The field missions should look for opportunities and the feasibility of planning and designing endemic disease control components into AID supported rural health projects. AID/W should provide field missions with whatever additional technical assistance resources needed for project development, design and implementation. In dealing with international organizations and other donors, AID/W should promote this concept.

3. The Bureau should promote the concept of planning, design and implementing endemic disease in integrated rural development projects/schemes for both prevention of dissemination/exacerbation and for control of these major endemic diseases in the target areas, as well as provide support for these activities in AID assisted projects.

a. Rationale.--

The rationale in this approach is essentially the same as previously noted, however this approach builds on the concept of preventing the worsening and/or taking steps to ameliorate the adverse environmental effects from socio-economic development schemes. This also provides a mechanism for properly responding to Environmental Regulation 16, as well as improving the effectiveness and impact of our development efforts. This approach should also facilitate the joint involvement of the various sectorial ministries (e.g., Agriculture, Health, Rural Development, Finance and Planning, Education, etc.) in the planning, development and implementation of endemic disease control programs/activities.

b. Program Requirements.--

Same as previously noted.

c. Available Technology.--

Same as above.

d. Types of Assistance from AID.--

Same as previously noted, except on this approach AID inputs for the most part will be pooled with those for support of the socio-economic development project/program. It must be kept in mind that the control effort should be integrated with the health delivery system, at least in the project area.

e. Actions by AID (AID/W and Field).--

The field missions and AID/W should carry out similar actions as previously noted, however the group of actors are somewhat different. In this exercise we will be dealing with participants from the pertinent sectors from an intersectorial concern and interest standpoint. AID/W will be acting in a similar fashion.

II. Research on Endemic Disease Control

A. Areas of Intervention or Assistance

There are essentially two types of relevant research which is needed in connection with control of endemic diseases. These are: 1) Basic Research - the search for and testing of newer or improved technology; and 2) Operational/Applied Research - the field testing and cost-effective packaging on existing and acceptable technology for the control of these diseases.

B. Strategy Recommendations

1. Operational/Applied Field Research

The Bureau should support operational/applied field research on selected tropical diseases for determining the most cost-effective methods of control and will ultimately provide sound bases for planning control programs.

a. Rationale.--

On one hand the majority of technology for control of endemic diseases is inadequate from a cost-effective standpoint. On the other hand we lack experience in packaging alternative control technology in the most cost-effective manner under actual field conditions. As a consequence we are often guilty of not applying all that we know as well as we could. The

application of existing control technology under field conditions can serve to give us greater experience in control measures, determine the effectiveness of control technology, and prepare the necessary infrastructure for application of new and/or improved technology.

b. Elements of Research Programs.--

The elements in an operational/applied research program should include, but not be limited to, such as the following elements:

1) Studies to assess the magnitude of endemic disease problems in Africa, including the relationship to socio-economic development schemes;

2) Collection of detailed data on endemic disease vectors, including information on their habitat and how environmental changes may affect their proliferation and survival;

3) Comparative evaluations of the cost-effectiveness of various control measures, either singly or in various combinations;

4) Studies assessing the cost-benefits and/or economic impact of control or lack of control of various endemic diseases;

5) Determination of the most cost-effective organization/infrastructure for operating an endemic disease control program, including manpower needed; and,

6) Manpower training and development programs for the various types and levels of manpower needed to plan and implement national control programs.

c. Types of Support from AID.--

Africa has planned a Regional Project entitled, "Health Constraints to Rural Production," which will serve as the principal vehicle for carrying out the operational/applied research program for endemic disease control. Inasmuch as such projects must be designed in a fashion to provide answers to research questions, most of the operational costs for such projects will be borne by AID. The types of support which could be provided by AID would be in such areas as noted in 1.b. above, more specifically technical assistance, manpower training, epidemiological studies, commodities, and establishment of data systems. Initially this

effort will focus on three of the major endemic diseases (i.e., schistosomiasis, trypanosomiasis and onchocerciasis).

d. AID Action.--

AID field missions are to identify potential areas or opportunities for carrying out operational research along the lines of the Health Constraints to Rural Production project, as well as discussing the desirability and acceptability of such a project with the particular host government. AID/W would review the submissions from the field and would provide technical consultation as needed to further explore the feasibility of carrying out a research project and/or making required analyses for preparation of a project/sub-project paper. Following this latter step, AID/W, in conjunction with field missions, would review and process project documentations for authorization and obligation. During implementation, AID/W would collaborate with field missions and host governments in a fashion to assure that the project was being carried out in a fashion to attain research objectives.

2. Basic Research

The Bureau should promote, encourage and support, wherever appropriate, relevant basic research on the control of major endemic diseases, as well as assist in identification of research needs for new and/or improved technology, and provide opportunities for carrying out relevant basic research studies.

a. Rationale.--

In view of the fact that presently we do not have cost-effective endemic disease control technology in most cases we need to mount and/or expand relevant basic research studies on this problem. In this context we need to more intimately tie-in operational/applied research studies and/or findings with basic research on control of endemic diseases. This tie-in could provide reciprocal benefits, i.e., promising results from basic research could be field tested in an operational research setting/mode, while at the same time field experience could be transmitted back to the basic researchers. In this manner new technology could either be refined or improved, while at the same time basic research needs and technological gaps could be identified.

b. Methods and Types of Support.--

Support of basic research studies by AID should be primarily from the central bureaus (e.g., DSB), in association with other appropriate Federal Government agencies (DOD, HEW). Examples are:
1) AID's support of the WHO/UNDP Tropical Disease Research and Training Program (TDR), and DOD's Naval Medical Research Units Program (NAMRU). Other DSB supported activities of this type are Malaria Vaccine research, and Molluscucide research and pesticide research.

c. AID Actions.--

The Africa Bureau (both AID/W and field) would be primarily responsible for identifying basic research needs; providing opportunities for field trials of new technology in its operational/applied research; and, sharing of data and/or operational research findings with other researchers. All direct support of basic research by AID should be via central bureau (DSB, etc.) routes, however technical resources in Africa Bureau may participate in basic research programs, as appropriate.

III. Manpower Training and Development

A. Types and Levels of Manpower Needed

As one considers the manpower needs for controlling endemic diseases in Africa, at least four general groups must be considered. They are:

- Host country nationals for carrying out/managing control programs. This would consist of both professional and para-professionals (para-medics);
- Host country nationals to serve as teachers and trainers;
- U.S. nationals for providing technical assistance and manpower training; and
- U.S. nationals to assist in planning and implementing AID's assistance programs. These individuals could be DH or contract personnel.

B. Strategy Recommendations

1. AID should provide support for the training of African nationals required to plan and implement endemic disease control programs/activities in Africa, including manpower development and training personnel.

   a. Rationale.--

   There is a scarcity of qualified Africans at all levels for planning and implementing endemic disease control programs. Although many African health professionals have received training abroad in tropical disease, the number of professionally qualified personnel is grossly inadequate to fulfill

research and operational control programs. In addition there is a serious shortage of trained non-professional technicians of all types to man control programs. At least two essential elements are necessary for both development and maintaining of adequate numbers of personnel required to plan and implement control programs. They are:

1) African personnel who are now or will become technically qualified in this area must have employment opportunities for working productively in some aspect of disease control activities; and,
2) The small core of existing qualified personnel must be substantially expanded through support of training programs for both professional and non-professional personnel for disease control programs/ activities in Africa.

   In respect to the latter, particularly, the U.S. and other international donor agencies can play an important role in assisting African governments to carry out effective training programs.

b. Types of AID Support.--

AID can provide support for training of both professional and non-professional personnel. In terms of the training of professional personnel, support can be provided for participant training (either in U.S. or in Africa) for planning and management of control programs, conducting field research, and to serve as trainers of local nationals. For training of non-professionals, AID can provide technical assistance for planning and implementing local and national training programs, including curriculum development and provision of training materials and equipment.

c. Elements of Program.--

Essential elements of a national manpower training and development program consist of the following:

1) A comprehensive and relevant manpower development and utilization plan;

2) Provisions for training both professional and non-professional personnel for staffing control program activities;

3) Adequate budgeting support for employment of trained personnel after completion of

training programs; and,

4) Adequate budgetary support of training institutions.

In planning and implementing manpower training and development programs, serious consideration should be given to carrying out as much of training in Africa as practicable. For training of professional personnel this will have to be done mostly in regional institutions, training of non-professionals can be accomplished in-country. For those instances in which satisfactory training can not be carried out in African institutions at the present time, the goal should be to move as rapidly as possible to Africa-based training through strengthening African institutions.

d. AID Actions.--

USAID should look for opportunities and plan to develop programs/projects which support training of needed manpower for operating endemic disease control programs. This support may take two forms, namely: 1) country training programs, and 2) support of participant training in U.S. or other African countries. AID/W should work with training institutions

to assist them in designing appropriate and relevant training programs. In addition AID/W should be prepared to seek and obtain appropriations from the Congress for support of training programs, as well as identifying training needs and qualified training centers.

2. <u>AID should promote, encourage and provide support of training programs for U.S. nationals to develop a pool of technical expert resources for assisting African governments in planning and implementing endemic disease control programs</u>.

a. <u>Rationale</u>.--

It is readily apparent that adequate numbers of technically qualified personnel are a mandatory prerequisite for the development and implementation of satisfactory endemic disease control programs. It is the consensus of the international scientific community that a dearth of such personnel exist world-wide. This shortage is especially severe in the U.S., particularly with respect to personnel who are knowledgeable about the control of these diseases in Africa. If the U.S. is to provide effective assistance to African governments for the control of tropical diseases, then it becomes imperative

that the U.S. (AID specifically) provide all practicable means of support to increase this manpower pool of U.S. nationals. In addition AID needs the services of technical experts on endemic diseases to carry out regulatory requirements (Reg. No. 16) in connection with development assistance programs.

b. Program Elements.--

There are three essential elements to a program of this type. They are:

1) Support of training of personnel (trainees);
2) Availability of qualified training institutions to conduct training programs; and
3) Availability of career opportunities for trained personnel.

In support of training for U.S. nationals, AID should play a major role. In view of the need for this type of personnel is a worldwide one, this should be an Agency-wide effort, at least. Similarly, the efforts necessary for insuring the availability of institutional training programs, of necessity, must be collaborative ones between the public and private sectors. The provision of career employment opportunities for trained personnel

requires collaboration between the U.S., international organizations, external donor agencies, and host country governments. In all of these areas, however, AID, including AFR, is required to play a major leadership role.

c. Types of AID Assistance.--

The types of assistance which could be provided in this area are traineeships, institutional support, and the use of trained personnel for DH, as consultants and as contractors for providing technical assistance to LDCs. In reference to institutional support, this will be further addressed under Strategy Recommendation 3 - "Support of U.S. Training Institutions," below.

d. AID Actions.--

AFR (AID/W and Field) should identify needs for trained manpower of all levels and types. AFR/W should work with other pertinent offices/bureaus of AID, other U.S. governmental agencies, and U.S. institutions to both identify training capabilities and develop required additional training resources. Both AID/W and field should identify needs and plan career employment programs/positions

for AID DH personnel (both in AID/W and the Field). Finally, AID/W should work diligently to request and obtain financial support from the Congress and the Administration for support of this component of the program.

3. <u>AID should promote and provide support to U.S. institutions for development and implementation of training programs for both U.S. and African nationals on research and/or control of endemic tropical diseases</u>.

a. <u>Rationale</u>.--

The rationale has been discussed for the most part previously, however, additionally some comments need to be made regarding the state of affairs of U.S. training institutions in conducting relevant training. There are several U.S. institutions which provide some training in tropical diseases, however, with few exceptions, most of the training is either on basic research or is unifocal (non-comprehensive) in scope. Very few of these training programs provide opportunities for related field training experiences. There are almost no medical schools which have tropical diseases and international health as a part of their undergraduate

curriculum. There is also practically no funding resources available for institutional support of this type of activity, which precludes U.S. institutions from serious considerations of this subject area.

b. Program Elements.--

The essential elements of the program would entail support of the institutions to develop relevant tropical disease training programs for both U.S. and African nationals, and support of U.S. and African trainees. This program should be coordinated with the WHO Special Tropical Disease Research and Training Program (TDR). This latter program could contribute significantly in light of its plan to strengthen research training institutions and to establish institutional networks for research and training. Much of the training for researchers on tropical diseases, particularly that in connection with the major endemic diseases, is appropriate for trainees for control of endemic diseases.

c. Types of AID Assistance.--

AID's assistance could take the form of support of trainees and support of training institutions. The training of African nationals could be supported by AFR Bureau. The support of U.S. institutions would most likely have to be under provisions of Section 211(d) of the Foreign Assistance Act. This should be done as a programmatic function of DSB, particularly in view of the fact that such will serve interregional needs. Support of training of U.S. nationals should similarly be programmed by DSB, perhaps in collaboration with other pertinent U.S. Government agencies.

d. AID Actions.--

AID/W (DSB and Regional Bureaus) should have primary actions for the planning and implementation of this program as noted above. The field missions should identify needs for training of host country nationals, as well as plan and develop programs to support the participant training activities of such individuals.

IV. Program Development and Support

A. Manpower Needed

There are at least two major areas to be considered under this heading, namely: 1) internal AID manpower resources, and 2) external manpower resources needed for program planning, development and review of AID's endemic disease control programs/activities. The former, i.e., internal manpower resources needed would consist of a group of experts on the control of various aspects of endemic diseases, plus other health and health related direct hire personnel. In regards to the external (non-hire) manpower, a panel of endemic disease control experts is needed to serve as an expert advisory committee. This latter group could perform such functions as program review, evaluation and recommendations for program improvement/refinement for AID's endemic disease control program activities. With the decision having been made to strengthen the technical capabilities of AID staff (AID/W and field), the addition of these two groups (i.e., Cadre of DH Experts and Expert Advisory Panel) should materially improve the quality and magnitude of our endemic disease control program activities.

B. Strategy Recommendations

The following are recommendations for strategy formulation/development in this area:

1. The Bureau should establish ceilings for DH positions for a cadre of professional experts on endemic disease control program/activities, and should recruit and strategically deploy such personnel primarily in field posts in Africa.

a. Rationale.--

There is a severe shortage of all types of trained and experienced personnel in the control of endemic disease. This state of affairs is compounded in tropical Africa by the tremendous health and socio-economic problems from these diseases, as well as the lack of adequate and cost-effective technology. In order to maximize the effectiveness of these scarce manpower resources and, at the same time strengthen the capability of African institutions, AID should recruit and strategically deploy small cadres of such experts. Once recruited and in place, these experts could provide direct consultation to our missions and host African

governments, as well as assist in the design of disease control programs. At the beginning these cadres of experts could be placed in the REDSOs, or in a strategic manner to serve needs for this type of service in both West and East Africa.

b. Types of Experts Needed.--

The types of experts needed would be such as Epidemiologists, Entomologists/Malariologists, Malacologists, Environmental/Water Engineers, Parasitologists and Vector Control Experts. All of these experts should have in-depth and broad-based knowledge on the control of such major endemic diseases as schistosomiasis, onchocerciasis, malaria and trypanosomiasis, particularly. Three or four of these experts could be stationed in each of the REDSOs, making a total of 6-8 experts based in Africa.

c. Functional Roles.--

These experts could carry out such roles as follows:

-Provide technical consultation on endemic disease control problems to USAIDs and host African governments;

-Conduct enviornmental health assessment studies in connection with socio-economic and/or rural development projects;

-Assist in the planning and design of endemic disease control programs/projects; and

-Provide assistance in program and strategy development and implementation for endemic disease control activities for the Bureau, as well as assisting in coordinating AID's activities with other donors and international organizations.

d. Actions by AID.--

AID/W would provide technical backstopping and support to these experts. REDSO's Directors would provide overall supervision as for other personnel. USAIDs would request and make use of their services in the functional areas as noted above. The Bureau would take the responsibility for getting approved ceilings and budgetary allocations for the positions, plus recruiting and delpoying these individuals.

2. <u>The Bureau should seek authority for and establish an outside Expert Endemic Disease Control Advisory Panel which should meet regularly for the purpose of reviewing AID's endemic disease control programs, program evaluations, and advising on program improvement/refinements</u>.

a. <u>Rationale</u>.--

Due to the shortage of personnel knowledgeable about the control of major endemic diseases and the need for external review and evaluation of AID's programs by peer professionals, a group such as this is sorely needed. AID does not have at the present time nor will it have in the foreseeable future adequate professional staff to plan and implement major endemic disease control programs/projects. Even if this were the case, external review and evaluation by peer professionals could serve both to improve quality of programs and better utilization of relevant U.S. technical resources.

b. <u>Functional Role</u>.--

This Expert Advisory Panel would meet regularly, perhaps quarterly, to carry out such functions as the following:

- Review programs/projects planned for endemic disease control;
- Review operational research programs for endemic disease control;
- Propose plans for program/project evaluation; and
- Make recommendations for improvement in control programs and strategy refinement.

c. AID's Action.--

AFR should take the responsibility for taking necessary actions to establish the Expert Advisory Panel, selection of panel members, and formulating plans for the working of the panel. Once the planel has been established AFR should take the responsibility for supporting and utilizing the expert panel along the lines of formulated terms of reference.

V. Coordination and Cooperation in Control of Endemic Disease

A. Types and Levels of Cooperation and Coordination Required

There are several levels and types of coordination and cooperation to be considered in the control of endemic diseases. From the levels perspective they are in the following:

1. In the U.S.

   a. Between the Bureau and other pertinent U.S. Government agencies.

   b. Between the Bureau and pertinent private sector agencies and institutions.

2. Outside U.S. and in Africa

   a. Between Bureau and international organizations, including members of U.N. family;

   b. Between Bureau and other external assistance agencies, both governmental and nongovernmental; and

   c. Between Bureau and regional organizations and African governments at local, national and regional levels.

Due to the magnitude of the problem, lack of cost-effective control technology and shortage of resources (financial and manpower) optimum use of all resources becomes critical. In this context it is essential that primary attention be given to cooperative efforts/ pooling resources; close coordination and prevention of wasteful duplication of efforts; and effective collaboration. Even with such actions as these we will not be able to completely solve endemic disease control problems in Africa, however this offers us the best hope of making a significant impact on the problem at this time.

B. Strategy Recommendation

The Bureau should make a deliberate and organized effort to achieve increased levels of effective coordination and cooperation (collaboration) with LDC African governments, other external assistance agencies and international health organizations (including UN family members) for endemic disease control activities at the regional, national and local levels.

a. Rationale.--

In the face of limited available resources for control of endemic diseases, coupled with the magnitude of the problem, coordination and collaboration between all interested parties becomes essential. Pooling of resources both for applying existing technology and for research to develop improved technology offers the only real promise of having a favorable impact on the problem.

b. AID Action.--

AID/W and USAID missions, along with Advisory Groups, must make concerted efforts to seek and find ways to improve the effectiveness of coordination and collaboration in endemic disease control activities. We must seek counsel and guidance from Africans, international organizations and other

donor agencies as to how we may improve on our programmatic efforts through coordination and cooperation.

c. Expected Outcomes.--

Improved control programs and a greater impact on the control of major endemic diseases in Africa should be the result of these activities. In addition we should expect to see improved endemic disease control technology in the foreseeable future as an outcome of these endeavors. Other anticipated outcomes would be improved capabilities of African governments to develop, plan and implement effective control programs.