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Regional Coordination in food and agriculture

SADCC
Blantyre 1981

SOUTHERN AFRICAN DEVELOPMENT CO-ORDINATION CONFERENCE:

Blantyre, Malawi; 19 - 20 November, 1981

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INTRODUCTION

Cooperation in the fields of Food Security and Agricultural Development is central to SADCC's programme for economic liberation in Southern Africa. This paper contains two memoranda, one, on Food Security, prepared by the Government of Zimbabwe; the other, on Animal Disease Control, prepared by the Government of Botswana.

In two other areas of regional agricultural cooperation, Crop Research and Soil Conservation, consultations are taking place among the SADCC states. It is anticipated that a regional policy in these areas will be agreed during the 1981/82 period.

Taken together, progress in these four areas of Food Security, Animal Diseases Control, Crop Research and Soil Conservation, will represent a major and comprehensive response to the agricultural problems which confront the SADCC states. It is hoped that the Blantyre Conference will provide a further opportunity for discussion of this programme with SADCC's international cooperation partners and for agreement on the modalities for its implementation.

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SECTION ONE - REGIONAL FOOD SECURITY

1. The SADCC Summit Meeting held in Lusaka on 1st April 1980 charged the Government of the Republic of Zimbabwe with the task of developing a food security programme for the region. This mandate derives from the concern of the Summit that:

"A majority of the people of Southern Africa are dependent on farming and animal husbandry. Their future livelihood is threatened by environmental degradation and in particular by desert encroachment as well as recurrent drought cycles. Even today few of the states of the region are self sufficient in staple foods. Both environmental protection and food security are major challenges both nationally and regionally."

The Government of Zimbabwe immediately put in hand consultations with SADCC Member States aimed at elaborating a common policy and a united approach to the urgent task of enhancing the region's food security. It was understood that the development of a regional food security policy would overlap with, and have to be coordinated with, regional development in the fields of soil conservation, animal husbandry and disease control, manpower development, industrial development coordination and transport.

2. Addressing the SADCC Summit Meeting held in Zimbabwe on 20th July 1981, the Prime Minister of the Republic of Zimbabwe, Hon. Robert Mugabe, outlined his Government's efforts in developing a regional food security programme:

"We in Zimbabwe, for example, as you will recall, were charged with the task of working out a Regional Food Security Plan. Our proposals on this vital issue were discussed with officials from other SADCC countries and subsequently presented to the SADCC/Donor Conference in Maputo in November last year. SADCC endorsed these proposals at Maputo and a number of donor countries expressed great interest in them at that Conference and at our recent international Conference on Reconstruction and Development (ZIMCORD). Follow-up action relating to the implementation of the proposals and associated projects is now being vigorously pursued by our Government."

3. After a series of regional consultations convened by Zimbabwe an initial programme in the field of Food Security was developed. At the Maputo Conference the Government of Zimbabwe presented nine project proposals which, taken together, comprise the first step in constructing a comprehensive programme for attaining regional food security. Food Security is clearly of central importance for the independent states of Southern Africa. The objectives of the programme outlined at the Maputo Conference are:

- (a) to meet the basic human need for food;
- (b) to provide a buoyant agrarian sector including both peasant and commercial subsectors;
- (c) to reduce present heavy drains on foreign exchange imposed by basic food imports;
- (d) to reduce dependence on the Republic of South Africa as a food supplier.

The nine projects cover the following areas of regional coordination:

(a) Information Exchange

The first step toward regional action for agrarian change is to create an effective interaction of national personnel through regional workshops, specialist meetings and data exchange.

(b) Feasibility Studies

It was acknowledged that food security must be advanced on several fronts concurrently and that the bulk of the projects presented were for studies. These would provide a firm basis on which proposals for concrete programmes of action would be developed in the following fields:

- (i) development of a regional and national early warning system to identify impending food shortages in adequate time to take preventative action;
- (ii) a regional data bank to allow storage and quick retrieval of basic agricultural information;
- (iii) an inventory of agrarian and agricultural resources available or capable of development regionally and nationally;
- (iv) a regional food reserve system based on enhanced national reserves and interaction among them;
- (v) storage loss reduction based on identification and application of better techniques and development of better storage facilities in the peasant and commercial sectors;
- (vi) development of food processing technology especially to increase the range of foods used and methods of preserving them;
- (vii) improvement of regional and national infrastructures for marketing including procurement, transportation, storage and distribution;
- (viii) exploration of possible regional action to coordinate procurement of extra-regional food aid and to facilitate intra-regional food trade.

The paper presented to the Maputo Conference, Project Proposals for Achieving Food Security by the SADCC Group of Countries, has been reproduced and circulated to donors. The paper also appears in the published report of the Conference, SADCC2-Maputo.

4. In order to facilitate the implementation of the Food Security Projects the Government of Zimbabwe is in the process of establishing a small Administrative Unit within its Ministry of Agriculture. The establishment of this Unit was noted with approval by the SADCC Council of Ministers in June 1981.
5. Detailed proposals have since been prepared relating to the structure, scope and funding of the Administrative Unit and external assistance has been sought to finance this programme for its first three years. It is intended that the Administrative Unit be operational by the end of 1981.
6. The project proposals will allow the region to define more clearly the nature of the threats to food security and particularly which groups within what countries are most at risk. Food Security strategies will differ according to the nature of the threat, the probability with which it is likely to occur and the number and location of the people likely to be affected. A regional food security system must therefore address itself to three levels of consideration: (a) the region's relations with the rest of the world; (b) problems affecting individual countries and therefore intra-regional relations; and (c) difficulties faced by different population groups with individual countries. The poor in a particular country can be dramatically affected by a change in food supply which is undetectable in national or regional terms.
7. In approaching the food security needs of the region a distinction must be made between action which can be taken immediately to enhance food security and programmes which will take considerably longer to come to fruition. Obviously the immediate action undertaken must in no way prejudice the longer term objectives. Among the items which might cause short term food security problems are:

At an International Level

- (a) interruption of food imports;
- (b) interruption to the import of agricultural inputs;
- (c) changes in the international market (e.g. changes in world commodity prices);
- (d) changes in the labour market outside the region.

At a Regional Level

- (a) interruption to between-country food movements, particularly to land-locked countries;
- (b) drought, pest or crop disease affecting more than one country;
- (c) large scale population movements.

8. The present food supply situation is detailed, in broad terms, in Annex I. As can be seen, although the present situation for most countries is improving, it is still far from satisfactory. It is estimated that the region's food needs for 1981 will be in the region of 1,490,000 tons of which some 759,000 tons has been allocated, committed or shipped.

9. Zimbabwe's 1981 grain surplus of 1,000,000 tons gives the region the potential ability to meet the bulk of the short term food aid needs from regional resources. The ability to mobilise these resources, however, is severely constrained both because of a lack of finance and because of transport difficulties. Even so the World Food Programme has been distributing grain from Zimbabwe within the region.

10. Four areas where SADCC international cooperating partners may wish to consider assisting the region in the short term are:

(a) Storage Facilities

Within the region there is an urgent need for financial assistance to cover the high maintenance and protection costs of storing grain. Although this is particularly true for Zimbabwe all the countries of the region require such assistance.

(b) Transport

Assistance in the transport sector is needed to facilitate the movement of food both between the nine countries of the region and within each country.

(c) Food Aid

Even given the relatively good harvest conditions for this growing season there will still be a need for a considerable quantity of food aid in the immediate future. In particular in Angola, because of disruption as a result of the war, which has come in the wake of an already poor harvest, and Tanzania and Mozambique both of which have suffered from bad growing conditions.

(d) Inputs

Considerable assistance is also required to help finance production inputs which would, in time, reduce the region's need for food aid in years to come. Fertilizer and pesticides are needed in all SADCC countries.

11. Longer term programmes must await the outcome of the already identified studies. In November 1980 the Government of Zimbabwe was given a mandate by the SADCC Council of Ministers to act on behalf of SADCC in matters relating to the Regional Food Security Projects. This mandate was confirmed in a letter to the Government from the Chairman of the SADCC in January 1981. The Government of Zimbabwe has prepared detailed terms of reference for each of the projects and has identified donor agencies who have been invited to fund the implementation of the eight feasibility studies. A donor has also been identified to fund Project One. Since the Maputo Conference in November 1980, the Council of Ministers has discussed the progress of the SADCC regional food security programme twice - first, in Mbabane in June 1981 and second, in Salisbury in July 1981.

The following progress has been made in implementing the nine projects:

12. Project One - A Technical Assistance Programme Designed to Achieve Coordination and Cooperation on all Agrarian Issues

The central concern of the nine states is to create a satisfactory food supply system from within its own resources to meet present and future needs and to lessen dependence on countries outside the region. On the available evidence, only 90 per cent of the food requirements of the population within the region are being met, and a considerable proportion of that food requirement is currently imported. Population projections for the region suggest that within ten years the region's population will have increased by approximately one third. It follows therefore that to satisfy adequately the nutritional needs of a growing population, and to lessen dependence on external countries a determined programme must be mounted to increase the food supply within the region.

In the past, political, social and economic barriers within the region have impeded effective communication between the nine states. Many of these constraints have now been removed. The prime source of food energy in the region is derived from grains and root crops. For most countries grain constitutes the most important component of the diet. Despite the limitations on the availability of precise data, it is probable that the grain output within the region amounts to between 8 and 9 million tonnes per annum. It is estimated that over 1 million tonnes of grain is imported into the region. Assuming that the demands of the anticipated population increase will be met from grain and assuming that consumption per capita increases by 10 per cent over present modest consumption levels, then the demand for grain in 1990 will be some two thirds over present levels of production. The bulk of this grain must be found from internal resources since logistical constraints alone will inhibit the movement of grain into the region from external sources.

The aim of the project is to facilitate the easy interchange of ideas and personnel between the nine Member States with a view to ensuring that all knowledge is commonly available and used to best advantage. In addition facilities would be provided to permit the holding of workshops designed to deal with specific problems in the field of food production, food handling, food processing, food nutrition and other related matters. These workshops could be specific to a commodity or a discipline and, in certain areas, will have to be coordinated with work being done, for instance to foster industrial development. It is also envisaged that experts could be drawn from appropriate external agencies to give added momentum to regional efforts.

The United States Agency for International Development (USAID) has agreed to provide funding for this project. The USAID assistance will take the form of financial support for the travel and other expenses which will be incurred by the various technical committee members when attending periodic meetings and workshops.

13. Project Two - An Early Warning System for Regional Food Security

An effective early warning system, which will monitor food availability covering stock, progress during the growing season and final production, would help in organising food supply requirements in the region and the associated logistics in good time. The objective is to devise and establish a system, or reinforce an existing system, which would permit the timeous recording of food availability within the countries of the region so as to determine if, when, and how, domestic food supplies need augmentation from external sources or whether food supplies from within the region need, and can, be relocated to meet the needs of specific countries or areas within the region.

Crucial to any regional food plan is the need to determine with greater accuracy the existing level of food output within the region. The fact that food production within the region is determined largely by climatic circumstances throughout the growing season, requires that crop progress be effectively monitored during the growing season. Existing crop reporting systems within the region may vary from country to country. Few if any of the countries are believed to be in a position to assemble data sufficient to provide an accurate forecast of the harvest. Fundamental shortcomings are probably the inability to determine satisfactorily the area under crops and the yield from such crops. It is possible that satellite imagery could contribute significantly in resolving this problem but would require suitable ground control in terms of crop identification, yield variations and relevant meteorological data. A sequitur to proposals for the creation of an early warning system is the existence of an adequate food data base. This project attempts to explore the requirements and possibility for establishing such a data base.

The feasibility study will examine within each of the nine countries existing methods of measuring periodic stocks of the commodities concerned. In the event that these methods could be improved upon either by the adoption of methods used by other countries within the region or by countries outside the region the report will make recommendations to achieve the necessary improvements in the systems.

The study will also examine within each of the nine countries existing methods of estimating area, and probable yields for the previously determined staple crop(s), during the growing season. Statistical questionnaires may not be able to provide the required information accurately particularly in the subsistence farming sector. For this reason it may be necessary to examine such methods as satellite imagery, seasonal variations from the norm and aerial photography or perhaps a combination of all three, before being able to determine the most practical solution. Suggested changes to the existing systems should take into account the various constraints incumbent on the SADCC countries.

While it is envisaged that each country within the SADCC group will have its own early warning system it will be important for the region as a whole to have a method of collating such information in timely fashion in order to be able to react to a given situation on a regional basis. The feasibility study will recommend how this is to be achieved.

The feasibility study will show the estimated financial cost to each country of implementing the recommended system, the material and personnel requirements and finally the estimated time scale for its implementation.

The Food and Agriculture Organisation of the United Nations has been invited to undertake the feasibility study for the project on behalf of the SADCC States. The Government of Zimbabwe has submitted terms of reference for the study to the FAO.

14. Project Three - A Regional Resources Information System

In order to promote effective regional cooperation between the nine states, it is necessary to establish a centralised bureau where existing specialised information can be catalogued and its place of storage recorded. This is a preliminary step toward the establishment of what can be termed a regional data bank. A further step in this process would be the standardising of the method of recording data. This would be followed by the development of a data retrieval system together with all the adjuncts associated with a resource information system.

The information at present available to the region suffers from the problem of aggregation. The balance between per capita output and per capita requirements often obscures as much as it reveals. The world may have enough to eat 'on average' but that does not stop a great number of people from starving. What is needed is more up-to-date, less aggregated data on which to base definitions of risk, needs and proportions.

The problem is essentially one of large scale data storage for the region, which can be stored in a form which makes it easily available. Ideally the system must be capable of analysing all data relating to a particular land unit. A comparative capability would be important for future planning throughout the region.

The problem is one which would require time and considerable resources to resolve. A feasibility study is required to determine what information is available within the region and to propose how a regional resource information system could be established and what realistic time scale would be entailed in its establishment.

It is envisaged that the data recorded by the system will include not only fixed agricultural resource base information derived from the inventory of such resources but also data relating to variable inventory items, such as national stocks of major food products and essential agricultural inputs and other matters of relevance to the industry. If resource information deficiencies exist in areas of the region, these should be identified. Recommendations on ways to rectify such deficiencies should be included in the study's report.

The study, having identified all the existing and proposed information sources, will then propose a method of standardising the collection and presentation of the data from these sources on both a national and a regional basis. Finally the setting up of a regional data bank for all this information will be investigated.

The feasibility study will show the estimated financial cost to each country of implementation of the recommended system(s), the material and personnel requirements and finally the estimated time-scale for its implementation.

The Commonwealth Fund for Technical Cooperation has agreed to finance the feasibility study. The Government of Zimbabwe has forwarded proposed terms of reference for the study to the CFTC and it is hoped that work will commence in the near future.

15. Project Four - A Regional Inventory of Agricultural Resource Base

Regional cooperation in the field of food security hinges to no small extent on the utilisation of resources within the region for the attainment of an adequate food supply system. The development and utilisation of such resources is conditional in the first instance on knowing what resources are available within the region. These resources include all elements which make up the overall food system, and embrace inputs utilised in the agricultural production process, and processing facilities. All these elements are important components in the food chain. A need exists to measure and document those resources of the region that are of consequence in the progression toward food security.

The objective of the feasibility study will be to determine the need for, and the approach to, the drawing up of an inventory of the region's potential agricultural resource base which would constitute part of the overall food system of the region.

Initially it will be necessary to examine all existing agricultural resource inventories in the nine countries of the region. The adequacy and usefulness of these inventories should be determined and compared to a predetermined agricultural resource inventory model recommended by the study. This predetermined inventory model should be of such a nature that will ensure there will be no hindrance to the development and utilisation of agricultural resources because of a lack of resource inventory information.

In the event that existing inventories need to be modified to reach the model standard, recommendations on how to achieve the necessary improvements should be contained in the study.

Finally, the feasibility study will investigate and recommend a system whereby the individual country inventories may be collated to give a regional resource inventory base for agriculture in the region as a whole.

The feasibility study will show the estimated financial cost to each country of implementing its recommendations, the material and personnel requirements and finally the estimated time-scale for its implementation.

The Commonwealth Fund for Technical Cooperation has agreed to finance the feasibility study. The Government of Zimbabwe has forwarded proposed terms of reference for the study to the CFTC and it is hoped that work will commence in the near future.

16. Project Five - A Regional Food Reserve

A fundamental element in food security for the SADCC region is creation of a food reserve which can be drawn upon in times of emergency. Certain countries within the region already have some form of food reserve. Logistical and other constraints impede large scale storage and rapid movement of grains throughout the region and necessitates that the problem of a regional food reserve be tackled on a national basis. The SADCC accepts that the establishment of food storage facilities in the individual countries and the holding of food stocks within these facilities constitutes the currently realistic method of creating an adequate food reserve for the region.

It is recognised that stocks need frequent turnover to reduce deterioration and should be part of national marketing authorities' stocks. Interruption to food trade usually affects urban areas before rural areas but interruption to import of agricultural inputs may be as vulnerable to blockade as food. Therefore consideration should also be given to stockpiles of seed, fertilizer and pesticides.

Interruption to inputs can be met in the short term by release of stocks onto the market. Drought, however, affects both market supply and the amount for on-farm consumption. Market channels may be inappropriate for replacing lost on-farm consumption hence a distinction can be made between commercial buffer stocks and food security stocks. Physically these may be the same to ensure frequent turnover but management and the criteria for release are different. In addition, seed, fertilizer and pesticides supplied free or with a heavy subsidy may be as important as food aid to peasant farmers in drought affected areas.

National stocks will increase regional security because they allow interim transfers between regional states. This has happened on occasion in the past and could be enhanced if national reserves were systematically strengthened. Accordingly, this project can be treated as individual projects for the individual states. It is considered that a coordinated state aid programme designed to achieve a regional food reserve as its end result should be promoted by SADCC itself.

The objective of the feasibility study will be to examine existing food reserve policies within the SADCC countries, and to suggest ways whereby these policies could be improved upon in the future. The problem will be looked at from the point of view of the medium term prospect. The study will relate to the major staple food crop(s) of each SADCC country. The study should also examine the transport facilities between the states and how they might affect the establishment of the regional food reserve system.

It will be necessary to examine within each of the nine countries existing food reserve systems and policies relating to the staple food commodities of those countries. In the event that these systems could be improved upon the report will make recommendations to achieve the necessary improvements. Suggested changes should take into account constraints incumbent on the SADCC countries.

The study will not only make recommendations regarding the commodities in which food reserves should be held but will also indicate the levels of these reserves. It will be important to indicate where these should be located both on a country by country basis and within each country. Suggestions should also be offered concerning such matters as the physical facilities needed to store the reserves and the estimated financial cost of establishing them.

The feasibility study will propose a method(s) whereby the facilities necessary for holding food reserves and the reserves themselves could be financed.

The Commission of the European Communities (EEC) has been invited to undertake the feasibility study. The Government of Zimbabwe has forwarded terms of reference for the study to the EEC and it is hoped that work will commence in the near future.

17. Project Six - Regional Post Harvest Food Loss Reduction

Although no estimate of post harvest food losses within the region is available, it is reasonable to assume that the position in the SADCC countries is not significantly different from the position in other developing countries where such losses have been variously estimated at 10 per cent, particularly in the peasant sector. In view of the existing insufficiency in food for the region, a major improvement in the strategy toward food security must be the preservation of such food as is currently produced within the region.

The amount of resources that should be directed into such food preservation programmes is difficult to determine but should conceivably be related to the amount of food lost. A need exists for research to be undertaken in post harvest food losses. Such a research programme would concern itself not only with developing but also adopting existing appropriate technology for tackling the problem and include programmes of education and training.

The objective of the feasibility study will be to identify and examine the problem of post harvest food losses within the region, and to offer proposals for its solution. The study will necessarily be of a cost-benefit nature. Various methods, and the associated costs involved, of reducing post harvest food losses to an acceptable level, are to be examined. The study must determine whether these losses can be avoided and whether the cost involved justify the reduction losses. It is envisaged that the solution to the problem lies in the development of appropriate technology and an educational programme to disseminate the research findings.

There are four major categories of farming units in the region: (a) large-scale commercial production; (b) large-scale collective production; (c) subsistence farming on communal land; (d) small-scale commercial production.

It is anticipated that the study will concern itself particularly with the last three categories of farms where losses are likely to be the greatest. The study should concentrate on the major food crops of the region. Major on-farm losses are likely to result from the poor preparation of food crops for storage, (e.g. inadequate drying of grain) and poor storage facilities. The relative importance of these factors should be determined and solutions suggested. Appropriate training and extension programmes will be required. The study will determine the facilities required and the costs involved in training staff to undertake the extension work successfully.

In addition, post harvest food losses are likely to occur during the processing of raw food products. Traditional milling techniques in peasant farming areas should be examined to determine their efficiency. Furthermore examination of milling losses in the developed sector may be necessary to determine the optimal extraction rate for grain crops.

The feasibility study will show the estimated financial cost to each country of implementing the project proposals, the material and personnel requirements and the estimated time-scale for its implementation. Recommendations should take into account constraints incumbent on the SADC countries.

The Government of Canada has agreed to fund the feasibility study. They in turn have proposed that the International Development Research Centre of Canada (IDRC) should undertake the study. This was accepted and proposed terms of reference were submitted to IDRC. A team of experts arrived in Zimbabwe on 21st September 1981 to begin work. The team will also be working on Project Seven.

18. Project Seven - Regional Food Processing Technology

Urban influx into the cities of the region is likely to continue. This fact together with an anticipated increase in incomes is likely to create an ever increasing demand for processed foods. While food processing facilities may be developed either by public or private sector funds, it is apparent that a need will arise for technological expertise in the processing of foods. The possibility of establishing an institute with the region for providing research and training facilities into food processing requires investigation in consultation with both SADCC's programme for Manpower Development and Industrial Coordination.

The objective of the study will be to establish the need for, and the requirements of, a Regional Institute of Food Technology. The institute would provide research and training facilities. The SADCC countries face the problem of feeding a rapidly growing urban population leading to a growing demand for processed foods. The study will be expected to quantify present demand trends for processed foods and estimate future requirements. Once these factors have been investigated the study must determine what facilities will be required to enable these demands to be met, and what type of Institute(s) will be needed to train the personnel to man these facilities.

The first stage of the study will identify the demand for processed foods and the trends in demand. It is important to determine what types of processed foods are in heavy demand. Secondly the study will ascertain what foods should be processed in view of the nutritional requirements of the population as a whole in the region. It is important that the study team keep in mind the aim of the SADCC group to achieve self-sufficiency in food production.

The next stage of the study will involve an investigation of existing food processing technology in each country. The investigation will determine the capacity of existing food processing plants to provide the necessary food products. The study will give recommendations where improvements are required.

Finally, an investigation of existing research and training facilities is required to ascertain the need for a Regional Institute of Food Technology. The study will suggest whether it is adequate to extend existing facilities or whether a new institute should be established. In addition, the study must not neglect the extension requirements which will of necessity be required during the development of adequate food processing throughout the region.

The study will show the estimated financial cost to each country of implementing the recommendations, the material and personnel requirements, and finally the estimated time-scale for their implementation.

The Government of Canada has agreed to fund the feasibility study for this project. They have recommended the IDRC as a suitable agency to undertake the study. This was accepted and proposed terms of reference were prepared by the Government of Zimbabwe and submitted to the IDRC. A team of experts arrived in Zimbabwe on 21st September 1981 to begin work on the study. They are also working on Project Six.

19. Project Eight - Regional Food Marketing Infrastructure

Some form of food marketing infrastructure exists in all of the nine states, though one of the major constraints in the effort toward increasing food output is the inadequacy of this marketing infrastructure. The objective of achieving a greater measure of self sufficiency must be accompanied by an effort to provide the necessary marketing facilities to handle the commodities between producer and consumer. This project lays emphasis on improving the marketing infrastructure at the national level.

The objective of the feasibility study is to examine the existing food marketing infrastructure within the region, to identify the strengths and weaknesses of the respective marketing systems and to recommend measures aimed at improving the marketing infrastructure. The inadequacy of marketing facilities is believed to be a constraint to the production by farmers of food commodities surplus to their own domestic requirements.

The feasibility study will involve an investigation of the food marketing infrastructures existing in each country. The efficiency and adequacy of each system will be assessed in relation to present and likely future needs. The study will identify the marketing factors which are constraining food production in the various countries. In line with the aim of self-sufficiency, the study will deal mainly with the important staple food crops produced in the region. Suggested changes should take into account the constraints incumbent on the SADCC countries.

Marketing is a diverse field and the study is expected to isolate the problem areas in order of priority. It is envisaged that certain changes can be made in the short term for example by improvements in existing transport and handling facilities.

The SADCC countries will be interested initially in improving the existing marketing systems within their individual countries. However, it is also desirable that the study team should consider and make recommendations concerning the advisability or otherwise of establishing in the longer term a marketing infrastructure to serve the region as a whole.

The feasibility study will show the estimated financial cost to each country of implementing the recommendations for improving respective national marketing infrastructures. Details of the material and personnel needs and the estimated time-scale for their implementation are also required. The problems of developing a regional marketing infrastructure will then be defined and costed.

The Commonwealth Fund for Technical Cooperation has agreed to finance the feasibility study. The Government of Zimbabwe has forwarded proposed terms of reference for the study to the CFTC and it is hoped that work will commence in the near future.

20. Project Nine - Regional Food Aid

The SADCC plan for regional food security lays stress upon the need to ensure an adequate supply of food for the region's population. Certain proposals within the plan aim at the objective of self-sufficiency in food needs. This objective is clearly long term in nature. The immediate problem is that food supplies of one sort or another are deficient in the region. Furthermore, in most of the countries severe production constraints impose limitations on plans to increase food output. In all countries of the region there appears to exist a growing demand for imported cereals such as wheat and rice - commodities that require a high level of technological input. Throughout the region climatic hazards are an important determinant of food output. The point at issue is that whereas constraints exist in the food production process the demand for food continues unabated. Under these circumstances it is probable that for some time to come food aid of one sort or another will continue to be a requirement for the region. At present the determination of food aid requirements can only be assessed at the individual national level. These can be consolidated into a regional need. The timing of requirements together with logistical considerations should be coordinated at the regional level.

The objective of the feasibility study will be to examine previous and current levels of food aid granted to the SADCC countries and to determine the adequacy or otherwise of that aid. The study will consider and suggest ways in which food aid could be more usefully obtained and utilised in the future, both from a national and a regional point of view. The study will relate to the major staple food crop(s) of each SADCC country.

It is envisaged that the efficiency and success of a regional food aid programme will depend primarily on the successful implementation of an early warning system for regional crop forecasting. Hence this feasibility study will be conducted with this in mind to ensure that the conclusions reached are realistic.

Initially the study will examine the methods currently used to calculate food aid requirements in each of the nine countries. This will entail examining food balance sheets and records of international trading in food products as well as other relevant material. The accuracy and efficiency of these methods of calculating food aid requirements will then be assessed and compared with available alternative methods. In the event that methods used could be improved upon for a particular SADCC Member Country either by adoption of methods used by other countries within the region or by countries outside the region, the report will make recommendations for the achievement of the necessary improvements. Suggested changes will take into account the constraints incumbent on SADCC Member Countries.

At present the determination of food aid requirements can only be and indeed is only being assessed at the individual national level. The study will necessarily therefore examine and recommend a system whereby information on food aid requirements for each of the SADCC countries may be collated so as to determine the regional food aid requirements at any particular point in time. The timing of requirements, together with logistical considerations will need to be coordinated at the regional level. Therefore recommendations to this end must be included in the report.

The feasibility study will, with the above in mind, investigate and outline a suitable intra-regional food transfer system to facilitate the most efficient distribution of individual national surpluses within the region. The study will also examine existing food aid agreements between SADCC Member Countries and countries outside the region. Recommendations will then be put forward on how the region as a whole may best satisfy its food aid needs in the medium term future. Existing food aid agreements and suggested food aid agreements could form the basis of the study's recommendations.

The proposed regional food aid system will incorporate a pricing strategy which takes into account both intra-regional and international parity prices and other relevant factors.

The feasibility study will show the estimated financial cost to each country of implementing the regional food aid plan, the material and personnel requirements and finally the estimated time-scale for its implementation.

The Commission of the European Communities (EEC) has been asked to undertake the feasibility study. The Government of Zimbabwe has forwarded proposed terms of reference for the study to the EEC and it is hoped that work will commence in the near future.

21. Conclusion

Once the Administrative Unit is in operation the Government of Zimbabwe will convene a first meeting of the SADCC Consultative and Technical Committee which will deal with Food Security. The Committee will consist of the Directors of the respective Agricultural Research, Extension and Economic organisations of the nine SADCC states. The task of the Committee will be to identify the need for, and the priorities in, the development of a coordinated programme to improve the region's food supply system.

The Government of Zimbabwe will work in close liaison with the Consultative Committee in overseeing the implementation of the food security projects. The findings of the nine studies will be presented to the Consultative Committee for consideration. From these consultations Zimbabwe will present firm proposals to the Council of Ministers concerning the implementation of the recommendations of the various studies. At this time Zimbabwe will also seek financial assistance from SADCC's international cooperation partners.

October 1981

1. The following table gives the cereal production in the nine SADCC states for 1979 and also the preliminary results for 1980 as estimated by FAO in February 1981.

COUNTRY	1979				1980 (preliminary)			
	WHEAT	RICE (milled)	COARSE GRAINS	TOTAL	WHEAT	RICE (milled)	COARSE GRAINS	TOTAL
	(. thousand tons)							
Angola	10*	13	340	363	10*	13	370	393
Botswana	1	-	7	8	1F	-	42	43
Lesotho	34	-	189	223	35*	-	172	207
Malawi	1F	32	1310	1343	1F	32	1220	1253
Mozambique	3*	47	485	535	3*	47	405	455
Swaziland	1F	3	57	61	1F	3	97	101
Tanzania	76	165	1282	1523	68	119	1182	1369
Zambia	4	1	790	795	7*	1	895	903
Zimbabwe	161	3F	1242	1406	165*	3F	1477	1645
TOTAL	291	264	5702	6257	291	218	5860	6369

F = FAO estimate

* = unofficial estimate (other than FAO)

2. Taking into account the above information FAO estimated that the import requirements of cereals for the SADCC countries in 1980/81 or 1981 and the quantities known to be covered by commercial purchases and food aid commitments would be as follows:

COUNTRY	1979/80 or 1980 Actual imports		Estimated import requirements in 1980/81 or 1981			
	Total	of which food aid	Total require- ments	Current import position		
				Commercial purchases	Food Aid allocated, committed, or shipped	Total commercial and aid
	(. thousand tons)					
Angola	187.3	8.3	200.0	83.9	11.0	94.9
Botswana	115.2	6.0	101.2	101.2	0.0	101.2
Lesotho	170.2	19.9	158.0	43.3	38.8	82.1
Malawi	123.0	1.0	125.0	48.0	33.6	81.6
Mozambique	390.0	190.0	625.0	141.0	246.3	387.3
Swaziland	69.5	0.0	39.5	39.5	0.0	39.5
Tanzania	119.7	85.1	480.0	203.7	225.7	429.4
Zambia	414.1	126.1	538.0	197.3	183.7	381.0
Zimbabwe	50.0	0.0	165.0	83.0	20.5	103.5
TOTAL	1639.0	436.4	2431.7	940.9	759.6	1700.5

3. Regional food prospects look considerably brighter for most of the countries of the region in late 1981 than they were in 1980 or early 1981. Recent reports from the Food and Agriculture Organisation of the United Nations confirm that good or average grain crops were harvested this year in Botswana, Lesotho, Malawi, Swaziland, Zambia and Zimbabwe. On the other hand adverse climatic conditions have led to another poor or below average crop production in Angola and Mozambique. Similarly, for the second year in succession Tanzania's production is well below normal.
4. In August 1981 the FAO issued the following summary of the situation and prospects for food supplies and crops in the nine SADCC countries:

FOOD SUPPLIES AND CROPS - SUMMARY OF SITUATION AND PROSPECTS

COUNTRY	Abnormal food Shortages		Estimated Foodcrop Production and Prospects					
	Current year (1)	Next year (2)	Crop (3)	Overall Conditions	Rainfall	Plantings	Harvest Progress	Crop Index (4)
Angola		X	Coarse grains (81)	Partial failure	Below normal	Below normal	Completed	75
Botswana			Coarse grains (81)	Normal	Normal	Normal	Completed	146
Lesotho			Coarse grains (81)	Normal	Normal	Below normal	Completed	93
Malawi			Maize (81)	Good	Normal	Increased	Completed	154
Mozambique		X	Cereals (81)	Below normal	Above normal	Normal	Completed	
Swaziland			Maize (81)	Normal	Above normal	-	Completed	100
Tanzania		X	Coarse grains (81) main	Un-favourable	Below normal	Below normal	Normal	
Zambia	X		Maize (81)	Normal	Above average	Increased	Completed	125
Zimbabwe			Maize (81)	Good	Normal	Increased	Completed	185

(1) = Marketing year 1980/81 (or Jan.-Dec. 1981) unless otherwise stated.

(2) = Marketing year 1981/82 (or Jan.-Dec. 1982) unless otherwise stated.

(3) = Year of harvest (or bulk of harvest) indicated in brackets.

(4) = As percent of previous year's harvest.

(Foodcrops and Shortages 7 August 1981 FAO)

5. The following comments were made on the food supply situation in each of the nine countries:

Angola - Food supply situation remains difficult. The country is facing problems created by an increasing number of refugees and displaced persons as a result of border conflicts. These have also seriously disrupted agricultural activities in the country. In addition, drought has affected the main season crops recently harvested. An official report issued in June indicated that the shortfall in maize production this year in the centre and south of the country (main producing area) is of the order of 40 per cent compared to a normal year. Cereal imports which had increased to about 300,000 tons in 1980/81 are likely to rise further this season. The number of people affected by the drought is put by government at 2.5 million. Of these 263,000 are suffering from serious food shortages and are in need of assistance. For these people FAO/WFP Emergency Food Assistance for three months consisting of 9,468 tons of maize was approved on 23 July 1981.

Botswana - Total foodcrop production in 1981 is still estimated to be about double that of previous three years. But because of insect and bird problems during harvest the yield is still likely to have been below earlier expectations. In June the coarse grain production was estimated at 65,000 tons (1980 crop: 44,800 tons). Livestock are reported to be in fair to good condition. Grazing is fair to good; water supply for livestock is satisfactory.

Lesotho - Outcome for 1981 summer cereal crops (maize, sorghum and spring wheat) was better than anticipated following heavy rainfall since February which improved conditions. The 1981 crop should be close to normal. But in southern areas, a poor crop was harvested. In these areas food shortages could develop later in the year. Lesotho is a substantial importer of cereals even in years of normal production. FAO/TCP emergency assistance consisting of selected wheat seed to rehabilitate domestic food production is currently under implementation.

Malawi - The maize crop recently harvested was very good. Preliminary estimates indicate a production of around 1.8 million tons against only 1.1 million tons in 1980 when severe drought affected the maize crop. Purchases of maize by the Government agency ADMARC have begun. The food supply situation in the country is now satisfactory.

Mozambique - The food supply situation remains difficult despite large cereal import arrivals and the harvesting of the new crop. Rationing of basic commodities continues in Maputo. FAO/WFP Emergency Food Assistance to 1980 drought-affected people is in operation. FAO Emergency Assistance consisting of selected seeds to rehabilitate domestic food production is currently being implemented. FAO is also providing logistic assistance for improving distribution of food and agricultural inputs.

The 1981 maize crop, just harvested, was better than that of last two years although it was substantially below normal. This is due to shortage of seeds, drought in parts of country early in season, and floods along Zambesi River in February. The maize crop was about double last year's poor crop in the north and government buying campaign there has been very successful although inadequate marketing structure and transportation problems are likely to limit government ability to purchase all the available surpluses. But in the main producing area of central Mozambique the maize crop was only slightly better than the poor 1980 crop. The rice supply outlook is poor. In the main surplus growing areas in the south, disease and serious harvest delays have severely affected rice production. Losses of 80 to 90 per cent of the crop are estimated in some areas. In Zambesi Province rice crop losses occurred because of heavy rains before and during harvest. Large cereal import requirements in 1981/82 are expected, although they should be lower than 1980/81 imports (over 600,000 tons).

Swaziland - Reflecting normal climatic conditions this year, good maize and sorghum crops were recently harvested.

Tanzania - Recent information confirms that for the second consecutive year food crop production has been sharply below normal. The preliminary estimate of maize purchases by the National Milling Corporation (NMC) which indicated a total of 113,000 tons for 1981/82, might have to be reduced and it is likely to be even lower than maize purchases in 1980/81 which amounted to 105,000 tons, about half the average of the previous three years. NMC purchases of wheat, rice and other cereals are expected to increase marginally over 1980/81 but to remain sharply below normal. Cereal import requirements in 1981/82 (June/May) are expected to be as large as or larger than in 1980/81 when a total of 390,000 tons of cereals was imported. In the previous three seasons, cereal imports, mainly in the form of wheat and rice, averaged less than 100,000 tons. FAO is providing logistic assistance for improving distribution of food and agricultural inputs.

Zambia - A difficult food situation continues in Western Province districts of Sesheke and Senanga, where food shortages are expected to continue throughout 1981. Government is undertaking relief operations. FAO/WFP Emergency Food Assistance to feed 24,000 persons for three months in the Sesheke and Senanga districts is in operation.

A large 1981 maize crop has been harvested. Marketed production in 1981/82 is estimated at approximately 700,000 tons, an amount close to annual domestic requirements. In 1980/81 marketed production was 382,000 tons. Some maize imports are likely to be required in 1981/82 to replenish stocks depleted during the last two seasons because of drought. To assist government in promoting food self-sufficiency, FAO is providing logistic assistance for improving distribution of food and agricultural inputs.

Zimbabwe - A record maize crop was harvested this year. Official forecasts indicate a crop of approximately 3 million tons against a production of about 1.6 million tons in 1980. Zimbabwe will have an exportable surplus in 1981/82 of over 1 million tons but actual exports will be limited by transport problems. Fuel shortages have been reported. In late July the National Railways of Zimbabwe imposed an embargo on traffic from South Africa and on traffic inside Zimbabwe in an effort to reduce transport congestion. FAO is providing assistance to improve the logistics situation.

(Foodcrops and Shortages 7 August 1981 FAO)

SECTION TWO - ANIMAL DISEASE CONTROL

1. The control of animal diseases can only be effectively tackled by concerted regional action. Disease does not respect political boundaries and only by coordinated effort can animal diseases be controlled and ultimately be eliminated from Southern Africa. For this reason Animal Disease Control has been given high priority in SADCC's programme from its inception.

2. At the Lusaka Summit held on 1st April 1980 Botswana was given responsibility for this area of cooperation and has convened a series of technical consultations among SADCC Member States since that date. These consultations have provided an opportunity for the development of a regional programme in this area and for the formulation of a number of specific projects. Progress has been made in respect of foot and mouth disease, animal trypanosomiasis, rabies, tick-borne diseases and general vaccine production.

The following projects have been identified and are presented to the Blantyre Conference for consideration:

3. Project One - Foot and Mouth Vaccine Institute

Botswana has been using a small temporary laboratory (phase 1) for the production of foot and mouth vaccine. The vaccine has been proved safe and potent. The amount of vaccine produced is not enough at the moment to supply both the domestic and regional needs.

Botswana has, however, managed to export vaccine for emergency use in Zimbabwe, Zambia and Swaziland in the last three years.

The permanent Botswana Vaccine Institute, capable of producing 21 million monovalent doses of foot and mouth disease a year, will be opened on the 27th October, 1981. The Botswana Vaccine Institute will be capable of satisfying the needs of the whole region with SAT type of foot and mouth vaccine.

4. Project Two - Feasibility Study on Regional Foot and Mouth Disease Control

The Commission of the European Communities (EEC) has agreed to fund a feasibility study toward developing a physical control programme for foot and mouth disease.

The Botswana Government has received submissions from two consultancy firms. The firms have been asked to supply additional information in the next two weeks. Selection will be complete before the Blantyre Conference.

5. Project Three - Botswana/Zimbabwe Border Fence
Vakaranga/Basuto Cordon Fence

This project is designed to prevent the mixing of cattle across the border between Zimbabwe and Botswana. Preventing contact between livestock is essential for foot and mouth disease control.

The project is a continuation of the border fence from Vakaranga to Tuli Circle.

The first section of the fence will be an ordinary stockproof fence from Vakaranga to Maitengwe Quarantine. A much stronger game proof fence will be constructed from Maitengwe to Basuto to prevent foot and mouth carrying buffalos from migrating from the Wankie Game Reserve into cattle rearing areas of Botswana.

The project is being funded by the Kuwait Fund for Arab Development. Construction of the fence started in August 1981 and should be completed by the end of the year.

6. Project Four - Eradication of Foot and Mouth Disease
Along the Botswana/Zimbabwe Border

Botswana's eastern border had been free from foot and mouth disease for more than 20 years until an outbreak of foot and mouth disease was reported in February 1980. The source of infection was cattle illegally moved from south western Zimbabwe.

The Zimbabwe outbreak in the area was caused by a spread of foot and mouth disease from the south east. The spread to west of the Beitbridge/Bulawayo road was a result of the war in Zimbabwe. Normally the disease is restricted to the east of the country.

Eradication of the disease in southern and south western Zimbabwe will not only protect Zimbabwe but also the north eastern part of Botswana. A safe north eastern Botswana will enable farmers in that area to sell slaughter stock to the Botswana Meat Commission. The area has been closed since August 1979.

A team of officials from Botswana is visiting Zimbabwe to finalise the necessary documentation for this project. The project documents will be circulated at the Blantyre Conference.

7. Projects Five and Six - Tsetse Fly Eradication
North Western Botswana/South Western Zambia

The smallest tsetsefly belt in Africa includes the Okavango delta in Botswana, the Caprivi, south eastern Angola and south western Zambia.

Since 1972 a study of the efficacy and safety of the aerial method of tsetsefly control using ultralow volume endosulphan droplets has been carried out in Botswana. It has been proved technically that tsetsefly can be eradicated safely with minimum damage to non-target species using endosulphan.

The purpose of the project is the eradication of the fly from this tsetsefly belt.

Cost of the Project: Botswana P6.2 million
 Zambia K2.28 million

Botswana and Zambia have agreed the project which has not yet been funded (see Appendices I and II).

8. Project Seven - Tsetse Training Complex, Zimbabwe

The project is for the reconstruction of the dual purpose research and training complex at Rukomechi, Zimbabwe.

The search for (i) odour attractants is an integral part of (ii) the development of trapping devices to incarcerate large numbers of tsetse flies, which will then (iii) be sterilised in automated devices and then released again to disrupt the reproductive process in the remainder of the population - the sterile male technique.

The training of local and visiting personnel from elsewhere in Africa in the use of the new system will take place at the same site as the development work is undertaken. The Department of Veterinary Services feel that this is a high priority project for it leads directly to a decrease in dependence on the imported insecticide currently in use. Expenditure on DDT alone in the current year is \$385,000 more than three times the cost of the proposed project. It is also highly desirable to reduce the environmental pollution which results from the current operations and the sterile male technique permits this ideal to fulfilled.

The proposed complex will consist of a lecture room and demonstration facilities as well as accommodation for up to five trainee officers and twenty field assistants with the related catering and toilet facilities, all electrified.

The full cost of the project is estimated at \$100,000. The project was admitted into the Public Sector Investment Programme and the work will be carried out in the 1981/82 fiscal year, all expenditure being within that year. It is not possible to phase the expenditure otherwise because the three projects within the total research effort are quite inseparable and must run concurrently.

9. Project Eight - Regional Meat Inspector Training School
Lobatse, Botswana

Three members of SADCC are fresh meat exporting countries - Botswana, Swaziland and Zimbabwe. The three countries depend on external institutions for training of meat inspectors. The number of places offered to our students in foreign institutions is not adequate for our basic manpower needs in this discipline.

The Government of Botswana has therefore decided to establish a meat inspector training school at Lobatse to train not only Botswana students but students from other countries in the region.

The project is supported by FAO and DANIDA.

Cost of the project: P2.6 million

DANIDA has offered to finance running costs of the project. Funds are needed for the capital costs (see Appendix III).

10. Project Nine - Tick and Tick-borne Disease Centre, Malawi

In most of the SADCC countries tick-borne diseases are the most important factor limiting development of livestock. East Coast Fever, a tick-borne disease, is the greatest killer of cattle in Tanzania and other neighbouring countries of the region. At the moment there is neither effective vaccine against East Coast Fever nor effective treatment against the disease.

It is therefore proposed that a centre be established in Malawi for research into a solution to this disease problem.

Cost of the project: \$14.2 million

The project is not yet funded (see Appendix IV).

11. Project Ten - General Vaccine Production

Botswana has been asked to investigate the possibility of including, within the foot and mouth feasibility study, a section covering the possibility of producing other vaccines within the SADCC region.

The answer will be known after tendering firms have submitted all the information.

Information should be available before the Blantyre Conference.

12. Other Projects - Rabies Control

Lesotho is expected to submit a project on Rabies Control in the near future.

13. Also included in this project documentation is a proposal for the establishment of a Zoonoses Centre in Lusaka, Zambia (Appendix V). Although a detailed breakdown of costs has not been included it is hoped that the Blantyre Conference will provide an opportunity for a preliminary discussion of the proposal with potential donors.

October 1981

REPUBLIC OF BOTSWANA

Project Memorandum

Project Title: Tsetse Fly Eradication

N.D.P. Number - A H 09

Funds requested P6,2 million

1st year 1,3 million

2nd year 4,9 million

1. Synopsis

Funds totalling P6.2 million are needed for eradication of the tsetse fly which infects the Okavango Delta, parts of the Kwando River front and along the Savuti Channel. The process to eliminate the fly from Botswana will involve the Ultra Low Value (U.L.V.) applications of endosulphan from the air over a two-year period. The eradication programme will rid Botswana of sleeping sickness and allow resource development to continue and accelerate in the Okavango.

2. Background

The tsetse fly problem in Botswana arises from the central south African infected area which affects southwest Zambia, southeast Angola, the eastern part of the Caprivi Strip (Namibia) and north-western Botswana. It has had a severe impact in all of these countries but the greatest territorial expansion recently is probably in Angola, while the greatest economic impact is in Zambia and Botswana. (See Map 1).

In Botswana the problem currently involves infestations associated with the Kwando/Chobe river system and a much larger area based in the delta of the Okavango river. The two infestations are linked by a relatively narrow neck on the Selinda Spillway and by another drainage system (Kwando) running north-east from the northern limb of the delta.

The tsetse fly has been causing difficulties in Botswana for many years. The first proven cases of trypanosomiasis in humans in northern Botswana were found in two police officers who visited Western Chobe in 1934. Following this finding, and a further 4 cases in 1938, two surveys were made. The first, carried out in 1939-40 by MacKichan, was a clinical examination of 20,000 people for the presence of trypanosomiasis. Nine proven cases were found. The second survey, carried out in 1941-43, was an entomological survey by Macavley who recommended the formation of a tsetse fly control unit.

In 1942-43 a major epidemic was said to have occurred in Ngamiland though exact records do not exist. Some reports indicate as many as 828 cases and 223 deaths during the two year period. The Maun hospital was taken over in 1945 by the Government and low numbers of cases were reported up to 1956. The sharp decline in cases of trypanosomiasis was likely due to people moving away from fly-infested areas.

From 1957 increasingly larger numbers of cases were diagnosed. Peak numbers of cases reported occurred in 1960-100 cases, 1966-105 cases, and 1971-272 cases. Since 1972 there has been a gradual reduction in cases of sleeping sickness with 13 in 1977, 5 in 1978 and 21 last year. Almost certainly this has been a direct result of the control measures now being employed which are the only major factors (variables) that have changed in recent years.

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Tsetse fly control (TFC) began with the formation of the TFC Unit under the office of the governor (DG) in 1943. It became the responsibility of the Veterinary Department in 1966. In the beginning, control methods ranged from fencing to control of game movement to shooting of game. However, the fly continued to spread. Bush clearing and ring barking of trees was intensified in heavily infested areas. Results were negligible.

In the early 1960's it was decided to try insecticides and this became the major control measure used. However, ground spraying is an expensive proposition and only controls the problem locally and to push the fly back into the swamp was found to be very difficult. Since trials of aerial insecticide spraying had been done in other African countries for some time it was decided to start such trials in Ngamiland. These commenced in 1972 using the knock down insecticide Endosulphan. The first control operation was on the Maun front in 1973.

Trials have been proceeding yearly since 1973 gradually refining the techniques and undertaking extensive Entomological investigations. The trials are an integral part of an aerial control programme. The spraying is carried out in the winter (July-October) at night (when cold inversion carries the insecticide downwards) and at a level of about 50 feet above ground. The area to be covered is marked out by ground cleared lines and by using Doppler and ultra low frequency radio guidance the pilot can tell when he has reached the end of the plot and must turn round onto another sweep. Swathes are at 300 metre intervals. To eradicate the flies in the trial areas it was found necessary to spray 5 times at intervals of about 15-16 days, depending on temperature and humidity readings: By this means pupae which are in the ground at the time of the first spray are caught by the second or subsequent rounds before they are able to reproduce.

The combined ground spraying and aerial control programme now in force has reclaimed substantial areas of valuable land resource amounting to some 4 600 km² on the West Bank of the Okavango and 1 600 km² on the Maun front. In the Chobe area, some 4 000 km² is cleared of fly and protected by current methods (see Map 2). Thus the tsetse control activity has made possible a deployment of cattle and people into large areas that would be closed to humans and livestock without the tsetse control program. MacLennan estimated in 1976* that 94,000 head of cattle were grazing and watering at places which would, in the absence of tsetse control, be infested with tsetse fly (See Map 3).

To substitute tsetse control with trypanoprophylaxis would involve nearly 500,000 treatments which is assuming that 5 treatments per year would be sufficient. Furthermore, long term use of the drug is cumulative and toxic causing liver damage and other problems. Thus, while prophylaxis control is justified in short term emergencies, it should not be considered for the longer term.

* A Review of Anti Tsetse Activities in Botswana
K.J.R MacLennan, Sept-Oct 1976.

Because of the infiltration of flies into protected areas and movement of cattle into unprotected areas or areas partially protected, curative treatments (Berenil) are available on request and for the past ten years these requests have been at the following rates:

	1972 - 3237	1976 - NA
	1973 - 597	1977 - 3870
1970 - NA	1974 - 5241	1978 - 3716
1971 - 7179	1975 - 2277	1979 - 1073

Note: while the bulk of treatments would be against trypanosomiasis, the prophylactic is also used to treat redwater and anaplasmosis.

The major disadvantage of the current programme is that the cleared areas are reinvaded very quickly. Thus, complete eradication of the fly would be the best solution. The Division of Tsetse Fly Control has been developing a technique capable of eliminating the fly from a given area with minimum effect on the environment. The technique to eliminate the fly has now been perfected and a great deal of effort has been put into the study of possible adverse effects of spraying. Officers of several disciplines from the Centre for Overseas Pest Research in London have studied non target insects, birds and fish. Their general observations are that, at the concentration of endosulphan used, no long term effect on the environment will occur and that short term effects are minimal and completely reversible. Thus, the Department of Veterinary Services is now in a position to begin the eradication programme.

3. Plan of Operation

The tsetse fly eradication programme will consist of a two year operation. The first year will involve the clearing of the Kwando area and a portion of the Caprivi Strip by aerial spraying. Overflying part of the Caprivi is necessary to prevent reinvasion and to establish a proper barrier between the Caprivi fly belt and the Ikavango. The area to be cleared of the fly during the first year is approximately 7 200 km². (See Map 4).

The second year will involve the clearance of the Salinda spillway and the Okavango delta and will overfly part of the Kwando area sprayed during the first year as a safety measure to control possible reinvasion between the two operations. The section to be treated will cover a total of 28 000 km² and will be divided into two operational areas. (See Map 4).

As soon as the Kwando area is cleared during the first year a barrier will be established along the Caprivi border. (See Map 5). This border patrol operation will involve a ground spraying programme along a 60 km section the Caprivi/Botswana border.

Closely associated with the tsetse eradication programme is the construction of the game fence around the perimeter of the delta. This fence will be built under Phase II of the Veterinary Gordon Fence Project which involves the construction of a 750 km game fence across northern Botswana. The delta perimeter fence is planned to be finished by the time tsetse eradication has been accomplished. The fence will serve to prevent livestock from entering the wildlife management area of the delta and protect livestock from contact with buffalo and other wild carriers of foot and mouth disease.

4. Technical Review

The Chief Tsetse Officer and Senior Field Officer currently controls the aircraft when spraying operations are under way and the Tsetse Officer (Entomologist) carries out dissections and other forms of assessment, assisted by two assistant field officers. Two flights of two aircraft will operate simultaneously during the second year of the programme which will require two teams of two controllers (minimum) for each team. During a four aircraft operation the current team would be stretched beyond reasonable limits and a backup of two further experienced personnel would be desirable. These could probably be recruited from COPR staff or their trainees as most of the ongoing programmes in Botswana will be concluded by the first application of insecticides.

On vehicles needs, the current departmental fleet of seven 4x4 7 tonners is rapidly deteriorating and at least six new vehicles will be required in the first year. If these seven vehicles are in reliable functional order, additional requirements will be three more 4x4 7 tonners for hauling fuel and insecticide. Ideal equipment would be two Mercedes Unimogs plus trailers and one 4x4 7 tonner.

On the light vehicle side, the current fleet of four Land Cruisers is in reasonable condition but inadequate in numbers. Supervision of aircraft and ground liaison will require a minimum of three vehicles continuously in the field, plus those of the officers supervising fly rounds assessments, etc. Additionally, one visiting expert is expected for drift studies and general observation of operations.

Therefore, a minimum of two extra 1 1/2 ton vehicles is required. These should be diesel vehicles for operation in wet conditions and maximum reliability and range and should be of the station wagon type which can be equipped with all radio and signalling equipment and will be used as a permanent base for four months at a time.

Existing marine equipment includes 2x16 foot aluminium boats, 1x48 hp. Mariner outboard motor, and 2x33 hp. Johnson outboards that are obsolete. There will be a requirement for further boats and engines in the delta as follows: one stationed at Shakawe, one

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stationed at Mboma (M'Gocha river), and two stationed at Maun (Boro River and Xaxwe). Additional needs include 2x16 foot boats, 6x25 hp. outboard engines and 1x40/50 hp. outboards. Thus, there will be total requirement for four boats and eight engines. Each boat carries a back-up engine.

Two mobile and one base/mobile radio stations will be required. Radio sets now on hand are unsatisfactory for vehicle mounting. Therefore 3 sets must be purchased.

5. Financial Analysis

A - Eradication Project Costs	P6,200,000
B - Current Annual Control Program Costs	P1,052,000
C - Annual Cost to Control Reinfestation	P 233,000

A. Eradication Programme Costs

1. Endosulphan

(a) area covered

1st year	7 200 km ²
2nd year	28 000 km ²
	<hr/>
	35 200 km ²

(b) applications

1 @ 15 gm/km ²	=	528 000 gms
4 @ 12 gm/km ²	=	1 689 600 gms
		<hr/>
		2 217 600 gms

(c) 2 217 600 grams in 35% solution makes 700 000 litres required.

1st year - 140 000 litres @ P4,25 litre	P 595 000
2nd year - 560 000 litres @ P4,25 litre	P2 380 000
	<hr/>
TOTAL	P2 975 000

2. Flying

(a) 1st year - Kwando (7 200 km²)

(i) The spray runs -

162 runs	@	100km/run
82 runs	@	40km/run
Assuming spraying speed		300km/hr

(ii) Sorties:

Spray runs 4x100km	=	80 minutes
Ferrying (average) 130km	=	26 minutes
Manoeuvring	=	20 minutes
		<hr/>

126 minutes = 2,10 hrs

70'

Total sorties @ 4 runs
 per sorties = 41 sorties = 86,01 hrs
 Spray runs 10 x 40 km = 80 minutes
 Ferrying 60 km = 12 minutes
 Manoeuvring = 50 minutes

142 minutes = 2,36 hrs

Total sorties @ 10 runs
 per sortie = 8 sorties = 19,00 hrs
 Total flying time per cycle = 105,00 hrs
 Total time for five cycles = 525,00 hrs
 @ P650/hour = P341 250

(b) 2nd year - Okavango/solinda (28 000 km²)

The operational area is divided into two parts:

Area A 14 500 sq km
 Area B 13 500 sq km

(i) Area A 14 500 - Cutline 90 km

Spray runs 188 km
 244 runs @ 188 km

Sorties

Spray runs 2 x 188 km = 76 minutes
 Ferrying (40 km) = 8 minutes
 Manoeuvring = 20 minutes

104 minutes = 1,73 hrs

Total sorties @ 2 runs per sortie - 22 sorties = 211 hrs

(ii) Area B 13 500 sq km - Cutline 75 km

Spray runs average 183 km = 202 runs @ 183 km

Sorties:-

Spray runs 2 x 183 km = 74 minutes
 Ferrying (110 km) = 22 minutes
 Manoeuvring = 20 minutes

116 minutes = 1,93 hrs

Total sorties @ 2 runs per sorties - 101 = 195 hrs

Total time for Areas A and B - 496 hrs

Total time for 5 cycles = 2 030 hrs

Cost at P650/hr = P1 319 500

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(c)	Total flying costs	
	Year 1	P 341 250
	Year 2	P 1 319 500
		<hr/>
		P 1 660 750

3. Miscellaneous Costs:

(a) Building and Camps:

Semi-permanent camps to be built at Savuti and Gomare. Showers, toilets, sleeping and cooking facilities for Pilots and Department Staff (reed huts, thatched roof, etc.). P5 000

(b) Manpower:

Majority of work can be handled by Departmental staff, however, additional labour will be required as follows:-

Cut-lines:

1981 Kwando:

90 km cut-line and one major bridge over Savuti channel. Airstrip will require clearing and grading. 1650 man-days Casual Labour @ P4,10 = P6 765

1982 Okavango:

80 km of cut-line to be cleared. Rest of operation to be controlled from Tsau/shakawe road which will require measuring and pegging. Upgrading of Gomare airstrip and construction of camp. 2 200 man-days @ P4,10 = P9 020

(c) Total miscellaneous costs = P20 785

4. Vehicles and Transport

(a) Heavy Vehicles

2 Unimogs with trailers	P80 000
1 4x4 7 tonner	20 000
	<hr/>
	P100 000
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(b) Light Vehicles

2 1-1/2 ton (diesel)	<u>P30 000</u>
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(c) Boats and Engines

2 x 16' boats (aluminium)	<u>P 5 000</u>
6 x 75hp outboard engines	<u>P 6 000</u>
1 x 40/50hp outboard engines	<u>P 1 500</u>

(d) Total Boats and Engines P12 500

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5.	Maintenance, parts and fuel	<u>P15 000</u>
6.	Radios	<u>P 8 000</u>
7.	<u>Total Costs</u>	
	<u>Costs in 1st year:</u>	
	Flying	P 341 250
	Endosulphan (20% of total)	595 000
	Buildings and camps	5 000
	Labour	6 765
	Vehicles - Heavy P100 000	
	Light <u>30 000</u>	130 000
	Boats and Engines	12 500
	Maintenance and running of Boats	7 500
	Radios	8 000
	Contingency	<u>221 120</u>
		P1 327 135
	<u>Costs in 2nd year:</u>	
	Flying	P1 660 750
	Endosulphan (80% of total)	2 380 000
	Labour	9 020
	Maintenance and running of Boats	7 500
	Contingency	<u>811 454</u>
	<u>Total Estimated Cost of Project</u>	<u><u>P6 195 859</u></u>

Note: The costing of the two major items, i.e. flying and endosulphan, are dependent on the petroleum prices and if any major increases in these costs occur before the project is implemented then these figures could be below the actual requirement. A larger than normal contingencies element has therefore been included.

B. Current Annual T.F.C. Budget (1980/81)

1.	Salaries	
	Permanent Staff	P 68 500
	Industrial and Casual	<u>280 000</u>
		348 500
2.	Travelling and Transport	21 000

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		b/f 369 500
3.	Aerial Spraying and Insecticides	573 000
4.	Maintenance	
	Boat	12 000
	Building	3 000
	Incidenta	5 000
		20 000
5.	General Expenses	10 000
6.	Running expenses for 12 vehicles	
	7 x 5 tonner (20 000 km @ 47t)	65 800
	5 x 5 Landcruisers (20 000 km @ 33t)	32 500
7.	Total Budget	P1 070 800

C. T.F.C. Annual Budget After Eradication

1.	Salaries	
	(a) Chief Tsetse Officer (S5)	P13 272
	- Local Allowance	360
	(b) 1 Senior Field Officer (T2)	8 925
	1 Senior Field Officer (T3)	6 384
	5 Assistant Field Officer (T5)	18 900
	(c) Industrial Class	
	33 men @ P4,80 (G3)	48 090
	3 drivers @ P5,70 (G2)	5 191
	2 storemen @ P5,70 (G2)	3 461
	4 guards @ P4,80 (G3)	5 829
	Allowances	15 120
		125 532
	(d) Total	P125 532
2.	Insecticides 10 000 litres Dieldrin @ 250	P 25 000
3.	Sprayers 24 @ P50 over 3 years	400
4.	Maintenance of Boats and Oil	1 360
5.	Vehicle Running Costs	
	3 4x4 7 ton (20 000 km @ 55t)	33 000
	4 4x4 Landcruisers (20 000 km @ 33t)	26 400
		211 692
6.	10% Contingencies	21 169
7.	Total Budget	P 232 861

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6. Social and Economic Analysis

The eradication of the tsetse fly from Botswana would have considerable impact, particularly upon the people living in northwestern Botswana on the perimeter of the Okavango Delta and Chobe river. It would eliminate sleeping sickness and permit a freedom of movement they have never experienced.

The elimination of the fly would maintain and expand the area of land usable for agricultural purposes in two ways. First, it would extend to some degree the area currently kept free of the fly by the Tsetse Control Unit. This would provide grazing for a total of 100 000 or more cattle. The value of grazing for this number of cattle at current commercial grazing rates is nearly P2,5 million annually. Secondly, it would maintain the current level, and perhaps expand slightly, the land suitable for cultivation in this area. While this is not quantifiable at this time, the land area made available for cultivation by the Tsetse Control Program amounts to several thousand hectares. It is clearly established that eradication of tsetse fly will bring a considerable amount of longer term savings as compared with continuous control. For example, the estimated cost of eradication is equivalent to P6,2 million. Annual costs to maintain the current level of control is about P1 million. Annual costs to maintain the current level of control is about P1 million. At constant prices, estimated annual costs to maintain a fly-free situation when the eradication programme is finished total about P230 000. The approximate P800 000 difference between maintenance costs now and after eradication means that the P6,2 million cost of the eradication will be paid out in about 8-10 years after the programme is completed. Thus, from a long term cost standpoint, the eradication programme is very favorable to the Government.

Wildlife development inside the fence will provide primarily for greater economic exploitation of wildlife in cattle free zones. In these areas greater emphasis will be given to development of tourism and controlled hunting made possible by the elimination of the fly.

Land and water development planning outside the fence will be required to ensure the rational use of these resources for the greatest benefit to the people of the area.

While the construction of the game fence around the Delta is not part of the tsetse eradication project, it has an important role to play in the development of the area following the eradication of the fly. It will tend to contain wildlife within the swamps area and to the area where wildlife development is to take place and keep out of cultivated areas where they could damage crops. However its main function will be, as mentioned earlier, to separate cattle from buffalo and other wild carriers of foot and mouth disease. It has been clearly established, as evidenced by the outbreak at Tsau in 1979, that cattle/buffalo contact is a major source of foot and mouth infection in the area.

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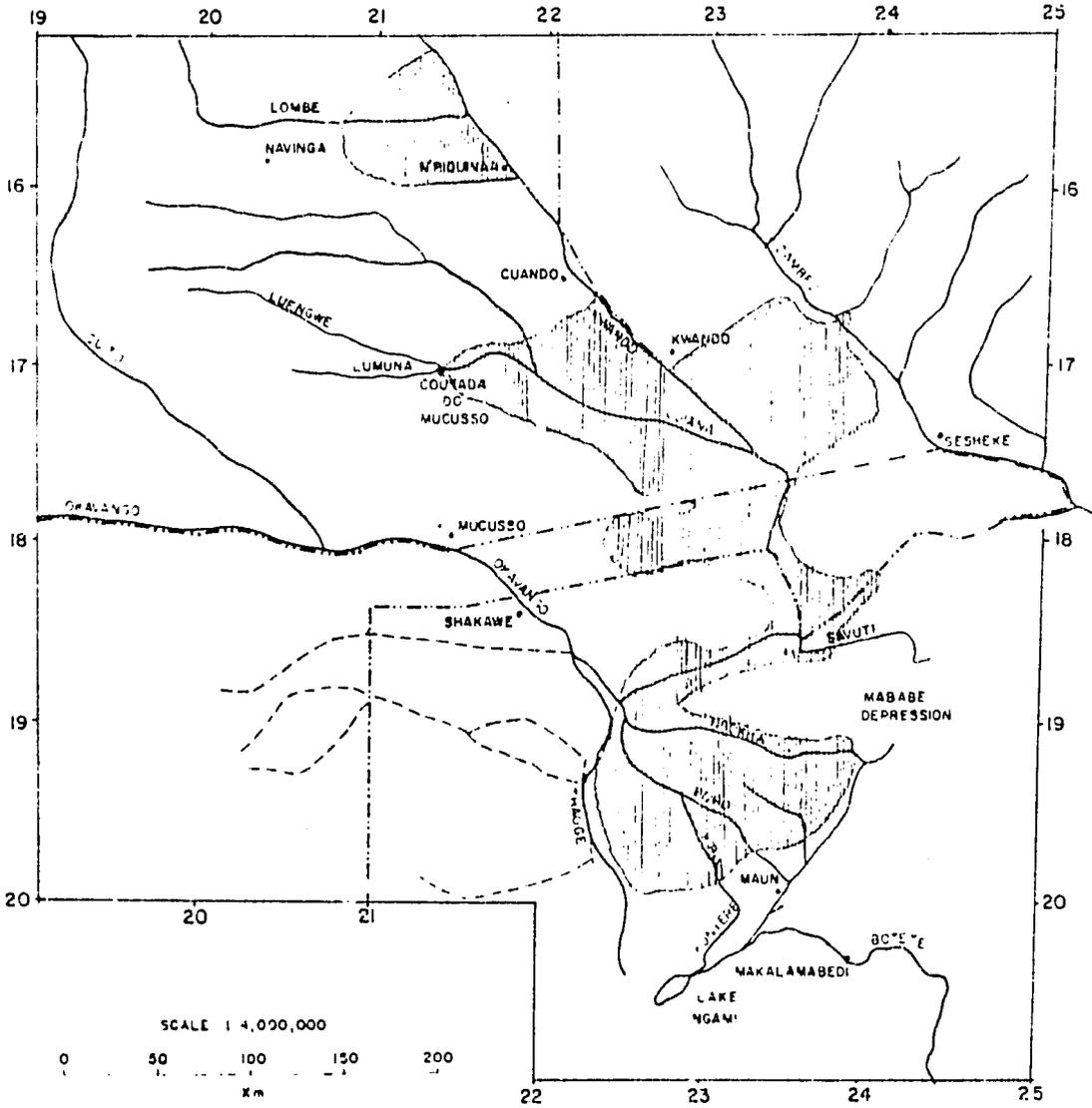
The losses to Botswana's cattle industry since the initial outbreak of foot and mouth disease in 1977 are well known. Northern producers have been particularly hard hit as they have been unable to market cattle, other than locally, since November 1977. Financial losses due to lost or delayed sales in Ngamiland alone are probably approaching P10 million. This lack of cattle sales has had a devastating impact on the entire economy of a region dependent on cattle revenue as a major source of money.

7. Related Projects

- A. During or shortly following the eradication programme a land and water development project will involve a study of available resources and the development of a plan and some infrastructural inputs for the use of these resources to increase crop and live-stock production around the Okavango. A second phase of land use planning will involve developing of a plan for the Chobe District.
- B. AH 04 - Veterinary cordon fences - Phase II of this project includes the construction of a buffalo fence running from east of Gomare around the perimeter of the Okavango Delta and on across northern Botswana to Basutas near the Zimbabwe border. A double cordon fence will be constructed along the border from Basutas to Vakaranga.
- C. AH 06 - Norther abattoirs Construction of a cannery at Maun and an abattoir at Francistown will improve the marketing situation for northern Botswana cattle producers and allow a higher offtake. Such facilities will also relieve the stress on the Lobatse plant during seasonally high or drought induced marketings.

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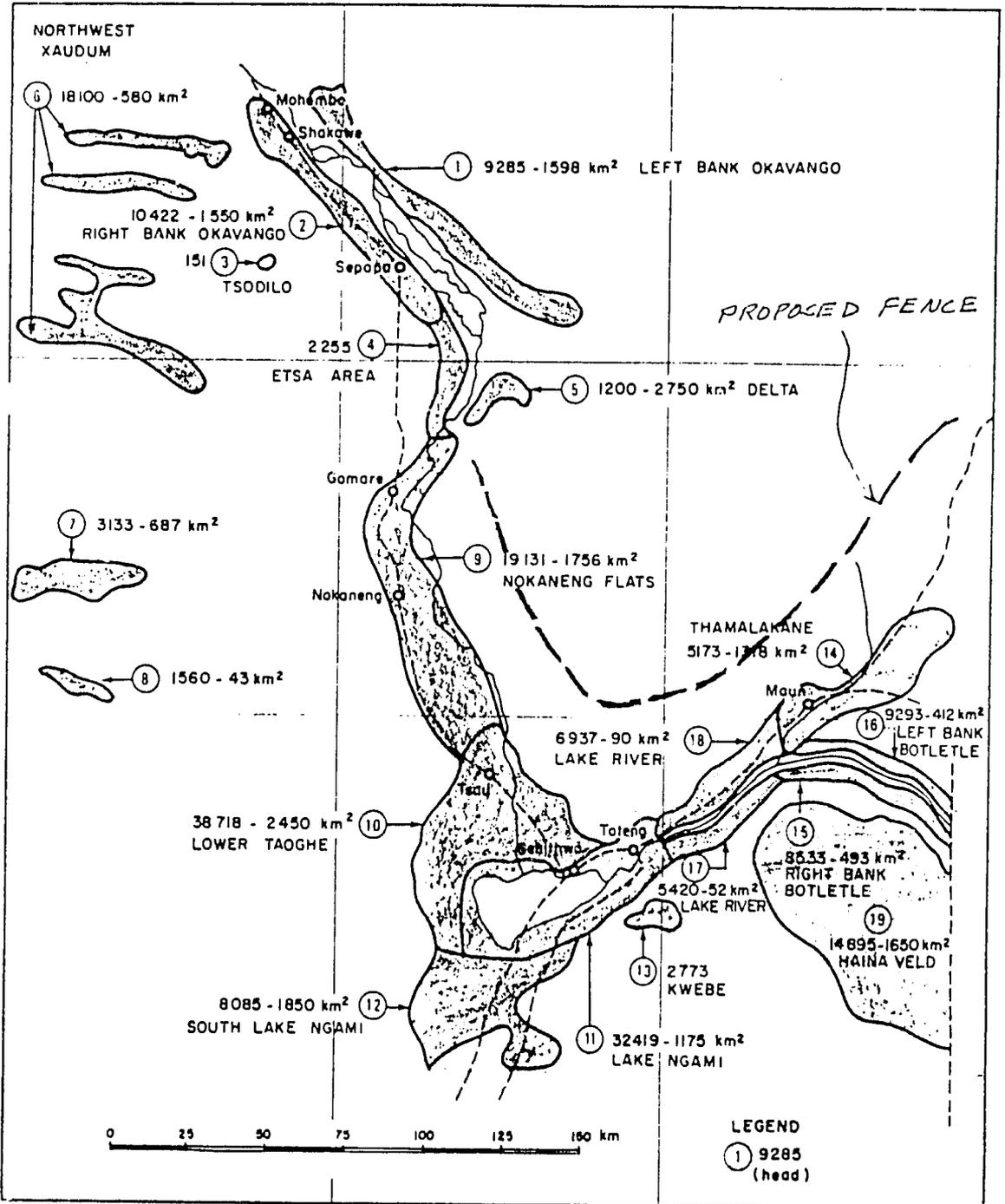
Map 2 DISTRIBUTION OF TSESE FLY INFESTATION
UNDER CURRENT CONTROL PROGRAMME



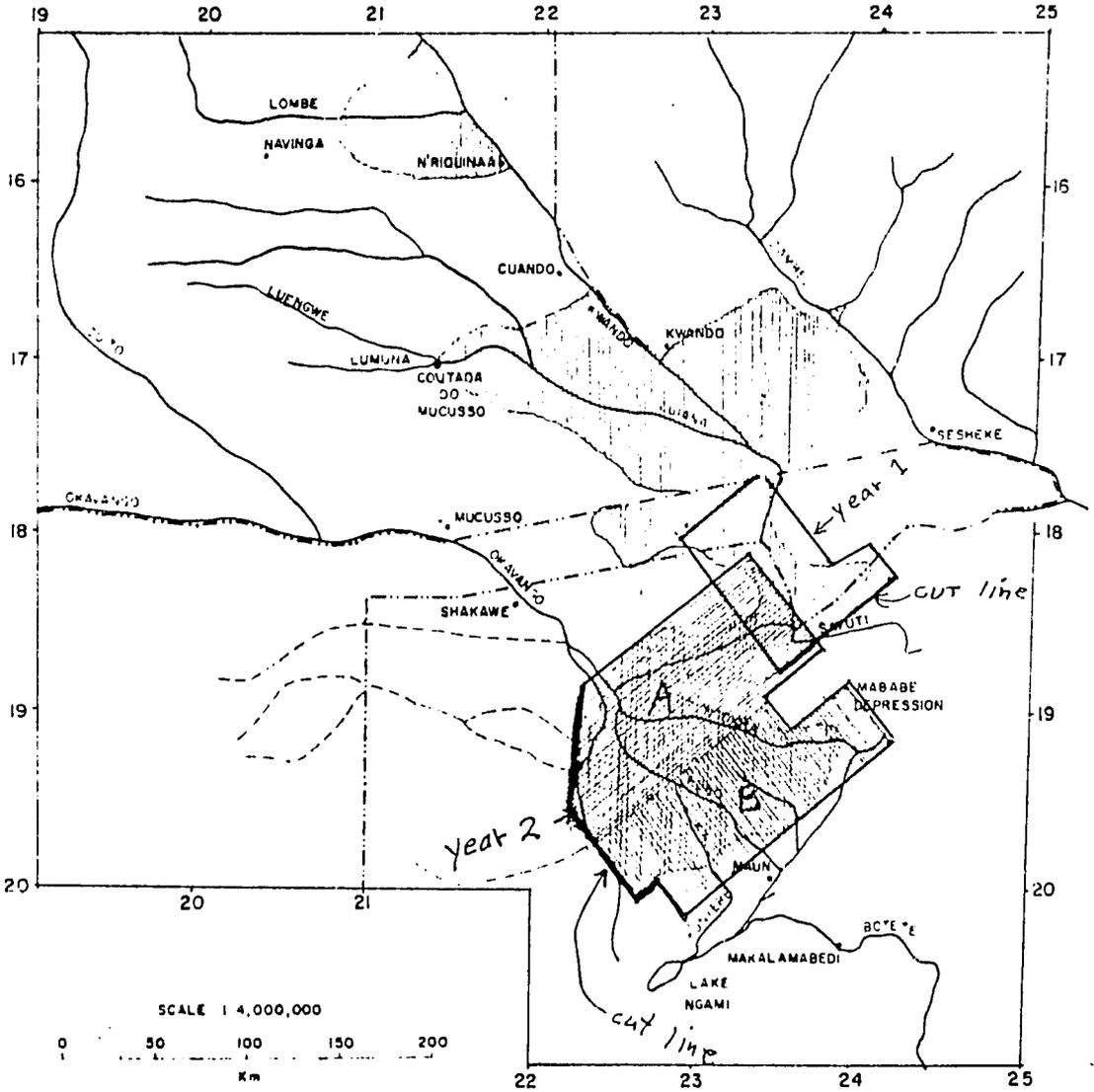
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Map 3 ESTIMATED CATTLE DISTRIBUTION - 1976



Map 4 IRRADIATION PROGRAM

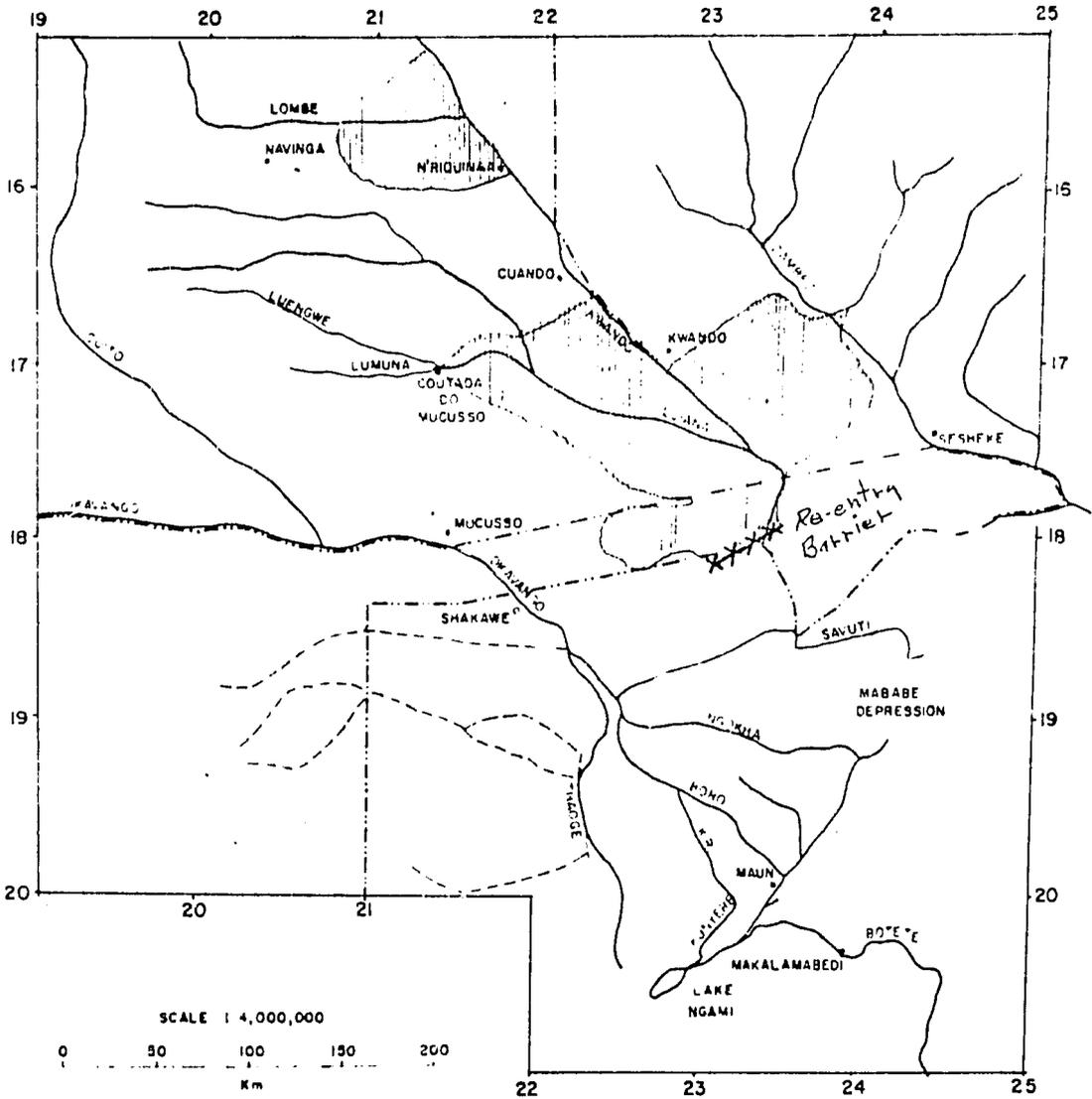


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Map 5

CONTROL AREA AFTER IRRADIATION



D 76 / 10 / 80
DLU/KP

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TSETSE AND TRYPANOSOMIASIS CONTROL PROJECT
PROPOSAL: TSETSE ERADICATION IN SOUTH WEST
ZAMBIA IN CONJUNCTION WITH NEIGHBOURING
COUNTRIES

INTRODUCTION

In South West Zambia (Western Province) there is an infestation of tsetse flies (*Glossina morsitans centralis*) covering an area of about 9000 km². This infestation appeared to cross the Kwando River in 1953. By the mid 1960's the infestation had spread North and East and was posing a considerable threat to one of the Zambia's major cattle producing areas. Various plans were formulated to contain the spread of the fly including aerial spraying and construction of a holding line consisting of game control and bush clearing measures. The main spraying operations are summarised in Table 1.

Table 1:

Summary of Aerial Spraying
Programme in South West Zambia

Year	Area Sprayed (Km ²)	Comments
1968	1600	Remained fly free until at least 1975.
1970	2500	Reinvasion noted after two years due to insufficient follow up
1975	3400	Fly free for 1 year after which monitoring was disrupted. Now believed to be reinfested.

In 1972 part of the area was declared a National Park. This severely limited the extent to which control measures could be carried out. Consequently the Department of Veterinary and Tsetse Control Services was forced to try and defend a fly line of about 150 km.

This became an impossible task as costs escalated and the fly was not necessarily being held on natural boundaries. By 1975 fly had crossed the east bank of the Zambezi River but further spread was temporarily contained by aerial spraying.

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Since 1975 there has been a complete breakdown of the tsetse and trypanosomiasis situation caused by the effects of liberation wars in the area. A considerable financial input is required to bring the situation back to a reasonable control situation or eradicate the tsetse challenge altogether. Until a firm commitment is made on the future of tsetse control operations a plan to create a Cattle Development Area (CDA) in the area has been temporarily suspended.

An improvement in the security situation occurred in December 1980. One major camp was reopened and limited fly monitoring took place.

REGIONAL TSETSE SITUATION

It is known that the tsetse infestation in Zambia is contiguous with those in Angola, Namibia (Caprivi Strip) and south along the Kwando River to Botswana. It would therefore be logical for any country combating their part of this infestation to work with their neighbours to ensure complete eradication. This would prevent the threat of reinfestation and possible recurrent costs of holding fly.

Botswana have already made their intentions clear in that they intend to eradicate their part of this infestation and possibly the section in the Caprivi-Strip as well. To prevent reinfestation they would like all possible fly sources eliminated. Zambia has made a proposal for complete eradication of her part of the fly belt in the Third National Development Plan (1979-1983).

The Zambian Government has accepted the proposal but no funds have been guaranteed. The Angolan Commitment to tsetse and trypanosomiasis control in the area was not known at the time of writing.

JUSTIFICATION

Botswana have made their own justifications for eradicating the fly from their own country up to the border. They have expressed concern about reinfestation from those parts of the fly belt in neighbouring countries and the recurrent expense of holding fly on the international border. If neighbouring countries could cooperate the fly in the area could be eradicated completely.

Within Zambia the same fly belt which is being eradicated in Botswana is an immediate threat to an important cattle rearing area. There are 190,000 cattle under a tsetse/trypanosomiasis challenge at present. The fly front is currently out of control and cannot be held with the present financial resources in the department. Consequently the number of cattle at risk will increase as the fly front continues to expand. A considerable number of cattle deaths in the area have been attributed to trypanosomiasis. Continued prophylactic cover is not desirable. If it was the difficult communication in the area would make it virtually impossible to maintain.

Cattle rearing is the only livelihood of this part of Zambia. Arable farming is virtually impossible on the Kalahari sand soils of the area. The loss of grazing lands by tsetse invasion could cause considerable social problems locally. These would eventually have greater economic implication as the Western Province is a major beef supplier to the nation. The plan to create a CDA here have already been mentioned. A major constraint to its implementation is inadequate tsetse control measures. If the constraint of tsetse was removed the creation of the CDA could have considerable local and national benefits.

Complete eradication of this fly belt in Zambia and Botswana is technically possible. Complete eradication would reduce the almost impossible defence of an extensive fly front to a narrow strip on the Angolan border. This border has extensive natural barriers to fly movement created by the swamps of the Kwando River. The defence of this border could even be eliminated if Angola could be brought into the Project. If this is not possible Zambia's resources should not be stretched to monitor this small front as existing staff could be deployed. Zambia does not have the resources to defend the present fly front. Botswana does not cherish the idea of a recurrent defensive project. Thus complete eradication of the Botswana/Zambia fly belt is essential.

ZAMBIAN RESOURCES

Excluding the experience and expertise at the National Headquarters, Zambia does have an established presence of tsetse trypanosomiasis control personnel in the area under discussion. This includes a Provincial Administrative Office at Mongu (154 km north of the area by road - 109 km tarred and 45 km dirt), a major tsetse field station 1000 m airstrip at Kanja (adjacent to spray block), a sub-station at Sinjembela and numerous camps from which survey patrols can radiate. Veterinary camps are situated throughout the cattle rearing areas affected by the fly. Veterinary Laboratory facilities exist in Mongu. The area has been severely disrupted by liberation wars but staff are present and fly rounds could be started in a small way at once. Much of the tsetse infrastructure (roads and camps) are in bad state of repair. If complete eradication is to be carried out only temporary accommodation will be erected for survey and other staff.

OPERATING SCHEDULE AND TECHNIQUES

The precise extent of fly distribution in Zambia is not known due to an enforced period of inactivity. Extensive surveys must be mounted to determine this. These will normally be manned fly rounds using existing staff.

Eradication of the fly will be by aerial spraying. The fixed wing sequential aerial spraying technique will be used. Both Botswana and Zambia have had considerable experience of this technique so that no retraining of any kind will be necessary.

One major difference between spraying techniques in the two countries is that Botswana fly during the night when conditions are ideal for aerial spraying. In Zambia the Department of Civil Aviation have not yet agreed to allow night flying in Zambia for aerial spraying and seem reluctant to change their attitude. Thus spraying in Zambia will normally be restricted to 1½ hours before sundown and about 1½ hours after sun rise.

The climatic conditions which normally prevail during flying periods in Zambia have not been conducive to increase the swathe width beyond 200m. Thus one aircraft can normally spray little more than 160 km² in a 24 hour period. This is often less if inversion is late to fall or rises early. One aircraft is unlikely to do more than 1000 km² in a cycle which allows pilots and aircraft an adequate rest between cycles.

Zambia's dry season normally lasts from May to mid November. Theoretically two blocks could be sprayed in a year. The cold season lasts from mid May - end July which biologically has not been found an ideal time for aerial spraying against the fly. Thus it is only likely that one block of 3000 km² (with up to 3 aircraft) will be possible in present conditions.

Follow up surveys and fly monitoring would continue. This will normally be manned fly rounds. Although vehicle mounted electric traps have been used fairly successfully in Botswana for this, Zambia has never had a vehicle or fuel to spare for constant use on such a Project.

Furthermore the sandy nature of the area severely shortens the life of land rovers. Temporary survey/monitoring camps would be established using portable metal huts.

The operating schedule would be:-

Year 1	Surveys to define fly perimeter
Year 2	Aerial spraying (3000 km ²) Post spray monitoring
Year 3	Aerial Spraying (3000 km ² inc. overlap) Post spray monitoring
Year 4	Aerial Spraying (up to 3000 km ² inc. overlap) Post spray monitoring
Year 5-7	Post spray monitoring

ESTIMATES

(Prices in Zambian Kwacha at 1st March, 1981;
K1.00 = £0.53 or US \$1.2

(N.B. Permanent staff salaries are not included).

A. Surveys (1 year)

1 Landrover diesel 109 PU	15,000 (i)
1 4 x 4 Truck " " "	45,000 (i)
2 MF 135 Tractors/Trailers	44,000 (i)
Fuel " " " " "	10,640
Survey Allowances " "	33,120
Camp Equipment " " "	5,000
Refurbish old camps " "	90,000 (ii)
	<u>242,760 (iii)</u>

NOTES:

- (i) The cost is for a new vehicle over one year. It is expected that each vehicle should have a 3 year life and be used on other duties after the initial survey.
- (ii) Destroyed and abandoned camps to be replaced by portable metal huts. These huts should have a life of at least five years.
- (iii) Assuming cost of vehicles and huts written over a longer period, cost for one year of survey should be reduced to K101,427.

B. Spraying (Maximum 9000 km²).

(Assumes dayling flying and only 1 block sprayed per year in warm season of mid August - end October).

Spraying 9000 km ² @ K120 km ²	1,080,000.00
Insecticide 240,000 lts.	
25% endosulphan @ K3.00/litre	712,800.00
Ground marking " " "	135,000.00
	<u>1,927,800.00</u>

C. Post Spray Monitoring

(Assuming existing staff in use)

Purchase of additional portable metal huts	25,000
1 Landrover 109 diesel/PU " " " "	15,000
Fuel (6 years) " " " " " "	70,000
	<u>110,000</u>

ENVIRONMENTAL IMPLICATIONS

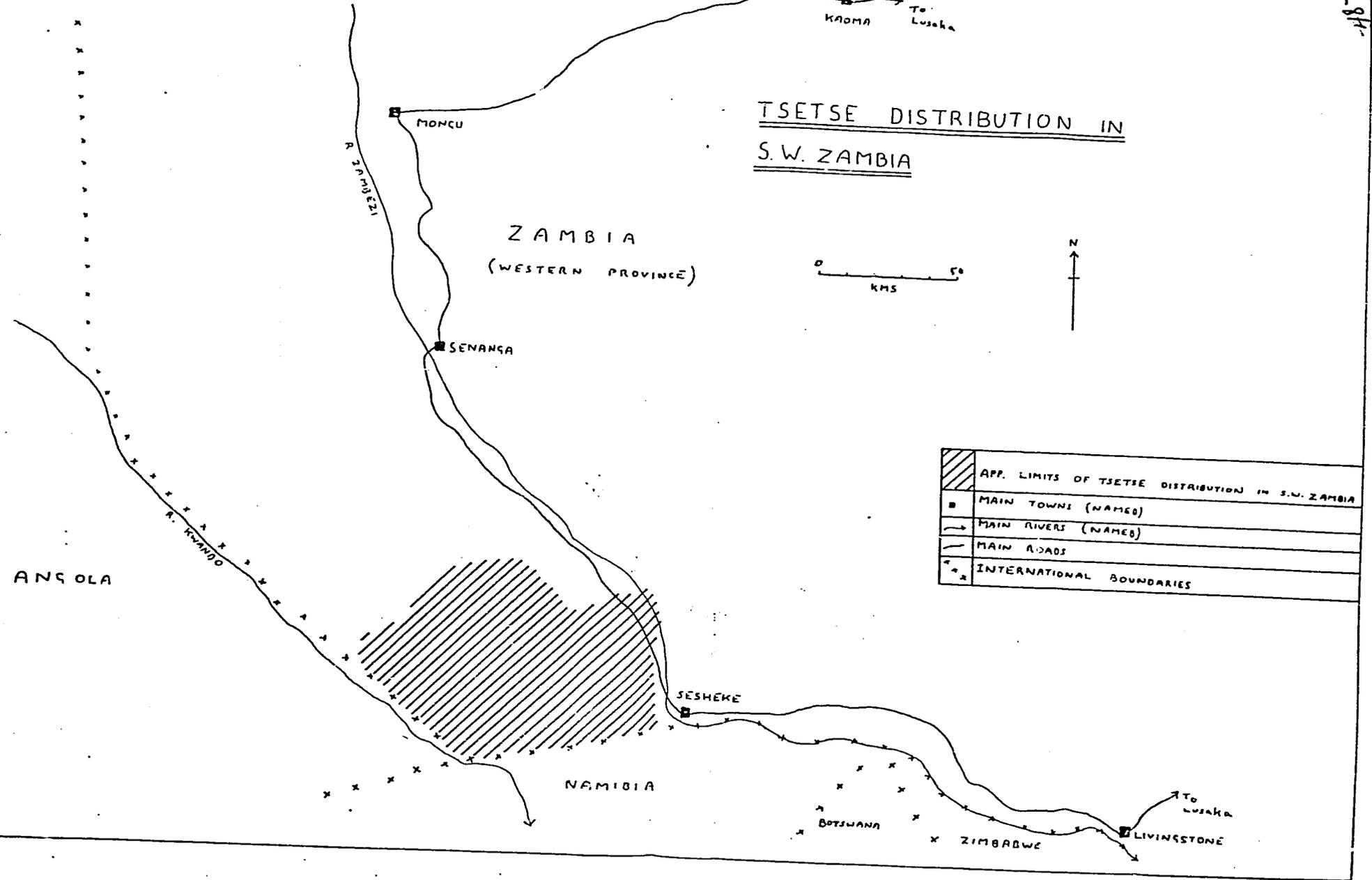
An area of about 4500 km² within the spray block is a national park. The spraying of this area will cause an outcry from the environmentalists. Sufficient work has been done in Botswana to show that the spraying technique proposed will have a minimal effect on the environment other than the removal of tsetse. However, those implicated with the management of the National Park may require an additional monitoring component to be written into Project. It is felt that sufficient manpower resources are available in Zambia to do this but additional funds will be required for transport and running costs.

TSETSE DISTRIBUTION IN S.W. ZAMBIA

ZAMBIA
(WESTERN PROVINCE)



	APP. LIMITS OF TSETSE DISTRIBUTION IN S.W. ZAMBIA
	MAIN TOWNS (NAMES)
	MAIN RIVERS (NAMES)
	MAIN ROADS
	INTERNATIONAL BOUNDARIES



ANGOLA

NAMIBIA

BOTSWANA

ZIMBABWE

To Lusaka

LIVINGSTONE

To Livingstone

KAOMA

To Lusaka

MONCU

SENGA

SESHEKE

REPUBLIC OF BOTSWANA

PROJECT MEMORANDUM

PROJECT TITLE: ABATTOIR AND SLAUGHTERHOUSE
STAFF TRAINING CENTRE

NDP NO. AH 05

TEC P 2 535 000

PHASING 1st year P 1 902 000

2nd year P 633 000

FUNDS AVAILABLE FOR RUNNING EXPENSES - US\$3 761 000

Refer to FAO/DANIDA Offer in UNDP Representative's
letter of 23/9/80

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Synopsis

This project is a sequel to the FAO/OAU Mission of May-June 1977 on the need and feasibility of establishing regional training centres for livestock production and slaughterhouse personnel in English-speaking African countries. The Mission recommended among other things the establishment of a Regional Training Centre for Meat Inspectors and Slaughterhouse Personnel in Botswana. This Centre will be built in Lobatse in the vicinity of the Botswana Meat Commission, the country's export abattoir. This Memorandum requests P 2 535 000 for the capital investment cost of the buildings. FAO/DANIDA have already pledged US\$ 3 761 000 running expenses for the first six years.

BackgroundRegional Need for the Centre

During the 1960s a Regional Training Centre for Meat Inspection was built in Athi River in Nairobi, Kenya which was administered by DANIDA. This was handed over to the Kenya Government in 1976 and is now used mainly as a national training centre. The Kenya Government offers a few places each year to foreign students and in the past Botswana has been able to get only two places for each of the six month courses. When DANIDA ran the centre the students took the external examination for British Public Health Inspectors which is an internationally recognised qualification for meat inspectors. Since the take-over by the Kenya Government, the students take an internal examination set by Nairobi University.

During 1977 FAO and OAU sent a Mission under the International Meat Development Scheme to study the need and feasibility of establishing regional training centres for livestock production and slaughterhouse personnel in English-speaking African countries. Their report LMDS/77/2 is available.

This Mission recommended among others:

- a regional centre for the training of meat inspectors and slaughterhouse personnel be established;
- the regional centre should be located at the Botswana Meat Commission Abattoir in Lobatse.

In October of 1978 a follow-up mission was commissioned. Their report is available. Lastly in January 1980 a further consultancy was launched, which was assigned to prepare a project document for DANIDA. The draft project memorandum is not available yet however extracts from the consultants work are.

Training of slaughterhouse personnel and meat inspectors is essential if the general hygiene and quality of work in slaughterhouses is to reach the level necessary to ensure better acceptability of meat for export and international consumption.

The present total demand for meat inspectors in the region exceeds 400 per annum and the possibilities for training in each country separately to meet its own demand do not exist. Trained slaughterhouse personnel of various categories are required for operation of approximately 30 industrial slaughterhouses in the recipient countries and for steadily increasing number of improved local slaughterhouses.

National Need for the Centre

At present there are 28 posts of meat inspectors and graders in Botswana (who require meat inspection as basic training) on the establishment at BMC, twelve of which are held by ex-patriates. This establishment will have to be increased by 1982 by at least 10 to cope with the new main abattoir, the proposed Maun cannery and the pet food factory in Lobatse. A further twenty will be required by 1984 to staff the proposed northern abattoir in Francistown. Thus, at least 42 Inspectors will be needed to fill and localise the cadre. This assumes that no one leaves the service in that time.

There are also under preparation, new meat inspection regulations to apply to local slaughtering facilities and it is estimated that at least 8 more inspectors will be needed for this service. A service which at present does not exist.

Botswana's need for this centre cannot be overemphasised. Without it, (or if it is not built soon) extensive ex-patriate recruitment will be needed to cope with commitments in the next 3-4 years.

Plan of Operation

It is proposed to build the centre at a site in Lobatse adjacent to the Botswana Meat Commission, one of the largest export abattoirs in the region. This site was chosen so that trainees could have access to the BMC for demonstration purposes on international meat inspection and grading. The centre will be built when funds are available by contract with the Daglush and Lindsay group as architects as they have already prepared drawings for the project on the instructions of the FAO consultant.

A hostel designed to take up to 40 students, with two students per room, will be built on site. The hostel's design is such that extensions, in the future, can easily be added. Furthermore, a teaching and administrative block, comprising a simple unit, two classrooms, a laboratory and offices for teaching and administrative staff will also be built on site. An abattoir especially designed to cope both with the local requirements of the Lobatse Township to meet its own demand and requirements for a teaching facility for slaughterhouse personnel will also be constructed on site. The object of the facility is to provide a first class local abattoir to replace the present Township one, which is located within the BMC premises. It is proposed to use the normal kill from the new abattoir for teaching purposes, as well as using the BMC within the precincts of the Department of Veterinary Services Meat Inspection and Grading Floor for demonstration purposes. A house for the bursar will also be provided on site. No provision for housing is made for any other staff.

Courses to be Run

Meat Inspectors

It is proposed that two courses a year be held with about 20 participants in each course. The teaching time will be divided almost equally between lectures and practical work. This practical work will take place in BMC for which management has already given approval.

A project manager, employed by FAO, will be responsible for the operation of the Centre. A Project Steering Committee comprising Government and FAO officials will be established to provide a regular forum for discussion on the Centre's functions.

The following training course will be implemented:

- (1) regional and national courses for meat inspectors (national courses in countries where adequate facilities for practical training exist);
- (2) courses for different categories of slaughterhouse personnel, viz:
 - (a) regional course for instructors destined to be responsible for national courses in killing floor operations;
 - (b) regional course for foremen in killing floor operations;
 - (c) regional course for teams of workers from industrial slaughterhouses;
 - (d) regional course for foremen in cutting and pre-packing;
 - (e) regional course for foremen in operation and maintenance of chilling and freezing facilities;
 - (f) regional course for production managers.

Additional courses may be initiated if and when the need arises.

- (3) regional seminar on measures to improve the meat industry.

In addition the Centre will offer advice in connection with development of the meat industry and organisation of meat inspection services to the extent requested by Governments of the recipient countries.

The courses, which will be of a duration of 3-5 months, will be practice oriented.

A minimum of two courses for meat inspectors and two for slaughterhouse personnel will be held annually when the Centre becomes fully operational.

The number of participants per course will be approximately 20.

The entrance qualification for the courses on meat inspection will be a Certificate in Animal Health. A final examination leading to the Royal Society of Health Certificates in Meat Inspection will be held.

The entrance qualification for the regional courses for slaughterhouse personnel will be school certificate preferably combined with practical experience of work in a slaughterhouse.

For practical training of meat inspectors a well operated slaughterhouse with a sufficient throughput of animals is essential. The Botswana Meat Commission export abattoir fulfils this requirement.

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Slaughterhouse Personnel

For training of slaughterhouse personnel a training slaughterhouse is necessary in order to avoid that training is subordinated to commercial considerations. The training slaughterhouse will be provided by the project together with buildings for students' accommodation, administration and theoretical training.

There will also be two courses a year for about 20 participants in each course.

The details of this course have not yet been finalised but this programme will be varied to provide the type of training required for each group.

An evaluation of the project should be carried out after the first two years of full operation.

Semi-annual progress reports and a terminal report will be submitted to the FAO for transmission to the donor and recipient countries.

Staff Housing

Provision is made for a small house of the grade recommended for a bursar to be built on site. Housing has not been included for the teaching staff as it is assumed that Botswana Housing Corporation houses will be available in Lobatse for them.

Costings

A. Capital Costs

The consultant architects employed by FAO for the design phase of the project costed the building and furniture at P1 500 000 at 1980 prices. Since the project is likely to begin in 1982, a cost escalation of 30% per year must be added giving P 2 535 000.

This project will therefore require P 2535 000 to build a Meat/Training Centre in Lobatse. This centre will supply training facilities for the region and any other English-speaking countries.

B. Running Costs

A detailed breakdown of the cost of running the project is available.

Economic and Social Analysis

The main purpose of this project is to improve through theoretical as well as practical training, demonstration and advice, the competence of personnel employed in the meat industry, with a view to improving meat inspection services, and slaughtering and processing techniques. Slaughtering in Africa is generally carried out under often unsatisfactory technical and hygienic conditions except in a few industrial slaughterhouses, the main constraint being the lack of trained manpower. This manpower problem will further be exacerbated by the ever increasing determined efforts by most African countries to expand livestock production, particularly of beef and mutton, either to meet the growing internal demand or to produce for export and thereby increasing needed foreign exchange earnings.

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For Botswana in particular and to some extent Swaziland and perhaps Zimbabwe, proper training of meat inspectors and graders for the export abattoirs is essential so that international meat hygiene standards can be maintained if continued access to the world export markets is to be sustained. Furthermore the present situation where most of these positions are ex-patriate held should be reversed and localisation programmes pursued. This has not been possible in the past and indeed the localisation programme of this technical cadre has been slow, mainly due to the lack of training facilities. The planned expansion of the Botswana export abattoir into three units will require a further increase in the numbers of meat inspectors required, further increasing the shortfall in the supply-demand relationship. This means therefore that there will be high demands for places by Botswana for the early courses.

Relationship to Other Projects

Related projects seek to improve the economic conditions of livestock producers through control of foot and mouth disease.

(1) AG 06 - Expansion of Slaughtering and Processing Facilities

This project will provide a more certain market situation for Northern Botswana cattle producers and ease the strain of seasonally large or drought-induced supplies of slaughter cattle to the Botswana Meat Commission in Lobatse. An abattoir will be constructed in Francistown and an abattoir/canning factory in Maun.

(2) AH 01 - Foot and Mouth Disease Vaccine Production

This project provides funds for the construction of a foot and mouth disease vaccine production factory and will produce high quality vaccine for Botswana and other African countries.

(3) AH 02 - Foot and Mouth Disease Control

Supplementary funds are provided to control foot and mouth disease such as buying vaccine, provision of pickets at quarantine camps, emergency fence repairs and transport for veterinary services.

(4) AH 07 - Improvement to Quarantine Camps

Most work involves increasing the carrying capacity, housing and sanitation facilities.

(5) AH 12 - Improvement of Disease Control

This project largely involves construction, improvement and smallstock proofing and cordon fences.

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6. AH 04 - Veterinary Cordon Fences

Phase I involved the construction of cordon fences along the Zimbabwe Botswana border from Vakaranga to Basuto and a 90km section between Sherwood Ranch and Palapye. Phase II will include the construction of a buffalo fence running from east of Gomare, around the perimeter of the Okavango delta and on across Northern Botswana to Basuto near the Zimbabwe border. A double cordon fence will be constructed along the border from Basuto to Vakaranga. There will also be construction of additional cordon fences to increase the number of foot and mouth buffer zones.

7. AH 09 - Botswana Veterinary Diagnostic Laboratory

The project will improve the animal disease diagnostic capacity by providing funds for the construction and equipping of a modern veterinary laboratory in the country.

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REGIONAL PROGRAMME FOR EAST COAST FEVER

IMMUNIZATION

PROJECT DOCUMENT

COUNTRY:

MALAWI

- PROJECT TITLE:- Regional Programme for East Coast Fever Immunization.
- Estimated Costs:- The plan of expenditure is in Appendix I.
- Planning Duration:- 6 months plus two preparatory months when the Project Manager and his assistant are at post.
- Financial Details:- See Annex I.
- Background & Purpose:- See Annex II.
- Description & Work Plan:- See Annex III.
- Supporting material for Work Plan:- Appendix IV.

Assumptions:-

- (1) New 1,000 Acres site.
- (2) Continuation of existing National Project GCP/MLW/018/DEN - lines of research.
- (3) New Laboratory and New facilities.
- (4) Autonomous unit from existing Diagnostic Laboratory Services in Malawi.
- (5) Field Laboratories to be attached to existing National diagnostic Central Veterinary Laboratories.
- (6) Eventually the centre should develop into a ticks and tick borne diseases centre for the Region.

Reporting:-

Progress of the project will be reported to the participating Governments and to the donor as detailed in Appendix III.

The Governments involved shall agree to the dissemination of information like descriptions of the project and its objectives and results, for the purpose of educating public opinion.

COUNTRY:- MALAWI

PROJECT TITLE:- REGIONAL PROGRAMME FOR EAST COAST FEVER IMMUNISATION

CODE	m/m	TOTALS	m/m	1983	m/m	1984	m/m	1985	m/m	1986	m/m	1987	m/m	1988
10. PROJECT PERSONNEL (a) (HQ)														
01. Project Manager (D1)	62	320,200	2	10,200	12	62,000	12	62,000	12	62,000	12	62,000	12	62,000
02. Asst. Project Manager (P5)	62	279,000	2	9,000	12	54,000	12	54,000	12	54,000	12	54,000	12	54,000
03. Sen. Protozoologist (P5)	60	270,000	-	-	12	54,000	12	54,000	12	54,000	12	54,000	12	54,000
04. Protozoologist (P4)	60	237,000	-	-	12	47,400	12	47,400	12	47,400	12	47,400	12	47,400
05. Vet. Research Officer (P5)	60	237,000	-	-	12	47,400	12	47,400	12	47,400	12	47,400	12	47,400
06. (6) Vet Res. Officer (P2)	360	960,000	-	-	72	192,000	72	192,000	72	192,000	72	192,000	72	192,000
07. (3) Sen. Lab. Tech.(Trainee)(P3)	180	630,000	-	-	36	126,000	36	126,000	36	126,000	36	126,000	36	126,000
08. Farm Manager (P3)	60	210,000	-	-	12	42,000	12	42,000	12	42,000	12	42,000	12	42,000
09. (6) Technical Assistants (G6)	360	108,000	-	-	72	21,600	72	21,600	72	21,600	72	21,600	72	21,600
10. Admin. Officer (P1)	60	160,000	-	-	12	32,000	12	32,000	12	32,000	12	32,000	12	32,000
11. Asst. Admin. Officer (G5)	60	20,000	-	-	12	4,000	12	4,000	12	4,000	12	4,000	12	4,000
12. (2) Stenographers (G4)	120	30,000	-	-	24	6,000	24	6,000	24	6,000	24	6,000	24	6,000
13. Typist (G2)	60	7,500	-	-	12	1,500	12	1,500	12	1,500	12	1,500	12	1,500
14. Messenger	60	3,000	-	-	12	600	12	600	12	600	12	600	12	600
15. (2) Cleaners	120	3,000	-	-	24	600	24	600	24	600	24	600	24	600
16. (12) Animal Attendants	720	18,000	-	-	144	3,600	144	3,600	144	3,600	144	3,600	144	3,600
17. (7) Drivers	420	52,500	-	-	84	10,500	84	10,500	84	10,500	84	10,500	84	10,500
18. (20) Labourers	1200	30,000	-	-	240	6,000	240	6,000	240	6,000	240	6,000	240	6,000
19. Casual Labour	-	30,000	-	-	-	6,000	-	6,000	-	6,000	-	6,000	-	6,000
SUB TOTAL		3,605,200		19,200		717,200								
(Field Laboratories)														
21. Laboratory Assistants	216	194,400	-	-	-	-	-	-	72	64,800	72	64,800	72	64,800
22. 6 Typists	216	27,000	-	-	-	-	-	-	72	9,000	72	9,000	72	9,000
23. (6) Messengers/Cleaners	216	10,800	-	-	-	-	-	-	72	3,600	72	3,600	72	3,600
24. (6) Drivers	216	27,000	-	-	-	-	-	-	72	9,000	72	9,000	72	9,000
SUB TOTAL		259,200		-		-		-		86,400		86,400		86,400
COMPONENT TOTAL		3,864,400		19,200		717,200		717,200		803,600		803,600		803,600

N.B. The 6 V.R.O. (Trainee) will be attached to Headquarters.

CODE	m/m Total	m/m 1983	m/m 1984	m/m 1985	m/m 1986	m/m 1987	m/m 1988
20. OFFICIAL DUTY							
<u>TRAVEL</u>							
Component Total	95,000	5,000	20,000	20,000	25,000	15,000	10,000
30. CONTRACTED SERVICES							
01. Reports	30,000		1,000	10,000	1,000	5,000	13,000
02. Review Mission	48,000		-	-	-	48,000	-
COMPONENT TOTAL	78,000		1,000	10,000	1,000	53,000	13,000
40. GENERAL OPERATING EXPENSES							
01. Maintenance	341,000	1,000	60,000	80,000	80,000	80,000	40,000
02. Miscellaneous	173,000	3,000	30,000	32,000	34,000	36,000	38,000
03. Hospitality	4,000		1,000	500	500	1,500	500
	518,000	4,000	91,000	112,500	114,500	117,500	78,500

16.

CODE	m/m Total	m/m 1983	m/m 1984	m/m 1985	m/m 1986	m/m 1987	m/m 1988
50. SUPPLIES AND MATERIALS							
01. Vehicles Operation & Maintenance	180,000	5,000	25,000	30,000	35,000	40,000	45,000
02. Office Equipment & Furniture	50,000	20,000	20,000	10,000	-	-	-
03. Services and Utilities (Water, electricity, gas, stationery, telephone, etc.)	91,500	5,000	10,000	15,000	20,000	20,500	21,000
04. Transport, Customs Clearance, Insurance	24,000	2,000	4,400	4,400	4,400	4,400	4,400
05. Revolving Fund for Cattle Purchase	300,000	-	120,000	180,000	-	-	-
06. Grazing 1,000 Acres at \$150/ Acre	150,000	-	60,000	30,000	30,000	30,000	-
07. Supplementary Cattle Feed-Hay and Concentrates	640,000	-	80,000	180,000	180,000	120,000	80,000
08. Reagents	100,500	500	20,000	20,000	20,000	20,000	20,000
09. Acaricides	25,000	500	5,000	5,000	5,000	5,000	4,500
10. Antibiotics and Drugs	50,000	1,000	9,500	12,500	12,500	10,000	4,500
11. Liquid Nitrogen	145,000	10,000	20,000	25,000	30,000	30,000	30,000
COMPONENT TOTAL	1,756,000	44,000	373,900	511,900	336,900	219,900	209,400

50.

CODE	TOTAL \$	1983	1984	1985	1986	1987	1988
60. EQUIPMENT							
01. Office Equipment	45,000	-	20,000	15,000	10,000	-	-
02. Vehicles	226,000	-	136,000	90,000	-	-	-
03. Tick Rooms and Tick Building	20,000	-	20,000	-	-	-	-
04. Liquid Nitrogen Containers	16,000	-	10,000	6,000	-	-	-
05. Microscopes	172,000	-	22,000	150,000	-	-	-
06. Spray Race & Weigh Scales	24,000	-	20,000	4,000	-	-	-
07. Freezer & Refrigerators	60,000	15,000	15,000	15,000	15,000	5,000	-
08. Laboratory Equipment	110,000	10,000	40,000	40,000	15,000	-	-
09. Farm Equipment	60,000	-	55,000	5,000	-	-	-
COMPONENT TOTAL	733,000	25,000	338,000	325,000	40,000	5,000	-
70. PREMISES							
01. Laboratory Buildings	1,600,000	-	1,000,000	600,000	-	-	-
02. Tick Proof Pens	80,000	-	80,000	-	-	-	-
03. Cattle Yards & Accommodation	950,000	-	950,000	-	-	-	-
04. Fencing & Water Supplies (75m at \$ 1,500/m)	112,500	-	112,500	-	-	-	-
05. Electrification	2,800	-	2,800	-	-	-	-
06. Land Acquisition (1,000 Acres at \$50/Hactre)	20,000	20,000	-	-	-	-	-
07. Staff Housing	968,000	-	968,000	-	-	-	-
08. Services (including PVH charges)	400,000	1,000	79,800	79,800	79,800	79,800	79,800
COMPONENT TOTAL	4,133,300	21,000	3,193,100	679,800	79,800	79,800	79,800

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CODE	TOTAL \$	1983	1984	1985	1986	1987	1988
80. TRAINING							
(12 x 12 months 144 m/m)							
01. Subsistence Allowance							
144 m/m x \$ 1,000	144,000	-	48,000	48,000	48,000	-	-
02. TRAVEL 12 x \$ 800	9,600	-	3,200	3,200	3,200	-	-
COMPONENT TOTAL	153,600	-	51,200	51,200	51,200	-	-
<u>SUB TOTAL</u>	11,331,300	119,200	4,794,400	2,427,600	1,452,000	1,293,800	1,194,300
90. PROJECT							
SERVICING 14%	1,586,282	16,688	671,216	339,364	203,280	181,132	167,202
SUB TOTAL	12,917,682	135,888	5,465,616	2,767,464	1,655,280	1,474,932	1,361,502
10% Special Factor/annum	-	-	546,561.6	276,746.4	165,528	147,493.2	136,150.2
GRAND TOTAL	14,133,161.4	135,888	6,012,177.6	3,044,210.4	1,820,808	1,622,425.2	1,497,652.2

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BACKGROUND

East Coast Fever, caused by T.Parva, is presently the most important disease which inhibits livestock development programmes in large parts of East and Central Africa. A method of immunization ("infection and treatment") has been developed by the FAO/UNDP project RAF/67/077 at EAVRO, Muguga, Kenya and has been successfully tested in a large-scale field trial at Pugu in Tanzania.

The regional project was terminated in December 1976 having achieved its objective with the success of the large-scale ECF immunization field trial at Pugu, Tanzania in collaboration with URT/72/009. Other projects concerned with ticks and tick-borne diseases in the region have come to rely on RAF/67/007 for expertise and materials (stabilates) for immunization against ECF. In fact certain projects have been planned with the expectation of continuing supplies of such materials for immunization against ECF.

Malawi, through the DANIDA project "Bilateral Central Veterinary Laboratory" and the FAO/TCP project 6/MLW/01/T, has already received support to establish a programme to control East Coast Fever through the development of the infection and treatment method of immunization carried out in Muguga; to date three strains have been isolated and cross immunity trials are in progress.

It is obvious that these efforts in many countries which are supported by international and bilateral projects, must not be prejudiced by withdrawal of the expertise and other support which was provided by RAF/67/077. It was proposed therefore, that a regional project be set up in Malawi which would meet support for field implementation of East Coast Fever immunization.

The regional project was suggested because the setting up of several national projects to prepare test and distribute stabilates for ECF immunization would involve unnecessary duplication of effort and expense.

However, before a regional project for ECF immunization could be brought to fruition, much preliminary work; isolation, purification, bulk preparation of stabilates (national and Muguga cocktail strains), purchase of equipment, provision of laboratory and animal accommodation and cross immunity trials, had to be carried out in one country, in this case, Malawi. Further the contractual and financial arrangements for a regional project require much time and effort. For these reasons and recognizing that the work of the first 3 years had to be aimed primarily at Malawi's requirements for ECF immunization; the project GCP/MLW/018/DEN to end in 1983 was written as a national project with limited provisions for regional inputs.

Malawi, with a land area of some 116,324 square miles supports a population of approximately 5m, giving the relatively high average density of 138 head per square mile. The economy is based mainly on the agricultural output of 885,000 small holdings with an average size of 3.8 acres producing subsistence food crops of maize, rice, cassava, pulses and vegetables and cash crops of tobacco, groundnuts and cotton. The per capita cash income in 1976 was K125 (US\$ 142).

The cattle industry is based on a national herd of 850,000 head, 96.5 percent of which are indigenous short-horned Zebu cattle kept under traditional systems of management in the villages. In addition to the indigenous cattle, there are about 900 dairy cows (mainly $\frac{1}{2}$ bred Friesian x Zebu) on small holdings in the milk shed areas surrounding Blantyre and Lilongwe; their average production is 400 gallons per lactation. There are also 500 high grade dairy cows on estates near Blantyre.

One of the major constraints to the continued expansion of beef and milk production is the incidence of tick-borne diseases, the most serious of which is East Coast Fever. These diseases not only cause mortality but also lower productivity. It is estimated that the annual mortality amongst village herds is about 15 percent. Laboratory records have indicated that, between 1973 and 1976, 30 percent of this mortality was due to East Coast Fever and that this increased to 40 percent in the early months of 1977. The country is therefore losing, from East Coast Fever alone, some 39,000 animals per year, equivalent to 6,100 tons of edible meat and sufficient to raise the per capita consumption by 2.7 lbs per annum.

Although tick-borne diseases are enzootic throughout the country, East Coast Fever appears to be concentrated in the Central Northern Regions. However, the vector tick *R. appendiculatus* is known to be present in the Southern region (Working Paper No. 26, AGA MLW/71/519) and the introduction of this disease into an area populated by 170,000 head of fully susceptible cattle is a constant and potentially dangerous threat.

The other interested countries of the region, viz Uganda, Rwanda, Burundi, Tanzania, Zanzibar, Zambia and Mozambique, have cattle populations of 4.1×10^6 , 0.8×10^6 , 12.1×10^6 , 1.8×10^6 and 2.2×10^6 respectively, most of which are in ECF enzootic areas. As the losses from ECF are more or less similar from country to country and all countries rate this disease as the most important constraint to development of their cattle industries, total losses can be roughly estimated to be more or less (1.3 million) based on the Malawi figures. (ECF is also present in Zaire and Angola but the number of cattle exposed is not known). When upgrading with exotic blood is undertaken higher losses are encountered and the economic importance of the disease is even greater.

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It should be recognized that in East Africa the primary reason for control of ticks by dipping or spraying is to control the vector of ECF, i.e. Rhipicephalus appendiculatus to such an extent that the transmission of this disease become impossible.

To achieve this, cattle in some regions have to be dipped as frequently as twice per week and not less than once in other regions. This is an expensive and tedious undertaking which if not done perfectly may even make the situation more serious, e.g. the incidence of ECF may be increased, persistent populations of acaricide resistant ticks may be established and discredit of dipping in the eyes of the cattle owners may occur. The introduction of an ECF immunization procedure would in the first instance give protection to improved stock and when applied on larger scale to indigenous cattle reduce the dependence on expensive dipping programmes.

As part of the background to this project it should be pointed out that OAU/STRC passed resolution in September, 1976 which recommended the establishment of regional centres in Africa for training and applied research on ticks and tick-borne diseases. These centres would cover aspects of tick control (dip management, acaricide chemistry, acaricide resistance testing, e.t.c.) and tick-borne disease control (epizootiology, immunization of ECF, heartwater, babesiosis, etc.) OAU with the collaboration of FAO identified the Central Veterinary Laboratory, Lilongwe, as their centre for East and Central Africa.

With this background in mind a project proposal was developed jointly by the Malawian Ministry of Agriculture and Natural Resources and official representatives of FAO and DANIDA, with the object of initiating a programme for ECF immunization. This programme supplied materials and expertise to carry out the necessary cross immunity trials, (e.g. cocktail immunes have been challenged with 3 or 4 Malawi strains and vice-versa) to establish the infection and treatment method for immunization against ECF in Malawi and, according to demand and financing, a limited input to other countries is expected. As far as possible and professionally acceptable, the mixture of stabilates produced in East Africa known as the "Muguga cocktail" or components thereof are being used for the ninitial cross immunity trials at the laboratory in Malawi. In this way it is hoped to avoid costly and time consuming work on the preparation of new "cocktails" for each of the participating countries.

Finally, it is hoped that the centre proposed by OAU/STRC for ticks and tick-borne diseases will grow naturally from this project.

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RELATED PROJECTS

This project will continue and expand work on ECF initiated by the DANIDA bilateral project and assisted by FAO/TCP project 6/MLW/01/T.

Further the introduction of effective ECF immunization of cattle will have direct relevance to several multilateral and bilateral aid projects in Malawi.

These include:

- 1) the FAO/UNDP project "Assistance to Livestock Development", MLW/75/020:- which has phased off.
- 2) the proposed project "Dip Construction Programme I";
- 3) dairy development programmes supported bilaterally by DANIDA, OIDA and ODM.

On a regional basis, the project will assist and support activities of national projects in several countries of the region.

Thus:

Uganda	FAO/UNDP - UGA/77/002
Rwanda	FAO/UNDP - RWA/77/006
Burundi	FAO/TCP - 6/01/M
Zanzibar	DANIDA (bilateral) FAO/UNDP - URT/73/025
Tanzania	World Bank regional development projects in Mwanza and Sukumaland
Sudan	Tick and Tick-borne Disease Control Phase I TF SUD/24 (DEN)

GOVERNMENT INTEREST AND SUPPORT

The Ministry of Agriculture and Natural Resources of Malawi has formulated this project and attaches high priority to it.

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PURPOSE

a) Long-term objectives

To control East Coast Fever in countries of East and Central Africa by immunization of susceptible stock and thereby accelerate the improvement of the livestock industries. A foundation for the proposed OAU/STRC regional centre for ticks and tick-borne diseases will be laid at the same time.

b) Short-term objectives

1. To produce cryopreserved bulk stabilates of the appropriate strains of Theileria for use in immunising cattle against ECF.
2. Based on findings in Malawi under Project GCP/MLW/O18/DEN-
 - (a) Apply the correct dose of each stabilate.
 - (b) Continue assessment of the efficacy of long acting tetracyclines.
 - (c) Apply the established methods of transportation of materials under field conditions and continue to improve on them.
3. Utilise the most appropriate combination of strains for immunization of cattle as to be established by the Project GCP/MLW/O18/DEN. in Malawi by the infection and treatment method.
4. Carry out field trials in the region to test the selected combination of strains before field application.
5. If tick-borne diseases other than ECF, such as heartwater babesiosis or anaplasmosis are shown to cause mortality in ECF, immunised cattle in the field challenge experiments, consider the possibility of applying existing methods of immunization against these diseases.

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WORK PLAN

The Project Headquarters will be located in Lilongwe. The activities of the project, their duration and starting dates are as follows:-

<u>I. Project Inputs</u>	<u>Starting Date</u>	<u>Duration</u>
<u>A. Recruitment of Personnel</u>		
1. Identify and recruit Project Manager and Assistant Project Manager	August 1983	3 months
2. Identify and recruit Senior Protozoologist and Protozoologist	October 1983	3 months
3. Identify and recruit Veterinary Research Officers and Veterinary Research Officer (Trainees)	October 1983	3 months
4. Identify and recruit Laboratory Technicians	October 1983	3 months
5. Identify and recruit Administrative Officer and Assistant Administrative Officer	November 1983	2 months
6. Identify and recruit Consultants to review and assess project progress	July 1986	3 months
<u>B. Procurement of Equipment & Supplies</u>		
1. Order and receive vehicles & trailer	November 1983	6 months
2. Order and receive equipment for tick room and tick buildings	November 1983	6 months
3. Order and receive Liquid nitrogen containers	November 1983	6 months
4. Order and receive spraying race and weigh scales	November 1983	6 months
5. Order and receive laboratory equipment (microscopes, freezers and refrigerators, etc.)	November 1983	Continuous
6. Order and receive laboratory reagents	November 1983	Continuous

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	<u>Starting Date</u>	<u>Duration</u>
7. Order & receive antibiotics & drugs	November 1983	Continuous
8. Order & receive antibiotics & drugs	November 1983	Continuous
9. Order & receive liquid nitrogen	November 1983	Continuous
C. <u>Sub-Contracts</u>		
1. Prepare plans & specifications of new building	November 1983	1 month
2. Make necessary contractual arrangements for construction of new buildings	December 1983	1 month
3. Construction & termination of new buildings	January 1984	6 months
4. Building completed	June 1984	
5. Preparation of plans for new tick proof pens	November 1983	1 month
6. Arrange for construction of tick proof pens	December 1983	4 months
7. Tick proof pens construction terminated	March 1984	
8. Arrange for installation of spray dips and scales	January 1984	1 month
9. Installation spray dips and scales	February 1984	1 month
10. Arrange for construction of yards and fencing necessary for experimental animal accommodation	November 1983	1 month
11. Termination yards and fencing for experimental animal accommodation	April 1984	
12. Establish Field Labs in each country	June 1984	12 months
D. <u>Arrangements for Training</u>		
1. Determine training programme	January 1984	6 months
2. Arrange fellowships	July 1984	Continuous
II. <u>Project Activities</u>		
1. Establish project headquarters in Lilongwe	November 1983	2 months

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	<u>Starting Date</u>	<u>Duration</u>
2. Define and initiate work programme of Protozoologists	January 1984	Continuous
3. Define and initiate work programme of the Veterinary Research Officer	January 1984	Continuous
4. Establish the routine laboratory methodology to support activities (2) & (3)	January 1984	Continuous
5. In-service training of Trainee staff (professional & technical) in field and laboratory techniques	January 1984	Continuous
6. Produce bulk stabilates cocktail components and tatrane bulk stabilates (in existing tick proof pens)	March 1984	4 months
7. Chemoprophylaxis cocktail components (in existing tick proof pens)	July 1984	2 months
8. Isolate Regional strains of <u>T. parva</u> (in existing tick proof pens)	March 1984	9 months
9. Produce intermediate stabilates Regional strains	August 1984	2 months
10. Selection (seriological) & purchase of cattle for cross immunity trials	July 1984	Continuous
11. Immunization of groups of susceptible cattle against cocktail strains or Regional strains of <u>T. parva</u>	September 1984	Continuous
12. Cross immunity trials	October 1984	Continuous
13. Assess the results of cross immunity trials and determine immunization procedure to be following in the Region	November 1985	1 month
14. Review mission to consider the project achievements and their implications for the second regional phase of the project	December 1987	3 weeks
15. Initiate field challenge trials immunized by the method chosen for the region	December 1985	6 months

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	<u>Starting Date</u>	<u>Duration</u>
16. On basis of (13) & (15) above advise and assist participating Governments on wider application of ECF immunization in the region	June 1988	
17. Assist in the preparation for and participation in a Regional meeting to discuss the second phase (regional) of the ECF Immunization Project	March 1988	2 months

III. Reporting

1. Initial report detailing progress to date and the forward plan of work	March 1985	
2. Successive progress reports at 6 monthly intervals detailing progress, highlighting problems and indicating the forward plan of work		Continuous
3. Draft terminal report detailing results achieved with recommendations for follow-up action. A draft plan of operations for the second phase (regional, see activity (17) above) will be attached as an annex to this report	November 1988	
4. The project staff and consultants will prepare reports and/or project working documents as circumstances dictate, under the direction of the Project Manager		
5. The Review Mission will prepare a detailed report	December 1987	

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(a) Personnel:-

The donor personnel to be assigned to the project will be as follows (only very senior staff considered)

(i) The Project Manager:-

The Project Manager will be a Veterinarian with expertise and experience in immunization against East Coast Fever and Research administration will be recruited two months before the recruitment of other personnel. He will be responsible for the overall execution of the project, for the detailed planning of the work programme, for general and financial administration of all inputs and for the custody of all equipment and supplies in accordance with laid down rules and regulations. He will be technically responsible for carrying out all the activities in the work plan concerned with his field expertise. He will be responsible for Co-ordinating and supervising the work of experts and consultants assigned to the project. He will be responsible in consultation with various participating governments for the selection of candidates for fellowships and for the preparation of their nomination forms. He will be assisted in the performance of his duties by an Assistant Project Manager.

(ii) Assistant Project Manager:-

The Assistant Project Manager will be a Veterinarian with working knowledge in the immunization against East Coast Fever plus relevant experience in the same. He will assist the Project Manager in the performance of his duties and deputies in his absence. He will under the direction of the Project Manager undertake any other duties delegated to him. He will be recruited at the same time as the Project Manager.

(iii) Senior Protozoologist:-

The Senior Protozoologist will be technically responsible for carrying out all the activities in the work plan concerned with Laboratory handling of strains of Theileria (isolation, identification, stabilate production, cryopreservation, serological examination etc.). He will be aided by a protozoologist. Protozoologist will assist the senior protozoologist in carrying out the activities in the work plan concerned with Laboratory handling of Theileria strains. He will aid the senior protozoologist in training personnel.

(iv) Veterinary Research Officer:-

The Veterinary Research Officer will be a Veterinarian technically responsible for carrying out of all the activities in the work plan concerned with Veterinary supervision of experimental animals both in the laboratory and field. He will be concerned in particular with

selection and testing of animals being prepared for experimental studies; day to day supervision of animals on experiment; administration of treatments, immunization and other veterinary procedures to experimental animals and the routine collection of specimens from, clinical examination and when necessary post mortem examination of all animals under experiment. He will be required to keep full records of these procedures. He will be responsible for the inservice training of the V.R.O. (trainees) who will in turn help in his work.

(v) Veterinary Research Officer (Training Grade):-

The V.R.O.'s (Trainee) will be veterinarians who will be attached to the Headquarters for the first two years. They will on rotational basis be attached to the Veterinary Research Officer and Protozoologist and will assist in both Laboratory and field experiments.

It is envisaged that - amongst these would be selected candidates for the fellowships under the Training Component. In the 3rd year of operation when field Laboratories have been established these officers will be posted out to these Laboratories where they will perform duties Co-ordinated from the Headquarters. Such duties will include receipt, storage of stabilates carrying out any field trials and monitoring them under direction of Senior staff at Headquarters.

(vi) Farm Manager:-

He will be responsible to the Project Manager for: Development of the E.C.F. Project Immunization Project Farm, supervision of clearing and double fencing farm area to make it suitable for quarantine and holding area for experimental cattle, construction of cattle yards and handling facilities, establishment of pasture for stock feeding for experimental cattle; supervision of security arrangements on the farm; maintenance of pasture management and supervision of farm labour.

The Farm Manager will be an officer with wide experience and known capability and a high sense of responsibility will be essential for the post.

(vii) Senior Laboratory Technicians:-

The Senior Laboratory Technicians will be responsible for the routine application of laboratory techniques used in the study of theilerial isolates in the laboratories, serology, staining and their production in tick stabilates (maintenance of tick colony, etc.). They will assist the protozoologists and will be responsible for training of Laboratory Assistants in the laboratory techniques.

(viii) Administrative Officer:-

The Administrative Officer will be responsible, under the direction of the Project Manager for all the administrative and clerical activities of the project assisted by the Administrative Assistant.

(lx) Consultants:-

Up to 12 man months of specialist consultant services will be provided as required from time to time by the project.

(b) EQUIPMENT AND SUPPLIES

The following equipment and supplies will be provided by the donor under the project.

Vehicles:-

- 3 Personnel carrier vehicles (1 Peugeot 504
(2 other saloon cars.
- 10 Long wheel base 4 wheel drive field vehicles.
- 2 Tractors (Farm)
- 1 Trailer
- 1 Cattle transporter

(Included are spares to the value of 10% of purchase price).

Laboratory Equipment:-

Laboratory equipment to include refrigerators, Ultra low deep freezers, deep freezers, balances, centrifuges (bench and floor models) as well microhematocritz, temperature and humidity control for both tick rooms and tick buildings, Silverson grinders, thermographs, water deioniser and surgical equipment etc.

Liquid nitrogen:-

Equipment to include storage cylinders, transporters and a large transporter/storage unit.

Microscopes:-

Research microscopes equiped for fluorescence studies together; Binocular and bench stereo Microscopes.

Furniture and Office equipment:-

Furniture, Calculators, duplicator, photocopy machine, filing cabinets and other small office equipment.

Laboratory supplies:-

Reagents, glassware, drugs (particularly antibiotics and acaricides) liquid nitrogen and other consumable supplies for laboratory.

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Yards, Fencing, Water & Electricity Supplies:-

Materials for construction of Yards and paddocks necessary for holding experimental animals, their water and electricity supply.

Training:-

Post-graduate and in service training of 6 Veterinary Research Officers i.e. 6 periods of 12 man months each.

Laboratory technicians training for 6 Laboratory Assistants i.e. 6 periods of 12 man months each.

AS

A
P R O P O S A L
FOR THE ESTABLISHMENT
OF
Z O O N O S E S C E N T R E
AMONG
S.A.D.C.C. C O U N T R I E S

BACKGROUND AND JUSTIFICATION

Animal Diseases are numerous and can be sub-divided into various categories as:

- a) Those that are solely for Animals and are transmitted among animals only. Some of these are mono-Specific, i.e. are transmitted only among animals of one Species, such as Contagious Bovine Plauropneumonia, while others are polyspecific i.e. are transmitted among animals within the species and between different species, such as Foot and Mouth Disease.

- b) Those that exist in nature and are maintained by lower animals and transmissible to man and domestic animals but are not readily or directly transmitted between man and domestic animals. Such diseases are those that are maintained in wildlife reservoirs and which from time to time may infect either man or his domestic animals as unrelated incidents although related epidemiologically. An example is Trypanosomiasis with common vector for both man and Domestic animals but has different strains or species involved and man does not become infected from cattle strains. Other examples are Leishmaniasis, Filariasis, Malaria, Colibacillosis and a range of Viral infections such as influenza Herpes Virus of Monkeys.

- c) Those that are transmissible between man and domestic animals involving the same causal agents. These are the diseases collectively known as Zoonoses. They form quite a comprehensive group and constitute a major part of Public Health. In many Developed Countries special Veterinarians are engaged on this aspect known as Veterinary Public Health which involves among others those community efforts influencing and influenced by the Veterinary Medical Arts and Sciences applied to the prevention of diseases, protection of life and promotion of the well being and efficiency of man.

Among the Zoonoses the following classifications are made.

(i) Direct Zoonoses

Those diseases transmitted from an infected Vertebrate host to a susceptible Vertebrate host by direct contact, contact with a formite or by a mechanical vector. The agent itself undergoes little or no propagative changes and no essential developmental change during transmission occurs. Examples include Rabies, Trichinosis and Brucellosis.

(ii) Cyclo-Zoonoses

Those diseases or infections that require more than one Vertebrate host species but no invertebrate host, in order

to complete the developmental cycle of the agent. Examples include Taeniasis and Echinococcosis.

(iii) Metae-Zoonoses

Those diseases or infections that are transmitted biologically by invertebrate Vectors. In these vectors, the agent(s) multiplies or develops or both, and there is always an extrinsic incubation period before transmission to another vertebrate host is possible. An example are the Arbo-Virus infections.

(iv) Sapro-Zoonoses

Those diseases or infections that have both a Vertebrate host and a non-animal developmental site or reservoir. An example of this are the various forms of Larva Migrans.

The economic impact of Zoonoses is extremely difficult to determine accurately, but it is known to be considerable. It includes mortality, acute and chronic debilitating illness of humans, loss of life and impairment of productivity of livestock, and consequent effects on the social fabric and economic development. For example economic losses caused by Brucellosis, Bovine tuberculosis, Rabies, cysticercosis and hydatidosis are estimated to be hundreds of millions of dollars annually in Latin American countries alone, quite apart from the human suffering and death caused by these diseases.

In addition to the economical losses Zoonoses is an occupational hazard. Some diseases have significantly higher attack rates on workers in the course of their occupations than on the rest of the human population.

There are many different Zoonoses now recognized among which those of particular importance include: Anthrax, Brucellosis, Salmonellosis, Tuberculosis, Leptospirosis, Toxoplasmosis, Cysticercosis, Hydatidosis, Trichinosis, Cutaneous and Visceral Larva Migrans, Rift Valley Fever and Rabies. These will be dealt with here only briefly but in general they infect man through various ways among which include

- . Contact with diseased animals
- . Consumption of tissues or products of diseased animals
- . Consumption of animal products contaminated during the processing and delivery of such foods to the consumer.

Anthrax

This is a peracute or acute febrile infectious disease caused by Bacillus anthracis and characterised by a rapidly fatal septicaemia. All mammals are susceptible especially herbivores, and pigs are also

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frequently infected. Carnivores are more resistant and in birds infection is very rare. The disease occurs world-wide but is more common in tropical than in temperate countries. Anthrax was the first to be recognised as a Zoonosis and is also of great historical interest in other respects.

Humanbeings are susceptible and infection occurs primarily among people living in rural areas although infections may also occur in industrial areas.

Brucellosis

Brucellosis is an insidious and contagious disease caused by Brucella Species causing losses to Livestock Industry largely through sterility and abortions in late stages of pregnancy. The Disease is more important in Cattle, Swine, Sheep and Goats with causal agents as Brucella abortus, Br. Suis, Br. ovis and Br. melitensis respectively.

The disease is transmitted among Livestock by ingestion, penetration of injured skin and conjunctive.

In Man Brucellosis is called Undulant Fever and arises primarily through ingestion of raw milk or other contaminated dairy products and presents a serious occupational hazard to animal handlers such as butchers, and meat inspectors. The disease is characterised by headache, malaise, anorexia, constipation and a bout of fever.

Salmonellosis

Salmonellosis is a disease of all animal species caused by a number of different species of Salmonellae (composed of more than 950 different types) and manifested either as a peracute septicaemia or as an acute to chronic enteritis.

The main source of infection is the infected subject contaminating pasture, feed and drinking water with faeces containing the organism. The complication is made by the fact that all adult subjects that recover become carriers for variable periods and are capable of shedding the organisms and thus infection can be introduced on the farm by these clinically normal carriers. The portal of infection is by ingestion of such contaminated materials.

The public health is manifested in the condition known as food poisoning which includes certain illnesses of abrupt evolution, usually enteric in nature and acquired through consumption of food. The main source in man is consumption of contaminated food of animal origin the common ones being meat and meat products, fish, milk products, poultry and eggs. Direct transmission through contact with infected animals is primarily an occupational hazard and a less common mode of transmission to the general population.

Salmonella food poisoning is an acute infectious disease with sudden onset of abdominal pain, diarrhoea and frequent vomiting. Fever is nearly always present and deaths are uncommon while anorexia and looseness of the bowels often persist for several days.

Tuberculosis

This is a disease of animals caused by Mycobacterium species and characterised by a chronic condition leading to loss of weight and different other signs depending on which organs are affected.

Among the causal agents are the following:

Mycobacterium bovis - Common cause in cattle.

Mycobacterium avium - Mostly of birds but may account for a considerable proportion of cases of Tuberculosis in cattle especially if they are kept in close association with infected birds.

Mycobacterium tuberculosis - Human Strain which also may account to a small proportion of cases in animals.

Among these the cattle strain is the most cosmopolitan causing disease readily in various species of animals.

The main source of disease is the infected animal from which organisms are secreted in exhaled air, sputum, faeces, milk, urine, vaginal and uterine discharges and discharges from open peripheral lymph nodes. The common mode of entry is by inhalation or ingestion.

In humans though the disease is caused by human type; in the majority of cases it is probable that human beings are as susceptible to the cattle type as they are to the human. It should be emphasized that the cattle type is just as virulent for man as the human type and is deadly and killing organism. The avian type has also been found to be involved in human infections.

Leptospirosis

This is a disease caused by Leptospira species affecting animals and characterised by acute septicaemia associated with subacute syndrome and abortions.

The source of infection is usually an infected animal which contaminates pasture, drinking water and feed by infected urine, aborted fetuses and infected uterine discharges. Wild animals are suspected of playing a significant role in the spread of the disease to domestic animals as the infection with Leptospira in these animals has been found to be high.

A complicating feature is the continual presence of Leptospira in the Urine of recovered animals for some time after recovery making urine the chief source of contamination. Entry of the organism into the body occurs most probably through abrasions on the skin and the inside covering membranes of the digestive organs.

One of the important features of Leptospirosis is its transmissibility to man presenting an occupational hazard to butchers, farmers and veterinarians. Human infections are easily acquired through water

and food contaminated by urine from carrier animals (Rodents act as best known carriers for humans). Contaminated pools, stagnant pools, slow moving streams and irrigation canals have also been incriminated as sources of infection. Infection through contact between infected animals and man may also occur but again the risk is great in certain occupational groups. Owners of dogs suffering from Leptospirosis are at risk.

Toxoplasmosis

Toxoplasmosis is a protozoon contagious disease of any species of animals and birds including man, manifested clinically by abortion and stillbirths in sheep and goats, encephilitis, pneumonia and neonatal mortality in all species.

The infection in most species is caused by Toxoplasma gondii. Infected carcasses, feed contaminated by saliva, nasal discharge, faeces or infected colostrum are the probable sources of infection. Rodents and house pets may be important reservoirs of infection for man. It is also now a known fact that cats are capable of transmitting Toxoplasmosis in the form of microscopic cysts in the faeces but the risks are relatively small because of the low frequency with which the cysts are passed and also the cysts in fresh faeces are not immediately infective till after 1 to 4 days under suitable conditions and remain so for a year. In addition contaminated soil, vegetables and fruits are possible sources of human infection. Congenital infection form an inapparent carrier to the foetus. Mechanical transmission by insect vectors occurs in exceptional circumstances.

The most important route of infection is ingestion although pneumonary invasion after the inhalation of infected droplets may also occur.

Cysticercosis

This is a parasitic condition whereby adult tapeworm parasites are in man (as final host) and the larval stages are in intermediate hosts in form of cysts which when ingested by susceptible final hosts develop into adult tapeworms.

Two tapeworms of man are of importance here and include Taenia saginata and Taenia solium. The intermediate stages (cysts) are found in cattle (cysticercus bovis) and pigs (cysticercus cellulose) respectively. The infection usually takes place when eggs are shed in faeces of man and ingested by the intermediate hosts in which the larval stage develops into cysts in the inter-muscular connective tissue. This larval stage when ingested by the final host develops into adult worms and on shedding eggs the cycle starts again. In case of Taenia solium, man and dog may act as intermediate hosts in which case the shed eggs are ingested by man or dog through contaminated fingers (man), food or water.

When the cysts are in the intermediate hosts they are known as Beef (cattle) and Pork (pigs) measles respectively.

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Hydatidosis

Hydatidosis is a condition found in man, domestic mammals as well as numerous wild mammals which act as intermediate hosts to a tapeworm known as Echinococcus granulosus. The intermediate stage in animals is characterised by formation of hydatid or echinococcus cysts which can be as large as 50cm in diameter. The adult tapeworm has as its final (definite) host the dog, jackal and wolf.

The life cycle can be briefly described as follows: Eggs are ingested by the intermediate host and embryos are absorbed after hatching in the intestines and carried in blood stream to any part of the body. Most common target organs are lungs and liver, but any other organ could be affected. The final host acquires infection by ingesting the fertile hydatid cysts.

Man gets the infection from dogs by dirty habits after playing with them. These eggs are transferred to man from dogs through unclean hands. This indicates, therefore, that great danger is among the children who are fond of playing with dogs and fail to wash their hands before eating anything or putting their fingers into the mouth before washing.

In man and other intermediate hosts the harmfulness of the hydatid cyst naturally depends on the organ in which it is situated and also the severity of the infection. Danger comes when they increase in size in which cases they may impair the health of the host. The disease is more dangerous in human beings than domestic animals on account of frequent development of exogenous daughter cysts which escape into the peritoneal cavity from the liver or leakage from primary cysts giving rise to multiple omental cysts.

Cutaneous and Visceral Larva Migrans

This is a condition caused by invasion of the skin and internal organs by larvae of worms. Several species may be involved but hookworms and ascarids (Toxocara canis and Toxocara cati) of dogs and cats are most common.

The condition is most usually seen in children under 4 years of age who frequently adopt the habit of dirt eating. Where the soil is heavily contaminated with the eggs of these worms the ingestion of even moderate amounts may result in large number of infected eggs. Also since it is common to give young puppies to children as play-mates a special hazard may arise since it is the young puppy which is preferentially infected by these Worms.

Other sources of infection could be doorstep and garden soil contaminated by domestic pets although this is not the sole danger. The much wider public health problem is the extensive fouling of public parks, playgrounds and sidewalks with faeces of domestic pets especially in cities.

The infective eggs are ingested and infections may be severe depending on the site of localisation of the larva e.g. eye involvement may lead to blindness.

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Rift Valley Fever

Rift Valley Fever is an infectious, non-contagious disease of ruminants, man and other animals caused by specific virus and transmitted by several species of mosquitoes. The animals affected get the infection by the bite of an infected mosquito and among our domestic animals cattle, sheep and goats are mostly affected.

The disease is manifested by high fever and abortion in pregnant animals and by high fever, hepatitis and sudden death in young animals particularly lambs. The disease as found in man is transmitted by mosquito bite but also and more commonly by handling infected materials from sheep, cattle and goats such as aborted fetuses and infected meat and other animal products. The illness presents a mild fever, muscle and joint pains, eye pains, headache, nausea and vomiting.

Rabies

Rabies is a disease of all warm-blooded animals caused by a virus transmitted by the bite of a rabid animal with the virus being inoculated from the saliva and characterised by a variable incubation period of nervous symptoms, paralysis and fatal termination.

The disease is more important in dogs, cats, bats and wild carnivores, although it occurs in all warm blooded animals. It is worldwide in distribution except for Australasia, New Zealand, New Guinea, Oceania, Sweden, Norway, Great Britain, Japan, Taiwan, Hong Kong, Malaya and a few others.

Rabies is always fatal and so great precautions should be taken to prevent it.

The objective of the Control of Rabies is to minimise, if not completely stop, human contacts and consequently the disease in humans. The death of humans is the most important economic loss of Rabies. In order to do this and since human contacts are mostly from dogs, the aim in any control measures should be at breaking the cycle between the wild carnivores and dogs.

From time to time, however, the Socio-economic problems associated with the epidemiology and control of Rabies are stressed. These normally comprise opposition to certain aspects of stray dog control, reluctance or inability to have pets vaccinated and general public ignorance or apathy. In most African countries, these problems exist in varying degrees from area to area but there are other significant Socio-economic factors which contribute towards sustaining the high incidence of canine Rabies. In rural areas of these countries dogs are maintained in fairly large numbers and many lead a partially self-sufficient existence. They are usually traceable to a particular owner but enjoy a relatively free range in a community where there are no demarcations between property lines and where residents maintain a strong sense of communal responsibility. Under these circumstances dogs develop a close relationship to the human community though not always in the same manner as that of a household pet and they are permitted to wander through the communities in search of food.

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The Proposal

The Control of Zoonoses is very important as these diseases cause illness in man and thereby becoming a public nuisance. Their control however, is costly and needs adequate financial support and close collaboration among different public organisations, particularly the medical and Veterinary Services. All levels of public institutions must be aware of the importance of Zoonoses. Since most diseases are easily spread from one area to the other within a country and from one country to the other within a region it is important that the control of Zoonoses like any other important epidemic be tackled with international collaboration and cooperation within the region or sub-region. Efforts of one country may be spoilt by disease entering such a country from a neighbouring country.

It is therefore proposed that control of Zoonoses be dealt with with Regional or Sub-regional Cooperation and Participation. In order that these efforts are well coordinated, a Zoonoses Centre be established within the Region or Sub-region. It is proposed further that Zambia hosts this centre and to be based in her Capital City of Lusaka. Zambian Authorities have already expressed willingness to host such a centre.

The main objectives of this Centre would be:

- a) To carry out and coordinate comparative studies on the Epidemiology of non-infectious diseases of animals in which there may be environmental or other influences common to man and his animals.
- b) To carry out and coordinate comparative studies on the Epidemiology of infectious diseases of animals readily transmissible to Man.
- c) To carry out and coordinate studies on Public Health related problems of other animal industries including the safe disposal of animal wastes.
- d) To carry out and coordinate studies on Public Health aspects of the production, processing and marketing of foods of animal origin.
- e) Determining the dangers to man of biting, toxic, venomous or other hazardous or objectionable animals and studying methods of controlling them.
- f) To coordinate and supervise the Zoonoses diagnosis, surveillance and control of the diseases so transmitted. The control of Zoonoses should be considered in three main contexts:
 - i) Zoonoses that have serious effects on animal production (e.g. Bovine Tuberculosis).

- ii) Zoonoses that have serious consequences both for man and for economically important animals (e.g. Brucellosis, and Salmonellosis).
- iii) Zoonoses that have serious consequences in man but which are much less serious in economically important animals (e.g. Trichinosis).

This centre is to serve all the S.A.D.C.C. countries and therefore be supported by these countries or a donor country yet to be identified.

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