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FOOD AND AGRICULTURE

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SOUTHERN AFRICAN DEVELOPMENT COORDINATION CONFERENCE

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PROJECT NUMBERING

Projects in Food and Agriculture are numbered in a 3-digit system:

The first digit defines the Sector:

0 - Overall Coordination
1 - Food Security
2 - Animal Disease Control
3 - Agricultural Research
4 - Fisheries
5 - Wildlife
6 - Forestry
7 - Soil and Water Conservation and Land Utilisation

The second digit indicates the country:

0 - Regional
1 - Angola
2 - Botswana
3 - Lesotho
4 - Malawi
5 - Mozambique
6 - Swaziland
7 - Tanzania
8 - Zambia
9 - Zimbabwe

(Where a group of countries is involved in the project the project is numbered according to the major participant)

The third digit is a serial number.

Section One

FOOD AND AGRICULTURE: AN OVERVIEW

FOOD AND AGRICULTURE: AN OVERVIEW

Agriculture forms the mainstay of the economy of the SADCC region. It contributes about 34% of the region's GDP, employs about 79% of the total labour force (see attached table) and accounts for about 26% of the total foreign currency earnings. This Sector could become more productive if improved techniques and new technologies were used in agricultural production. At present food production is largely in the hands of the smallholders whose traditional methods of cultivation have not yet been adapted to utilise improved methods of farming and external farm inputs. In most SADCC countries yields of food crops have been either increasing slowly, stagnant or declining. On average food production in the region has been growing at 2% where human population has been increasing at the rate of 3.4% per year. This human population growth, which is one of the highest in the world, nullifies any gains in food production with the result that on a per capita basis, food production in the region has declined at an annual rate of 0.8%. Where production has increased, it is mainly because of an expansion of the area under cultivation. Yields per hectare have, on the whole, stagnated or declined with average grain yields down by 15% between 1974 and 1983. The crop yields in the region average 30% below levels obtained in Asia and Latin America.

Rapidly growing population has increased pressure on the land resulting in more intensive cropping, extension of cultivation into pastureland, areas of low rainfall and steeper slopes, and increased tree and shrub clearing for new land and for fuel. The intensive settlement, particularly on fragile habitats, has accentuated both deforestation and erosion of fertile soils, thereby increasing the region's vulnerability to droughts.

The decline in per capita agricultural production between 1978 and 1983 was particularly disastrous with the rate of growth of food production barely half that of population for the region and safely above it in only one member State. That record was in large measure the result of drought which severely affected all member States for at least one year and most for three years. Despite continued drought, food output in the region increased less weakly in 1984 and, with a good 1984/85 rainy season, 1985 food output should show an increase of at least 6%. The drought, however, persisted in Botswana and parts of Angola, Lesotho and Mozambique. The better 1984 and good 1985 results do not, by themselves, represent a revival of growth in food production. It is noteworthy that this decline in the rate of growth of food production in the SADCC region has not been the result of a shift from staple food crops to export cash crops.

The decline in food production, high rate of urbanisation, drought and recession, have forced the region to import large quantities of food. The import of wheat and rice reflect changes in the food consumption pattern of the region away from traditional staples. This shift should give rise to concern as it involves cereals that either cannot be grown economically at all, or are more costly to produce than millet, sorghum and maize.

One of the major factors that affect agricultural productivity is the variability of rainfall both intra-seasonal and inter-seasonal. This results in long periods of sub-normal production followed by equally long

periods of favourable rains which accentuates variability in yields. It should be noted that a large proportion of the region receives less than 600 mm of rainfall per year. The unreliability of this rain compounded by the poor water retention capacity of many of the soils and high temperatures cause rapid depletion of soil moisture.

Fortunately, most SADCC countries have substantial surface water resources in or close to areas with suitable soils and gentle slopes that could be developed for irrigation. Ground water resources are less well-known. At present less than one eighth of the irrigation potential has been developed.

The region has a great potential for livestock production. Although attention is being paid to cereals and grain legumes which contribute substantially to the incomes and diets of low-income groups and smallholders, beef, goat meat, mutton and milk are equally important parts of the agricultural activities of the smallholder and should not be neglected in agricultural planning. The majority of the countries in the region import between 25% and 50% of their dairy product requirements. Such imports represent a drain on foreign exchange which is also needed for procuring basic staples for consumption by the whole population. Well developed livestock enterprises can also act as users of surplus cereals, waste farm products, spoilt crops and underutilized pastures and rangelands. It is estimated that the demand for livestock products in developing countries will rise 100% by 1990. The investment in livestock production enterprises to meet domestic and export markets cannot therefore be over emphasized.

Both animal and crop diseases are major barriers to raising productivity. Among the most serious and widespread diseases affecting livestock over the past decade have been foot and mouth disease, trypanosomiasis and east coast fever, while since 1980 rinderpest - the scourge which nearly wiped out the region's herds at the turn of the century - has re-emerged in Tanzania at near epidemic levels. In respect of crops a wide variety of diseases from rusts to mosaics and major pests such as quelea birds, army worms and locusts, are prevalent. While the damage from the last of these has been markedly reduced since the 1980's by a Nairobi based regional control scheme, SADCC's maize crops are now threatened by an unwelcome immigrant from the 'New World'. The Larger Grain Borer beetle has spread rapidly since its 1979/80 arrival and now destroys up to 100,000 tonnes of maize and cassava a year in Tanzania.

To deal effectively with these problems requires appropriate and applicable knowledge and expertise. Agricultural research in the region has never been strong except in a few cases of export crops and more generally in Zimbabwe. Instead it has tended to emphasise high import content inputs, mechanical equipment and capital; approaches whose economic appropriateness in terms of employment, balance of payments and even unit costs is increasingly open to question. Where it has been undertaken, research has not concentrated on developing crop varieties appropriate to local conditions or on techniques financially and technically relevant to small farmers.

This failure of general policies, and particularly of research and extension, to address the problems of the small farmer has been a major

part of the more general problem of declining agricultural production.

The Food and Agriculture Sectors have also been affected by three more general weaknesses of the SADCC economies. The first is the severe shortage of qualified personnel - for research, extension, equipment maintenance, policy formulation and implementation and for sectoral enterprise management. A second is the small size and limited product coverage of SADCC manufacturing sectors which limits their ability to produce agricultural inputs such as gunny bags, hoes, fertilizers, pesticides, tractors, and irrigation pumps and pipes. Since 1980 this already inadequate capacity has been further eroded by the third general factor - the shortage of foreign exchange, as a result of which the import content of domestic production could no longer be afforded. Thus availability of agricultural inputs has declined even for items as crucial and basic as gunny bags (a basic obstacle to prompt collection and safe storage of crops) and hoes.

SADCC has been conscious of, and placed priority on, overcoming these sectoral weaknesses since its founding. Food Security and the overcoming of malnutrition and food import dependence feature highly on the SADCC priority programmes, so do agricultural research, with special attention on the problems of semi-arid areas, animal disease control and soil and water conservation and land utilisation. Fisheries, forestry and wildlife have also been integrated into the priority areas of Food and Agriculture.

SADCC's concern with and emphasis on Food and Agriculture has continued and deepened as evidenced by the accordance of priority status to this Sector at the 1983 Maseru, the 1984 Lusaka and the 1985 Mbabane Annual Consultative Conferences. Besides, since the 1979 Arusha Consultative Conference, Agriculture has been one of the areas in which dialogue and exchange of views both among SADCC member States and between SADCC and its cooperating partners has been most extensive and fruitful.

Over the past five years SADCC has built up substantial programmes and projects in Food and Agriculture covering the Sectors of Food Security, Agricultural Research, Animal Disease Control, Soil and Water Conservation and Land Utilisation, Fisheries, Forestry and Wildlife. The projects fall in the following categories:

- Regional projects involving all member States, e.g. Early Warning System, Sorghum and Millet Research, Meat Inspectors' Training School at Lobatse, Botswana;

- Regional projects involving several member States, e.g. control/eradication of Foot and Mouth Disease, Tsetse-fly and Trypanosomiasis;

- Pilot projects in one member State whose findings and post-pilot implementation stage have clear regional benefits, e.g. proposed afforestation/fuelwood projects in the Forestry Sector and the testing of conservation techniques on steep slopes in the Soil and Water Conservation and Land Utilisation Sector;

- National projects with regional impact, i.e. projects which though implemented at national levels, collectively and cumulatively

contribute towards the attainment of regional objectives, e.g. development/strengthening of national certified seed production facilities or strengthening of national research institutions.

In compliance with the directive of the Council of Ministers, all SADCC Sectors, including those of Food and Agriculture undertook reviews of their programmes and projects and endeavoured to work out sectoral strategies to guide and direct their work over the next five years. Summaries of the status of programmes in the Food and Agriculture Sector are presented below:

Food Security

Many of the first set of studies have been completed. National components of the Regional Early Warning Sytem are moving to implementation in several States this year, and the regional unit will be operational next year. Work is at an advanced stage towards the establishment of A Regional Resources Information System and A Regional Inventory of Agricultural Resource Base. Studies are in progress on the Recruitment and Retention of Professional and Technical Staff and Post-Harvest Food Loss Reduction and Food Processing Technologies. The ongoing work of Consultative Technical Committees and consultation among specialist officials have proved valuable.

Two new project proposals are presented concerning:

(a) Establishment of Interim Regional Grain Reserves in Malawi and Zimbabwe; and

(b) Control/Eradication of the Larger Grain Borer in Tanzania

The strategy for this Sector will, in future, lay emphasis on the consolidation of programmes and projects so far initiated, particularly the implementation of the projects providing infrastructural and institutional support services to member States in order to strengthen their capacities for increased food production. It will also concentrate on the establishment of regional strategic food reserves which is of particular relevance since crude regional balance in grain has been achieved as a result of substantial surpluses, especially in Zimbabwe and Malawi. Consultations among member States, and with international cooperating partners will be maintained on matters relating to broad policies on food production and general agricultural development. A new programme area covering the control/eradication of crop diseases and pests has been approved for project identification and implementation.

Agricultural Research

The programme in this Sector centres around two operational projects, viz. the Soghum and Millet Research Programme and the Southern African Centre for Cooperation in Agricultural Research (SACCAR). Three other projects, the Grain Legume Improvement Programme, the Land and Water Management Research Programme and the Agricultural Research Resource Assessment are at advanced stages of preparation and consultations are underway with interested cooperating partners on financing and other pre-implementation arrangements.

The strategy for this Sector will concentrate on measures to strengthen National Agricultural Research Systems and the effective dissemination of information relevant for the improvement of national agricultural production systems. Emphasis will continue to be laid on effective implementation of projects already underway.

Animal Disease Control

Several projects covering the control and/or eradication of Foot and Mouth Disease, Tsetse-fly and Trypanosomiasis, Rinderpest, East Coast Fever, etc. are at various stages of implementation. Serious concern has been expressed over the possible harmful effects to the environment, of some of the methods and chemical agents applied in some of the projects in the Sector. SADCC member States welcome and commend SADCC's cooperating partners for their genuine concern for the environment, and SADCC wishes to re-affirm its position that the quest for increased food production will not be allowed to place in jeopardy the natural environment and its different ecosystems.

Two new regional projects dealing with the training of Auxiliary Animal Health Personnel and Technicians for the Maintenance of Equipment in Veterinary Laboratories, and one national project with regional impact, concerning the strengthening of Veterinary Infrastructure and Services in South-Western Angola have been identified.

Over the next five years, the scope of the programme in this Sector will be developed to cover broader issues of livestock production, e.g. range and pasture management, improvement of livestock breeds and breeding methods, dairy, poultry and pig production, etc. Consequently, it has been agreed to re-designate the Sector Livestock Production and Animal Disease Control.

Soil and Water Conservation and Land Utilisation

This is a relatively new Sector and emphasis has hitherto been centred on the establishment of the machinery for coordination.

However, three pilot projects are being presented, viz.:

- project to Introduce and Test Conservation Techniques on Steeply Sloping Land - Malawi;
- Rainfall Simulation Tests - Lesotho; and
- Afforestation of the Area surrounding Letsa-La-Letsie Lake - Lesotho.

Forestry, Fisheries and Wildlife

These are also relatively new Sectors which have strong overlaps with the Soil and Water Conservation Sector. Initial sets of projects in these Sectors were first presented at the 1985 Annual Conference in Mbabane. Work is progressing saisfactorily towards the implementation of these projects.

Forests, rivers and lakes and the fishes in them and wildlife, which are all integral components of balanced ecosystems, occupy a central position in the strategies for agricultural development.

The thrust of strategies in these Sectors will be to further elaborate programmes and projects for the exploitation and utilisation of these resources whilst maintaining and enhancing the natural habitat and ecological balances.

SOME BASIC RESOURCES FOR AGRICULTURAL RESEARCH AND PRODUCTION IN THE SADCC[1]

Country	Population 1000	% Labour Force in Agric.	% Agric. Contrib. to GDP	Total Land Area 1000 ha.	% Land in Arable Agric.[2]	No. Graduates in Agric. Research[3]	Hectares of Arable Land per Grad.	Additional Hectares of Potential	Hectares of Total Arable + Pot. per Grad.
Angola	7,452	n.a	n.a	124,670	2.0	n.a	n.a	n.a	n.a
Botswana	940	83.0	12	60,037	2.0	46	29,565	n.a	n.a
Lesotho	1,640	87.0	31	3,300	13.0	18	23,889	0	0
Malawi	6,400	84.0	43	9,410	17.6	127	13,070	3,450,000	40,236
Mozambique	11,052	n.a	n.a	80,159	4.0	83	34,337	n.a	n.a
Swaziland	605	75.0	24	1,736	12.4	24	8,333	0	0
Tanzania	21,000	80.4	52	88,360	5.0	321	13,763	48,700,000	165,476
Zambia	5,679	67.0	13	75,000	2.0	197	7,309	9,000,000	52,995
Zimbabwe	7,546	n.a	15	39,024	6.0	222	10,547	15,609,800	80,861

(1) Data compiled from the Devres Agricultural Research Resources Assessment and the F.A.O. document Trained Agricultural Manpower Assessment in Africa, Harare Conf. July 1984.

(2) In some cases this includes improved grazing land or land cultivated within 5 years.

(3) In some case this includes professionals in forestry, fisheries and wildlife.

Section Two

FOOD SECURITY

FOOD SECURITY

OBJECTIVES OF THE REGIONAL FOOD SECURITY PROGRAMME AND STRATEGIES FOR IMPLEMENTATION

Food Security Defined

Food security is achieved when a country can assure all its citizens of both physical and economic access to food of an appropriate nutritional quality. This concept of food security places equal emphasis on the demand as well as the production or supply.

Regional Food Security Programme Objectives

The overall objective of the regional food security programme is to increase agricultural production so that the region can become self sufficient in its basic food needs. Within this broad aim three stated objectives are:

(i) to satisfy the basic need for food of the whole population of the region and progressively to improve food supplies to the people irrespective of the specific economic situation of each person or their position in society;

(ii) to achieve national and regional self-sufficiency in food supply to the maximum extent possible in order to reduce the region's dependence on external sources of supply; and

(iii) to eliminate the periodic food crises which affect areas or countries in the region.

Experience has shown that joint ventures between groupings of states to promote long-term regional and sub-regional food-security goals risk failure if they are over ambitious or aimed at promoting uncompensated investment transfers from one country to another. Nevertheless SADCC considers that joint programmes in agricultural research, in the development of food production technologies and marketing infrastructure will be beneficial if they have modest beginnings.

SADCC's programme for achieving regional cooperation in food security involves a step-by-step approach rather than one which entails from the outset a high degree of integration of domestic policies on the part of member States. In the initial stage, these co-operative arrangements centre on activities such as the exchange of information and experiences in agricultural production, technology and food supply management.

Principal elements of the strategy for the achievement of SADCC's food security objectives are:

- reinforcement of national food production capacity;
- improvement of the food storage, marketing and distribution systems;
- development of skilled manpower;

- development of intra-regional food trade;
- establishment of systems for the prevention of food crises;
- establishment of programmes for the control of major pests and diseases;
- the development of national food policies; and
- the development of institutions and mechanisms for the exchange of information on all of these issues.

Each of these elements is reviewed briefly below.

Reinforcement of National Food Production Capacity

The SADCC countries collectively contain some of the most fertile agricultural land in Africa yet few produce enough food to meet the ever increasing internal demand. Food-deficit countries cannot continue indefinately to cover their needs by ever-mounting imports. A strengthening of SADCC's agricultural production sector generally and its food production capacity in particular is a vital priority for the achievement of food security.

Despite the considerable agricultural potential of the region, there are significant natural and man-made constraints as well as a wide range of infrastructural and institutional weaknesses inhibiting rapid agricultural development. The main constraints and the ways to overcome them are discussed in SADCC Agriculture: Toward 2000 (F.A.O., Rome. 1983).

The reinforcement of national food production capacity will require the mobilization of considerable financial and manpower resources. It will also entail institutional and policy changes to provide services and incentives to a larger number and broader range of recipients than formerly, notably to small scale farmers.

SADCC member States appreciate that the extent to which food production can be increased will depend principally upon action taken at the national level. Individual member States are engaged in a wide range of activities directed toward the enhancement of agricultural production in the region. Examples include:

- the development of new irrigation schemes and the rehabilitation of existing schemes;
- the expansion of the arable land base;
- the intensification of land use through the application of new techniques and technologies and re-settlement programmes;
- the development of new cultivars and an associated expansion of seed production and distribution facilities;
- the introduction of special programmes for the control and/or eradication of major pests and diseases affecting crop and animal

production;

- the introduction of special programmes to increase the availability of crop inputs;

- an expansion of agricultural credit facilities, particularly for smallholders;

- improvements to rural infrastructure generally and to the storage, marketing and distribution systems in particular;

- improvement and expansion of agricultural research, extension and training facilities.

Action in these areas will continue and measures taken will be in accordance with national policies and priorities and the capacities of individual member States.

At a regional level, reinforcement of food and agricultural production capacity is addressed through cooperative programmes in SADCC's Agricultural Research, Animal Disease Control, Soil and Water Conservation and Land Utilization, and Food Security sectors.

Within the food security programme, emphasis is placed on the detailed analysis of factors affecting regional food production with the view to providing member States with comprehensive information which may be used by those responsible for the development of national programmes. Information from these studies will also be used to identify areas for the development of production improvement programmes involving regional cooperation.

Examples of work currently being undertaken are the projects on: the establishment of a Regional Inventory of Agricultural Resource Base; and the Recruitment and Retention of Professional and Technical Staff of SADCC Agriculture Ministries. Two other studies directed at enhancement of food production capacity, Regional Seed Production and Improvement of Irrigation Management are due for implementation as soon as funding can be secured.

Coordination in the production, procurement and supply of basic agricultural inputs is another area identified as a priority for regional cooperation in SADCC. Many of the fertilizers, pesticides and agricultural implements used are common to the regions' agriculture. SADCC has the industrial capacity to produce some of these requirements. The Regional Resources Information Systems project, when operational, will be of considerable assistance in determining the region's requirements for agricultural inputs.

Improvement of the Food Storage, Marketing and Distribution System

Within SADCC, marketing outlets serving subsistence farmers, and the traditional commodities produced by them, are often limited. Small farmers often have no marketing outlets for their produce even when governments have encouraged the growing of the crops concerned. The volumes handled by parastatal and cooperative marketing agencies in a

number of countries have often declined while overhead and operating costs have continued to escalate. The high costs of operations restricts the possibilities for increasing producer prices and thereby encouraging output. Financial and management contraints have limited the parastatals' ability to handle crops efficiently and have caused delays in payments to farmers.

Improvement and upgrading of the delivery, storage, processing and distribution components of the food marketing system are needed to utilize existing food supplies more effectively and are an essential complement to measures to expand food production. The additional infrastructure required to improve crop marketing in most SADCC countries consists of improved trunk and feeder roads, expanded storage facilities as well as the adequate provision of trucks, rail waggons and shipping by which produce may move from producing areas to consumption (or export) points.

Upgrading of such facilities will primarily be undertaken within the context of national development programmes. However, development undertaken within the context of SADCC's regional transportation and communication programme will have an important bearing on the upgrading of the food marketing system.

Within the regional food security programme, improvements to the food marketing system are being addressed through three projects. The first of these - Regional Food Marketing Infrastructre is still in the feasibility study phase. The other two - Regional Post-Production Food Loss Reduction and Regional Food Processing Technology - have recently commenced implementation.

The lack of sufficient numbers of adequately trained management and operational personnel in the marketing institutions in SADCC has been identified as an important constraint to effective operation. The manpower training needs of the organizations involved in the various post production food systems will be addressed in all three of the projects above.

One industrialised country recently initiated a training programme designed to help strengthen technical and managerial skills of personnel in grain marketing and handling institutions in 13 African countries, including all but one SADCC member State. SADCC welcomes this initiative and hopes that all of its members will benefit from this programme.

Development of Intra-Regional Food Trade

SADCC recognizes the important role of inter-country food trade as a means of increasing regional food self-sufficiency. Indeed the enlargement of intra-regional trade generally is an essential component of SADCC strategies for reducing external dependence and is explicitly recognised in the Lusaka Declaration. With the progress now being made in developing SADCC industries and intra-regional transport and communication, measures to remove constraints on trade are now being studied. Intra-regional food trade will directly benefit from such developments.

However, there are significant costs in the development of such trade in food commodities and a certain size market is needed to make investment in

marketing infrastructure cost-effective. In many cases present infrastructure has been designed to serve "north - south" trade without regard to economies which might be gained from promoting intra-regional trade.

SADCC considers that another way in which its cooperating partners can participate in the strengthing of intra-regional trade arrangements is by effecting triangular transactions through the purchase of food surpluses from one country in order to meet the needs of other deficit countries in the SADCC region. Apart from transport cost advantages, such triangular transactions will stimulate and foster regional self reliance.

The development of intra-regional trade links could also allow SADCC countries to opt for a degree of specialisation in agricultural production in line with natural resource endowments, resulting in economic efficiency gains for the region as a whole.

Development of Skilled Manpower

SADCC recognizes that the expansion of food and agricultural production in the region is severely constrained by a general shortage of skilled manpower and is acutely aware of the need for improved training programmes in the region. The assistance of SADCC's cooperating partners in this important area is particularly welcome.

The development and strengthening of national training institutions to meet regional requirements for technically trained personnel for an expanded food and agricultural sector is coordinated by SADCC's Manpower Sector. The specialised training requirements for particular regional and national programme and project areas will, wherever possible, be addressed through the incorporation of specific training programmes as an integral part of the project proposals, as is the case in current regional food security projects. The role of the sector's Consultative Technical committees in identifying specialized training needs and coordinating training programmes will also be enhanced.

Establishment of Systems for the Prevention of Food Crises

The establishment of a regional capability to respond to fluctuations in food supplies caused by crop failure, sudden shortfalls in world markets or major breakdowns in the chain of supply is essential to the achievement of regional food security.

Concerted regional action: can provide early warning of the advent of drought and major crop pest and disease outbreaks; can help deficit countries to obtain imports more quickly from surplus countries within the region; may result in economies in procurement and the movement of supplies within the region; can improve the bargaining position of SADCC countries in international markets; can co-ordinate requests for emergency food aid support from donors; can provide infrastucture facilities for storage in the principal food surplus producing countries; and can provide easier and more reliable access to food reserves within the region at times of shortages.

The strategy adopted by SADCC to achieve this capability to respond to

sudden food shortages has two main elements. The regional food security project - An Early Warning System for Regional Food Security - involves the establishment or strengthening of national early warning units in each member State together with the establishment of a regional coordinating unit. The system, currently in its pre-implementation phase, combines crop-forecasting with monitoring of food in store, within the marketing system and as imports, and will enable countries to take timely action to avert forecasted food shortages.

The second element of the strategy to respond to sudden food shortages is encompassed in the regional food security project - Regional Food Reserves and Food Aid. The project, shortly to enter the feasibility study phase, will examine options to alleviate immediate constraints in food storage and distribution and define medium and long term policy measures required to bring about a regional food reserve system based on national structures.

Establishment of Programmes for the Control of Major Pests and Diseases

Pre and post harvest crop losses from pests and diseases are currently estimated to reduce food availability by 30 to 40 per cent or more. Grain losses alone possibly exceed grain imports by several hundred thousand tonnes. Each of the main cereal crops is susceptible to about half a dozen serious diseases and similar numbers of field and storage pests which cause substantial and in some cases, complete crop losses. The problem is not restricted to indigenous species. There are already a number of new pests and diseases that have been introduced into the region accidentally - for example, the great grain borer recently established in Tanzania from America (ANNEX A(1)).

Most member States have control programmes for the reduction of field and storage losses from pests and diseases that are constrained by a lack of sufficient funds, trained staff and appropriate technologies. However the occurence of most of the serious pests and diseases across all member States suggests this as an ideal area for the development of regional cooperation. Possibilities exist for cooperation in the development of new resistant varieties; the deliberate introduction of natural predators and parasites; pest identification services; the transfer of successful technologies; the coordination of quarantine efforts; the preparation of advisory leaflets; and in the research needed for the development of integrated systems of pest control.

Accordingly, SADCC has adapted this as a new area of cooperation within the regional food security programme.

Development of National Food Strategies

Regional cooperation on food security is being strengthened by food strategy development at the national level. National food strategies seek to provide "a coherent framework of policies, programmes and projects, directed to achieving greater food self-sufficiency through an integrated effort to increase food production, improve food consumption and eliminate

hunger".[1] Their development is a response to the recognition that individual projects can best realize their potential when they are part of more comprensive national policies and with recognition of the need for greater concern with the socio-economic dimension of hunger, alongside food production efforts.

Some SADCC countries are currently preparing or implementing explicit national food strategies whilst others are developing policy programmes which implicitly incorporate the objective usually enunciated in national food strategy proposals. Thus governments are attaching higher priority to the food sector by devoting more resources and closer attention to it and by creating appropriate mechanisms to coordinate the activities of the various agencies which are tackling the problems of food production, food consumption and food security.

Whilst the development and implementation of such national food strategies-policies is the responsibility of individual member States, SADCC believes that an exchange of information and experiences in this area would strengthen national food strategy planning and management capacities. Accordingly SADCC is investigating the possibility of establishing some form of institutional arrangements within the regional food security programme for studying food stratagies and other issues of agricultural policy on behalf of member countries.

The economic and ecological complementarities which characterise much of the national economies of SADCC are such that cooperation in the design, formulation and implementation of food strategies will have both national and regional benefits.

Development of Institutions and Mechanisms for the Exchange of Information

The exchange of information and experiences in agricultural production technology and food supply management is central to SADCC's food security programme. Cooperation in the exchange of information on food production, food supplies, crop prospects, regional resource bases, food trade, prices, and a variety of related subjects contributes to both collective and individual food security.

Much of the emphasis in the regional food security projects is on information gathering and exchange to provide information necessary for planning and decision making of governments on food matters. Three projects in particular - An Early Warning System for Food Security, A Regional Resources Information System and A Regional Inventory of Agricultural Resource Base - are largely data base oriented. The first and third of these have commenced implementation whilst the second is shortly due to commence a pre-implementation phase.

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1. World Food Council, statement made at SADCC Annual Conference, Lusaka, 1984.

The second main avenue for the exchange of information on food security matters is through the activities of the Consultative Technical Committees on Agricultural Research, Agricultural Extension and Training, and Economics and Marketing. In addition to holding regular consultative meetings, the committees organize periodic seminars and workshops on matters affecting food security.

FOOD SECURITY PROJECTS: OBJECTIVES, STRATEGIES AND PROGRAMMES

The SADCC Food Security Sector encompasses a range of projects, both national and regional in character, which are directed toward the overall objective of increasing agricultural production so that the region can become self sufficient in relation to its basic food needs. The regional projects are primarily directed at the establishment of a comprehensive network of institutions aimed at strengthening SADCC's capacity to respond, at both national and regional levels, to the problems which have undermined the ability of member States to achieve food security. The sector also aims to provide support for a series of projects which, though national in character, when taken together contribute significantly to the achievement of SADCC's overall food security objectives.

Regional Projects

Analyses by SADCC of the major issues concerned with the food security of the region led to the identification of twelve projects designed to address these issues which could be more effectively handled on a cooperative rather than on an individual national basis. These twelve projects are:

Project 1 - A Technical Assistance Programme Designed to Achieve Coordination and Cooperation on all Agrarian Issues.
Project 2 - An Early Warning System for Food Security
Project 3 - A Regional Resources Information System
Project 4 - A Regional Inventory of Agricultural Resource Base
Project 5 - A Regional Food Reserve
Project 6 - Regional Post-Production Food Loss Reduction
Project 7 - Regional Food Processing Technology
Project 8 - Regional Food Marketing Infrastructure
Project 9 - Regional Food Aid
Project 10 - Recruitment and Retention of Professional and Technical Staff in the Ministries of Agriculture in the SADCC Region.
Project 11 - Regional Seed Production and Supply
Project 12 - Improvement of Irrigation Management

A summary of the status of these Projects appears as Annex B.

REGIONAL PROJECTS UNDER IMPLEMENTATION

Project 1 - A General Technical Assistance Programme

The principal source of funding for operational coordination for the period June 1982 - December 1985 has come from a USAID grant of US$ 675,000 in support of Regional Food Security Project 1 - A General Technical Assistance Programme Designed to Achieve Coordination and Cooperation on all Agrarian Issues. The objectives of this project are: (a) to permit the easy interchange of ideas and personnel among nine SADCC member States, and (b) to enable the Zimbabwe Government to play fully its SADCC designated role to coordinate a regional food security programme.

Project 2 - An Early Warning System for Food Security

Objectives

The primary objective of the regional early warning system is to provide advance information on basic food crop production and food supplies in the region and to alert member States of impending food shortages and surpluses in sufficient time to enable preventative action to be taken.

Strategies

The strategy to be employed to achieve these objectives includes:

(i) the establishment of a Regional Early Warning Unit (REWU) to be located in Zimbabwe.

(ii) the establishment or improvement of National Early Warning Units (NEWU) in each of the SADCC countries, which would provide those countries with good early warning systems of their own and also feed information to the REWU and act as a national receiving centre for the output from that source.

Details of action required at a national and regional level to establish the REWU and the NEWUs are outlined in the reports An Early Warning System for Regional Food Security, FAO, Rome, 1983 and An Early Warning System for Regional Food Security: Appraisal Report, DANIDA, August, 1984.

Implementation

Preparation for the implementation of the Regional Early Warning System commenced in July, 1985 with the appointment, under a Technical Assistance Agreement with FAO, of an FAO Technical Adviser and a SADCC Meteorologist as a counterpart. The twelve month preparatory phase is designed to establish the nucleus of the REWU and provide assistance to member States in the setting up or strengthening of NEWUs. Work plans and budgets for implementation of the early warning system will be prepared in sufficient detail to enable the negotiation of project agreements for the full implementation phase between SADCC's cooperating partner and member States.

Targets for implementation of the early warning system are:

(i) Finalization of agreements between SADCC and its cooperating partner for the technical assistance and funding of the early warning system by July 1986.

(ii) Nucleus of REWU at full operational status and initial flows of information to and from member States by July 1986.

(iii) REWU and NEWUs fully established and operational by July 1987.

(iv) Funding of SADCC inputs to REWU required by July 1987 to be negotiated by January 1987.

Funding

Total cost of the early warning system during its initial three years is estimated at US$ 5,38 million. The Danish Government has indicated that it is able to make available D.Kr. 42,0 million (US$ 3.7 million) for the system. SADCC inputs towards the cost of the NEWUs are estimated at US$ 1,4 million. SADCC seeks the support of its cooperating partners to provide the balance US$ 280,000 needed to cover the cost of the REWU during its initial three years and to provide US$ 190,000 per annum to cover the cost of operating the REWU after this period.

Project 3 - A Regional Resources Information System

Objectives

The objectives of the Regional Resources Information System (RRIS) are:

(i) to develop a regional data bank related to food production, inputs and resources used in the food production process, for medium and long term planning purposes.

(ii) to set up a computer-based data management system that allows for storage and quick retrieval of basic agricultural information.

(iii) to use the data bank for generating information necessary to monitor the development of the food security situation and to provide information necessary for planning and decision making of governments on food matters.

Strategies

Elements of the strategy to achieve these objectives are:

(i) the establishment of a RRIS Central Unit, located in Zimbabwe, which must define and work out an analytical framework for food security analyses and planning and act as a systems and data coordinator.

(ii) the appointment of national liaison officers with

responsibility for coordination of the transmission of the information generated by a range of national government agencies and other institutions to the Central Unit, and for ensuring that output from the SADCC system is distributed to interested national institutions.

Implementation

Alternatives for the implemenation of the RRIS, the informational requirements for the system, its uses, and its relationship with the SADCC Regional Early Warning System and the SADCC Inventory of Agricultural Resource Base are outlined in detail in the report SADCC Food Security Feasibility Study: A Regional Resources Information System, Ministry of Agriculture, Zimbabwe, November, 1982.

An agreement with UNDP relating to the provision of assistance for Phase I of the project has been concluded and implementation is anticipated to commence shortly. Phase I, to last 18 months, is concerned with setting up the basis of the RRIS and its initial flow of information. It involves:

(i) Establishment of the nucleus of the Central Unit;

(ii) Nomination of nine National Liaison Officers;

(iii) Preparation of a design for the preliminary information system and the design of information formats and mode of transmission;

(iv) Arrangements for an initial flow of information;

(v) The preparation of a detailed work plan and budgets for full implementation and the identification of required internal and external inputs.

(vi) The negotiation of project agreements relating to full implementation between SADCC's cooperating partners and member States; and

(vii) The provision of on-the-job training to SADCC counterpart and national staff.

Funding

Funding of Phase I is through the UNDP technical assistance programme. The Netherlands Government has expressed strong interest in providing financial and technical support for the full implementation phase. Preliminary estimates, of the cost of establishing and operating the RRIS for a six year period are US$ 4,57 million. The Netherlands commitment to fund the RRIS is dependent upon an assessment mission to be undertaken in conjunction with Phase I of the project.

Project 4 - A Regional Inventory of Agricultural Resources Base

Objectives

The objectives of the Regional Inventory of Agricultural Resource Base project (RIARB) is to compile, collate and develop a data bank of the region's natural agricultural resource base upon which, in time, various interpretative and land use planning procedures can be undertaken as required.

The Inventory will be made up of a range of information on a number of important aspects of the natural environment affecting agricultural production such as soil type, climate, land form and vegetation, together with those elements which can be used to modify the naturally occurring conditions such as fertilizers or water for irrigation. The Inventory will also contain information on current forms of land use.

Quite extensive information exists about natural resources in the region, but it is scattered and often in a range of different formats. An important objective of the Inventory will be to compile and collate the information in a unified manner so that all relevant information and knowledge is formally documented and presented.

The function of the Inventory is to ensure that natural resource information is readily available to assist management, planning and research. One of its most important uses will be to allow the documentation of the widely different environmental conditions in the SADCC region and to establish its agricultural potential and food production possibilities.

One system containing many different types of information offers the possibility of a variety of uses in relation to resource appraisal and evaluation. A regional inventory made up from a series of compatable national inventories provides the basis for a planning capability at the regional level and can be used to assist in defining priority areas for development projects and in selecting projects suited to the environmental conditions. The presentation of resource information in a standard way throughout the region will enable planners to be in a better position to identify projects and assess the region's potential for development as a whole.

Strategies

Development of the Inventory involves:

(i) the establishment of a Central Unit in Zimbabwe which has both a technical and coordinating function.

(ii) the preparation of necessary data in the required format at country level for transfer to the Central Unit.

(iii) the undertaking of further surveys as required.

The Central Unit is the depository for the RIARB, and is responsible for compiling national data into the Inventory. It will provide

certain common services to reduce the administrative burden to individual countries of data gathering. It will oversee and monitor progress of country level operations and arrange liaison and contact between technical personnel in member countries.

Individual countries are responsible for action required under (ii) and (iii) and it will be necessary to appoint a technical liaison officer to coordinate the activities of institutions responsible for preparation of the country's contribution to the inventory.

Details of information required for the Inventory, the national activities which will contribute to it, institutional arrngements and resources required are outlined in the report SADCC Food Security Feasibility Study: A Regional Inventory of Agricultural Resource Base, Ministry of Agriculture, Zimbabwe, November, 1982.

Implementation

The core of the Central Unit has been established with the appointment from the region, of a Land Use Planner and Soil Scientist together with administrative support staff. Professional personnel still to be appointed include the Agro-Ecologist/Team Leader and a Cartographer/Draughtsman.

Member States have been requested to appoint Technical Liaison Officers (TLOs) and a key workshop on Agro-Ecological Zoning has been arranged under the auspices of FAO for October 1985.

Meetings of TLOs with Central Unit staff will be held to consider and report on:

(i) detailed structure and content of the data to be included in the RIARB;

(ii) the feasible time for collection of specific items;

(iii) the approach to agro-ecological zoning;

(iv) the categories of land use to be used;

(v) the presentation format for all items;

(vi) the ways in which deficiencies in national data bases might be filled;

These activities will provide each country with precise information on its commitments and identify the need for any surveys requiring external assistance in the form of funds and/or personnel.

Completion of the inventory is targetted for 1989. As different segments of the Inventory are compiled, information will be made available for regional food planning and integrated with information from other projects.

Funding

Funding to cover the operation of the Central Unit, estimated at Z$ 1,7 million, is being provided by the Government of the Republic of Ireland. The support of SADCC's cooperating partners for assistance with any surveys needed to fill information gaps will be sought as needs determine.

Project 6 and 7 - Regional Post-Production Food Loss Reduction and Regional Food Processing Technology

When first conceived, Project 6 was envisaged as a programme for the review of post-production food handling techniques within the SADCC region with a view to determining measures to reduce food loss. Project 7 envisaged a programme aimed at enhancing adoption of appropriate food processing technology. Since both projects are closely related, with their focus on a reduction of post-production food loss either through improved handling techniques or by the use of appropriate processing techniques, it was proposed that a regional technical advisory unit, the Post-Production and Food Industry Advisory Unit (PFIAU) be established in Zimbabwe to undertake both programmes.

Objectives

The stated objectives of the PFIAU are:

(i) to improve the efficiency and effectiveness of existing post-production systems, food processing industries and technologies; and

(ii) to recommend the research, development and training facilities and programmes necessary to the creation of improved post-production systems and food preservation processes.

Strategies

The strategies to be adopted by the PFIAU to achieve these objectives are:

(i) To study and evaluate existing post-production, food processing and preservation systems and technologies to identify those which are effective and should be more widely demonstrated, to determine needs for research, development and training, and to prescribe courses of action within SADCC regions to satisfy these needs.

(ii) To help formulate demonstration, training, research and development projects relevant to post-production systems, rural food industrialization and preservation.

(iii) To review and evaluate the existing facilities for education and training throughout SADCC, relevant to its purpose, and to advise on new or revised training programmes and materials of instruction for essential training programmes.

(iv) To devise mechanisms to encourage cooperation and communication among research, development, demonstration and training organizations, marketing boards and food industries throughout SADCC to ensure that the valuable knowledge available in any one country is made known to and can be adapted by others.

In essence, the PFIAU will seek to catalyse and stimulate cooperation, research, technical development, education and training essential to the common and individual interests and priorities of the SADCC member countries in regard to their post-production systems.

Implementation

Implementation commenced in September 1984 with the appointment of the Marketing Economist/Team Leader of the PFIAU and associated support staff. Initial work has involved the Team Leader in familiarization visits to member States and the preparation of a draft work programme for the Unit for review by the project's Scientific Advisory Committee. The balance professional staff of the Unit, comprising a Policy Economist, Agricultural Engineer, Food Processing Technologist and Information Officer have been recruited and are expected to commence duties in September.

The Unit's draft work programme is undergoing revision in accordance with recommendations made by the Scientific Advisory committee and will be discussed with individual member States by the Team Leader before finalization by the end of 1985.

To facilitate implementation of the PFIAU programme the project's Scientific Advisory Committee has recommended the formation of national post-production systems committees or working groups comprised of representatives from Government, training institutions and industry. The committees would provide a communication link with the PFIAU on matters relating to its programmes and identify suitable national programmes in food processing and post-production loss minimization which could be implemented with assistance of the PFIAU.

Funding

The operations of the PFIAU for five years, estimated to cost $ 1,9 million are being funded by the Canadian Government through the Canadian International Development Agency and the International Development Research Centre.

With the development of the PFIAU's work programme it is envisaged that a number of projects related to post-production loss minimization and food processing technology in the region will be identified. Support from SADCC's cooperating partners for the implementation of such projects will be sought when required.

Project 10 - Recruitment and Retention of Professional and Technical Staff in the Ministries of Agriculture in the SADCC Region

Objective

Insufficient numbers of adequately trained personnel in the research, extension and veterinary services of the SADCC region have been identified as an important factor limiting the region's capacity to expand agricultural production. The objective of Project 10 is to assist SADCC in ascertaining the major factors which affect the demand for agricultural professionals within the SADCC region in order that SADCC can take appropriate action to ensure an adequate supply of agricultural research, extension and veterinary personnel.

Strategy

The project involves a study of factors affecting recruitment of professional and technical workers in Ministries of Agriculture in each SADCC country, in departments of agricultural research, agricultural extension, agricultural economics and veterinary services.

The study involves the collection of a wide range of information on factors related to the recruitment and retention of technical personnel and the analysis of this information with a view to preparing a General Report on regional findings and individual Country Reports.

The study is coordinated by a Study Director, based in Zimbabwe and information is collected by three-man Country Teams nominated by Agriculture Ministries in each SADCC country. Details of the study, the roles and responsibilities of participants, financial budgets and the timing for the study are set out in the Memorandum of Understanding (MOU) between the Government of Canada and the Government of Zimbabwe relating to the project.

Implementation

The study effectively commenced in January, 1985 with the arrival in Zimbabwe of the Canadian Study Director. A meeting of Country Teams to discuss arrangements for data collection was convened in Harare in late March at which four countries were represented. Country Teams were subsequently formed by late May in four other countries following visits of the Study Director. Mozambique advised that it did not have the manpower to participate in the study.

The MOU for the project envisaged completion of data collection and the preparation of Country Reports by 1st August 1985, the submission of a draft General Report and Country Reports by 1st September 1985 and the final reports published by 1st January 1986. Delays in data collection by Country Teams indicates these targets cannot be met. In view of the delays experienced in the collection of data and the effect this will have on the whole of the project's operational schedule, the status of the project is under major review by the donor Agency and the Government of Zimbabwe.

Funding

The Government of Canada, through the Canadian International Development Agency is contributing up to C$ 400,000 towards the costs of the study. The services of the personnel comprising the Country Teams are provided by SADCC member countries which are also meeting the in-country costs of data collection.

REGIONAL PROJECTS TO BE IMPLEMENTED

Projects 5 and 9 - Regional Food Reserves and Regional Food Aid

Project 5 is concerned with an examination of existing food reserve policies and infrastructure within the SADCC countries and the means by which these may be improved, thereby improving food security in the SADCC region. Issues of concern are the optimal levels of food resources, their location, the distributional network required and the appropriate regional consultative mechanisms to operate a regional food storage system effectively.

Project 9 is concerned with the assessment of food aid requirements of the SADCC region, coordination of procurement and the role of food aid in nutritional programmes and for agricultural development. Since both projects are interrelated, action on them is being undertaken jointly.

Pre-feasibility studies on both projects, which were funded by the EEC, were completed in early 1984 and at the meeting of SADCC Agriculture Ministers in September 1984 Ministers approved that a definitive study be carried out so that concrete policy decisions can be made on the strategic location, size and quantity of food stocks, and establishment of food reserves. Terms of reference have been drawn up by Zimbabwe with inputs from SADCC technical experts and representatives of the EEC which has indicated its willingness to provide financial support for the study.

The time schedule for the study envisages a draft report on the first two parts of the three part study to be completed by 1st May 1986. Phase A of Part 1 of the study will present alternative approaches to the upgrading of storage capacities in cereal surplus producing countries to meet regional requirements. Provided the SADCC Council of Ministers at their meeting in June 1986 indicates which of these options is acceptable, Phase B of the study, concerned with definition of the chosen option to full feasibility level, will proceed. A draft final report is anticipated by 1st July with the final report being completed by November 1986. Preparation of a financing proposal would proceed at the same time with a view to commencing implementation by the end of 1986.

Project 8 - Regional Food Marketing Infrasturcture

This project is concerned with an examination of the existing food marketing infrastructure within the region, the identification of the strengths and weaknesses of the marketing systems in regard to their abilities to move food commodities and farm inputs; and the identification of ways to improve the capacities of the systems and

means of improving the movement of agricultural commodities between SADCC countries.

A feasibility study for the project, financed by the Commonwealth Fund for Technical Cooperation, was undertaken and a final report submitted to the SADCC Council of Ministers in July 1983. The report was referred to the SATCC and SADCC Industry Sector for comments which were, in turn, submitted to Agriculture Ministers in September 1984. Agriculture Ministers requested a meeting of SADCC technical experts to re-examine the report, identify its deficiencies and determine how best these might be rectified.

It is now proposed that the further investigations and analysis required to complete the feasibility study will be undertaken by each member country working together with a small team of experts nominated from within the region, supported by a consultant. Zimbabwe will have administrative responsibility for coordinating the work and costs will be met from Project 1. It is anticipated a final report will be available by July 1986.

Project 11 - Regional Seed Production and Supply

Lack of improved seed has been identified as a major constraint to crop production in the SADCC region. Measures to raise soil fertility or reduce losses from pests and diseases commonly involve, or are complemented by, the use of improved seed. However, in many instances appropriate seed types do not exist or are in short supply. Investigations by the FAO suggest progress is required in three main areas: first, in raising seed quality. Much can be achieved by greater extension efforts to improve on-farm selection. Second in improving genetic characteristics in terms of higher yield potential, better adaption to poor soils and low rainfall, greater disease resistance and fertilizer response. Finally, progress is required in expanding seed production and distribution.

In most SADCC countries improved seeds are used for only 30 to 40 per cent of the area under basic cereals. Furthermore, these seeds are overwhelmingly of modern rather than traditional cultivars. Commercial seed production is held back by the attitudes of farmers in so far as they are not always convinced of the economic benefits of purchased seed; and by the low (and in some countries) declining number of specialised seed growers.

A feasibility study is proposed within the project which has as its objectives: the determination of the extent of suitable seed crop available in the region; the identification of seed production and supply problems; and the identification of short and long term measures to overcome these problems.

Terms of Reference for the study are being finalised.

Project 12 - Improvement of Irrigation Management

Most SADCC counries have substantial surface water resources close to areas suitable for the development of irrigation. The area under full

irrigation is projected by FAO to nearly 600,000 hectares in 2000. At present less than one-eighth of the irrigation potential has been developed. The high cost of construction of large-scale irrigation is a major factor constraining further irrigation development, Once irrigation has been provided, the lack of trained water management personnel, the absence of institutional structures for water management and the lack of irrigation experience among farmers decrease the efficiency of water use.

The project envisages the undertaking of a feasibility study with the objectives of: identifying and assessing the magnitude of water management problems in the region; identifying ways and means of improving water management practices in the region; and examining the feasibility of establishing a regional interdisciplinary consultative team to examine management and training needs of the region, coordinate programmes intended to solve irrigation problems and provide other technical assistance to SADCC institutions involved in irrigation management.

Terms of Reference for the study are being finalised.

NATIONAL PROJECTS WITH A REGIONAL IMPACT

The food security programme also provides support for a series of projects which, though national in character, when taken together contribute significantly to the achievment of SADCC's overall food security objectives.

The national projects, which are identified by individual member States, are generally directed towards production enhancing activities which have an immediate impact on food supply. Notwithstanding the potential impact that these projects could have on the food producing capacities of member States, experience to date has shown that, with the exception of the food aid related projects, it has proved difficult to mobilize international resources for the implementation of these national projects.

In discussions with representatives of SADCC's cooperating partners it has become apparent that greater emphasis must be placed on the regional aspects of the national projects if they are to receive support as truly regional projects. The following steps are proposed to achieve an increased regionalization of the national projects:

(i) Review all national food security projects identified to-date and group projects on a sector or functional basis e.g. food storage, irrigation, quarantine, seed production etc.

(ii) Once grouped, meetings of representatives of the appropriate national implementing agencies will be convened to identify those components of the national projects which would benefit from being addressed on a regional basis instead of a national basis, e.g. the training aspects of a common project could be linked on a regional basis, technical assistance needed for the design or irrigation schemes or food storages could be utilized more efficiently across a range of national projects.

In some cases e.g. quarantine projects, the benefits of a cooperative approach will be readily apparent.

(iii) Once common areas have been identified, a single project document would be drawn up grouping the projects but showing clearly those components to be implemented on a national basis and those to be implemented regionally,.

This coordinated approach to project formulation will be initiated through the activities of the CTCs or through technical experts meetings.

It is anticipated that in addition to the national food security projects already identified, other national projects will be identified as a result of implementation of the regional food security projects. In some cases similar projects will be identified in two or more member countries. These projects in particular will lend themselves to preparation of a coordinated project proposal with the assistance of the relevant Regional Food Security Project Team.

Three new national projects with a regional impact have been approved, details of which appear in Annex A.

ANNEX A

PROJECT PROPOSALS

AN INTERIM REGIONAL GRAIN RESERVE 1986/7: Malawi (1.4.1) and Zimbabwe (1.9.1(ii))

In November 1982 SADCC decided to establish a 250 tonne interim regional grain reserve in Zimbabwe. This project, which was funded by Norway, was successfully implemented.

Although the proposal only involved Zimbabwe, the gravity of grain-shortage in the region now calls for larger storage capacity.

In the context of Malawi and Zimbabwe's current grain surpluses and the continuing food shortage in the region as a whole, it has been decided to seek assistance to establish a SADCC reserve of 430,000 tonnes (Malawi: 180,000 tonnes and Zimbabwe: 250,000 tonnes) of grain for one year beginning April 1986.

BACKGROUND

Malawi and Zimbabwe, as grain exporters, are exceptions in a region which generally suffers from food shortages and a dependence on food imports. It is clearly in the interests of SADCC as a whole to ensure that this surplus is available to other member countries because Malawi and Zimbabwe's proximity to the areas of need ensures that grain can be delivered more quickly and at less cost than with more distant suppliers. However, the cost to Malawi and Zimbabwe of maintaining a grain surplus is very great. Handling and storage costs are high while exports frequently have to be undertaken at prices which do not cover the total cost of the product (including production costs) to the Grain Marketing Boards. Such losses cannot be sustained indefinately and must cause the Governments of Malawi and Zimbabwe to consider measures which would reduce the grain surpluses and to seek to dispose of stocks as quickly as possible, regardless of destination. With anticipated end of market-year stocks of over 1.2 million tonnes the position is likely to become particularly acute this year.

In the case of the previous grain reserve, aid was provided by Norway to cover the Grain Marketing Board's costs in handling and storing the grain for one year. At the present cost the total aid required to repeat the exercise in the case of Zimbabwe would be US$ 8.28 million and in the case of Malawi, would be US$ 13.75 million.

Regional aid in this way would:

(a) assist Malawi and Zimbabwe meet the cost of storing their grain surpluses;

(b) ensure that 430,000 tonnes of maize was readily available to other SADCC countries;

(c) reduce the region's dependence on grain imports from extra-

regional suppliers.

PROPOSAL

It is proposed that, on behalf of SADCC, the Governments of Malawi and Zimbabwe establish a grain reserve of 430,000 tonnes for one year beginning on 1 April 1986 with the assistance of SADCC cooperating partners to cover handling and storage costs. The grain thus reserved will be used within the specified period, solely for export to SADCC member countries.

ERADICATION OF LARGER GRAIN BORER (PROSTEPHANUS TRUNCATUSHORN) IN TANZANIA (1.7.3)

Executing Agency

Ministry of Agriculture and Livestock Development, Tanzania.

Project Duration

Five years.

Starting Date

1985/86.

Project Costs

Donor Input US$ 0.732 million
Local Input US$ 0.251 million
Total Cost US$ 0.983 million

INTRODUCTION

The Larger Grain Borer (LGB), known in Tanzania as "Dumusi", is a pest of stored maize and dried cassava. It was introduced into the country at the end of the 1970's, probably in maize from the Southern U.S.A. or other areas adjoining Central America, where the beetle is endemic. It has burgeoned from a localised nuisance then, a transnational menace today and a threat to all SADCC maize producers in the forseeable future. It was first reported in Tabora Region in 1980 where it was causing considerable losses in cob maize at farm level. The beetle has since spread to twelve regions in the north, west and south of Tanzania, including those producing the bulk of Tanzania's maize crop. Up to 1 million tonnes of annual production is already at risk. It has crossed the northern border to Kenya and the western border to Rwanda. At its pesent rate of advance, it is likely to enter Zambia, Malawi and Mozambique (via cross border maize trade especially around Lake Malawi/Nyasa) as well as Zaire, Burundi and Uganda by 1987 and to reach Zimbabwe by or soon after 1990.

Realising the seriousness of the losses caused by this beetle when compared with those caused by indigenous pests of stored maize, the Government of Tanzania asked donors for assistance. Initial surveys and other investigations were carried out by the Tropical Development and Research Institute (TDRI), UK, working with the Ministry of Agriculture and Livestock Development (KILIMO) personnel. Tanzania next developed a programme to control the beetle. The objectives of the programme were:-

(a) to reduce losses caused by LGB to economically acceptable levels in areas where the pest was already well established, and

(b) to attempt to contain the pest within existing boundaries.

OBJECTIVES

Unlike the previous programme whose target was to contain the pest so as to reduce losses to economically acceptable levels, the target now is to eradicate the beetle. Thus the following are the objectives of the eradication of LGB project.

(a) to eradicate the LGB from all infested areas in Tanzania

(b) to control the LGB in white maize and cassava while the eradication campaign continues

(c) to monitor the effectiveness of (a) and (b) above.

RATIONALE

More than 70% of the grain produced in the country (Tanzania) is stored in traditional storage structures for family use until the next harvesting season. It is this 70% which is primarily at risk from the borer beetle. Infestation can result in total loss within a relatively short period with obvious nutritional and economic impact on peasant households as well as potentially wiping out the seed stock held aside for planting by them. Annual loss estimates are imprecise but may be of the order of 100,000 tonnes with a farm-gate value of US$ 25 million in Tanzania alone.

Failure of the containment programme and rapid spread of the LGB, from one region in 1980/81 to twelve regions in 1984/85, calls for prompt eradication of the beetle. Eradication of LGB in Tanzania is very important since continued existence of the beetle will defeat the previous idea of having a regional food reserve storage in Mbeya as suggested by Project 5 of the SADCC food security projects.

It is known that the International Centre for Insect Pathology and Environment (ICIPE) is launching a research programme aimed at identifying possible new eradication techniques and Tanzania will maintain contact with ICIPE in order to incorporate any tested breakthroughs made into its eradication programme. Given the grave and immediate danger both from the present scale of damage and the rapid spread of this plague it would not, however, be prudent to delay initiating a full scale eradication programme based on existing research carried out in Tanzania and noted above and using presently known techniques.

THE PROJECT

The project area will include 608 villages (i.e. over 150,000 households) in twelve regions. Project implementation will take five phases of twelve months each. The following activities will be undertaken:

(1) Courses for Extension staff

(2) Training for village officials

(3) Printing of posters, booklets and teaching aids

(4) Purchase of insecticides, fumigants, application equipment,

monitoring equipment and camping gear.

Ten districts in five regions will be covered in the first year of implementation. A total of US$ 0.193 million will be required in terms of insecticides, fumigants, application equipment and motor vehicles. In the second phase 120 villages will be covered from four regions. A total of US$ 0.16 million will be required. During the third phase 438 villages will be covered from four regions. This will require US$ 0.148 million monitoring, controlling and eradicating the pest where it was not fully eradicated and new infested areas will be undertaken in the fourth and fifth phases. The extended period is necessary to ensure that eradication is complete and that the beetle does not survive in small pockets to spread again on the termination of a shorter campaign. A total of US$ 100,000 will be needed during the last two phases.

PROJECT COSTS

The total cost of the project is estimated at T. shs. 17.748 million or US$ 0.986 million of which T.shs. 4.560 million or US$ 0.251 million are local and T.shs. 13.188 million or US$ 0.732 million are foreign.

PROJECT COSTS (IN MILLIONS AS PER 1985 PRICES)*

	Total Costs	Local Costs	Foreign Costs
YEAR OF PROJECT IMPLEMENTATION	US$	US$	US$
YEAR ONE	0.303	0.105	0.198
YEAR TWO	0.214	0.050	0.164
YEAR THREE	0.193	0.050	0.148
YEAR FOUR	0.055	0.005	0.050
YEAR FIVE	0.055	0.005	0.050
SUB TOTAL	0.820	0.209	0.610
PLUS 20% CONTINGENCY	0.164	0.045	0.122
TOTAL COST	0.984	0.251	0.732

* The figures shown are indicative. The detailed costings are still being finalised.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON: FINANCING STATUS ACTION
1.0.1.	A Technical Assistance Programme Designed to Achieve Coordination and Cooperation on All Agrarian Issues	2.389	2.024	0.675	-	USAID grant.
		-	-	0.149	-	Australia grant and TA.
		-	-	0.215	-	Zimbabwe Government contribution.
		-	-	-	1.200	Under negotiation with USAID (for 1986/9)
1.0.2.	An Early Warning System for Regional Food Security (Study/Implementation)	5.760	4.360	0.130	-	Study completed, funded by FAO grant and TA.
		-	-	0.250	-	Pre-implementation funded by UNDP/FAO grant & TA
		-	-	3.700	-	DANIDA grant for implementation.
		-	-	1.400	-	SADCC Inputs
						Shortfall in funding - US$280.
1.0.3.	A Regional Resources Information System (Study/Implementation)	4.950	4.950	0.200	-	Study completed, funded by CFTC grant.
		-	-	0.250	-	Pre-implementation funded by UNDP/FAO grant & TA.
		-	-	-	4.57	Netherlands grant implementation.
1.0.4.	A Regional Inventory of Agricultural Resource Base (Study/Implementation)	1.938	1.938	0.200	-	Study completed, funded by CFTC grant.
		-	-	1.738	-	Ireland grant for implementation.
1.0.5.	A Regional Food Reserve* (Study/Implementation)	0.220	0.220	0.220	-	Pre-feasibility study completed, funded by EEC.
		-	-	-	0.220	Under negotiation with EEC for feasibility study.
1.0.6.	Regional Post Harvest Food Loss Reduction (Study/Implementation)	2.077	2.077	0.150	-	Studies completed, funded and carried out by IDRC.
		-	-	1.928	-	Under implementation, funded by Canada and IDRC grant.
1.0.7.	Regional Food Processing Technology (Study/Implementation)					

* funded and carried out together

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
1.0.8.	Regional Food Marketing Infrastructure (Study/Implementation)	0.150 -	0.150 -	- 0.150	- -	Study completed, funded by CFTC. Implementation not costed yet. Interest from ADB.
1.0.9.	Regional Food Aid* (Study/Implementation)	See 1.0.5. above				See 1.0.5. above
1.0.10.	Study on Staff Recruitment and Retention in Ministries of Agriculture	0.400	0.400	0.400	-	CIDA grant for implementation
1.0.11.	Study on Seed Production and Supply	-	-	-	-	Terms of Reference to be drawn up. Interest from EEC, Netherlands and FAO.
1.0.12.	Education and Training for Irrigation and Water Management	-	-	-	-	Terms of Reference to be drawn up. Interest from EEC, Ford Foundation and FAO.
1.1.1.	Improvement of the Agricultural Water Supply in the Bengo Valley, ANGOLA	14.124	14.124	-	-	Interest from UNDP.
1.1.2.	Reinforcement of the Department of Soils and Climate of the Agronomic Research Institute, ANGOLA	0.553	0.553	-	-	Interest from Italy.
1.1.3.	Creation of an Agricultural Experimental Station in Luanda, ANGOLA	2.361	2.361	-	-	
1.1.4.	Primary Milling of Maize and Cassava, ANGOLA	2.241	2.241	-	-	Interest from AOBAD.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
1.3.1.	Improvement of Food Storage Capacity, LESOTHO	9.958	-	-	-	Partially funded from local resources.
1.4.1.	Interim Grain Reserve, MALAWI	13.75	13.75	-	-	Presented at Harare
1.5.1.	Production of Groundnut and Sorghum Seed, MOZAMBIQUE	8.650	5.0	1.9	-	France loan.
		-	-	-	3.10	Under negotiation with IFAD.
1.5.2.	Establishment of Seed Security Stocks, MOZAMBIQUE	3.430	2.5	-	-	Under negotiation with IFAD (with project 1.5.1.)
1.5.3.	Reinforcement of Food	5.452	3.552	-	3.552	Under negotiation with NORDIC countries and IFAD
1.5.4.	Reduction of Post-Production Losses, MOZAMBIQUE	-	-	-	-	Withdrawn for reformulation.
1.5.5.	Establishment of a Network of Quarantine Stations, MOZAMBIQUE	0.975	0.750	0.550	-	DANIDA grant.
1.5.6.	Storage Facilities, MOZAMBIQUE	19.330	13.330	3.056	-	Netherlands grant.
		-	-	6.440	-	FR Germany loan.
		-	-	-	3.634	Under negotiation with Japan and Denmark.
1.7.1.	Kopunga Rice Project, TANZANIA	18.40	12.90	-	-	Presented at Mbabane.
1.7.2.	Madibira Rice Scheme, TANZANIA	22.50	19.90	-	-	Presented at Mbabane.
1.7.3.	Eradication of the Larger Grain Borer	.933	.732	-	-	Presented at Harare.
1.8.1.	Construction of Food Storage Facilities, ZAMBIA	4.021	4.021	4.021	-	CIDA, EEC and NORAD.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANCE. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
1.9.1.(i)	Interim Regional Grain Reserve, ZIMBABWE (1984/85)	8.750	8.750	8.750	-	NORAD.
1.9.1.(ii)	Interim Regional Grain Reserve, ZIMBABWE (1985/87)	8.280	8.280	-	-	Presented at Harare.
1.9.2.	Rural Service Centres and Periodic Market Programme - Pilot Project, ZIMBABWE	1.950	1.950	-	1.00	Italy (grant Z$1.5m).
1.9.3.	Rural Public Works Programme Ecological Upgrading and Rural Income Underwriting, ZIMBABWE	50.0	50.0	-	50.0	Under negotiation with Italy.
1.9.4.	Land Use Reform Programme (Communal Areas), ZIMBABWE	16.0 -	16.0 -	2.00 -	- 14.00	Italy (loan Z$3m). Under negotiation with CIDA.
1.9.5.	Communal Areas Management Programme, ZIMBABWE	1.243	1.243	-	1.243	Under negotiation with Austria.
1.9.6.	Tractor Credit Fund, ZIMBABWE	10.5	10.5	-	10.50	Under negotiation with Austria.

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Section Three

AGRICULTURAL RESEARCH

AGRICULTURAL RESEARCH

THE STATE OF AGRICULTURAL RESEARCH

Agricultural Research

Historically agricultural research institutions focussed their attention on the needs of cash/export crops and large-scale producers. The research work was undertaken by expatriate staff. Although much of their work on crops and livestock is recognised as being valid even today for use by large-scale producers, the problems associated with smallholder production are just beginning to be recognised. It can be concluded therefore, that research institutions in SADCC countries have been slow to give priority to the research needs of smallholders. It is observed by Devres that methodologies used and the principal objectives of the individual research projects, in many cases, are addressing problems that are not of the highest priority to the large number of smallholders and emerging farmers. For example, maximising yield may be the principle objective of a crops research project while other concerns, such as resistance to a disease or bird control, are not considered as part of the research effort, even though they are very important to small-scale producers. SADCC countries are now making an effort to balance research between cash/export crops and food crops.

The other characteristics of agricultural research are lack of adequate qualified nationals which means expatriate staff will continue to be needed. There are relatively few trained nationals in such disciplines as systems analysis, social sciences and agricultural economics, and there is too much reliance on post-graduate training in developed countries. The SADCC member States do not seem to reward adequately good agricultural research workers. There continues therefore a tendency for movement from research to administration as scientists seek higher financial gains and recognition in the society. Finally, although SADCC member countries accord high priority to agricultural research, and give adequate funds from local resources to research, deterioration in foreign exchange earnings have resulted in inadequate purchase of equipment, chemicals, transport, books and journals for research workers. This has affected performance and morale.

It is also widely known that there is a backlog of research results which await broad dissemination in the field. However, both the wider use of known methods and the development of new methods are severaly constrained by a lack of manpower for research and extension and proper orientation of such staff. There is a need to understand the farmer's perception of risk, his needs and resources before introducing a new technology. One related matter is the farmers desire to continue planting traditional varieties of crops. These have proved to be adapted to their local conditions and they have the palatability which is needed. New varieties, although higher yielding than the local varieties sometimes do not have the adaption, storability and palatability that the local farmers need. Breeders of maize, sorghum, millet and rice must therefore take into account farmers' and consumer needs when developing new varieties. There is also the question of cost of inputs such as seeds, fertilizer, pesticides, farm machinery and implements. Regarding cost of pesticides,

there is little research that is dealing with integrated systems of pest control especially in the low rainfall areas (less than 600 mm per annum) where crop production is risky. To assist these farmers technological packages which combine improved and drought and disease resistant varieties of sorghum and millet with integrated pest management should be developed.

Constraints to Food Production

Constraints to increased agricultural productivity are many but are all soluble to a degree. They include:-

(a) Poor Soil Fertility and Physical Properties

The soils lack organic matter hence when artificial fertilizers are applied, the nutrients may be rapidly leached before plants can make use of them. Some soils are acidic and have specific deficiencies or toxicities. Other soils have in addition a poor structure which leads to compaction, crusting, poor infiltration and vulnerability to water and wind erosion. They therefore need careful management if increased and sustained agricultural productivity is to be achieved.

(b) Rainfall and Irrigation

Although the average annual rainall over much of the region is sufficient to grow a wide range of crops, the variability during the growth of a crop coupled with poor retention of water by the soil lead to poor crop yields. Crops growing in such environments are greatly affected by water stress and the yields therefore diverge by as much as 50-100% between low-rainfall and good rainfall areas and/or years. As stated earlier, the region has great potential for irrigation. In Zimbabwe, where irrigation is more developed than elsewhere, some of the best farmer fields of irrigated groundnuts are twenty times greater than those in the traditional rainfed sector. However, the development of irrigation may be constrained by several factors such as: the high cost of developing facilities required in large-scale irrigation projects,[1] lack of trained irrigation engineers, lack of irrigation experience of farmers, lack of trained water management personnel, lack of research data on suitability of soils for irrigation and a lack of knowledge of appropriate cultivars of crops and of pest and disease control. There are other factors such as lack of coordination and agreements among countries on the use of shared water resources. The small scale irrigation systems (e.g. flood recession agriculture, leading to more sophisticated systems involving drainage and supplementary irrigation) which are under developed at present may cost only US$ 500 to 1,000 per hectare and can be cost-effective for a wide range of crops including basic staples.

(c) Fertilizer Use

Current use of fertilizer in the region, although it varies among nations, districts and crops is on the average below 20 kg per

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[1] Approx. US $ 10,000 are required to develop 1 hectare of irrigated land

hectare. In order to attain self sufficiency in food and high and sustained agricultural productivity, it is recommended that annual fertiliser use be targeted at over 6% increase for the rest of the present century. It is observed further that greater fertilizer use will be needed in irrigated land and in areas with high rainfall. Elsewhere, fertilizer use can be economical if suitable technologies and uncertain economic returns/risks can be removed by long term research and development efforts.

(d) Pests and Diseases

It has been observed that pre-and post harvest losses from pests and diseases currently reduce food availability by 30 to 40% or more. This loss amounts to over 2 million tonnes of grain per year and exceeds grain imports by several hundred thousand tonnes. Improvement in pest and disease control in the field and during storage could, therefore, lead to increased food self-sufficiency. It is proposed that pest and disease control should therefore be one of the components of any agricultural strategy. Biological and efficient management practices in control of pests and diseases need to be given greater emphasis as chemicals and fungicides are expensive and have toxic effects not only to micro-flora and fauna but to human beings as well.

Depression in crop yields and therefore loss of expected returns can be attributed to competition between crops and weeds for sunlight moisture and soil nutrients. These losses can be as great as those from all pests and diseases combined, yet weed control is commonly neglected. The lack of weed control is also the result of labour shortage since farmers and their families have other numerous tasks to perform during the few critical days when weeding should take place.

(e) Lack of Improved Seed

To raise agricultural productivity, improved soil and water management techniques; control of pests, diseases and weeds; increased use of fertilizer; and appropriate cultural practices such as timely planting, weeding and harvesting will not be sufficient if they are not associated with the use of good seeds. The latter lead to optimum plant populations and therefore greater competition with diseases, pests and weeds hence higher yields per hectare. A sound seed industry should be the basis of crop production and development in every country.

(f) Labour Shortages and Mechanisation

It is estimated that draught power will grow at only 1% and tractor power at between 3 to 6% per year while labour inputs will increase parallel to population growth and continue to provide about 85% of the total power input. If agricultural productivity has to increase, timely planting, and weeding through the use of efficient tools must be the target. It is observed that delayed planting due to late tillage of the soil by hand-hoes, leads to reduced yields of 10 to 50%. Similarly, lack of timely weeding leads to another loss of 50% in yields.

The other characteristic of agriculture in the SADCC Region is the predominant use of women labour. Although, traditionally men are responsible for land preparation while women are responsible for planting, weeding, harvesting and storage, there has been a shortge of male labour as many of these leave for paid jobs in the mines and urban areas. This means women must perform all farm activities on their own. Since they have also to do household tasks, agricultural activities normally suffer. It is recommended therefore that research strategies to raise food self-sufficiency must address the labour supply constraints.

(g) Technology Acceptance and Gaps

There are technologies which have been generated through research but farmers are reluctant to adopt them. Research and extension workers somtimes fail to understand the farmer's ability and his experience, and his reluctance to take risks by adopting a new technology. There is a need to understand the environment, socio-economic and cultural factors before introducing a new technology.

(h) Inadequate Delivery Systems

The natural, phsyical and biological constraints to increased agricultural production are compounded by the failure to provide the necessary input supply, credit, extension and marketing services, and to provide adequte incentives. The governments in the region must improve the transport infrastructure (roads, railways and harbours) and marketing systems if farmers are to receive inputs on time and to market their agricultural produce.

(i) Constraints to Livestock Production

the following factors are major constraints to increased livestock productivity:-

- low carrying capacity of pastures,
- lack of supplementary feeds and fodders,
- overgrazing and land degredation,
- prevalence of livestock diseases and parasites.

Livestock diseases on their own, cause between 20 to 35% mortality in sheep and goats. Some diseases and parasites do not kill but retard weight gain by 20 to 30%, reduce fertility, resulting in calving, kidding and lambing well below potential. Tick-borne diseases, trypanosomiasis and foot and mouth disease all require urgent attention if self-sufficiency in animal products is to be achieved. The breeding and development of adaptable and productive breeds of cattle, sheep, goats, pigs, and poultry is in principle similar to the need for better varieties of sorghum, millets and maize.

STATUS OF SADCC AGRICULTURAL RESEARCH COOPERATION

The SADCC member countries have agreed that an essential element in achieving the above objectives is to strengthen the agricultural research capability of the region. SADCC has thus far launched the following projects:

Southern African Centre for Cooperation in Agricultural Research (SACCAR)

Following the approval of the Memorandum of Understanding establishing SACCAR by the meeting of Agriculture Ministers and the appointments of a substantive Director the Centre is now fully operative Its functions are of two general categories - cooperation/coordination and service. It will act only in a coordinating role for intra-regional activities without, however, handling individual project funds.

The strategy of SACCAR is to develop the base for all factors which affect agricultural production as it relates to agricultural research and by axiom to become the documentation centre for all regional and ultimately national agricultural research activities in the SADCC. Assistance will be given in the development of national agricultural research systems which reflect the relative importance of the various activities in the national economies.

A small research grant programme has already been initiated and nine (9) awards were made for 1985. The Zimbabwe Journal of Agricultural Research has been chosen as the official journal of agricultural research papers for the SADCC. It is hoped that in future abstracts will appear in both English and Portuguese. The work programme for 1985/86 includes continuation of Small Research Grants Awards, issuing of Study Grants, and Travel Grants, the holding of three workshops and seminars dealing with (1) Appropriate Human Resources; (2) Animal Production in the Communal Areas and (3) Crop Research Conference, and the organisation of a "Summer School" to deal with instruction in some specialised topic in agricultural research. Also the development of a documentation centre which will involve the integration of the ARRA data base and the expansion of that base as deemed necessary.

Liaison officers will be attached to the SACCAR Headquarters to represent International Agricultural Research Centres and EMBRAPA (Brazilian Agricultural Research Service). The International Development Research Centre of Canada (IDRC) supported the appointment of the Interim Director and the Swedish Agency for Research Cooperation (SAREC) supports the small research grants programme. IDRC have indicated interest in supporting the services of a documentationalist to help set up the SACCAR data base.

The core funds for SACARR have been contributed by USAID, CIDA (Canada) and NORAD covering a period of five years.

Regional Sorghum and Millet Programme

This project which is being implemented and administered with technical assistance from ICRISAT (International Crop Research Institute for the Semi-Arid Topics - India), commenced during June 1984 with the arrival of senior staff at Bulawayo, Zimbabwe. Trials and nurseries for the 1984/85

season were planted at Matopos and regional trials of millet and sorghum were also distributed to other SADCC countries.

Workshops for senior SADCC sorghum and millet research workers were held in Harare during October 1984 and in Gaborone in September, 1985. Plant breeders from the SADCC region visited Matopos and other national nurseries during the 1984-85 cropping season.

USAID is providing funds for the bulk o. the programme US $ 14.8 million. Additional donor support is required to cover the shortfall of US $ 2.6 million (GTZ - Federal Republic of Germany and CIDA - Canada, have agreed to make good this shortfall). The aim of the programme is to provide germplasm for national breeding programmes and to train national staff in sorghum and millet improvement. A ten year education programme to train 65 scientists to the M.Sc and Ph.D level in the SADCC region in the next 10 years in sorghum and millet improvement has been approved.

Grain Legume Improvement Programme (GLIP)

The objective of the programme is to improve legume production in the region. The groundnut programme will be sited in Malawi, cowpeas in Mozambique and beans in Tanzania. An additional groundnut breeder will be appointed for location in the low elevations of Malawi. Donor support is now being sought. USAID, CIDA, GTZ, EEC, and France have expressed interest in supporting the programme.

The Land and Water Management Research Programme (LWMRP)

The aim of the programme is to maximise the amount of water entering the soil profile by reduction in run-off, increased infiltration and reduction of evaporation of surface water (i.e. retention of water in situ). The strategy is to assemble a team of three professionals to be based in Botswana/SACCAR and to charge them to prepare within two years the groundwork developing the research proposals and transferable technologies which are capable of generating a 50 per cent increase in agricltural production per mm of water within three to five years, and to develop a research agenda for the intermediate and longer term. The team will report to SACCAR, and SACCAR as a regional agency will have a unique role to play in this proposal. The management mode of additional projects on the research agenda, should be developed as part of the individual proposal.

Agricultural Research Resource Assesssment (ARRA) and the Zonal project Document (ZPD)

SADCC established a Committee for the assessment of the research capability of the SADCC countries. The committee selected three (3) countries, Botswana, Malawi and Swaziland for pilot studies. A draft report based on these studies was presented at the SADCC Research Conference held in Gaborone during February 1984. An assessment of the research capabilities of the remaining SADCC countries (Angola excepted) has now been done and the assessments of Botswana, Malawi and Swaziland were updated. This means that the Agricultural Research Resources Assessment Documents have been prepared and a good start has been made on preparation of a longer term Zonal Plan for the region. The Zonal document will be looked upon as a framework and act as a guideline for

regional cooperation programmes. The National Reports (Vol.II) will form the start of the data base for SACCAR which must be continuously updated and should be comparable across countries. The installation of a Data Base Management Information System (DBMIS) at SACCAR into which the national and regional data has been put is an excellent start for SACCAR to act in its major role of becoming the documentation centre for all regional and ultimately national agricultural research activities in the SADCC.

THE STRATEGY FOR THE NEXT FIVE YEARS

The strategy for the next five years will be to continue to implement the already identified projects and programmes already mentioned. These are high priority projects which are in line with SADCC's objectives. At the same time efforts will be made to intensify workshops and seminars so as to achieve the following: (a) create greater individual researcher, extensionist and trainer capacity, (b) develop institutional capacity, and (c) develop an adaptive and collaborative approach to research, extension and training in the following fields:-

- Develop a farm power collaborative research programme to address poor seedbed preparation, and the labour shortage at seeding, weeding and harvest times.

- Develop a smallholder dairying, small ruminant, swine and poultry collaborative research programme in order to meet the projected demand for livestock products in the region. This effort will go hand in hand with improving pastures, management of the rangelands, developing feed supplies and controlling animal disease and parasites.

- Develop a horticulture and speciality crop collaborative researh programme which will lead to increasing family food supply and for incomes of farmers near markets.

- Establish a regionwide research data base so as to provide a higher level of information to those working on technical solutions at national and regional levels and to provide a means for them to find out about research going on in other SADCC countries. It would also provide information for appropriate researchers, trainers and extension supervisors.

- Establish regional - oriented and extension/laymen - oriented publications so as to achieve a better means of communication for professional and lay persons.

- Develop an economic and agricultural policy collaborative research programme which will be an analysis of existing government policies, policy options and their consequences and to develop and provide other relevant policy-related information to policy makers.

- Develop a system of cataloguing the germ plasm of the crops and livestock that exist in the region including ways and means of storing some of these.

- The strengthening of faculties of agriculture, forestry and veterinary

medicine in the region so that they can have strong undergraduate and post-graduate programmes. This will enahle the national agricultural research systems to have adequate manpower and, one which has been trained in the environment in which they will be working.

The educational and training strategy will be implemented in close collaboration with the Manpower Development Programme for which Swaziland has a coordinating role.

In implementing collaborative research programmes efforts will be made to liaise closely with other sub-sectors. For example, there will be need for close collaboration for commodity projects such as Sorghum and Millet and Grain Legumes (GLIP) with the Food Security Programme for which Zimbabwe has the coordinating role.

The Land and Water Management Research Programme (L&WMRP) will be developed in close collaboration with the Soil and Water Conservation and Irrigation for which Lesotho has a coordinating role.

The need to plan and/or reorganise the national Agricultural Research Systems (NARS) in the SADCC so that they may respond better to the demands of the farmer have, fortunately, been recognised by most nations. Some member States have been assisted in this endeavour. The steps to be taken in attempting to make the NARS strong and responsive to their respective country's needs will be:-

- Develop the set of priorities which shall apply to the NARS and which take into account the needs of the small farmer. Show how these may be phased in over a ten year period. Indicate those which may change in time e.g. more land is brought into arable agriculture.

- Develop a plan for the publicly funded NARS using a basic set of criteria which are similar for each country. The plan would show the expected rate of growth of the NARS for an initial ten year period.

- Show the staff profile for the NARS consistent with (1) and applying the set of priorities which have been developed.

- Develop the plan for physical needs of the NARS over the 10 year period. This would include outlying research stations etc.

- Examine the other agricultural research agencies on the national scene, universities, parastatals, industrial and dem astrate how these might be best integrated into the NARS.

- Examine the technology transfer linkage that operates within the country. Determine whether a satisfactory mechanism exists for the two-way flow of information in particular back to the researcher to assist in developing appropriate technology.

- Comment on and examine the NARS contribution to regional programmes and on linkages current and needed to ex-regional/international programmes.

The development of the individual NARS plans as well as the regional cooperation plans will in addition indicate the type of research information required from external agencies in order to complement the NARS capability. These needs may be of great importance to the NARS of the SADCC but it will also be extremely important information for the concerned external agencies and cooperating partners.

Funding will be needed to undertake feasibility studies in these broad fields so that projects may be developed and implemented.

Expected results of SADCC Agricultural Research Strategy

1. Provide a framework for relationships between national and regional structures.

2. More effective coordination of assistance in support of nationally and regionally determined high priority research needs.

3. More effective coordination with the International Agricultural Research Centres and with other international agencies.

4. Improve smallholder and emerging farmer productivity and welfare.

5. Accelerate exchange of information and enhanced professional capabilities.

6. Publications will lead to improved communications among the research, extension and training professionals in the region.

7. Short course training will lead to improving skills and be developed to address issues which later become problems.

8. Training in multidisciplinary approach to research will result in a better mix of professional skills to match the needs of the several countries' current and anticipated programmes.

9. Post-graduate level training will lead to regional collaboration in education efforts and to the preparation of African scientists in their own environment.

10. Production of relevant text books and reference materials will substantially increase the ability of those receiving the training to contribute to national development objectives. It will also be expected to lead to revision of curricula.

11. The development of a food crop production collaborative research programme will lead to increased productivity in smallholder and emerging farmers' fields through national research and extension services. (Sorghum and Pearl Millet and GLIP programmes).

12. Policy research will over time, lead to greater understanding for policy changes.

13. Studies in land and water resource management collaborative research will lead to increased agricultural productivity by smallholders and

open up more land for agricultural activicies in the 400 - 600 mm rainfall zone.

14. Farm power collaborative research can lead to timely operations of agricultural activities, labour saving and increased agricultural productivity. It will also encourage the development of a rural industry involved in the production of needed tools and agricultural equipment suitable for utilising animal power.

15. Development of smallholder dairy, small ruminants, pigs and poultry will lead to increased food supply and higher rural incomes resulting from sale of additional food products and from small agro-industries, and processing of animal products such as cheese-making, mohair weaving etc.

ANNEX A

SUMMARY OF ACTIVITIES AND STAGES OF IMPLEMENTATION - SADCC AGRICULTURAL RESEARCH

Activity	Programme Design (Year)	Programme Start-up (Year)	Length
1. Development of policy guidelines and a management system for collaborative activities including: Establishment c SACCAR	1983	1984	N.B. SACCAR is on-going
2. Conduct conferences, workshops, short courses and technical meetings (SACCAR - managed activity)	1983	1986	Indefinite
3. Establish a regional professional-oriented and extension/layman-oriented publications (SACCAR-managed activity)	1985	1986	Indefinite
4. Establish a regional-wide data base (SACCAR-managed activity)	1985	1986	On-going but needs updating. Indefinite
5. Provision of study and travel grants for staff (SACCAR-managed activity)	1985	1986	Indefinite
6. Implementation of research grant programme (SACCAR-managed activity)	1985	1986	Indefinite
7. Provision of multidisciplinary training for staff required for adaptive research	1986	1987	5 - 10
8. Provision of training in disciplines critical to collaborative research programmes	1986	1987	5 - 10
8a. Preparation of country Agricultural Research Resources Assessment ARRA	1983	1984	Completed but needs continuous updating
8b. Preparation of a Zonal Programme Document	1983	1984	Completed but needs continuous modification

9. Provision of training for agricultural technical editors science writers	1986	1987	3 - 6
10. Development of SADCC capacity in graduate level training	1985	1987	10 - 20
11. Development of appropriate texts and reference materials for certificate and diploma training institutions	1986	1987	2 - 5
12. Development of a food crop production collaborative research programme			
a. Sorghum & Millet	Before 1983	1984	20 - 25
b. Maize Research Project	In design stage	-	-
c. Grain Legume Improvement Project	1984	Awaiting funding	5 - 10
13. Development of a land and water resource management collaborative programme	1984	Funding partly pledged	10 - 20
14. Development of a Farm Power collaborative research programme	1987	1989	5 - 10
15. Develop a small scale dairy, small ruminants, pig and poultry collaborative research programme	1987	1988	5 - 10
16. Development of a horticulture and speciality crop corraborative programme	1988	1990	5 - 10
17. Development of an economic and agricultural policy collaborative research programme	1986	1987	-

ANNEX B

STATUS OF PROJECTS

	US $	Period
1. SACCAR - Funded There is a shortfall in working space. 100 m^2 to include a Documentation Centre and Small Conference Room @ US $600/$m^2$ US $ 600,000 will be needed	5 million	1985-1990
- Additional	60,000	1985-1990
2. Sorghum and Pearl Millet	17,857,183	1984-1989
3. Land and Water Management Research Programme (L&WMRP)		Funding is needed especially for Phase I. One donor has made a pledge.
(a) Rainfall Management		
Phase 1 2 years	1,386,200	To be determined when Phase I of 3(a) is completed
Phase 2 4 years*	-	
(b) Water storage in soil and use by crops over 5 years*	-	"
(c) Crop management 5 years*	-	"
(d) Draft Power and Tillage 3 years*	-	"
Other aspects of LWMRP are:		
I. New Crop Introductions		"
II. Management of Grazing Lands		"
III. Agro-climatology		"
IV. Agro-Hydrology		"
V. Action Research will also be reviewed soon		"
4. Grain Legume Improvement Programme		
Phase I	16.3 million	5
Phase 2		20
Pledges have been made for Phase I		

Phase I will include:

(a) Establishment of research facilities at Chitedze, Malawi
(b) Training of 22 M.Sc and 5 Ph.D Scientists
(c) Workshops and seminars
(d) Study visits to participating SADCC member countries
(e) Germ plasm collection and evaluation, conducting experiements in breeding, agronomy, etc.

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* To be determined after Phase I of the project has been completed.

Section Four

SOIL AND WATER CONSERVATION AND LAND UTILISATION

SOIL AND WATER CONSERVATION AND LAND UTILISATION

Although of crucial importance to the future development of the SADCC region this sector is still in its infancy. The Government of Lesotho has, however, established a Coordinating Unit in Maseru and consultations are taking place among SADCC member States aimed at elaborating a programme and identifying projects of regional priority. This is a complex task since the region has a great diversity of eco-systems, climatic and geographic conditions and water systems. As a result there is also a considerable variety in the nature and severity of the conservation problems which face member States and the types of conservation measures best suited to address these problems.

All SADCC member States, however, face serious conservation problems and agree that much can be achieved to overcome these difficulties through a coordinated regional approach to environmental protection. While the rate of environmental deterioration is accelerating and in many cases threatening the production of food and fuelwood, it is not at present sufficiently understood that demographic pressures have altered the relationship between the land, the beast and the man, and that modifications to farming systems and practices have become a necessity for survival. SADCC places a high priority on environmental protection and the programme being developed in this sector will seek to ensure that government officials responsible for conservation and agricultural development, as well as the farmers themselves, are made fully conscious of these problems. This awareness must permeate all programmes, both national and regional, which have an impact on the environment. To this end the Soil and Water Conservation and Land Utilisation sector will liaise closely, in particular, with the Agriculture, Forestry and Energy Sectors.

In approaching these problems, Lesotho, in its capacity as sector coordinator, is seeking to develop a programme aimed at assisting member States:

(i) to improve their performance in relation to soil and water conservation and land use including range management;

(ii) to avoid conflicts between agricultural development and environmental protection;

(iii) to develop policies and practices for involving the people in conservation activities; and

(iv) to interest relevant institutions in the problems of conservation and land utilisation.

In order to achieve these objectives efforts will be made to maximise the sharing of training and other technical facilities which exist in the region. Programmes will also be developed to provide for the exchange of data, information, knowledge and expertise among the member States. Where appropriate jointly run field programmes will be developed and the Coordinating Unit will assist member States in the preparation of priority projects.

Three initial projects have been identified and brief descriptions appear as an Annex to this report.

ANNEX A

PROJECT PROPOSALS

A PILOT PROJECT TO INTRODUCE AND TEST CONSERVATION TECHNIQUES ON STEEPLY SLOPING LAND, MALAWI

The Project will be piloted in Malawi and will have a regional impact on all countries with steep sloping topography.

BACKGROUND

High land pressure, due to the rising population has forced many subsistence farmers to cultivate land that would normally have remained under natural vegetation. It has been the policy of the Government of Malawi to discourage crop cultivation on land of over 12% slope.

During the last 10-15 years, there has been a marked increase in cultivation of steep slopes due to population pressure on the more suitable land.

Resettlement is not a practical option in many cases due to the high cost and lack of available suitable land. A satisfactory conservation package has yet to be designed for steeply sloping land in Malawi and elsewhere in the region. The only advice presently given to farmers on proper land use is to plan on ridges aligned on the contour backed by bands (graded structures).

So far there is no formal programme of research or testing new farming techniques on steep lands in any SADCC member State.

AIM OF THE PROJECT

The project aims to develop appropriate farming systems that could be implemented on steep land without degrading the soil's physical as well as fertility status.

EXPECTED OUTPUT

It is expected that food production from such land will be maximised on a sustainable basis.

PROPOSED ACTIVITY

The project will undertake the conservation of pilot catchment areas of up to 1,000 ha on steep land of over 12% slope.

Specifically the Project will

(a) identify cost-effective and socially acceptable conservation methods suited to steep land. These will include use of both physical technique and vegetation (alley cropping, strip cropping and terracing). Attention will also be paid to livestock grazing

patterns and planting of fruit trees to make the package attractive.

(b) select one of the pilot areas where conservation is urgently needed and farmers would be willing to participate.

In the process, determine the likely social economic and technical constraints that might present problems in a large conservation programme based on the pilot project.

(c) assist the farmers with implementation of conservation measures.

(d) compile a simple manual of conservation techniques for steep land for use by field staff when planning such areas.

(e) prepare a detailed report on project fundings which, together with (d), will be made available to all SADCC member States.

PROJECT DURATION AND PHASING

Phase 1: (2 months)

Arrival of Soil Conservation consultants to plan with Land Husbandry personnel, potentially applicable methods, and identification of possible site.

Phase 2: (2 months)

Study tour by local staff involved in the project to countries institutions undertaking similar projects.

Phase 3: (4 months)

Site selection by local personnel with involvement of local farmers. discussion of conservation methods with farmers.

Carry out detailed topographic surveys and gather all relevant basic data.

Phase 4 (6 months)

Construction of necessary conservation structures, including the supply of vegetative material, e.g. seedlings as advised by the consultant earlier on.

Phase 5 (2 months)

(Last phase) compilation of the manual by consultant and local personnel after conducting observations on the farming systems for 4 years.

REQUIRED RESOURCES

1 x Farming Systems Consultant 6m/m (3 visits of 2 months each)
1 x Land Husbandry Officer for 5 years
2 x Field Officer (L.H.) for 5 years
10 x Labourers for 2 years

Equipment: 1 x 4 W.D. vehicle, simple levels, fertilizers, seed and vegetative materials.

TRAINING COMPONENT

This will be in the form of study tours which will last a total of 2 months.

FINANCE AND FUNDING

Contribution by Government:

1 x	Land Husbandry Officer @ K5,000 per annum for 5 years	25,000
1 x	Field Officer @ K3,000 per annum for 5 years	15,000
2 x	Field Assistants @ K1,500 per annum each for 5 years	15,000
10 x	Labourers @ K360,00 per annum each	3,600
	Sub Total (Salaries)	58,000

Vehicle running cost @

10,000 km/year @ 50t/km for 5 years	25,000
Sub Total	83,600
Plus 25% contingency	20,900
TOTAL	104,500

External Contributions

Consultants 6m/m (3 visits of 2 months)	40,000
International travel (3 return trips)	12,000
Study tours by local personnel (Air fares and hotel bills)	30,000
Purchase of 4 W.D. Vehicle	20,000
Equipment and material	4,000
Production of manual	3,000
TOTAL	109,000
Plus 25% Contingency	27,250
	136,250
GRAND TOTAL MK	241,000

U.S. Dollar = MK 1.64

RAINFALL SIMULATOR TESTS AND PURCHASE OF A RAINFALL SIMULATOR, LESOTHO

Country: LESOTHO

Duration: 5 years

Cost of project:

Total cost	M 491,200
Government contribution	121,000
Additional funding	370,200
Total	491,200

OBJECTIVES

1. The long term objective of the project is to encourage correct cropping practices and management of the soil to reduce soil loss and thus increase food production in the arable land.

2. Short term objectives to be achieved with implement tion are:-

   a) Rainfall simulator trial tests will be used to obtain estimates of soil erodibility (k-factor) for various soils, and a data bank of the k-factor of various bench mark soils in different locations will be compiled. These soil erodibility factors will be compared with the k-factors predicted by a nomograph to check the validity of the predicted values, since it will be quicker and less costly to rely on nomograph values for quick reference in planned areas. Tests will classify the soils into broad erodibility classes. Soil erodibility factor is a parameter in the USLE signifying soil loss per unit of rainfall erosivity on a unit plot.

The k-factor is one of the necessary data to be included in the USLE as the valuable first approximation data to be used for the country's conditions. The USLE, developed in the USA, is an erosion model to predict long term average soil loss from specific fields in specified cropping and management systems. Its major purpose is to guide methodical decision making in conservation planning on a site basis in order to apply optimum erosion measures on the basis of the soil loss tolerance.

Further, the difference in measured and predicted k-factors, as mentioned above, will help in the local conservation planning and conservation training programmes since the difference indicates crop and tillage practices history.

   b) Surface cover plays a dominating role in reducing soil losses and run-off. The rainfall simulator test trials will be used as a demonstration tool to show the ability of any level of surface mulch to capture run-off and reduce soil loss. Additionally, these tests will be used to quantify mulch effects for a variety of soils, slopes, crops, tillage practices and anticedent moisture conditions in practical Lesotho conditions. This will provide another local input data in the USLE - the mulch and

canopy cover effects, the c-factor. The c-factor also includes land use residual. This variable is the measure of the difference between the measured and predicted k-factor values as described above. And this variable will also be derived by rainfall simulator tests. In the USLE, the c-factor is the ratio of soil loss from land cropped under specified conditions to the corresponding loss from clean-tilled continuous fallow.

c) A rainfall simulator will also be used to determine initial abstraction, the depth of water which infiltrates into the soil profile before run-off commences, and the average infiltration rates for various soils and tillage practices. This will provide an important data for the run-off equation.

BACKGROUND

Soil erosion is a major constraint to long-term objectives for increased food production in Lesotho. The Government of Lesotho has, in its third 5-year development plan, targeted reduction in soil loss through an intensified soil conservation programme.

Soil erosion is mainly due to incorrect management and inferior cropping practices, and this cannot be tolerated, especially in the light of increasing losses of potential agricultural soils to uses for road development, airports, urbanization and nature conservation.

It has been determined from aerial photographs that about half of the 600,000 ha. of land recently farmed is on the potentially high yielding soils. These soils have both physical and chemical characteristics which make them susceptible to water erosion.

Due to mismanagement and inferior cropping patterns, annual soil loss from the arable land in the country may be in excess of 40 tonnes/ha which exceeds by a great margin the 12 tonnes/ha acceptable annual soil loss level for long term, sustained agricultural production. This soil loss is attributed mainly to rill and sheet erosion. About 4% of the arable land is lost to gullies annually, while extension or widening of new gullies accounts to a loss of 1000 ha of the arable land annually. This erosion process is made worse by the steep topography, long slope lengths and shallow, eroded and erodible soils that form a natural feature of the topography.

If this erosion process continues at this rate, within a few years much of the land will not be suitable for cultivation.

DESCRIPTION OF PROGRAMME

Rainfall simulation tests will be run to measure soil losses and run-off in arable lands with a variety of practices - tillage and mulch practices on the so-called "bench mark soils of Lesotho" which form part of the productive soils in Lesotho. A technical description on each of these soils is being prepared by the Soils Section of the Division of Conservation and Foresty. A swanson rotaring - boon simulator will be used to apply two 63mm/hr storms on run-off plots in the croplands, two plots as bare reference plots and the other two with mulch.

1) Soil erodibility factor (k-factor) is measured for each of the soils.

2) The effect of mulch on soil loss and runoff for the two types of treatment.

The results will be obtained from samples of soils to determine soils texture, moisture content and sediment concentration.

The tests will be run during the 7 month dry period (May - Nov) in selected areas on "Bench Mark Soils" with an average of 2 day test runs in a week. Two 1-hr test runs per site will be done.

A station wagon will tow the simultor mounted on a standard caravan chassis to allow long distance high speed transport. The station wagon will also be carrying test and laboratory equipment plus tools.

3) Included in the programme, is the training of an engineer and assistants to carry out the tests and analyse the results of simulator test runs. The training will have to be in the country where simulator experimental results have been used to localise the input data in the USLE and the simulator long term research data in refining the USLE.

ECONOMIC JUSTIFICATION

Increased food production is both a long term and short term objective of the Government of Lesotho and therefore counter measures to soil erosion which reduce loss of top soil and help conserve moisture in the soil must be implemented on all croplands. Results of the rainfall simulator tests help in conservation planning and provide the technical basis for implementing optimum conservation measures. Its results will help provide a model for incorporating correct management and cropping practices for the farming community, and this will make a contribution to the self-sufficiency and well being of the nation as shown in the following table depicting the effect of soil loss on maize production in Lesotho as extrapolated from table B-1 of the LASA Research Report No. 3, "An economic and policy analysis of soil-water problems and conservation programmes in the Kingdom of Lesotho".

From the table shown below it is seen that about 40 tonnes/ha soil loss will result in very high maize value losses. Simulator trial tests over 2-3 years period will cost about M170,000 as compared to 2.57 million Maluti annual maize value loss when 100,000 ha is farmed resulting in about 3 mm loss of top soil. This corresponds to the estimated 40 tonnes/ha soil loss due to sheet and rill erosion resulting from incorrect management and cropping practices.

Mechanical measures are needed for "most cropland in Lesotho to make the land base secure for the inputs necessary for high production. However, much of the land needs only minimal engineering measures but does need sound conservation cropping programmes". This observation is extracted from a report by a former conservation Agronomist/Planner in the Division of Conservation and Forestry; H.W. Fausch.

TABLE 1 EFFECT OF SOIL LOSS ON MAIZE PRODUCTION

Plot No.	Amt. of top soil remaining	Observed maize yield kg/ha	Annual value of yield M/ha	Reduction M/ha
1	30	4825	M1626.71	
2	27.5	4750	M1601.42	M25.29
3	22.5	3650	M1230.57	M396.14
4	15.0	3575	M1205.29	M421.42
5	7.5	3550	M1196.86	M429.85
6	0	3200	M1078.86	M547.85

Increasingly high costs of installing the engineering measures call for greater emphasis on the biological measures which also very directly involves the land user. Rainfall simulator results will be indispensable in the conservation planning programme through the measured input data in the USLE to implement only the optimum conservation measures for the allowable soil loss tolerances indicated. At present no such data exists except that extrapolated from other countries and not necessarily applicable to Lesotho.

It has been observed that, with high levels of soil management the potential is there to produce 300,000 ton of maize annually on the 100,000 ha of land normally growing maize. This would be enough production to feed the nation. This is the short and long term objective of the country, which can be attained through correct management and cropping practices, and application of optimum cost effective conservation measures. These applications can only be implemented if the local input data is available. And the simulator is needed to produce these data in the short term.

FINANCIAL SUMMARY

1) Estimated capital cost

Swanson rotating boom simulator and accessories	M 25,000
Transport towing vehicle	25,000
"Porta Pools"	5,000
Trial plots equipment and tools	200
Laboratory equipment	5,000
Total capital cost	M 60,200

2) Estimated operating costs per annum

Test trials	M300,000
Transport	8,500
Subsistence plus labour costs	18,000
Training	10,000
Salaries	95,000
Total Annual Operating Costs	M431,500
Combined Initial Year Capital and Operating Costs	M491,700

AFFORESTATION OF THE AREA SURROUNDING LETSA LA LETSIE, LESOTHO

Area: 85 ha

Duration: 2 years

Total Costs: US $ 300,000

Government Contribution: US $ 114,000

Additional Financing Required: US $ 186,000

BACKGROUND JUSTIFICATION

Letsa la Letsie is an artificial lake found in Quthing District near Mphaki area. The lake is 100 km away from Quthing town, from which it can be reached by car in about one and a half hours. Its areas is about 22 ha when the volume of water is at its minimum and 35 ha when at its maximum. Its elevation is 2375 meters above sea level. It is almost totally enclosed by a series of mountains of an average slope of 35 degrees.

It gets its water mainly from the watershed which starts from the border of Lesotho/South Africa and extends some 9 kilometres to the south-east border of the lake and to a lesser extent from the water run off of the slopes surrounding the lake.

The volume of water accumulating in the small natural depression of the lake has been increased by the construction of a rough, concrete dam having a height of about 2 metres and a top width of 60 cm. This dam is, however, ill-constructed and about 1.2 meters of its height is unutilized as it allows the water to leak through.

There is a good access to the lake by an earthen road, running along the Southern border of the lake.

The rocks surrounding the lake consist of basalt, which outcrops frequently adding to the scenic value of the area. The soil is therefore of a basaltic origin, dark in colour, rich in organic matter and acidic having a pH value of 5. Its depth varies from 60 cm at the foothills to a few centimetres on the slopes. In general the soil, with proper ground preparation, is considered suitable for forest growth. In view, however,of the high elevation, the choice of species to be used is rather limited. The exact rainfall is not known, but is adequate for forest growth, judging from trees growing in similar nearby areas. The main ground vegetation found on the slopes consists of Chrysocoma Tenuifolia and some grasses.

The main additional species that will grow there are Cupressus glabra, which will be planted on the slopes, and Salix babylonica and Populus canescens which will be planted near the lake water and in general where there is abundant soil moisture. Some other species to be planted in small numbers are pinus radiata, Pinus patula, Pinus ponderosa, Pinus pinaster, Pinus tumberragii, pinus densiflora and Robinia Pseudaoacia. The greater the variety of species to be used the more attractive the

environment will be made.

Two thirds of Lesotho consists of mountains, which with very rare exceptions, are treeless. The country is therefore in great need of fuelwood and other forest products and in urgent need of arresting soil erosion through various means, including afforestation.

Afforestation of the lake and its environs will enhance their already high beauty through the combination of an extensive mass of water with green trees.

At present the area around the lake and indeed all the watershed from the border with South Africa covering an area of about 700 ha, is being used for grazing. Some 600 animals graze in the area. The livestock owners are organized into a Grazing Association, though some graziers are not members of the Association. The watershed has ben divided into 3 areas and each such area is used annually on rotation for grazing. The area earmarked for afforestation is about 85 ha out of which about 12% or 15 ha are unplantable due to rockiness.

OBJECTIVES

Long-Term Objectives

The afforestation of the area surrounding the lake will aim at the following long-term objectives:

1) Protection of the lake against siltation.

2) Enhancement of the beauty of the lake and its environment; hence enhancement of its value for recreation and tourism;

3) Production of fuelwood and other forest products;

4) Provision of employment to the people;

5) Provision of clean drinking water for livestock;

6) Provision of fodder - use of branches of certain species such as *Salix viminalis* and ground vegetation;

7) Provision of shelter against heat and cold to livestock when the trees grow above animals' heads.

By repairing the existing dam, so as to prevent leakage, and by raising its height by about a meter, the following objectives may also be attained:

1) The lake may be used for fishing - some fish already exist in the lake.

2) The lake may be used for boating, windsurfing and in general for recreation and tourism.

With further improvement of the dam and installation of the necessary

plant, hydro-electric power may be generated. Though a feasibility study carried out by the Highland Water Project has shown that this lake is of low potential for that purpose; the idea has not however, been altogether abandoned.

Short-Term Objectives

The short-term project objectives are to:

1) Come into agreement with the Grazing Association and local Authorities for allocation of the necessary land for afforestation.

2) Fence in the area to be afforested, allowing for access of the animals to lake water.

3) Construct two paths (to be converted later into Nature Trails) one all along the middle of the slopes and one all along the ridges surrounding the lake.

4) Prepare the ground for afforestation through the construction of gradoni and pits on the slopes and cross-cultivation and pitting on level ground.

5) Planting the prepared ground.

6) Repairing and raising by one meter the existing dam and enriching the lake with fish.

7) Reconstructing the existing road adjacent to the lake for about 300 meters.

8) Constructing a tourist pavillion for supply of refreshments and food to visitors.

OUTPUTS

Expected direct results of the project include the following:

a) Production of 210 m^3 of wood products per year.

b) Production of fodder for about 80 livestock for four months per year.

c) Provision of 10,000 man days of employment for establishment of the plantation and 400 man days per year after establishment for tending and utilization operations.

USE OF OUTPUTS

The direct outputs will be used by the people of neighbouring communities against payment of a fee. Twenty percent of the revenue will be spent for development projects required in the same communities.

The results of the project will be used for execution of similar activities in other areas of Lesotho and in other countries having similar conditions and problems.

PLAN OF WORK

the project will be implemented in two years. In the first year the activities for attainment of short-term objectives (1) to (5) and in the second year the activities for attainment of short-term objectives (6) to (8) will be executed.

Before the execution of any activity, extension officers will explain to the people concerned the benefits to be obtained from the plantation to be established and the need for its protection, maintenance and proper utilization so as to enjoy these benefits on a sustained basis. Such extension work will ensure the participation of the people in both the execution and maintenance of the project.

INPUTS

(a) Government Inputs	US$
1 part time Forester (professional level) 12 man months	4,362
1 Forester (sub-professional level) 24 man months	6,324
1 Bulldozer	88,000
Land	15,314
TOTAL	114,000

(b) Donor Contribution	
1 Four wheel drive vehicle	12,000
1 lorry	52,000
Tools	700
Fencing Materials	4,000
Plants	8,000
Fertilizer	1,400
Labour for afforestation (including the construction of two paths)	51,000
Running of machinery	15,000
Construction of a tourist pavillion	20,000
Repairing and raising water dam by 1 metre	2,000
Reconstructing the road for 300 metres	2,000
Maintenance of the plantation for one year	1,000
Contingencies	16,900
TOTAL	186,000
GRAND TOTAL (a) + (b)	300,000

INSTITUTIONAL FRAMEWORK

The executing body will be the Ministry of Agriculture and Marketing. The Director of Conservation and Forestry Division will be directly responsible.

STATUS OF PROJECTS - SOIL AND WATER CONSERVATION AND LAND UTILISATION

ANNEX B

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
7.0.1.	Establishment of a Coordination Unit for Soil and Water Conservation and Land Utilisation	1.662 -	1.662 -	0.815 0.600	- -	Sweden (SK6,500,000 over 2 years).
7.	Pilot Project for Conservation Techniques on Steeply Sloping Land, Malawi	.147	.083	-	-	Presented at Harare.
7.3.1.	Rainfall Simulator Tests, LESOTHO	.191	.144	-	-	Presented at Harare.
7.3.2.	Letsa La Letsie Afforestation LESOTHO	.300	.184	-	-	Presented at Harare.

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Section Five

LIVESTOCK PRODUCTION AND ANIMAL DISEASE CONTROL

LIVESTOCK PRODUCTION AND ANIMAL DISEASE CONTROL

Introduction

The livestock industry (especially cattle) plays an important and ever increasing role in the economies of all SADCC member States. Beside providing rural households with a source of income, milk, meat and draught power for crop production, the industry is also a source of foreign exchange to some member States from the export of hides, leather and leather goods and beef. Animal draught power and manure, in particular, constitute important inputs for the development and indeed the improvement of SADCC Agriculture. In fact these inputs are critical for the achievement of food self-sufficiency among the farming households who cannot afford tractors and fertilizers. Further, a significant number of the SADCC population derives its employment from the livestock industry. In addition, the livestock industry provides capital which is in turn invested in other sectors of the region's economies and thereby creating a foundation for diversification.

Stratification for Livestock Production

At present the SADCC cattle population is about 29 million head of which about 75 percent is owned by rural small holders, and the remaining 25 per cent by freehold/commercial, and state farms. (See Table 1). While productivity coefficients such as calving rate, live weight gain, etc., are high in the freehold/commercial subsector, the same is not the case in the smallholder system.

Table 1 SADCC Cattle Population (1985) by Production Systems

	SmallHolder/ Communal	Freehold/ State Farm	Total (Million)
Angola	3.15	0.03	3.18
Botswana	2.21	0.39	2.60
Lesotho	n.a	n.a	0.56
Swaziland	0.49	0.13	0.62
Malawi	0.88	0.03	0.91
Tanzania	9.90	2.40	12.30
Zambia	2.23	0.35	2.58
Zimbabwe	3.40	2.07	5.47
Mozambique	0.65	0.33	0.98
TOTAL	22.91	7.29	29.20

Source: SADCC Ministries of Agriculture

This sub-sector is characterised by overstocking, poor breeding stock, low technical know-how and inadequate support services. Whereas the more developed commercial sector will be encouraged and supported, greater attention and emphasis will be placed on the small holder in order to achieve higher levels of production and productivity.

Animal Disease Control was adopted as a priority sector for regional cooperation within the field of Food and Agriculture since disease does

not recognize national boundaries. Whereas the control or even eradication of animal diseases is important for a healthy livestock sector, the ultimate objective must be the implementation of an integrated and comprehensive programme of livestock production. Thus, the strategies and programmes for the future will also address issues of pasture management and improving grazing systems, improving livestock breeds and breeding systems, nutrition, etc.

Furthermore, there is need for emphasis to be given to projects which would result in the effective transfer of technology. The capacity and capability for the production of important inputs such as vaccines, anthelmintics and acaricides is largely under-developed in the region as a whole. SADCC is pesently too dependent on outside sources, for essential vaccines such as Blue-tongue, Botulism, Rift Valley Fever, African Horse Sickness, Lumpy Skin, etc. Most of these are not produced in the industrial countries of the North due to the restricted occurence of the disease in tropical areas. Regional laboratories and/or commercial concerns should be identified and upgraded to enable them to supply the region's requirements for these products.

The introduction of new methods of animal husbandry, especially to the traditional rural communities requires that due care be taken not to offend social and behavioural patterns and that the methods of extension do not generate resentment. Thus the strategy for this sector for the next five years will comprise two major elements:

- the consolidation of the current programme of control and/or eradication of major animal diseases e.g. FMD, Tsetse Fly and Trypanosomiasis, Rinderpest, East Coast Fever;

- the elaboration of programmes and projects for improved livestock production including dairy production, small livestock, improvement of pastures and pasture management, improving stock breeds and breeding methods. Associated with this will be efforts to develop a regional industry for the production of veterinary products and stock feeds. This will be pursued in cooperation with the Industry sector.

The training of appropriate manpower is crucial for the success of this strategy and the programmes thereof. Hence, programmes for the training of animal health personnal and professional veterinarians will be formulated within the context of the Regional Manpower Development Sector.

Status of Projects

A brief description of a new project to strengthen the veterinary facilities in the South West of Angola appears as Annex A. A report on the status of projects appears as Annex B.

ANNEX A

PROJECT PROPOSAL

VETERINARY ASSISTANCE IN THE SOUTHWEST OF THE PEOPLE'S REPUBLIC OF ANGOLA (PROVINCES OF HUILA, CUNENE, NAMIBE AND BENGUELA)

I. SUMMARY

Government Implementing Agency:

Livestock Department of the DNOPA/Ministry of Agriculture

Estimated starting date:

January, 1986

Duration:

5 years

Government inputs:

497,206,000 Kwanzas*

Donor inputs:

2,371,030 US$

Expected effects of the project:

By resorting to international assistance, we intend to increase the efficiency and coverage of veterinary assistance structures in the Provinces in the south of People's Republic of Angola in order to bring about substantial improvement in the existing sanitary conditions, and as a result minimize risks of some diseases spreading to neighbouring countries. Improvement in the sanitary coverage of livestock in this region should lead to a decrease in mortality rates and ultimately to an increase in rural population's economic resources.

II BACKGROUND AND JUSTIFICATION

1. The Provinces of Huila, Namibe, Cunene and Benguela, with an area of 262,824 km^2, equivalent to 20.8% of the total area of the country, has 3,150,000 cattle, 780,000 goats and 252,000 pigs. These figures account for 90%, 52% and 31.5% respectively of the total of these categories of livestock in the People's Republic of Angola.

   The figure below shows the geographical distribution of livestock, percent of total in each region and density for each species:

	Huila	Cunene	Namibe	Benguela	Total
1. Area km^2	92,000	77,200	55,816	37,808	262,824
2. Existing Livestock					
2.1. CATTLE					
Number (000)	1,417.5	945	315	472.5	3,150
% of total	45	3	10	15	100
Density/km^2	15.41	12.24	5.64	12.50	11.99
2.2. GOATS					
Number (000)	491.4	109.2	70.2	109.2	780
% of total	63	14	9	14	100
Density/km^2	5.34	1.41	1.26	2.89	2.97
2.3. PIGS					
Number 10^3	171.3	5	12.6	63	251.9
% of total	68	1.98	5	25.02	100
Density/km^2	1.86	0.06	0.23	1.67	0.97

The fact that cattle prevail numerically over other species, along with their social and economic importance for the rural population in the south of the country was what determined that cattle were to be the main subject-matter of this Project. Owing to agro-ecological, social and religious factors, the rural populations' lives are centred on cattle. In fact, this species of livestock is the populations' traditional food supplement.

2. With respect to the diseases appearing below (Notifiable diseases), the sanitary situation during the last six years was as follows:

	Number of Outbreaks					
	1979	1980	1981	1982	1983	1984
Contagious Bovine Pleuropneumonia	446	315	169	164	47	126
Anthrax	42	139	124	49	18	26
African Swine Fever	28	15	29	25	30	25
Newcastle Disease	-	2	-	3	11	2
Rabies	26	8	-	3	11	16

The number of outbreaks reported are those that were actually detected by the sanitary assistance network. Since the network is inadequate to cover all the sanitary areas and is insufficiently equipped in terms of mobility, this situates the incidence of disease far below the number of outbreaks which actually occurred.

The decline in recorded outbreaks in fact represents a weakening in coverage and control capacity not an improved disease experience. This reduction was largely the result of South African aggression.

In addition to these diseases, there are others in the infectious and contagious category which have undergone increasing, indeed alarming, development. The most outstanding due to their economic impact are the following: Bovine tuberculosis, bovine brucelloosis, pasteurelosis, enterotoxemia.

In the category of parastical disease, the following are of particular importance: hemoparasitoses, dermatoses, gastro-intestinal verminoses, cysticercosis, globidiosis, etc.

The overall rejection rate when carcasses are subjected to veterinary inspection is over 6% for cattle and over 14% for pigs.

3. During recent years some of the concerns of the Ministry of Agriculture have been to extend the sanitary coverage network and to carry out yearly vaccination campaigns against Contagious Bovine Pleuropneumonia, Anthrax and Black leg to improve the existing sanitary situation. Though some positive, encouraging results have been achieved in vaccination (1,520,000 cattle were vaccinated in 1980 against Contagious Bovine Pleuropneumonia, Anthrax and Black Leg), the occupation of the Cunene Province and the constant aggression against other Provinces by the South African army, as well as inadequate financial and material means in the competent structures of the Ministry of Agriculture, have all caused degradation of sanitary infrastructures (dip tanks and cattle crushes) and made widespread efficient sanitary coverage impossible. This has meant that out of the 130 dip tanks and 606 cattle crushes existing in the region, only 40% are operational and that number of animals vaccinated has decreased in the last 4 years (910,000 cattle in 1981, 635,000 in 1982, 423,131 in 1983 and 302,131 in 1984). As a result, the sanitary situation in the region has seriously worsened, causing heavy economic losses among the rural population.

III OBJECTIVES

1. Improve and extend sanitary coverage of livestock in the Provinces of Huila, Cunene, Namibe, and Benguela, and therefore increase the earnings of the populations that own the herds and help increase the supply of meat to other regions of the country.

2. Minimize the risk of some diseases spreading to neighbouring countries.

IV PROJECT DESCRIPTION

1. Re-establish the material basis for veterinary assistance by complete rehabilitation of existing sanitary infrastructures:

Designation	Provinces Huila	Cunene	Namibe	Benguela	Total
1. DIP TANKS					
1.1. Existing	63	30	13	24	130
1.2. In service	20	1	3	6	30
1.3. To be rehabilitated	43	29	10	18	100
2. CATTLE CRUSHES					
2.1. Existing	221	180	95	110	606
2.2 In service	146	30	55	56	287
2.3. To be rehabilitated	75	150	40	54	319

2. Gradually extend yearly vaccination campaigns in order to control Contagious Bovine Pleuropneumonia, Anthrax and Black Leg:

	Units	1986	1987	1988	1989	1990
Number of head	(000)	3,150	3,150	3,150	3,150	3,150
Coverage rate	%	30	38	46	60	75
Number of head to be vaccinated	(000)	945	1,197	1,449	1,890	2,363

Each Province's share is as follows: Huila (45%), Cunene (30%), Namibe (10%) and Benguela (15%).

3. Gradually extend use of dips for a better control of hemoparasitoses and dermatoses:

	Units	1986	1987	1988	1989	1990
Number of head	(000)	3,150	3,150	3,150	3,150	3,150
Coverage rate	%	20	23	26	30	35
Number of head to be vaccinated	(000)	630	725	819	945	1,103

Each Province's share is the same as percentages given in IV.2.

4. Treat 6,300 head per year, with each Province's share being the same as given in IV.2 and IV.3.

5. Train 112 technicians per year in basic animal husbandry.

V. DONOR INPUTS SOUGHT

Item	Costs in US$ 1986	1987	1988	1989	1990	Total
a) Veterinary specialist - 1	96,000	96,000	-	-	-	192,000
b) Medicine and vaccines	160,033	183,266	206,333	245,966	289,033	1,084,631
c) Medical and surgical equipment	14,500	18,000	22,000	28,500	36,000	119,000
d) Refrigeration system						
1. Kerosene refrigerators - 58	40,000	4,000	4,000	5,000	5,000	58,000
2. Iceboxes - 72	966	233	267	433	500	2,399
e) Tents - 72	14,500	3,500	4,000	6,500	7,500	36,000
f) Vehicles						
1. Trucks (6 Ton) - 9	100,000	20,000	-	20,000	40,000	180,000
2. Tanks Trucks (5,000 litre) - 9	125,000	25,000	-	25,000	50,000	225,000
3. Jeeps - 42	140,000	70,000	70,000	70,000	70,000	420,000
4. Motorcycles - 72	21,750	5,250	6,000	9,750	11,250	54,000
g) Total	712,749	425,249	312,600	411,149	509,283	2,371,030

VI. ANGOLA GOVERNMENT CONTRIBUTION

Item	Costs in Kwanzas (Kz)* - 10^3 1986	1987	1988	1989	1990	Total
a) Salaries	49,488	60,512	76,604	92,26	118,163	401,027
b) Professional training for technicians in basic animal husbandry	6,464	6,464	6,464	6,464	6,464	32,320
c) Building construction materials	5,000	5,000	5,000	5,000	5,000	25,000
d) Pesticide dips	2,704	2,958	3,194	3,536	3,967	16,359
e) Miscellaneous expenses	4,500	4,500	4,500	4,50	4,500	22,500
f) Total	68,156	79,434	95,762	115,760	138,094	497,206

* 1 US$ = 30 Kwanzas

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
2.0.1.	Regional Food and Mouth Control and General Vaccine Production (Study)	0.500	0.500	0.500	-	Completed, funded by EEC.
2.0.2.	Regional Food and Mouth Vaccine Bank	7.200	7.200	-	7.200	Interest from ADB.
2.0.3.	Regional Programme for East Coast Fever Immunisation - MALAWI/ MOZAMBIQUE/TANZANAI/ZAMBIA	5.900	5.900	-	5.900	Under negotiation with Nethlands/UNDP.
2.0.4.	Tsetse and Trypanosomiasis Training Centre - ZAMBIA	2.445 -	2.445 -	- -	0.120 2.325	Under negotiation with UNDP. Under negotiation with CIDA.
2.0.5.	Training of Animal Health Auxilliary Personnel	0.110	0.110	0.110	-	Funded by SIDA.
2.0.6.	Training of Technicians for the Repair and Maintenance of Equipment in Veterinary Laboratories	0.815	0.815	0.815	-	Funded by DANIDA.
2.2.1.	Botswana/Zimbabwe Border Fence - Vakaranga/Basuto Border Fence	0.500	0.500	0.500	-	Completed, funded by EEC.
2.2.2.	Eradication of Food and Mouth Along the Botswana/Zimbabwe Borders (and in Southern Malawi - see 2.4.3. below)	12.800	12.800	12.800	-	Funded by EEC.
2.2.3.	Regional Meat Inspector Training School, Lobatse, BOTSWANA	2.400	2.400	2.400	-	Operational: Funded by DANIDA and executed by FAO.
2.2.4.	Tsetse Eradication on Northwestern Botswana/Southwestern Zambia	4.500	4.500	-	4.500	Under negotiation with Canada.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON: FINANCING STATUS ACTION
2.3.1.	Production of Inactivated Rabies Vaccine - LESOTHO	0.145	0.125	-	-	Presented at Mbabane
2.4.1.	Tick and Tick-borne Disease Centre, MALAWI	14.200	14.200	-	-	Presented at Maseru, Lusaka and Mbabane.
2.4.2.	Food and Mouth Disease Control - Malawi/Tanzania/Zambia Borders	1.3	1.3	-	-	Interest from ADB.
2.4.3.	Foot and Mouth Disease Control - Southern Malawi	-	-	-	-	Now incorporated in project 2.2.2.
2.4.4.	Rinderpest Control - Malawi/ Zambia	1.100 -	1.100 -	0.125 -	- 0.100	U.K. grant. UK grant under negotiation. Interest from Canada, presented to New Zealand.
2.5.1.	Equipment of the Biological Substances Laboratory in MOZAMBIQUE	3.729	2.431	-	-	Interest from ADB.
2.7.1.	(i) Control/Eradication of Rinderpest in TANZANIA	7.35	4.75	3.75	-	Funded by EEC.
	(ii) Phase II	-	1.1	-	1.1	Under negotiation with EEC.
2.7.2.	Integrated Animal Disease Control, TANZANIA	4.230	4.230	-	-	Presented at Maseru, Lusaka and Mbabane.
2.8.1.	Establishment of a Zoonosis Centre in ZAMBIA	5.170	5.170	-	-	Presented at Maseru, Lusaka and Mbabane.
2.8.2.	Tsetse Eradication on the lower Zambezi - Zambia/Zimbabwe/ Malawi/Mozambique	15.24	15.24	15.24	-	Under implementation. Funded by EEc.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US $ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON: FINANCING STATUS ACTION
2.8.5.	Epidemiology and Control of African Swine Fever (ASF) - Angola/Malawi/Mozambique/ Tanzania	-	-	-	-	Documentation being finalised.
2.9..1.	Tsetse Training Complex, ZIMBABWE	-	-	-	-	Withdrawn.
2.9.2.	Animal Disease Reference Laboratory	2.5	2.5	2.5	-	Under implementation. Funded by DANIDA.

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Section Six

FISHERIES

FISHERIES

INTRODUCTION

In order to arrive at what would be developed as a regional five years development strategy for the Fisheries Sector, the Government of Malawi sent a mission to all member States to discuss with the technical and professional staff involved in this sector. During the consultations national plans for each country were examined. From these national plans a regional pattern of needs emerged which forms the basis of the regional plan for the next five years.

Marine Fisheries

The Marine Fisheries of the region'. .hree maritime states namely Angola, Mozambique and Tanzania fall into two distinct classes, artisanal and commerical. Of these two types, most emphasis has been placed on commercial marine fisheries. In most cases these were started prior to independence many years ago by foreign companies. More recently, however, the licensing of foreign fishing activities has been introduced and a number of state and parastal, commercial fishing enterprises have entered the business sometimes in conjunction with foreign companies.

Inland Fisheries

The SADCC region covers some 5,708,000 sq. km. of which over 150,000 sq. kms. is taken up by natural lakes, swamps, rivers, man-made lakes and water conservation dams which yield a total of about 300,000 metric tonnes of fish per year, giving an average consumption rate of 5.5 kg per head per annum from this source alone.

None of the member countries has a fully developed fisheries management programme owing to lack of adequate funds, trained manpower and source of readily available scientific data. Some of the member States, for instance, Malawi,Tanzania, Zambia and Zimbabwe have been able to commercialise their inland fisheries to an appreciable extent but artisanal fisheries are still undeveloped. Botswana and Mozambique on the other hand have a large and untapped potential. All countries in the region could therefore benefit from assistance in planning and developing this resource. Where waters are shared between member countries there is a need for a coordinated approach in research and development so that duplicated effort is avoided. This would also facilitate the conservation programmes and practices which are best planned and implemented jointly.

Aquaculture

It is generally recognized that sooner or later the fisheries resources in the region's natural bodies of inland waters will not be sufficient to meet future requirements. For this reason most countries in the region have aquaculture programmes presently at different levels of execution. Even Lesotho and Swaziland which have no natural bodies of water from which to exploit large quantities of fish, have in recent years embarked upon similar aquaculture programmes. Experience in aquaculture and inland

capture fisheries varies from country to country throughout the region and regional planning in these fields would offer distinct advantages. In this regard it will be beneficial for member States to adopt a common strategy.

PLAN OF ACTION

As indicated in the introduction, the following regional strategies for the Fisheries Sector have been developed:

Marine Fisheries

The three states which have marine fisheries are Angola, Mozambique and Tanzania.

All three countries plan to expand or intensify their efforts to fish within their territorial waters. The total potential yield from these countries marine fisheries is estimated at 100,000 tons per year, and if fully exploited would not only make the three states self-sufficient but could also meet the requirements of the rest of the region. Assistance will, therefore be needed to further develop the marine fisheries of these countries in the following broad areas:

(i) rehabilitation and expansion of the national fishing fleets;

(ii) provision of adequate assistance to the artisanal fishermen;

(iii) setting up of sound catch monitoring machinery based on updated research data;

(iv) assistance in promulgation of sound legislation to control all fishing activities including those of foreign vessels to ensure that no over fishing takes place;

(v) assistance in training technical and professional staff;

(vi) improvement of fishhandling and distribution facilities.

Inland Fisheries (Lakes, Rivers and Swamps)

(i) Training

On the inland fisheries scene emphasis is placed on the need for trained personnel to carry out the necessary development work. Already a training project proposal has been made by the technical consultative group for the sector.

ii) Stock Assessment

Stock assessment and research of the unexploited and underexploited waters is of importance. The sector will thus be seeking assistance for carrying out this task in order to make meaningful plans for projects to rationally exploit the freshwater fishery resources of the region.

(iii) Infrastructure

Infrastructure and equipment are very inadequate in all member States of the region, and development and production will form an important part of the regional programme of cooperation.

(iv) Marketing and Distribution Studies

The region needs a thorough study of the marketing of its fishery products.

(v) Documentation of Research and other Materials

Some of the states with a long history of fishing activity have amassed a wealth of data for their fisheries. This information is of vital importance to the planning of future activities in this sector. It is therefore considered very important, if not urgent, that this data be properly documented so that it becomes easy to retrieve. A documentation centre for the sector is planned.

(vi) Aquaculture Development

This includes training of aquaculture and provision of infrastructure.

REVIEW OF EXISTING FISHERIES PROJECTS

Regional Fish Production, Processing and Marketing Survey (4.0.1.)

This aims at determing the regional needs and possibilities for further fish production, processing and marketing of the catch remains relevant in the 5 years. This is a genuine regional project of importance to both marine and inland fisheries.

Study to Identify Regional Projects/Programms of Production and/or Commercialization of Fish and Fish Processing Materials and Equipment (4.0.2)

This project which is complementary to 4.0.1. aims at discovering non-fishing industries which could be diversified to produce fishing equipment within the region as well as expanding existing ancillary fishing industries (e.g. net making plants) to enable them to produce types of equipment which are currently imported into the region. This project is relevant to both marine and inland fisheries.

Fisheries Administrative Unit (4.0.3.)

This is relevant as it provides the capacity for the coordination of the sub-sector by the co-ordinating State.

Fisheries Programme Planning Support (4.0.4.)

This project is complementary to No. 4.0.3.

Regional Fisheries Training (4.0.5.)

Fisheries Investigation in Botswana (4.2.1.)

As a national project its regional impact can be said to be the supply of cheap animal protein to an area prone to drought, thereby alleviating the need for such protein deficit to be covered from imports especially from outside SADCC.

Integrated Fish-Cum Duck Farming in Lesotho (4.3.1.)

For Lesotho with no lakes, large rivers, swamps etc. this kind of project is appropriate. Other member States might also benefit from the experience of Lesotho when this project is completed. In this respect it can be said to have regional impact.

Joint Research of Pelagic Fishery Resource of Lake Malawi (Nyasa) (4.4.1.)

This project has three aims:

(i) providing a good picture of the entire lake's resource base. Hitherto such studies have been undertaken on national basis yet the fish know no national boundaries. The picture has therefore not been a complete one.

(ii) assisting the member States (especially Mozambique) establish commercial fisheries based on pelagic resources.

(iii) coordinating and harmonizing the legislation for the management of the fishery so that the control of the fishing activities is uniform and is guided by scientific information.

Integrated Pig-Fish Farming Development and Research Project (4.4.3).

This project which is to be undertaken in Malawi will serve as a pilot for possible application in other member States.

Lake Kariba Fisheries Research and Development - Zambia/Zimbabwe (4.8.1.)

This project may develop into other phases or sub-projects during the next five years.

NEW PROJECT PROPOSAL

Annex A is a brief description of a new project for the establishment of a Regional Fisheries Documentation Centre (4.0.6).

A Summary of the status of projects is appended as Annex B.

ANNEX A

PROJECT PROPOSAL

REGIONAL FISHERIES DOCUMENTATION CENTRE (4.0.6)

1. Background Information

SADCC has identified the need for the region to establish a regional information centre for purpose of study and diseminating fisheries research and development data for all the nine member States.

Dependence on centres outside the region for the above function has tended to slow the transfer and exchange of information from state to state and this has resulted in the wasteful duplication of efforts by member States by repeating research work which had already been concluded and documented in the other countries.

2. Objective

To set up a fisheries data storage centre in SADCC region for ease of retrieval and disemination of information throughout the region.

3. Terms of Reference

The Terms of Reference for the consultan cy are as follows:-

3.1. To assess the feasibility of establishing a fisheries information centre either at any of the existing research centres in any of the nine member States.

3.2. The study should detail capital and running costs that would be incurred to set up such a data centre in any of the countries so as to provide comparative sets of costs.

3.3. Make a recommendation on the form in which the centre should be developed, what staffing, equipment and services it will require.

4. Project Life

The study will be for 8 man/months.

5. Personnel Required

1 Documentation Expert 4 m/m
1 Fisheries Economist 4 m/m

6. Qualification

Document Expert

He should have at least five years experience in the management of the Documentation Centre.

He should also have experience in a computerised information system.

Experience in a developing country will be an advantage.

Fisheries Economist

He should be a graduate in Economics from a recognised institution.

He should have five years experience working in tropical fisheries preferably in Africa at a senior level.

7. Cost

US $ 120,000.

STATUS OF PRO[illegible] - FISHERIES

ANNEX B

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	ESTIMATED COST US$ MILLION FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON: FINANCING STATUS ACTION
4.0.1.	Regional Fish Production Processing and Marketing Survey	0.1	0.1	-	0.1	Under negotiation with EEC.
4.0.2.	Study to Identify Regional Projects/ Programmes of Production and/or Commercialisation of Fishing and Fish Processing Materials and Equipment	0.060	0.060	-	0.060	Under negotiation with EEC.
4.0.3.	Fisheries Administrative Support Unit	-	-	-	-	Grant from EEC under negotiation.
4.0.4.	Fisheries Programme Planning Support	0.974	0.974	0.974	-	Funded by USAID.
4.0.5.	Regional Fisheries Training Project	0.150	0.150	-	0.150	Under negotiation with USAID.
4.0.6.	Regional Fisheries Documentation Centre	0.120	0.120	-	-	Presented at Harare.
4.2.1.	Fisheries Investigation in Botswana	0.748	0.748	0.748	-	NORAD.
4.3.1.	Integrated Fish-Cum-Duck Farming in Lesotho.	0.243	0.243	-	0.243	Under negotion with NORAD/DANIDA.
4.4.1.	Joint Research of Pelagic Fishery Resources of Lake Niassa/ Malawi - Malawi/Mozambique/Tanzania	2.508	2.508	2.508	-	Funded by UK.

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION		SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
		TOTAL	FOREIGN			
4.4.3.	Integrated Pig-Fish Farming Development and Research Project	0.309	0.243	-	0.243	Under negotiation with France and the Federal German Republic.
4.8.1.	Lake Kariba Fisheries Research and Development - Zambia/Zimbabwe	2.656	2.656	-	2.656	Under negotion with Denmark.

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Section Seven

WILDLIFE

WILDLIFE

INTRODUCTION

The SADCC region is endowed with a wide variety of wildlife resources, and member States manage these resources under different categories of conservation areas for specific objectives. Three of the most important of these are national parks, indigenous forest reserves and game reserves (or game management areas). These areas cover some 654,000 square kilometres, accounting for 11.5% of the land area of the entire region.

The primary aim for setting aside such areas is to conserve for aesthetic, cultural and scientific reasons, representative samples of each major biotic community of each state, for the benefit of nationals and visitors from outside alike. The major thrust in relation to new conservation areas with the concommitant consolidation and improvement of wildlife conservation strategies has in the majority of member States occurred after attainment of political independence. This clearly points to the seriousness with which member States of the region view their wildlife resources.

Acceptance that all successful long term human endeavours must be socio-politically acceptable, ecologically viable and sustainable, is central to evolving SADCC's wildlife policy. Within this context, it is acknowledged that wildlife is a renewable natural resource that can and should be managed correctly for the continuing benefit of the people. Wildlife being a renewable resource is a highly marketable commodity which offers an opportunity for diversification and enhancement of rural productivity. The conservation and proper use of wildlife requires broad based natural resources skills with special management and marketing techniques, involving proper control and coordination at national, regional and international levels.

ECONOMIC VALUE AND USE OF WILDLIFE

Bearing in mind the rapidly rising human population and the desire for better standards of living, there is an urgent need for developing the wildlife resource in order to allow for sustanable yields of economic returns in the form of protein, hides and other wildlife products. There is also a need to generate employment and earn revenue from hunting activities and organised tourist packages. Harvesting wildlife population is the oldest form of land use known to man and it is still widespread around the world today. Modern wildlife management is, to a large extent an adaptation of this ancient practice to expanding human populations and changing market forces. Utilization may involve culling, game ranching, hunting, bee-keeping, crocodile farming and photographic safaris among other activities.

PRINCIPLES OF THE WILDLIFE STRATEGY

The SADCC wildlife strategy for the next five years is based on the following principles:

(a) Wildlife resources contribute significantly towards revenue

generation through utilization on a sustainable basis.

(b) The region is committed to ensuring that personnel charged with management of the region's wildlife resources have adequate, relevant professional training and experience.

(c) Member States recognise that in some cases revenue generated by wildlife institutions may not cover the expenditure required to meet wildlife conservation objectives. The region is therefore committed to ensuring adequate funding for the management of the region's wildlife resources so that objectives set may be achieved.

(d) SADCC member States recognize that wildlife management is a complex activity in which many factors are either unknown or not fully understood. The region is therefore committed to an adaptive management strategy in which research and monitoring are incorporated as integral components.

(e) Public understanding and appreciation of wildlife and the reasons for managing it can lead to enhanced support for the region's programmes. The region intends to foster public understanding and participation through relevant institutions and school curricula.

(f) The region recognises that wildlife management cannot be carried out in isolation in view of the fact that ecological, cultural and commercial processes are continuous irrespective of international borders. SADCC is therefore committed to cooperate with other governments and international agencies in managing wildlife communities and controlling illegal trade in wildlife products.

TARGETS AND TARGET AREAS

SADCC member States recognise that the primary target in wildlife resource management is the building up of different stocks to levels that can stand utilization on a sustainable yield basis. In order to achieve this target it is recognised that the following have to be enhanced and strengthened:

(a) Public awareness;

(b) Law enforcement;

(c) Habitat improvement;

(d) Regional and international cooperation;

(e) Translocation/restocking;

(f) Game ranching and domestication;

(g) Research and monitoring on an on-going basis.

Expected outputs from the primary targets stated above would be:

(a) Increased revenue through conventional tourism;

(b) Increased flow of meat, hides and other wildlife products;

(c) Furtherence of general knowledge;

(d) Maintenance of the ecological balance.

A PROGRAMME FOR THE NEXT FIVE YEARS

In order to achieve the goals set out in the strategy, work in the following progamme areas will be undertaken:

Restocking and Establishment of new Conservation Areas

Many countries in the region have in the past few years lost some of their indigenous wildlife species through habitat destruction, wanton killing and sometimes through diseases like rinderpest. Fortunately for the region, nearly all animals required for restocking are still in existence within the SADCC states. This project aims at identifying the species that have been lost and/or endangered in certain states with a view to restocking them from states that have similar species and are still plentiful. Malawi and Zimbabwe have partly undertaken this project with insufficient local funding.

It is recognised that good habitat management is a key to the success of this project. In this respect, it is, therefore, important that there must be a component of the establishment of new conservation areas especially in those states that do not have enough conservation areas in order to allow for the building up of viable wildlife populations.

Public Education and Equipment

There is a general lack of understanding and appreciation of wildlife in SADCC member States. This is evident in the low national priorities attached to conservation programmes and the lack of support from the general public. There is, therefore, need for systematic and continuous public education programmes in order to raise national awareness on conservation and in order to solicit support from the general public.

However, to launch an effective public education programme, adequate means of disseminating conservation messages to the public are required. At present SADCC member States are ill-equipped in this regard. There is need for the establishment of mini parks and to set up extension programmes in order to reach the populations.

Utilisation of Wildlife

(a) Wildlife Utilisation Programme

This initative is aimed at developing a wildlife utilization programme that will generate food, revenue and enjoyment from the wise use of the resource. Projects to be developed in this area will cover:

(i) game ranching;

(ii) bee-keeping;

(iii) crocodile and ostrich farms;

(iv) domestication of buffalo for draught power in tsetse fly infested areas;

(v) resource management and utilization in communal lands.

(b) Management Workshop

The main problem in utilizing wildlife for recreational hunting has been the uncoordinated approach in marketing, licensing, fees, hunting facilities, and in the control of export and import permits. It is proposed to hold a workshop where the following subjects will be discussed.

(i) habitat management;

(ii) population management;

(iii) cropping methods:
culling;
hunting - non-resident hunting;
- resident hunting;
- hunting fees;

(iv) translocation;

(v) marketing of wildlife and wildlife products;

(vi) ranching:
mixed ranching;
crocodile farming;
ostrich farming.

(c) Study Tour

Botswana and Zimbabwe are the most advanced in the region in wildlife utilization. It is proposed to sponsor a study tour of wildlife specialists from the SADCC region to these two countries.

The study tour is intended to expose the participants to the following aspects of wildlife management and utilization:

(i) game ranching;

(ii) bee-keeping;

(iii) crocodile and ostrich farming;

(iv) domstication of buffalo as a draught animal in tsetse infected areas;

(v) resource management and utilization in communal lands;

(vi) game culling as a management tool.

The following items form the main basis for funding:

(i) training materials for the tour during and after;

(ii) road transport while in Botswana and Zimbabwe;

(iii) secretariat services to print out the proceedings of the tour;

(iv) travel fares from the respective member States to Botswana-Zimbabwe and back;

(v) per diem allowances;

(vi) consultancy fee.

Research and Monitoring

The main regional goal of research and monitoring will be to provide information relevant to the effective management and exploitation of wildlife. As such, the project will involve:

- determining and monitoring of wildlife species, and stocks (populations) so as to determine levels of off-take;
- conducting behavioural and reproductive studies of commercially important wildlife species so as to build data for their effective management and exploitation;
- conducting studies in habitat improvement and manipulation for the purpose of increasing diversity and abundance of the needed commercial and threatened wildlife species;
- conducting socio-economic studies and demonstrations in the participation by the rural populations in the utilization of their local wildlife resources.

The current difficulties in harvesting wildlife species for economic and food values are attributed to the lack of supportive data. At present, there are indication of over harvesting, declining population of elephants, rhinos, buffaloes, etc. in some areas of the region, but with appropriate management, this trend would be reversed. This would only be possible if relevant data were available. The following commercially important species will be studied in detail:

Elephant	Sable
Rhino	Roan
Buffaloo	Hippopotamus
Eland	Crocodile
Kudu	Ostrich

These studies will also be extended to other commercially significant bird and reptilian species.

Preparation of Master Plans

Most SADCC member States do not have master Plans for the development and management of their conservation areas. Master plans are a major component in the efficient and systematic management of conservation areas. About 11.5% of the region's total land area is under conservation in the form of Game and Forestry Reserves and National Parks. Master plans spell out details of why and how conservation areas should be managed in order to effectively contribute both to the economic and social development of a country. The contribution can be achieved if resources are well-planned. It is, therefore, planned that each SADCC state develops their master plans so as to achieve efficient and proper management and utilization of resources under their charge. The master plans will be reviewed periodically.

Development and Upgrading of the Infrastructure in the Conservation Areas

SADCC countries have a very high potential in the development of Tourism through the development and upgrading of the infrastructure in the Conservation Areas.

Lack of funds has been a real hanlicap in the development of these facilities. The promotion of tourism which has become a great revenue earner in many countries has thus been retarded and hindered.

It is the intention of SADCC countries to improve these facilities, with the objective of attracting more tourists.

The programme will involve the improvement and upgrading of existing roads and bridges to facilitate tourist traffic, the provision of houses and lodges, camping facilities and amenities in the conservation areas.

ANNEX A

PROJECT PROPOSALS

MWEKA COLLEGE OF AFRICAN WILDLIFE, TANZANIA

INTRODUCTION

The College of African Wildlife, Mweka in Tanzania was established to train wildlife technical officers for the Anglophone countries in Africa. The College offers three types of course, namely, a two year certificate course, a two year diploma course and a one year post-graduate course.

STATUS

Mweka college has developed over the years to cater for specific needs in wildlife and the management of the conservation areas. The College intends to continue to fulfil a regional role in the training of wildlife and protected areas management personnel in Africa as a whole and the SADCC region in particular.

STRENGTHENING OF MWEKA IN ORDER TO CATER FOR THE SADCC REGION

SADCC proposes to strengthen Mweka so that it can cater for the SADCC region's training needs. The project submission comprises the following:

(a) provision of scholarships to students from SADCC countries;

(b) provision of assistance for the procurement of the necessary teaching equipment and materials to enable the College to maintain and/or improve the standards of pactical training in wildlife management techniques;

(c) consolidation of transport and physical infrastructure at the College;

(d) provision of scholarships for staff development.

WETLAND CONFERENCE

Rationale

A wetland is a land transitional between terrestrial and aquatic systems and this includes features such as swamps, bogs, marshes, flats, shallow lakes, flood plains, deltas. These areas are common in this region, and are known to be the principal wildlife habitats. But wetlands are significant to man because they are also used for agriculture, sources of water, fishing, recreation. It is, however, unfortunte that most of these are being threatened by pressures from the rising human population and expanding economic development. Although the demand for exploiting

wetlands is increasing, their ecological systems have not been studied. It is certain that if not protected, wetland potential could easily be damaged.

The need for regional approach towards the conservation of wetland is obvious. Most large wetlands are shared by adjoining member States, and as such, there is need for the member States to agree on measures for conserving these areas. It is therefore, proposed to convene a conference on Wetlands with the following aims:

- to discuss areas of cooperation between member States in the protection and utilization of shared wetlands;
- to identify factors leading to wetland destruction and to discuss methods of their protection;
- to develop research programmes for the effective management and utilization of wetlands;
- to introduce the concept of an integrated approach towards the conservation of wetlands.

Participants

At least three (3) participants from each country will be expected to attend the Conference and such persons are expected to come from fields of environmental conservation, agriculture, forestry, wildlife, water affairs, fisheries and land-use planning.

There will be need for at least one consultant who should act as a resource person.

Timing

The Conference is intended for November 1986. This Conference is expected to take a maximum of three days.

Venue

Lusaka, Zambia

Cost

	US$
Consultant (2 weeks) plus travel	5,000
Participants present papers (15 papers), per diem	2,000
Contributors (travel)	9,000
Local transport	7,000
Field trip	6,000
Publication of proceedings	11,000
US$	69,000

STATUS OF PROJECTS - WILDLIFE

ANNEX B

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
5.0.1.	Wildlife Conservation, Management and Utilisation	0.2	0.2	-	-	Presented at Mbabane.
5.0.2.	Wildlife Coordination Unit	-	-	-	-	TA and Grant from EEC under negotiation.
5.0.3.	Relief Programme for Drought Stricken Wildlife Areas in Southern Africa.	2.3.	-	-	-	Presented at Mbabane.
5.0.4.	Feasibility Study on Processing and Marketing of Durable Wildlife Products in the SADCC Region	0.08	-	-	0.08	Funding under negotiation with CFTC.
5.0.4.	College of African Wildlife, Tanzania	-	-	-	-	Presented at Harare.
5.0.5.	Wetland Conference	0.067	0.067	-	-	Presented at Harare.

Section Eight

FORESTRY

FORESTRY

INTRODUCTION

This paper is in five sections: Introduction, Status and Development of Forestry in SADCC Member States, SADCC Forestry, Policy and Strategy, SADCC Forestry Development Proposals and Conclusions. The paper aims at briefly outlining the co-ordinated policy, strategy and projects/programmes for forestry development for the next five years in the member States of the Southern African Development Coordination Conference (SADCC).

STATUS AND DEVELOPMENT OF FORESTRY IN SADCC REGION

Forestry Resources

The SADCC countries have some 2,933,000 sq. km. or about 61% of total land surface, which is predominantly of open woodland, relatively dry savanna, and dry grassland. Approximately 246,000 sq. km. of land has been set aside specially for forestry purposes, such as natural resources conservation, environmental protection, critical water catchments, etc. Indigenous forests of a more closed nature are quite limited; a relatively small area of moist forest in northern Angola, and mountain areas in Malawi; forest-savanna mosaics in Angola, Malawi, Zambia, coastal Tanzania, riverine and coastal strips of Mozambique, dry deciduous forest in northern Botswana, Malawi, south-western Zambia, and western Zimbabwe. A narrow strip of mangroves occurs along the Congo river in Angola, and the coasts of Mozambique and Tanzania. Grasslands occur in Lesotho, Malawi, western Swaziland, along the Angola-Zambia boundary, and Zimbabwe. In 1981, about 7,828.31 sq. km. (782,831 hectares) of industrial plantations and woodlots had been established in SADCC countries for the production of sawlogs (sawtimber), pulpwood, and they consisted of mainly fast growing exotic tree species. These afforestation programmes are being expanded and developed. The region as a whole is self-sufficient in commercial indigenous and plantation wood resources but fuelwood resources are becoming increasingly scarce.

Forest Authority

All member States, even those with little forest resources, have some form of forestry service, policy, and leglislation. The forestry authorities are generally responsible for forest reservation; conservation, management and utilization; research and development.

Forestry Financing

All countries allocate some financial, economic and technical resources to the development of the forestry sub-sector. They have also made use of some external assistance for forestry, through the multilateral programmes of the World Bank, UNDP, FAO, and other agencies; and through the bilateral programmes. However, in relation to the forestry responsibilities, problems, and importance in improving the quality and standard of living of the people in the region, the resources allocated to this sub-sector are generally inadequate.

Forest Production, Processing and Consumption

The forestry sub-sector provides a wide range of goods and services basic to human welfare, e.g. sawlogs, pulpwood, fuelwood, poles, wood-based panels (plywood, veneer, fibreboard, particle board, etc.) pulp, paper, fodder, edible fruits, honey and beeswax, and protective forestry values (soil and water conservation, climatic effects, etc.) Although the commercially productive closed forests are limited, considerable quantities of industrial forest outputs come from the natural woodlands and the plantations. The indigenous forests and woodlands are also main sources of fuelwood, building poles, and other local wood requirements. The indigenous forests and woodlands are relatively slow growing, and have low biomass production.

The geographical distribution of wood supply varies from one country to another, but does not necessarily correspond to requirements for forest products, resulting in some situations, where the demand exceeds the supply. Hence, deforestation, desertification, and erosion are becoming very common features. Generally, with very few exceptions, wood consumption is outstripping new tree growth, and there are apparent local shortages or scarcities of fuelwood and poles in man, countries. Similarly, timber is becoming increasingly scarce. However, there are indigenous fine hardwood resources in Angola and Mozambique but also surplus exotic coniferous timber in Malawi, Swaziland, and Zimbabwe. In all SADCC member States, programmes have been undertaken or initiated to increase the wood supplies (better use and management of remaining natural forests, agro-forestry, afforestation) and to efficiently utilize the forest produce through the improved stoves/other wood conserving technologies, briquetting of agro-industrial residues, etc.

There is a substantial forest industry; predominantly sawmilling to meet the domestic requirements; plywood products in most countries (Malawi, Mozambique, Tanzania, Zambia and Zimbabwe); particle board output in Mozambique, Tanzania and Zimbabwe; as well as some fibreboard production in Tanzania. Zimbabwe produces large quantities of ground wood-pulp and low-grade paper for domestic consumption. Tanzania has started producing chemical pulp and paper. Swaziland produces large quantities of wood pulp and paper for local markets. Malawi and Zambia are to establish pulp and paper industries.

Per capita consumption of processed wood products, like sawnwood, wood-based panels, and paper is generally low. On the other hand, wood, being the primary souce of energy for the majority of the population (both rural and urban residents) and the agro-based industries, is consumed in large quantities, and the per capita fuel wood consumption is among the highest in the world, reflecting non-availability of fossil fuels, industrial use in agro-based and rural industries, lack of efficient conservation and utilization technologies. For example, wood-energy consumption varied from 52% for Zimbabwe to about 90% for Malawi, with values for other countries in between these two figures.

Forest and Wood Products Trade

Trade in forestry products, among the SADCC member Sates, is very negligible; but the business may be nationally important. There is

limited regional trade in the fine hardwood timber, railway sleepers, wood-based panels, pitrons pulp and paper products. There is considerable import into the region of manufactured wood-products, especially chemical wood-pulp, paper and paperboards. The exception is Swaziland which is an exporter of wood-pulp.

Forestry Problems

Forestry problems stem from the increasingly severe pressure on the forest land, forests and trees by the growing human population, agricultural expansion, grazing, unplanned settlements, uncontrolled bush fires, etc. The forestry facilities and infrastructure are short of trained manpower, including for research and training. There is an increasing shortage of fuelwood resources for rural and urban use, and the consequently fast depletion of woody vegetative cover essential for environmental protection, soil and water conservation, and improving agricultural productivity. There is a general lack of adequate statistics on the extent of forests, especially for forestry planning and management. Although there are surpluses of commercial plantation wood, and in a few cases also indigenous forests, these resources cannot be absorbed due to low consumption of processed wood, industrial capacity and marketing. Haulage problems also hamper trade in commercial wood. Funds required for protection, control, management, and development of the ecologically fragile natural resource base are inadequate. During the past years, constant drought in the region has also added problems and constraints to forestry development.

SADCC FORESTRY POLICY, STRATEGY AND PROGRAMMES/PROJECTS

Forestry Policy

The first meeting of the Technical sub-committee for Forestry was held in Blantyre in December, 1983. The meeting discussed the report which was produced by the coordinating country and came up with a policy and strategies which were recommended to Council of Ministers. In line with the goals set out in SADCC's founding declaration, Southern Africa; Towards Economic Liberation the basic policy of the Forestry sub-sector is to coordinate efforts towards equitable regional and national development, and to reduce external dependence. This policy was translated into the following statements:

(i) To promote regional self-sufficiency in all forest and wood products and the improvement of the economic and social welfare of the people of the region.

(ii) To set aside more areas of indigenous forests, establish plantations and woodlots and develop existing areas through protection, control and management.

(iii) To develop and promote trade in forest produce, with particular emphasis on the SADCC region.

(iv) To meet the forestry manpower requirements within the SADCC region through the provision of the necessary educational and training facilities for general and specialised cadres.

(v) To enhance the forestry research capability of the region and to conduct investigations with a view to developing, introducing and disseminating appropriate technologies.

(vi) To ensure adequate consultations and liaison amongst the relevant SADCC Sectors, the public and private institutions within the region.

(vii) To ensure at all times the protection and management of the environment and its impact on other land-use disciplines.

Forestry Strategy

In order to fulfil the stated policy, strategies were formulated to designate areas that required immediate regional co-operation.

	Areas Identified for Regional Cooperation and Coordination	Recommendations for Action
(1)	Management and development of indigenous and exotic forests for production of fuelwood, poles and commercial timber	
(i)	Promotion of forest wood and wood products trade through commercial and industrial investments	Encouraging wood and wood products trade among SADCC member states through promotion of industrial and commercial programmes matching deficits/surplus through regional production and dissemination of statistics
(ii)	Forestry Education and Training	The strengthening of existing training facilities and provision of new ones as necessary
(iii)	Technical Assistance	Technical assistance, support and provision of equipment.
(iv)	Forestry Research	Cooperation and coordination in exchange and dissemation of forestry research information, study tours visits; in order to avoid duplication.
(v)	Forest Wood and Wood Products Technology	Member states to the sharing of technological information on forestry products.

(vii)	Production and Distribution of Forest Tree Seeds	Regional Forest Tree Seed centre, with satellite National seed centres where necessary should be established in a member country to coordinate collection, and distribution, setting out common grading standards on testing, storage and phyto sanitary requirements.
(viii)	Forestry Extension and Farm Forestry	Study tours and effective dissemination of information be encouraged. Promotion of rural forestry and agro-forestry.
(ix)	Regional Forestry Inventory	Promotion and establishment of capability for carrying out forest inventory and monitoring to provide resource base data.
(x)	Standardization and Specification Forest Products and Phytosanitary requirements	Development/Adoption of practices of common standards, grading rules, codes of practices, and photosanitory requirements.
(xi)	Forestry Data Bank and Processing Unit	Pre-feasibility study needed for regional forestry processing unit.

Forestry Programmes/Projects

The stated strategies have been translated into Programmes/Projects activities, which were submitted to the Mbabane Conference in January 1985:

Special facility for SADCC Forestry Project Development.

The establishment of a SADCC Regional Herberum and Conservaton of Endangered Species Study.

Urban Fuelwood Project.

Regional Forest Inventory Project.

Regional Seed Centre.

Dry Zone High Altitude Fuelwood Species Trials.

Forestry Technical Consultation Project.

Forestry Industries Training Centre for SADCC Countries (FITC).

Expansion and strengthening of existing Forestry colleges in SADCC

Region. (see Annexure A)

A summary of the status of these projects appends as Annex B.

The programmes/projects for further discussion in the next five years:

Pre-feasibility study for creation of a Regional Data Bank and processing Unit.

Scholarship schemes to facilitate short-term study tours and Exchange of personnel with the SADCC region.

Technical Assistance Project for strengthening forestry and Wood products Research and Dissemination of Research Information.

Development of common regional standards for wood and wood products and other forest products.

Technical Assistance Project for a regional study and monitoring system and wood products trade and trade statistics.

Forestry Manpower Survey Project for the SADCC region.

Project to create a Regional Library and produce Forestry Text books of relevance to the region.

Creation, establishment and promotion of economic, industrial and commercial projects.

CONCLUSION

The SADCC region still has relatively abundant forest resources requiring protection, conservation, management, utilization and development. The member States are pursuing remedial measures, such as, improved management and use of existing natural forests, establishment of industrial plantations and woodlots, agro-forestry, silviculture, forestry extension, reserch, improved wood-use efficiency and technologies. The main constraints have been lack of funds, trained manpower, and frequent drought. During the past five years, the Forestry sub-sector will therefore continue to pursue the agreed policy, strategies and concentrate on progrmmes/projects listed in this paper.

ANNEX A

PROJECT PROPOSAL

IMPROVEMENT AND STRENGTHENING OF FORESTRY COLLEGES IN THE SADCC REGION PROJECT

Project Title

Improvement and Strengthening of Forestry Colleges in the SADCC Region.

Presented by

SADCC Forestry Sub-Sector

Location

Malawi

Duration

8 months

Total Estimated Costs

$ 342,000

OBJECTIVE

To determine the current overall status of Forestry Colleges in the SADCC member States, and to make recommendations on improvement within individual states, and changes necessary to achieve common training standards.

Terms of Reference of the Consultant

1. To examine each forestry training centre in member States in the company of a SADCC Coordinator with particular reference to the following items:

   1.1. Existing facilities (buildings, libraries, laboratories), including teaching aids.

   1.2. Staffing levels and staff qualifications relative to their teaching programmes.

   1.3. Student entry qualifications.

   1.4. Curricula, time allocations on individual topics, type and standard of examinations or other graduation requirements.

   1.5. Current level of financing and their source.

2. To examine current and projected forestry man-power requirements in each member State including both government and private sectors.

3. To produce a report for submission to the SADCC Forestry Sector Technical Sub-Committee summarising the findings and making recommendations on:

   3.1. Improvements necessary to existing facilities in each member State, including teaching aids.

   3.2. Changes in individual member State's entrance qualifications and curricula to achieve common standards.

   3.3. Minimum qualifications for lectures in given subjects.

   3.4. Exchange programmes for students and staff in view of the facilities at each centre.

4. To draw up project proposals to implement the recommendations.

Duration

Eight months (approximately three weeks per country, plus writing up the report).

Budget

	U.S. $
Consultant fee	120,000
Air fares and local travel	20,000
Subsistence	60,000
Secretarial services including report production	10,000
Coordinator's expenses (hotels)	40,000
Air fares and local travel	20,000
Coordinator's salary	15,000
Contingencies	57,000
TOTAL	342,000

STATUS OF PROJECTS - FORESTRY

ANNEX B

PROJECT NO.	PROJECT TITLE	ESTIMATED COST US$ MILLION TOTAL	FOREIGN	SECURED FINANC. US$ MILLION	FUNDING UNDER NEGOTIATION + US$ MILLION	COMMENTS ON:FINANCING STATUS ACTION
6.0.1.	Special Facility for SADCC Forestry Project Development	3.0	2.4	2.0	-	Funded by CIDA.
6.0.2.	The Establishment of a SADCC Regional Herbarium and Conservation of Endangered Species Study	1.7	-	-	-	Under negotiation.
6.4.3.	Urban Fuelwood Project (1) MAPUTO	4.7	4.7	-	-	NORAD and EEC have expressed interest.
6.5.4.	Regional Forest Inventory Project	6.0	6.0	-	6.0	Under negotiations with EEC.
6.0.5	Regional Seed Centre	1.3	1.3	-	1.3	Under negotiation with IDRC and DANIDA.
6.0.6.	Dry Zone and High Altitude Fuelwood Trials	0.4	0.4	-	-	Interest from EEC.
6.4.7.	Forestry Technical Consultative Project	0.9	0.9	-	-	
6.0.8.	Forest Industries Training Centre for SADCC Countries (FITC)	14.8	13.6	13.6		Funded by Italy.
6.0.9.	Improvement and Strengthening of SADCC Forestry Colleges	.342	.342	-	-	Presented at Harare.
6.0.10.	Regional Documentation and Information Centre	-	-	-	-	Presented at Harare