Emergency Prevention System
for Transboundary Animal and Plant Pests and Diseases
(EMPRES)

Desert Locust Management in the Central Region

IMPLEMENTATION DOCUMENT

PHASE II

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1.

Introduction

The Desert Locust component of the FAO Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) was initiated by the Food and Agriculture Organization (FAO) in 1994. Following the formulation exercise and some pilot activities, a donor-assisted EMPRES programme began in 1997 in the Central Region (CR). This region, which consists of the countries bordering the Red Sea and the Gulf of Aden, has in the past frequently been the origin of Desert Locust outbreaks and plagues. The development goal of the EMPRES/CR programme reads:

> *To reduce the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area in order to mitigate food security, economic and environmental concerns in the Central Region and beyond*

and the programme goal:

> *To strengthen the capabilities and capacities of the national, regional and international components of the Desert Locust management system to implement effective and efficient preventive control strategies based on early warning and timely, environmentally sound, early control interventions.*

Phase I of the EMPRES/CR programme was implemented from 1997 to 2000 in accordance with the programme document developed by FAO in 1995 in close collaboration with the locust affected countries and interested donors. The objectives of the programme and the achievements of Phase I are briefly summarized in Annex 1. The original programme document (dated October 1995) and the annual EMPRES/CR reports should be consulted for more details.

An independent Evaluation Mission, which took place in July/August 1999, made several major recommendations including that:

a) *The original programme document should be revised. The revised document should define more clearly the goals and outputs of the whole programme, based on the experiences gained during the first three years.*

b) *A planning workshop should be organized in early 2000 in order to agree on the expected results, activities and indicators of Phase II of the programme.*

c) *A separate implementation document should be prepared for Phase II.*

A revised EMPRES/CR programme document was distributed to the participating countries and to collaborating organizations in February 2000. The Phase II planning workshop was held in El-Tur, Egypt from 26 – 30 March 2000.

The workshop was conducted in a participatory manner and was attended by the national EMPRES Liaison Officers (ELOs), representatives from donor agencies and FAO staff. The workshop participants developed the framework for a three-year phase from 2001 – 2003 based on the revised programme document.

2. Concept of Phase 2

The workshop participants adopted the objectives of the revised EMPRES/CR programme document and formulated a number of results and activities, which are expected to contribute to the long-term programme goals during Phase II. The findings and recommendations of the EMPRES/CR evaluation were discussed and considered during the planning process.

It should be noted that the activities under the first objective (D-1) of the overall EMPRES/CR programme:

> *"To increase the level of coordination of the Desert Locust monitoring, survey, and control activities in the Central Region by facilitating networking between national, regional, and international organizations and by strengthening information exchange systems."*

include activities dealing with general coordination and administration and are considered the core component of the programme. These core activities include, for example, meetings of the ELOs and the Consultative Committee, and the coordination of bilateral components to the EMPRES/CR programme.

On the basis of a short problem analysis (Annex 2), the Purpose of Phase II was formulated as:

> ***"Components of preventive Desert Locust control management developed and adopted."***

The following eight results were anticipated to contribute to the above purpose of Phase II:

R-1: Operational mandate of different regional organizations in Desert Locust management harmonized.

R-2: National and regional communication networking enhanced.

R-3: Desert Locust early warning and information systems improved.

R-4: Desert Locust survey procedures of the member countries improved.

R-5: Desert Locust technicians and officers qualified.

R-6: Contingency plans available and implemented.

R-7: Efficient and environmentally safer control methods introduced.

R-8: Systematic methods of campaign evaluation developed.

The results 1 and 2 are considered to be part of the core component of the EMPRES/CR programme. A summary of the results, indicators and activities is presented in the programme planning matrix for Phase II in Annex 3.

2.1. Result 1: Operational mandate of different regional organizations in Desert Locust management harmonized.

The workshop concluded that coordination and collaboration between the two regional organizations, the FAO Commission for Controlling the Desert Locusts in the Central Region (CRC) and the Desert Locust Control Organization for Eastern Africa (DLCO-EA), need to be increased to support the development of effective preventive control at the regional level. EMPRES is expected to facilitate the harmonization of the technical mandates of these organizations. Further integration of the activities of EMPRES/CR and the CRC will also be negotiated during Phase II.

It is expected that by the year 2002 at least one of the Central Region countries, which is not yet a member of the CRC, will decide to join the Commission and submit a formal application to FAO. The countries eligible for membership, in accordance with an earlier decision of Commission members, are Djibouti, Eritrea, Ethiopia and Somalia.

In addition it is expected that at the end of the Phase II, the discussion between CRC and DLCO-EA will have reached the stage that a Memorandum of Understanding between these two organizations will have been drafted. This memorandum will outline collaboration between CRC and DLCO-EA as part of a concept of sustainable preventive Desert Locust management in the Central Region.

To achieve the above result 1, it is assumed that the member countries of the CRC and DLCO-EA see common benefits in increased collaboration.

The CRC and the DLCO-EA will be asked to nominate two persons each for a joint working group. The nominations should be acceptable to the other party. It is expected that the CRC and the DLCO-EA will have agreed on the membership of the joint working group before end of 2001. The CRC/DLCO-EA working group will meet twice to review their mandates, as well as those legal issues which are relevant to increased collaboration between both organizations. A draft memorandum of understanding will be prepared by 2003 to be presented to the member governments of the CRC and DLCO-EA.

In order to promote the membership of non-CRC-countries, the EMPRES Coordinator, the CRC Secretary, and FAO HQ staff, will discuss the issue of CRC membership with high-level representatives of the eligible governments. The subject of membership should be raised in at least two high-level meetings.

Cooperation between EMPRES/CR, the CRC and DLCO-EA should further be strengthened. The EMPRES Coordinator, the CRC Secretary and the DLCO-EA Director will meet on a regular basis to discuss integration of activities and improved coordination. Mechanisms of shared responsibilities will be established.

2.2. Result 2: National and regional communication networking enhanced.

Considerable progress has already been made during the previous years in designing and establishing an efficient communication network in the Central Region. However, as technology advances and some equipment requires replacement, the network needs to be upgraded and maintained. In addition, further efforts need to be made to ensure that the network is used regularly by the stakeholders in the region for exchanging Desert Locust reports, and for communication with the Desert Locust Information Service (DLIS) at the FAO HQ.

The timeliness with which locust survey reports are submitted to the DLIS at FAO HQ is considered to be a useful indication of improved information exchange. These reports should be submitted within 5 days after completion of a survey carried out by national Desert Locust Control Units (DLCUs). Even if no surveys have been done, DLIS needs to receive a national report once a month and this report should be received not later than on the 25th of that month, so that the information can be incorporated into the monthly bulletins. It is anticipated that by 2001 at least 20 % of the reports will meet these criteria and that timeliness increases to 50 % by 2002 and 80 % by 2003.

The ELOs will discuss and establish a suitable system for encouraging and monitoring communication among the EMPRES/CR countries and with DLIS. Such a system will cover regular survey reports, special locust events, and other topics. The FAO-EMPRES staff will assist when necessary and will promote communication with donors and collaborating research organizations.

The establishment of schedules for radio contacts between the different units of the national locust services is considered another indicator for improved communication on locust aspects within the affected countries. It is expected that such schedules are established and are used regularly by at least five DLCUs by 2003.

Furthermore, FAO will provide updated or new computer software and support the repair of equipment if needed. Requests for new communication equipment will be considered in the light of available funds.

2.3 Result 3: Desert Locust early warning and information systems improved.

EMPRES considers the improvement of early warning and information systems at the DLCUs as a key prerequisite for efficient preventive control and has given high priority to this aspect since its inception. Phase 2 will further contribute to this area and will pay special attention to defining and meeting information needs. This includes further efforts to introduce the access to satellite images in the region as well as to continue the development of appropriate data management systems such as RAMSES.

It is expected that the RAMSES data management system is installed in at least 5 countries by 2003 and that these countries make full use of the system for recording and analysing survey results, for forecasting as well as for other data management purposes. The Natural Resources Institute (NRI) is expected to provide assistance to

selected EMPRES countries in establishing the RAMSES system. This includes country specific software, training and follow-up.

As a prerequisite for improved information management systems it is necessary to define the information needs for better decision making. The ELOs, with assistance from FAO staff, will determine the types and sources of information which most likely can improve the assessment of locust populations. This analysis will help to clarify priorities for improving information systems.

In recent years, new technologies, in particular remote sensing, have gradually improved the assessment of Desert Locust breeding areas and forecasting at the FAO HQ. Some EMPRES countries have participated in ground-truthing activities. Efforts will be made to make some of those advanced technologies available to the locust-affected countries so that surveys can be planned and directed more efficiently and the locust population level can be assessed more reliably. It is foreseen that by the end of Phase II, DLCUs in at least 2 countries will regularly receive recent satellite images, which indicate vegetation distribution and which allow improved implementation of surveys.

Further efforts will be made to harmonize and streamline the flow of Desert Locust information within the region. The regional organizations CRC and DLCO-EA will assure that copies of survey reports from the member countries reach DLIS without delay. The regional organizations will further help in alerting the countries of special locust events.

2.4. Result 4: Desert Locust survey procedures of the member countries improved.

Exploring the possibilities for improving survey procedures is a long-term process which has already started during Phase I. This result will be achieved through a combination of applied research (e.g. in respect of survey methodology and the assessment of survey results), data collection on important breeding areas, surveys, which are jointly conducted by EMPRES countries along their border areas and training of technical survey staff. Training activities are combined under result 5 with training activities on control procedures.

It is expected that by the end of Phase II, comprehensive survey plans, including mechanisms to activate and modify the plans depending on environmental conditions, will have been developed in at least four EMPRES/CR countries. More accurate description and mapping of the key breeding areas will be in place in at least two countries by 2003.

The distribution and density of locust populations that may occur during Phase II will be recorded. These data will be analysed together with data available from past assessments. The analysis will contribute to improved and more targeted surveys as well as to better forecasting. This activity is a joint collaboration between PPD, EMPRES/CR and the University of Wageningen. Information will be collected on the delimitation and ecology of important locust breeding areas. These data will be

analysed against historical records and meteorological/remote sensing data, and will be incorporated into survey plans.

A joint border survey has been carried out for the first time between Egypt and Sudan in early 2000. Due to the success of this activity, it is expected that two similar surveys will be conduced in important breeding areas which are located near the borders between two other EMPRES/CR countries. The surveys will be completed by 2003, provided that access to the border areas is not restricted for security reasons.

2.5. Result 5: Desert Locust technicians and officers qualified.

Training of different personnel involved in locust control aspects is an important component of strengthening the preventive control capacities of the EMPRES/CR countries. EMPRES/CR has already given considerable attention to this subject. However, it is not only necessary to organize additional training courses which meet given training standards but also to develop these standards, training materials such as manuals, guidelines and curricula, explore new training approaches as well as to develop and introduce appropriate procedures for identifying training needs. In addition, monitoring procedures need to be introduced, which provide feed-back on how effective the training events have been and also on how they translate into an improved performance of trainees when they work in their Desert Locust control unit. Attention also needs to be given to collaboration with universities and with other organizations conducting training events in the field of locust management (e.g. donor agencies sponsoring bilateral training).

It is expected that at least 50 % of the combined total of Desert Locust control officers and technicians in the Central Region will be trained during the Phase II. Furthermore by 2002 each of the member countries will have designated at least two trainers in Desert Locust management and they will have received special training from EMPRES/CR.

Result 5 is based on the assumption that locust officers and technicians are available for training and that the organization of training courses in the respective countries is not prevented by political instability.

The ELOs in collaboration with FAO staff will need to assess firstly the training needs in their countries for different technical subjects such as survey and control operation, forecasting and information management. This process has started in Phase I under the umbrella of the country focus programmes and will be completed. It is also likely that additional training needs will be identified during the evaluation of the training impact. It is expected that the assessment of the training needs is completed by 2001.

Secondly, the ELOs and the FAO staff will jointly develop standards, which describe what level of knowledge and technical skills locust officers should have reached after a given training event. These standards will form the basis for the evaluation of training events and will also be used when training needs are assessed jointly. On the basis of the identified training standards and in order to harmonize the training concepts of different international and national organizations and services, EMPRES/CR, CRC and DLCO-EA will contact and collaborate with relevant

institutions. The aim is to achieve a uniform level of knowledge and skills throughout the region and to avoid duplication or conflicting dissemination of technical information. The harmonized procedures should be defined by the first half of 2001 and endorsed by the CRC, DLCO-EA and EMPRES/CR by 2002.

To meet the identified training needs, EMPRES/CR will support and organize at least 2 special regional training courses for information and forecasting officers, one in 2001 and the other in 2003, and one special training course on administrative planning and management aspects for the heads of the DLCUs. With regard to improved survey and control operations, EMPRES/CR and the CRC will organize one regional training course every year for locust officers and technicians.

It is anticipated that the DLCUs of the member countries will increasingly incorporate specialized training courses for the different groups involved in Desert Locust in their own national training programmes and will be able to maintain such a system. Success will become apparent when national training courses are organized on a routine basis.

To evaluate training impact, the DLCUs will monitor the performance of locust officers who benefited from training courses, against the agreed standards. Information will be collected on how effective the trainings have been in improving the competence of the trainees on the job and where further improvements are needed. To enable EMPRES/CR and the CR to assist the DLCUs further with training, the ELOs should provide reports on training impact during each ELO-Meeting.

FAO consultants and EMPRES/CR, in collaboration with the ELOs and the University of Greenwich, will complete the revision and preparation of training manuals, which have started under Phase I. A comprehensive training manual in at least two languages, English and Arabic, will be prepared covering improved survey procedures, population assessment, control operations and training organization. This manual should serve for train-the-trainers courses as well as a guideline for national and local training events conducted by the national services. It is anticipated that the manual will be ready and introduced as a training aid, by 2002.

The University of Khartoum, with support from the CRC, has developed a special Diploma course on Desert Locust management, which will start in 2001. In order to assist different universities in the Central Region in Desert Locust curricula development, EMPRES/CR will provide interested universities others than the University of Khartoum with teaching materials. The use of the Diploma course in locust management at the University of Khartoum will be promoted through DLCC and CRC scholarships. In this context, attempts will be made to involve students in different field studies and other relevant investigations.

It is assumed that at least 3 other universities in the Central Region will show interest in the incorporation of locust related teaching curricula and will be provided with appropriate materials and organizational assistance. In order to maintain the DL Diploma course at the University of Khartoum at least 5 students should be enrolled every year.

2.6. Result 6: Contingency plans available and implemented.

Contingency planning is a vital component during the prevention of Desert Locust plagues. The DLCUs in the individual member countries not only need to prepare plans covering scenarios from recession to plague situations, but also need to ensure that arrangements for implementation of these plans are in place and regularly reviewed. Such arrangements should cover the provision of manpower, equipment, supplies and financial resources. In some of the EMPRES/CR countries progress has already been made and guidelines are already under preparation.

In order to develop comprehensive and operational contingency plans for different levels of infestation, the DLCUs will be assisted by EMPRES/CR and the University of Wageningen through regional seminars. The plans will cover the full range of possible scenarios, starting from monitoring operations during recession periods, to outbreak, upsurges and even plague situations. The plans will specify the resources in terms of manpower, equipment, supplies and operational funds, as may be required to implement recession monitoring or campaigns under specific scenarios. A modelling tool developed by the University of Wageningen and GTZ is considered to be an important element for the development of contingency plans.

It is expected that national contingency plans will be prepared in at least six EMPRES/CR countries by 2003.

It is seen as necessary that EMPRES/CR and the University of Wageningen will periodically provide assistance in reviewing the likely origin of resources needed to implement contingency plans. In this case, it is anticipated that the PPDs will allocate at least core resources to assure the start of control campaigns at all levels. For upsurges or plague situations it is likely that additional resources will be needed from the Ministries of Agriculture and from other sections of the Governments. Arrangements for the supply of these additional resources will be made and will be reviewed periodically to ensure that the other government units can supply such resources at short notice. In some cases external assistance will be needed to fill gaps in resources. These gaps will be specified and discussed at the regional and the international levels. Possibilities for meeting these requirements will be identified and mechanisms for mobilization reviewed.

In order to ensure the necessary follow-up regarding the arrangements for preparedness of the member countries, it is anticipated that the ELOs will prepare reports for the regular ELO-Meetings, which will be based on the contingency planning documents.

2.7. Result 7: Efficient and environmentally safer control methods introduced.

Research on new pesticides and application technology has opened up the prospect of introducing new methods for Desert Locust control, which are both more economical as well as safer for humans and the environment. In particular the application of environmentally safer chemical pesticides in barriers and the use mycopesticides has become attractive. However, more testing under operational conditions on a large scale and registration is required in the EMPRES/CR countries before these new technologies can be made part of the control strategy.

It is expected that during Phase II at least one new and environmentally sound control technology will be introduced and used on an operational scale. Relevant registration procedures for pesticides are expected to be completed during the 3-years period. However, it should be noted that the ability to conduct field trials in the Central Region will depend on the presence of sufficient locust infestations.

To facilitate the testing of new technologies, EMPRES/CR and the CRC in collaboration with national institutions and with anticipated assistance from GTZ, field trials of mycopesticides and environmentally friendly chemical pesticides will be organized. The trials will be designed to meet national registration requirements, but also to explore the performance on a large scale under operational conditions. Particular attention will be paid to barrier treatments, which offer significant advantages in terms of economics and logistics.

The impact on the environment of new and traditional control technologies will be studied with assistance from SIDA, through the Universities of Uppsala and Goeteborg. These studies will produce recommendations on the types of pesticides which should be used in various habitats (e.g. rangeland, nature reserves or wetlands).

It is assumed that recommendations on environmentally safer campaign operations are formulated by 2003.

The promotion of new technologies for more efficient and economic Desert Locust control is one of the major activities envisaged for Phase II. In some of the EMPRES/CR countries the importation of biocontrol agents such as mycopesticides will only be possible if it is demonstrated that the most promising strain (*Metarhizium anisopliae* var. *acridum*) is already naturally present in the country. Efforts will be made to obtain information on this aspect and to solve issues of quarantine and import regulations. It would be desirable to obtain import permissions for mycopesticides from up to 3 member countries by 2003.

2.8. Result 8: Systematic methods of campaign evaluation developed.

The process of developing an improved preventive control strategy requires long-term attention and support. Until the end of Phase I, EMPRES/CR has been active in the collection of data and has been looking into various components of preventive control, but has not yet started a systematic process of analysis leading to improvements in this strategy. This requires first of all to assemble and to collate more data and then to develop analytical tools and methods such as case studies and theoretical models. Socio-economic studies have already started and a preliminary analysis has been completed during Phase I. However, more detailed socio-economic analyses need to start in specific areas.

With regard to the achievement of result 8, it is expected that at least two case studies on the efficiency and socio-economic impact of national control campaigns will be conducted by 2002. Furthermore, it is expected to complete the work on one computer based model, which comprises elements of population dynamics and campaign organization as a tool for better contingency planning by 2003.

EMPRES/CR in collaboration with the University of Wageningen will assemble and collate existing data from survey operations and recent campaigns. These data will be analysed with regard to estimating locust population levels and what impact control interventions may have had on the populations.

It was seen as necessary to continue the work on socio-economic impact assessments of locust control campaigns. The Universities of Göteborg and Wageningen expressed their willingness to assist the EMPRES/CR programme in its efforts to analyse the socio-economic impact of recent locust upsurges and plagues. Furthermore, EMPRES/CR with assistance from the University of Goetenburg will investigate the viability of farmer insurance schemes and other approaches, which could provide financial assistance to locust control operations at the national and regional level. It is envisaged to conduct studies on different insurance mechanisms in up to four countries by 2003.

Different scenarios to enable the DLCUs to conduct more targeted survey and control operations will be investigated by EMPRES/CR in collaboration with the Universities of Wageningen, Goetenburg, Uppsala and with GTZ. These scenarios will be incorporated into a theoretical model, which will describe various regional and national events of locust population development, the expected impact of control operations under certain conditions and the environmental effects of the campaigns. The models will be tested, calibrated and used for formulating recommendations on improved preventive control strategies.

It is expected that a first version of the model will be tested and completed by 2003.

3. Regional Cooperation

An important objective of EMPRES/CR is to increase collaboration between locust-affected countries at the regional as well as the international level. It is clear that locust control activities in one country can create substantial benefits for other countries in terms of prevented crop damage. The preliminary economic analysis prepared under the EMPRES/CR programme has made a first attempt to analyse and quantify the interrelationship between costs and benefits for individual countries. Ideally, regional collaboration should be based on an overall balance of costs and benefits for all countries, which are affected actually and potentially by the Desert Locust. This is achieved, if collaboration reaches a level, which can support and maintain effective preventive control systems in all countries from which upsurges and plagues may originate.

In the Central Region, the CRC and DLCO-EA have the mandate for supporting regional collaboration. The CRC assists in regional training activities and research. It can also provide modest financial aid to member countries when emergency situations develop. The DLCO-EA provides operational assistance during Desert Locust campaigns, mainly in the form of aerial surveys and aerial application of pesticides. Collaboration is further strengthened by the FAO Desert Locust Control Committee (DLCC), which provides a forum for the locust-affected countries from all regions together with interested donor countries to discuss Desert Locust management issues. DLCC funds can also be provided in case of emergencies. In

the absence of emergencies, DLCC has agreed to and is currently contributing to EMPRES operations.

During Phase II, EMPRES/CR will promote discussions between CRC and DLCO-EA on closer cooperation and on a regional concept of preventive control. In addition, closer interaction between EMPRES/CR and the CRC will be developed. Since both bodies are part of the FAO, the CRC is the most logical partner for eventually taking over those functions of the EMPRES/CR which are needed to maintain a sustainable system of preventive Desert Locust management at the regional level. EMPRES/CR will look into the attempt on how sustainability can be ensured and how its functions can eventually be integrated into the CRC. Since the CRC membership does not yet cover four EMPRES/CR countries (Djibouti, Eritrea, Ethiopia, and Somalia), EMPRES/CR will actively promote applications from these countries to join the CRC. It should be noted that the current CRC member countries have already agreed in principle to accept the remaining EMPRES/CR countries (see result 1).

4. Organizational Framework and Budget

The workshop agreed that the duration of Phase II should be three years, starting on 1 January 2001 and ending on 31 December 2003.

The Phase II results and activities were designed as modules as it was anticipated that a number of donors would prefer to assist with certain technical subjects such as strategy development, economics, improved operational control techniques or data management. The contributions by the different stakeholders and the planned mechanisms of collaboration are described as follows:

During Phase II, the current structure of EMPRES/CR as well as the commitments of participating countries and collaborating regional organizations (CRC and DLCO-EA) will be maintained and further strengthened. Also the two EMPRES/CR bodies involved in planning / implementation (the EMPRES/CR Liaison Officers), as well as in monitoring progress and advising FAO on directions to be taken (the Consultative Committee), will function as before. The Liaison Officers are expected to meet in the final quarter of each year to prepare a workplan for the following year and to discuss its implementation. The Consultative Committee decides its own meeting schedules but it is anticipated that it will meet twice during Phase II. The Consultative Committee will also advise on a second mid-term review envisaged possibly around mid 2003.

The workshop participants felt that the following FAO field staff will be needed for conducting and implementing Phase II: a programme coordinator, one international expert, two National Professional Officers, one training officer, and administrative support staff. The post of a training officer should ideally be established at the level of an international expert. However, funding could not be identified at the time of the planning workshop. Therefore, the post of a training officer was tentatively entered into the budget at the level of a National Professional Officer.

The workshop participants agreed also on tentative levels of funding requirements for each of the results foreseen as well as for other costs such as staff, travel, or meetings. These estimates are presented in Annex 4. Three additional budget lines for equipment, survey in Somalia and a Phase II evaluation, which were not

discussed during the workshop, have been included in the cost estimates. The total budget requirements for Phase II are estimated at approximately US$ 5 million, excluding support costs of 13 % for FAO Trust Fund projects.

The participants of the planning workshop identified a number of resources which will likely or possibly become available for implementing the programme during Phase II. These are summarized in Annex 4. and include:

FAO: FAO is likely to contribute US$ 960,000 including the EMPRES/CR programme coordinator, one National Professional Officer, and the costs of routine meetings and other expenses related to the EMPRES/CR core activities.

CRC: The CRC countries, apart from contributions in kind, are likely to be able to contribute up to US$ 350,000 (US$ 304,500 excluding support costs). This contribution would be made available mainly for joint training and research activities.

DGIS: The Netherlands Development Cooperation is likely to be able to contribute unspent funds remaining in its FAO EMPRES/CR Trust Fund project " Improvement of the Desert Locust Survey Operations and Control Strategies". Since final expenditures in this project for 1999 are not yet available and expenditures for 2000 will only be known in 2001, this contribution can only be estimated at present. However, it is expected to be at the level of US$ 1,200,000 (US$ 1,060,000 exclusive of support costs). The contribution will focus on development of improved survey techniques and control strategies and is likely to cover one international expert, one National Professional Officer, some administrative support and travel as well as parts of the costs related to activities 4.1, 4.2, 5.3, 5.4, 5.7, 6.1, 6.2, 8.1 and 8.4 (see Programme Planning Matrix, Annex 3). In addition to support through an FAO Trust Fund project, DGIS is likely to provide bilateral support through the University of Wageningen, mainly in terms of expert advice for the above listed activities.

SDC: The Swiss Development Cooperation is likely to be able to contribute the unspent funds remaining in its FAO EMPRES/CR Trust Fund project ("Swiss contribution to EMPRES (Desert Locust component) Central Region Programme") in the form of a no-cost-extension. These are estimated at US$ 140,000 (US$ 124,000 excluding support costs. Accurate figures will only become available after Phase I is completed.

USAID: USAID has provided significant support to EMPRES/CR during the recent years, but decides on continued contributions on an annual basis. Given current funding levels this contribution could reach US$ 600,000 (US$ 531,000 excluding support costs) during Phase II.

BMZ: The German Technical Cooperation (GTZ) is likely to contribute bilaterally to the activities under result # 7, "Efficient and environmentally safer control methods introduced". In addition, GTZ may contribute with 12 expert months during 2001 and 2002.

SIDA: The Swedish Development Cooperation is also likely to contribute bilaterally, through the Universities of Uppsala and Göteborg, to the implementation of those activities which are related to economic studies (8.2 and 8.3) as well as to the environmental aspects of pesticides (part of activity 7.1). The expected funding level through SIDA is estimated at approximately UD$ 600,000.

DFID: The British Department for International Development through the Natural Resoures Institute (NRI) already contributed to the development of the RAMSES data management system and of remote sensing technology. It is likely that it will be able to continue the development of the RAMSES system (activity 3.4). The likely funding level from DFID is estimated at about US$ 300,000.

The breakdown in Annex 4 indicates that support for some activities is likely to be available, but that significant resources are lacking or are uncertain for others. The current stage of planning does not yet allow a division of most budget components into standard FAO budget lines such consultancies, non-staff travel, supplies or general operating expenses. Such details can only be included after a yearly workplan has been prepared by the EMPRES Liaison Officers. These workplans will then form the basis of establishing and revising budgets for EMPRES/CR Trust Fund projects.

5. Reporting

The current EMPRES/CR reporting schedules and formats will be maintained. These will include

- An annual EMPRES/CR report;
- Semi-annual reports for specific trust fund projects, where required;
- A terminal report for Phase II

6. Risks and Assumptions

There are a number of factors, which may prevent the implementation of Phase II as planned. Three are of particular importance:

1. Political instability and insecure areas

   During Phase I some EMPRES/CR operations have been seriously affected by political instability and restricted access to insecure areas. It is possible that during Phase II similar situations may reduce some of the planned activities including data collection, field trials or training.

2. Insufficient allocation of resources

   It is possible that sufficient resources cannot be found in order to implement the programme as planned. The lack of locust outbreaks in the Central Region during

the last years may have reduced the motivation of the stakeholders to support the strengthening of preventive Desert Locust control capacities.

3. Insufficient locust infestations for field trials

   Infrequent locust infestations are usually considered to result from a combination of efficient control operations and insufficient rainfall in the major breeding areas. If this situation continues, it would provide few opportunities for field studies. However, it may be possible to implement some of the studies in other EMPRES regions.

7. Appendices

Annex 1: Outline of the EMPRES Central Region Programme and its achievements

Annex 2: Problem analysis

Annex 3: Programme Planning Matrix, Phase II

Annex 4: Budget Plan, Phase II

Annex 5: List of workshop participants

Annex 6: Acronyms

Annex 1: Outline of the EMPRES Central Region Programme and its achievements

The Desert Locust is considered to be one of the most serious threats to agricultural production in Northwest, West and East Africa, the Near East and Southwest Asia. In these regions the risk of catastrophic damage and even famines is always present in the minds of farmers, Government officials and the general public.

The Desert Locust component of the EMPRES/CR programme has its origin in the 1986 – 1989 locust plague and in a large upsurge, which started 1992. In both cases Desert Locust infestations started in the Red Sea region, triggered by favourable rainfall in key breeding areas. Control operations were insufficient or delayed and the locust infestations escalated quickly and spread to other regions. In particular West and Northwest Africa but also India and Pakistan were invaded by large numbers of locust swarms, which triggered further breeding and an expansion of the plague. The control campaigns which were conducted during this plague, raised widespread concern regarding the economic costs as well as the safety and the environmental impact of the control strategies used.

The EMPRES/CR programme is based on the realization that it is important to strengthen the locust early warning, monitoring and control systems in those countries from which plagues can originate. A consensus exists among the stakeholders that preventive control at an early stage will be able significantly to reduce the risks of upsurges and plague developments. It is further accepted that for a preventive control strategy to be effective, close regional cooperation and concerted action by the affected countries is needed because of the migratory nature of the pest.

Hence the EMPRES/CR programme aims to achieve four objectives over a period of approximately 12 years:

I. To increase the level of coordination of Desert Locust monitoring, survey, and control activities in the Central Region by facilitating networking between national, regional, and international organizations and by strengthening information exchange systems (core programme).

This core component of the EMPRES/CR programme aims at more effective collaboration and communication between the national locust control services as well as two regional organizations, the FAO Commission for Controlling the Desert Locust in the Central Region (CRC) as well as the Desert Locust Control Organization for Eastern Africa (DLCO-EA). During Phase I, EMPRES field offices have been established in Asmara (Eritrea), Khartoum (Sudan), Sana'a (Yemen) and Addis Ababa (Ethiopia). Eight of the nine EMPRES/CR member countries (Djibouti, Egypt, Eritrea, Ethiopia, Saudi Arabia, Somalia, Sudan, Oman and Yemen) have each designated one National Liaison Officer, who, together with the CRC Secretary, the Director of the DLCO-EA and the FAO/EMPRES staff form the main body for organizing and implementing the programme. The FAO staff is headed by an EMPRES/CR Coordinator. The programme's progress is monitored by a Consultative Committee, consisting of senior representatives of the participating Governments, and donor representatives. The Committee advises FAO on directions to be taken by

the programme. A regional communication system based on e-mail connections has been established and facilitates implementation of the programme and coordination.

II. To establish an improved Desert Locust early warning system based on meteorological, remote sensing, and field information capture and analysis

The strengthening and improvement of survey procedures and early warning systems is a key element of effective preventive control. During the first phase of the EMPRES/CR programme, the needs for equipment and training have been analysed in some of the member countries and efforts have started to fill the identified gaps. The technical improvements of survey and early warning procedures have so far focussed on three aspects:

- The use of remote-sensing technology to identify vegetation in important breeding areas has been tested in Eritrea and Sudan. This technology is considered to be a promising tool to guide survey teams and to assess locust populations.

- A data management system with GIS capability (RAMSES) has been developed under the EMPRES/CR programme by the Natural Resources Institute (University of Greenwich, UK). RAMSES offers a powerful data management feature, specially designed for data related to Desert Locust management including survey and control data and satellite images. RAMSES packages tailored for specific national needs and conditions have been developed and introduced into Eritrea and Yemen.

- The analysis of survey procedures, in particular with regard to the development of methods for assessing locust populations has started in collaboration with the Wageningen Agricultural University.

III. To strengthen and improve national preventive control capacities through (a) improved planning, training, provision of equipment and operational resources, as well as through (b) the field testing of new control technologies

A Country Focus Programme (CFP) has been initiated in Eritrea, Yemen and Sudan, which analyses the national capacities for survey and control and identifies the needs for staff training, equipment and operational improvements. Based on the CFPs and other assessments, EMPRES/CR has addressed critical needs in equipment and supplies and training. Equipment provided included field vehicles, survey equipment such as GPS, ULV-sprayers and communication equipment such as radios and computers.

Training has been focussed on qualification of national trainers for survey and control operations and modern training approaches. In addition, a number of courses and workshops addressed specific technical subjects such as aerial control operations, data management, information and forecasting, environmental impact and safety aspects. Particular attention was given to contingency planning development in selected countries.

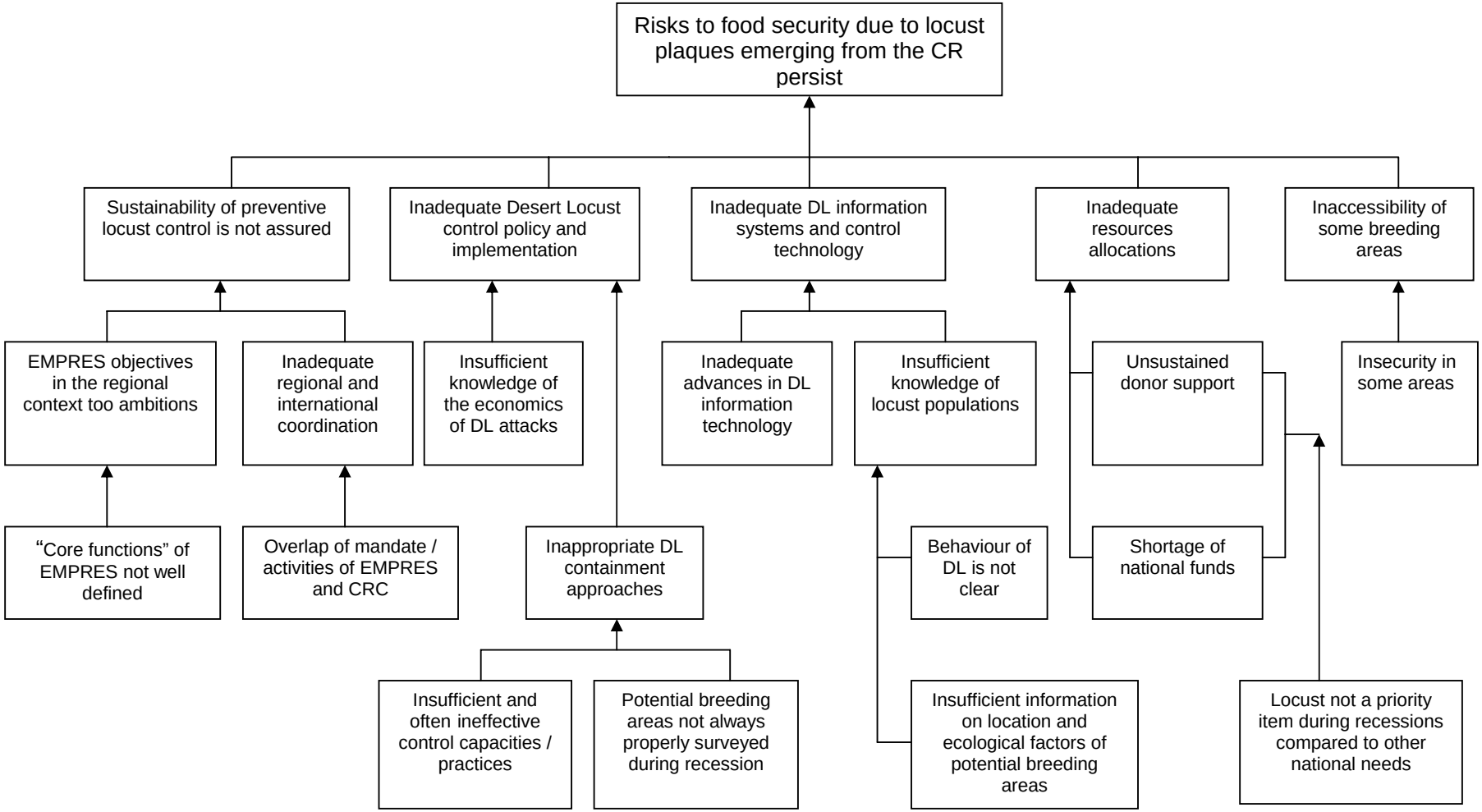
The low levels of locust infestations, which prevailed during Phase I, prevented field-testing of improved control methods under operational conditions. However, progress was made in identifying bottlenecks for the introduction of biological control agents (mycopesticides), as well as in demonstrating, in collaboration with the Norwegian-funded EMPRES project based in Mauritania, more accurate methods of applying pesticides from the air by using a differential GPS system.

IV. To formulate improvements in the Desert Locust emergency prevention strategy through evaluating the effectiveness, efficiency and environmental soundness of current approaches and new technologies.

Current preventive control strategies in the affected countries are not yet based on systematic data analysis and are insufficiently defined. Data collection and analysis have started under EMPRES/CR with the aim to develop improved preventive control strategies. In particular, a preliminary economic analysis has been conducted in 1996 – 1997 and was published in 1998. This study assembled and reviewed the information available and used a modelling approach for examining different scenarios. It provided a valuable first overview on aspects of cost and benefits, which can be incorporated into future efforts in developing more economic control strategies.

It can be concluded that EMPRES/CR has already made a significant contribution to strengthening the preventive control capacities of the member countries in the Central Region. The problems which need to be addressed in the Region have been analysed and in most cases also quantified. Substantial progress has been made in developing appropriate training approaches and training of locust officers. An efficient communication network has been set up and advances have been made in developing early warning and environmentally friendly control technologies. However, much remains to be done in the coming years before an effective and suitable preventive control system is established in the Central Region.

Annex 2: Problem analysis



Annex 3: Programme Planning Matrix, Phase 2

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
Development Goal: To reduce the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area in order to mitigate food security, economic and environmental concerns in the Central Region and beyond			• Statistics • Reports • Studies	• Desert Locust Control Services in the Central Region sustained and further components of preventive control strategies developed • The governments of the affected countries maintain support to the Locust Control Services during recession periods • External assistance in case of emergency provided in time
Programme Goal: To strengthen the capacities and capabilities of the national, regional, and international components of Desert Locust management system to implement effective and efficient preventive control strategies based on early warning and timely and environmentally sound early control interventions		Up to 8 of the Desert Locust Control Units in the Central Region practice at least X essential components of preventive control techniques/methods as part of their Desert Locust management strategy in a sustainable way (end of the programme)	• Planning documents • Strategy papers • Reports	• All EMPRES member countries become part of the CRC • Donor agencies support the EMPRES programme

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
Purpose of Phase 2: Components of preventive control management developed and adopted				
R-1 Operational mandates of different regional organizations in DL management harmonized	• EMPRES Coordinator • EMPRES / FAO HQ	I.R-1 At least 1 EMPRES country joins CRC as a new member by 2002 I.R-2 A draft MoU between CRC/DLCO (supported by EMPRES) on implementation of sustainable DL management concepts in the CR formulated by 2003	• Signed agreement • Draft MoU	Regional organizations are willing to cooperate
1.1 Support a working group consisting of staff from CRC, DLCO, (+IGAD)				
1.2 Organize inter-governmental exchange on legal issues on DL regional organizations				
1.3 Promote CRC membership of non-member countries of the CR	CRC secretariat and EMPRES			
1.4 Further develop joint-activities between CRC, DLCO and EMPRES towards creating sustainability	CRC + DLCO + EMPRES management			

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
R-2 National & regional communication networking enhanced	ELOs	I.R-2.1 Timeliness of sending DL reports to DLIS improved by 20% by 2001, 50% by 2002, 80% by 2003 I.R-2.2 Fixed radio schedules defined and made standard communication procedures at 5 DL units by 2003	DLIS log analysis	
2.1 Stimulate pro-active attitude in information exchange among stakeholders	PPDs / EMPRES			
2.2 Maintain & update communication equipment and S/W				
R-3 DL early warning and information systems improved		I.R-3.1 RAMSES installed and being used in at least 5 countries by 2003 I.R-3.2 Remote sensing images incorporated into surveying decisions in at least two countries by 2003	EMPRES progress reports	
3.1 Define information needs	ELOs/EMPRES training officer			
3.2 National locust information routinely dispatched to DLIS	PPDs			
3.3 Harmonize DL information systems between CRC / DLCO-EA / DLIS	EMPRES			
3.4 Provide facilities for data management systems	EMPRES			

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
3.5 Introduce new technology including remote-sensing into early warning information system	EMPRES			
R4 DL survey procedures of member countries improved		I.R-4.1 Survey plans developed and made integral procedure of the PPD in at least 4 member countries by 2003 I.R-4.2 Key breeding areas of at least 2 member countries identified and described by 2003 I.R-4.3 Up to 2 joint border surveys conducted on two borders in the CR by 2003. (Other than the Egyptian – Sudanese borders)		Security and accessibility of breeding areas in the Central Region assured
4.1 Develop sustainable and targeted survey procedures	EMPRES/ELOs		Survey reports	
4.2 Define and describe potential breeding areas	EMPRES/ELOs			
4.3 Carry out joint surveys	• PPDs • EMPRES			
R-5 DL technicians and officers qualified		I.R-5.1 At least 50% of DL technicians trained in each CR country by 2003 I.R-5.2 At least 2 trainers trained according to agreed standards for each country by 2002	Reports of training events	Political conditions and / or infrastructure permits equally conducted programme activities
5.1 Define training needs	• ELO • FAO			

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
5.2 Define training standard	• FAO • PPDs/MoAs			
5.3 Develop training curricula / manuals for ToT-courses & locust officers	Consultants			
5.4 Assist universities in DL curricula development and involve students in EMPRES activities	ELOs	At least 5 students are enrolled at the diploma course per year at Khartoum University		
5.5 Organize training of trainers	FAO			
5.6 Provide training for informa-tion and forecasting officers	FAO MoAs	Supply universities in CR countries with K.hartoum University curricula		
5.7 Organize survey control and management training courses on national level	MoAs FAO DLCO-EA			
5.8 Harmonize training concepts of international and national organizations and services	CRC EMPRES DLCO-EA			
5.9 Evaluate training impact	MoAs			

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
R-6 Contingency plans available and implemented		I.R-6.1 National contingency plans for recession monitoring and control for outbreaks upsurges and plagues adopted in up to 6 countries by 2002	Contingency plans	
6.1 Prepare national contingency plans	MoAs/FAO			
6.2 Update preparedness for implementing contingency plans	MoAs/FAO			
R-7 Efficient and environmentally safer control methods introduced		I.R-7.1 At least 1 new additional control technology introduced in at least 3 countries by 2003	EMPRES reports	Locusts infestation permits field trials
7.1 Facilitate development testing of new technologies taking into account human health and the environment	MoAs/FAO			
7.2 Promote the use of proven new technologies	MoAs/FAO			

Results/Activities	Responsibility	Indicators	Sources of verification	Assumptions
R-8 Systematic method of campaign evaluation developed		I.R-8.1 Two case studies conducted by 2002 I.R-8.2 Models to identify efficient control strategies via scenarios completed by 2003	Technical and scientific publications	
8.1 Assemble, analyse and document survey and control operations	EMPRES		Technical reports	
8.2 Analyse socio-economic impact of campaigns	EMPRES			
8.3 Investigate the potential for alternative approaches to offset the effects of DL damage	EMPRES			
8.4 Investigate scenarios on survey and control operations to improve strategies	EMPRES			

Annex 4: Budget Plan, phase 2

Result	Estimated funding required (US $)	Likely (possible) funding sources	Remarks
R-1 Operational mandates of different regional organizations in DL management harmonized	30,000	• (USAID: $ 20,000)	Insufficient resources
R-2 National & regional communication networking enhanced	50,000	• (USAID: $ 15,000)	Insufficient resources
R-3 DL early warning and information systems improved	500,000	• FAO: $ 20,000 • DFID: bilateral for RAMSES • DLCC: $ 50,000 • (USAID: $ 50,000)	Insufficient resources
R4 DL survey procedures of member countries improved	300,000	• FAO: $ 30,000 • DGIS: $ 100,000 • SDC: $ 40,000	Insufficient resources
R-5 DL technicians and officers qualified	500,000	• CRC: $ 150,000 • DGIS: $ 100,000 • SDC: $ 40,000 • (USAID: $ 55,000)	Insufficient resources
R-6 Contingency plans available and implemented	50,000	• DGIS: $ 50,000	
R-7 Efficient and environmentally safer control methods introduced	300,000	• BMZ: bilateral through GTZ for field trials • SIDA: bilateral for environmental impact assessment • CRC: 124,500	
R-8 Systematic method of campaign evaluation developed	500,000	• DGIS: $ 160,000 • CRC: $ 30,000 • SIDA: bilateral for economic studies	Insufficient resources
Total 1:	**2,230,000**		

Other inputs required:

Input	Estimated funding required (US $)	Likely (possible) funding sources	Remarks
Programme Coordinator	420,000	• FAO: $ 420,000	
Internat. Expert	370,000	• DGIS: $ 370,000	
NPO-Control	75,000	• FAO: $ 75,000	
NPO-Survey	60,000	• DGIS: $ 60,000	
NPO-Training	60,000	• (USAID: $ 60,000)	
Support staff	180,000	• FAO: $ 55,000 • DGIS: $ 40,000 • (USAID: $ 20,000)	Insufficient resources
Staff travel	200,000	• FAO: $ 60,000 • DGIS: $ 80,000 • (USAID: $ 30,000)	Insufficient resources
Meetings	200,000	• FAO: $ 180,000 • (USAID: $ 20,000)	
Operation, maintenance & miscellaneous	300,000	• FAO: $ 80,000 • DGIS: $ 80,000 • (USAID: $ 30,000)	Insufficient resources
Equipment	300,000	• FAO: $ 40,000 • (USAID: $ 31,000)	Insufficient resources
Survey op., Somalia	150,000	• (USAID: $ 150,000)	
Evaluation, Phase II	50,000	• DGIS: $ 20,000 • (USAID: $ 20,000)	Insufficient resources
Contingency	400,000	• (USAID: $ 30,000)	Insufficient resources
Total 2:	**2,765,000**		

Summary of likely and possible contributions:

FAO:	$ 960,000	no support costs
SDC:	$ 124,000	plus 13 % support costs, $ 140,000
DGIS:	$ 1,060,000	plus 13 % support costs, $ 1,200,000
USAID:	$ 520,000	plus 13 % support costs, 600,000
CRC:	$ 304,500	plus 13 % support costs, 350,000
BMZ:	$ 300,000	bilateral contribution, plus 12 Expert Months in 2001 – 2002
SIDA:	$ 600,000	bilateral contribution
DFID:	$ 300,000	bilateral contribution
Total:	$4,168,500	

Remaining estimated funding requirements:

US$ 4,995,000 – 4,168,500 = US$ 826,500 + support costs where applicable.

Annex 5: List of participants

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Annex 6: Acronyms

FAO	Food and Agriculture Organization of the United Nations
BMZ	German Ministry for Economic Cooperation
C	Control
CR	Central Region
CRC	FAO Commission for Controlling the Desert Locust in the Central Region
DFID	British Department for International Development
DGIS	Dutch Development Cooperation
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DLCU	Desert Locust Control Unit
ELO	EMPRES Liaison Officer
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (Desert Locust component)
GTZ	German Technical Cooperation
HQ	Headquarters
ICIPE	International Centre for Insect Physiology and Ecology
NPO	National Professional Officer
NRI	Natural Resources Institute
PPD	Plant Protection Division (Department)
S	Survey
SDC	Swiss Development Cooperation
SIDA	Swedish Development Cooperation
USAID	United States Agency for International Development
US $	US-Dollar