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PROGRAMME DOCUMENT

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

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Desert Locust Management in the Central Region



Food and Agriculture Organization of the United Nations

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SUMMARY

Background and justification

The Desert Locust is considered to be one of the most devastating pests of agriculture. Since 1987 large scale control operations have been carried out with few interruptions and have caused considerable concern in relation to their economic costs, the safety and environmental impact of the chemical pesticides used, and the capacity of existing organizations to deal with the problems in an efficient and effective manner.

The FAO Council in mid-1994 endorsed a proposal for the development of an Emergency Prevention System (EMPRES) for transboundary pests, with a major focus assigned to the Desert Locust. Given the importance of the Central Region as a source of many Desert Locust outbreaks and upsurges, it was proposed that the programme would begin in this region, focussing on countries on either side of the Red Sea, and expanding later into other regions. The current programme document deals with EMPRES (Desert Locust) activities in the Central Region. A comparable document has been prepared for the Western Region.

Detailed background information on the Desert Locust, analyses of the problems and difficulties associated with its control, as well as justifications for a preventive approach have been provided in Annexes I and II of the original version of the programme document. The programme is designed as a collaborative effort between key locust-affected countries, regional institutions, such as the FAO Desert Locust Control Commission for the Central Region (CRC) and the Desert Locust Control Organization for Eastern Africa (DLCO-EA), donors which have traditionally provided assistance to Desert Locust management, and FAO which has a mandate for overall monitoring and coordination of Desert Locust matters.

The EMPRES (Desert Locust) programme in the Central Region began as pilot activities in 1995 and 1996, after which a full donor-assisted programme started in 1997. A document for the full programme was prepared in October 1995. As requested by the Evaluation Mission (1999), the current document is a revised version of that document, prepared in early 2000 as part of the planning process for the Second Phase of the programme. The modifications incorporated take into account the experience gained during the first three years of the programme, as well as the evaluation of the EMPRES (Central Region) programme in July/August 1999, which concluded that certain aspects of the programme needed to be more clearly defined.

Programme goals and concept

The development goal of the EMPRES programme is:

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.

The programme goal is:

To strengthen the capabilities and capacities of 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.

The strategy of the programme is built around two major axes. It has a strongly **preventive character**, which seeks to improve the effectiveness of dealing with Desert Locust problems as they arise. It also has a strong **learning** component, which includes activities related to regular evaluation of progress, training and research. The latter components will rely heavily on collaboration with existing and planned bilateral projects (Section C).

The goals and objectives of the programme together with indicators and assumptions are summarized in a logical framework attached as Annex I. The current programme document describes the objectives, important outputs and institutional arrangements of the programme in general terms. More specific outputs and activities applicable to each of the following twothree programme phases foreseen will be defined in form of participatory workshops prior to each of the phases.

Objectives

1. 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).

A regional EMPRES unit will be established in the Central Region for coordinating and organizing the activities of the programme. It will collaborate closely with the CRC. Coordination will involve the activities of national and regional counterpart organizations as well as associated FAO projects. Collaboration will be also sought with various organizations and bilateral projects which have an interest in the Desert Locust. An efficient information exchange system will be developed aimed at improving decision making and at rapid mobilization of control operations (Section D-1).

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

Survey operations will be improved and an early warning system will be established in the Central Region, complementing FAO Headquarters activities, which will identify and monitor actual and potential outbreak areas (D-2).

3. 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.

The early control capacity of key countries in the Central Region will be strengthened by reviewing and restructuring campaign organization and execution, by training and by providing technical assistance and equipment. Improved methods for monitoring the efficacy of control operations as well as the safe use and environmental impact of pesticides will be introduced. New control technologies, aimed at increasing efficiency and reducing environmental impact, will be field-tested and if applicable introduced at the operational level (D-3).

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

The programme will introduce a procedure for analysing and evaluating current survey/control methods and procedures, establishing research priorities and recommending the adoption of modified strategies. Among others, this will include economic studies as well as modelling of the effects of various types of control interventions as components for improved strategies (D-4).

Institutional structure

The following countries are participating in the EMPRES programme in the Central Region: Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen. While the collaboration of all these countries is needed for the success of the programme, there is at present great variability in the capabilities and resources available in these countries. Those efforts from EMPRES, which are directed towards strengthening national capacities, will be particularly directed towards overcoming this imbalance. On the side of FAO a Programme Coordinator will have the overall responsibility for coordination, technical development, budgeting,

administration and personnel. The assignment of other staff will be considered as part of planning for each phase of the programme.

The EMPRES programme will collaborate closely with the CRC, to the extent that joint workplans are prepared, that many activities are jointly funded, and that both organizations closely coordinate their activities through regular and frequent contacts. The programme will further collaborate closely with the DLCO-EA. Five of the DLCO member countries are also participating in the EMPRES Central Region programme.

The management and coordination of the programme will involve two bodies:

(1) A Consultative Committee comprised of senior representatives of all participating countries, organizations and donors which either take part in the implementation of the programme or support it directly or indirectly. The Consultative Committee will meet approximately every year and will have a mandate to review EMPRES activities and results, to review the workplan and the budget, evaluate the constraints and problems, review coordination/collaboration and special issues, and make recommendations to FAO on necessary actions that should be taken.

(2) EMPRES liaison officers appointed by the participating governments and DLCO-EA who will meet once or sometimes twice a year with FAO staff and relevant experts. These workshops and meetings will be aimed at producing annual workplans and ensuring collaboration during the implementation of the programme.

Budget

For the first 4-year phase of the EMPRES Central Region programme, FAO and donors have allocated approximately \$ 5.5 million in inputs. It is anticipated that comparable resources will be needed during subsequent phases.

Sustainability

It is expected that the EMPRES programme will need multi-donor support over three phases of 3 or 4 years each. However, each phase will involve modifications reflecting evolving knowledge and conditions as well as experience gained from the programme implementation. By the end of these phases, it is anticipated that national Plant Protection Services will have been substantially strengthened both materially and in terms of human resources to organize methodologies, technologies, and resources for Desert Locust survey and control in a more systematic manner. At the end of this period there may still be a need for continuing involvement of FAO in some areas such as operating the early warning system or providing ongoing support at a reduced level to some countries. The establishment of sustainable post-EMPRES institutional mechanisms for maintaining available on-going preventive strategies will be an essential objective of the programme. Merging the roles and mandates of CRC and EMPRES under one umbrella, is one of the options, which will be considered. The Consultative Committee has the mandate to review from time to time progress of the programme and to promote the long-term sustainability of its achievements in the light of national control policy statements. (Section H)

A. BACKGROUND AND JUSTIFICATION

The Desert Locust plague of 1986-89 and the more recent upsurges between 1992 and 1998, have caused considerable and widespread concern in locust affected countries, in donor countries and agencies. These concerns relate to the apparent increase in the frequency of such events, the economic costs of control, the safety and environmental impact of the chemical pesticides used, and the capacity of existing organizations to deal with the problems in an efficient and effective manner. A consensus exists that it is important to strengthen the early warning, monitoring, and control systems for the Desert Locust. Early detection of nascent problems would allow control to be undertaken at the earliest possible stage, thus minimizing the risk of significant expansion of important pest populations.

The programme and its justifications are based on a number of detailed analyses conducted since the 1986-89 plague. It builds on past and ongoing efforts by the international community to strengthen national and regional locust control services and to develop more efficient and environmentally acceptable control techniques. It is also based on the premise that affected countries and donors can consolidate and coordinate their efforts under EMPRES in a more effective manner.

The programme is based on the framework proposed by an EMPRES formulation mission which had visited key affected countries in Eastern Africa and the Near East in late 1994. This framework of EMPRES has been discussed and endorsed by a number of international meetings including the 33rd session of the Desert Locust Control Committee (January 1995) and the 4th session of the Desert Locust Technical Group (March 1995).

Background information on the pest, analyses of the problems and difficulties associated with its control as well as justifications for a preventive approach are provided in detail in Annexes I and II of the original version of the programme document.

Part of the difficulty associated with having in place an effective and efficient management system for dealing with the Desert Locust is the biology and ecology and especially the erratic nature of the pest itself. The capability of the Desert Locust for rapid multiplication and long-distance migration under favourable conditions results in highly variable population levels over space and time. This migratory ability means that the problem may shift from one location, country, or region to another in a short period. This has implications with regard to the level of priority given to it in different countries, and the importance of coordination of efforts between countries and institutions. Because of its rapid movement, there are limited windows for control, demanding high organizational and logistical capability. Finally, the Desert Locust covers a huge territory, and areas which need to be monitored, surveyed, or controlled are frequently remote or hard to access. This makes it extremely difficult to find and deal with the pest at an early stage in its development.

The history of Desert Locust plagues and upsurges is comparatively well documented and it is known that they originate in so-called gregarisation areas after these have experienced a sequence of favourable rains. During gregarisation Desert Locusts concentrate and multiply and finally form large swarms, which are a serious threat to agricultural production in locust-affected countries. The gregarisation areas along the coasts of the Red Sea and the Gulf of Aden are considered particularly important and the 1986-89 plague as well as recent upsurges have originated in that region. However in the past, gregarisation areas in South-West Asia and in West Africa have also played important roles during the origin and development of upsurges and plagues.

The system of Desert Locust management as currently practised by affected countries, regional control organizations and the international community suffers from a number of deficiencies which are interrelated and tend to reinforce each other. Those which need to be addressed most urgently are:

(i) The Central Region of the Desert Locust distribution area (Eastern Africa and the Near East) has not been sufficiently recognized as a major source of locust upsurges and plagues. Too much is assumed of the capacity of some of the key countries in that region to conduct the surveys needed to monitor the Desert Locust populations and give early warning of developing upsurges as well as take firm early and timely control measures. It needs to be better recognized that some affected countries will require considerable time and support before they will be able to sustain an effective monitoring and control capacity.

(ii) At the international level, FAO, as the key UN Agency for locust control, through its Regular Programme, is constrained by financial resources to support field operations, to promote, coordinate and monitor research, as well as to strengthen the activities of the Desert Locust Control Committee and the three Commissions for controlling the Desert Locust in North West Africa, the Near East, and in South-West Asia.

(iii) While some funds are available to FAO to handle emergencies, the majority of emergency funds comes from donors in response to the spectre of Desert Locust plagues. Frequently, these emergency funds cannot be allocated fast enough in order to intervene at an early stage, resulting in further breeding and migration of the locust and in an escalation of the cost of control. Management of the Desert Locust on an emergency basis, that is combating upsurges and plagues as they occur - in contrast to ongoing regular management oriented to prevention - appears not to be cost efficient, impedes development, increases the risk of adverse environmental impacts, and makes no sustained contribution to better scientific understanding of the Desert Locust and its control.

(iv) Insufficient attention has been paid to the organizational and logistical changes which were required by the switch in the 1970s and early 1980s from a control strategy using persistent organochlorines to a technically more demanding strategy based on less persistent pesticides. The consequences of this shift in strategies with regards to overall efficacy of control operations have not been analyzed thoroughly enough.

The constraints experienced during the last campaigns are outlined in more detail in Annex III of the original version of the programme document. In addition to the constraints in the current locust management systems, there is an urgent need to promote more vigorously research aimed at improving monitoring, forecasting and control methods, including the development of methods which could replace the currently used chemical pesticides. Although the current pesticides are less persistent they are still hazardous to humans and the environment.

Responding to the above, the FAO Council in mid-1994 endorsed a proposal for a Special Programme on the development of an Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases, with a major focus given to the Desert Locust. Given the importance of the Central Region as a source of many outbreaks and upsurges it was proposed that the programme would begin in this region, focussing on countries on either side of the Red Sea, and expanding later into other regions.

During the design of the programme it became clear that collaborative efforts by a larger number of partners would be needed to address the problems associated with Desert Locust management. Discussions with donors about such collaboration started in 1995 and a full donor-assisted programme started at the beginning of 1997. On its side, FAO has allocated Regular Programme resources to EMPRES which have been used in early 1995 to start urgently needed initial activities in key locust affected countries. These were aimed at establishing an early warning system in the Central Region and to strengthening the capacity to react quickly to build-ups of pest populations in critical areas. The pilot activities were integrated into the full Central Region programme when it became operational with FAO providing significant support to that programme as well.

A document for the full programme was originally prepared in October 1995. The current modified version of the programme document was prepared in early 2000, in connection to planning for the Second Phase of the programme. The modifications incorporated take into account the experience gained during the first three years of the programme, as well as the evaluation of the EMPRES (Central Region) programme in July/August 1999, which concluded that certain aspects of the programme need to be more clearly defined. In particular, the objectives were defined more precisely in order to enable the formulation of clearer and more focussed outputs. In addition, institutional and collaborative arrangements were described more specifically.

The programme deals with Desert Locust management in the Central Region. It should be noted that, while the Central Region is the main focus of EMPRES, some FAO and donor resources are also allocated for preventive control in West Africa and Southwest Asia, as well as for international components like improving forecasting and information exchange activities at FAO Headquarters. A comparable programme document for the Western Region was formulated in 1998. As of early 2000, implementation of the programme was still awaiting additional donor support. In the meantime, pilot activities are continuing in that region.

The inter-regional importance of preventive Desert Locust control is commonly recognized (see for example section 2 of Annex II of the original programme document). It is widely accepted that an effective system of preventive control requires not only adequate monitoring and early control capacities in the key countries of all regions but also close collaboration between all affected countries within and across regions. While FAO and many countries promote such collaboration it is necessary to remember, and if possible revive, the spirit of collaboration which we know from earlier Desert Locust campaigns. For example in the 1950s locust survey and control teams from Egypt, India, Iran, Iraq, Jordan, Pakistan, Saudi Arabia, Sudan, Syria, the U.K. and Yemen were actively involved for many years in the joint international Desert Locust campaign in the Arabian Peninsula.

B. PROGRAMME GOALS

The development goal of the EMPRES programme is:

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.

The programme goal is:

To strengthen the capabilities and capacities of 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.

The goals and objectives of the programme together with indicators, assumptions and responsibilities are summarized in a logical framework attached as Annex I.

C. PROGRAMME CONCEPT

The EMPRES programme concept is designed to satisfy the following conditions:

its components should contribute to economic and social justification for preventive control strategies, it should be environmentally sound ,
it should be technically and financially feasible,
it should be sustainable,
there should be no duplication of existing efforts,
it should rely and build on national systems,
it should have the flexibility to adjust to changing conditions and an improved knowledge base,
it must include a strong technical capability to review and advise on locust control strategies,

It is anticipated that the concept should have the strong support of locust affected countries at both senior policy and operational levels, and the strong support of donors.

On the basis of the various background considerations described above and in Annex I to III of the original programme document, a programme strategy is adopted here which calls for the assignment of FAO field staff in the Central Region. The staff will provide technical advice and support for locust monitoring, control, training and operational research and will include a Programme Coordinator with overall responsibility for coordination and management of the programme, supported by national and regional experts, by international and national consultants and if possible by Associate Professional Officers.

The EMPRES programme strategy adopted here is built along two major axes. Firstly, it has a strong **preventive character**, which seeks to improve the effectiveness of dealing with Desert Locust problems as they arise. This is to be achieved through an improved early warning and forecasting system, and through the strengthened capabilities and capacities of the locust control services in the region for monitoring, survey and control.

Secondly, the strategy has a strong **learning component**. This is premised on the belief that while certain concrete steps can be taken immediately to improve the efficiency and effectiveness of Desert Locust management systems, there are still many gaps in knowledge regarding Desert Locust ecology and management, which need to be addressed, and which may influence the outcome of any programme. There are also new technologies under development, which, if they prove feasible, may influence strategies. The implication of this is that the strategy must be an adaptive one, built on existing knowledge, but allowing for modification as the knowledge base expands.

Given the behaviour of the Desert Locust, the successful development and implementation of a preventive strategy depends also on many actors working towards common goals and objectives. A strong sense of ownership in the programme is needed by the benefiting institutions to ensure its success in the short-term as

well as to promote its longer-term sustainability. The EMPRES programme strategy will therefore build on and encourage collaboration among all parties, ensuring that both enlightened self-interest as well as the good-will to participate in a joint strategy which benefits all, are recognized as motivating factors.

Geographically, the programme will focus on Desert Locust early warning and control in the Central Region but will promote the development of related activities in the other regions and will link up and coordinate with these once they become operational. In any case research activities promoted and supported should benefit all countries affected by the Desert Locust. The foreseen information exchange mechanism should be designed to be able to expand to cover other countries in West Africa and Southwest Asia.

D. OBJECTIVES AND OUTLINE OF OUTPUTS AND ACTIVITIES

The following sections describe the objectives of the programme and provide an outline of which outputs and activities are foreseen to be major contributing elements in achieving these objectives. Details of outputs and activities will be formulated when planning for each programme phase.

D-1. 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

The core component of the EMPRES (Central Region) programme will be a regional unit which collaborates closely with the CRC and which is responsible for the regional coordination of EMPRES activities as well as for increasing information exchange and collaboration between the EMPRES countries. This unit will also be responsible for ensuring smooth collaboration with other important partners like the DLCO-EA, donor agencies supporting EMPRES bilaterally, and relevant research institutes. The unit will further establish and maintain contacts with partners in other regions with the aim of exchanging experience and information. An EMPRES (Central Region) Programme Coordinator will head this unit and will be assisted by other staff.

To ensure the sustainability of the achievements of the EMPRES programme, it will be important to pay particular attention to the question of what elements of regional coordination and information exchange need to be maintained after the conclusion of EMPRES, and in which form. The establishment of an improved institutional mechanism for maintaining in the long-term regional coordination and information exchange will be an important output under this objective.

Important elements of this core component are expected to be:

EMPRES **field offices** are established and maintained in a number of strategic locations within the Central Region. Criteria for establishing a field office in a given location include reliable communication facilities, frequent airline connections, easy access to important locust breeding areas and office space provided by the Government. At the beginning of the first phase of the programme, EMPRES field offices were established in Asmara (Eritrea), Sana'a (Yemen), Khartoum (Sudan), and Addis Ababa (Ethiopia).

A regional network of EMPRES **Liaison Officers**, representing the participating Governments, CRC and DLCO-EA, is established. The Liaison Officers are considered the focal points during the implementation of the programme. They were nominated before the start of the full programme, but were replaced in several cases by the Governments due to staff changes. While the network of Liaison Officers has been functioning for some time, it is necessary that they take on more responsibilities during the implementation of the programme and collaborate more closely among each other.

A **Consultative Committee** is established, which consists of senior representatives from the Governments of the participating countries (at a level above the Liaison Officers), DLCO, collaborating donor agencies and relevant FAO staff. The Committee will have the mandate to monitor, review and evaluate the programme periodically, making appropriate recommendations to FAO for necessary actions, and to encourage adequate policy and financial support from all partners. The Consultative Committee has been established at the beginning of the full programme and has met in 1998 and 1999. A third meeting is scheduled for the year 2000.

A regional **communication network** is designed and established. It is linked to the Desert Locust Information Service at FAO Headquarters and aims at improving information exchange and at facilitating decision-making. The network has been designed and established at the beginning of the programme, but some improvements are still necessary. It is based primarily on e-mail connections. Depending on advances in communication technology in the region it will be desirable to further upgrade the network to enable the transfer of larger files (e.g. files with satellite images, several megabytes in size) through e-mail or FTP/Internet.

Establish a **post-EMPRES institutional mechanism** for ensuring continuation of a coordinated emergency prevention programme in the Central Region. It is foreseen that some elements of regional coordination and information exchange need to be continued after the termination of the EMPRES programme in order to ensure that the regional capacity for preventive Desert Locust management is maintained at an adequate level. These post-EMPRES activities could be combined with the activities of the FAO Desert Locust Control Commission for the Central Region and could be supported financially in a similar way as the activities of the Commission. Discussions on such a mechanism have started during the first phase and need to be continued at a senior governmental level. Since this mechanism is likely to require formal intergovernmental agreements, considerable time will be needed to finalize it.

- Coordinate **bilateral projects** in regard to the EMPRES goals and objectives. Some donor agencies follow their own policies and have their own expectations concerning expected results. Others, e.g. research institutions, could offer special expertise in certain fields, which are complementary to the programme concept. EMPRES could provide the forum as well as the logistical support to donor and/or implementing agencies to contribute to the achievements of the EMPRES programme as a whole. Already in certain areas, e.g. remote sensing and the development of geographic information systems, such modalities of collaboration are taking place. This kind of bilateral cooperation may have particular importance in environmental investigations, in applied research projects as well as in the development of computer based models, and should further be supported.

D-2. To establish an improved Desert Locust early warning system based on meteorological, remote sensing, and field information capture and analysis

The importance of early warning of Desert Locust population increases cannot be overemphasized. Recent experience has clearly illustrated that there are serious gaps in the current early warning systems for Desert Locust population developments. Leaving aside the issue of a preventive control strategy, which is premised on the detection of early gregarising populations, it is evident that even highly gregarious populations, including bands and swarms are often not being detected to facilitate early control. The result is that major populations appear suddenly without warning and this, coupled with unpreparedness, cause lost opportunities for containment.

Mobile survey teams, well motivated, equipped and trained in standard procedures, are the most important elements of an efficient national early warning system. These teams need to receive adequate support from a special unit in the national Desert Locust service which can provide information on rainfall events, other ecological conditions, as well as on the likelihood of infestations occurring in a given area based on historical data and forecasts (national forecasts as well as those provided by FAO). This unit should also analyze the survey records, format and transmit the data to FAO Headquarters, prepare national forecasts and, if necessary, translate the results into recommendations for control operations and the activation of specific contingency plans.

Survey operations need support in terms of equipment and training. In addition, the aspects of providing information on rainfall and vegetation distribution for guiding survey teams, as well as the procedures for translating survey records into forecasts and population estimates are currently little developed at the national level.

Remote sensing has long been considered as a promising tool for obtaining information on rainfall and vegetation distribution and has received special attention in the past. For example, satellite information is now routinely used to estimate rainfall events by the FAO Desert Locust Information Service in Rome and progress

has been made in detecting, through satellite images, the scarce and scattered vegetation which can support Desert Locust breeding. Current technology offers possibilities of making this information available at the national level. Similarly there is a good prospect for improving the procedures for implementing surveys, the analysis and interpretation of survey result, as well as the processes of translating these results into forecasts and/or decisions to mount control operations.

It should be noted that the activities under this objective link up with several aspects of the next objective, which aims at improving preventive control operations:

- Experience during the first years of the EMPRES programme has shown that activities for analysing needs and filling gaps at a national level are best combined for both early warning and early control aspects. For this a Country Focus approach has been developed which is described below.
- Surveys are also done as part of control operations for finding and delimiting the target areas. Further development work is needed to clarify if, when, and how, surveys to find infestations and surveys to identify targets can or should be combined.
- Training often covers survey as well as control procedures.

It is foreseen that the programme includes the following aspects in order to achieve the current objective:

Analysing and strengthening the **national early warning capacities** in the EMPRES member countries through Country Focus programmes. The EMPRES Country Focus programmes are designed to improve survey and control operations at the national level. They are being implemented for each country at different times. In 1998 and 1999 Country Focus programmes have started in Eritrea, Yemen and Sudan. At the beginning of a Country Focus programme, the national needs for staff, training, equipment and other aspects as well as potential areas for operational improvements are identified in a participatory workshop. A programme is then developed which attempts to fill these gaps, based on inputs from the country as well as EMPRES. Operational improvements will depend on the needs of individual countries and will cover a variety of aspects. For example there is often a need to establish a system to prepare regularly detailed national survey plans. The financial support of EMPRES to survey operations may also be considered in exceptional cases when critical situations develop, depending on available resources. Countries like Djibouti and Somalia need special attention because their national survey and early warning operations still need substantial development efforts. During the first 3 years of implementation, EMPRES has already made substantial progress in the area of strengthening national early warning capacities. However, it is expected that this work needs to be continued through all three phases of the programme.

Provide **training** on survey operation, analysis of survey results and on forecasting. Training events will often be combined with training on control operations (see D-3). Improved training concepts and manuals will be developed, especially for training trainers. Considerable progress has been already made during the first 3 years of the programme. However, more attention will need to be placed on developing procedures for identifying training needs and for determining how training events contributed to improved survey and control operations. It is expected that during the three phases of the programme most training events will increasingly be handled self-reliantly under the auspices of the locust control services and will require little external support by the end of the programme.

Improve procedures for **identifying priority areas for surveys**. National survey teams have currently little information available to guide them to the areas which have recently received rains and which can support the build-up of Desert Locust populations. They have to rely on their own experience as well as on information received sporadically through nomads, scouts or other channels. Often scarce resources are wasted on visiting areas where conditions for breeding are not suitable. Valuable information on meteorological events or vegetation distribution often exists but rarely becomes available to those who organize survey operations. There are a number of areas where improvement is likely to be achievable in the short and medium term. These include a) establishing a system for providing countries with satellite vegetation maps and other remote sensing data, b) establishing biotope maps based on ecological conditions and historical records of Desert Locust breeding, and c) establishing and improving systems for channelling relevant nationally collected information to persons organizing surveys (e.g. meteorological data, scouting schemes, etc.). EMPRES has already made significant progress in this area, particularly in capturing, analyzing and distributing remote sensing data. It is expected that these efforts will start to result in improved operational methods beginning with phase II of the programme.

Establish **standardized data management systems**, which will facilitate data maintenance, exchange and analysis, as well as coordination. The most important data are records of survey operations, which need to be preserved, formatted according to FAO standards and transmitted to the FAO Desert Locust Information Service (DLIS) at FAO Headquarters. In collaboration with the Natural Resources Institute (NRI), the “Reconnaissance And Management System of the Environment of Schistocerca” (RAMSES) data management system has been introduced into Eritrea and Yemen. This system is technically advanced and is specifically designed to facilitate formatting, exchange and analysis of survey data. The data can be also retrieved as maps (GIS feature) and used readily for national forecasting and planning activities. Management systems need also to be developed for other types of data; these could include data on control operations, on equipment and pesticide stocks, as well as on literature, training and research activities. RAMSES is flexible and could be modified to include the management of other types of data as well.

Improve procedures for conducting **surveys and analysing** their results. Current survey methods provide valuable information to forecasters and decision-makers. A weak aspect is how to translate survey results into numerical population estimates to enable more accurate forecasts as well as decisions on what level of control operations should be initiated or what type of contingency arrangements should be activated. Other areas of possible improvements include: a) developing improved procedures for locating swarms, b) bringing the Desert Locust trajectory model, which has been developed for tracking the origin of Desert Locust swarms from wind directions and other parameters, to an operational stage, and c) developing standard procedures for estimating increases and movements of Desert Locust populations based on survey results, which would assist forecasters. Work has already started on several of the above aspects. Special attention has been given to aspects of sampling and population assessment in collaboration with the University of Wageningen. It is expected that this work will result in operational improvements during phases II and III of the programme.

D-3. To strengthen and improve national preventive control capacities through (a) improved planning, training, provision of equipment and operational resources; (b) the field testing of new control technologies.

The responsibility for implementing improved survey and forecasting systems as well as preventive Desert Locust control lies with the national Plant Protection services. DLCO member countries receive assistance through that organization, particularly for aerial control operations. However, effective preventive control operations require a minimum of indigenous capacity in adequately trained staff, as well as the necessary material and operational resources. EMPRES will analyze the needs and provide inputs according to its available resources. In order that control operations become more efficient, safer and environmentally acceptable, improved technologies need to be developed and adopted at the operational level. EMPRES will support and promote the field testing and operational introduction of such improved technologies. As part of the Country Focus programme described above, EMPRES will cover, for example, safer and more efficient pesticide application methods, as well as the use of environmentally benign pesticides such as mycopesticides.

It is expected that the establishment of improved early warning systems and the development of more efficient procedures for planning and implementing early control will reduce the need for large-scale control operations. However, situations may occur, where prevention is either not possible or is not successful and a critical situation may develop. While EMPRES is not designed to deal with such critical situations when they arise, some of its activities will be aimed at improving planning and preparations for Desert Locust control campaigns.

It is foreseen that the programme pays particular attention to the following aspects in order to achieve this objective:

Analysing and strengthening **national early control capacities** in the EMPRES countries through Country Focus Programmes (described above under D-2). Desert Locust populations can quickly expand to a scale, which overwhelms the capacity of national services. Careful planning and training for control campaigns is essential. Among others, activities should focus on the following elements:

- Staff is assigned to - and trained in - the regular preparation of contingency plans which include, if required, the mobilization of additional resources from Plant Protection Services, Ministries of Agriculture, as well as other parts of the Government.
- Develop improved procedures and mechanism for analyzing critical locust situations and determining at an early stage those needs, which cannot be met at a national level.
- Develop and establish procedures for systematically recording and reviewing control operations and campaigns.

During the first three years of the programme, progress has already been made in meeting equipment needs, in the regular preparation of contingency plans and in campaign evaluation. However it is expected that this aspect will still require attention during all three programme phases.

Provide **training** on ground and aerial control operations as well as on contingency planning and on organizational and management aspects in relation to implementing campaigns. In many cases training events will also cover survey operations and aspects like training trainers and identifying training needs are described under that component (see D-2). These aspects have already received considerable attention during the first 3 years of the programme. It is expected that relatively few external inputs will be required after phase II of the programme, and that the responsible locust institutions will sustain regular training programmes.

Develop improved procedures for **mobilizing external assistance** for control operations in case critical situations develop. During the course of the programme, it is expected that EMPRES can only allocate relatively small amounts of assistance to control operations. At the same time current procedures which evaluate the need for - and mobilize - external assistance often take too long to result in fast reaction in terms of field operations. Efforts will, therefore, be made during phases II and III to streamline, and if possible modify, current mechanisms of providing locust-affected countries quickly with external assistance for control campaigns, when needed.

Develop improved and new procedures for monitoring the **impact of control operations**, in terms of efficacy and of the effect on the environment. Due to the urgency of Desert Locust control campaigns and lack of resources, aspects of monitoring the efficacy of control operations together with any adverse effects on the environment are often neglected. EMPRES will aim at developing simple practical methods for collecting relevant information. This aspect will also include studies on comparing the safety and environmental impacts of different pesticides (including biological pesticides) and different application methods. Some work has started under phase I in this field, but most activities are expected to be implemented during phases II and III of the programme.

Develop improved **Desert Locust control methods** which are more efficient, safer and environmentally acceptable. Operational research on this aspect is a continuing process, which has intensified with the banning of dieldrin and the need to pay closer attention to safety aspects and environmental side effects. EMPRES will aim at moving to the operational stage a number of technological improvements, which have been under development for some time. These will include the use of mycopesticides and neem, the use of barrier treatments, and the use of differential GPS for aerial (and if possible also for ground) applications. During phase I of the programme work has started on several of these new technologies and is expected to continue during all three phases of the programme.

D-4. To formulate improvements in the Desert Locust emergency prevention strategy through evaluating the effectiveness, efficiency, economic and environmental soundness of current approaches and new technologies

Since the 1986-89 Desert Locust plague, discussions have intensified among experts on what is the most effective and the most efficient preventive control strategy (see also Annex II of the original programme document). There was, and still is, no overall consensus on whether “preventive control” should apply to the prevention of Desert Locust outbreaks, or upsurges or plagues, or simply the prevention of significant and large-scale crop damage. These discussions have covered various scenarios on when to intervene in the sequence of events ranging from the start of the gregarisation process to the development of outbreaks and upsurges. Related to these discussions were questions on what structure of Desert Locust control services would be required for different strategies, what resources would be needed for survey and control operations, as well as how the benefits

of these different strategies would compare with the costs involved. Few conclusions on strategies emerged from these discussions. The main constraint has been the lack of detailed information on actual Desert Locust population sizes, on what effect control operations had on these populations, and on what costs were incurred. A preliminary economic analysis conducted under EMPRES in 1996 and 1997 (published in 1998) assembled and reviewed the information available and used a modelling approach for examining different scenarios. It provided a valuable overview on aspects of costs and benefits but allowed few conclusions to be drawn with regard to strategies.

It has become clear that more systematic data collection will have to be done for some time, combined with the use of models before further progress can be made on the strategy question. Elements of data collection are incorporated in the other EMPRES objectives described above. The current objective aims at continuing relevant economic analyses and at establishing a process of analysis and evaluation which looks at new data becoming available and at new experience gained on the different methods and procedures related to strategies. This will link with the above-described efforts to improve early warning and early control procedures. A mechanism is needed for looking at the results of these efforts, for examining how they can contribute to improved strategies, and for providing feedback in terms of expert advice and recommendations. The development of improved strategies is a long-term process and it is unlikely that it can be completed within the lifetime of EMPRES. At the end of the EMPRES programme it needs to be considered whether certain elements of the evaluation and analysis process should be incorporated into a post-EMPRES mechanism of regional coordination and information exchange proposed under D-1.

It is foreseen that this objective will include the following activities , which will be addressed mainly during phases II and III of the programme.

Conduct **economic studies** to provide more detailed quantitative information on the costs connected to Desert Locust management as well as on its economic and social benefits at the national, regional and inter-regional levels. The studies will include comparisons between different preventive control strategies. They will be based on the results of the “Preliminary analysis of economic and policy issues related to Desert Locust management” (FAO Desert Locust Tech. Series 1998), as well as on other relevant studies. The preliminary analysis has clearly identified areas where future work is needed.

Develop and test a mechanism of **analysing and evaluating** Desert Locust management methods and procedures, as well as research results, with the aim of formulating improvements in strategies. It is foreseen that a small body of experts is formed which meets periodically to review and discuss current knowledge and possible improvements in preventive control strategies. The mandate of this body could include:

- propose and evaluate expert studies which review specific technical components of preventive control strategies;
- propose and evaluate expert studies which model the impact of different control strategies in terms of efficacy in preventing Desert Locust upsurges, cost/benefit ratios, operational feasibility, and environmental impact;
- evaluate the results of operational research efforts, particularly those supported by EMPRES;
- recommend priority areas for operational research;
- recommend new operational procedures for testing and adoption by the national Desert Locust control services.

The findings and recommendations of this body of experts could be periodically discussed in regional workshops and/or in meetings of the DLCC Technical Group.

E. PROGRAMME IMPLEMENTATION AND INSTITUTIONAL FRAMEWORK

E-1. Participating countries and regional organizations

Two regional organizations, CRC and DLCO-EA, and the following countries are implementing the EMPRES programme in the Central Region: Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen. While the collaboration of all these countries is needed for the success of the programme, there is at present great variability in the capabilities and resources available in these countries. Those efforts from EMPRES, which are directed towards strengthening national capacities, will be particularly directed towards overcoming this imbalance. It is expected that the CRC will participate in EMPRES to the extent that joint workplans are prepared, that many activities are jointly funded, and that both organizations closely coordinate their activities through regular and frequent contacts. The CRC is currently considered the most suitable regional body for maintaining the coordinating aspects and advisory services after the end of the EMPRES programme. The programme will further collaborate closely with the DLCO-EA. Five of the DLCO-EA member countries are also participating in the EMPRES programme.

E-2. Achievements in different phases

As indicated above EMPRES is intended as a collaborative and participatory programme, which evolves on the basis of experience. The nature and extent of its achievements will therefore depend in part on priorities identified by the participants as well as on modifications in plans resulting from ongoing evaluation of its activities. In addition the political, economic, and ecological conditions prevailing in the region will influence programme operations. For example, locust conditions may determine the extent of research possibilities, political conflicts may have an impact on implementation of some programme activities, responsiveness to changing perceived national needs may influence programme inputs, etc. Notwithstanding this, the following achievements are expected in the three phases of the programme.

Phase I: A full field programme is established in the Central Region and the problems which need to be addressed are analysed at the national and regional level. Needs for training, research and other inputs such as equipment are clarified and quantified. An information exchange mechanism is established and operational. Collaborative mechanisms are developed and established. Approaches for providing training as well as initiating and supporting research are developed. Training, research and other inputs are under way and experience is gained in these approaches.

Phase II: Survey operations are significantly improved in terms of quality and efficiency. The preventive control capacities, especially in those countries needing most urgent strengthening, have been significantly increased through training, equipment and other support. Substantial operational improvements have been formulated through analyses, evaluations and research. Some of these operational improvements have been adopted on a trial basis. A concept has been developed for a long-term institutional framework promoting effective preventive control in the region.

Phase III: Agreement is reached on a regional system for maintaining preventive control strategies of the EMPRES countries in the long-term. Significantly improved national Desert Locust management structures are in place, which can effectively and efficiently follow and implement a sound preventive strategy. Such a system will include improved procedures for initiating, organizing and implementing Desert Locust monitoring and early control activities.

During the course of the programme, the Consultative Committee will evaluate progress with respect to the above achievements and will, among others, recommend for how many years each phase should be implemented.

E-3. Detailed planning for the different phases

In chapter D the programme objectives are described together with an outline, in general terms, of possible outputs and activities. For phase I of the programme (1997 – 2000), details of outputs and activities (together with suitable indicators) have been developed as part of formulating individual Trust Funds projects

supporting EMPRES, the biennial and annual workplans of FAO, a planning workshop held by the EMPRES Liaison Officers in May 1998, as well as during the preparation of the annual EMPRES (Central Region) workplans by the Liaison Officers. For phases II and III it is envisaged that a participatory planning workshop, held during the first half of the last year of the preceding phase, will determine the outputs for the coming phase together with indicators, responsibilities and funding sources. These workshops will involve the EMPRES Liaison Officers, FAO staff, donor representatives and representatives from collaborating organizations. Detailed workplans and activities will be planned, as before, in annual meetings with the Liaison Officers, again organized as participatory workshops.

E-4. Management Structure

EMPRES is designed as an FAO field programme based in the Central Region. On the side of FAO, the EMPRES Central Region programme will be primarily managed by a Programme Coordinator based in the region. His/her Terms of Reference are attached as Annex II. The EMPRES Programme Coordinator will provide day-to-day coordination and management of the programme under the overall supervision of the Senior Officer, Migratory Pest Group at FAO Headquarters. He/she will closely collaborate with FAO Representatives in the participating countries, with other relevant FAO staff as well as with EMPRES counterparts and collaborating organizations. Collaboration between the EMPRES Coordinator and the Secretary of the CRC will receive special attention in order to strengthen the above-described link between EMPRES and CRC.

Additional regionally and nationally assigned FAO field staff will be required for implementing the different phases. However, details of staff requirements will be determined in connection to planning for each phase. Selection of the duty stations of FAO field staff will be based on the following criteria: a) anticipated volume of EMPRES activities in an individual member country, b) proximity of important Desert Locust recession habitats, c) availability of office space and other support from the host country, d) frequency of airline connections to other EMPRES member countries, e) other considerations such as infrastructure (e.g. quality of telecommunication services) and security in the duty station.

The work of EMPRES will be integrated closely with that of the Locust Group at FAO Headquarters. The role of FAO Headquarters will be to provide supervision of the EMPRES Coordinator, take decisions on policy matters, provide certain administrative services and assist the Coordinator in technical and administrative matters when necessary and appropriate.

On the side of the participating governments and DLCO, the Liaison Officers, described under D-2, will be the focal points for planning, implementation and coordination of EMPRES activities. During the first meeting of Liaison Officers, Terms of Reference have been prepared by the Liaison Officers and adopted (see Annex III).

As described under D-2, a Consultative Committee, composed of senior representatives from the participating countries, donors, other organizations and FAO, will have the mandate for monitoring and reviewing the programme, making recommendations regarding its directions and the necessary actions for FAO to take. The Consultative Committee will meet about once a year, but will determine its own schedule.

F. INPUTS AND BUDGET

F-1. Inputs by Participating Governments

The inputs by the participating Governments will be based on a restructured framework of their Desert Locust monitoring and control services. Such a framework will be prepared by the Governments in collaboration with FAO staff and will be based on the EMPRES Country Focus programmes. The framework will foresee inputs at two levels: Government inputs related to routine survey and control operations on a small to medium scale, and inputs related to critical and emergency situations when contingency arrangements are put into effect.

An outline of the current inputs by the participating Governments was provided as Annex VII of the original programme document. The following table provides a summary of these inputs by the participating Governments:

Country	Regular technical staff for DL work	Vehicles permanently available for DL work	Aircraft regularly available for DL work	Regular annual operational budget (US\$)	Possible additional Government resources in years of upsurges (US \$)
Djibouti	4	1	-	2,000	60,000
Egypt	183	72	-	1,091,000	847,000
Eritrea	15*	2	-	25,000	20,000
Ethiopia	9	2	-	110,000	800,000
Oman	10	22	1	217,000	85,000
Saudi Arabia	10	120	6	3,170,000	18,000,000
Sudan	100	20	4	300,000	1,600,000
Yemen	36	18	-	40,000	200,000
DLCO	38	50	7	1,000,000	-
Total	514	304	18	5,955,000	21,612,000

* Not full time for Desert Locust work.

In addition, EMPRES will benefit indirectly through the contributions of the participating countries to DLCO-EA and CRC. The memberships of these two organizations include all countries participating in the Central Region component of EMPRES (Sudan is a member of both organizations). A number of activities, particularly in the field of training and research, will be planned and implemented jointly together with the CRC and will be also jointly funded. The CRC funds are paid by the locust-affected countries into an FAO Trust Fund.

F-2. Inputs by FAO and Donors

The original programme document contained details of estimated inputs and budget resources. These estimates were necessary for planning and allocating resources for the first phase of the programme. For the planning of the following phases, a joint planning workshop involving the participating countries and the donors will be used, during which outputs and required inputs will be identified. In order to give an overview of the required inputs and budget resources of the programme the actual and estimated expenditures during the first phase of the programme are listed in the following table. It is anticipated that comparable resources will be required for phases II and III.

Expenditures/budget during phase I of the EMPRES Central Region programme (US \$)

Funding source	1997	1998	1999	2000	Total phase I
FAO Regular Progr.*	255,488	338,500	353,500	360,000	1,307,488
Belgium*	222,341	124,777	-	-	347,118
Germany**	182,207	345,706	338,900	150,000	1,016,813
Japan*	60,397	99,984	50,800	-	211,181
Netherlands*	-	220,404	505,900	510,000	1,236,304
Norway*	-	65,580	73,500	-	139,080

Switzerland	19,116	84,496	62,700	340,000	506,312
United Kingdom*	(in kind)	(in kind)	(in kind)	(in kind)	(in kind)
U.S.A.*	132,528	143,510	279,950	160,000	715,988
Total	872,077	1,422,957	1,665,250	1,520,000	5,480,284

* support also provided to other components of the EMPRES programme, outside the Central Region

** in addition, an Associate Professional Officer has been provided for 3 years

Apart from resources allocated by donors through Trust Fund projects, support in kind was provided for the development of remote sensing technology and data management systems. There is further a possibility that Sweden will provide an Associate Professional Officer in 2000. Several Trust Fund projects supporting EMPRES have already resources allocated which extend over the current end of the first phase. However, substantial additional resources will be required for phases II and III of the programme.

During a typical year (1999) of the first phase of the programme, approximately 40% of the budgetary resources were spent on staff and consultants, 15% on travel (including travel for training courses), 20% on equipment and contracts, and 25% on other items. It is expected that at the end of the first phase 7 professional staff will have served in the field, for an average of about 3 years. This includes 3 internationally recruited staff members, 2 nationally recruited staff members, an Associate Professional Officer, and an UN-Volunteer.

G. RISKS AND PRE-CONDITIONS

There are a number of risks associated with the successful implementation of the EMPRES programme. These are detailed below together with, where appropriate, suggested pre-conditions which would significantly reduce the risk(s).

G-1. Interdependence of countries in the region

There is a strong interdependence between locust-affected countries, which is related to the nature of Desert Locust outbreaks and upsurges. Desert Locust populations present in one country of the region are likely, unless effectively controlled, to have an impact on other countries through migration. It is therefore essential that **all** the "front line" countries of the region participate in the activities of the EMPRES programme especially in terms of regular surveys and information exchange. Unless they all do, the effectiveness of an early warning system and timely effective control may be compromised. This underscores the importance of obtaining high-level political support for the programme, as well as the commitment of participants at the operational level.

G-2. Diversion of resources to other pests

There is a risk that if the Desert Locust situation is calm and outbreaks of other pests occur within a country, the resources of the Plant Protection Services, perhaps including resources supplied under EMPRES, be diverted to such problems. Whilst this is understandable, it poses a risk for the EMPRES programme in that Desert Locust activities may be suspended. This could result in weakening of the early warning and control systems and in insufficient monitoring of Desert Locust breeding. It is important that the participating countries commit themselves to the permanent dedication of at least a significant proportion of EMPRES-supplied resources to Desert Locust activities.

G-3. Sustainability during long recession periods

Experience has shown that in long recession periods with little or no Desert Locust activity there is a tendency for the utility of monitoring and surveillance programmes to be questioned and their priority reduced. Similarly, if the EMPRES programme is successful in limiting the scale of Desert Locust activity in the long term, then again there may be pressure to reduce support as the "visibility" of the pest is reduced. Whilst at present, due to the recent Desert Locust upsurge of 1992-95, this is generally not applicable there will be an

ongoing need to guard against such complacency if a long recession period occurs and/or EMPRES is successful in its objectives.

G-4. Political instability and insecure areas

There is a risk that the programme activities, and hence success, could be undermined by periods of political instability in an EMPRES member country, as well as by the development of Desert Locust populations in areas where access may be impossible or limited due to civil strife and insecurity. The response by EMPRES to such situations cannot be predicted in advance but will have to be decided on an ad hoc basis. FAO has in the past been able to work, albeit in a limited manner, in such situations.

G-5. Feasibility of improved early warning

The improved early warning system relies heavily on access to meteorological and remotely sensed data. For meteorological data there may be difficulty of access on a real-time basis. A solution needs to be actively pursued with appropriate meteorological agencies and relevant organizations operating satellites.

Notwithstanding major advances in technology, there remain some questions about whether the detection of areas of potential breeding through the use of remotely sensed data is reliable. Promising research results using the SPOT satellite system indicate that the detection of such areas can be improved, but it remains to be seen whether further research can develop an operational system. The degree of risk is difficult to assess but there is little question that the research is worth pursuing.

H. PROGRAMME SUSTAINABILITY

The issue of long-term sustainability of the EMPRES programme and its achievements has two separate aspects. The first concerns the maintenance, over the long-term, of the capabilities and capacities of national programmes to undertake monitoring, survey and control operations at the levels required to sustain a "preventive" character. The second concerns the maintenance of EMPRES' own role and responsibilities in support of national and regional efforts and as coordinator and executor of external inputs.

There is the concern, expressed repeatedly by Plant Protection Services, that trained staff move on to other responsibilities. The national programmes and EMPRES will therefore have to ensure that enough experienced personnel remain to undertake further training as needed on a roll-over basis. With regard to equipment such as vehicles, sprayers, and radios, these will have to be replaced at regular intervals to ensure that a minimum capacity exists. EMPRES will be seeking to improve equipment maintenance capability which will prolong the useful life span of physical plant. The costs of both staff training and provision of equipment will therefore, it is hoped, be reduced in subsequent years.

The original EMPRES programme document foresaw that the EMPRES programme would need multi-donor support over about three four-year phases, which would involve modifications in each subsequent phase reflecting evolving conditions. By the end of these phases national Plant Protection Services will have been substantially strengthened both materially and in terms of human resources.

The early warning system will have been developed, put in place, tested, and much experience gained with its operations. As part of this system, the communications and information exchange mechanisms will have been designed and put in place. There may be a need for financing the ongoing operation of these activities. Although it is too early to predict the requirements for this on a regional level, there may be a possibility that they are small enough for the system to be maintained by the community of affected countries, for example under the auspices of the FAO Commission for Controlling the Desert Locust in the Central Region.

At the end of three phases significant advances should also have been made in improving Desert Locust control strategies, methods, and technologies and integrating them into an overall Desert Locust management system. This would reduce costs associated with the research component of EMPRES.

Thus, at the end of three phases there will be a continuing need for EMPRES to: (a) provide ongoing support, but at a reduced level, to national programmes, and possibly (b) support the operation of the early warning system and the communication network. Under objective D-1, EMPRES will look into the need and feasibility of establishing a post-EMPRES institutional mechanism, which could ensure that the capacity for preventive control is maintained in the region. The Consultative Committee will be mainly responsible for reviewing this topic and making recommendations on how to advance discussions on this matter.

I. REPORTING AND EVALUATION

The Programme Coordinator will prepare an annual report at the end of each year, and six-monthly reports for individual Trust Fund projects, as required. The annual reports will include:

- the actual, as compared to programmed, execution of the work plan;
- the identification of problems and limitations (human, technical and financial) that have arisen during execution and the identification of corrective measures;
- a detailed work plan for the coming year.

During the last year of each phase of the programme, the Programme Coordinator, in close consultation with national and regional counterparts, will prepare a draft report covering this phase and submit it to FAO Headquarters not later than 4 months before the scheduled end of this phase. This report will include a detailed evaluation of the degree to which the programmed activities have been implemented, whether they have produced the outputs expected and whether progress has been made in achieving the objective of the programme. The report should also include recommendations for possible elements to be covered by succeeding phases.

Reports, guidelines and other results produced by the programme will be regularly communicated to all participating countries in the region as well as to DLCO-EA, the CRC and to participating donor agencies. Those of more general interest will be distributed to other locust-affected countries and other regional organizations. Detailed progress reports will be also prepared for meetings of the Desert Locust Control Committee if they fall within the implementation period of the programme.

FAO, the donor agencies and the Governments of the participating countries will jointly monitor progress of the programme as part of the activities of the Consultative Committee. The Consultative Committee will also recommend programme evaluation missions which may cover the whole programme or specific subject areas.

Terms of Reference of the EMPRES Central Region Programme Coordinator

Under the general direction of the Chief of the FAO Plant Protection Service, AGPP, the overall supervision of the Senior Officer, Migratory Pests Group, in close collaboration with other relevant FAO staff, and with counterparts of national and regional locust control organizations, the Programme Coordinator will be responsible for the overall coordination of the EMPRES Central Region programme including operations, technical development, budgeting, administration and personnel. The Programme Coordinator will:

prepare and submit an annual progress report on programme activities to FAO, together with six-monthly progress reports on certain Trust Fund projects, as may be required;

prepare, in collaboration with the Liaison Officers and the Secretary of the FAO Commission of controlling the Desert Locust in the Central Region, joint EMPRES/CRC annual work-plans which can be dynamically revised;

oversee and guide other FAO EMPRES staff;

oversee EMPRES activities including training courses, research and field activities;

stimulates and contribute to conceptual thinking and long-term planning regarding the programme and Desert Locust management;

in consultation with FAO HQ staff, discuss contributions to the Programme with donors.

Qualifications and experience:

- Ph.D. degree in Entomology or closely related subject;
- minimum of 10 years experience in plant protection, preferably with direct significant experience with locusts;
- demonstrated managerial abilities and proven administrative skills;
- ability to undertake field missions under arduous conditions;
- proven ability to cooperate and work with persons from diverse cultural backgrounds;
- good oral and written communication skills;
- English language (oral and written) essential with working knowledge of Arabic preferred.

Terms of Reference for EMPRES Liaison Officers

1. Serve as a focal point for the EMPRES Programme in his/her country.
2. Review, in collaboration with the relevant national authorities and EMPRES, annual survey plans in traditional breeding areas and areas of rainfall/vegetation.
3. Develop/review and update in collaboration with concerned national authorities and EMPRES a plan for campaign organization and execution.
4. Implement surveys and, where justified, control activities.
5. Request Government funds for the execution of appropriate locust activities in the country.
6. Follow-up on day-to-day activities of the EMPRES programme.
7. Ensure regular flow of information to all relevant parties on the Desert Locust situation and on the environmental conditions in the country.
8. Represent the country in the EMPRES Liaison Officers meetings.
9. Undertake national activities of the EMPRES Programme such as training etc.
10. Work closely with the EMPRES Coordinator in all issues concerning the EMPRES Programme in the Central Region.
11. Liaise closely with the Central Region Commission and DLCO on all issues concerning the EMPRES programme.