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**Emergency Prevention System for  
Transboundary Animal and Plant Pests and Diseases**

**- Desert Locust Component -**

**Central Region Programme**

**EMPRES/CR**

**Progress Report**

January - December 2003

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**Food and Agriculture Organization of the United Nations**

## A Introduction

The Desert Locust component of EMPRES (Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases) was initiated in mid 1994. Its purpose was to strengthen the locust management capacity of locust-affected countries with the aim of minimising the risk that Desert Locust plagues will develop. It was designed as a collaborative programme in which affected countries, regional organizations, donors, and FAO, participate in the development of improved preventive control strategies. Preparatory activities started in 1995 in the Central Region, comprising nine countries around the Red Sea (Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen). This area is considered to be the origin of most Desert Locust outbreaks.

The **primary development objective** of the EMPRES Central Region Programme (EMPRES/CR) is stated as:

*“To minimise the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area through well-directed surveys and timely, environmentally sound interventions in order to mitigate food security concerns in the Central Region and beyond.”*

The overall **Programme goal** was re-defined in February 2000 as:

*“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.”*

A full donor-assisted programme began in 1997 with the recruitment of the EMPRES/CR team in duty stations at Asmara, Sana’a, Khartoum and Addis Ababa.

Since then the EMPRES/CR activities have focussed on five main areas:

### **Early Detection**

Desert Locust survey and forecasting methodologies and systems are being strengthened and improved. Timely action relies on efficient information networking.

### **Early Reaction**

Technical assistance and advice is being provided to affected countries in order to increase their early intervention capacity, and to assure more effective and environmentally safer control operations

### **Research**

EMPRES/CR provides the platform for joint national and international research programmes on improved Desert Locust control tactics and strategies. Initial topics being covered include bio-control, population dynamics, survey methodology, barrier treatment, economic impact, and environmental impact. These involve, for example,

field trials on insect growth regulators (IGR), botanical insecticides, and mycopesticides.

### **Campaign Planning and Contingency Arrangements**

Campaign planning procedures and contingency arrangements are being developed in close cooperation with Central Region countries. The aim is to improve preparedness for Desert Locust interventions so that the necessary resources can be mobilised early enough when critical situations arise.

### **Capacity Building**

Apart from improvements in technical and organizational areas, EMPRES concentrates on the development of human capacity through intensive international, regional, and national training programmes for different target groups and on relevant subject matters. Database and information management, training of national trainers and field staff, and training of scouts, farmers and nomads, are being addressed.

Following the approval of the EMPRES Programme by the FAO Council in mid-1994, a number of donors provided support to FAO for EMPRES/CR, namely the Netherlands, the USA (through USAID), Germany and Switzerland (through GTZ). Other development agencies such as those from the U.K., Belgium, Japan and Norway provided assistance bilaterally or to specific areas of the Programme. All in all, including FAO funds from the Regular Programme, an amount of about US\$ 4.5 million was spent during the 4-year Phase I of the Programme (1997 – 2000). Following a Evaluation Mission in 1999 which recommended that there should be a Phase II of EMPRES/CR, a Programme Planning Workshop for Phase II was held in El-Tur (Egypt) in March 2000.

A 3-year Phase II of the EMPRES/CR Programme (2001 – 2003) started in January 2001, taking into account the recommendations of the Evaluation Mission and based on the Implementation Document developed by participants at the EL-Tur Workshop. The total cost was US\$ 3.53 million, covering staff salaries, operational expenses, equipment and contracts, research programmes, training and support costs.

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:

- 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.

By the end of 2003, three FAO-EMPRES/CR staff remained, based in Khartoum (1), Sana'a (1), and Cairo (1). In addition, one GTZ staff, seconded to the EMPRES/CR Programme as a Visiting Scientist for the duration of Phase II, was based in Cairo. Because of policy changes at GTZ, the GTZ expert left the Programme in April 2003. The position of the former EMPRES National Professional Officer (NPO) in Khartoum has been vacant since August 2001 due to administrative difficulties in transferring the NPO post under changed Terms of Reference to Addis Ababa. As before, EMPRES/CR is supported by national EMPRES Liaison Officers (ELO) in eight of the nine the member countries and by a representative of the Desert Locust Control Organization for Eastern Africa (DLCO-EA). Somalia is represented by an "EMPRES Link Person" based in Hargeisa.

## B. Status Report

### B.1 Achievements of Outputs

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

**Indicator 1.1:** At least 1 EMPRES country joins CRC as a new member by 2002

**Indicator 1.2:** A draft MoU between CRC/DLCO-EA (supported by EMPRES) on implementation of sustainable DL management concepts in the CR formulated by 2003

Under Result 1 it is expected that coordination and collaboration between the two regional organizations, the FAO Commission for Controlling the Desert Locust in the Central Region (CRC) and the DLCO-EA will have increased by the end of Phase II. This will support the development of effective preventive control at the regional level. EMPRES/CR is facilitating the harmonization of the technical mandates of these organizations and the integration of the activities of EMPRES/CR.

In addition it is expected that at the end of the Phase II, the discussion between CRC and DLCO-EA will have resulted in a Memorandum of Understanding between these two organizations. 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.

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

Planned Activities	Status / Reasons for Deviation
<p><b>1.1 Coordinate EMPRES/CR activities with various partners</b></p>	<p>FAO-EMPRES/CR <b>staff meeting</b> was held in Khartoum from 13-15 January 2003 with the main purpose to develop individual work plans for 2003.</p> <p>EMPRES/CR Coordinator and CRC Secretary attended the <b>1st EMPRES/WR ELO Meeting</b> in Niamey from 30 January – 3 February 2003 to share experiences between the two Regions and to join in activities of common interest.</p> <p>A <b>Phase II evaluation</b> mission was organized in collaboration with AGPP and conducted from 24 February - 08 March 2003. The mission consisted of one FAO HQ staff from the Evaluation Service and two independent consultants. Because of time and other constraints, only Egypt, Sudan and Eritrea could be visited, but locust staff from Yemen came to Cairo to meet the mission. Information from the other countries and the participating donors was gained by written questionnaire and by telephone contacts. The mission identified eight areas in which important results had been achieved including the good collaboration with CRC, the increased membership of CRC to include some more EMPRES/CR countries, the exemplary planning and reporting routines established, improved technical/administrative support from FAO/AGPP, the introduction of new technologies such as RAMSES and eLocust, the efforts to promote bio-pesticides, the development of a training manual, and the training programmes leading to the creation of national master trainers.</p>

**Planned Activities****Status / Reasons for Deviation**

The mission came to the conclusion that the Programme made sufficient progress towards the development of a sustainable preventive control. However, it was observed that the results achieved by individual countries varied. Some of the member countries were fully committed to the EMPRES approach, while others lagged behind in process of adopting components of improved DL management. Thus, it was felt that not all aspects of a preventive Desert Locust control might be in place at the end of Phase II. The mission therefore recommended a Phase III of three years which would address the unfinished components of Phase II within the overall objective of establishing a sustainable locust management system in the Central Region.

Based on the findings of the Phase II evaluation mission, a Phase III planning workshop was held in Rome from 19-23 May 2003 in connection with the 5th Consultative Committee Meeting. The meeting and the planning workshop were attended by senior officials from the member countries, representatives from the donor community and FAO. The concept of Phase III was developed in a participatory format, using the card system.

The participants agreed that the concept of Phase III of the EMPRES/CR Programme should focus on gradually transferring the Programme's responsibilities to the Commission and the member countries and on the development and introduction of mechanisms to improve the preparedness of the national and regional entities to prevent locust emergencies from getting out of hand. The purpose of Phase III was identified as:

*Improved preventive Desert Locust control management approaches reinforced on a sustainable basis*

with four results leading to the achievement of the Programme purpose:

- R1: *EMPRES/CR Desert Locust management components<sup>1</sup> gradually taken over by the CRC and the participating countries.*
- R2: *Implementation of improved early warning systems supported.*
- R3: *Campaign evaluation measures and contingency planning mechanisms in place.*
- R4: *Alternative control technologies supported.*

Based on the results of the planning workshop, a Phase III implementation document was prepared and distributed after endorsement by all the stakeholders of the Programme.

The EMPRES/CR Coordinator participated in the **37th DLCC Meeting** in Rome from 22-26 September 2003 and gave a presentation on EMPRES/CR achievements and directions.

The **11th ELO-Meeting** was organized in Djibouti from 19-23 October 2003 instead of December to avoid a clash of dates with 2nd EMPRES/WR ELO Meeting. The Meeting followed the usual procedures by jointly evaluating the EMPRES/CR progress and developing the key elements of the work-plan for 2004. Because of Desert Locust outbreaks in Mauritania, Niger and Sudan, neither EMPRES Regional Coordinator could participate in the other ELO meeting.

In total 18 **country visits** have been conducted by FAO HQ and FAO

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<sup>1</sup> **Components of safer control technologies:** *training of staff; contingency planning & rapid deployment; stakeholder interaction; early detection and early warning; economically/environmentally safer control methods.*

Planned Activities	Status / Reasons for Deviation
<p><b>1.2 Develop mechanisms towards sustainability of improved DL management</b></p>	<p>EMPRES/CR staff under the Programme during 2003, and all the nine participating countries have been visited at least once by one staff member. Matters addressed include follow up on specific EMPRES activities, technical backstopping and advice, monitoring of survey and control operations, installation of RAMSES, training on the use of satellite images, meetings etc. These visits contributed in many ways to improving the preventive control capacities of the countries.</p> <p>Two meetings on <b>harmonizing the collaboration between the two regional bodies</b>, the FAO Commission for Controlling the Desert Locust in the Central Region (CRC) and the Desert Locust Control Organization for Eastern Africa (DLCO-EA), with the aim of developing a common approach to preventive control, have been organized under the umbrella of the Programme in 2001 and 2002.</p> <p>A 3rd Meeting of the <i>Joint CRC/EMPRES/DLCO-EA/FAO Technical Forum for the Central Region</i> (TFCR) was held at the DLCO-EA HQ in Addis Ababa from 17-20 November, 2003. The main purpose was to prepare a Memorandum of Understanding (MoU) on cooperation between the Commission and DLCO-EA, to ensure that the resources of both bodies are used to maximum effect to sustain preventive Desert Locust management, and to avoid duplication of efforts. This MoU extends both to operational and technical collaboration, including future research and development of improved preventive Desert Locust management, training, and information exchange. It was proposed to submit the draft MoU to the concerned authorities for comments and endorsement.</p> <p>EMPRES/CR continued supporting <b>Country Focus Programmes (CFP)</b> in five countries, Sudan, Eritrea, Yemen, Ethiopia and Somalia, in order to provide special support to overcome operational constraints of locust management and to raise the responsibility of the LCUs for their own national programmes.</p> <p>Good progress had been made under the <b>CFP in Sudan</b> since its initiation in 1999. Amongst others, the national survey and information system had been improved by giving special attention to the development of the Locust Information Office (LIO) at LCU of the PPD. Intensive training of locust control staff at all levels had been conducted in various aspects of locust management. Also the introduction of novel control technologies and contingency planning mechanisms have actively been supported and pursued by the PPD. For that reason, the capacity of the PPD in Sudan to organize and conduct well managed Desert Locust campaigns was considered as exemplary in the Region.</p> <p>As a means of evaluating the progress made in Sudan, the Head of the LCU in Mauritania was invited to organize and guide a self-reflection workshop at the PPD in March 2003. The workshop was held in Arabic, allowing full participation and the easier expression of opinions by all participants. As a result of the discussions, it was jointly agreed to continue developing the survey and early warning capacity of the LCU and to reduce the negative impacts of locust control on the environment by favouring novel control techniques. It was also recommended to strengthen the LCU by centralizing locust control activities in the country and to make enough funds available from the national budget.</p> <p>However, these recommendations have not been taken up by the PPD. On the contrary, during the following months the new management withdrew more responsibilities and resources from the LCU with considerably negative effects on the capability of the LCU to operate as efficiently as before. The consequences of this setback became critical when the first outbreaks of the Desert Locust occurred in Sudan in October 2003. The</p>

**Planned Activities****Status / Reasons for Deviation**

FAO EMPRES/CR management felt the need directly to address the observations to the Minister of Agriculture after several earlier interventions at a lower level failed. The Senior Officer, Migratory Pests of AGPP, eventually met the Minister, who responded constructively to the comments. He confirmed that the policy of the Government was that locust control should be centralized and that there should be no unnecessary interference of the PPD into the routine interaction between the LCU and its partners. He agreed that all the equipment provided by the Programme should be earmarked for locust control only. He mentioned also that coordination at the PPD needed to be improved and assured FAO that Sudan would make the maximum effort to ensure that all resources were deployed in the most effective way.

As a result of the alarming Desert Locust developments, the Government of Saudi Arabia showed high interest in assisting Sudan to raise its intervention capacity and reduce the likelihood of locust swarms invading from Sudan. In close consultation with the CRC Secretary and the DG of the PPD Sudan, a proposal for major assistance (up to US\$ 2 million) has been prepared for the Saudi Government's consideration. In addition, UNDP Sudan has agreed to provide US\$ 50,000 for an aerial spraying contract and for other operational costs.

The implementation of the **CFP in Eritrea** continued to suffer from severe staff shortage and the still ongoing restructuring process at the MoA. Specially assigned locust control staff is so far not available and the position of an ELO in Eritrea has been vacant since 2001. In particular the latter has affected the interaction with the Programme severely on top of the erratic and slow Internet connection. In order to solve at least this problem, EMPRES/CR provided assistance to improve the communication system at the MoA by setting up a 10 node Local Area Network (LAN) linked to the wireless base station at the main building of the Ministry. The cables and fittings have been installed in July 2003 and connected to all computers of the Crop Production and Protection Division (CPPD).

The events of the past years had a more negative impact on the Eritrea's ability to develop its preventive control capacity than originally thought. The national early warning system no longer exists since almost all radio stations had been removed because of security concerns. Consequently it is impossible for the Locust Information Officer at the MoA to have smooth access to locust information from the key breeding areas along the Red Sea coast. Lacking an agricultural monitoring system, the MoA has been taken by surprise by grasshopper and armyworm outbreaks in 2003. Based on this experience, it has been recommended as a matter of urgency to rehabilitate the national locust early warning system and to incorporate a Migratory Pest Control Division into the new structure of the MoA.

EMPRES/CR provided immediate support to help restore a functional locust information system under the currently difficult conditions. The available means of communication have been assessed and summarized. Other on-the-job instructions have been given regarding information analysis / interpretation, the preparation of monthly locust reports to the MoA, preparation of survey operations, and the organization of survey & control training courses etc. In August 2003 the RAMSES system has been updated and further instructions been given on how to improve the Locust Information Office at the MoA.

Despite all the obstacles, the few crop protection staff remaining at the MoA are trying hard to cope with the situation to secure a least a minimum level of locust operations in-country in collaboration with the regional agricultural offices.

Substantial progress has been made under the **CFP in Yemen** in a comparatively short period of time. As a very promising step in the right direction, locust control has been given autonomy under a reorganized



Planned Activities	Status / Reasons for Deviation
	<p>Desert Locust Monitoring and Control Centre (DLMCC) and provided with sufficient funds and staff to conduct regular surveys. In addition the Yemeni Government supported the DLMCC with 17 new vehicles and 15 vehicle mounted ULV sprayers. An agreement has also been reached with the Saudi Government to support and organize annual joint border surveys.</p> <p>With only limited support in kind from EMPRES/CR, the DLMCC undertook exemplary efforts to set up a reliable locust information system. Contacts have been made with all relevant agricultural offices in the breeding areas and a modus operandi established on how to transfer ecological and locust information from the field to DLMCC and how to provide feedback. Most of the 28 surveys conducted during 2003 were based initially on the interpretation of NDVI satellite imageries and information received from the field. As a result of all these efforts the locust reports received from Yemen have improved in terms of quality and timeliness. The RAMSES system at the Information Office has been updated in August 2003 and is fully operational.</p> <p>A comprehensive training needs assessment was conducted in June 2003 by the DLMCC to evaluate the level of knowledge of crop protection personnel involved in Desert Locust survey and control operations. But also extension agents, farmers, nomads and scouts were interviewed regarding information collection and transmission. The results showed that around 50% of all personnel lacked basic skills of locust identification, survey and control aspects. The knowledge gaps observed among the extension agents were even more serious. Only around 30 % were familiar with at least some parts of the standard skills. Based on these finding the DLMCC is planning to prepare a detailed training programme for the coming years.</p> <p>Good progress has been made in introducing contingency planning mechanisms. A first draft contingency plan has been prepared by the DLMCC in August 2003 and an intergovernmental steering committee established.</p> <p>The implementation of the <b>CFP in Ethiopia</b> continued to make good progress during the reporting period. Operational information links have been established between the Federal Crop Production and Protection, Technology and Regulatory Department (CPPTRD) at the MoA, the regional Agricultural Bureaux and the Plant Health Clinics. Locust and ecological information is being regularly transmitted to the Federal Department, surveys conducted according to the analysed information/ NDVI satellite pictures which have been provided by DLIS. The RAMSES system has been updated in August 2003 and is properly being used by the Information Officer. Based on the RAMSES data, the CPPTRD is preparing monthly DL situation reports, which are distributed to governmental and non-governmental institutions. The capacity to conduct survey &amp; control training courses was further strengthened by providing some training equipment. The CPPTRD organized with limited support from EMPRES/CR one survey &amp; control training course for 21 trainees from five regions in July 2003. Under the direction of the CPPTRD, a research cooperation started with the University of Addis Ababa to evaluate the efficacy of the bio-pesticide "Green Muscle" against grasshoppers. It was hoped that this would encourage the introduction of bio-control for pest control in Ethiopia.</p> <p>Little progress has been observed in introducing contingency planning mechanisms and an intergovernmental steering committee. This requires follow up.</p> <p>It should be noted that the Locust Control Office under the Migratory Pest Section of the CPPTRD consisted of only one person, who was functioning at the same time as Information Officer, Survey Officer, Master Trainer, national coordinator and ELO. This could serve as an example that much can be achieved even under restricted conditions by one energetic individual. However, it is recommended that the MoA should appoint at least a full-</p>

Planned Activities	Status / Reasons for Deviation
	<p>time Locust Information Officer at the CPPTRD in order to ensure continuous monitoring of the locust developments and to allow the ELO to comply with his many other duties.</p> <p>Another encouraging example of what can be achieved in improving locust management under difficult conditions is the <b>CFP in northern Somalia</b>. Since the nomination of the EMPRES Link Person (ELP) in Somalia (Hargeisa) in December 200, surveys continued being conducted on a regular basis even after the EMPRES/CR UNV left in June 2001. Comparatively good quality locust reports are being prepared and passed electronically to DLIS usually in time. To strengthen the survey and information capacity further, a second MoA staff obtained on-the-job training from EMPRES/CR on survey procedures, the use of GPS and other survey equipment and training on radio operation by UNDP.</p> <p>The MoA in northern Somalia is operating at a very basic level without any outreach and links to the regional agricultural offices. It is therefore very difficult to receive information from the field on rainfall events, vegetation and locust occurrence. For this reason, the establishment of a network using private radio operators, who are found in many even remote areas, has been initiated. The procedures on how to make contact with private radio operators, the type of information to be collected and what kind of training or instruction to be given, has been discussed in detail with the ELP. It was estimated that roughly 20 radio stations are located in the strategically important (for locusts) settlements. Since these places are being regularly visited by travellers, nomads and herdsmen, the likelihood of obtaining valid information on important ecological aspects seems promising. During recent surveys, some radio operators have already been contacted and their coordinates, radio codes and frequencies noted.</p> <p>It was still not possible to initiate a <b>CFP in Saudi Arabia</b> as planned because of changes in management at the Locust Control Centre in April 2003. The subject has been discussed with the new Director and pointed out that there is a high need for improving the national survey and information management capacity. These needs became obvious after first Desert Locust outbreaks have been observed in Saudi Arabia. But no agreement has been reached yet on how and when to address these questions in the context of a CFP. However, a country specific RAMSES version has been developed/installed at the Information Office of Locust Control Centre in January 2003. Unfortunately, the system encountered some difficulties soon after which made it necessary for the Remote Sensing expert from AGPP to go again in December 2003 to fix the problem and to install an updated version.</p>
<p><b>1.3 Strengthen the collaboration between EMPRES/CR and WR</b></p>	<p>After it became a routine for EMPRES/WR staff to share experience between the two Regions, the interaction on technical questions developed further. Amongst others, two trainees from the Central Region (Saudi Arabia and Sudan) participated in a DGPS workshop in Mauritania in December 2002. One fellow from Libya graduated from the Desert Locust Management Diploma Course at the University of Khartoum in August 2003, and three participants from Niger, Mauritania and Libya attended the EMPRES/CR bio-control workshop in Sudan in January 2003.</p> <p>Mauritania was provided with one copy of the English version of the Master Training Manual, developed by EMPRES/CR, for testing. The Training Manual was considered as very useful and recommended for translation into French. EMPRES/WR has been provided with the models of the Standard Operating Procedures (SOP) for ground and aerial survey and control operations for field staff which had been developed in collaboration with CRC. It has been agreed that the SOPs will be translated into French and copies printed in Cairo.</p>

Planned Activities	Status / Reasons for Deviation
<b>1.4 Promote the CRC membership of non-member countries of the Central Region</b>	<p>Negotiations, under the umbrella of EMPRES, between Egypt and Libya on conducting a joint survey around Jebel Oweinat have been initiated but are still ongoing. The EMPRES/WR Coordinator participated in the EMPRES/CR Phase III planning workshop in May 2003.</p> <p>After Djibouti became 14th member of Central Region Commission (CRC) in March 2002, Ethiopia also submitted an official request to FAO in December 2003 to join the CRC. Ethiopia will be welcomed as 15th member of the CRC during the forthcoming 24th Session of the Commission in April 2004.</p> <p>Eritrea, as one of the two remaining EMPRES/CR non-CRC member countries, has shown interest in joining the CRC some time ago. Currently, the subject is being discussed at Cabinet level and with the Ministry of Foreign Affairs. It is hoped that the Government of Eritrea will submit their official adherence to the CRC by December 2004.</p>

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

**Indicator 2.1:** Timeliness of sending DL reports to DLIS improved by 20% by 2001, 50% by 2002, 80% by 2003

**Indicator 2.2:** Fixed radio schedules defined and made standard communication procedures at 5 DL units by 2003

Considerable progress has already been made during Phase I 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, maintained and advanced technology introduced. 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 DLIS at the FAO HQ.

The timeliness and quality of locust survey reports submitted to the DLIS at FAO HQ is considered to be a useful benchmark for improved information exchange. These reports should be submitted within 5 days after completion of a survey carried out by national Locust Control Units (LCUs). 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.

The establishment of schedules for radio contacts between the different units of the national locust services is considered another important factor for improved communication on locust aspects within the affected countries. Furthermore, EMPRES/CR will consider up-dated and / or new computer software and support if repair of equipment is needed.

Planned Activities	Status / Reasons for Deviation
<p><b>2.1 Stimulate proactive attitude in information exchange among stakeholders</b></p>	<p>The picture regarding the national locust communication systems in the EMPRES/CR countries has been completed. However, it is subject to change and needs to be monitored and updated constantly. Approximately 470 mobile and base HF radio stations are currently operating in all of the EMPRES/CR countries for communicating locust information to the LCUs. Standard Operating Procedures (SOP) for regular radio communication on locust matters have been drafted and distributed for final comments. The approved version for printing is expected by early 2004.</p> <p>It was mentioned under 1.2 that the national locust information network in Eritrea suffered from a severe setback after the radios were removed from their original sites. It also was found out that it is difficult for the field staff to have easy and quick access to the <i>unified</i> communications network using data-fax technology as it is being used for all administrative purposes in relation to the federal government. The radio communications network therefore needs to be re-established once the security situation allows. In Sudan the performance of the information network suffered from recent developments. Incoming messages were held back unnecessarily by the management before being passed to the Information Office for processing and forwarding to DLIS.</p> <p>Despite some internal obstacles, the performance of locust reporting from the member countries to DLIS was above average and continued to improve further during the reporting period. The overall reporting performance in terms of frequency, timeliness and quality was particularly good in Yemen, Ethiopia, Djibouti and Egypt. Also the locust reports from Eritrea were much improved compared to previous years. But some fine-tuning in some quality aspects is still necessary in those countries that are using RAMSES with regard to the accuracy of the export data files, and the general interpretation of locust information. Timelier reporting to DLIS is still necessary from the Information Offices in Eritrea and Saudi Arabia.</p>
<p><b>2.2 Maintain and update communication and radio equipment</b></p>	<p>EMPRES/CR procured five HF Codan radio transceivers in 2002 for Djibouti (3 sets), northern Somalia (1) and the DLCO-EA base in Djibouti (1). In Djibouti one mobile and one base station have successfully been installed at the LCU with the assistance from a DLCO-EA engineer in June 2003. The installation of another base station at Obock outpost was not accomplished as planned due to some technical difficulties and missing electrical fittings at the office. Also the installation of the radio set at the DLCO-EA base in Djibouti could not be realized, again because of electricity problems. Solutions have been discussed with the DLCO-EA management and possible arrangements made.</p> <p>Fortunately, the installation of the base station at the MoA in Hargeisa went smoothly. The HF radio station in Hargeisa is now providing the chance to the MoA to establish a national communication network with private radio operators as mentioned under point 1.2.</p> <p>With support from the GTZ locust project, it was planned to provide the DLMCC in Yemen with two additional mobile HF radios for use in connection with eLocust. This could not be achieved because of an unexpected shortfall of GTZ funds. However, this will be resumed once alternative funding sources will become available to the Programme.</p>

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

**Indicator 3.1:** RAMSES installed and being used in at least 5 countries by 2003

**Indicator 3.2:** Remote sensing images incorporated into surveying decisions in at least two countries by 2003

EMPRES/CR 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 II will further contribute to this area and will pay special attention to defining and meeting information needs. This includes further efforts to introduce access to satellite images in the region as well as to continue the development of appropriate data management systems such as RAMSES (Reconnaissance and Monitoring System for the Environment of *Schistocerca*) for forecasting as well as for other data management purposes.

New technologies, in particular remote sensing, have gradually improved the assessment of Desert Locust breeding areas and forecasting at the FAO HQ. It is expected that further efforts will be made to make 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. Further efforts will be made to harmonize and streamline the flow of Desert Locust information within the region.

<b>Planned Activities</b>	<b>Status / Reasons for Deviation</b>
<b>3.1 Build up national and regional DL information systems</b>	Locust Information Offices have now been set up at all the LCUs and national information networks have been established or are in the process of being built up in almost all countries except for Eritrea for reasons pointed out above. But not all national information systems are working to the desired extent because of internal difficulties, sometimes reluctance to keep regular contacts with the various outstations and contact persons or for organizational difficulties. EMPRES/CR and CRC are observing the process closely and made several case-by-case recommendations for improving national information systems further.
<b>3.2 National locust information routinely dispatched to DLIS</b>	The reporting of locust information to DLIS is being monitored closely and has jointly been evaluated during the past three ELO Meetings. As mentioned under 2.1, the overall reporting performance is satisfactory in all countries. Eight of nine countries sent at least one locust report per month to DLIS. The quality of the reports as far as interpretation and details were concerned was above average. But those received from Djibouti, Egypt, Eritrea, Saudi Arabia, Somalia and Sudan could still be improved. Also with regard to timeliness some improvement is expected from Saudi Arabia and Eritrea.

Planned Activities	Status / Reasons for Deviation
<b>3.3 Harmonize DL information systems between CRC, DLCO-EA and DLIS</b>	<p>As a result of the 2nd meeting of the Technical Forum for the Central Region (TFCR) and to avoid duplication, DLCO-EA modified its monthly bulletin by incorporating information on the locust situation and forecasts from the monthly FAO Desert Locust Bulletin into its reports. DLIS and CRC are now being provided regularly with copies of the DLCO monthly bulletin.</p>
<b>3.4 Incorporate DL data management systems at the LCUs</b>	<p>The geographic information system, RAMSES, provides a platform for viewing remote sensing images, checking past records of locust occurrence, and assists decision-making in respect of locust survey and control operations. By the end of Phase II, the system had been introduced to Eritrea, Ethiopia, Oman, Saudi Arabia Sudan and Yemen. A country specific version for Egypt has been developed and will be installed at the Locust Information Office in early 2004. The old RAMSES versions with better connectivity to SWARMS GIS at DLIS have been updated during July-August 2003 in Sudan, Eritrea, Ethiopia and Yemen. Also follow up training has been provided by DLIS and national Information Officers from Sudan and Ethiopia to their colleagues on the new version of the RAMSES system, eLocust and the use of remote sensing images. As a result of these efforts, information transmission and locust reporting improved significantly. Reports are being distributed regularly and are being dispatched timely in most cases. Good progress has also been made in entering historical data in Yemen. Data sets from 1997 to date for analysis of locust developments and case studies are available in RAMSES. Also in Sudan, DL data from 2001 – 2003 are now available in RAMSES.</p> <p>Despite the good progress made in introducing the RAMSES system to the EMPRES/CR countries it should be recalled that at the beginning of the process its introduction suffered from the lack of backstopping capacity and expertise to assist the countries in getting familiar with this comparatively sophisticated technology. Fortunately the situation changed with the temporary appointment of a Remote Sensing consultant at DLIS in early 2002, who contributed to a large extent to the development of the system and its introduction. His contract finished by end of 2003. But further technical backstopping is still needed before RAMSES can be used by the LCUs with good confidence as a key instrument for analysing locust developments and decision making. It has therefore been recommended that Phase III should further contribute to strengthening the national and regional expertise on RAMSES. Since the backstopping depended on the expertise provided by the Locust Group at FAO HQ, the ELOs strongly urged FAO to ensure a continuation in this matter. It should be noted that the same applies to the introduction of the remote sensing technology.</p>
<b>3.5 Introduce new technology including remote-sensing into early warning information system</b>	<p>Modern early warning technologies such as satellite imagery and eLocust proved to be a very effective contribution to improving the survey and locust information management systems. The objective was to enable the LCUs to carry out more targeted locust surveys to areas identified as green, and thereby reduce the cost of surveys. With the developing IT technology, SPOT satellite images are now directly accessible through Internet for all EMPRES/CR member countries every 10 days. It is no longer necessary to pass through national meteorological agencies, which previously proved to be a difficult and cumbersome process. Recent developments in remote sensing technology will make it even possible to examine vegetation conditions on a smaller scale in near future.</p> <p>The process of adapting the remote sensing technology has much been affected in the past by the uncertain staffing situation at DLIS. The good experience made during the recent months clearly indicated that the post of a Remote Sensing expert is essential for the adaptation, transfer, implementation and sustainability of new early warning technologies. The</p>

Planned Activities	Status / Reasons for Deviation
	<p>Remote Sensing expert provided technical backstopping to Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen, and made analyzed satellite imagery available to every locust-affected country to help in guiding their survey teams. This service risks to stop if no solution could be found to extend his contract.</p> <p>In 2002 the LCUs in Sudan and Yemen were provided with electronic data transmission equipment for field-testing wireless transmission of field-data to the Information Offices. A complete set included a GPS and a palmtop computer with eLocust software installed, and a communication unit including a mobile and a base HF radio transceivers plus modem. This technology should not only facilitate sending field data instantly, but should also reduce errors i.e. while copying information from the data sheets into RAMSES. Satisfactory results have been achieved in Yemen. The eLocust system is functioning well and the palmtop is regularly being used for entering and transmitting survey data.</p> <p>The experiences made with the eLocust system in Sudan were not initially positive. Several technical difficulties in installing and configuring the communication unit and the fear that dust might damage the eLocust computer interrupted testing during surveys. After several attempts failed to find a solution locally, external expertise will be sought as soon as possible. However, the computer unit with the eLocust software is now being used during survey operations.</p> <p>Despite the relatively mixed results, the eLocust technology has been evaluated as being another promising component in improving the early warning capacity of the member countries. It has therefore been recommended to go further in the introduction process and make this technology also available for Egypt, Ethiopia, Eritrea, Oman and Saudi Arabia. Appropriate arrangements have been put in place (see 4.3).</p> <p>Further investigations on the question whether the eLocust system could be connected to the data fax system in Eritrea or to mobile cell phones revealed that these are no feasible alternative means for communicating survey data electronically.</p>
<p><b>3.6 Carry out ground truthing operations</b></p>	<p>Ground verification of SPOT satellite NDVI images is important for further calibration and fine-tuning of satellite pictures in order to provide more valuable information to the member countries on the actual extent and degree of green vegetation. Past experience showed that NDVI images do not always reflect the real situation on the ground and therefore might mislead survey teams. In order to improve the relevance of NDVI imageries for directing surveys, two ground truthing operations were carried out in Sudan from July - September 2003 and in Eritrea in February 2003. The data have been sent for analysis to DLIS. The referring data record sheets with the necessary requirements were provided by DLIS in April 2003.</p> <p>In order to allow survey teams and other field staff to identify plant species relevant for DL breeding better and to distinguish the Desert Locust from other locusts or grasshopper species, flip-over vegetation and locust/ grasshopper recognition pocket-size field cards have been developed. These field cards will be print ready by early 2004 and made available to the CRC and EMPRES countries by end of 2004. It will be discussed with EMPRES/WR whether these cards could also be useful for their countries.</p>

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

**Indicator 4.1:** Survey plans developed and made integral procedure of the PPD in at least 4 member countries by 2003

**Indicator 4.2:** Key breeding areas of at least 2 member countries identified and described by 2003

**Indicator 4.3:** Up to 2 joint border surveys conducted on two borders in the CR by 2003. (Other than the Egyptian – Sudanese borders)

Exploring the possibilities for improving survey procedures is a long-term process that already started during Phase I. It 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.

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 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 the national Locust Units, 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.

Planned Activities	Status / Reasons for Deviation
<b>4.1 Develop sustainable and targeted survey procedures</b>	<p>By end of Phase II most of the EMPRES/CR member countries, except Oman, have developed and made use of national survey plans. These plans are increasingly being based on the analysis of RAMSES data and satellite imageries. Good examples are those from Ethiopia and Yemen. It is still too early to say whether this more systematic survey planning approach will lead to better detection of early gregarization. Intensive backstopping to reinforce this process sustainably, as part of the locust control system is still required throughout the whole period of Phase III. During 2003, backstopping and follow up visits on the use and handling of national survey plans were conducted to Djibouti, Egypt, Eritrea and Somalia.</p> <p>Standard Operating Procedures (SOP) on survey operations as quick field reference for survey officers have been prepared in collaboration with DLIS and CRC. 1000 copies have been printed and are being distributed to the EMPRES/CR and CRC member countries. A French version will be prepared for EMPRES/WR.</p>
<b>4.2 Carry out joint surveys</b>	<p>One joint border survey between Egypt and Sudan has been conducted in January 2003. A joint survey between Yemen and Saudi Arabia was planned for December 2003 but had been postponed to January 2004. A proposal for a joint survey between Eritrean and Djiboutian teams was pre-</p>



Planned Activities	Status / Reasons for Deviation
	<p>pared by the ELO from Djibouti and submitted to the LCU of Eritrea. Since no reply was received from the Eritrean Government, alternative arrangements have been made between Djibouti and northern Somalia to support a survey in the Geriyad area early in 2004.</p>
<p><b>4.3 Support national survey teams</b></p>	<p>By the end of Phase II, all LCUs were sufficiently equipped with basic survey material such as GPS hand sets, maps and other materials. However, some of the equipment may get damaged or lost and replacements will be needed. For that reason EMPRES/CR and CRC are preparing to establish a stock of survey equipment in Cairo to be in a better position to respond quickly to demands coming from the member countries.</p> <p>A similar stock of fourteen palmtop computers has been set up at DLIS to provide the member countries with the eLocust system. Out of this stock, one palmtop computer has been handed over to Oman. An additional six will be provided for the regional survey teams in 2004. Yemen requested additional five because the LCU intends to equip all its survey teams with this technology. Saudi Arabia requested one computer for testing the eLocust system. Ethiopia will be provided with four pieces to equip survey teams in Dire Dawa and Jigjiga in 2004. No demand has been received yet from Egypt</p> <p>EMPRES/CR and CRC supported Egypt in establishing the Information Office at the Locust Control Centre. Various office supplies including computers equipment had been provided in addition to one vehicle for surveys.</p>

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

**Indicator 5.1:** At least 50% of DL technicians trained in each CR country by 2003

**Indicator 5.2:** At least 2 trainers trained according to agreed standards for each country by 2002

Training of the 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 during Phase I. However it is not only necessary to organize additional training courses which meet the given training standards but also to develop these standards and the training materials required such as manuals, guidelines and curricula. New training approaches have to be explored and appropriate procedures for identifying training needs developed and introduced. 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 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 was 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.

It is anticipated that the LCUs 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.

The University of Khartoum, with support from the CRC/EMPRES, has developed a special Diploma course on Desert Locust management. The use of the Diploma course in locust management at the University of Khartoum is promoted through DLCC, EMPRES and CRC fellowships.

Planned Activities	Status / Reasons for Deviation
<p><b>5.1 Define training needs on technical DL subjects at different levels</b></p>	<p>Efforts to identify the training needs of the locust control staff in the member countries remain insufficient. Apart from some information that had been received from Ethiopia and Sudan in 2002, only Yemen actively picked up this subject in 2003. As mentioned under point 1.2, Yemen carried out one training needs assessment survey. As a result of the findings, indicating considerable knowledge gaps, a comprehensive training programme for next two to three years has been initiated. Unfortunately, most of the other LCUs were reluctant to assess the performance of their staff involved in locust operations although the need is obvious in particular in countries like Egypt, Eritrea and Saudi Arabia. It has therefore been recommended that the LCUs should undertake more efforts to assess and monitor the technical knowledge of the locust control staff in their countries in order to be in a better position to develop more targeted national training programmes according to the actual needs. The other countries should learn from the experience made in Yemen in this case.</p>
<p><b>5.2 Develop training curricula / manuals for ToT-courses</b></p>	<p>In collaboration with NRI and DLIS, EMPRES/CR prepared a Training Manual (TM) for national trainers, which was tested during the international ToT training course in October 2002. The final version of the TM has been submitted in February 2003 to CRC and EMPRES/CR for printing and distribution. One sample of the TM has been handed over to the colleagues in Mauritania for testing in the Western Region. The response received was very encouraging. It is being discussed with EMPRES/WR to produce also a French version of the TM. The overhead transparencies of the TM have been translated into Arabic for use in Arabic speaking countries.</p> <p>In collaboration with CRC, EMPRES/CR is in the process of assembling Training Kits which contain besides the TM also other useful material such as maps, hygrometers, compasses, lenses, field cards, CD ROM etc., to enable the national master trainers to conduct training courses according to the standards. All LCUs of the member countries as well as other national training institutions will be provided with such kits to perform and sustain training courses on technical locust management aspects under their own responsibility. It is planned to provide 35 kits in English and Arabic to the CRC and EMPRES/CR countries by mid 2004.</p>

**5.3 Assist universities in DL curricular development and involve students in EMPRES activities**

Since 2000, CRC, EMPRES/CR and FAO have supported a special Diploma Course at the University of Khartoum on Desert Locust management for students. The first term started in 2001 with six students from Sudan, Eritrea and Ethiopia who graduated by August 2002. Eight students have been enrolled at the University for the academic year 2002/2003, two of them from outside the CR, (India, Libya), funded by various fellowship resources. An additional six students (2 from Yemen, 1 from Sudan, 1 from Saudi Arabia, 1 from Ethiopia and 1 from Egypt) have been enrolled at the University of Khartoum in September 2003. These students will graduate by mid 2004. The students have been involved in several EMPRES/CR activities conducted in Sudan. One of the examples was their involvement in bio-control workshop carried out near Port Sudan in January 2003.

From the experience gained by end of Phase II, it is doubtful whether the DL management Diploma Course at the University of Khartoum will be sustainable. It is highly dependent on support from EMPRES/CR and the CRC with only a marginal effort from within the University to obtain additional support from other sources. On many occasions the University had been made aware that support from EMPRES/CR is limited and subject to available funds. Also little has been done by the University to integrate the Diploma course as a continuing programme or to attract interest. EMPRES/CR has offered its support to the University to develop concepts on how to organize the Diploma Course in more self-sustained manner and to improve its standard. As a first step, EMPRES/CR and the CRC are assisting the University to develop and publish a flyer which could be distributed to the locust-affected countries and to make them aware of this particular opportunity.

Although the member countries show much interest in the Diploma Course in principle, their practical recognition remains below expectations in that their response to announcements was slow. Apart from Yemen and Ethiopia, only a few applications have been received from the countries by EMPRES/CR and CRC for the academic year 2003/2004. In addition, experiences from the previous years showed that most of the candidates did not have the required minimum qualification or lacked sufficient language skills to follow the lessons. Also, little feedback has been received from the University and the member countries on the performance of the course and/or the students. The report on the 2002/2003 term from the University is pending, and no information was received from the countries on the positions given to students that successfully graduated, nor on their performance in the field.

After one M.Sc. student from Oman benefited from CRC sponsorship and graduated from the Greenwich University, U.K., by December 2002, one additional fellowship was approved in July 2003 to be supported by the CRC for the year 2003/2004. The selection of the candidates is in progress.

**5.4 Organize different training courses at different levels**

During 2003 only a few member countries have taken concrete steps towards developing their own staff capacity building schemes. Although the training of national Master Trainers by EMPRES/CR has made an important contribution and enough Master Trainers had been trained during the past years, most LCUs still depend on the inputs and direct involvement from EMPRES/CR. Nevertheless, little use has been made of the opportunity offered by EMPRES/CR and CRC to support national or local training courses in kind. Only three countries took this opportunity and organized training courses instead of six as originally been planned:

- In Saudi Arabia, one Survey & Control course from 8-19 March 2003, 17 trainees,
- In Ethiopia, one Survey & Control course from 19-28 July 2003, 21

trainees,

- In Egypt, one Survey & Control course from 13-18 September 2003, 20 trainees.

In Eritrea the planned training programme for farmers was postponed to 2004 due to other urgent seasonal activities.

In general, the ability to develop and to make continuous use of their own training capacities remains weak in most of the countries. The qualified Master Trainers should be encouraged by the management of the LCUs to practice their skills to train local staff. During Phase III of the EMPRES/CR Programme, Master Trainers should become the main vehicle for the delivery of training to locust control staff with EMPRES/CR staff and the CRC playing a support role only. It is therefore important that more efforts are undertaken by the member countries to integrate locust S&C training subjects into the existing national training schemes such as agricultural schools and rural extension services.

The Information Officers from Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, northern Somalia, Sudan and Yemen received intensive technical backstopping and on-the-job-training on various locust information management procedures and techniques such as RAMSES, eLocust, remote sensing, and general computer training from FAO-EMPRES/CR and FAO-HQ staff. But further backstopping and refresher training is still required in particular at the LCUs of Egypt, Eritrea, Saudi Arabia and Sudan until the Information Officers become more confident in applying these technologies and in handling the standard day-to-day procedures. It is therefore necessary that the management of the LCUs makes effective use of their Information Offices i.e. by keeping the relevant government agencies, FAO Representations and donor agencies informed through regularly updated locust reports.

#### **5.5 Develop and introduce regular training impact mechanisms**

It was mentioned under 2.1 that a training needs and impact survey carried out in Yemen in June 2003 revealed considerable knowledge gaps among the staff involved in locust survey and control operations. A short and mid-term training programme is being developed by the DLMCC to respond to the immediate needs.

In a different approach to Yemen, the survey and control teams in Sudan were observed during their actual field work during January, February, September and December 2003. On-the-job training and advice had been given on the spot to rectify some of the mistakes, but a more comprehensive follow-up and refresher training in particular for control seems to be necessary.

In Eritrea no training impact or needs assessment survey was conducted by the Crop Health Division due to other immediate seasonal tasks.

Conducting training needs assessment surveys and drawing sensible conclusions from the observations proved to be difficult for the LCUs to organize. One of the reasons was that the management of most LCUs lacks a complete picture of their personnel that might potentially be involved in campaigns, particularly in those countries with decentralized locust control structures. A second aspect was the lack of check-lists which could serve as reference to detect shortcomings. For that reason EMPRES/CR developed in collaboration with CRC, Standard Operating Procedures (SOP) for ground and aerial survey and control activities. These pocket size flip-over cards are meant to serve the survey and control teams as quick reference guides during their operations and as a check-list to detect obvious knowledge gaps. Since actual field operations are not always being conducted during calm periods, it has been recommended that the LCUs should conduct regular mock survey and control exercises in order to obtain a better picture of the performance of the Plant Protection

staff to carry out efficient locust control activities in the field.

## **Result 6:** Contingency plans available and implemented.

**Indicator 6.1:** National contingency plans for recession monitoring and control for outbreaks, upsurges and plagues adopted in up to 6 countries by 2002

Contingency planning is a vital component during the prevention of Desert Locust plagues. The national LCUs 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. For upsurges or plague situations it is likely that additional resources will be needed from the Ministries of Agriculture and from other departments 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. A modelling tool developed by the University of Wageningen and GTZ is considered to be an important element for the development of contingency plans.

Planned Activities	Status / Reasons for Deviation
<p><b>6.1 Introduce national contingency and rapid deployment plans into the locust management system</b></p>	<p>As a result of the findings of the regional contingency planning workshop organized in Borg El Arab, Egypt, in 2002 it was planned to discuss the subject in a broader context as part of the DLCC Technical Group Meeting involving also EMPRES/WR. Unfortunately it was difficult to find a consensus between all parties involved in the preparation of the meeting. It was agreed to organize the follow-up contingency planning workshop by early 2004. The aim is to agree on cohesive regional contingency approaches for outbreaks that are too large or appear too rapidly to be contained by national LCUs as it is unrealistic to expect that countries acting individually can achieve prevention of all outbreak situations. The regional plan should define roles and responsibilities of all players: AGPP, CRC, and member countries, and the procedures to be followed, to enable an effective international response, including access to donor funding.</p> <p>As part of the regional efforts to raise the level of preparedness, DLCO-EA has started providing updated details of the operationality of its aerial fleet to CRC and EMPRES/CR every three months, giving details of its readiness for survey and control operations. The Organization also provided CRC and EMPRES/CR with details of procedures and responses to be followed for the deployment of its aircraft to member countries. Once the requirements are met, a DLCO-EA aircraft could be deployed within 1-2 weeks. In addition, the conditions for deployment of an aircraft to countries outside the DLCO-EA Region have been discussed. Due to some legal implications, the procedures were considered as too complicated and concluded that in case of FAO-supported aerial intervention in non-DLCO-EA countries, a Letter of Agreement between FAO and DLCO-EA is more appropriate. One DLCO-EA aircraft has been positioned in Sudan in September 2003.</p> <p>For meaningful national and/or regional contingency planning, it is indispensable to keep a record of available resources. To obtain updated</p>

Planned Activities	Status / Reasons for Deviation
	<p>information on the capacities of the countries in terms of personnel and equipment, EMPRES/CR circulated in early 2003 a “capacity spread sheet” to the LCUs. The response from the countries was often very slow and in some important aspects incomplete or contradictory. The example clearly showed that management of some LCUs has no complete overview of the actual locust control capacities and is lacking consistent store keeping and staff management systems. This observation was particularly critical in those countries where the LCU has no autonomy over the national campaign and depends on the collaboration with the regional plant protection offices. The result of this collaboration is however often affected by different authorities, inconsistent lines of command and poor communication between the central and regional offices. Not only for this reason, EMPRES/CR is sensitizing the national authorities to provide the LCUs with more autonomy and responsibilities in order to be in a better position to manage national locust campaigns more effectively. The case of Yemen was an encouraging example where the government responded positively to the recommendations with substantial positive results. The opposite was the case in Sudan where the government’s decision to centralize locust control under the federal PPD was not implemented as expected with adverse consequences for containing Desert Locust outbreak populations from October to December 2003.</p> <p>However, the LCU in Sudan revised their national Contingency Plan (CP) for the preparation of the winter campaign 2003/2004. When it came to implementing the plan, it became clear that the plan was too rigid to be able to react adequately to changing situations that were different from those that have been predicted. Also the initiated intergovernmental Contingency Planning Steering Committee is not yet operational.</p> <p>In Yemen, official arrangements have been by the PPD in March 2003 for initiating a national Contingency Planning Steering Committee, and a detailed plan prepared for the winter breeding season 2003/2004.</p> <p>In Eritrea, locust contingency matters are now being addressed as part of a Sectorial Food Security Group, but the composition of Sectorial Food Security Group committee is not yet known to EMPRES/CR.</p>
<p><b>6.2 Allocate funds for emergency pesticide stocks</b></p>	<p>The CRC reallocated USD 100,000 for emergency pesticide stocks in July 2003. These funds are available to all CRC member countries upon request.</p>

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

**Indicator 7.1:** At least 1 new additional control technology introduced in at least 3 countries by 2003

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 of mycopesticides have 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 national control strategy.

During Phase II at least one new and environmentally sound control technology should be introduced and used on an operational scale. Relevant registration procedures for pesticides are expected to be completed during the 3-year period. 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 assistance from GTZ, field trials of mycopesticides and environmentally friendly chemical pesticides will be organized.

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

Planned Activities	Status / Reasons for Deviation
<p><b>7.1 Facilitate development and testing of new technologies taking into account human health and the environment</b></p>	<p>In collaboration with the associated GTZ Locust Project and the International Centre of Insect Physiology and Ecology (ICIPE), an interregional <b>bio-control field workshop</b> was organized in Port Sudan from 10-20 January 2003. Fourteen participants from Egypt, Ethiopia, Saudi Arabia, Sudan, Yemen, Mauritania, Niger, Libya, Syria and DLCO-EA attended the workshop. The objective was to promote bio-control approaches by familiarising locust control officers and researchers from selected countries with the characteristics and effects of novel locust control products. The workshop provided a forum for exchange of opinions and to gain practical experience with two biological products: <i>Metarhizium anisopliae</i> var. <i>acridum</i> (Green Muscle) and one of the main components of the adult Desert Locust pheromone, phenylacetoneitrile (PAN). Green Muscle and PAN were tested on reared gregarious Desert Locust hoppers, both in the laboratory and in semi-field trials. In addition, background information was provided to the participants on the development of the two products, their different mode of action and potential for more economic and environmentally safer control strategies.</p> <p>The workshop suffered from some organizational complications and the fact that the effects of the two bio-control components could not be demonstrated on natural hopper bands. It did therefore not entirely succeed in its objective to convince the participants of the efficacy of Metarhizium, nor on the effects of PAN. For example, increased stress and reduced coherent behaviour of gregarious hoppers as a result of PAN were less obvious under the limitations of semi-field conditions. More convincing were the observations that, in the presence of PAN, the normal doses of the pesticides could be reduced by 2/3 while achieving comparable mortalities. Also the enhanced mode of action of Green Muscle in the presence of PAN could be demonstrated.</p> <p>In the final assessment of the workshop, the participants felt that metarhizium products were not acting fast enough to prevent hopper bands from causing damage to crops before mortality sets in, although damage caused by hoppers can be considered as marginal. In addition, the participants considered the price of Green Muscle as being too high, if the product has to be used at 50 g/ha, while accepting that the price becomes competitive at 25 g/ha. Unfortunately, the workshop could not prove that the lower dose was effective.</p> <p>It was planned to organize a 2nd field workshop by end of 2003, but this could not be fulfilled when the GTZ Locust Project unexpectedly pulled out of EMPRES/CR in April 2003.</p>

Planned Activities	Status / Reasons for Deviation
<p data-bbox="297 1774 503 1906"><b>7.2 Assess environmental impact of locust control operations</b></p>	<p data-bbox="597 279 1399 443">EMPRES/CR continued to support ICIPE in its efforts to make the <b>Desert Locust pheromone PAN</b> available to the affected countries as a low-cost and effective alternative to conventional locust control. Because of the absence of natural hopper bands and to facilitate at least the testing of PAN under semi-natural conditions, mass-rearing facilities had been built up at the ICIPE station in Port Sudan in 2002 and further optimized during 2003.</p> <p data-bbox="597 464 1399 842">Validation trials in enclosures were conducted to confirm the effects of PAN on hopper sensitivity to Green Muscle and conventional pesticides at a series of fractional doses of the recommended rates. Significant enhancement of the rate of daily as well as overall mortality of hoppers was observed in almost all treatments involving exposure of hoppers to PAN. The results showed that in the presence of the pheromone, about 25% of the normal application rate of the pesticides can give overall mortalities that are comparable to recommended doses. The trails with PAN in combination with Green Muscle resulted in higher infection rates and mortality of the nymphs at almost all doses. These results suggest that, in combination with PAN, the recommended application rate of Green Muscle can be reduced to a quarter or less without significant reduction in mortality. Trials on hopper bands on natural vegetation are being prepared and it is hoped that these trials can be realized in 2004.</p> <p data-bbox="597 863 1399 999">Also the effects of PAN on egg development have been investigated in artificial egg fields. The results showed that PAN has adverse effects on the viability of eggs and embryonic development. If results could be confirmed also on natural egg fields, it may open up the possibility of PAN-based intervention in egg-fields during outbreaks.</p> <p data-bbox="597 1020 1399 1262">Based on the recommendations made by the participants of the <b>sprayer testing</b> workshop conducted in 2002, guidelines on minimum requirements and standards for ULV locust and grasshopper sprayers, and related test procedures have been drafted in collaboration with CRC, NRI and the Agricultural and Food Technologies Engineering Service (AGST) of FAO. The draft has been submitted for publication to AGST. In addition, a new model of a hand-held ULV rotary atomizer sprayer has been tested following the recommended procedures by the LCUs in Egypt and Sudan. The final test results are expected by early 2004.</p> <p data-bbox="597 1283 1399 1713">In 2002 FAO provided the Desert Locust Control Organization for Eastern Africa (DLCO-EA) through the EMPRES/CR Programme with one <b>DGPS equipment</b> (Trimflight 3) for testing the system under operational conditions. The system has proven its potential during large-scale control operations carried out against the Red Locust in Tanzania. It was found much easier to navigate with better track spacing, and a detailed record of the spray operations was obtained. It was therefore agreed to give an opportunity to share this experience and to encourage private air operators to introduce this equipment for better and more cost effective aerial pesticide application. In collaboration with DLCO-EA it was planned to demonstrate the advantages of the system in a workshop under practical field conditions during 2003. Advanced arrangements had been made to organize the demonstration in October 2003, but the slow response from the countries did not allow the organizers to conduct the workshop as scheduled. The issue was discussed during the 11th ELO Meeting and it was agreed to postpone the DGPS demonstration until April 2004.</p> <p data-bbox="597 1776 1399 1936">Following the recommendations made by the participants of the 10th ELO Meeting, DLCO-EA handed over one blood-testing kit to the MoA in Eritrea for conducting <b>blood-testing surveys</b>. But due to various other commitments, the Crop Health Division was not in the position to organize a baseline survey as planned. In the meantime efforts were made to identify a nurse who could do the blood sampling and analysis, but it was</p>



Planned Activities	Status / Reasons for Deviation
	<p>also not possible find a suitably qualified person by the end of 2003.</p> <p>A study on environmental risks of insecticides used for DL control in the selected <b>ecological sensitive areas</b> such as the mangroves was carried out over the past two years in Sudan by the former EMPRES/CR APO. The study has been completed and documented in August 2003. The author concluded that mangrove ecosystems are very vulnerable to pesticides. If control operations are being conducted too close to the mangroves, pesticides risk to be carried by wind drift and water transport into this sensitive habitat. The author recommended establishing buffer zones around the mangroves to reduce this risk.</p>
<p><b>7.3 Support operational research projects</b></p>	<p>During Phase II, a total of 17 research proposals have been received from the member countries. Only 4 proposals met the minimum quality requirements, and are being supported by EMPRES/CR and CRC:</p> <ul style="list-style-type: none"> <li>• <i>Relationship between Desert Locust infestation, environmental factors and control measures in Saudi Arabia</i>, King Faisal University, Saudi Arabia, 2002;</li> <li>• <i>Distribution of the Desert Locust in relation to herbage quality at the Red Sea coast</i>, University of Khartoum, Sudan, 2003;</li> <li>• <i>Evaluation of the efficacy of Metarhizium anisopliae products (Green Muscle) against mixed grasshoppers in Central Ethiopia</i>, University of Addis Ababa, Ethiopia, 2003;</li> <li>• <i>The effects of Green Muscle on locusts and grasshoppers</i>, Plant Protection Research Institute, Cairo, Egypt, 2003.</li> </ul> <p>One additional proposal from the University of Khartoum, <i>Effect of PAN on non-target insects</i>, is in the process of being reviewed for support.</p> <p>One study, <i>Ecological field research on Desert Locust population dynamics</i>, October 2000, under the supervision of the University of Khartoum has successfully been finalized by October 2003.</p> <p>A draft final report on the project <i>Evaluation of the efficacy of metarhizium anisopliae products (Green Muscle) against mixed grasshoppers in Central Ethiopia</i>, University of Addis Ababa has been submitted to EMPRES/CR by December 2003, but major amendments need to be made before it could be accepted.</p> <p>The final report from the University of Aden, Yemen, on the study <i>The impact of alternative pesticides used in Desert Locust operations on honeybees and other non-target organisms</i> (July 2000) is still pending since March 2003. The matter has been commissioned to PPD in Sana'a for follow up.</p> <p>The implementation of the EMPRES/CR – CRC collaborative research initiative to give support on Desert Locust research to scientists from the Region remains difficult. As highlighted in the previous EMPRES/CR progress reports, most of the research proposals submitted in the past were of very poor quality or not always related to the research priorities. Also the quality of the scientific reports is in most cases far below minimum standards. After the ELOs started to be more actively involved not only in the process of advertising this possibility, but also in following up the research results, some improvements could be observed. However, none of the findings so far would merit being published in internationally recognized journals.</p> <p>A PhD student from Ethiopia graduated from the Wageningen University in December 2003. In collaboration with the PPD in Sudan and with support from EMPRES/CR staff, he investigated since July 1999 the <i>Habitats and spatial patterns of solitary Desert Locusts on the coastal plains of</i></p>

*Sudan.* The study confirmed a strong correlation between the Desert Locust and the millet croplands and *Heliotropium*-dominated plant communities as these habitats are from the ecological point of view, i.e. soil moisture and nitrogen content, more suitable for Desert Locust development than other plant communities. It is expected from the results that the area on which survey operations need to concentrate during recession periods could be reduced by more than 90 % as compared to the total green area and hence could reduce costs for surveys.

#### 7.4 Promote the use of proven technologies

In the context of the interregional **bio-control** field workshop in Port Sudan from 10-20 January 2003 (see 7.1), it was hoped that the trial results could also fulfil the requirements for registration of Green Muscle in Sudan. Unfortunately this was not the case as the data were inconclusive and not sufficient to allow registration. The PPD therefore requested ICIZE bilaterally to assist in conducting registration trials on reared Desert Locust from the ICIZE rearing unit at Port Sudan. ICIZE agreed, provided that the PPD is sharing the costs for insect rearing and transport, but no trials were initiated up to October 2003. Due to the uncertain situation at the PPD, it was not clear by December 2003 to what extent the registration process continued and with what results.

It has been five years since suitable Desert Locust outbreaks last occurred to allow bio-pesticide registration trials on natural hopper bands. The experiences made from October to December 2003 showed that the LCUs face difficulties to spare sufficient resources from the national campaign or to leave certain DL infested areas untreated for registration purposes. For this reason EMPRES/CR encouraged the LCUs during the past years to initiate testing of bio-control products also on grasshoppers as they pose continuous problems almost every year in most locust-affected countries (see also 7.3). If national registration authorities accept a single registration for both grasshoppers and locusts, work on grasshoppers could speed up the process. It might even eliminate the need for separate registration trials on locusts, which are more difficult to carry out and more costly.

A consultant was contracted by the GTZ Locust Project in 2002 to compile the experiences made on **barrier treatments** and to develop guidelines in collaboration with PRIFAS. Some internal difficulties delayed the process but it is now expected that the final report can be submitted to FAO by April 2004.

As the only remaining country in the Central Region using **Exhaust Nozzle Sprayers** (ENS) for Desert Locust control, Oman confirmed having suspended the use of ENS in favour of the ULV technology for Desert Locust control in June 2003, but they are still being used for grasshopper control. The participants of the 11th ELO Meeting recommended that the LCU in Oman should also stop using ENS for grasshopper control.

**Standard Operating Procedures** (SOP) for easy reference in the field and containing the key elements of standard ground and aerial survey and control operations have been prepared in English and Arabic in collaboration with CRC and DLIS (see also 4.1 and 5.5). Production of the laminated pocket size cards is in progress. The field cards will be distributed to the member countries by January 2004.

The **Spray Monitoring Form** was recommended by the DLCC in September 2001 for use by the LCUs during all locust control operations. It was expected to allow the better evaluation of the actual impact and the efficacy of Desert Locust control campaigns. An electronic version of the data input format has been incorporated in the updated RAMSES versions in June 2003, but it was not yet possible to update the eLocust programme for palmtop computers accordingly. It is planned that the revised eLocust software will be available by June 2004.

With control operations in Sudan and Saudi Arabia against Desert Locust

outbreaks starting in October 2003, it turned out that the LCUs made no use of the Spray Monitoring forms. It was only after having been encouraged by EMPRES/CR and CRC that at least in Sudan the control teams, having been provided with enough copies, have started using them for recording control data and spray efficiency. In Saudi Arabia the management was still hesitant in applying the form because it was perceived as too complicated to fill. Intensive field testing of the Spray Monitoring form during the past years, especially in EMPRES/CR training courses, proved that the form could easily be used by locust control officers once they become used to it. It is self-explanatory and based on the survey form, which is being used by the LCUs for many years.

#### **7.5 Provide LCUs with DL references**

A consultant was recruited by the GTZ Locust Project to prepare a comprehensive locust literature data base on CD ROM which also includes references from NRI, PRIFAS and GTZ archives. A draft version has been presented during the 37th DLCC meeting in September 2003. It appeared that insufficient consultation between the consultant, FAO and EMPRES/CR led to some technical misconception regarding the features of the literature data base and its contents. It was agreed to incorporate the recommended improvements as much as possible into the data base before being distributed to FAO and EMPRES by December 2003.

An Arabic translation of the revised FAO Desert Locust Guidelines has been published in November 2003 and is being distributed to the member countries.

### **Result 8: Systematic methods of campaign evaluation developed.**

**Indicator 8.1:** Two case studies conducted by 2002

**Indicator 8.2:** Models to identify efficient control strategies via scenarios completed by 2003

The process of developing an improved preventive control strategy requires long-term attention and support. Up to 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. However it was seen necessary to assemble and to collate more data. Analytical tools and methods such as socio-economic case studies and theoretical models were then to be developed.

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 using a computer-based model, which comprises elements of population dynamics and campaign organization as a tool for better contingency planning.

<b>Planned Activities</b>	<b>Status / Reasons for Deviation</b>
<b>8.1 Develop suitable campaign evaluation mechanisms</b>	The baseline information and data on the status of the preventive control capacities of the CR countries collected over the past years was perceived as incomplete in some parts in particular on aspects such as rapid deployment arrangements and contingency planning. As mentioned under 6.1, a capacity spread sheet has been circulated in early 2003 to the LCUs in order to fill some of the gaps. As pointed out, the response from the countries was not always as expected and the reliability of the information obtained from the LCUs was questionable. EMPRES/CR decided to assign

Planned Activities	Status / Reasons for Deviation
	<p>a consultant in July 2003 to review preventive control strategies since 1920, and to assess the current level of preparedness of the affected countries to prevent plagues. A first instalment of the preliminary findings was submitted in September 2003. Besides technical difficulties, such as the absence of objective quantitative methods for assessing 'dangerous' populations in different environments, some of the findings highlighted the problem that governments, while responding to crises, seem never anticipate them. Support to locust control risks losing priority to more pressing agricultural needs faced by new generations of managers who had not experienced large plagues. The current situation in Sudan highlights this observation as well as the decline of financial support by member states to DLCO-EA and CRC. In addition, without regular training and retraining, control teams will be unfamiliar with new anti-locust measures. Details about control methods and tactics need to be in a readily available format for training reserve staff called upon during emergencies. The latter confirms the EMPRES/CR strategy to support building up self-sustained training capacities in the countries.</p> <p>It is anticipated that the findings of the study will be presented during the next DLCC Technical Group meeting early 2004. The findings should be presented to the ELOs and provide a basis for discussion during the planned Strategy Workshop in 2004.</p> <p>The use of the <b>Spray Monitoring Form</b> is being considered by EMPRES/CR as an important tool to evaluate the actual impact and success of locust control. RAMSES could provide the platform for analysing the data and reaching more conclusive results as far as the campaign efficiency is concerned. Due to the absence of Desert Locust infestations during the past years, the Spray Monitoring Form could not be practiced under real campaign conditions. This opportunity now opened up with the recent Desert Locust outbreaks in Sudan and Saudi Arabia. The LCUs have been sensitised to make active use of the form during all forthcoming control operations and to provide feedback to EMPRES/CR and CRC.</p>
<p><b>8.2 Analyse socio-economic impact of campaigns</b></p>	<p>It was planned to organize an economic symposium by December 2003 to discuss the results of the various socio-economic studies conducted under the EMPRES/CR Programme and their relevance in order to come to a final conclusion (refer also to the EMPRES/CR progress reports 2001 and 2002). But since the EMPRES/CR approach was criticized by the Phase II Evaluation Mission as not holistic enough, it was seen inappropriate to discuss the issue in a broader context at this point. The mission felt that the approach had been too academically oriented and too limited in scope in order satisfactorily to address economic questions of locust management. It recommended considering the subject across the whole spectrum of economic, environmental, social and political issues. The EMPRES/CR management agreed to review the matter again as part of the Phase III activities, i.e. to evaluate the economic advantage of preventive control versus emergency operations. The discussions highlighted again the implications and sensitivity of the socio-economic question of preventive Desert Locust control, which is a global strategy designed to prevent damage to agricultural production not only nationally but also beyond the borders of individual countries. Modelling concepts assessing the theoretical effects of intervention strategies did not solve this dilemma. They relied too much on critical assumptions in a complex environment which could easily change the overall results of the analysis.</p>

**8.3 Investigate scenarios on survey and control operations to improve strategies**

A computer based campaign simulation model, symLocust, has been developed by a consultant, supported by the Wageningen University and GTZ, in 1996 and was updated in 2001. The model was introduced during the contingency planning seminar in 2002 and much appreciated by the participants as a useful tool to assess the national survey and control capacities and their likely impact in order to detect shortfalls. Some of the applications failed to operate from CD ROM. In order to make the computer model available to the member countries, the consultant had been requested to resolve the problem. The matter will be followed up further and is planned to distribute 50 copies of the CD to the member countries by mid 2004.

**C. Staff status and Inputs**

**C.1 Staff situation**

**a. Professional staff**

<i>1 Programme Coordinator (Cairo, Egypt)</i>	From August 2001, under FAO Regular Programme funds. Contract extended until December 2005.
<i>1 International Migratory Pest Expert (Khartoum, Sudan)</i>	Project funded post. Appointed in December 2002. Current contract until January 2004.
<i>1 National Professional Officer</i>	Position vacant since August 2001.
<i>1 National Professional Officer for Survey (Sana'a, Yemen)</i>	Project-funded post. Current contract until February 2004.

**b. Support staff**

*1 Administrative Secretary* in Cairo, Egypt, project-funded fixed-term contract from September 2002, currently until December 2004  
*1 Driver* in Sana'a, project-funded fixed-term contract until August 2004  
*1 Driver* in Cairo, GTZ-Project-funded until April 2003. Since May 2003 project funded fixed-term contract.

## C.2 Equipment purchased since January 2003 (Phase II)

- Djibouti:**
- 3 Air conditioners
  - 1 Digital camera
  - various office equipment
- DLCO-EA**
- 1 Desk-top computer incl. accessories
- Egypt:**
- 1 4-wheel drive Pick-up
  - 1 Desk-top computer incl. accessories
- Eritrea:**
- 1 computer incl. accessories
  - 1 Digital camera
- Ethiopia:**
- 1 Desk-top computer incl. accessories
  - various training equipment
- Oman**
- 1 eLocust Palm-top computer
- Somalia:**
- 1 motorbike
  - 1 GPS hand set
  - 1 fax machine
  - 1 small photocopier
  - 6 camp beds
  - 1 Digital camera
- Saudi Arabia:**
- Sudan:**
- Yemen:**
- various survey equipment
  - various training equipment
  - 8 fax machines

### **C.3 Training activities during the reporting period**

- 1 National Survey & Control course in Saudi Arabia from 8-19 March 2003, 17 trainees,
- 1 National Survey & Control course in Ethiopia from 19-28 July 2003, 21 trainees,
- 1 National Survey & Control course in Egypt one from 13-18 September 2003, 20 trainees.
- 1 DL Diploma course, University of Khartoum, 6 students (academic year 2003/2004)
- Various on-the-job training opportunities on RAMSES application, use of eLocust system, survey operation, locust information systems in Egypt, Eritrea, Ethiopia, Saudi Arabia, Somalia, Sudan, and Yemen.

### **C.4 Meetings, workshops, seminars attended by EMPRES/CR staff during the reporting period**

- Interregional bio-control field workshop, Port Sudan, Sudan, 10-20/01/2003
- EMPRES/CR Staff Meeting, Khartoum, Sudan, 13-15/01/2003
- 1<sup>st</sup> EMPRES/WR ELO Meeting, Niamey, Niger, 30/01–03/02/2003
- 5<sup>th</sup> Consultative Committee Meeting, Rome, Italy, 19-23/05/2003
- 37<sup>th</sup> DLCC Meeting, Rome, Italy, 22-26/09/2003
- 11<sup>th</sup> EMPRES/CR Liaison Officers Meeting, Djibouti, Djibouti, 19-23/10/2003
- 3<sup>rd</sup> Joint Technical Forum Meeting, Addis Ababa, Ethiopia, 17-20/11/2003

### **C.5 Relevant publications during the reporting period**

- Improved Survey Methods for Gregarious and Gregarizing Hopper Patches of Desert Locust (FAO), January 2003.
- Report on Survey and Control Training Course in Saudi Arabia (CRC) March 2003.
- Report on 2<sup>nd</sup> Joint Survey of the DL Winter Breeding Areas on the Egyptian-Sudanese Border (EMPRES/CR) April 2003.
- Report on 5<sup>th</sup> EMPRES Consultative Committee Meeting, Rome, 19-23 May 2003 (FAO), May 2003.
- Final Report on Ecological Field Studies on Desert Locust Population Dynamics (University of Khartoum) May 2003.
- Guidelines on Minimum Requirements for Ground-based Locust and Grasshopper sprayers (FAO-NRI) July 2003.
- Guidelines on Standards for Ground-based Locust and Grasshopper Sprayers, and Related Test Procedures (FAO-NRI) July, 2003.
- Draft Report on Environmental Impacts of Pesticides used for Desert Locust Control in Ecological Sensitive Areas (EMPRES/CR), August 2003.

- EMPRES/CR Phase III Implementation Document (FAO), September 2003.
- Report on Survey and Control Training Course in Ethiopia (CPPTRD) September 2003.
- Report on Survey and Control Training Course in Egypt (GDLAAA) October 2003.
- Phase II consolidated Report on Optimization, Validation and Transfer of Pheromone Technology to National Locust Control Organizations (ICIPE) December 2003.
- Workshop report on the use of Green Muscle and Desert Locust Adult Pheromone to Control Desert Locust Hopper Bands (GTZ-EMPRES/CR) December 2003.
- Standard Operation Procedures (SOP) for Ground and Aerial Survey and Control (CRC-EMPRES/CR) December 2003.
- Minutes of Meeting, 11th ELO Meeting (EMPRES/CR) December 2003
- PhD Thesis on Habitat and Spatial Pattern of Solitarious Desert Locust (*Schistocerca gregaria* Forsk.) on the Coastal Plain of Sudan (Wageningen University) December 2003.



## **D. General Assessment**

Conclusion: whether the programme purpose can be achieved  
Recommendations on necessary steps to be taken  
Future action required

During year 2003, the Programme experienced three major events, namely the evaluation of Phase II in March, the unexpected departure of the seconded GTZ expert in April and the beginning of Desert Locust outbreaks in Sudan and Saudi Arabia from October onwards. Although all these events affected the routine implementation of the EMPRES/CR activities considerably, sufficient progress could be made in all major aspects towards achieving the objectives of the second phase of the Programme.

The EMPRES/CR Phase II evaluation mission came to the conclusion that important steps towards the development of sustainable preventive control had been made, including the improved collaboration with CRC, the increased membership of EMPRES/CR countries in the Commission, the introduction of national geographic information systems (RAMSES), rapid field data entry and transfer (eLocust), the efforts to promote the introduction of bio-pesticides, the development of a training manual, and the training programmes leading to the creation of national master trainers. Progress was assessed as limited as far as the research initiative within the Region was concerned, in respect of the outcome of socio-economic studies, and the failure so far to fully establish a system to verify best practices for survey and control. The mission also observed variations in the success achieved in adopting and introducing EMPRES/CR approaches into the national programmes by stating that some countries were wholly committed to the EMPRES approach, while others were more marginally involved. In general the mission considered that sufficient progress had been made in Phase II to warrant an extension of the Programme into a third Phase of three years which should focus on completing unfinished activities and establishing a sustainable locust management system in the Central Region.

During the reporting period it became obvious that much of the overall success of the Programme depends on the commitment by the governments, the ability and the willingness of the management of the national locust control institutions to collaborate. New management resulted in much improved progress particularly in Yemen and Egypt. While both countries only marginally participated in the joint EMPRES/CR efforts in the past, they are now actively introducing the various EMPRES/CR concepts into their national systems and are obtaining full support from their Governments.

The developments in Sudan took the opposite direction after the management at the PPD changed. By comparison, in previous years, Sudan was seen to be making the best progress in EMPRES/CR in introducing aspects of improved Desert Locust management. If recent directives from the Minister to maintain a centralized locust control service under the umbrella of the PPD are properly implemented, the LCU, with the necessary operational autonomy and support, may soon begin again to operate to its full potential.

Similarly, the situation in Eritrea remains critical. The Ministry of Agriculture is still severely suffering from staff shortage and the ongoing restructuring process, such that it is almost impossible to re-establish an operational LCU. The failure of the

agricultural monitoring system already put agricultural production at risk due to undetected armyworm and grasshopper outbreaks. This example was taken to sensitize the MoA of the urgent need to rehabilitate the national locust early warning system. It is important for the food security of the country to incorporate a Migratory Pest Control Division into the new structure of the Ministry.

The precipitate end of German support made it painfully clear how much the Programme still depends on sufficient donor assistance to accomplish its development tasks and to reinforce the EMPRES/CR approaches into national systems. The Programme operated during most of the past months with only three professionals performing a similar level of activities to those of Phase I which had significantly more staff. During the reporting period, the EMPRES/CR Programme reached the limits of its capacity to initiate, monitor and to provide the necessary technical backstopping in all of the various technical aspects of improved locust management. The situation is particularly crucial as far as the transfer, implementation and sustainability of new technologies are concerned, specifically in aspects such as remote sensing, RAMSES, eLocust, and for maintaining the human capacity in Desert Locust management of the member countries. It cannot be expected that comparatively sophisticated approaches and new technologies can be successfully transferred with only limited backstopping within short period of time.

For that reason it is hoped that the post of Remote Sensing expert at DLIS, who was of great support in providing analyzed satellite imagery to all locust-affected countries, which helped guiding their survey teams and to estimate the extent of likely locust infestations, can be maintained. The same applies also to the still vacant position of an EMPRES/CR NPO based in Addis Ababa from whom it is expected to follow the process of staff development programmes in the countries. Despite encouraging response from the donor representatives during the EMPRES/CR Phase III planning session, it is at this moment not clear whether project funds in support of Phase III are realistically forthcoming. This situation is not only affecting the planning of the EMPRES/CR Programme but also two of the currently remaining three posts are at stake. If no quick solution can be found, it is unlikely that the Programme can maintain its current momentum and fulfil its obligations as described in the Phase III implementation document.

## List of Acronyms

AGPP	Plant Protection Service (FAO)
APO	Associate Professional Officer (FAO)
CFP	Country Focus Programme
CPPD	Crop Production and Protection Division
CPPTRD	Crop Production and Protection, Technology and Regulatory Department
CR	Central Region
CRC	FAO Commission for Controlling the Desert Locust in the Central Region
DGPS	Differential Global Positioning System
DL	Desert Locust
DLC	Desert Locust Control
DLCC	Desert Locust Control Committee
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DLIS	Desert Locust Information Service (FAO HQ)
DLMCC	Desert Locust Monitoring and Control Centre - Yemen
ELO	EMPRES Liaison Officer
ELP	EMPRES Link Person
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
EMPRES/CR	EMPRES Central Region Programme
EMPRES/WR	EMPRES Western Region Programme
FAO	Food and Agriculture Organization of the United Nations
GDPP	General Directorate for Plant Protection
GIS	Geographical Information System
GPS	Global Positioning System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HF	High Frequency
HQ	Headquarters
ICIPE	International Centre of Insect Physiology and Ecology, Nairobi
IGR	Insect Growth Regulator
LCC	Locust Control Centre
LCU	Locust Control Unit (National)
LIO	Locust Information Office
MoA	Ministry of Agriculture

MoU	Memorandum of Understanding
NPO	National Professional Officer (FAO)
NRI	Natural Resources Institute (UK)
PAN	Phenyl-Aceto-Nitrile
PPD	Plant Protection Department (National)
RAMSES	Reconnaissance and Management System of the Environment of Schistocerca (GIS data management and aid to decision-making)
S&C	Survey and Control
TFCR	Joint Technical Forum for the Central Region
ToT	Training of Trainers
ULV	Ultra Low Volume
USAID	United States Agency for International Development
WR	Western Region
WU	Wageningen University