Emergency Prevention System

for Transboundary Animal and Plant Pests and Diseases

EMPRES

(Desert Locust Component)

Central Region

Report of the Evaluation Mission

November 2005

Preface

This report represents the views of the independent Evaluation Mission on the performance and achievements of the EMPRES (Desert Locust Component) Central Region Programme (EMPRES/CR) Phase III. The programme began its first phase in 1997; the second phase began in January 2001 and ended in December 2003. The third phase began in January 2004 and will end in December 2006. The present evaluation focuses mainly on this phase of the programme but, as this is likely to be the Programme's final evaluation, also refers to previous phases[1]. The Mission started on 12 September and ended in Rome on 11 October 2005; six EMPRES/CR countries were visited (Egypt, Sudan, Ethiopia, Saudi Arabia, Yemen and Eritrea[2]).

The evaluation was initiated with a view to providing donors, collaborating agencies and countries as well as FAO with an independent and objective assessment of the achievements of the Programme, including a review of problems faced and a consideration of future perspectives. The final report will be presented to the EMPRES/CR Consultative Committee meeting in November 2005; the present draft is intended for debriefing and feedback sessions with FAO staff in the Regional Office (RNE) and at FAO headquarters.

The short visits paid to the EMPRES/CR countries cannot do full justice to the Programme's performance at country level: encounters with EMPRES/CR collaborators were restricted to meetings at HQ level. A more in-depth assessment of individual Desert Locust units' capabilities was beyond the limits of the Evaluation Mission. However, the extensive documentation available and the excellent cooperation accorded to the Mission by EMPRES/CR collaborators provided valuable information. In addition, a questionnaire was sent out to participating countries and partner/donor institutions. The responses have further informed the Mission's conclusions and recommendations. The report has some inbuilt redundancies: hasty readers should turn to the Executive Summary; the arguments found there are taken up and expanded in the Conclusions and Recommendations section. Finally, the body of the report and the annexes contain a comprehensive discussion of the Programme as well as more factual information.

The Evaluation Mission is most appreciative of the efforts made by the staff of AGPP, the CRC Secretary, the EMPRES/CR coordinator and his colleagues and collaborators in the countries visited, as well as a range of other individuals who provided information and discussed issues in a frank and constructive manner.

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[1] The annexes give a statistical overview of the Programme's main outputs and activities since its inception.
[2] Itinerary and Persons Met in Annex 2; visit to Saudi Arabia: Bateno and Bultemeier only; visit to Eritrea: Bultemeier and Latchininsky only. Djibouti, Oman and Somalia had to be left out due to time and other constraints.
[3] The designations employed and the presentation of material in this information product are those of the authors and do not imply the expression of any opinion whatsoever on the part of their employers.

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List of Acronyms

AELGA	Assistance for Emergency Locust and Grasshopper Abatement (USAID)
AGP	Plant Production and Protection Department (FAO)
AGPP	Plant Protection Service (FAO)
APO	Associate Professional Officer (FAO)
CFP	Country Focus Programme
CLCPANO	FAO Commission for Controlling the Desert Locust in North West Africa
CLCPRO	FAO Commission for Controlling the Desert Locust in the Western Region
CRC	FAO Commission for Controlling the Desert Locust in the Central Region
CRT	Cooperative Research Team
CTA	Chief Technical Adviser
DGIS	Directoraat Generaal voor Internationale Samenwerking (Directorate General for International Cooperation)
DGPS	Differential Global Positioning System
DL	Desert Locust
DLCC	Desert Locust Control Committee
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DLIS	Desert Locust Information Service (FAO)
DLTG	Desert Locust Technical Group (of DLCC)
DLU	Desert DL unit (National)
ELO	EMPRES Liaison Officer
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases
EMPRES/CR	EMPRES Central Region Programme
EMPRES/WR	EMPRES Western Region Programme
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GIEWS	Global Information and Early Warning System
GIS	Geographical Information System
GOE	General Operating Expenses
GPS	Global Positioning System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HF	High Frequency (Radio transmission of information)
HQ	Headquarters
ICIPE	International Centre for Insect Physiology and Ecology, Nairobi
IGR	Insect Growth Regulators
LOCDAT	Desert Locust Database (developed by GTZ)
LOCUSTOX	Project on Environmental Impact of Locust Control, Dakar
LUBILOSA	Locust Biological Control Project (Benin)
MoA	Ministry of Agriculture
MoU	Memorandum of Understanding
MPG	Locusts and Other Migratory Pests Group (in FAO AGPP)
NDV	Normalized Differential Vegetation Index
NGO	Non-Governmental Organization
NPO	National Professional Officer
NRI	Natural Resources Institute (UK)
OiC	Officer-in-Charge
PBE	Office of Programme, Budget and Evaluation
PD	Programme Document
PID	Programme Implementation Document
PIM	Programme Implementation Matrix
PPD	Plant Protection Department/Division/Directorate
PPM	Project Planning Matrix
PWB	Programme of Work and Budget (FAO)
RAF	Regional Office for Africa
RAMSES	Reconnaissance and Management System of the Environment of Schistocerca (database developed by NRI in collaboration with FAO)
RNE	Regional Office for the Near East (FAO)
RP	Regular Programme (FAO)
SFO	Senior Field Officer
SPFS	Special Programme for Food Security (of FAO)
SWOT	Strengths, Weaknesses, Opportunities, Threats
TCAP	Field Programme Development Service (FAO)
TCDC	Technical Cooperation among Developing Countries
TCP	Technical Cooperation Programme (of FAO)
TF	Trust Fund

TOR	Terms of Reference
ULV	Ultra Low Volume
UNV	UN Volunteer
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WAU	Wageningen Agricultural University (now Wageningen University)
WFP	World Food Programme

Executive Summary

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 minimizing the risk that Desert Locust (DL) plagues will develop. It was designed as a programme in which affected countries, regional organizations, donors, and FAO collaborate in the development of improved preventive control strategies. EMPRES/CR[4] completed its first phase at the end of 2000[5] and Phase II by December 2003. The current (and last) Phase III started in January 2004 and will end in December 2006. The Programme has been financially supported by FAO Regular Programme funds together with Trust Fund projects financed by the Netherlands (GCP/INT/670/NET), Switzerland (GCP/INT/817/SWI), the United States of America (GCP/INT/720 & 757/USA), the Commission for Controlling the Desert Locust in the Central Region (CRC - MTF/INT/007/MUL), and the Desert Locust Control Committee (DLCC - MTF/INT/008/MUL). The overall funding required for Phase III was an estimated US$ 3,353,000.

EMPRES/CR's primary goal is: "to minimize 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." Following this, a Programme Goal was defined 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." Five components in particular were emphasized: (i) enhanced interaction between the stakeholders; (ii) early detection and early warning; (iii) introduction of economic and environmentally safer control technologies and support to applied research; (iv) capacity building and training; and (v) contingency planning and rapid deployment.

For Phase III, the EMPRES/CR objectives were translated in a participatory process involving the EMPRES/CR participating countries, donor representatives, and FAO staff into an Implementation Document, which defined the purpose of Phase III as: "improved preventive DL control management approaches reinforced on a sustainable basis." This purpose was further broken down into four results areas: "EMPRES/CR Desert Locust management components gradually taken over by the CRC and the participating countries; implementation of improved early warning systems supported; campaign evaluation measures and contingency planning mechanisms in place; and alternative control technologies supported."

The EMPRES/CR programme has been evaluated three times since its inception: 1999, 2001 and 2003. The current evaluation confirms many positive conclusions of the preceding evaluations, and sees a generally positive trend in Desert Locust prevention and control in the Region:

- Most governments attach high priority to the prevention and control of DL outbreaks;
- Financial resources allocated to DL units have risen in most countries[6]; some DL units have received relative institutional autonomy, which will increase their response capacity;
- There is better planning and management of DL survey and control campaigns; and
- Regional collaboration has increased among countries[7].

[4] Central Region: participating countries are Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen.
[5] Excluding bilateral contributions, funding for EMPRES/CR for Phase I amounted to approximately US$ 5.5 million through FAO Trust Fund projects, Regular Programme and FAO Central Region Locust Commission (CRC) funding for the period 1997 to 2000. Phase II received an overall amount of US$ 4.4 million.
[6] This was also due to DL outbreaks in the Region.

Other important results achieved during Phase III include:

- Demonstrated quick response capacity in most EMPRES/CR countries during DL outbreaks in 2004-05;
- Steady improvements in the quality and timeliness of DL survey reports over the past years;
- Increasingly close collaboration between EMPRES/CR and the FAO Commission for Controlling the Desert Locust in the Central Region (CRC);
- CRC membership now comprising almost all EMPRES/CR countries[8];
- Increased interaction with the Western Region, particularly in information exchange, survey and training;
- Growing recognition of EMPRES/CR's contribution to Food Security, and in some countries a closer collaboration of DL units with early warning and disaster management bodies;
- Exemplary work planning and reporting routines by EMPRES/CR programme management, which have increased transparency and accountability for participating countries and donors alike;
- Improved operational support from AGPP[9];
- Continuing support for the introduction of environment-friendly control agents such as Metarhizium and PAN and provision of superior equipment (Differential GPS), which can significantly improve control efficiency and thus reduce environmental damage;
- Ongoing training courses, including for Master Trainers (in each of the participating countries at least one national Master Trainer has been trained), and the provision to DL units and other institutions of Master Trainers' Training Kits, which are used extensively in national training programmes.

EMPRES/CR has thus provided a solid foundation for future coordinated preventive DL control efforts, after its scheduled phasing out by December 2006. However, levels of preparedness among countries in the Region are uneven, and there will remain some issues that will require continued attention in the future.

Progress has been limited particularly in four areas:

- The regional research component of EMPRES/CR has fallen short of expectations, mostly due to the limited number of research proposals of acceptable quality;
- Technological improvements such as RAMSES (Reconnaissance And Management System of the Environment of Schistocerca) and eLocust (system for wireless field data transmission), as well as satellite images have been introduced to several countries, but their utilization has been limited due to technical and operational constraints, pointing to a need for additional training and better backstopping capabilities in the Region[10];
- Equipment provided during the previous phases of EMPRES/CR is becoming outdated or is no longer operational, thus reducing the DL units' current and future effectiveness; replacement particularly of more advanced items is difficult for most DL units in the Region[11];

[7] The number of joint surveys has increased, information exchange within the Region has improved, and Saudi Arabia has (on a bilateral basis) provided crucial operational support to other EMPRES/CR participating countries for control activities.
[8] Djibouti and Ethiopia are already full-fledged members, Eritrea will be formally acknowledged as member in the next CRC session; only Somalia due to its political situation is unlikely to be able to join in the near future.
[9] By establishing designated positions in FAO HQ, and by commissioning consultancies to the Programme.
[10] A start has been made by sending the national Information Officers on backstopping missions.
[11] There are some countries that have not yet received advanced equipment and software, such as eLocust and RAMSES. Also the issue of standardization within the Region is important here.

- Management systems to support and verify best practices for survey and control are not yet sufficiently established.

The absence of donors for a continuation of EMPRES/CR under the CRC umbrella can partly be attributed to the DL upsurge in the Western Region in 2003-04. Donors as well as FAO HQ focused their attention on events there, to the detriment of preventive work in the Central Region. The generous donor contributions to emergency measures in the Western Region also confirm a general trend that it is easier to find funds for fighting emergencies than for preventing them. However, FAO and the countries themselves should make continuous efforts to secure donor funding, in order to keep the momentum created by EMPRES/CR and ensure that the level of preparedness attained in most countries does not deteriorate.

In the Mission's view, by the end of Phase III, many components of a preventive DL management system will be operational in the Region. At the same time, it remains doubtful whether the recurrent needs of, as well as necessary upgrades for, DL preventive control systems can be met from the CRC alone, which seems to be the only substantive future funding source at present.

Thus, to prepare for the post-EMPRES/CR time, participating countries should identify areas in their DL preventive control systems where they would require further external support, and develop two scenarios: one minimum-case scenario, and one best-case scenario (the former outlining the necessary resources to ensure normal functioning, and the latter identifying additional resources needed to build up capacity and/or improve efficiency). EMPRES/CR and CRC as well as FAO HQ (AGPP and TCAP) should assist countries in developing funding requests: general proposals to donors for regional follow-up support, as well as individual (modular) proposals, which would allow donors to associate themselves with a specific part of the Programme or with activities in one particular country.

Conclusions and Recommendations

General

The development goal of EMPRES/CR remains relevant and appropriate. EMPRES/CR has made satisfactory progress towards achieving its targets in almost all its components. However, the adoption rate of the various approaches and technologies has varied from country to country. Some of the participating countries need to make greater efforts to incorporate and make use of the improved locust management components in a sustainable way. Follow-up and reinforcement is still required in some technical aspects such as RAMSES, eLocust, the use and interpretation of satellite images, introduction of bio-control techniques and campaign evaluation. During the remainder of Phase III emphasis should also be given to structural questions of locust control operations and to raising the management capacity at the DL control units in particular with regard to contingency planning.

Recommendation One: If EMPRES/CR were to be phased out as planned by December 2006, follow-up arrangements beyond an administrative taking-over of EMPRES-CR functions by CRC would be needed in order to ensure the continuation of a regional DL preventive control system. FAO and the countries themselves should make renewed efforts to secure donor funding to guarantee the availability of some crucial inputs (regional training, technology upgrades, equipment replacement, increased use made of RAMSES and eLocust). Preferably, this should happen within the framework of a follow-up Regional Technical Assistance Programme.

Recommendation Two: EMPRES/CR participating countries should review their DL preventive control systems, and identify areas where further external support would be required. Based on these reviews, countries should develop two scenarios: one minimum-case scenario, and one best-case scenario (the former to outline the necessary resources to ensure basic functioning, and the latter identifying resources needed to build up capacity and/or improve efficiency).

Recommendation Three: CRC member countries in their next meeting, should determine the level of support to be provided by the CRC secretariat to EMPRES/CR participating countries. In the opinion of the mission, it is inconceivable that the CRC secretary alone can meet all future technical demands: at least one additional CRC technical staff member based in the Region and familiar with, among other things, RAMSES and eLocust will be needed.

Project sphere

Project design

The planning and implementation documents for EMPRES/CR are of high quality. The Implementation Document uses a comprehensive Logical Framework matrix, which clearly lists Results/Activities, Responsibilities, Indicators, Sources of Verification and Assumptions, making it easy to verify progress made against targets. A difficulty for the third Phase has been the uncertainty regarding available funding; only indicative figures were available, and the Programme was expected to find additional donors beyond the three existing ones (NET, SWI, USA). This has not happened.

The Programme's institutional arrangements adopted in Phase II facilitated planning as well as collaboration, but the distinction between the EMPRES Liaison Officers Meeting and the Consultative Committee Meeting was not always maintained; at times, the same people attended both meetings. At FAO HQ level, arrangements have remained vague regarding the internal EMPRES Steering Committee in FAO HQ and its mandate.

Technical and operational backstopping

The complex nature of EMPRES/CR has placed a significant workload on AGPP in recent years. Currently one senior AGPP technical officer, among many other duties, acts as the focal point for EMPRES/CR and is budget holder for the TF projects supporting the programme; in addition, other FAO HQ staff (such as Information and Forecasting Officer, Programme Support Officer, RS Officer) support the Programme.

As a mature Programme, EMPRES/CR did not require much unscheduled technical support: the interaction with FAO HQ was mostly in the form of regular information exchange and participation by HQ staff in meetings. However, the search for new donors to the Programme received little attention by HQ staff, possibly due to the DL upsurge in the Western Region.

Some persistent technical problems, especially those regarding the full utilization of RAMSES and the functioning of eLocust, would have needed more support from FAO HQ, as problems apparently could not be solved from within the Region.

Recommendation One: EMPRES/CR and AGPP will need to build up more capacity in the Region to introduce and troubleshoot new technologies.

Recommendation Two: Despite the coming into existence of the Western Region EMPRES Programme, AGPP should maintain a designated officer to assist the CRC Secretariat with technical backstopping and concept development.

Project management

Management and administration of the EMPRES/CR programme has been of high standard. Work planning and reporting routines are exemplary, as is the commitment to involving ELOs in planning and decision-making. Occasional (over-) optimistic reporting regarding country capacities probably should be taken as a sign of the Coordinator's undiminished enthusiasm.

The efficient running of the Programme was made more difficult by a relatively high turnover among experienced counterparts: among others, three ELOs left their positions to join DLCO-EA.

Results sphere

EMPRES/CR Desert Locust management components gradually taken over by the CRC and the participating countries

Although EMPRES/CR has made significant contributions to build national governments' capacities to practice preventive desert locust control, the adoption rate is not at the same level in all participating countries. The standard of locust information technologies and equipment, and provision of training opportunities for the countries in the Region was found to be not on an equal basis. Also the differences in the number of trained staff currently working in DL units will have an effect on countries' preparedness to take over EMPRES/CR functions after the end of the Programme.

It appears possible that the most vital DL management functions so far performed by EMPRES/CR can be taken over by the CRC secretariat, but anything going beyond taking on the EMPRES/CR coordination tasks will be difficult to achieve. Regarding the provision of funds to replace obsolete equipment and maintain minimum campaign alertness, the Central Region will still require additional funds, extra staff and equipment after EMPRES/CR has terminated.

Recommendation: For the sustainability of improvements introduced by EMPRES/CR, attention must be focused on activities that will bring all countries to an adequate level before the end of Phase III.

Implementation of improved early warning systems supported

EMPRES/CR has provided various form of support to improve the survey and early warning capacities of participating countries, including training of plant protection officers, scouts and farmers, and the provision of references, survey and communication materials. By September 2005, EMPRES/CR had in Phase III already organized more training courses than during the entire Phase II.

As a result of these efforts, most countries are preparing targeted survey plans; quality and timeliness of survey reports has improved steadily and the number of locust reports received has increased by more than 50 % since 1997. Many survey and control reports are prepared using RAMSES and transmitted to DLIS (and copied to other EMPRES/CR DL units) in machine-readable form.

However, the lack of funds for continued operation of equipment and supplies provided by EMPRES/CR and the frequent turnover of trained staff in the DL units remain unsolved problems. Constraints due to underutilized equipment and limited staff capabilities are already beginning to affect the efficiency of DL units.

Recommendation: Technical backstopping, replacement of obsolete equipment, and training of newly assigned experts on new technologies will require continued support beyond the planned duration of EMPRES/CR.

Campaign evaluation measures and contingency planning mechanisms in place

While theoretical efforts have been made to determine campaign evaluation criteria, these were not further developed partly due to the limited scale of DL operations, and partly due to an ongoing scientific discussion of the issue. However, it would have been desirable to attempt some modest assessments of control campaigns in the affected countries: this has happened only on a limited scale.

Recommendation: A team composed of international consultants (from CR countries) together with counterparts from the DL unit should be formed to evaluate the recent DL campaign in July – August 2005 in Eritrea. The results should be distributed among all CR countries through ELOs.

Alternative control technologies supported

Perceptible progress has been achieved in promotion of alternative technologies, including biocontrol, which resulted in official registration of Metarhizium (Green Muscle®) and PAN with the relevant authorities in Sudan.

Recommendation One: In addition to Sudan, registration and promotion of at least one bio-pesticide should be accomplished in two other countries of the CR.

Recommendation Two: Operational DL treatments with Metarhizium (Green Muscle®) should be carried out in Sudan, provided the appropriate DL populations become available. Results outlining practical benefits and shortcomings of the alternative control technology should be distributed among all CR countries through ELOs.

Recommendation Three: Based on previous research, and in collaboration with ICIPE, operational guidelines for the use of PAN for DL control should be developed, including dose rates and formulation in combination with other chemical or bio-pesticides.

Recommendation Four: Demonstration trials of barrier treatments with IGRs or fipronil should be organized in one of the CR countries, possibly together with DLCO-EA. It is desirable to conduct these trials under supervision of one of the experts from WR who has the necessary expertise.

Future donor support to EMPRES/CRC

The EMPRES/CR Programme has made a significant contribution to the development of improved DL management in the participating countries. Through the Programme, technologies have been provided and human resource capacity built. Although it is evident that some countries can implement and sustain EMPRES/CR practices, the variation from country to country is considerable. Sustainability of improved DL practices is closely associated with the national experts assigned to the programme and continuity of the trained experts within the DL units. Without future donor assistance to guarantee the availability of some crucial inputs (regional training, technology upgrades, equipment replacement, increased use made of RAMSES and eLocust), it is unlikely that the improvements brought about by EMPRES/CR can be sustained.

Recommendation One: Considering that the Region is the origin for most DL outbreaks, FAO together with the beneficiary countries needs to prepare funding proposals to potential donors in order to safeguard the improvements made by EMPRES/CR. The proposals should also document the contribution of improved DL surveys to better early warning systems for food security.

Recommendation Two: EMPRES/CR and CRC must continue discussions with national authorities on ways and means to sustain preventive DL control efforts within the national system.

Technical support needs in EMPRES/CRC countries

DL preventive control capacities in the Region have improved. However, due to different factors EMPRES practices have not been adopted equally by the participating countries. Advanced technologies such as RAMSES, eLocust and satellite image interpretation are not being used to their full potential in most participating countries, pointing to a need for additional training and better backstopping capabilities in the Region[12].

Recommendation One: In order to use already built capacity in the Region and to exploit the potential of existing and new technologies, countries should identify their technical assistance needs and develop two scenarios: one minimum-case scenario, and one best-case scenario (the former to outline the necessary resources to ensure basic functioning, and the latter identifying resources needed to build up capacity and/or improve efficiency).

Recommendation Two: In addition to identifying their external assistance requirements, it is desirable that participating countries allocate sufficient financial resources to their DL units and give them relative institutional autonomy, in order to build up their institutional capacity (which would also increase the speed of their response in the event of a DL outbreak).

[12] A start has been made by sending the national Information Officers on backstopping missions.

CRC: taking over EMPRES/CR responsibilities

Although EMPRES/CR has made a significant contribution to national governments' capacity, there are aspects of preventive DL control (in terms of operational requirements as well as management and scientific approaches) that cannot be met by the countries alone. The CRC secretariat in its present set-up is not equipped to give more than limited support to countries in this regard.

The CRC's financial basis is relatively narrow. Although the contributions from member countries have improved, any large-scale support to ex-EMPRES/CR countries would overtax the CRC's financial resources.

The CRC's mode of operation is different from that of EMPRES/CR. The general meeting frequency is lower (biennially), and the annual meetings of the CRC Executive Committee comprise only a small number of participants.

Recommendation One: There is a need to create a mechanism under the CRC to provide technical backstopping to meet current and future technical demands. At least one additional CRC technical staff member based in the Region and familiar with, among other things, RAMSES and eLocust will be needed.

Recommendation Two: The CRC should try to attract donor funds as well as to encourage voluntary contributions from its own member countries, in order to be able to provide continued support to former EMPRES/CR participating countries.

Recommendation Three: The EMPRES/CR experience with participatory workshops has been successful. CRC should modify its mode of operation in order to continue the participatory approach developed by EMPRES/CR.

Relationship Western Region – Central Region

EMPRES/CR activities in Phase III have promoted increased collaboration between Western and Central Regions in the areas of information exchange and management, joint surveys and training.

Recommendation One: An international expert from the WR (e.g. Mauritania or Morocco) should be invited to the Consultative Committee meeting in November 2005 to present "lessons learned" from large-scale DL control campaign in WR in 2003-05.

Recommendation Two: Campaign organization and execution workshops should be organized based on the experience of one of the national DL units in WR (e.g. Mauritania, Morocco, Algeria or other). The participants should include selected directors of national DL units from all three DL regions.

Capacity building

The aim of the EMPRES/CR capacity building component was to strengthen the control capacity of the participating countries; to build up self-reliant and sustainable national training structures; to reduce accidents with chemical pesticides and to increase the efficiency of the national survey and control teams. Since 1997 more than 900 locust officers and/or plant protection staff, scouts and farmers have received training on various DL management subjects. Taking high staff turn-over into consideration, it is assumed that at least 50% of all plant protection officers dealing with locusts and currently in place have received training supported by EMPRES/CR. In each of the participating countries, at least one national

Master Trainer has been trained to conduct and organize national training courses on survey and control topics.

A standard DL Master Trainers kit has been distributed to all participating countries in order to improve and standardize locust training courses.

Recommendation One: In order to meet the continuing need for refresher training as well as to address the training needs for increased utilization of new technologies (RAMSES, eLocust, interpretation of RS data), CRC should be enabled to increase its support to regional and national training courses.

Recommendation Two: Training materials of the FAO Train-the-Trainers comprehensive course on DL management in Niamey (March-April 2005) should be translated into English and Arabic for further circulation within CR countries, as an addition to the existing Master Trainers Kit.

Desert Locust Diploma Course

The DL postgraduate diploma course proved a useful instrument for in-service training of DL officers, and the inclusion of the course in the University of Khartoum's curriculum has recognized its merits towards academic degrees. However, doubts remain over the course's future as the costs are high and funding uncertain.

Recommendation One: The DL postgraduate diploma course should be continued after phasing out of EMPRES/CR.

Recommendation Two: A concerted effort by EMPRES/CR, CRC, AGPP, and the University of Khartoum should be made to market the Diploma course within and outside the CR, in order to recruit additional students.

Recommendation Three: Based on the recommendations of the recent evaluation of the DL diploma course, its curriculum should be revised jointly by the University of Khartoum, CRC and AGPP. In particular, the following changes are advisable:

- Modern technologies of DL information management, including RAMSES, eLocust and satellite imagery should be integrated into the Diploma curriculum.
- During the field semester, a part of the curriculum should be allocated for practical exercises with PPD on modern pesticide application technologies.

Research

Due to various constraints, primarily because of a limited number of research proposals of acceptable quality, the DL research in the Region remains one of the areas with room for significant improvement.

Recommendation One: Joint CR-WR applied research themes identification workshop should be conducted with participation of scientists from leading research institutions from donor countries.

Recommendation Two: Research proposals solicited by EMPRES/CR and/or CRC, as well as monitoring of their progress reports should be endorsed by ELOs.

Recommendation Three: Proposals emphasizing the use of new DL monitoring technologies, including Remote Sensing and GIS, as well as population ecology studies and

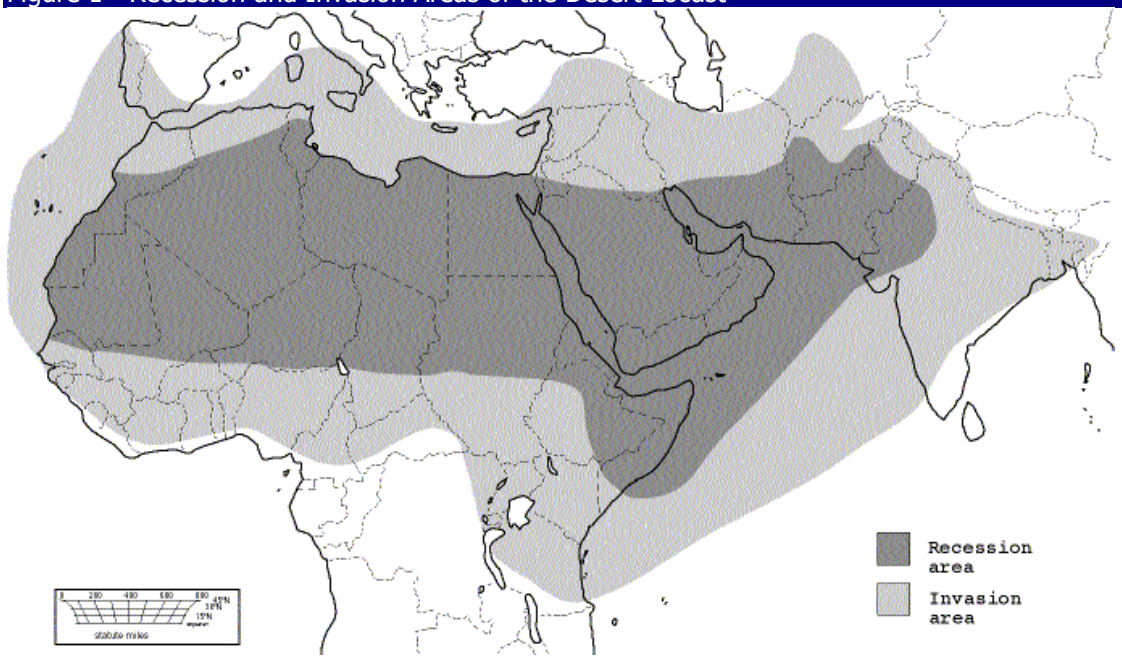
alternative control strategies should receive priority funding as being most compatible with EMPRES goals.

Recommendation Four: Development of joint proposals with research institutions outside CR should be encouraged.

A. INTRODUCTION AND BACKGROUND

The capacity of the Desert Locust (DL) for rapid multiplication and long-distance migration under favourable conditions can result in major population upsurges and plagues, when locusts form large swarms which threaten crops and pastures over large areas. During plagues, swarms can invade countries as far south as Tanzania and Cameroon or as far north as Turkey and southern Russia. To the west, swarms can reach the Cape Verde islands and to the east, the Indian subcontinent. During recessions, the Desert Locust is restricted to a much smaller (but still vast) area (Fig 1). The migratory ability of the Desert Locust means that the problem may shift from one location, country, or region to another in a short period. Because of its rapid movement, there are limited opportunities for control, demanding high organizational and logistical capability.

Figure 1 - Recession and Invasion Areas of the Desert Locust



The FAO Council approved the establishment of the EMPRES (Emergency Prevention Systems) Programme in mid-1994 to strengthen the emergency prevention capacity of countries affected by transboundary pests and diseases.

In the late 1980s and early 1990s, the international community had been clearly reminded of the capacity of the Desert Locust (Schistocerca gregaria) to exploit a sequence of favourable environmental conditions and develop rapidly as a major transboundary pest. The resurgence of Desert Locust activity the late 1980s and early 1990s resulted in large-scale emergency control operations which required substantial human and financial resources from both locust affected countries and the international donor community.

This dramatic resurgence of the Desert Locust to plague proportions also highlighted the general decline in the early warning, survey and control capacities and capabilities of many national and regional plant protection organizations in the recession area. This decline had occurred during the prolonged recession period between the late 1950s and the 1980s. The Desert Locust outbreaks and plagues of the 1980s and 1990s, together with other

agricultural emergencies such as the outbreak of Screw Worm in Africa in the late 1980s, in many ways acted as a catalyst to the establishment of the FAO EMPRES Programme

Historically the Central Region, comprising the countries along both sides of the Red Sea coast, has been a frequent source of major outbreaks of the Desert Locust. It was in recognition of the pivotal role the Central Region has often played in the initial stages of the development of major locust upsurges and plagues that FAO decided to initiate an EMPRES Programme for Desert Locust in this region.

In 1994 an FAO Project Formulation Mission produced a project proposal for the establishment of an initial Desert Locust programme in the Central Region (EMPRES/CR). The formulation mission envisaged a two or three-phase programme with each phase of up to five years duration[13]. Phase I of the Programme commenced in the Central Region in 1997. Phase II of EMPRES/CR lasted from January 2001 to December 2003; Phase III began with a much reduced staff complement (as well as reduced donor support) in January 2004 and is scheduled to terminate by December 2006.

B. PROGRAMME DOCUMENTS

B.1 Objectives and Outputs

EMPRES/CR programme and planning documents have gone through a number of transformations. The original (1995) Programme Document for EMPRES/CR was revised in February 2000. This document took into account the experience gained in the first three years of the programme as well as the findings of the EMPRES/CR evaluation in 1999[14]. On the basis of the revised Programme Document, two participatory planning workshops, which included representatives of the participating countries as well as donors, developed Implementation Documents for Phase II and Phase III. These workshops (in 2000 and 2003, respectively) developed programme priorities, agreed on the implementation approach and approved the work plans.

The Development Goal of EMPRES/CR has remained largely unchanged: “To reduce the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area in order to mitigate food security, economic and environmental concerns in the Central Region and beyond”.

The revised Programme Document redefined the Programme goal[15] as:

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

For Phase III, the Planning Workshop adopted as purpose of Phase III: “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 gradually taken over by the CRC and the participating countries;
R2: Implementation of improved early warning systems supported;

[13] The Programme Document of October 1995 anticipated three four-year phases.
[14] The revision provided greater clarity on the overall direction of the programme. The changes did not significantly change or compromise the nature or scope of the programme.
[15] Original Programme Objective: “To promote and catalyse the realization of regional self sufficiency for averting locust plagues through strengthening existing national, regional, and international components of Desert Locust management systems.”

R3: Campaign evaluation measures and contingency planning mechanisms in place; and
R4: Alternative control technologies supported.

In a subsequent section, the EMPRES/CR Programme Phase III was described as to "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".

B.2 Indicators, Work Plans and Assumptions

The Implementation Document for Phase III contained a Programme Planning Matrix which listed the expected Results together with Activities, Responsibilities, Indicators, Sources of Verifications and Assumptions. Yearly progress reports described the project status against planned activities. Work plans were reformulated each year for the ELO meetings, and progress reports to ELO meetings used a matrix format (listing Activity > Milestone > Remark > Achievement > Deviation > Recommendations for Next Year) which provided an evaluative account of past achievements. The systematic and participatory approach to work planning provides an excellent example of good project management; the integration of work plan matrices with progress reports made sure that progress could easily be checked for achievements as well as deviations and delays.

The Implementation Document for Phase III also listed some general risks, assumptions and prerequisites: as prerequisite for Result One that all EMPRES/CR participating countries become part of the CRC (difficult to achieve in the case of Somalia).

The following risks were identified:

- Lack of DL outbreaks in the Region which may reduce the motivation of stakeholders to support the strengthening of preventive DL control capacities;
- Frequent transfer of qualified staff which would have a negative impact on the implementation of EMPRES/CR activities:
- EMPRES/CR countries not fulfilling their commitments within the EMPRES/CR Programme;
- Political instability and restricted access to insecure areas which could obstruct proper monitoring of the locust habitats and affect national and regional early warning systems;
- Insufficient DL infestations to permit field trials to support the introduction and registration of environmentally safer locust control techniques and biopesticides.

The latter aspect also carried a further risk, which has partly materialized: that national legislation would be slow to register DL biopesticides.

B.3 Institutional Arrangements

The institutional arrangements for Phase III did not change significantly from the arrangements already found for Phase II. EMPRES/CR depends on collaboration between all partners: donors, EMPRES/CR participating countries and FAO. The Programme Coordinator, based in the region, has responsibility for general management, while budget responsibility, general backstopping and overall supervision remain with the Plant Protection Service (AGPP) in FAO HQ.

Two bodies already created in the preceding Programme phases are also involved in programme implementation, review and management:

- The EMPRES/CR Consultative Committee, comprising senior representatives from the participating countries, other organizations including DLCO-EA and CRC, donors, AGPP senior staff and the EMPRES Coordinator. The Consultative Committee normally meets annually to review progress and issues and to discuss the work plan for the following year; and

- EMPRES Liaison Officers (ELOs) meetings; with ELOs having been appointed from the DL units by participating governments and DLCO-EA. These meet normally every year with EMPRES and AGPP staff, to assist in the planning, implementation and coordination of activities and also to review progress made in the preceding year.

Concerns regarding possible duplications in the composition of the EMPRES/CR Consultative Committee and the ELO meetings in Phase I were largely resolved during Phase II. However, the distinction between the EMPRES Liaison Officers Meeting and the Consultative Committee Meeting also during Phase III has not always been maintained; at times, the same people attended both meetings. At FAO HQ level, arrangements seem to have remained vague regarding the internal EMPRES Steering Committee in FAO HQ and its mandate. (The Committee appears to have met only infrequently and with no particular inputs to EMPRES/CR oversight and management.)

B.6 Staffing

In Phase I, EMPRES staffing comprised three international staff (Coordinator, a Senior Field Officer and an Expert on Research), one Associate Professional Officer (APO), two National Professional Officers (NPOs) and one United Nations Volunteer (UNV). Since then, staff posts have been continuously reduced: the Research Expert and the Senior Field Officer posts were abolished as well as the UNV post and one NPO post. One International Migratory Pest Expert (Khartoum, Sudan) was appointed in December 2002, but left after the end of Phase II in early 2004. A second Associate Professional Officer post based in Khartoum, Sudan ended in January 2003.

For the most part, the remaining staff seems to have been able to keep the momentum, but some implementation difficulties in participating countries seem to indicate that the available capacities for regular backstopping and trouble shooting are sometimes inadequate. In addition, with the resignations and/or transfers of a number of experienced EMPRES/CR Liaison Officers and Information Officers, it is obvious that expertise created within the Region needs to be re-built constantly.

C. IMPLEMENTATION

The Programme is now in its third phase, which began in 2004 and will end in 2006. The current EMPRES/CR Phase III is funded by a smaller number of donors compared to previous phases: Netherlands, Switzerland and USA. (Germany and Sweden ended their contributions in Phase II.) In addition, the Programme receives contributions from the FAO Regular Programme, and supplementary funding provided by CRC and DLCC.

The following sections give an overview of the budget and expenditure situation, and a summary of Programme activities during Phase III. Additional information on main Programme activities and services (training, meetings, equipment, etc) since inception in 1997 is provided in the annexes.

C.1 Programme budget, expenditure and utilization

The funding levels likely to be available for the Programme were not clear at the beginning of Phase III, and some uncertainty has remained. Netherlands, Swiss and United States contributions were mostly carry-overs from the preceding phase, and contributions from other sources (Central Region Commission, Desert Locust Control Committee and FAO Regular Programme) were not determined for the entire period of Phase III.

A participatory Phase III Planning Workshop was held as part of the 5th Consultative Committee Meeting in Rome from 19 - 23 May 2003. Workshop participants agreed that the tentative levels of funding required for Phase III would be about US$ 3.5 million, based on the experience of Phase II. However, the sources of the funding were undefined then: unspent balances possibly available from the Netherlands, Switzerland, and the United States, and new funds likely to be available from the Central Region Commission, the Desert Locust Control Committee and the Regular Programme were expected to reach about US$ 1.7 million, which left a considerable shortfall. Although some reduction in staffing occurred (the international Migratory Pest Expert position in Khartoum ended in January 2004), Phase III has had to cope with budget constraints.

The table below was prepared during the Phase III Planning Workshop.

Table 1 Estimated funding required (US $)

Programme Coordinator	500,000
NPO-Survey	60,000
NPO-Training	60,000
Support staff	45,000
Field Staff travel	180,000
HQ Staff travel	50,000
Non-staff travel (Meetings, seminars and workshops, inc. joint surveys)	260,000
Consultancies	290,000
Operation and maintenance (GOE)	250,000
Equipment	225,000
Support to Diploma Course	240,000
Support to national training courses and field seminars	95,000
Support to biopesticide introduction	150,000
Support to research projects	225,000
Survey operations in Somalia	70,000
Support to CF Programmes	120,000
Evaluation, Phase III	40,000
Contingency	200,000
Total	**3,060,000**

Overheads Approx.	**293,000**
Grand Total	**3,353,000**

Table 2 below shows expenditure during the first year of EMPRES Phase III. The FAO contribution concerns mainly the cost of the EMPRES/CR Coordinator's post at the P-5 level, with the balance covering a consultancy and some of the running costs of EMPRES activities. Inputs made by other FAO HQ staff (Senior Officer of the Locust Group, Information and Forecasting Officer, and by the AGPP Programme Support Officer) are not included in the FAO expenditure figures. The funds provided by the Central Region Commission (CRC) come from its Trust Fund which is supported by the 13 Member States (now 16 Member States after the adherence of Djibouti, Ethiopia and Eritrea in the Near East Region). The CRC provided more funds in 2004 in support of EMPRES/CR than in previous years: a sign of the close (and growing) collaboration that has developed between the CRC and EMPRES. The DLCC Trust Fund, which is supported by locust-affected countries from all three EMPRES Regions, made a small contribution to the Programme, mainly related to training.

Table 2 EMPRES/CR Estimated Expenditure up to 30/9/2004[16]

Category	FAO	CRC	NET	DLCC	SWI	USA
Salaries Professional	108,621		58,640			
Salaries General Service		21,128	6,392		1,575	
Consultants	27,943					
Contracts		23,525	12,072	2,984	70,400	
Locally Contracted Labour		369				
Travel	25,460	27,008	3,548	13,035	544	8,924
Training		111,300	56,132	15,084	9,320	
Expendable Equipment	1,925	29,006	(19)		4,604	81,660
Non Expendable Equipment					17	687
Hospitality						
General Operating Expenses	7,445	1,959	5,520	143	633	24,678
General Overhead Expenses						
Chargeback		1,135				156
Charge out						
Technical Support Services		2,700				
Sub-total	***171,394***	***218,130***	***142,285***	***31,246***	***87,093***	***116,105***
FAO Support Costs	n.a.	14,512	46,962	5,742	15,202	8,518
Total	**171,394**	**244,166**	**160,782**	**35,308**	**98,415**	**131,199**
Grand Total			**841,264**			

The total funding of the Programme in 2004 was US$ 1,100,000, while the total expenditure until September amounted to US$ 841,264 leaving a balance of US$ 258,736. The relatively high unspent amount was due to a late release of funding from the Netherlands in July 2004. Funds available for 2005 were estimated at US$ 1,068,000 and approximately US$ 800,000 in 2006.

[16] Update requested

It should be borne in mind that during Phase III, the Kingdom of Saudi Arabia has given bilateral support worth US$ 2 million to Sudan, and US$ 300,000 to Eritrea (firm pledge, not yet disbursed)[17]. In addition, there has been support by FAO to Sudan, Eritrea and Yemen through a TCP project (TCP/INT/3003, US$ 390,000).

C.2 Status of activities implemented and outputs achieved[18]

Programme Progress listed below follows the Results Areas identified in the Phase III Implementation Document.

Result 1: EMPRES/CR Desert Locust management components gradually taken over by the CRC and the participating countries

Indicator 1.1: Improved preventive Desert Locust management component taken over by 2 countries by 2004, 3 more by 2005, 2 more by 2006

By September 2005 EMPRES/CR Phase III had already organized more training courses than during the entire Phase II. The subjects addressed were survey and control principles, and reporting. In total 357 plant protection staff, extension staff, scouts and farmers have been trained and retrained during the current phase.

In close collaboration with CRC, 35 Master-Trainers' Training Kits have been distributed by EMPRES/CR to the EMPRES/CR participating countries, DCLO-EA, AGPP and the University of Khartoum. These Kits contain the EMPRES Training Manual including two series of overhead transparencies in English and Arabic, and some important training materials such as compasses, stop watches, hand lenses, anemometers, tachometers, hygrometers, oil and water sensitive papers for the use during the practical exercises. Other non-EMPRES CRC countries received one kit each. Also Libya and Mauritania (EMPRES/WR) have been given one kit each.

The Diploma Course in Desert Locust Management at the University of Khartoum was continued during Phase III with CRC and EMPRES/CR support. The Diploma Course has been integrated into the syllabus of the University of Khartoum, but the high costs for the course (US$ 24,000 per student) raise doubts about its continuation after EMPRES/CR termination. An independent consultant was fielded in 2005 to review the Course and develop proposals for consideration by CRC and FAO-EMPRES/CR.

Progress in improving administrative and managerial procedures has taken place particularly in Yemen, Sudan and in Saudi Arabia. The importance of better staff management and human capacity development has been recognized, and delegation of responsibilities, planning and monitoring of survey and control activities is gaining momentum. In addition, the countries are undertaking more efforts in keeping track of their resources, its distribution and use.

EMPRES/CR and CRC in collaboration with DLIS have developed check lists in English and Arabic on good survey and control practices to improve monitoring of field activities. These check lists should help the management of the DL units to better assess the performance of the field staff during the operations and should help needs for training.

The Desert Locust upsurge following an outbreak in Sudan in September/October 2003 made it clear that most countries will exhaust their available resources in a very short period of time. FAO and EMPRES/CR initiated in April 2004 a TCP Project for Sudan, Eritrea and

[17] Saudi made donations also to countries in the Western Region.
[18] Based on progress reports and Mission observations.

Yemen for US$ 390,000 to provide these countries with supplies and operational funds. All in all, EMPRES/CR and CRC assisted in providing supplementary support in particular to Sudan through UNDP (US$ 50,000), FAO TCP (US$ 150,000) and IFAD (US$ 200,000). Including its own resources, the DL unit in Sudan was by the end of 2004 in a position to face an infestation of about 700,000 ha, to mobilize 34 fully equipped Survey & Control teams and to secure about 380 flying hours. In addition, in response to the unexpected Desert Locust invasion of Egypt in November 2004, EMPRES/CR and CRC supported the Ministry of Agriculture in the preparation of a TCP Project worth US$ 193,000.

In the same context, one highlight in 2004 was the contribution of US$ 2 million by Saudi Arabia to Sudan to strengthen its capacity to deal with the DL outbreak.

EMPRES/CR also prepared short guidelines on how to develop requests for bilateral assistance to donors and presented them during the second Emergency Prevention Ad Hoc Meeting in Khartoum in September 2004. The 12th ELO Meeting recommended making the guidelines available to all EMPRES/CR countries.

During Phase III, the CRC Secretariat was fully involved in all aspects of day-to-day follow up and monitoring of the various activities and operations. Daily briefings were routinely held between EMPRES/CR Coordinator and the CRC Secretary, initiatives and activities were fully harmonized and joint backstopping provided to the participating countries. However, the close collaboration also provides the evidence that the CRC Secretariat alone will not be able to provide the services currently provided jointly with EMPRES/CR.

Also in Phase III, EMPRES/CR continued providing support to the Country Focus (CF) approach in Eritrea, Somalia, Sudan, Yemen and Ethiopia and for the first time also in Saudi Arabia. A Country Focus Planning workshop was held in Jeddah in April 2004. A concept paper was prepared, which reviewed the structure of the Centre and proposed recommendations. The DL unit in Saudi Arabia is now increasingly following the standards of preventive control and is participating actively in all EMPRES/CR meetings.

The implementation of the CF activities continued also in northern Somalia. Regular surveys are being conducted and reports sent to DLIS and EMPRES/CR. A radio communication network has been built up comprising 22 private radio operators in the locust prone areas, and some informal training has been provided to private radio operators. However, the MoA in Hargeisa is operating at a very basic level without enough capacities of its own to sustain a DL unit, but EMPRES/CR has succeeded to monitor the locust situation in this strategically important area. Somalia remains the only country where no formal training courses have been given.

During the past years good progress has been made in Yemen in building up an autonomous Desert Locust Monitoring and Control Centre (DLMCC). This encouraging development continued also during 2004. A model locust information network and early warning system has been built up. Field information from various sources is regularly collected and registered by the Locust Information Office at the Centre. Surveys are being conducted according to the ecological developments and the information received from the field, meteorological agencies and DLIS. As a result, early signs of an outbreak situation in the Tihamah area after heavy rainfall in September 2004 were immediately detected and contained in October.

The DLMCC is keeping all national and international stakeholders regularly informed of the operations of the Centre by producing a national DL Bulletin since January 2004 to provide the national authorities and the donor community with updates on the national and regional locust situation, the operations carried out and the status of the control capacities. The performance of the Centre has also been acknowledged by the MoA, which has promised to provide the DLMCC with a dedicated budget of its own. Besides increased operational

funding, the GoY supported the Centre with 5 micron ULVAmast sprayers, 33 micronair AU 7010 sprayers, and 34 micronair AU 8110 sprayers. In view of the critical Desert Locust developments in the Western and Central Region, FAO gave supplementary assistance through an international TCP project by providing 15,000 L of ULV pesticides, 10 additional GPS hand sets, 2 mobile HF radio stations and funds for intensified survey operations and training courses.

As far as training is concerned, the DLMCC established a commendable training cycle following need assessment > training > performance assessment > retraining etc. In 2004 three training courses have been conducted for plant protection staff, scouts, extension agents and new recruited staff reaching 43 trainees. During the 12th ELO Meeting in October 2004 it was recommended that the good approach practised in Yemen should also be followed by the other DL units.

The CFP programme in Sudan, initiated in 1999, achieved its objective with the ministerial decree dated 20 March 2004 to create an autonomous Central Institution of Desert Locust Research and Control[19]. The Centre gained full autonomy for locust control operation in the country by August 2004. However, certain aspects regarding the authority over the summer season campaign need to be clarified, and additional qualified staff is required in order to cope with the new responsibilities and extended tasks.

The past summer campaigns in 2003 and 2004 revealed dangerous gaps as far as the national early warning system is concerned. The danger of Sudan being invaded during the summer season by swarms arriving from Chad through Darfur was high. For this reason, EMPRES/CR brokered regular telephone contacts between the Sudanese DL unit and a Mauritanian DL expert working in Chad.

The Centre has made considerable progress in making use of the contingency planning mechanisms. Following the example of Yemen and with some support form EMPRES/CR and CRC, the Centre is preparing similar monthly DL Bulletins since May 2004 and called in regular Steering Committee Meetings. By keeping the national and international authorities well informed, the Centre received important support also from the GoS in terms of pesticides, operational funds and flying hours.

Following the DL outbreak in 2003-04, emergency preparedness measures have been put in place in case of a re-invasion from the Western Region. Contingency/action plans for the summer and the winter campaigns have been prepared. By closely following the predicted movements of the Desert Locust, advanced preparations have been initiated, recourses and aircraft mobilized and prepositioned, and survey and control operations launched immediately where and whenever necessary.

The implementation of the CF Programme in Ethiopia was affected by the results of the structural adjustment process at the MoA and the resignation of the ELO in September 2004. The former ELO, who gained during the past years good experience in operating RAMSES and as master trainer, was recruited as DLCO-EA Base Manager in Dire Dawa. That was the third ELO trained by EMPRES/CR to join DLCO-EA. Because of his good experience and performance, his resignation was considered as a great loss. Amongst others, the ELO assisted in installing RAMSES in Egypt in April 2004 and gave on-the-job-training to the Egyptian Information Officers[20].

[19] 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. A similar exercise was repeated in 2004.
[20] Also in Djibouti the former ELO, who was trained by EMPRES/CR as Master Trainer, resigned from his position at the Ministry of Agriculture in March 2004.

Two training courses have been organized in May and December 2004 for 52 trainees. With the establishment of a Contingency Planning Steering Committee in October 2004, the original objective of the CF Programme was achieved. However, support to the CF Programme will need to continue in particular with the aim to reinforce the links to the Agricultural Offices and Plant Health Clinics. At present, the DL unit seems overwhelmed by the many simultaneous tasks to be performed.

Eritrea was the first country to benefit from a CF Programme to build up its locust control capacities. Eritrea was also the first country in the CR to which the RAMSES system was introduced. Plant protection staff was trained as national Master Trainers, and in order to improve the interaction between the former Plant Protection and Quarantine unit and EMPRES/CR and to allow full participation in the international context of locust management, a Local Area Network was established. Unfortunately, the efforts to develop national locust control capacities in Eritrea had been affected by unfavourable external and internal conditions.

Trained personnel have been assigned to other duties, and the position of ELO remained vacant from 2001 to 2005, with the consequence that a number of activities could not be implemented as planned. The DL unit also experienced various difficulties in using RAMSES, but the RAMSES problems have been resolved and two new Information Officers have been assigned in recent years. But the timeliness of the reports as well as the link of the Locust Information Office to sources of information in the field remained critical.

However, since 2004 efforts have been made to reactivate the CF Programme: a detailed action plan for 2005 has been prepared with emphasis on improving communication between the Zobas and the MoA. Furthermore, two training courses were organized in May and June 2004 by using the national Master Trainers. The Information Officer from Yemen was sponsored by EMPRES/CR in June 2004 to provide on-the-job-training on RAMSES to the Locust Information Office in Asmara. Subsequently, EMPRES/CR invited the two Information Officers from Eritrea in December 2004 to visit Yemen in order to observe the Yemeni national early warning system. Since June 2005, information on the locust developments in the country as well as details on control operations, crop damage and available resources for locust control in the country has become a regular component of the National Food Information System (NFIS) monthly newsletter[21].

The restructuring process of the agricultural institutions finalized in 2004 created uncertainties regarding DL responsibilities; the responsibility for coordinating locust survey and control operations in Eritrea was split between two Departments: the Agricultural Promotion & Development Department and the Regulatory Services Department. This was remedied in early 2005: the new ELO is Head of the Technical Service Division, Agricultural Promotion and Development Department, and the Locust Information Office is operated by the Technical Service Division. However, under the new structure there is no longer a designated unit for plant protection, let alone DL operations. This has implications for the capacity of the DL staff to plan, and be ready for, dedicated DL operations.

However, high-level coordination has improved with the creation in 2003 of a Desert Locust Steering Committee headed by the Minister. In addition, Eritrea's membership in the Central Region Commission is almost complete: only the formal acknowledgement by the CRC at its next session is needed to conclude the accession process.

Eritrea experienced a small Desert Locust outbreak in January/February 2004 in the areas of Meleet, Shieb and Wadilo which was controlled rapidly by DLCO-EA aircraft. In order to

[21] NFIS receives support from an FAO-implemented Trust Fund project. A national Locust Bulletin also appears regularly in Yemen and Sudan.

strengthen the intervention capacity of Eritrea in case the country is invaded by swarms or confronted with another outbreak during the winter breeding season 2004/2005, FAO assisted the MoA through an international TCP project, shared between Eritrea, Yemen and Sudan, with 15,000 L of pesticides, 4 ULVA mast sprayers, 70 ULV handheld sprayers and operational funds for conducting intensified surveys.

Result 2: Implementation of improved early warning systems supported
Indicator 2.1: Improved early warning systems (routine survey, functional national information offices etc.) are operational in at least 6 DL units by 2006

RAMSES (Reconnaissance And Management System of the Environment of Schistocerca), is an important prerequisite for improved early warning systems and was emphatically promoted by EMPRES/CR during Phase II. The system provides a platform for checking past records of Desert Locust occurrence, entering survey and control results, viewing remote sensing images, and assists decision-making in respect of locust survey and control. During Phase I and II RAMSES has been installed in Egypt, Eritrea, Ethiopia, Oman, Yemen, Saudi Arabia and Sudan. However, there are still constraints associated with technical problems and a lack of available local expertise to operate the system appropriately. The ELO from ETH provided RAMSES training for Information Officers (IOs) in EGY in March/April 2004, and the IO from YEM provided RAMSES refresher training to IOs in ERI in June/July 2004.

Most countries are using RAMSES to plan their survey operations. A particularly good example of making appropriate use of RAMSES as a decision making tool for survey and control operations is Yemen with encouraging results on directing survey teams and finding infestations at early stages. RAMSES data are also being shared between countries, but the Mission observed that some countries still face difficulties in operating RAMSES.

With regard to historical data sets, the DL unit in Ethiopia is keeping perhaps the most comprehensive locust data base in the Region. Locust data from 1963-67, 1970-86, 1989- to date are kept in the RAMSES computer. No participating country has made use of the opportunity to obtain historical data from DLCO-EA with EMPRES/CR assistance.

The objective of improved interpretation of remote sensing images is to facilitate more targeted locust surveys in areas that are prone to locust breeding, and thereby to reduce the cost of survey operations. Recent technical developments in satellites imagery make it possible to obtain and to analyse better quality and smaller scale images. Initial work on accessing these images and ground-truthing them in the field began during Phase II and was to be continued and expanded during Phase III[22]. With the appointment of a new remote sensing expert at DLIS in August 2004, the distribution of Normalized Difference Vegetation Index (NDVI) satellite maps to the EMPRES/CR countries resumed in September 2004. Satellite images are made available by DLIS to the IOs in 10-day intervals. Most of the IOs started making use of satellite vegetation maps for directing survey teams and gave positive feedback on the usefulness for decision making. However, feedback to DLIS on ground verification of the SPOT satellite images from the countries was late to arrive: the first country to provide feedback was Yemen in December 2004.

The ultimate aim is to direct the survey teams according to rainfall situation, analysed RAMSES data, NDVI maps and FAO DL Bulletins rather than following “traditional” tracks. This approach has been taken up foremost in Sudan and Yemen, but also Eritrea, Ethiopia, Saudi Arabia and Somalia are monitoring the breeding areas at regular intervals. However, according to EMPRES/CR progress reports, more backstopping especially concerning the interpretation of RAMSES and NDVI maps is required.

[22] A workshop on the use of RS images and RAMSES was planned for 2005 but had to be postponed as the FAO HQ RS expert could not travel due to an accident.

Special attention has been given by EMPRES/CR to encouraging joint surveys in important breeding areas shared by countries. In the Central Region, such areas are presently located between the borders between Somalia/Ethiopia, Eritrea/Sudan, Yemen/Saudi Arabia, and Sudan/Egypt. During Phase II progress has been made in organizing joint surveys with the participation of DL officers of the concerned countries, and these have been continued in Phase III. Joint border surveys took place between Yemen and Saudi Arabia in January 2004 and Djibouti/Somalia in February 2004, and again by Saudi and Yemeni teams at the Red Sea coastal plains of the Tihamah region in January 2005, and by Egyptian and Sudanese teams in the winter breeding areas of the Red Sea coast in the area of Wadi Diib and Oseif in February 2005. More joint surveys could not be conducted due to DL units' involvement in control campaigns.

With regard to survey teams, EMPRES/CR aims to help DL units to equip their survey teams with comprehensive, standardized survey sets (one GPS, compass, wind-meter, psychrometer, stop watch, hand-lens each and maps). Generally, most countries are sufficiently equipped with survey material, but due to losses or damage one or the other item requires replacement, and additional teams need be mobilized and equipped in case of emergency. For this reason, FAO through TCP/INT/3003 provided Yemen with supplementary ten GPS handsets and Sudan with nine pieces. In addition to that, EMPRES/CR and CRC set up a reserve stock at the RNE Office in Cairo of 30 GPS and psychrometers[23], and 50 pieces each of the other survey material in order to react quickly in emergencies.

EMPRES/CR in close cooperation with DLIS is supporting the countries to further improve their locust communication network by providing the DL units with additional HF radio equipment and new communication technologies such as eLocust. Amongst others, Yemen and Sudan received two additional mobile HF radio stations each, and Egypt one base and two mobile stations. All equipment fits to the requirements for transfer of field data by using eLocust. In addition, Sudan received in September 2004 a RBGAN portable satellite receiver for field-testing. This equipment can be used in connection with a laptop computer for sending data files by email and to have Internet access in the field. However, eLocust has not become operational in Sudan, due to difficulties with the configuration of eLocust, corrupted or lost files, and connectivity problems despite numerous interventions from EMPRES and FAO/DLIS. Also Oman and Saudi Arabia received two palm-top PCs including eLocust, but the actual transmission of data is not possible at least in Saudi Arabia due to the absence of dedicated transmission channels. Only in Yemen eLocust seems to be working as envisaged. However, the planned introduction of eLocust2 will introduce significant changes, not all of which seem to be real improvements for the DL units concerned. Feedback on eLocust2 is currently being gathered by DLIS[24].

The importance of operational DL information systems at the national level has clearly been demonstrated during the 2003/2004 upsurge. Serious gaps in the network were identified in Sudan regarding the supervision of the summer breeding areas and in Egypt after the country was invaded by swarms in November 2004. Also in Eritrea the locust information system is not organized in the best way; the use of HF radio has been impossible for DL purposes for the last couple of years. Only in Saudi Arabia, Oman and partly in Yemen cell-

[23] According to one comment received, these equipment items are outdated and not useful in DL survey or control operations.

[24] The eLocust system showed some weaknesses, particularly where the platform for data entry was concerned. The system has become inoperative, as the previously used hand-held computer is no longer produced. The new eLocust2 uses a dedicated platform using a satellite connection instead of radio. First indications are that eLocust2 is much easier to use than eLocust1 for transmitting data, but that there are inconveniences due to not having a possibility to transfer collected data directly from eLocust2 to a PC, that it is not possible to display the data transmitted through eLocust2 directly in RAMSES, and that DL officers at least initially faced difficulties to understand and analyse the data transmitted by eLocust2, as they did not have an appropriate programme that allowed direct downloading and automatic conversion.

phones and fax are being used for transmitting information from the field to HQ. EMPRES/CR has advocated regular and defined contacts between a country's DL Information Office and the field stations and prepared in cooperation with DLIS Standard Operating Procedures (SOP) for radio communication.

In order to facilitate better identification of plant species relevant for locust breeding and to distinguish the Desert Locust from other locusts and grasshopper species, pocket-size locusts and grasshopper index cards were prepared in 2004. After discovery of errors, the cards have been revised and reprinted in 2005.

The improvement of survey practices and technologies through solicited research projects was a planned joint output for EMPRES/CR and CRC in Phase III. To this end, CRC has sponsored since August 2004 one MSc student for two years at the University of Khartoum to provide more accurate estimates of Desert Locust infestation present in the field. Regarding solicited research projects, no research project proposals on improved survey practises have been received.

Result 3: Campaign evaluation measures and contingency planning mechanisms in place
Indicator 3.1: National contingency planning mechanisms adopted and the operationally assessed as satisfactory for 2 countries by 2004, 3 more by 2005, and 2 more by 2006
Indicator 3.2: Regional contingency planning mechanisms adopted by the CRC and operationally assessed and satisfactory by 2005.

Contingency planning is considered a vital component in the prevention of DL plagues. During Phase II, only Sudan was in the position to develop contingency plans for the summer and winter breeding seasons in a comprehensive manner. EMPRES/CR has encouraged participating countries to create national locust management committees (Steering Committees) to keep the concerned governmental institutions informed of locust developments, and to solicit additional assistance in case of shortfalls. The EMPRES/CR initiative in this regard to create such committees in Sudan, Yemen, Ethiopia and Eritrea started already in 2001. As a result of the deteriorating locust situation in 2003/2004, committee meetings were organized in Sudan and Eritrea and the Locust Centre in Sudan managed to obtain fast and substantial assistance from the government and the donor community. In Ethiopia, a "National Desert Locust Control and Preparedness Steering Committee" was established in September 2004. In Yemen, locust emergency matters are dealt with by the National Disaster Management Committee, but plans are under way to establish a separate committee for Desert Locust operations only. At the regional level, similar arrangements are planned both for the CRC and the Desert Locust Control Organization for Eastern Africa (DLCO-EA) in order to facilitate rapid deployment of additional resources and timely aerial intervention.

At the heart of the EMPRES programme is the objective of improving the effectiveness and efficiency of locust control. Such improvements should be measured through campaign monitoring and evaluation, but to do this realistically during recession periods has proved difficult. The various socio-economic case studies carried out under the umbrella of EMPRES/CR during Phase II revealed that the poorest farmers were the most vulnerable to locust invasions and considered the pest as the second most important threat to their livelihood after drought. The idea of introducing insurance schemes to compensate for crop damages caused by the Desert Locust was rejected as not realistic and not viable given the uncertainty of insurance schemes in most of the affected countries.

Contingency planning is defined as an interlinked process, which concerns not only the affected country, but needs to be backed up by FAO (coordination of emergency assistance) and the donor community (allocation of assistance). FAO organized an interregional Contingency Planning Workshop under the umbrella of DLCC Technical Group (TG) in

Nouakchott, May 2004. The workshop was attended by three members of the DLCCTG, seven FAO staff and six country representatives form all three Regions (Mauritania, Morocco, Saudi Arabia, Sudan, Iran and Pakistan). The programme comprised several computer simulations, resource assessments by using spread sheet and field exercises. The workshop participants considered that in periods of a long recession the countries find it difficult to maintain large specialized structures for DL control. These relatively small DL units need to be quickly reinforced during periods of higher locust activity either by mobilizing additional national resources or by addressing their needs early enough to FAO and to the international donor community[25].

EMPRES/CR continued assisting the participating countries in various aspects of contingency planning. Some of the mechanisms have already been introduced during previous phases. Sudan made best progress in regularly preparing contingency plans and made a number of useful experiences when it first came to application in late 2003. As a result of this experience, Sudan could prepare a more realistic plan for the summer season 2004, which has been presented as a good example during the DLCCTG in May 2004. Contingency plans are also being prepared by Eritrea and Yemen. With the impending threat of further DL outbreaks in the Region, EMPRES/CR and CRC took the initiative to organize Ad Hoc Emergency Prevention Meetings with the immediately affected countries Sudan, Saudi Arabia, Yemen and Eritrea. A first meeting was held in March 2004 and a second in September 2004. The meetings had as objective to assess the locust situation, to discuss the likely scenarios during the forthcoming season, to agree on appropriate countermeasures in accordance with the predicted movements month by month, to assess the available and pledged resources and to convene on a detailed regional action plan. Based on the regional action plans for the summer campaign 2004 and winter campaign 2004/2005, in Eritrea, Saudi Arabia, Sudan and Yemen prepared national plans. Particularly important was that the Saudi DL unit prevented an escape of locust swarms into the spring breeding areas in the interior of the country.

An FAO consultant prepared guidelines on how best to organize for possible, probable and certain locust threats and which mechanisms to be used at the various levels. A first draft guide for contingency planning was circulated for comments in September 2004.

Guidelines for preparing DL Bulletins were jointly drafted by CRC and EMPRES/CR and distributed to participating countries in March 2004. DL Bulletins in Arabic and English are being prepared by the DL units in Egypt, Saudi Arabia, Sudan and Yemen. During 2004 the Locust Centre of Yemen issued most DL Bulletins (eleven), Sudan eight (in addition to 32 updates!), Egypt five, and Saudi Arabia three. Eritrea issued four summary reports including RAMSES outputs in 2004; since June 2005 locust information is incorporated in the existing National Food Information System (NFIS) Newsletter. Following the Memorandum of Understanding between CRC and DLCO-EA signed by DLCO-EA in October 2004, CRC and EMPRES now obtains Migratory Pests Situation Reports from DLCO-EA.

A CD ROM containing some computer simulations and useful spread sheets on assessing resources needed for outbreak, upsurge and plague campaigns was distributed to all DL units in September 2004. The computer simulations run well on computers operated with Windows 2000 but unfortunately not all simulations work with Windows XP.

EMPRES/CR advocated in 2003 the use of “Capacity Information Spread Sheets” by the DL units (Intervention capacity monitoring). Because of some organizational difficulties (i.e. locust control equipment is often been used for other plant pests control) and the absence of an appropriate resource management in most cases, it was not always that easy for the

[25] Following the recommendations of this meeting, FAO re-established the Emergency Center for Locust Operations (ECLO) at FAO HQ in August 2004.

managers of the DL units to provide this important piece of information as needed in order to help in the process of soliciting assistance. EMPRES/CR received in 2004 information with regard to pesticide stocks, spray equipment, staffing situation and other items from six countries namely Egypt, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen. Updates have been received most frequently from Sudan (4) and Yemen (3); and CRC received from DLCO-EA seven updates on the situation of its air fleet.

Advance preparations were made for an expert mission to evaluate campaign efficiency, but the DL situation in the CR did not allow the launching of the mission. In this regard, it seems that although contacts existed between the WR and the CR, not enough specific information on campaign experiences has reached the CR DL units.

Guidelines for campaign evaluation were discussed during the 12th ELO Meeting in October 2004. The meeting concluded that a blanket was not feasible. It was therefore recommended to use a more practical approach, e.g. by applying the checklists for good survey and control practices developed by EMPRES/CR and the FAO Spray Monitoring Form. However, first feedback from countries indicated that teams were facing difficulties filling in the forms, due to a preoccupation with finishing their control work.

Small-scale simulated survey and control exercises are already a routine part of the standard S&C training courses followed in the CR. EMPRES/CR has initiated work on medium mock survey and control exercises on simulated outbreak campaigns due to interest shown in this subject by Eritrea, Sudan and Yemen.

EMPRES/CR approached FAO-ESAF to assist in the selection of an appropriate consultant for assessing the economic advantage of preventive Desert Locust control, but no relevant suggestions were received. However, a report “Preparedness to Prevent Desert Locust Plagues in the Central Region[26]” was commissioned by EMPRES/CR and circulated as an internal draft in 2005. While the report does not focus specifically on socio-economic aspects of DL control, it gives a very comprehensive overview of the circumstances surrounding DL operations and also a discussion of previous attempts to develop a model for economic analysis of DL operations.

Result 4: Alternative control technologies supported

Indicator 4.1: At least one bio pesticide against the Desert Locust registered in at least 3 countries and ready for operational use by 2006

Low Desert Locust populations since 1998 until autumn 2003 did not allow large-scale field trials on alternative control technologies. During Phase II, the introduction of bio-pesticides and the encouragement of the national authorities to adopt bio-control had to depend on reared Desert Locust. As an alternative, EMPRES/CR has also promoted bio-pesticide research on other locust species or grasshoppers.

One of the important highlights during 2004 was that Sudan registered as first country in the CR the bio-pesticide “Green Muscle®” (Metarhizium anisopliae var. acridum) for use against locusts and grasshoppers in August 2004. The registration trials have been conducted in close collaboration between PPD Sudan and ICIPE. Also Egypt, Ethiopia and Yemen have experimented with Metarhizium, but various factors have hindered official registration. In Ethiopia the results were not significant enough to allow the registration of Green Muscle®. It has therefore been agreed to repeat the trials with assistance from DLCO-EA, but apparently the results of these efforts are not circulated yet.

[26] Authors: J I Magor, P Ceccato, H M Dobson, J Pender and L Ritchie.

Regarding operational trials and small-scale demonstrations of the use and efficacy of bio-pesticides and other novel technologies, DLCO-EA with support from EMPRES/CR conducted a field demonstration of the Differential Global Positioning System (DGPS) in Ethiopia in April 2004. Observers from Ethiopia, Oman, Saudi Arabia, Sudan and Yemen as well as several air companies were present. As a result of the demonstration, the Omani Air Force, responsible for aerial control operations in the country, indicated interest to obtain DGPS equipment for locust control. EMPRES/CR with support from USAID supplied four additional DLCO-EA aircraft with the track guidance device in November 2004. In total five aircraft of DLCO-EA are now equipped with DGPS.

Since 2002 EMPRES/CR has collaborated with ICIPE to make the DL pheromone, phenylacetonitrile (PAN) available 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 were built up at the ICIPE station in Port Sudan in 2002 and semi-field validation trials on reared locusts conducted during 2003. The Desert Locust outbreak in Sudan in 2003 opened a first opportunity to conduct trials with PAN on natural Desert Locust hopper bands in early 2004. ICIPE succeeded to carry out several trials at the Red Sea coast of Sudan during winter 2004 on marching hopper bands and non-marching hopper groups under bushes.

Two sets of trials have been conducted: Pesticide (Carbosulfan ULV) at different dosages with and without PAN, and Green Muscle® (Metarhizium anisopliae) at different dosages with and without PAN. The results could confirm the previous findings from various laboratory and semi-field trials that PAN is showing the expected effects also under natural conditions. Mixed with pesticide, an equal mortality has been observed by 60 % reduced application rate. Also when mixed with Green Muscle® an equal mortality by 50 % reduced application rate could be achieved. If these results could be verified, the cost per ha of Green Muscle® for locust control would become competitive to the price of conventional insecticides.

As one of the pending items as part of the GTZ support to EMPRES/CR, GTZ finalized a study on barrier treatments as means of controlling migratory locusts. This study has been presented in the Pesticide Referee Group Meeting of FAO in October 2004 and the final version was submitted to EMPRES/CR in December 2004.

Since the beginning of the Programme, EMPRES/CR, CRC and FAO have provided support to in total eleven research projects. Five projects have been completed; five were still in process, and one was in preparation. Subjects covered included eco-toxicological aspects of PAN, survey methods, efficiency of Green Muscle®, effect of herbal quality on DL distribution, impact of environmental factors and control operations on DL populations, control technologies, DL population comparisons in different recession periods, a study on population dynamics, and a study on effects of GM on honey bees[27].

However, the preparation, implementation and the reporting on research projects was not always following acceptable scientific minimum standards. This led in many cases to significant delays as far as the approval process was concerned and also extended project periods beyond the actually expected timeframe. This situation has basically continued from the first to the present phase. One reason cited by EMPRES/CR and CRC management is that ELOs did not follow the implementation of the projects in all cases as necessary, that research proposals did not follow the CRC EMPRES/CR guidelines, and that the studies themselves fell short of established scientific standards. Countries deplored that a dedicated position within EMPRES/CR dealing with research had fallen away, and one comment mentioned that response time by EMPRES/CR and CRC often was discouragingly slow[28].

[27] A detailed list can be found in the annex.
[28] However, most research proposals on record seemed to have received a fairly rapid response.

C.3 Technical and operational backstopping

The complex nature of EMPRES/CR has placed a significant workload on AGPP in recent years. Currently one senior AGPP technical officer, among many other duties, acts as the focal point for EMPRES/CR and is budget holder for the TF projects supporting the programme. Other FAO HQ staff (DLIS Information and Forecasting Officer, Programme Support Officer, Remote Sensing Officer) provide additional technical and administrative support to the Programme. The Senior Officer and the DLIS Information and Forecasting Officer have participated in many EMPRES meetings.

Even though EMPRES/CR is a mature programme, it still required some unscheduled technical support mainly regarding the use of RAMSES, remote sensing imagery, eLocust, Internet connections and the dissemination of EMPRES reports on the Web. Consequently, substantial technical support was provided by FAO DLIS, mainly the Information and Forecasting Officer and the Remote Sensing Officer. (Remote sensing support was briefly disrupted due to staff changes at FAO HQ.)

In view of the persistent technical problems, especially those regarding full utilization of RAMSES and the functioning of eLocust, the Programme would have benefited from more support from FAO HQ, as problems apparently could not be solved from within the Region. In addition, the planned search for new donors to the Programme received little attention by HQ staff, possibly due to the DL outbreak in the Western Region.

C.4 Programme management

Management and administration of the EMPRES/CR programme has been of a high standard. Work planning and reporting routines are exemplary, and generally programme management attempts to involve ELOs in planning and decision-making. Occasional (over-) optimistic reporting regarding country capacities probably should be taken as a sign of undiminished enthusiasm.

The efficient running of the Programme was made more difficult by a relatively high turnover in experienced counterparts: among others, in the course of Programme implementation, three ELOs left their positions to join DLCO-EA. These experienced officers were expected to build up the regional backstopping capacity to support the Programme Coordinator and the National Professional Officer based in Yemen. (Despite the title of “national” professional, his mandate is de facto regional.) Especially the former ELO from Ethiopia had been very active in setting up RAMSES and giving training. (DLCO-EA has agreed to release him form time to time for further backstopping.) The Information Officer in Yemen has provided some technical backstopping to Egypt, Eritrea and Sudan in 2004-05. However, as borne out by the limited capacity in some countries to make full use of RAMSES and eLocust despite regional backstopping visits, the Programme’s current regional backstopping capacity is likely not enough to keep up, let alone spread, the use of modern technologies in the Region.

D. Results

D.1 EMPRES/CR DESERT LOCUST MANAGEMENT COMPONENTS GRADUALLY TAKEN OVER BY THE CRC AND THE PARTICIPATING COUNTRIES

It appears possible that the some vital DL management functions so far performed by EMPRES/CR can be taken over by the CRC secretariat. However, the close collaboration between EMPRES/CR and the CRC secretariat in the past years has shown that both bodies already have a full work programme; anything going beyond taking on the EMPRES/CR coordination tasks will be difficult to achieve for the CRC secretariat (a one-person unit at present). The continued introduction and integration of new techniques into national programmes will be hard to accomplish given the recurrent backstopping needs. In addition, it will be more challenging to keep up the same level of interaction and feedback achieved by EMPRES/CR. Regarding the provision of funds to replace obsolete equipment and maintain minimum campaign alertness, some Central Region countries will continue to require external funding, extra staff and equipment after EMPRES/CR has terminated.

At the same time, there have been notable improvements: DL units in Egypt, Oman and Saudi Arabia have traditionally enjoyed a relatively comfortable budget situation. DL units in Sudan and Yemen have received more institutional autonomy, and it is also likely that they will be given more independent – and better – budget allocations in the future. Overall, financial resources allocated to DL units seem have risen in most countries (also due to DL outbreaks in the Region), there is better planning and management of DL survey and control campaigns in the Region. Only Somalia has no DL unit, thus creating the danger of delays in monitoring and control there. Political conflicts in other areas also pose a constant threat to the Region's early warning capacity.

Regional collaboration has increased among countries. A highlight in Phase III was the provision by Saudi Arabia (on a bilateral basis) of crucial operational support to other EMPRES/CR countries for control activities.

The absorption of former EMPRES/CR countries by CRC is almost complete: Djibouti and Ethiopia are already full-fledged members, and Eritrea will be formally acknowledged as member in the next CRC session; only Somalia due to its political situation is unlikely to be able to join in the near future. In view of the increased number of CRC member countries, the FAO Council in June 2005 has revised the number of Executive Committee Members of the Central Region Commission from five to seven members.

D.2 IMPLEMENTATION OF IMPROVED EARLY WARNING SYSTEMS SUPPORTED

EMPRES/CR has provided various forms of support to improve the survey and early warning capacities of the participating countries including the training of plant protection officers, scouts and farmers, and provision of references, survey and communication materials. By September 2005, EMPRES/CR had in Phase III already organized more training courses than during the entire Phase II. The subjects addressed were survey and control principles, and reporting. In total 357 plant protection staff, extension staff, scouts and farmers have been trained and retrained during the current phase.

As a result of these efforts, most countries are preparing targeted survey plans based on the ecological situation and forecasts. The quality and timeliness of the survey reports has improved steadily over the years and, in terms of quantity, the number of locust reports received from the participating countries has increased by more than 50 % since 1997. In addition, most EMPRES/CR countries demonstrated a quick response capacity during DL

outbreaks in 2004-05. Many areas not previously surveyed (pre-EMPRES/CR) are now fully covered. Many survey and control reports are prepared using RAMSES and transmitted to DLIS (and copied to other EMPRES/CR DL units) in machine-readable form. However, there is room for additional improvements, most notably the inclusion of a short interpretation of RAMSES data when it is transmitted to DLIS and the continuation of timely and accurate reporting during periods of increased locust activity. The latter often declines as national units become more occupied with control operations.

Future agriculture graduates in Sudan will have a better knowledge of the Desert Locust: DL biology, survey and control topics have become subjects for students at the University of Sudan for Polytechnic Sciences, Faculty of Agriculture. In Yemen and Egypt, the FAO Desert Locust Guidelines have been distributed to universities and training institutes. As a reaction to the DL emergency situation in Northwest Africa and the Central Region since October 2003, three ad-hoc emergency prevention meetings were organized by EMPRES/CR in collaboration with CRC in Khartoum in March and September 2004, and in Cairo in March 2005. In these meetings possible countermeasures and pre-emptive actions were discussed with the immediately affected countries in the Central Region, namely Sudan, Saudi Arabia, Yemen and Eritrea. Following these meetings and based on a mutually agreed regional action plan, detailed national action plans were prepared and acted upon by the participating countries.

In several countries, EMPRES/CR has encouraged participating countries to create national locust management committees (Steering Committees) to keep the concerned governmental institutions informed of locust developments, and to solicit additional assistance in case of shortfalls. To date, such committees have been established in Sudan, Yemen, Ethiopia and Eritrea. Also in Eritrea, since June 2005 information on the locust developments in the country as well as details on control operations, crop damage and available resources for locust control in the country has become a regular component of the National Food Information System (NFIS) monthly newsletter. (NFIS is supported by an FAO-implemented Trust Fund project.) National Locust Bulletins also appear regularly in Djibouti, Egypt, Oman, Saudi Arabia, Sudan and Yemen. In addition, an EMPRES website is under construction and expected to be become available still in 2005.

However, technological improvements such as RAMSES (Reconnaissance And Management System of the Environment of Schistocerca) and eLocust (system for field data recording and transmission), as well as the interpretation of satellite images have remained underutilized due to technical and operational constraints (e.g. in Egypt, Eritrea, Ethiopia, Saudi Arabia, and Sudan). EMPRES/CR provided technical backstopping from within the Region[29], but it appears that more efforts are needed to build up sufficient training and better backstopping capabilities, and countries need to be encouraged to make greater use of these new technologies.

Also, equipment provided during the previous phases of EMPRES/CR is becoming outdated or is no longer operational, thus reducing the DL units' current and future effectiveness; even if general budget resources are available for standard equipment, the replacement particularly of more advanced items is difficult for most DL units in the Region.

D.3 CAMPAIGN EVALUATION MEASURES AND CONTINGENCY PLANNING MECHANISMS IN PLACE

[29] The Information Officer from the DL unit in Yemen visited Egypt, Eritrea and Sudan and assisted his counterparts in the countries in installing and setting up the eLocust system, and provided advice on managing the RAMSES database; a DLCO-EA staff (and former EMPRES/CR ELO) from Dire Dawa (Ethiopia) provided training on RAMSES applications and data management to the Ethiopian Locust Officer and two assistants in May 2005.

D.3.1 Campaign Evaluation Measures

During Phase III of EMPRES Programme, anti-locust treatments were executed in the Central Region (CR) on the area of about 250,000 ha. However, in neither case the evaluation of campaigns has been planned or executed, except for a retrospective assessment of operations in Egypt in 2004 by EMPRES/CR Coordinator and CRC Secretary. The reasons for that include, but not limited to, the following:

- with few exceptions (e.g., Egypt in October 2004, Eritrea in July 2005) the campaigns were not large-scale. As such, the basis for campaign evaluation in the CR was extremely limited;
- standard indicators for campaign evaluations are not developed;
- the relevant expertise is very limited in the CR;
- time constraints and emergency nature of campaigns;
- institutional constraints and sensitivity to any evaluation in certain countries.

According to the decisions of the 12th ELO CR meeting, guidelines and mechanisms for routine evaluation of campaign efficacy will be developed in the CR by mid-2006. The responsibility for this task should be shared by EMPRES, AGPP and CRC. The first step in this direction has been accomplished by development of Standard Operation Procedures (SOPs) which include measurable indicators for campaign assessment. The outcomes and recommendations of the upcoming campaign evaluation in the Western Region, where 12 million ha were treated in 2003-2005 and tens of millions of US dollars were spent, should be taken in consideration. Potential sites for campaign evaluations in the CR may include Ethiopia (for small-scale campaigns), Eritrea and Yemen (for mid-size campaigns), and Sudan (for large-scale campaigns).

D.3.2. Contingency planning

There are three interconnected levels of contingency planning (CP): national, regional, and CP from the FAO. In order to initiate CP, meetings with affected countries have been carried out. Based on a regional CP, national CPs have been developed. Due to facilitation by EMPRES/CR, these CPs became available to neighbouring countries, which increased their applicability.

Steering committees were created in several affected countries (e.g. Sudan, Eritrea, Ethiopia, Yemen, Egypt). These were instrumental in increasing preparedness for DL emergency. Such steering committees involved representatives of the key ministries, customs, transportation and communication agencies, donors etc. Steering committees convene regular meetings to update the situation with every type of resources available in the country. They increase the awareness of both national authorities and donors, which facilitate the mechanism of resource deployment in case of DL emergency. The problematic area is Somalia where such a committee is impossible to establish.

D.3.3. Economics and Social Aspects of DL Control

Despite numerous efforts, the value of the crop and pasture damage caused by the DL remains largely unknown. It is still not clear whether control can be justified by the extent of the prevented damage. The impact of the DL depends on the scale of perception: for an entire national economy, it can be negligible while for an affected subsistence farmer, it is devastating. As such, the DL impact may go far beyond the monetary value of agricultural products and should include such socio-political issues as food security, maintaining good stewardship of the land and preventing migration of rural population in the cities. For such

cases, developing the indicators to evaluate the DL control campaign will require a concerted effort of entomologists, agricultural economists, and sociologists.

D.4 ALTERNATIVE CONTROL TECHNOLOGIES SUPPORTED

The overall goal is to develop more economical, efficient, and environmentally benign strategies to manage the DL populations. DL control approaches using agents different from conventional pesticides (organophosphates, pyrethroids and carbamates) are considered as alternative technologies. These can be grouped in three categories:

- control using biopesticide agents;
- control using semiochemicals (DL pheromones);
- control using insecticides with long residual toxicity and action by ingestion [insect growth regulators (IGRs) and/or fipronil] applied in parallel swaths (barriers) with pesticide-free inter-barrier spacing.

D.4.1. Introduction of biopesticides

Commercially produced mycopesticide formulation Green Muscle® with a fungus *Metarhizium anisopliae* var. *acridum* as an active ingredient was identified during Phase II of EMPRES/CR programme as the potential DL control agent. In order to use it operationally, the CR countries need to accomplish its registration within national pesticide registration authorities. This process is hampered by 2 factors:

- national laws and regulations governing biopesticides are in a state of uncertainty;
- low DL populations have not allowed large-scale field trials.

Nevertheless, in one participating country, Sudan, Green Muscle® has been registered. In other participating countries (e.g., Egypt, Ethiopia and Yemen) significant steps were made to promote the biopesticide registration using trials on grasshopper species. For example, in Yemen, where beekeeping and honey production are important for local economy, EMPRES/CR financed a study on non-target effects of Green Muscle®. Biopesticide research was done in cooperation with the University of Khartoum (Sudan), Plant Protection Research Institute (Egypt), University of Aden (Yemen) and Addis-Ababa University (Ethiopia). Field demonstration trials of Green Muscle® were conducted in collaboration with ICIPE.

D.4.2. Utilization of semiochemicals (DL pheromones)

The male adult DL pheromone, phenyl aceto nitryl (PAN) has been demonstrated by ICIPE scientists to disrupt the aggregation behaviour and physiology of DL nymphs. As an additive to chemical insecticides, PAN appears to have potential to act as a “stressor,” allowing a decrease in the insecticide dose rate without compromising its efficacy. The University of Khartoum was commissioned by EMPRES/CR to conduct a project regarding the effect of PAN on non-target arthropods. Together with previous research results, its outcomes contributed to PAN registration in Sudan.

D.4.3. Barrier treatments using IGRs and/or fipronil

Field demonstration of DGPS equipment took place in Ethiopia in collaboration with DLCO-EA. Among other purposes, this equipment can be used for guidance for the aerial barrier spraying. Tests of an IGR teflubenzuron (Nomolt®) for grasshopper control were carried out in Sudan by LCC.

D.4.4. Applied research

Despite some perceptible progress in promoting alternative DL control technologies, the regional research component of EMPRES/CR has fallen short of expectations, mostly due to the limited number of research proposals of acceptable quality. In addition to research activities mentioned above (D.4.1-3), an MSc study on DL survey modelling is being carried out by a candidate from the University of Khartoum (financed through a CRC scholarship).

E. ISSUES

E.1 Future Donor Support to EMPRES/CRC

EMPRES/CR also in its current phase was expected to find additional donors beyond the existing three (NET, SWI, USA) at the beginning of Phase III. This has not happened: the search for new donors to the Programme received little attention by HQ staff[30]. However, without future donor assistance to guarantee the availability of some crucial inputs (regional training, technology upgrades, equipment replacement, increased use made of RAMSES and eLocust), it is unlikely that the improvements brought about by EMPRES/CR can be sustained.

Many countries in the Central Region are to poor to sustain the momentum created by EMPRES/CR and ensure that the level of preparedness attained in most countries does not deteriorate. Although it should be borne in mind that during Phase III, the Kingdom of Saudi Arabia has given bilateral support worth US$ 2 million to Sudan, and US$ 300,000 to Eritrea, but it is at present not clear whether this assistance could in the future also be extended to support a regional follow-up programme to EMPRES/CR.

Therefore, FAO and the countries concerned should make renewed efforts to secure donor funding to guarantee the availability of some crucial inputs (regional training, technology upgrades, equipment replacement, increased use made of RAMSES and eLocust). Preferably, this should happen within the framework of a follow-up Regional Technical Assistance Programme. EMPRES/CR and CRC as well as FAO HQ (AGPP and TCAP) should assist countries in developing funding requests: general proposals to donors for regional follow-up support, as well as individual (modular) proposals, which would allow donors to associate themselves with a specific part of the Programme or with activities in one particular country.

E.2 Technical Support Needs in EMPRES/CRC Countries

Technical support is needed for a wide range of DL operations: coordination of locust control and management activities and supply of technologies to improve locust survey, forecasting, early detection of desert locust outbreaks and upsurges. The need for technical support is most evident when it comes to supplying, maintaining and upgrading modern technologies, such as eLocust and RAMSES.

This implies also a measure of financial support, as most countries in the Region are too poor to invest in advanced technologies such as computers and information exchange facilities[31].

[30] The absence of donors for a continuation of EMPRES/CR under the CRC umbrella can partly be attributed to the DL upsurge in the Western Region in 2003-04. Donors as well as FAO HQ focused their attention on events there, to the detriment of preventive work in the Central Region.

[31] Fast and reliable Internet connections still appear to be a problem: in some countries, the connection is too poor to allow downloading of satellite imagery, and some connections have very limited storage capacity to receive larger email attachments.

Technical support is needed to assist research activities to develop alternative desert locust control technologies, as farmers are becoming reluctant to use pesticide chemicals especially on grasslands. Research on population estimate during outbreaks and upsurge could help to know the size and the extent of the population and it is necessary to support as donors have showed their interest.

E.3 CRC: Taking over EMPRES Responsibilities

The concept of Phase III of the EMPRES/CR programme is focused mainly on gradual transferring the programme's responsibilities to the Central Region 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 EMPRES/CR programme was planned in a way that during the Phase III and thereafter participating countries will assume more ownership and responsibility for implementing improved Desert Locust management components within their own national system.

Even if transfer of EMPRES/CR's responsibility to CRC is the only option, there must be structural changes in the CRC in order to enable it to undertake additional responsibilities without affecting the existing momentum. In this regard, training and provision of technical backstopping on new technologies, information exchange, providing assistance to the countries on locust survey and control could be taken as an important component of strengthening the preventive control capacity of the participating countries. It is also very important to consider that the adoption rate among EMPRES/CR countries varies. Therefore, EMPRES/CR/FAO assistance remains necessary to build the capacity of the countries, as the Desert Locust is economic important pest and a threat to food security in the Region.

The role of Central Region Commission will be to enhance the relationships between countries and encourage CRC member countries to fulfil their financial commitments, as well as facilitation and supervision of DL management and control through technical experts.

E.4 Relationship Western Region – Central Region

Although naturally, the distribution area of the DL is continuous, it is usually considered to comprise three major parts (Western, Central, and Eastern regions) for geographical and administrative reasons. Since locust populations migrate between the regions following the seasonal breeding patterns, an inter-regional collaboration is crucial for efficient DL monitoring and management. Until recently, the EMPRES programme was functional only in the CR, while in two other regions, the plans to establish such programmes were in different stages of implementation. EMPRES/CR activities in Phase III have promoted increased collaboration between Western and Central Regions in the areas of information exchange and management, joint surveys and training despite numerous political, administrative and linguistic differences.

Obviously, the CR-WR collaboration has gained an important momentum. It should be further enhanced with the eventual transfer of the EMPRES/CR Coordinator to WR. For productive functioning of EMPRES/WR, it is highly beneficial to build upon the successes and “lessons learned” of the EMPRES/CR. Further possible avenues of WR-CR collaboration include:

- joint training activities and harmonization of training approaches. This should be done based on existing support materials as DL guidelines, CR Master Training Kit, and WR Train-the-Trainers modules. It is advisable to translate the latter into English and Arabic;
- recruitment of WR students for postgraduate Diploma course at the University of Khartoum;

- harmonization of pesticide registration requirements between the bordering countries;
- development of administrative mechanisms allowing to implement timely across-border control interventions in case of inter-regional DL emergency (e.g., between Egypt and Libya, Sudan and Chad);
- promotion of bilateral, inter-regional donor assistance to countries in need.

E.5 Integration of Improved Early Warning and Control

The integration of early warning and control is essential for successful DL emergency prevention. As a result of numerous EMPRES/CR activities, in particular, introduction of modern technologies for DL information collection and transmission, early detection and early warning significantly improved in most CR countries. The next logical step is to develop mechanisms which would trigger control operations in case the early warning warrants their necessity. Such scenarios are described in detail under contingency plans.

Improved early warning is based on the continual monitoring of Desert Locust habitats by actively surveying areas on a regular basis where locusts, rainfall or green vegetation are thought to be present. The RAMSES system is an appropriate tool to manage and interpret the field results, including meteorological information and satellite imagery for estimating rainfall and green vegetation, in order to delimit these relatively large areas and prioritize survey and control operations (for more detail see D.2).

A recent example from Eritrea, a country with a less-than-optimal communication system (and HF radio network entirely lacking) illustrates the increased capacity for rapid deployment of control operations. As a result of unexpected and heavy rainfall, first reports of a DL outbreak in the Eastern Lowlands of Eritrea (Mahmimed) were received on 19 July 2005. The Ministry of Agriculture and Land Resources immediately initiated control operations, which actually started on 25 July. By the end of August, the treatments were applied to over 20,000 ha. With support from EMPRES/CR, Eritrea received bilateral aid from Senegal and Sudan (insecticides), as well as Saudi Arabia (US$ 300,000 grant). The outbreak has been brought under control by 12 September. The EMPRES/CR NPO visited the infested areas twice to assess the situation and to provide technical assistance.

E.6 Capacity Building

EMPRES/CR contributed to capacity building of the participating countries primarily by training and technology transfer. Since 1997 more than 900 locust officers and/or plant protection staff, scouts and farmers received training on various technical locust management subjects. The total target group of persons in the Central Region, directly or indirectly involved in locust control operations, is about 550 staff. Taking high staff turn-over into consideration, it is assumed that at least 50% of all plant protection officers currently in place have received training. In each of the participating countries, at least one national Master Trainer has been trained to conduct and organize national training courses on survey and control topics.

A Desert Locust Master Trainer Manual based on FAO DL Guidelines has been developed and distributed in the form of a training kit to all participating countries to standardize and facilitate locust training.

In 2004 -2005, twenty-one national and local training courses were conducted in Yemen (4), Eritrea (3), Ethiopia (3), Sudan (6), Oman (1), Jordan (1) and Egypt (3) by using EMPRES/CR Master Trainer's Training Manual, with more than 350 plant protection staff, extension staff, scouts and farmers trained and retrained.

EMPRES/CR contributed to national capacity building by introducing advanced equipment (e.g. eLocust) and associated training to several locust units. This equipment needs to be updated on a regular basis.

E.7 Desert Locust Diploma Course

EMPRES/CR and CRC supported the University of Khartoum in 1999 to develop a curriculum for a post graduate Diploma Course particularly oriented to preventive Desert Locust management. The aim was to provide a unique opportunity to locust-affected countries in building up new generations of Senior Locust Officers.

Since its introduction in 2001, the course was attended by 31 students from 11 countries: Egypt (6), Eritrea (1), Ethiopia (3), Jordan (1), India (1), Libya (1), Oman (1), Saudi Arabia (2), Syria (1), Sudan (10), and Yemen (4).

As the Post Graduate Diploma in Desert Locust Control (PGDDLC) is sponsored by CRC and EMPRES/CR with US$ 24,000 per year and student, the continuity of the Course after EMPRES/CR as a donor-supported Programme phases out in 2006 is endangered. So far, there has been little attempt to attract additional sponsors. The Diploma Course is taught by 7 University of Khartoum lecturers, together with Plant Protection Directorate (PPD) staff working in the Locust Control Centre (LCC), together with some inputs from the Meteorology Office. The LCC also provides transport and logistics for the students during their three month field semester on the Red Sea Coast.

Although the course is unusual in its practical nature and is financed in a different way from other courses, it is a course that has been approved by the University Senate and as such is formally part of the University's prospectus.

In 2005, the Diploma Course has been evaluated by a team including an International FAO Consultant and a national Sudanese counterpart.

E.8 Research

Despite the relatively wide array of research topics and responsible organizations, research activities (with a few exceptions) remain one of the weakest areas of EMPRES/CR programme. Solicited research proposals[32] submitted for EMPRES/CR funding are often very poor, with low standards of scientific approach and methodology. Three final reports of completed studies have not been approved because of apparent deficiencies in experimental design and methodology. As a result, funds allocated for research were often diverted for other purposes. The reasons for this include:

- insufficient scientific capacity of universities and other research institutions as bases for research studies (lack of equipment, support personnel …);
- insufficient qualifications of researchers;
- logistical difficulties for field DL research (remote areas, few locust populations …);
- weak ties with overseas research institutions (e.g. Wageningen University, NRI, CIRAD) and lack of joint projects. The few exceptions include one PhD study completed on the subject of DL habitats in Sudan (Wageningen University) and an ongoing joint project between CIRAD and University of Kordofan.

One particularly serious problem remains the collaboration with ICIPE regarding the applicability of DL pheromone PAN for practical locust control. Despite significant levels of funding allocated by EMPRES/CR for these purposes (up to US$ 150,000 in 2004-2005), the

[32] List of research projects in Annex.

reports submitted by ICIPE remain not cleared by EMPRES/CR Coordinator because of their very low quality. The issue of collaboration with ICIPE will require special attention from CRC and AGPP once the EMPRES/CR programme phases out.

For the future, it can be recommended that the ELOs become more involved in the process of soliciting the proposals, their selecting and monitoring their progress. Progress and final reports of such studies should be cleared by ELOs. Research proposals on new strategies and approaches to locust survey and monitoring, including Remote Sensing and GIS applications should receive particular attention as most appropriate for the goal of DL emergency prevention.

It is important to emphasize that previous research made available many new, advanced technologies for DL monitoring and control. To ensure their adoption, extension type activities should be encouraged in the region.

Annexes

Annex 1 Terms of Reference

Terms of Reference for EMPRES (Desert Locust Component)
Evaluation of Phase III
(September/October 2005)

Background

FAO established a Special Programme on EMPRES (Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases) in 1994. It aimed to address on the one hand the problems of epidemic diseases in livestock and on the other hand of the Desert Locust (DL), both of which threaten food security in many countries, can spread quickly from one country to another, and require international cooperation and coordination to achieve control.

The plant pest component focused on the DL because it is this locust species that has the widest global range, potentially affecting up to 65 countries during a fully developed plague. The DL exists permanently in semi-arid and desert environments from Mauritania and Morocco in the West to the Pakistan/India border in the East. These habitats are divided for convenience into three Regions: the Western Region comprising West and North-West Africa, the Central Region (CR) comprising nine countries around the Red Sea and the Gulf of Aden, and the Eastern Region comprising four countries in South-West Asia.

The EMPRES/CR Programme attempts to address transboundary pest and disease problems by emphasizing early warning, early reaction and research. Instead of creating new or replacing existing structures, the Programme intends to strengthen the national DL survey and control capacities in affected countries. The EMPRES-DL Programme began as a series of pilot projects. At an early stage it was decided to initiate the first field programme in the Central Region because many past plagues were thought to have begun in this region. After an extended formulation process involving extensive consultations with locust-affected countries and donors, a fully developed donor-supported field programme for the Central Region was launched early in 1997. It completed its first Phase in December 2000, Phase II at the end of 2003 and is now in its three-year Phase III, which ends in December 2006.

The EMPRES/CR Programme, covering Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen, was established under the Programme Document “Desert Locust Management in the Central Region”, dated October 1995. It became fully operational with the appointment of a Central Region Coordinator in March 1997. An independent evaluation of Phase I was carried out in July/August 1999 and lead to some important changes in implementation arrangements. An extraordinary evaluation of the whole EMPRES Programme including its Central Region Desert Locust component was carried out on special request of the Director-General of FAO in August 2001. The scheduled evaluation focusing on Phase II of the programme took place in February/March 2003.

The EMPRES/CR Programme strategy has two major axes, a strong preventive character and an important learning component. Prevention is to be achieved through an improved early warning and forecasting system, and by strengthening the capacities of national locust control services in the region for monitoring, survey and control. The learning component addresses research on the gaps in the knowledge of DL ecology and management, and the potential introduction of new technologies and training of national plant protection staff in improved DL management subjects.

The Programme is designed as a collaborative effort between key locust-affected countries, regional bodies especially the FAO Commission for Controlling the Desert Locust in the Central Region (CRC) and the Desert Locust Control Organization for Eastern Africa (DLCO-EA), together with donors and FAO.

The EMPRES/CR Programme Document gives the development goal as:

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

while the programme goal is:

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

During the Phase III planning workshop in May 2003 the Purpose of Phase III was formulated as:

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

The concept of Phase III of the EMPRES/CR Programme has two main thrusts: (i) gradually transferring the programme's responsibilities to the CRC and the member countries; and (ii) the development and introduction of mechanisms to improve the preparedness of the national and regional entities to prevent major locust emergencies. To this end, four expected result have been identified:

- EMPRES/CR Desert Locust management components gradually taken over by the CRC and the participating countries.
- Implementation of improved early warning systems supported.
- Campaign evaluation measures and contingency planning mechanisms in place.
- Alternative control technologies supported.

The EMPRES/CR Programme has been financially supported in its Phase III by FAO Regular Programme funds, together with Trust Fund projects funded by the Netherlands (GCP/INT/670/NET), Switzerland (GCP/INT/817/SWI), the United States of America (GCP/INT/720+757/USA), the Commission for Controlling the Desert Locust in the Central Region-CRC (MTF/INT/007/MUL), and the Desert Locust Control Committee-DLCC (MTF/INT/008/MUL).

Purpose of the Evaluation

The evaluation is intended to provide donors, participating countries and FAO with an independent and objective assessment of the current status of implementation and the relevance effectiveness and impact of the EMPRES/CR DL Programme, including progress and problems faced. The mission will in particular focus on the progress achieved by Phase III in transferring the programme's responsibilities to the CRC to ensure continuity of the regional coordination of preventive DL management components after the programme as a donor funded project has terminated. It will also address the question to which extent the components of early detection and rapid reaction have been adopted by the national DL units of the participating countries.

It will further examine activities funded under the FAO Regular Programme, various donors, the CRC and the DLCC. On the basis of its assessment will advise whether the Phase III objectives are likely to be largely completed by the end of 2006, such that no further extensions of the EMPRES/CR Programme are required. The evaluation will make recommendations for the future of the EMPRES/CR DL Programme as a permanent Programme of FAO, and any requirement for reorientation or adjustment in:

- priorities;
- coverage and scope;
- implementation (management, coordination and operations).

Scope of the Evaluation

The emphasis of the evaluation will be on programme performance, especially on:

- efficiency in implementation, including programme management;
- effectiveness in achieving the expected results (outputs/services and their use for intended purposes);
- institutional coordination among countries and regional organizations to prevent and combat locust emergencies and organizational and operational improvements in DL management in the participating countries;
- contribution of training activities to the build-up of sustainable technical capacities;
- research on improved methods for forecasting and control;
- impact on the capacities of the locust-affected countries; and
- effectiveness in achieving sustainability.

In general, the Evaluation Mission will assess, and make recommendations where appropriate, on the:

a) Relevance of the programme to the development priorities and needs of the locust-affected countries;
b) Realism, clarity and flexibility of the programme design, including the objectives, structure and mechanisms for adjustment, supervision and programming;
c) Adequacy of institutional relationships, partnerships and links to related activities by FAO, donors, participating countries and regional organizations;
d) Efficiency of programme implementation, including the programme management at FAO Headquarters and in the field, coordination of activities in all member countries, as well as monitoring and reporting arrangements;
e) Effectiveness in achieving programme outputs and objectives (i.e. immediate results and prospects for longer-term outcomes). The evaluation will review the progress towards targets and indicators defined for the programme, especially regarding:

- collaboration among the countries and regional organizations to promote and encourage establishing sustainable regional DL management system(s);
- the contribution of training activities towards building up solid technical expertise and sustainable capacities in the participating countries in general and to the Diploma Course at the University of Khartoum in particular;
- the integration of improved early warning and control mechanisms;
- its role in preventing emergencies,
- relevant operational research activities and the collaboration with ICIPE;
- progress made towards transferring the programme's responsibilities to the CRC for Controlling the Desert Locust in the Central Region, and
- reasons for implementation successes and failures.

The Evaluation Mission will take advantage of previous three evaluations that have been carried out, in 1999, 2001 and 2003 respectively, in making its assessment of the progress achieved.

Composition of the Evaluation Mission

The Evaluation Team will consist of:

- Team Leader (representing FAO) with experience in the evaluation of regional development programmes and projects, preferably familiar with plant protection matters;
- Desert Locust control specialist representing the donor community;
- Crop Protection expert representing the member countries with technical experience relevant for DL management.

Countries visited by the team will be requested to nominate a liaison person to interact with the mission. In addition, participating countries not visited by the Evaluation Mission, will be requested to provide written comments on the programme in advance. Major collaborators/donors involved in the EMPRES Desert Locust Programme will also be contacted for comments on the EMPRES-DL Programme through questionnaires. The relevant units in FAO HQ will be interviewed, and available documentation reviewed.

The evaluation team members should be independent and thus have no previous direct involvement with the programme. They should preferably have experience with project evaluations.

Timetable and Itinerary of the Evaluation Country Visits

See Itinerary and Persons Met in Annex 2.

Consultations

The Evaluation Mission will interact closely with the FAO technical experts, FAO representatives, representatives of main collaborating agencies and the concerned national agencies, as well as with national and international project staff. Although the mission should feel free to discuss with the authorities concerned anything relevant to its assignment, it is not authorized to make any commitments on behalf of the governments, the main collaborators, or FAO.

Reporting

The Evaluation Mission is fully responsible for its independent report which may not necessarily reflect the views of the governments, the donors, or FAO. The report should include the following sections:

- Summary, including Conclusions and Recommendations;
- Programme Objectives, Design, Structure and Partners;
- Programme Resources and Implementation;
- Programme Results;
- Programme Sustainability;
- Conclusions and Recommendations.

The report should be completed in draft form to the extent possible during the final stage of the mission. The main findings and recommendations should be discussed with the concerned parties. The mission leader bears responsibility for finalizing the report. At the end of the mission, the report should be completed in a form which will allow distribution of an

advanced copy to those donors which require the report urgently. Final editing should be completed not later than two weeks after the end of the mission.

Annex 2 Itinerary and persons met

Rome, 16-17 September

Mr CCH Elliott, Senior Officer Migratory Pests, AGPP
Mr Nasser Al-Harthy, Locust Information and Forecast officer, DLIS
Mr Mahmoud Solh, Director, AGP
Ms Joyce Magor, Locust Consultant
Ms Caroline Rosi, Operations Clerk
Ms Coralie Wassenaar, Remote Sensing Officer, DLIS
Mr Niek Van Der Graaff, Chief, Plant Protection Service, AGPP

Cairo, 17-18 September

ARRIVING	CAIRO	AZ 896	16SEP	13:55
DEPARTING	CAIRO FOR KHARTOUM	KQ 321	19SEP	00:30

Mr Mohamed Tawfik Mohamed, Under-Secretary, Head Central Administration for Pest Control, Ministry of Agriculture
Mr Mohamed M Abdel Rahman, EMPRES/CR Liaison Officer, Director General, General Department for Locusts & Agro-Aviation Affairs (GDLAA)
Mr Gamal Abdelatif, Assistant Researcher, Plant Protection Research Institute?
Dr Mahmoud Harb, Senior Researcher, Plant Protection Research Institute?
Ms Samera Moh. Nabil, DL Information Officer, GDLAA
Ms Raneya Husain Mustafa, DL Information Officer, GDLAA

Mr Mohamed Albraithen, FAO Regional Representative

Mr Christian Pantenius, Coordinator, EMPRES Central Region
Mr Munir Butrous, Secretary of the Commission for controlling the Desert Locust in the Central Region (FAO)

Khartoum, 19-22 September

ARRIVING	KHARTOUM VIA CAIRO	19 SEPTEMBER	KQ 321	03:05
DEPARTING	KHARTOUM FOR ADDIS ABABA	22 SEPTEMBER	ET 441	20:35

Mr Ahmed Ali Al-Hassan, Acting Under Secretary, Ministry of Agric. and Forestry

Mr Babiker El Wassila, Deputy Dean of Agriculture, University of Khartoum (UoK)
Mr Kamal Mowafi Abdel Fattah, Head, Department of Crop Protection, UoK
Mr Sayed el Beshir, Professor of Entomology, UoK (Coordinator, Diploma Course)

Mr Abu Obieda Osman Ibrahim, DLCO-EA Base Manager, Sudan

Mr Sharaf El Deen Hassan Dawoud, Director General, Plant Protection Department (PPD)
Mr Rabie Abd El-Hameed Khalil, Director Locust Control Centre (LCC/PPD) and EMPRES Liaison Officer in Sudan
Abd El-Moneim Khidir Taha, Survey, Head of Control and Monitoring Unit, LCC
Mr Kamal Suliman Obeid, DL Information Officer, LCC/PPD
Mr Hussien Osman Abaker, Assistant DL Information Officer, LCC/PPD
Mr Montasir Elhadi, Survey and Control Officer, LCC/PPD

Mr Abdulla Tahir Bin Yehia, FAO Representative

Mr Marc Abdala, FAO Deputy Emergency Coordinator, Darfur & East
Mr Emad Yacoub, FAO Administrative Officer

Addis Ababa, 22-24 September

ARRIVING ADDIS VIA KHARTOUM 22 SEPTEMBER ET 441 22:25

Bultemeier & Bateno only
DEPARTING ADDIS FOR JEDDAH 24 SEPTEMBER ET 462 01:20

Ms Tsehay Azage, Acting Head of Crop Protection Department, Ministry of Agriculture and Rural Development (MOARD)
Mr Lemma Gebeyehu, Crop Protection Team Leader, MOARD
Mr Alemayehu W/Amanual, Acting Team Leader Crop Protection, MOARD
Mr Solomon Admasu, EMPRES Liaison Officer, MOARD

Ms Victoria Sekitoleko, FAO Representative
Mr Ali Haribou, FAO Representative in Djibouti, FAO Liaison Officer to AU and ECA
Mr Mesfin Kinfu, Assistant FAO Representative

Latchininsky only
Telephone interview with former ELO, Mr Felege Elias
Meeting with Mr Fikre Markos, Director, Crop Protection Department, Ministry of Agriculture and Rural Development (MOARD)

Jeddah, 24-26 September (Bultemeier & Bateno only)

ARRIVING JEDDAH VIA ADDIS 24 SEPTEMBER ET 462 04:00
DEPARTING JEDDAH FOR SANA'A 26 SEPTEMBER SV 680 17:55

Mr Ghazi A Hawari, Director General, National Center for Locust Control and Research, Ministry of Agriculture
Mr Adnan Suliman Mohammed Khan, Agricultural Engineer, National Center for Locust Control and Research
Mr Mohamed Hassan Al-Halawani, Agricultural Engineer, National Centre for Locust Control and Research
Mohamed Al-Harbi, Head of Survey Section, National Center for Locust Control and Research
Mr Yasseen Ali Saleh, Information Officer, National Center for Locust Control and Research

Sana'a, Yemen: 26-29 September

Bultemeier and Bateno
ARRIVING SANA'A VIA JEDDAH 26 SEPTEMBER SV 680 19:45

Latchininsky
ARRIVING SANA'A VIA ADDIS 26 SEPTEMBER IY 625 20:30

Bultemeier and Latchininsky
DEPARTING SANA'A FOR ASMARA 29 SEPTEMBER IY 612 22:20

Bateno
DEPARTING SANA'A FOR CAIRO 30 SEPTEMBER MS 692 05:00

Mr Hassan Omar Mohd Swuid, Minister of Agriculture & Irrigation

Mr Johan F L Blankenberg, Ambassador of the Netherlands

Mr Abdou Farea Al-Romaih, EMPRES/CR Liaison Officer, Manager, Desert Locust Monitoring and Controlling Centre (DLMCC), General Department for Plant Protection, Ministry of Agriculture & Irrigation
Mr Adel Al-Shaibani, EMPRES Information Officer

Mr Hashim G A Shami, FAO Representative
Mr Ibrahim Abdulla Thabet, Assistant FAO Representative
Mr Mohamed ? FAO Programme Officer

Mr Fuad Bahakim, NPO (Survey), EMPRES/CR

Asmara, Eritrea: 29 September-1 October (Bultemeier & Latchininsky only)

Bultemeier and Latchininsky

ARRIVING	ASMARA	29 SEPTEMBER	IY 612	22:20
DEPARTING	CAIRO	2 OCTOBER	MS834	05:45

Mr Eyob
Mr Zerizenay EMPRES/CR Info Officer
Ms Zimam, Locust Information Officer (national Master Trainer) Ministry of Agriculture

Ms Emma Gori, Director, Cooperazione Italiana Asmara
Mr Lorenzo Larghi, Programme Officer, Cooperazione Italiana Asmara

Mr Admir Pancas M Bay, FAO Representative
Mr Filippo Fossi, FAO Project Operational Officer
Mr CCH Elliott, Senior Officer Migratory Pests, AGPP

Mr Peter Odiyo, Director, DLCO-EA

Cairo, 2-7 October

Bateno

ARRIVING CAIRO	MS692	30SEP	07:15

Bultemeier & Latchininsky

ARRIVING CAIRO	MS834	2 OCT	07:30

Mr Mohamed Albraithen, FAO Regional Representative

Mr Christian Pantenius, Coordinator, EMPRES Central Region
Mr Munir Butrous, Secretary of the Commission for controlling the Desert Locust in the Central Region (FAO)

ALL THREE DEPARTING CAIRO FOR ROME	AZ897	7 OCT	13:55

Annex 3 DL Information – Assessment of Country Capabilities

In general, there have been steady improvements in the quality, timeliness and frequency of national reporting in most of the EMPRES countries during the third phase. Nevertheless, some improvements appear to be short-lived and are easily disrupted when locust activity increases and the staff of national units become more occupied with control operations in the field. This occurred during the outbreaks in Sudan (autumn 2003) and Eritrea (summer 2005) and the invasions of Egypt (autumn/winter 2004/05) and Ethiopia (summer 2005). The single most common weakness in nearly all countries is the absence of a brief interpretation of RAMSES data that should accompany files sent to FAO DLIS. Country assessments are provided below.

Djibouti
A greater number of surveys in the important locust habitats was carried out in the past year compared to previous years. Completed FAO Desert Locust Survey and Control Forms are sent to FAO DLIS and simple monthly reports are received on a regular basis. Due to the low volume of locust and environmental data to manage, RAMSES has not been installed in the country.

Egypt
Information is regularly received about the locust and rainfall situation, mainly RAMSES data files and monthly bulletins. During the past year, RAMSES has been used more and the quality of the bulletins has improved significantly. Information staff have been very receptive to improvements suggested by EMPRES/CR, CRC and DLIS. Unfortunately, the quality and timeliness of information tends to decline during periods of increased locust activity. This was most recently seen when swarms invaded the country in November 2004. A greater effort is required to ensure that this does not occur in the future. Furthermore, a brief interpretation of the data should accompany RAMSES files that are sent to DLIS

Eritrea
The quality, timeliness and frequency of reporting is hampered by difficulties in transmitting survey and control results from the field to the national unit in Asmara because of the inavailability of HF radios and satellite telephones for DL operations in the country. This also makes is extremely difficult to organize effective control campaigns. During a recent increase in locust populations in the summer of 2005, the quality and timeliness of information declined. Greater use of RAMES is needed in the future and a brief interpretation of the data should accompany RAMSES files that are sent to DLIS. Monthly bulletins used to be issued, which have recently been amalgamated into a national early warning bulletin.

Ethiopia
There has been a slight decline in the quality, timeliness and frequency of reporting in the past year due to staff changes in the national unit. RAMSES data is sent less frequently and a brief interpretation of the accompanying data is absent.

Oman
Monthly reports and RAMSES data are sent on a regular basis. Despite the absence of locusts, the quality and timeliness of these reports remain high.

Saudi Arabia
Although there has been a slight improvement in the quality, timeliness and frequency of reporting, progress has been limited and slower than expected. RAMSES data are occasionally sent to FAO DLIS but often there are inaccuracies. The quality and timeliness of the data is a function of field surveys and monitoring which are usually carried out by district agricultural officers rather than well-trained field officers from the Locust Centre in Jeddah. If

the latter were to make more surveys, then the quality of the data should improve. If RAMSES were to be used on a regular basis for data management and analysis, including the use and interpretation of satellite imagery, then surveys could become better targeted. This would lead to a more effective monitoring and reporting system.

Somalia
Despite the difficulties of insecurity and access to the locust habitats, surveys are carried out by the EMPRES Link Person on a monthly basis and results on completed FAO Desert Locust Survey and Control Forms are sent to FAO DLIS. Efforts have been made to establish a radio network in the north of the country. Consequently, the quality, timeliness and frequency of reporting is high. Due to the above difficulties and low volume of data to manage, RAMSES has not been installed in northern Somalia.

Sudan
The quality, timeliness and frequency of reporting improved further with the establishment of an increasingly autonomous national locust unit. Nevertheless, insecurity in western Sudan and near the Eritrean border hampered survey and reporting efforts during the past year. Greater use of RAMSES and remote sensing imagery should be made especially for data interpretation and the targeting of surveys. Unfortunately, it was difficult to sustain the operational use of eLocust. It was unclear if the RBGAN satellite system at the national unit office in Khartoum provided a reliable and fast connection to the Internet.

Yemen
There was steady progress in the improvement of the quality, timeliness and frequency of reporting during the past year. The Information Officer is well versed in the basic and advanced use of RAMSES and is considered as a resource person within the Region. During periods of increased locust activity or overlapping breeding periods, surveys were not always carried out on a regular basis in all of the areas. Greater efforts are required to insure that all important habitats are monitored regularly.

Annex 4 Major Non-Project Reference Material Consulted

Courshee, R.J. 1990. Desert locusts and their control. Int. Pest Control, 32:16–18

Dobson, H.M. 2005. Review report on the postgraduate Diploma in Desert Locust control, University of Khartoum. Report to FAO

Lecoq, M., Duranton, J-F. & Rachadi, T. 1997. Towards an integrated strategy for the control of the Desert Locust. In S. Krall, R. Peveling & D. Ba Diallo, eds. New strategies in locust control. p. 467 473. Basel, Switzerland, Birkhäuser Verlag

MacCuaig, R.D. 1970. Locust control – the economic impact of new technologies. In The technological economics of crop protection and pest control. Monograph, No. 36. p. 119–128. London, Society of Chemical Industry

Magor J.I., Ceccato, P., Dobson, H.M., Pender, J., and Ritchie, L. 2005. Preparedness to prevent Deser Locust Plagues in the Central Region, An historical overview. Draft Report to the FAO-EMPRES/CR

Posamentier H. & Magor J.[I.]. (rapporteurs). 1997. Results and recommendations of the working group on management strategies. In S. Krall, R. Peveling & D. Ba Diallo, eds. New strategies in locust control. p. 515 517. Basel, Switzerland, Birkhäuser Verlag

Symmons, P.M. 1992. Strategies to combat the Desert Locust. Crop Prot., 11: 206–212

Symmons, P.M. 1997. Desert Locust control strategies. In S. Krall, R. Peveling & D. Ba Diallo, eds. New strategies in locust control. p. 445 452. Basel, Switzerland, Birkhäuser Verlag

van Huis, A. ed. 1994. Can we combat the Desert Locust successfully?. In Desert Locust control with existing techniques, an evaluation of strategies, proceeding of a seminar, Wageningen, 1993. p. 11 17. Wageningen, The Netherlands: Wageningen Agricultural University

Annex 5 Status of CRC Contributions

TRUST FUND No. 9409.00 - MTF/INT/007/MUL -
Inter-Regional Commission for Controlling Desert Locust in the Central Region

Status of Contribution as at 19 September 2005

(expressed in US$)

ORACLE Account TF - AGPDD - TFAA970089159

Member Governments	Outstanding 31/12/2004	Contribution due for 2005/2006*	Received up to 19/09/2005	Outstanding 19/09/2005
BAHRAIN	30,869.50	8,750.00	39,619.50	0.00
DJIBUTI	3,300.00	1,100.00	0.00	4,400.00
EGYPT	65,080.00	32,540.00	0.00	97,620.00
ETHIOPIA	8,000.00	8,000.00	0.00	16,000.00
IRAQ	632,500.00	28,750.00	0.00	661,250.00
JORDAN	85,602.50	14,357.50	7,584.90	92,375.10
KUWAIT	15.47	25,000.00	25,015.47	0.00
LEBANON	194,940.33	11,212.50	141,095.37	0.00
OMAN	28,005.00	10,000.00	0.00	38,005.00
QATAR	56.04	12,500.00	0.00	12,556.04
SAUDI ARABIA, Kingdom of	0	44,035.00	44,035.00	0.00
SUDAN	439,827.25	18,667.50	19,960.08	218,621.05
SYRIA	33,230.63	16,687.50	0.00	49,918.13
UNITED ARAB EMIRATES	0	26,250.00	0.00	26,250.00
YEMEN	3,529.31	5,000.00	0.00	8,529.31
Total	1,524,956.03	262,850.00	277,310.32	1,225,524.63

* Fiscal year begins in July

Lebanon and Sudan: Ref recommendations 17 and 18 of the 24th Session CRC, Jeddah, April 2004:

Cancellation of 50% contribution arrears of Lebanon and Sudan:
Sudan is paying regularly its annual contribution since December 2002 and part of the arrears. Consequently, the arrears were reduced by 50% as of 31/12/2004.

Lebanon has settled more than 50% of the arrears in 2005, and its annual contribution 2005. Consequently, the remaining arrears were cancelled.

Annex 6 Programme statistics

Staff

Professional staff

Programme Coordinator, Mr Allan Showler (Asmara, Eritrea)	March 1997 – Oct 1999
Programme Coordinator, Mr Christian Pantenius (Cairo, Egypt)	Aug 2001 – Dec 2005
Senior Field Officer, Mr Christian Pantenius (Addis Ababa, Ethiopia)	July 1997 – Aug 2001 (Acting Coordinator Oct 1999 – July 2001)
International Research & Development Expert, Mr Tsedeke Abate (Sana'a, Yemen)	August 1998 – July 2002
International Migratory Pest Expert, Mr Charles Dewhurst (Khartoum, Sudan)	Dec 2002 – Jan 2004
National Professional Officer for Control, Mr Munir Butrous (Khartoum, Sudan)	Oct 1996 – Aug 2001
1 National Professional Officer for Survey, Mr Fuad Bahakim (Sana'a, Yemen)	May 1997 – Oct 2005
Associate Professional Officer (APO), Mr Jan Breithaupt (Sana'a, Yemen)	Feb 1997 – Feb 2000 (temporary post in Addis Ababa March - Aug 2000)
Associate Professional Officer, Ms Helena Eriksson (Khartoum, Sudan)	November 2000 – January 2003
United Nations Volunteer, Mr Charles Mushi, (Hargeisa, Somalia)	1995 – June 2001

Support staff

Administrative Secretary, Ms Lidia Naguib (Cairo, Egypt)	Sept 2002 – Dec 2005
Administrative Assistant, Ms Elsa Tekle (Asmara, Eritrea)	Nov 1997 – Dec 2002
Driver, Yahya Al-Oumani in Sana'a, Yemen	1997 – Dec 2005
Driver, Abdalla Ahmed Aofal in Cairo, Egypt	May 2003 – Dec 2005

Additional support staff in Asmara, Addis Ababa, and Sana'a on casual labour contracts

Backstopping missions by FAO HQ staff to EMPRES/CR

1997

Mr A Hafraoui	5th ELO Meeting and workshop on economics in locust management in Cairo, Egypt	18-28 September 1997
Mr N van der Graaff		
Mr C Elliott		
Mr B Zelazny		

1998

Mr C Elliott	Participation in FAO EMPRES/CR staff meeting in Asmara, Egypt	10-16 January 1998
Mr K Cressman	Assessment of the Desert Locust situation in northern Somalia and improvement of locust reporting	8-21 May 1998

1999

Mr K Cressman	Backstopping on locust monitoring and reporting in Sudan	15-17 March 1999
Mr C Elliott	Debriefing of the EMPRES/CR Coordinator in Asmara, Eritrea	1-6 October 1999
Mr A Hafraoui	Participation in 6th ELO Meeting in Sana'a, Yemen	4-7 November 1999
Mr B Zelazny		

2000

Mr K Cressman	Participation in NRI/FAO International Train the Trainers Course held in Muscat, Oman	18 January- 3 February 2000
Mr K Cressman	Participation on 1st joint survey on the Sudanese-Egyptian border	23 February – 8 March 2000
Mr N van der Graaff	Participation in EMPRES/CR Phase II planning workshop held in El Tur, Egypt from 26-30 March 2000	
Mr C Elliott		
Mr B Zelazny		
Mr A Hafraoui	Transfer of EMPRES/CR Coordination Office to Cairo	2-5 October 2000
Mr A Hafraoui	Participation in 8th ELO Meeting held in Muscat, Oman from 22-26 October 2000	21-26 October 2000
Mr C Elliott		
Ms A Monard	Participation in CRC/EMPRES research definition workshop held in Cairo, Egypt from 6-8 November 2000	
Mr K Cressman	Assessment of the potential Desert Locust populations in the Western Desert of Egypt and backstopping on improved monitoring methodologies	5-12 November 2000

2001

Mr C Elliott	Participation in 9th ELO Meeting held in Khartoum, Sudan from 13-18 October 2001	12-20 October 2001
Mr K Cressman		
Ms A Monard		

2002

Mr K Cressman	Assessment of the potential Desert Locust habitats in Djibouti and advice on improving data collection and reporting	23 January – 1 February 2002
Mr A Hafraoui Mr C Elliott	Participation on 4th Consultative Committee Meeting held in Cairo, Egypt	13-17 January 2002
Mr K Cressman	Assistance to and participation in EMPRES/CR contingency planning field seminar held in Burg El Arab, Egypt from 13-20 February 2002	8-22 February 2002
Mr C Elliott	Participation in EMPRES/CR contingency planning field seminar held in Burg El Arab, Egypt from 13-20 February 2002	11-22 February 2002
Mr K Cressman	Follow up to Sudanese Desert Locust Information Officer training and operational use of eLocust and RAMSES in Sudan and Yemen	4-15 June 2002
Mr K Cressman	Installation of RAMSES at he Locust Centre in Jeddah and participation in 10th ELO Meeting held in Jeddah, Saudi Arabia from 27-31 October 2002	25 October – 1 November 2002
Mr A Hafraoui Mr C Elliott	Participation in 10th ELO Meeting held in Jeddah, Saudi Arabia from 27-31 October 2002	25 October – 1 November 2002
Mr K Cressman	Assistance to organizing a FAO Desert Locust Master Trainers course held in Muscat, Oman from 7-17 October 2002, and field-testing of FAO Desert Locust Master Trainer Manual	4-18 October 2002
Mr K Cressman	Backstopping on improved Desert Locust survey and reporting to the Locust Information Office at the national Locust Control Centre and participation in 2nd TFCR Meeting held in Cairo, Egypt	25-29 November 2002

2003

Mr K Cressman	Backstopping on improved Desert Locust survey and reporting including on-the-job-training during survey of key Red Sea Desert Locust winter habitats in the eastern lowlands of Eritrea	17-27 February 2003
Mr P Ceccato	Installation of up-dated RAMSES data base at the DL unit in Muscat, Oman and training of national Information Officers	9-15 May 2003
Mr K Cressman	Assessment of the Desert Locust habitat in northern Somalia	9-20 June 2003
Mr P Ceccato	Installation of up-dated RAMSES data base at the DL units in Khartoum, Sudan and Asmara, Eritrea and training of national Information Officers	8-26 July 2003
Mr P Ceccato	Installation of up-dated RAMSES data base at the DL units in Addis Ababa, Ethiopia and Sana'a, Yemen and training of national Information Officers	5-19 August 2003
Mr A Hafraoui Mr C Elliott Mr K Cressman	Participation in 11th ELO Meeting held in Djibouti from 19-23 October	18-24 October 2003
Mr P Ceccato	RAMSES trouble shooting and retraining of Information Officers at the Locust Control Centre in Jeddah, Saudi Arabia	12-17 December 2003
Mr C Elliott	Mediation of bilateral assistance from Saudi Arabia to Sudan at the MoA in Khartoum, Sudan	9-12 December 2003

2004

Mr K Cressman	Participation in joint survey along the Saudi/Yemeni border on the Red Sea Coast and technical backstopping on reporting, campaign organization and use of RAMSES, eLocust and SPOT-VGT	10-20 January 2004
Mr K Cressman	Participation in 12th ELO Meeting held in Hurghada, Egypt from 09–13 October 2004	10-14 October 2004

2005

Major equipment/supplies provided since project inception[33]

Djibouti:

Phase I	Phase II	Phase III (up to September 2005)
• 1 Toyota pick-up (damaged) • 1 Desk-top computer incl. accessories • 2 fax machines, one Panasonic KX P81 • 4 Garmin GPS • 5 Wind speed meter • 3 ULVAmast sprayers • 1 printer	• 2 ULVA mast Micron sprayers • 5 Hand-held Micro- ULVA sprayers • 3 Codan Radio Transceivers • 3 Air conditioning • 1 Digital camera • various office equipment • 5 vibra-tak tachometer • 1 Toyota Pick up double cabin • 2 Compaq Desk-top computer incl. accessories • 2 Canon Laser jet printer 810 • 2 UPS • 1 Scanner • 2 Fax machines (canon + Panasonic)	• 1 Master Trainers' Training Kit (English)

Eritrea:

• 1 Toyota Land cruiser Station wagon • 2 Toyota Land cruiser pick up • 1 fax machine • 1 typewriter • 3 computers incl. Accessories • 1 heavy duty photocopier • 1 video camera • 2 test-mate OP kits • Various field equipment • 1 Motorola mobile radio • 5 HF station radio • 13 Micron ULVA mast sprayers • 240 SOLO motorized sprayer • 100 SOLO manual knapsack sprayers • 20 Solo-Port 423 • 100 micron ULVA sprayer	• Various field trial and camping equipment • 5 Micron ULVA mast sprayers • 1 computer incl. accessories • 1 Digital camera • Various survey equipment incl. 20 Garmin GPS. • 1 colour printer	• 15,000 L Fenitrothion ULV 45 %, • 4 ULVA mast vehicle mounted sprayers, • 70 ULVA+ handheld sprayers • 2 Master Trainers' Training Kits (English) • 10 GPS from EMPRES/CRC stock • 5 Windmeters from EMPRES/CRC stock • 5 Hygrometers from EMPRES/CRC stock • 5 hand lenses from EMPRES/CRC stock • 5 Compass from EMPRES/CRC stock • 5 stopwatches from EMPRES/CRC stock • 5 Tachometers from EMPRES/CRC stock • 5 Droplet Counting Templates from EMPRES/CRC stock

[33] Equipment purchased since January 2004 (Phase III) includes equipment purchased under TCP/INT/3003(e) and TCP/SUD/3003.

• 120 solo motorized sprayer • 2 generators • 9540 l Dursban • 10 ULVA mast V3M sprayers • 2 HP printers		

Egypt:

• 1 Toyota Land cruiser Station wagon • 1 Desk top computer incl. accessories • 2 Desk-top computers inc. accessories (EMPRES/CR office) • 1 printer HP desk jet 600 • 2 HP LaserJet 1100 printers (EMPRES office) • 1 digital camera (EMPRES office)	• 2 Land Rover Discovery (1 EMPRES Office, 1 GTZ Project) • 2 Desk-Top computers incl. accessories (EMPRES Office) • 1 Lap top computer (EMPRES Office) • 1 Scanner (EMPRES Office) • 1 canon photocopier GP160PF (EMPRES office). • 1 Compaq computer incl. accessories.(MoA). • 1 Sony digital camera. • 1 HP printer • 1HP scanner. • Various office furniture (EMPRES Office) • Various survey equipment incl. 20 GPS hand sets • Various field trial and camping equipment • 2 ULVA mast Micron sprayers • 5 hand-held Micro- ULVA • 25 Vibra-tak Tachometer • 1 4-wheel drive Pick-up • 1 Desk-top computer incl. accessories	• 2 mobile HF radios including modems • 1 HF base station including modem • 2 Master Trainers' Training Kits (English/Arabic) • 2 HP Compaq DC 7100 desktop computers (EMPRES/CR office) • 2 HP all-in-one printers HP PSC2353 (EMPRES/CR office) • 2 Psion computers • 10 GPS pcs. From EMPRES/CRC stock • 5 Windmeters from EMPRES/CRC stock • 5 Hygrometers from EMPRES/CRC stock • 5 hand lenses from EMPRES/CRC stock • 10 Compass from EMPRES/CRC stock • 5 stopwatches from EMPRES/CRC stock • 5 Tachometers from EMPRES/CRC stock

Ethiopia:

• 4 LaserJet printers • 1 scanner • 2 Hi Lux Toyota pick ups • 1 Toyota Prado Land Cruiser (EMPRES Office) • 1 Lap-top computer • 2 Lap-top computers (EMPRES Office) • 3 Desk-top computers incl. accessories • 1 Desk-top computer incl. accessories (EMPRES Office)(RAMSES)	• 1 Desk-top computer incl. accessories • Various training equipment • 1 digital camera	• 2 Master Trainers' Training Kits (English)

• 2 Psion computers • 1 fax machine (EMPRES Office) • 1 light photocopier (EMPRES Office) • Various field equipment (20 GPS, etc.) • 4 base HF radios • 1 mobile HF radio • 2500 Locust Manuals in Amharic • 2 Garmin GPS (EMPRES Office) • 1 Digital camera (EMPRES Office)		

Saudi Arabia:

• 2 mobile HF radios • 5 base HF radios • Various field equipment, 10 GPS	• 5 Hand-held Micro-ULVA • 5 Vibra-tak Tachometer	• 2 Master Trainers' Training Kits (English/Arabic)

Oman:

• 1 pc computer + accessories • 1UPS • 1 printer • 1 typewriter	• 5 Hand-held Micro- ULVA • 5 Vibra-tak Tachometer • 1 eLocust Palm-top computer	• 2 Master Trainers' Training Kits (English/Arabic)

Sudan:

• 1 Toyota Land cruiser station wagon • 4 Toyota Land cruiser pick-up (1 pick-up hijacked in Nov. 1999) • 2 Fax machines • 3 HP printers • 4 Desk top computers incl. accessories (1996, 1997, 2 in 2000) • 1 Lap top computer • 1 Generator • 2 photocopiers machine (1997, 1999) • Various field equipment • 12 HF Base radios • 10 HF mobile radios • 20 portable VHF radios • 1 Test mate kit • 16 ULVA mast sprayers • 1 overhead projector	• Various field trial and camping equipment • 1 eLocust field data transmission system (Incl. 2 Codan) • Radios, modems, GPS and hand-held computer) • 1 Generator • 8 Garmin GPS and other survey material (University of Khartoum) • 2 ULVA mast Micron sprayers • 5 Hand-held Micro-ULVA sprayers • 5 Vibra-tak Tachometer • 5 Garmin GPS • 1 Desk-top computer, incl. accessories • 1 Photocopy machine • 16 field beds incl. mosquito nets • 1 Toyota 4WD Land Cruiser Pick up • 1 National air-conditioner	• 1 Media Projector • 5 Solar cells • 1 Laptop computer • 2 UPS • 2 Stabilizers • 1 RBGAN Satellite receiver • 9 GPS hand sets • 2 mobile HF radios including modems • 2 Master Trainers' Training Kits (English/Arabic) • 100 sets of Protective clothing • Vehicle spare parts • Various stationeries • 4 digital cameras • 3 Compaq laptop computers • 1 desk jet colour printer • 1 laser jet printer

• 1 Psion computer	• 1 HP printer	• 1 sharp photocopier • 3 generators • 3 HF based Codan radios • 5 pcs. GPS from EMPRES/CRC stock • 5 Windmeters from EMPRES/CRC stock • 5 Psychrometer from EMPRES/CRC stock • 5 Tachometer from EMPRES/CRC stock • 5 Droplet Counting Templates from EMPRES/CRC stock • 5 Compasses from EMPRES/CRC stock • 5 Stop watches from EMPRES/CRC stock • 5 Hand lenses from EMPRES/CRC stock

Yemen:

• 1 Toyota Land cruiser station wagon (EMPRES Office) • 1 Toyota Land cruiser pick-up (EMPRES Office) • 1 Desk-top computers incl. Accessories, 1995 • 3 Desk-top computers incl. Accessories (EMPRES Office) (1997, 1998, 2000) • 1 Lap-top computer (EMPRES Office) • 1 e-locust computer • 1 fax machine • 1 heavy duty photocopier (EMPRES Office) • 4 HF radios • 1 Test-mate OP kit • 2 Garmin GPS (EMPRES Office) • 2 Digital camera (EMPRES Office) • 2 printers	• Various survey equipment incl. 20 GPS hand sets • Various field trial and camping equipment • 1 eLocust field data transmission system (Incl. 2 Codan • Radios, modems, GPS and hand-held computer) • 1 Desk-top computer, incl. accessories • 1 Laptop computer, incl. accessories • 1 Digital camera • 5 Hand-held Micro-ULVA sprayers • 5 Vibra-tak Tachometer • 8 fax machines • Various survey equipment • Various training equipment • 3 HP printers • 1 HP scanner • 1 projector	• 10 GPS hand sets • 2 mobile HF radios including modems • 15,000 L Fenitrothion ULV 45 % • 2 Master Trainers' Training Kits (English/Arabic) • 3 digital cameras • 1 Epson projector

Somalia:

• Various field equipment	• 1 Desk-Top computer incl. Accessories • 1 Fax machine	• 1 radio antenna • 1 Master Trainers' Training Kit (English)

	• Various office furniture • 1 Codan Radio Transceiver • 1 Honda motorbike • 1 GPS hand set • 1 fax machine • 2 photocopiers • 6 camp beds • 1 HP printer	• 1 Digital camera

DLCO-EA:

• 1 Desk-top computer incl. accessories	• 1 Blood testing kit • 1 Codan Radio (DLCO station Hargeisa) • 1 DGPS gear • 1 Codan Radio Transceiver (Djibouti base) • 2 Desk-top computer incl. accessories • 2 Hp printers • 1 HP colour scanner • 1 digital camera	• 4 DGPS track guidance equipment • 1 Master Trainers' Training Kit (English) • 1 pcs. GPS from EMPRES/CRC stock • 1 Windmeter from EMPRES/CRC stock • 1 Psychrometer from EMPRES/CRC stock • 1 Tachometer from EMPRES/CRC stock • 2 Droplet Counting Templates from EMPRES/CRC stock • 1 Compasses from EMPRES/CRC stock • 1 Stop watches from EMPRES/CRC stock • 1 Hand lenses from EMPRES/CRC stock

FAO-AGPP:

		• 1 Master Trainers' Training Kits (English/Arabic)

University of Khartoum:

	• Various laboratory equipment • 2 lap top Toshiba computers + accessories • 1 UPS • 2 Nokia op computers + accessories • Field equipment • 4 binoculars Kruss. • 2 HP LaserJet printer • 2 HP desk ink jet printer • 2 Sony digital cameras • 1 screen projector • various training material • 1 overhead projector A+K	• 2 Master Trainers' Training Kits (English)

EMPRES/WR:

		• 2 Master Trainers' Training Kits (Arabic) – Mauritania, Libya

CRC, EMPRES/CR[34]

• **50 Windmeters** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA* • **50 Droplet Counting Templates** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Sudan* ➢ *2 pcs. to DLCO-EA* • **50 Tachometer** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA*	• **50 Compasses** ➢ *5 pcs. to Eritrea* ➢ *10 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA* • **50 Stop watches** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA* • **50 Hand lenses** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA*	• **30 GPS hand sets** ➢ *10 pcs. to Eritrea* ➢ *10 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA* • **30 Psychrometers** ➢ *5 pcs. to Eritrea* ➢ *5 pcs. to Egypt* ➢ *5 pcs. to Sudan* ➢ *1 pcs. to DLCO-EA* • **35 Master Trainers' Training Kits (Eng./Arabic)** ➢ *1 Djibouti* ➢ *2 Egypt* ➢ *2 Eritrea* ➢ *2 Ethiopia* ➢ *2 Saudi Arabia* ➢ *2 Oman* ➢ *2 Sudan* ➢ *1 Somalia* ➢ *2 Yemen* ➢ *1 DLCO-EA*

[34] Phase III only; for distribution to EMPRES/CR countries upon request.

		➢ *1 AGPP* ➢ *2 Univ. of Khartoum* ➢ *2 EMPRES/WR*

Meetings and Seminars

- Regional training course on aerial spraying in Ziway, Ethiopia from 3-10 November 1996

Phase I

- International Train the Trainers course in Silwood Park, UK from 16-27 June 1997
- Workshop on economic impact of Desert Locust control, and 5th ELOM in Cairo, Egypt from 21-25 September 1997
- 2nd FAO EMPRES/CR Staff meeting in Asmara, Eritrea from 12-14 January 1998
- International Train the Trainers course in Silwood Park, UK from 8-19 June 1998
- Core Research Team (CRT) meeting at NRI, Chatham, UK from 27-30 September 1998
- Workshop on EMPRES development indicators in Ziway, Ethiopia from 25-29 May 1998
- Country Focus planning meeting in Asmara, Eritrea from 19-20 November 1998
- 6th EMPRES Liaison Officers meeting in Cairo, Egypt from 6-8 December 1998
- 1st Consultative Committee Meeting in Cairo, Egypt from 9-10 December 1998
- Workshop on defining a standardized staff training concept on Desert Locust management in Addis Ababa, Ethiopia from 25 – 29 January 1999
- 3rd FAO EMPRES/CR Staff Meeting in Sana'a, Yemen from 8-10 February 1999,
- Bio-control workshop in Cairo, Egypt from 27-29 April 1999
- Technical meeting at NRI on RAMSES data base and training development in Chatham and Wolverhampton, UK from 16-20 May 1999
- 35th DLCC Meeting in Rome, Italy from 24-28 May 1999
- Country Focus planning workshop in Khartoum, Sudan from 19–22 June 1999
- Regional Training of Trainers seminar in Sana'a, Yemen from 6-10 September 1999
- Country Focus planning workshop in Sana'a, Yemen from 12-15 September 1999
- CRC Executive Committee meeting in Amman, Jordan from 18-20 October 1999
- 7th EMPRES Liaison Officers meeting in Sana'a, Yemen from 6-10 November 1999
- 2nd Consultative Committee Meeting in Rome, Italy from 24-26 November 1999
- 4th FAO EMPRES/CR Staff Meeting in Addis Ababa, Ethiopia from 12-14 January 2000
- International Train the Trainers course in Muscat, Oman from 22 January – 2 March 2000
- EMPRES/CR Phase II planning workshop in El Tur, Egypt from 26-30 March 2000
- Workshop on simulation studies at Wageningen University, The Netherlands from 17-20 April 2000
- Technical meeting at NRI on preparation of Desert Locust management Training Manual in Chatham, UK from 7-9 May 2000
- 7th Session of DLCC Technical Group meeting in Rome, Italy from 12-15 June 2000
- Workshop on economic questions of Desert Locust control in Rome, Italy from 28-30 June 2000
- Technical meeting at ICIPE on Desert Locust pheromone research, Nairobi, Kenya from 12-13 July 2000
- Participation in 45th session of DLCO-EA Council of Ministers Meeting in Djibouti Town, Djibouti from 28-29 September 2000
- 8th EMPRES Liaison Officers meeting in Muscat, Oman from 22-26 October 2000
- Technical meeting on the promotion of applied research in the Central Region, Cairo, Egypt from 6-8 November 2000
- 3rd Consultative Committee Meeting, Rome, Italy from 7-8 December 2000

Phase II

- 4th FAO EMPRES/CR staff meeting in Addis Ababa, Ethiopia from 22-26 January 2001

- Virginia Tech Pan African workshop on harmonization of mycopesticide registration in Cotonou, Benin from 29 January – 2 February 2001
- EMPRES/WR, Programme planning workshop in Nouakchott, Mauritania from 10–15 February 2001
- Research workshop at University of Wageningen, The Netherlands from 21-23 May 2001
- 36th DLCC Meeting in Rome, Italy from 24-28 September 2001
- 9th EMPRES Liaison Officers meeting in Khartoum, Sudan from 13-18 October 2001
- Experts Consultation Meeting on mycopesticide importation/registration in Rome, Italy from 3-7 December 2001
- Country Focus planning workshop in Addis Ababa, Ethiopia from 4-7 December 2001
- 1st FAO/CRC/EMPRES/DLCO Joint Technical Form Meeting in Addis Ababa, Ethiopia from 12-13 December 2001
- 4th Consultative Committee Meeting in Cairo, Egypt from 15 – 17 January 2002
- 5th FAO EMPRES/CR Staff Meeting in Cairo, Egypt from 21-22 January 2002
- Contingency Planning Seminar ion Borg El Arab, Egypt from 13 – 21 February 2002
- CRC Meeting, Damascus, Syria from 9 – 14 March 2002
- Sprayer Testing Workshop in Cairo, Egypt from 9 – 16 September 2002
- 4th International ToT Training Course in Muscat in Muscat, Oman from 7 -17 October 2002
- 10th EMPRES/CR Liaison Officers Meeting in Jeddah, Saudi Arabia from 27 – 31 October 2002
- 2nd Joint Technical Forum Meeting in Cairo, Egypt, 27 – 28 October 2002
- EMPRES/WR DGPS workshop in Nouakchott, Mauritania from 15-19 December 2002 (with two participants from EMPRES/CR)
- Interregional bio-control field workshop in Port Sudan, Sudan from 10-20 January 2003
- 6th FAO EMPRES/CR Staff Meeting, Khartoum, Sudan, 13-15 January 2003
- 1st EMPRES/WR ELO Meeting in Niamey, Niger from 30 January – 3 February 2003
- 5th Consultative Committee Meeting and Phase III planning workshop in Rome, Italy from 19-23 May 2003
- 37th DLCC Meeting in Rome, Italy from 22-26 September 2003
- 11th EMPRES/CR Liaison Officers Meeting in Djibouti Town, Djibouti from 19-23 October 2003
- 3rd Joint Technical Forum Meeting in Addis Ababa, Ethiopia from 17-20 November 2003

Phase III

- Locust Group staff meeting in Rome, Italy, 23-25 February 2004
- 1st ad hoc emergency prevention meeting, Khartoum, Sudan, 15-17 March 2004
- CRC Meeting in Jeddah, Saudi Arabia from 17-22 April 2004
- Country Focus planning workshop in Jeddah, Saudi Arabia from 23–27 April 2004
- DLCCTG Meeting in Nouakchott, Mauritania from 2–6 May 2004
- 2nd ad hoc emergency prevention meeting in Khartoum, Sudan from 6-10 September 2004
- 12th EMPRES Liaison Officers meeting in Hurghada, Egypt from 9–13 October 2004
- Extraordinary Session of the DLCC in Rome, Italy from 29 November–02 December 2004
- Participation in 3rd EMPRES/WR Liaison Officers Meeting in Dakar, Senegal from 7-11 February 2005
- Participation in 2nd Locust Group staff meeting in Rome, Italy from 23-25 February 2005
- 3rd ad hoc emergency prevention meeting in Cairo, Egypt from 22-24 March 2005
- Participation of ELO from Djibouti in regional Train the Trainers course organized by EMPRES/WR in Niamey, Niger from 14 March – 05 April 2005
- National workshop for Information Provider in Sana'a, Yemen from 24-25 June 2005

- EMPRES/WR starting up meeting in Rome, Italy from 5-9 September 2005

Training Courses Phase I to III[35]

Attendance

	DJI	EGY	ERI	ETH	OMA	SAU	SUD	SOM	YEM	Total
Phase I	35	30	21	122	27	29	123	11	45	443
Phase II	17	17	19	61	2	19	32	10	2	179
Phase III	1	46	81	56	10	0	102	0	61	357
Total	53	93	121	239	39	48	257	21	108	979

Topics

	S&C	Survey	ToT	Radio Operation	Data Processing	Total
Phase I	307	61	33	8	42	451
Phase II	97	49	24	18	6	194
Phase III	262	83	3	0	9	357
Total	666	193	60	26	57	1002

[35] Slight differences in the training statistics due to people trained from outside the Region (Pakistan, Libya, Jordan, Australia).

Reports and Publications since Phase I

1997

- Report on regional training course with emphasis on aerial spraying in Ziway, Ethiopia from 3-10 November 1996 (NRI), January 1997
- Report on train the trainers course on safety and efficient locust control in Silwood Park, UK from 16-27 June 1997 (NRI/IPARC), July 1997
- Preliminary analysis on economics and policy issues in Desert Locust management (AGPP), October 1997
- Report on 5th EMPRES/CR Liaison Officers Meeting in Cairo, Egypt from 23-25 September 1997 (EMPRES/CR), October 1997,
- EMPRES/CR annual progress report 1997 (EMPRES/CR), September 1997

1998

- Consolidated evaluation report on past Desert Locust control campaigns in the Central Region (EMPRES/CR), January 1998
- Report on regional training course on Desert Locust control in Hodeidah, Yemen from 28 March – 2 April 1998 (AGPP), May 1998
- Report on Desert Locust and the ecological conditions in the Kingdom of Saudi Arabia (National Centre for Locust Control and Research), June 1998
- Potential for the implementation of microbial control of Desert Locust in the Central Region, report of biocontrol scoping mission (EMPRES/CR), June 1998
- Report on train the trainers course on safety and efficient locust control in Silwood Park, UK from 8-19 June 1998 (NRI/IPARC), July 1998
- Report on EMPRES Liaison Officers Workshop on identification of progress indicators and roles of the Liaison Officers within the implementation process of the EMPRES Programme, Ziway, Ethiopia from 25-29 May 1998 (EMPRES/CR), September 1998
- Report on Desert Locust monitoring systems in the Central Region (EMPRES/CR), October 1998
- Eritrea Country Focus concept paper (EMPRES/CR), October 1998
- Report of contingency planning workshop conducted in Khartoum, Sudan from 6-8 October 1998 (EMPRES/CR), October 1998
- Report on national survey and control training course in Kosti, Sudan from 10-19 October 1998 (EMPRES/CR), November 1998
- EMPRES/CR annual progress report 1998 (EMPRES/CR), November 1998
- Report on regional training course on aerial and ground control of the Desert Locust in Ismailia, Egypt from 14-24 November 1998 (EMPRES/CR), December 1998
- The cost of aerial and ground control operations of the Desert Locust in Sudan, winter campaign 1997/89 (EMPRES/CR), December 1998
- Report on 6th EMPRES/CR Liaison Officers Meeting in Cairo, Egypt from 6-8 December 1998 (EMPRES/CR), December 1998

1999

- Report on 1st Meeting of the Consultative Committee in Cairo, Egypt from 9-10 December 1998(AGPP), January 1999
- Report on national survey and control training course in Sana'a, Yemen from 15-17 February 1999 (EMPRES/CR), February 1999
- Report on remote-sensing-meteorology-survey information integration (EMPRES/CR), February 1999

- Report on workshop for the development of a standard training concept on Desert Locust management subjects, Addis Ababa, Ethiopia from 25-29 January 1999 (EMPRES/CR) May 1999
- FAO Desert Locust Technical Series No. 29; Field tests on integrated Differential GPS navigation and spray monitoring system for aerial Desert Locust control operations conducted in Sudan from 25 March – 8 April 1998 (EMPRES/CR), May 1999
- Report on contingency planning workshop conducted in Addis Ababa, Ethiopia from 12-15 April 1999 (EMPRES/CR), May 1999
- Sudan Country Focus concept paper (EMPRES/CR), August 1999
- Report on national training course on locust management and pesticide application techniques in Kombolcha, Ethiopia from 14-26 September 1999 (EMPRES/CR), September 1999
- Report of Training the Trainers workshop in Sana'a, Yemen from 6-10 September 1999 (EMPRES/CR), October 1999
- Report on national survey & control training course in Djibouti Town, Djibouti from 18-22 October 1999 (EMPRES/CR), October 1999
- Yemen Country Focus concept paper (EMPRES/CR), October 1999
- Draft regulation for the introduction and release of biological control agents in Ethiopia (MoA Ethiopia), November 1999
- EMPRES/CR annual progress report 1999 (EMPRES/CR), November 1999
- Report on 7th EMPRES/CR Liaison Officers Meeting in Sana'a, Yemen from 6-10 November 1999 (EMPRES/CR), December 1999
- Report on 2nd Meeting of the Consultative Committee in Rome, Italy from 24-26 November 1999 (AGPP), December 1999

2000

- Semio-chemical research for sustainable management and control of the Desert Locust, report on mission to ICIPE and its field station in Port Sudan, Sudan (DEZA-Switzerland), January 2000
- MSc thesis on bio-ecological studies on the Desert Locust [Schistocerca gregaria (Forskål)] (CRC-Department of Agricultural Zoology and Entomology, Rajasthan College of Agriculture, Udaipur, India), January 2000
- EMPRES Brochure (FAO), February 2000
- Revised EMPRES Programme Document (FAO), February 2000
- EMPRES Phase II Implementation Document (EMPRES/CR), April 2000
- Report on NRI/IPRC/FAO International Train the Trainers Locust S&C Course in Oman 22 January – 2 February 2000 (NRI), February 2000
- Travel report to Sudan, Red Sea Coast on Population Dynamic Assessment (Wageningen University), February 2000
- 1st review Sudan Country Focus concept (EMPRES/CR), April 2000
- 1st review of Eritrea Country Focus concept (EMPRES/CR), May 2000
- 1st review of Yemen Country Focus concept (EMPRES/CR), May 2000
- Report on the national training course on Desert Locust Survey and control operations, Sudan (EMPRES/CR), May 2000
- Report on the First Joint Survey of the Desert Locust Winter Breeding Areas on the Egyptian-Sudanese Border from 26 February – 8 March 2000 (DLIS-EMPRES/CR), June 2000
- Draft Guide to Economic Evaluation of Desert Locust Management (University of Hanover), June 2000
- Midterm Progress Report, January to June 2000 (EMPRES/CR), August 2000
- Report on Desert Locust Economics Meeting, Rome. 28 - 30 June 2000 (EMPRES/CR), August 2000

- Report on workshop on Desert Locust strategies, Wageningen, 21-28 April 2000 (Wageningen University, EMPRES/CR), August 2000
- Report on local training course on Desert Locust survey and control operations, El Obeid, Sudan, 26 – 28 August 2000 (EMPRES/CR), September 2000
- Report on national training course on Desert Locust survey and control in Djibouti Town, Djibouti, from 11-14 September 2000 (EMPRES/CR), September 2000
- PhD study on the effect of different food plant species on the life system of Desert Locust Schistocerca gregaria, Forskål (Acrididae: Orthoptera), (CRC, University of Khartoum), October 2000
- Comparative study on the effect of the efficiency of available survey methods of adult and hopper populations of Desert Locust, Schistocerca gregaria (Forskål) (Orthoptera: Acrididae), (CRC, University of Khartoum), October 2000
- Report on national training course on Desert Locust survey and control operations in Muscat, Oman 28 October – 6 November 2000, (EMPRES/CR), October 2000
- Report on national training course on Desert Locust survey and control operations, Hurghada, Egypt, 11-16 November 2000, (EMPRES/CR), November 2000
- Report on national training on Desert Locust survey and control in Harar, Ethiopia from 16-25 October (EMPRES/CR), November 2000
- Report on 8th EMPRES/CR Liaison Officers Meeting in Muscat, Sultanate of Oman from 22-26 October 2000 (EMPRES/CR), November 2000
- Report on workshop for strengthening applied research on the Desert Locust in the Central Region, Cairo, Egypt from 6-8 November 2000 (EMPRES/CR), November 2000
- Report on local training course on Desert Locust survey and control operations, Ed-Damer,, Sudan, 26/1 - 28/11/2000 (EMPRES/CR), December 2000
- Proceeding of the workshop on Ethiopian draft regulation on bio-control agents (MoA Ethiopia, Virginia Technical Institute), December 2000
- EMPRES/CR annual progress report 2000 (EMPRES/CR), December 2000

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- Report on 3rd Meeting of the Consultative Committee in Rome, Italy from 7-8 December 2000 (AGPP), January 2001
- Mid-term report: Bio-geographical research into desert locust recession populations in Ethiopia, January 2001
- Travel Report to Sudan, Red Sea Coast, on Population Dynamic Assessment, 24 November - 3 December 2000 (Wageningen University), January 2001
- Report on national training course on Desert Locust survey and control Operations, El-Obeid, Sudan 03-11 February 2001 (EMPRES/CR), February 2001
- Guidelines to the EMPRES Programme Monitoring System, A. Activity Monitoring (EMPRES/CR), March 2001
- Guidelines for conducting joint surveys (DLIS), March 2001
- Report on national training course on Desert Locust survey and control operations, Dubarwa, Eritrea from 19/02 - 03/03/2001, (EMPRES/CR), March 2001
- 2nd review of Eritrea Country Focus concept (EMPRES/CR), May 2001
- 2nd review of Sudan Country Focus concept (EMPRES/CR), May 2001
- MSc. thesis on Desert Locust populations comparison in different recession periods in Ethiopia (University of Alemaya, Ethiopia), May 2001
- 6th mid-term Progress Report (University of Wageningen), June 2001
- Darstellung und Bewertung des PPP-Projektes “Produktion und Vermarktung eines biologischen Heuschreckenbekämpfungsmittels” (GTZ), June 2001
- Report on ground NDVI verification survey along the Red Sea coast and its peripheries in Eritrea from 11-22 May 2001, (EMPRES/CR – MoA Eritrea), June 2001

- Report on national survey and control training course in Hargeisa, Somalia from 10-13 June 2001 (EMPRES/CR), July 2001
- Report on in-country joint survey of Desert Locust in summer breeding areas in the states: North Kordofan, White Nile and Western section of the Sudan from 25 August – 3 September (DLIS-EMPRES/CR), September 2001
- Report on regional ToT training course in Port Sudan, Sudan from 23-31 October 2001 (EMPRES/CR), November 2001
- Report on local training on the use of standard survey and control forms in Khartoum, Sudan from 16-17 June 2001 (PPD Sudan), November 2001
- Report on 9th EMPRES/CR Liaison Officers Meeting in Khartoum, Sudan from 13-18 October 2001 (EMPRES/CR), November 2001
- Ethiopia Country Focus concept paper (EMPRES/CR), December 2001

2002

- EMPRES/CR annual progress report 2001 (EMPRES/CR), January 2002
- Farmers' Desert Locust training guideline in Tigrinya (PPQU Eritrea), January 2002
- Report of 4th EMPRES Consultative Committee Meeting, Cairo 15-17 January 2002 (FAO), February 2002
- Publication: Spatial distribution of the Desert Locust in the coastal plains of Sudan (Wageningen University-EMPRES/CR), January 2002
- Report on RAMSES training at Natural Resources Institute, Chatham, UK from 14-25 January (EMPRES/CR), 2002
- 2nd Report on progress "Ecological Field Studies on Desert Locust Population Dynamics" (University Khartoum), February 2002
- 2nd Report on progress "Impact of Alternative Pesticides used in Desert Locust Operation on Honey Bees and other Non-Target Organisms" (University Aden), March 2002
- Contingency planning workshop manual (EMPRES/CR), March 2002
- Report on progress - Country Focus Programme Ethiopia (CPPTRD), March 2002
- Report on workshop for improved spraying techniques and novel survey methods, Nouakchott, Mauritania from 17 November – 6 December 2001 (EMPRES/CR-WR), April 2002
- Report on progress on mass rearing of Desert Locust for PAN and Green Muscle® semi-field trials near Port Sudan (ICIPE), April 2002
- Report on radio operators training in Ethiopia (CPPTRD), April 2002
- Assessment of the Socio-Economic Impact of Desert Locust and their Control (DFID) April 2002
- Review of CF Programmes in Eritrea and Yemen (EMPRES/CR) May 2002
- Report on Radio Operation and Maintenance Training in Addis Ababa, Ethiopia from 15-19 April 2002 (CPPTRD), June 2002
- EMPRES/CR Report on Progress - Period January - June 2002 (EMPRES/CR) July 2002
- 2nd review of Yemen Country Focus concept (EMPRES/CR), June 2000
- 3rd review of Sudan Country Focus concept (EMPRES/CR), July 2002
- Compilation of high frequency breeding areas and incidences of the Desert Locust in the Central Region (EMRES/CR), July 2002
- Report on expert consultation and risk assessment on the importation and large scale use of mycopesticides against locusts, Rome, Italy from 2-7 December 2001 (FAO), August 2002
- Report on RAMSES training in Yemen (EMPRES/CR) August 2002
- Report on RAMSES training in Eritrea (EMPRES/CR) August 2002
- Scenario studies for improved DL survey and control strategies, 8th progress report (Wageningen University) August 2002

- Report on national survey & control training course in Burg El Arab, Egypt from 17-25 August (CRC), September 2002
- Minutes of Meeting, 10th ELO Meeting (EMPRES/CR), November 2002
- Socio-economics of Desert Locust control in Sudan - A Micro Level Case Study (EMPRES/CR), November 2002
- The effect of Metarhizium anisopliae var. acridium (Metch.) Sorokin in conjunction with the adult gregarization pheromone on the gregarious nymphs of Schistocerca gregaria, Forskål (Acrididae: Orthoptera), (CRC, University of Khartoum), October 2002
- Report on installation of Trimble Trimflight3 on DLCO-EA aircraft (DLCO-EA), October 2002
- Report on 2nd meeting of the Joint Technical Forum for the Central Region (EMPRES/CR – CRC), November 2002
- Report on 10th EMPRES/CR Liaison Officers Meeting in Jeddah from 27-31 October 2002 (EMPRES/CR), November 2002
- Compilation of literature and references with regard to the bio-pesticide Green Muscle® (GTZ-EMPRES/CR), November 2002
- Report on national survey and control training course in Djibouti from 9-11 November 2002 (MoA, Djibouti), November 2002
- 1st review of Ethiopia Country Focus concept (EMPRES/CR), December 2002
- Consolidated report on progress (Phase I) "Optimization, validation and transfer of pheromone technology to national Locust Control Organizations" (ICIPE), December 2002
- Draft workshop report on sprayer testing used in Desert Locust control in Cairo, Egypt from 23-25 September 2002 (EMPRES/CR – CRC), December 2002
- Manual to visualize and analyze SPOT4-Vegetation images (DLIS-AGPP), December 2002
- MSc thesis on Review and testing old and new Desert Locust control technologies with a view to recommending technologies for the future, (CRC-NRI), December 2002
- Report on national survey and control training course in Kombolcha, Ethiopia from 25 November – 4 December 2002 (CPPTRD), December 2002
- Report on international Training of Trainers training course conducted in Muscat, Oman from 7-17 October 2002 (NRI-CRC-EMPRES/CR-DLIS), December 2002
- Report on local training course on Desert Locust identification, survey and reporting in Dire Dawa, Ethiopia from 16-20 December 2002 (CPPTRD Ethiopia), December 2002
- 3rd Report on Progress "Ecological Field Studies on Desert Locust Population Dynamics" (University of Khartoum), December 2002

2003

- MSc thesis on improved survey methods for gregarious and gregarizing hopper patches of Desert Locust (AGPP, University of London Imperial College), January 2003
- Report on 1st joint cross border survey between Saudi Arabia and Yemen at the Red Sea coastal plains in December 2002 (EMPRES/CR), January 2003
- EMPRES/CR annual progress report 2002 (EMPRES/CR), January 2003
- 4th review Sudan Country Focus concept (EMPRES/CR), February 2003
- Report on national survey and control training course in Jeddah, Saudi Arabia from 8-19 March 2003 (CRC), March 2003
- Report on 2nd joint cross border survey of the Desert Locust in the winter breeding areas on the Egyptian-Sudanese Border (EMPRES/CR), April 2003
- Report on 5th EMPRES Consultative Committee Meeting, Rome, 19-23 May 2003 (AGPP), May 2003
- Final report on ecological field studies on Desert Locust population dynamics (University of Khartoum), May 200

- 3rd review of Yemen Country Focus concept (EMPRES/CR), June 2003
- Assessing the socio-economic impact of Desert Locust control in Egypt, a case-study (Ain Shams University, Cairo), July 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
- Optimization, validation and transfer of pheromone technology to national locust control organizations, Phase II 1st scientific report (ICIPE), 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 national survey and control training course in Ziway, Ethiopia from 19-28 July 2003 (CPPTRD Ethiopia), September 2003
- Report on national survey and control training course in Burg El Arab, Egypt from 13-18 September 2003 (Locust Control Centre Egypt), October 2003
- Report on 11th EMPRES/CR Liaison Officers Meeting in Djibouti Town, Djibouti from 19-23 October 2003 (EMPRES/CR), November 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, Port Sudan, Sudan from 10-20 January 2003 (GTZ-EMPRES/CR), December 2003
- Standard Operation Procedures (SOPs) for ground survey and control in English and Arabic (CRC-EMPRES/CR) December 2003
- Report on 11th ELO Meeting in Djibouti Town, Djibouti from 19-23 October 2003 (EMPRES/CR) December 2003
- PhD thesis on habitat and spatial pattern of solitarious Desert Locust (Schistocerca gregaria, Forskål) on the coastal plain of Sudan (Wageningen University) December 2003

2004

- Report on 2nd joint cross border survey between Saudi Arabia and Yemen (EMPRES/CR), January 2004
- Report on testing the MATABI hand-held ULV sprayer (MoA Egypt, MoA Sudan), January 2004
- EMPRES/CR annual progress report 2003 (EMPRES/CR) , February 2004
- 1st report on progress on the effects of Green Muscle® on locusts and grasshopper in Egypt (Plant Protection Research Institute, Cairo), February 2004
- Report on joint cross border survey between Djibouti and Somalia (EMPRES/CR), March 2004
- 11th progress report, July - December 2003; Scenario studies for improved Desert Locust survey and control strategies (Wageningen University), March 2004
- Report on 1st ad hoc emergency prevention meeting in Khartoum, Sudan from 15-17 March 2004 (EMPRES/CR), March 2004
- Report on RAMSES installation in Egypt (EMPRES/CR), April 2004
- Report on local training course in Shabwah, Yemen from 27-31 March 2004 (EMPRES/CR), April 2004
- Report on 8th Session of the DLCCTG - contingency planning workshop in Nouakchott, Mauritania from 2-7 May 2004 (AGPP), May 2004
- Report on national survey & control training course in Dongola, Sudan from 22-29 May 2004 (Locust Control Centre-Sudan), May 2004

- Final report on evaluation of efficacy of metarhizium anisopliae (Green Muscle®) against mixed grasshoppers spp. in central Ethiopia (Addis Ababa University), May 2004
- Report on DGPS demonstration and training on ground support for aerial operations (DLCO-EA), June 2004
- Report on Green Muscle® registration trials in Sudan presented to the 70th meeting of the Pest and Diseases Committee of the MoA in Sudan: Use of the fungus Metarhizium anisopliae var. acridium in the control of locusts with reference to Schistocerca gregaria (Forskål) and Locusta migratoria migratoriodes (R.&F.) (PPD Sudan-ICIPE), June 2004
- Workshop report on spray equipment used in Desert Locust Control: English and Arabic (CRC-EMPRES/CR), June 2004
- 2nd report on progress on Desert Locust distribution in relation to herbal quality in Sudan (University of Khartoum), June 2004
- Draft final report on the impact of alternative pesticides used in Desert Locust operations on honey bees and other non-target organisms in the Republic of Yemen (University of Aden), June 2004
- EMPRES/CR Phase II Evaluation Report (FAO), June 2004
- Optimization, validation and transfer of pheromone technology to national locust control organizations, Phase III 1st scientific report (ICIPE), July 2004
- Report on local training course in Mekele, Ethiopia from 3-7 May 2004 (MoA Crop Protection Department-Ethiopia), July 2004
- Checklist on assessing the training impact/performance of survey officers, in English and Arabic (EMPRES/CR, CRC), July 2004
- Checklist on assessing the training impact/performance of control officers, in English and Arabic (EMPRES/CR, CRC), July 2004
- Checklist on assessing the training impact/performance of locust information officers, in English and Arabic (EMPRES/CR, CRC), July 2004
- Report on national survey & control training course in Hajjah, Yemen from 5-10 June 2004 (EMPRES/CR), July 2004
- Report on national survey & control training course in El-Obeid, Sudan from 3-9 July 2004 (Locust Control Centre-Sudan), July 2004
- 35 Master Trainer's Training Kits on standard training on survey and control operations, English/Arabic (CRC- EMPRES/CR), July 2004
- Report on national survey & control training course in Sharqia and Dofar, Oman from 17-21 July and 29 July – 4 August 2004 (EMPRES/CR, MoAF Oman), August 2004
- 2nd report on progress on the effects of Green Muscle® on locusts and grasshopper in Egypt (Plant Protection Research Institute, Cairo), August 2004
- Report on national survey & control training course in Eritrea (MoA Eritrea), August 2004
- Report on national survey & control training course in Borg El-Arab, Egypt from 7-16 August (MoA Locust Control Centre-Egypt), September 2004
- Report of 2nd ad hoc emergency prevention meeting in Khartoum, Sudan from 6-9 September 2004 (EMPRES/CR), September 2004
- Guideline on the preparation of campaign summary reports (EMPRES/CR, CRC) September 2004
- Draft guidelines for the development of country contingency plans for Desert Locust plague control campaigns (AGPP), September 2004
- Report on 12th ELO Meeting in Hurghada, Egypt from 9-13 October 2004 (EMPRES/CR), October 2004
- Standard Operating Procedures (SOP) on aerial survey and control (CRC), November 2004
- 3rd report on progress on the effects of Green Muscle® on locusts and grasshopper in Egypt (Plant Protection Research Institute, Cairo), November 2004
- Report on 12th EMPRES/CR Liaison Officers Meeting in Hurghada, Egypt from 9-13 October 2004 (EMPRES/CR), November 2004

- 3rd review of Eritrea Country Focus concept (EMPRES/CR), December 2004
- 4th review of Yemen Country Focus concept (EMPRES/CR), December 2004
- 2nd review of Ethiopia Country Focus concept (EMPRES/CR), December 2004
- Report on national survey & control training course in Hodeidah, Yemen from 27 November – 2 December 2004 (Locust Control Centre-Yemen), December 2004
- Report on national Desert Locust management training course in Dire Dawa, Ethiopia from 16-25 December 2004 (MoA Crop Protection Department-Ethiopia), December 2004
- Study on barrier treatments as means of controlling migratory locusts, Final version (GTZ- EMPRES/CR), December 2004

2005

- Saudi Arabia Country Focus concept paper (EMPRES/CR), January 2005
- Report on local training course on locust information reporting and safety measures in El-Damar, Sudan from 27-29 December 2004 (Locust Control Centre-Sudan), February 2005
- Report on 3rd joint cross border survey between Saudi Arabia and Yemen, January 2004 (EMPRES/CR)
- Report on national Desert Locust management training course in Suakin, Sudan from 11-20 December 2004 (Locust Control Centre-Sudan), February 2005
- EMPRES/CR report on progress, 2004 (EMPRES/CR), March 2005
- Report on national Desert Locust management training course in Gadarif, Sudan from 19-25 February 2005 (Locust Control Centre-Sudan), March 2005
- Report on 3rd ad hoc emergency prevention meeting in Cairo, Egypt from 22-24 March 2005 (EMPRES/CR), March 2005
- Report on 3rd joint cross border survey between Egyptian and Sudanese survey teams in the winter breeding areas of the Red Sea coast (Locust Control Ministry of Agriculture & Land Reclamation, Egypt), April 2005
- Report on national Desert Locust management training course in El-Ismailia, Egypt from 19-26 March 2005 (Locust Control Ministry of Agriculture & Land Reclamation, Egypt), April 2005
- 2nd report on progress on Desert Locust distribution in relation to herbal quality in Sudan (University of Khartoum), April 2005
- Report on 3rd joint cross border survey between Yemeni and Saudi survey teams in the winter breeding areas of the Red Sea coast of the Tihama (Desert Locust Control and Monitoring Centre, Yemen), April 2005
- Report on national Desert Locust management training course in Debub, Eritrea from 20 April – 4 May 2005 (MoA Eritrea), May 2005
- Report on RAMSES training in Addis Ababa, Ethiopia from 23-27 May 2005 (DLCO-EA), May 2005
- Report on national Desert Locust management course in El Fashir, Sudan from 3-9 May 2005 (Locust Control Centre, Sudan), May 2005
- Report on local Desert Locust control training course in Marib, Yemen from 28 May – 2 June 2005, (Locust Control Centre, Yemen), June 2005
- 1st report on progress on the effects of PAN on non-target insects (University of Khartoum), June 2005
- Review report on the Post Graduate Diploma in Desert Locust Control at University of Khartoum (CRC-EMPRES/CR), September 2005
- Preparedness to prevent desert locust plagues in the Central Region, An historical review (EMPRES/CR), September 2005
- A Locust Officer's Field Guide, locusts and some other grasshoppers of the Central Region, (CRC-EMPRES/CR), September 2005

Research projects supported by EMPRES/CR and CRC

- 1 study on eco-toxicological aspects of PAN, DLCO-EA (in the pipeline),
- 1 study on efficiency of Green Muscle® on grasshoppers since March 2005, DLCO-EA (ongoing),
- 1 MSc study on eco-toxicological aspects of PAN since June 2004, University of Khartoum (ongoing),
- 1 MSc study on survey methods since Sept. 2004, University of Khartoum (ongoing),
- Phase III: field-testing of Desert Locust pheromone Phenylacetonitrile (PAN) since March 2004, ICIPE (ongoing),
- 1 project on efficiency of Green Muscle® since Aug. 2003, Plant Protection Research Institute, Cairo (ongoing),
- 1 project on efficiency of Green Muscle® on grasshoppers, University of Addis Ababa, February 2003 – June 2004 (completed),
- 1 MSc study on effect of herbal quality on Desert Locust distribution since January 2003, University of Khartoum (ongoing),
- Phase II: field-testing of Desert Locust pheromone Phenylacetonitrile (PAN) February 2003 – November 2003, ICIPE (completed),
- 1 project on impact of environmental factors and control operations on the Desert Locust population in Saudi Arabia, since July 2002, King Faisal University (ongoing),
- 1 MSc study on control technologies, May 2002 – December 2002, NRI (completed),
- Phase I: field-testing of Desert Locust pheromone Phenylacetonitrile (PAN) October 2001-2002, ICIPE (completed),
- 1 MSc study on Desert Locust population comparison in different recession periods in Ethiopia, Alemaya University, October 1999 - May 2001 (completed),
- 1 PhD study on Desert Locust population dynamics, University of Khartoum, September 2000 – April 2003 (completed),
- 1 study on effects of Green Muscle® on honey bees, University of Aden, September 2000 – October 2004 (completed, revised final report pending),
- 1 PhD study on habitats and spatial pattern of solitarious Desert Locust (*Schistocerca gregaria* Forsk.) on the coastal plain of Sudan, University of Wageningen, July 1999-December 2003 (completed).

List of Consultants since Phase II

Year	Month	Name	Purpose
2002	February	Phillip Symmons	Contingency Planning Workshop
2002	February	Hans Dobson	ToT Training Manual Development
2002	August (4 w)	Judith Pender	RAMSES Saudi Arabia
2002	April 2002 – August 2003	Bernhard Zelazny	Preparation of electronic Locust Literature Bank
2002	May	Bernhard Zelazny	Status of preventive control in the EMPRES/CR participating countries
2002	July -	Mamdouh Nasr	Socio-economic impact of locust control in Egypt
2002	July	Kamal Suleiman	RAMSES training in Eritrea
2002	August	Felege Elias	RAMSES training in Yemen
2002	September	Hans Dobson	Sprayer Workshop
2002	October	Hans Dobson	International ToT Training Course
2002		Rainer Scherer (GTZ)	Compilation of Barrier treatment experiences
2002	October	John Lowe	International ToT Training Course
2003	1/12/2002 – 30/03/2003	Christiaan Kooyman	Organization of Metarhizium Workshop in Port Sudan (GTZ funds)
2003	January	Judith Pender	RAMSES installation and training in Saudi Arabia 17-25/01/03
2003	January	Kamal Suleiman	RAMSES training in Saudi Arabia 17-25/01/03
2003	Feb-March	Judith Pender	RAMSES OMA development, Up-dating RAMSES SUD, ETH and SUD
2003	Feb-March	Graeme Hamilton	EMPRES Phase II evaluation
2003	April	Judith Pender	Up-dating of RAMSES in ERI, ETH, SUD, YEM
2003	July-December	Joyce Magor	Review of preventive control strategies 1920 - 1990

2003	August - October	John Grunshaw	Preparation of specimen drawings for field cards
2003	August	Judith Pender	Development of RAMSES EGY and updating RAMSES SAU
2004		Joyce Magor	Review of preventive control strategies 1920 - 1990
2005	August	Hans Dobson	Review of DL Diploma Course