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ANNUAL REPORT 1997

EMERGENCY PREVENTION SYSTEM

EMPRES

For Transboundary Animal and Plant
Pests and Diseases

DESERT LOCUST
CENTRAL REGION PROGRAMME

Food and Agriculture Organization of the United Nations

1. INTRODUCTION

1.1 This is the first Annual Report of the EMPRES (Desert Locust) Central Region Programme. It herein documents progress made by EMPRES staff and Liaison Officers during 1997. 1997 was the first year of full activities in the field.

1.2 The Food and Agriculture Organization (FAO) Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases is a Special Programme of the FAO. It has two components, one on certain animal diseases, the other presently focussing on the prevention of migratory Desert Locust plagues. Most of the previous Desert Locust plagues have started in countries around the Red Sea. Therefore, the first priority was to start a programme in this region which is the so called "Central Region" for the Desert Locust. EMPRES (Central Region) is a regional programme encompassing Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan, and Yemen.

1.3 The primary goal of the EMPRES Programme is:

To minimize the risk of Desert Locust plagues through early warning and control research, well-directed surveys and timely, environmentally sound interventions in order to mitigate food security concerns in locust-affected countries.

1.4 The objective of the Programme is:

To promote and catalyze the realization of self sufficiency for averting locust plagues through strengthening existing national, regional, and international components of Desert Locust management systems.

1.5 Bearing the goal and objective in mind, it follows that EMPRES is an ephemeral programme rather than a new organization or institution. It was not designed to replace, substitute, or duplicate activities being carried out by existing national and regional institutions. When EMPRES completes its mandated tasks, national and regional capacities to provide early warning and to conduct early interventions with the aim of preventing major Desert Locust plagues should be functional and sustainable.

1.6 EMPRES promotes and catalyzes Desert Locust management, including reporting, training, research, survey, control, strategy development and implementation. All of these need to be addressed to cover the many scenarios of Desert Locust outbreaks that can arise. Training is approached from regional and national perspectives to create, enhance and strengthen survey, reporting, and control. Expertise from within the region is being relied upon to plan and accomplish training, with follow-on mechanisms for achieving sustainability receiving a high priority along with the usual technical components of the curricula. Research aims at improving survey, reducing conventional pesticide application, ensuring environmental safety, and creating a better understanding of Desert Locust population dynamics. Knowledge gained will be interfaced as

appropriate such that country specific strategies developed can be meshed within an overarching and increasingly rational regional strategic approach.

1.7 EMPRES is built on two realms of manpower; national Ministry EMPRES Liaison Officers (ELOs), one from each member country, except Somalia and one additional Liaison Officer is from the Desert Locust Control Organization for Eastern Africa (DLCO-EA); and an EMPRES staff in the employ of the FAO (listed below in para. 2.1). ELOs bridge EMPRES with the national Ministries and are responsible for planning, initiating, implementing, and assessing activities in partnership with EMPRES. Ultimately, the ELOs are pivotal elements to the programme. When EMPRES is no longer in existence, ELOs will be orchestrating the tactics, strategies and networks for preventive Desert Locust management within and among each of their respective countries.

1.8 In addition to strengthening national capacities, the EMPRES Central Region Programme is expected to work closely with the FAO Commission for Controlling the Desert Locust in the Central Region (CRC), which is based in Cairo. The CRC, which has had a role in locust coordination, the provision of assistance and the promotion of national capacities for many years, will continue this work complementarily to EMPRES. It is expected that the EMPRES Central Region Programme is incorporating its accomplishments and findings into the CRC.

1.9 It is very important to understand that the EMPRES Programme is a departure from the traditional donor-recipient model. Rather, EMPRES is intended to establish a new partnership approach that relies exclusively on full collaboration and cooperation among all involved parties to reach a common regional goal. Eventually, upon dissolution of the EMPRES Programme after years to come, the responsibility for preventive locust management will rest mainly on national capabilities to apply best fit tactics within the most appropriate strategic contexts, with coordination activities expected to be taken on by the CRC. In addition, DLCO-EA will provide operational support to its member countries. Success in the Central Region will mean that outbreaks can be prevented or terminated before they spread to other regions.

1.10 Programmatically, EMPRES supports a global locust management programme which provides coordination for locust-affected countries and donors in line with the mandate handed down by the U.N.General Assembly. EMPRES is building on work already accomplished by FAO and others to achieve its goal and objective.

1.11 At this point, EMPRES Central Region is developing indicators for assessing the progress for its work, and it is expected that such indicators will be included in the next EMPRES Central Region Annual Report.

2. EMPRES ACTIVITIES

A. Establishment of EMPRES Central Region Field Unit and National Liaison Officers

2.1 As of 31 December, 1997, the EMPRES Central Region field unit was comprised of the following staff:

- Regional Coordinator, Allan Showler: began field duty March 1997 in Asmara.
- Senior Field Officer, Christian Pantenius: July 1997 in Addis Ababa.
- National Professional Officer (NPO)-Control, Munir Butrous: October 1996 in Khartoum.
- NPO-Survey, Fuad Bahakim: May 1997 in Sana'a.
- Associate Professional Officer (APO)-Strategies, Jan Breithaupt: February 1997 in Sana'a.
- Administrative Officer, Elsa Tekle: November 1997 in Asmara.
- Driver, Tesfalem Meles: November 1997 in Asmara.
- Additional staff recruitment for NPO-Training and a Strategies Officer will be initiated in early 1998 and this will complete the team.

2.2 EMPRES Liaison Officers (ELOs) have been selected by each of their respective governments:

- | | |
|----------------|----------------------|
| • Djibouti | Hussein Elmi Amir |
| • Egypt | Samir Simary |
| • Eritrea | Mehari Tesfayohannes |
| • Ethiopia | Abderahman Abdulahi |
| • Oman | Talal Al-Zadjali |
| • Saudi Arabia | Jaber Al-Shehri |
| • Sudan | Ali Mohamed Ali |
| • Yemen | Abbas Abdelmoghni |
| • DLCO-EA | A.H. Karrar |

B. EMPRES Central Region Structure and Function

2.3 Figure 1 is a diagrammatic representation of EMPRES Central Region's overall organization and approach, as has been developed during 1997.

C. Coordination

2.4 EMPRES Central Region has strengthened the existing communication network between FAO Representatives, the Central Region Locust Commission, and FAO Headquarters in Rome by establishing telephone, fax, and e-mail facilities among Plant Protection Departments (PPD)/ELOs and EMPRES staff. As a result, messages can now be transmitted between all the concerned parties. EMPRES Central Region holds regular staff meetings, including one in May 1997. An ELO Meeting was held in September 1997 in Cairo. Where problems in maintaining communication exist, EMPRES assists by troubleshooting technical obstacles as well as offering training to ELOS.

2.5 EMPRES Central Region strengthened contacts established by FAO headquarters and the CRC, and created new links with donors, research institutions, regional organizations, and multilateral organizations with special interests in Desert Locust management in the Central Region. In 1997, discussions were held among EMPRES and various national, regional and international research entities in order to initiate research programmes in a number of fields such as population dynamics, barrier treatments, biological control, early warning, database collection and dissemination, and scoping the EMPRES Programme's development of the West Africa component.

2.6 EMPRES staff participated in the Desert Locust Control Commission conference held in February, 1997. In November 1997, EMPRES and FAO Headquarters staff met with representatives from donor and locust affected countries in a Stakeholders Meeting in Rome with the aim of determining the structure and venue of the envisaged EMPRES Steering Committee.

D. Early Warning and Survey

2.7 In 1997, EMPRES Central Region has, through encouragement and by strengthening links from the field to the FAO Information and Locust Forecasting Unit (LIFU) in Rome, contributed to improving the consistency and quality of locust reporting from EMPRES Central Region countries. A standardised survey form developed by the LIFU was disseminated widely, with instruction for use, by the EMPRES staff, FAO headquarters, the CRC, and EMPRES Liaison Officers. Such information, when provided systematically, is the base on which the quality of the monthly FAO Desert Locust Bulletin is built.

2.8 Calibration, collection, and distribution of satellite-derived normalized difference vegetation index (NDVI) maps has been accomplished through EMPRES in collaboration with Natural Resources Institute of the U.K. (NRI) and the Belgian contribution to EMPRES. Training on the use of these NDVI maps for situation evaluation and survey planning has been given to the Eritrean PPD staff. EMPRES is evaluating plans to complete the remote sensing picture for the region by installing the required equipment in Muscat, Oman, in the near future. Further plans are in the development stage to optimize satellite data reception and to calibrate images for areas beyond the Eritrean Red

Sea coastal plains as well as to conduct ground verification to ascertain the operational utility of these images for surveys.

2.9 EMPRES is in the process of developing a team mission to assess and plan for better integration of survey methods, remote sensing, and meteorological information with the objective of improving data collection and analysis, and ultimately the survey efforts themselves in the Central Region. This mission is scheduled to commence in the first quarter of 1998.

2.10 Material assistance for doing survey has begun with procurement and distribution of meteorological and entomological tools, and vehicle spare parts to the EMPRES Central Region member countries. EMPRES vehicles are made available to national ministries of agriculture to complement their own vehicular resources. Plans exist to assist with procurement and training on use of GPS, radio maintenance and operation, and assessment of locust infestations to standardize the methods of reporting from the field.

2.11 Plans also exist for establishing indigenous reporting systems within each country. These indigenous networks will then be bridged among the countries such that both national and regional networks will be in place once this initiative is completed. EMPRES has obtained Systems Monitoring Reports from EMPRES Liaison Officers in selected member countries that detail non-Ministry sources of locust activity information. One EMPRES Liaison Officer then travelled among these countries to consolidate and fill information gaps that existed in the original reports. The final report will assist EMPRES Central Region in identifying and further developing indigenous modalities for information collection.

2.12 Aerial survey is a collaborative effort among EMPRES, national ministries of agriculture, and aerial firms and organizations, including DLCO-EA. DLCO-EA surveys and control operations are carried out as a service to member nations. Supplementary surveys and control operations are funded and arranged by EMPRES staff particularly for areas that have no survey capacity such as northern Somalia or for other special purposes.

E. Early Control

2.13 Aside from a campaign in Saudi Arabia in the first quarter of 1997, a Desert Locust outbreak began in November and December along the Red Sea coast of Sudan and Eritrea. EMPRES staff visited both areas, and was able to provide advice to the governments of each country on taking action against the gregarizing locust populations. As a result, early interventions in Sudan aerial and ground operations commenced against adult locust groups and hopper bands early in the winter breeding season before swarms developed. EMPRES encouraged the pre-positioning of an additional Polish aircraft at Port Sudan in case the situation magnified, and EMPRES was able to assist with the procurement of much needed vehicle spare parts to bring the Sudanese PPD locust vehicle fleet to operational capacity for the winter campaign. In Eritrea, EMPRES also provided advice

on scouting and control so that operations began against hopper bands early and no swarms developed in Eritrea in 1997.

2.14 EMPRES Central Region has developed, in cooperation with NRI and FAO HQ, a spray form to detail important aspects of control operations such that corrective action can be taken more readily, if required. The form was initiated at the EMPRES Lake Zway regional control training course in 1996, and it is currently being reviewed by the EMPRES Liaison Officers. In Eritrea and Sudan, the form has been field tested and it was found that some details should be modified to maximize its accuracy and usefulness.

2.15 EMPRES Central Region is, for the time being, concentrating most (but not all) of its efforts in both survey and control in “front line” Desert Locust countries with an aim to improve operations and information flow to further facilitate early control.

2.16 Other EMPRES activities that pertain to both survey and control are identified in sections for research and training, below.

F. Research

2.17 EMPRES Central Region has been active in promoting research activities of two kinds: a) solicited research projects among EMPRES Central Region countries, and b) catalyzing research by other entities.

- a) Solicited Research: in September, EMPRES and the CRC distributed a list of research topics that should be researched in order to fully develop appropriate desert locust control strategies. The deadline for EMPRES member countries to respond with prioritized lists of those topics was December 30. Responses from several countries were received and EMPRES and CRC will review them, then distribute guidelines for the development of proposals during the first quarter of 1998. Some of these research projects can be linked to other projects (see b, below).
- b) Research Through Other Entities: EMPRES Central Region has identified primary potential contributors in most relevant fields of research including population dynamics, remote sensing, biological control, botanicals, barrier/reduced agent application treatments (BRAATS), pheromones, and locust impacts. In many cases, such as biological control, EMPRES Central Region has brought principle contributors together for collaborative discussions on developing less competitive and more synergistic approaches to obtaining a final useful product. It has been determined that many arenas of research will be focused on “core teams” consisting of selected research bodies that can then interface related research capabilities of other research entities. EMPRES Central Region has, in close collaboration with core teams, developed Terms of Reference for field missions to develop guidelines for EMPRES efforts in biological control, environmental concerns, and survey-related issues. Practical guidelines, once in place, will assist EMPRES in promoting optimal collaboration within and among the different research disciplines.

2.18 General categories of research are 1) biological control, 2) botanicals and insect growth regulators (IGRs), 3) BRAATS, 4) differential global positioning system (GPS), 5) environmental concerns, 6) locust impacts, 7) locust population dynamics, and 8) survey and early warning.

- 1) Biological Control: In 1997, EMPRES encouraged LUBILOSA and Montana State University to discuss collaboration among themselves as part of an overarching EMPRES-coordinated biocontrol initiative. The two parties agreed and they have drafted a Terms of Reference for a scoping mission in the region. Sudden and unexpected funding problems for both groups have complicated the process, but the mission will nevertheless begin in the first quarter of 1998. In the meantime, EMPRES has been working with the Eritrean Ministry of Agriculture in conducting a field trial using a Montana State University/Eritrean developed strain of *Metarhizium*. These trials are expected to begin in January 1998 using hopper populations that have been occurring on the Red Sea coast.
- 2) Botanicals and IGRs: EMPRES discussed with the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) the development of botanical agents for use against Desert Locusts. Work in this field so far has not yielded any compounds that appear suitable for strategic implementation. However, EMPRES has raised the possibility that the International Centre for Insect Physiology and Ecology (ICIPE) and GTZ might form a core team to undertake work in this arena in the Central Region. EMPRES will continue to promote the development of a programme through GTZ and ICIPE. IGR studies have been carried out in Madagascar and by LOCUSTOX in West Africa. No IGR work has been done in the Central Region though it is expected to begin in 1998.
- 3) Barrier Application: EMPRES Central Region has promoted trials using BRAATS methods. A Rhone Poulenc trial using fipronil is expected to begin in Eritrea in early 1998 against hopper populations developing during the winter season. EMPRES has agreed to assist in locating suitable populations of locusts, but the trial itself is the responsibility of Rhone Poulenc and the Eritrean Ministry of Agriculture. Also, EMPRES began discussion on the development of a proposal by the University of Wyoming (USA) to create a post graduate degree programme for study of BRAATS in the Central Region that may involve standard insecticides, IGRs, mycopesticides, and botanicals.
- 4) Differential Global Positioning System (GPS): FAO has planned to conduct trials in Mauritania using the new differential GPS technology, combined with a spray output monitor, for greater application precision as part of a Norwegian contribution to EMPRES. EMPRES Central Region has offered to assist in conducting the trial in Sudan if FAO headquarters, the Mauritanian government, and the Norwegian donor are willing to capitalize on EMPRES Central Region's help. The possibility that real targets, as opposed to simulations, could be included in the trials if they are held in the Central Region in 1998 is another advantage.

- 5) Environmental Concerns: EMPRES Central Region has held a meeting in Addis Ababa with representatives from LOCUSTOX and Swedish International Development Assistance (SIDA). SIDA agreed to draft a proposal that will aim at identifying and characterizing environmentally sensitive areas in the Central Region and beyond. LOCUSTOX and EMPRES drafted a general guideline of the approach to ensuring environmental and human safety. This guideline will be developed further such that concrete activities can then be formulated and implemented.
- 6) Locust Impacts: EMPRES Central Region has assisted in holding the Economics of Desert Locusts Workshop in September in Cairo where preliminary data were presented on costs/benefits of control. EMPRES has held discussions with several donors on further studies on locust and control impacts, as well as with ICIPE. EMPRES is encouraging the development of a comprehensive, well balanced approach to the questions of locust and control impacts. The aim, once all key entities are brought into the discussions, is to develop a core team that can then tackle these issues systematically using field collected data. EMPRES has found that ICIPE's field station in Port Sudan has already made some progress on certain aspects of this issue, and this information will be capitalized upon as part of an overall study.
- 7) Desert Locust Population Dynamics: EMPRES has made progress in establishing several of the principle entities to work as a core team, but proposals are still being developed. One significant area of population dynamics is the study of genetic markers (some preliminary work has already been done through the University of East Anglia). Also, ICIPE has conducted some unpublished work along these lines (including pheromone studies). EMPRES aims now at bringing the two research entities into closer contact such that a collaborative study can be conducted. EMPRES has reviewed and is carefully considering funding a small research programme by a Sudanese M.Sc. student who will be working on ways to estimate Desert Locust populations.
- 8) Survey and Early Warning: EMPRES Central Region has funded work along the Red Sea coastal plains in collaboration with in-kind contributions by NRI on calibration of NDVI images. As part of their contribution to EMPRES, NRI and the Belgian funded EMPRES project developed, installed and provided training on the Reconnaissance and Management System of the Environment for Schistocerca (RAMSES) application. RAMSES is a computer based and specifically designed desktop mapping user interface offering adapted tools to analyze and manage survey data integrated with other sets of information, such as satellite based NDVI. Improved distribution and optimization of these images through field calibration was an important part of this work. EMPRES Central Region will undertake ground verification of NDVI imaging to determine the real operational utility of this tool.

G. Training

2.19 Training initiatives will take three forms: 1) national courses, 2) regional courses, and 3) academic programmes.

- 1) National Courses: EMPRES Central Region, in collaboration with the CRC, provided resource personnel for a national course on locust control in Saudi Arabia. Plans are currently being developed for similar courses in Sudan and in Eritrea. The development of national courses will largely fall to the EMPRES Training Officer once this person is hired in 1998. EMPRES Central Region has made plans to institute national indigenous reporting and scouting networks largely through a comprehensive teaching approach. NRI was assisted by EMPRES in giving a course on RAMSES, NDVI, and database use in Eritrea. EMPRES Central Region offers computer class assistance in any of the member countries - so far, Sudan has chosen this option. EMPRES staff has given lectures at the University of Khartoum on Desert Locust plagues, and at an Arab Organization for Agricultural Development (AOAD) course held in Sana'a.
- 2) Regional Courses: In November 1996, EMPRES Central Region sponsored a workshop on Desert Locust control, which was organized by DLCO-EA at Lake Zway, Ethiopia; and EMPRES contributed resource personnel for a control course held in Silwood Park, U.K in June 1997. EMPRES has plans to expand its role in regional courses, especially with the arrival of the Training Officer in 1998. Plans under consideration are regional courses on new technologies in aerial application, biological control, environmental monitoring, and barrier treatments.
- 3) Academic Programmes: EMPRES Central Region has agreed to assist the CRC in promoting the establishment of a graduate and/or post-graduate degree programme at the University of Khartoum. The EMPRES Coordinator visited the university and had discussions with the faculty of agriculture. It was decided that the University of Khartoum would prepare a proposal for a course, to be submitted to EMPRES and to the CRC. EMPRES may contribute funding to the degree programme, but it is more likely that EMPRES contributions will be in-kind (e.g., identifying and providing specific lecturers). The academic programme will focus on locust biology and control.

As mentioned in a previous section, EMPRES is also encouraging universities abroad to educate persons from the Central Region as part of their research programmes on Desert Locusts. The University of Wyoming, USA, in compliance, is planning to send faculty to the Central Region to recruit one or more students for an advanced degree in barrier treatment studies.

H. Strategies

2.20 Ultimately, the development and practical implementation of Desert Locust control strategies is one of the primary aims of EMPRES Central Region. This, however, will be highly dependent upon the establishment of new technologies and networks, development of infrastructure, and levels of resources available nationally and regionally.

EMPRES Central Region has begun the process of collecting information on survey, control, resources, and locust biology and movements. At this point, EMPRES has on its staff an APO who is mainly responsible for laying the foundation for strategies development. The EMPRES Coordinator has begun the process of conceptualizing strategies by making available to staff a “think” paper on locust scenarios and possible strategies for Eritrea. As information is further compiled, the addition of the International Expert for Strategies will allow EMPRES Central Region to concentrate more fully on the task of developing strategies. Further to this, EMPRES Central Region and Wageningen Agricultural University (WAU) will be collaborating closely on this issue; WAU is presently searching for a suitable doctoral candidate to model desert locust populations dynamics and strategic control options.

2.21 Complementarily to this, EMPRES Central Region has begun developing a database on many facets of locust control that will be made available to the CRC which might in a sense serve as a sort of locust information library to the region in the future. EMPRES Central Region and NRI have discussed possible collaborative uses of RAMSES and other NRI databases in this context.

3. 5th EMPRES LIAISON OFFICERS’ MEETING

3.1 EMPRES Central Region sponsored and participated in the 5th EMPRES Liaison Officers’ Meeting (ELOM) in 23-25 September 1997, Cairo. The meeting place was arranged by the CRC. All Liaison Officers attended, and Mr. Mohamed Abdulahi Ould Babah from Mauritania sat as an observer.

3.2 EMPRES progress, locust situation reports, and aspects of the EMPRES Central Region approach were presented by the appropriate participants, and discussions followed. Salient recommendations that emerged from these discussions included:

- formation of an EMPRES Central Region committee to study ways of doing joint border survey and control where necessary: (members: Samir Simary, Ali Mohamed Ali, Mehari Tesfayohannes, Munir Butrous).
- ELOs should distribute frequent informal information updates to neighbouring countries during critical situations.
- NDVI maps should be used to determine survey areas, but with caution.
- Eritrea should hire a field linkage officer to improve the scouting and training network in Eritrea.
- EMPRES should promote the study of environmental impacts of Desert Locust spray operations.

- when donors wish to sponsor bilateral research in support of EMPRES goals and objectives in the Central Region, they should obtain the necessary authority and clearances from the appropriate national ministry. EMPRES can only facilitate and coordinate such activities if requested, but the authorization must come from the host country itself. National participation should be inherent to such projects and activities.
- FAO headquarters is required to determine the roles of the CRC and EMPRES to better accommodate interfacing of the two.
- FAO Forecasting and Information Unit should provide more information on important Desert Locust activity to the appropriate countries and to EMPRES staff.
- scouting networks need to be delineated and modalities for their improvement developed and undertaken.
- advanced specialized courses in Desert Locust management should be established in the region.
- training should be conducted to the extent possible using experts from the region, and these training programmes should be held within the region.
- a train-the-trainer component should be included in most or all curricula.
- Indicators for progress in the different aspects of EMPRES' work should be developed and used.
- ELOs are the key element to achieve success through EMPRES. They were strongly encouraged to take an increasingly active part in the EMPRES framework with respect to initiation of actions such as research and training, and to strengthen communication among one another.
- the next ELOM was then tentatively scheduled for August or September, 1998. [It was subsequently decided that an ELO Workshop should be held in May 1998, so the ELOM may be held later in 1998].

4. DONOR SUPPORT FOR EMPRES CENTRAL REGION

4.1 In 1997, the principal support provided to EMPRES Central Region was derived from FAO's Regular Programme. As can be seen from the Table below, the expenditure in 1997 was US\$255,488, against an overall budget of US\$ 4,327,000 provided since 1995 for all EMPRES activities regardless of region. The funds were mainly used to cover the costs of the Coordinator's post in Asmara, the National Professional Officer

posts in Sana'a (Survey) and in Khartoum (Control), and operations costs throughout the Central Region.

4.2 During the year, two projects specifically designed to support the Central Region became operational, namely, GCP/INT/655/GER - German contribution to EMPRES (Desert Locust) in the Central Region, and GCP/INT/654/SWI - Swiss contribution to EMPRES (Desert Locust) in the Central Region. In addition, a third project funded by the Netherlands, GCP/INT/670/NET - EMPRES, Improvement of Desert Locust Survey Operations and Control Strategies, which will be based in the Central Region but provide inputs to all the EMPRES regions, was approved but did not yet become operational.

4.3 The budgetary support from Germany in 1997 covered the fielding of the Senior Field Officer and the establishment /equipping of his office at the Ministry of Agriculture in Addis Ababa. A contribution was also made towards the travel costs of holding an EMPRES Workshop on the Economics of Desert Locust Management in Cairo in September 1997. The Swiss project became operational relatively late in the year. The main contribution was to the travel costs of holding the EMPRES Liaison Officers Meeting in Cairo in September. The project also covered travel costs of a mission by a regional consultant to compile information on using the informal sector (e.g., nomads and farmers) as supplementary sources of information on locust populations.

4.4 The Belgium-funded GCP/INT/596/BEL - Improving Monitoring Desert Locust Habitats by Remote Sensing, which has been in operation since 1995, continued to work in the Central Region with its main focus on calibration of remotely-sensed NDVI data for the Eritrean coastal plains. The project worked together with a bilaterally-funded NRI project in developing the Global Information System (GIS) survey management system called RAMSES (see above).

4.5 USAID provides funds for EMPRES in general under the project GCP/INT/622/USA. For the Central Region, an important contribution was made to the costs of the UN Volunteer responsible for locust survey in Somalia, and for four months of inputs by a Senior Consultant attached to the Locust Group in Rome. Funds were also provided for hiring the aircraft of the DLCO-EA for locust surveys in the Central Region, and for equipping the EMPRES Coordination Office in Asmara.

4.6 The major contribution by Japan, through its project GCP/INT/189/JPN, was to fund urgently needed spare parts for locust survey operations in Sudan. In addition, a contribution was made to travel costs of a Workshop on locust control.

Table. Expenditures incurred by Donors to the EMPRES (Desert Locust) Central Region Programme in 1997 against overall contributions (in \$US)

<u>Donor</u>	<u>1997 Expenditure</u>	<u>Overall Contribution</u>
FAO Regular Programme	255,488	4,327,000 (since 1995)

Belgium	222,341	596,000
Germany	182,207	1,330,000
Japan	55,556	157,000
Netherlands	-	2,498,000
Switzerland	19,116	720,000
USA	132,528	350,000
<hr/>		
-	Total: 867,236	9,978,000

ACRONYMS

AOAD	Arab Organization for Agricultural Development
APO	Associate Professional Officer
BRAATS	Barrier/Reduced Agent Application Treatments
CRC	Central Region Locust Commission
DLCO-EA	Desert Locust Control Organization for Eastern Africa
ELOM	EMPRES Liaison Officers' Meeting
EMPRES	Emergency Prevention System
FAO	Food and Agriculture Organization
GIS	Global information system
GPS	Global positioning system
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
ICIPE	International Centre for Insect Physiology and Ecology
IGR	Insect growth regulator
LOCUSTOX programme	This is not an acronym, but the full name of an FAO
LUBILOSA	Lutte Biologique Contre les Locustes et Sauteriaux
NRI	Natural Resources Institute
NDVI	Normalized difference vegetation index
NPO	National Professional Officer
PPD	Plant Protection Department
RAMSES	Reconnaissance and Management System of the Environment for Schistocerca
SD	Strategies development
SIDA	Swedish International Development Aid
UN	United Nations
WAU	Wageningen Agricultural University