

Looney

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REPORT

Rome,
Italy,
12-16 June
1989

FAO Desert Locust Control Committee

Thirtieth session



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

Meeting Report
No. AGP/1989/M/2

REPORT OF
THE THIRTIETH SESSION OF THE FAO DESERT LOCUST CONTROL COMMITTEE

held in
Rome, Italy
12 - 16 June 1989

Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, 1989

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INTRODUCTION

The Twenty-Ninth Session of the FAO Desert Locust Control Committee, which was held in Rome on 13-17 June 1983, agreed that the next Session of the Committee should be held in Rome at a time to be chosen by the Director-General of FAO.

Due to the plague and the importance of the assistance provided by the international community in the campaigns, it was considered appropriate to involve both DLCC Member Countries and donors at this particular Session.

The Director-General therefore invited the following Governments to be represented at the Thirtieth Session.

Afghanistan	Libya
Algeria	Mali
Australia	Mauritania
Bahrain	Morocco
Belgium	Netherlands
Benin	Niger
Bulgaria	Nigeria
Burkina Faso	Norway
Cameroon	Oman
Cape Verde	Pakistan
Central African Republic	Portugal
Chad	Qatar
Côte d'Ivoire	Saudi Arabia, Kingdom of
Djibouti	Senegal
Egypt	Sierra Leone
Ethiopia	Somalia
Finland	Spain
France	Sudan
Gambia	Sweden
Germany, Federal Republic of	Switzerland
Ghana	Syria
Greece	Tanzania
Guinea	Togo
India	Tunisia
Iran, Islamic Republic of	Turkey
Iraq	Uganda
Israel	United Arab Emirates
Italy	United Kingdom
Japan	United States of America
Jordan	Yemen Arab Republic
Kenya	Yemen, People's Democratic
Kuwait	Republic of
Lebanon	

He also invited representatives of the following organizations to attend as observers: Desert Locust Control Organization for Eastern Africa (DLCO-EA), Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV), International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA), United Nations Development Programme (UNDP), World Meteorological Organization (WMO), International Fund for Agricultural Development (IFAD), African

Development Bank (ADB), Islamic Development Bank (IDB), Economic Commission for Africa (ECA) and the Interafrican Phytosanitary Council (IAPSC) of the Organization for African Unity.

The Session was opened by Mr. C.H. Bonte-Friedheim, Assistant Director-General of the Agriculture Department who, on behalf of the Director-General, welcomed the participants to Rome and reminded them of the terms of reference of the Committee which was established in January 1955 (see Appendix I). He reviewed the important developments in the Desert Locust situation since the previous Session a year ago: in the Western Region widespread breeding in North-West Africa was followed by a widespread invasion and breeding in the Sahel necessitating large-scale control operations; important escapes from the Sahel invaded Morocco, Senegal and Gambia; escapes from the two latter countries joined the southern circuit. In the Central Region there were large-scale control operations in Sudan and Saudi Arabia. Thereafter there was a rapid decline in the number of swarms in the whole invasion area and in April 1989 the plague was practically over. However, a number of swarms reappeared in the Sudanian-Guinea zone in May and together with populations formed in the Southern Sahara, constitute at present the main targets of the campaigns aimed at terminating the plague in 1989. This will require strict vigilance. In this respect, Mr. Bonte-Friedheim drew attention to the measures being taken by FAO in cooperation with regional organizations, member countries and various donors in monitoring the situation, and extended the Director-General's thanks to all donors for their outstanding efforts in the campaign. He mentioned two major new activities being launched by FAO: the inter-regional project for the preventive control against the Desert Locust in West and North-West Africa and the study of future research priorities. He also drew attention to the necessity of increasing the participation of affected countries in meeting the costs of control operations and of the urgency for DLCC member countries to pay their contributions to the International Trust Fund for controlling the Desert Locust.

The Representative of the Secretary-General of the World Meteorological Organization expressed appreciation at having been invited to the Session and announced that several urgent steps had been taken by WMO in response to the Desert Locust plague. His statement appears at Appendix II.

Officers of the Session

Chairman: Mr. Daouda Diagne (Senegal).

Vice-Chairman: Mr. Mustafa Aliesh (Libya).

Drafting Committee

The Drafting Committee was made up of the delegates of: Algeria, Chad, DLCO-EA, Iran, Morocco and Saudi Arabia. Mr. J. Roffey acted as Technical Secretary.

Obituary

The Committee regretted the sudden death of Mr. S. Moobola, Director of IRLCO-CSA and of Mr. M.V. Venkatesh, former Assistant Director (Locust Control) in India. It paid tribute to the US citizens who lost their lives during the course of the campaign in West Africa.

Acknowledgements

The Chairman thanked the Director-General of FAO, Mr. Brader and the FAO staff for the arrangements which had been made for the meeting, which had facilitated open discussions. He also thanked the affected countries and the international donor community for the very successful collaboration which had eventually resulted in the dramatic decline of the plague.

PARTICIPANTS IN THE SESSION

DELEGATES FROM MEMBER NATIONS OF FAO

Algeria

Abdelkader Benabdi
Directeur-général de l'INPV
Ministère de l'agriculture
12, avenue Pasteur
El Harrach
Alger
Algérie

Ramdane Kellou
C.E.S.-MA
Ministère de l'agriculture
Alger
Algérie

Belgium

Antoine Saintraint
Représentant Permanent
de la Belgique auprès de la FAO
Ambassade de la Belgique
Via Omero, 8
00197 Rome
Italie

Philippe Ruelle
Consultant
Tienne du Sarment 5
1300 Wavre
Belgique

Bulgaria

Yuli Minchev
Permanent Representative
of Bulgaria to FAO
Bulgarian Embassy
Via Rubens, 21
00100 Rome
Italy

Bulgaria

Swetoslav Jirkov
Deputy Permanent Representative
of Bulgaria to FAO
Bulgarian Embassy
Via Rubens, 21
00100 Rome
Italy

Burkina Faso

Fulgence Toe
Représentant Permanent Adjoint
du Burkina Faso auprès de la FAO
Ambassade du Burkina Faso
Via Alessandria, 26
00198 Rome
Italie

Cameroon

Steven Njinyam
Sous-directeur de la Protection
des végétaux
Ministère de l'agriculture
B.P. 1639
Yaoundé
Cameroun

Cape Verde

Antonio Pires
Représentant Permanent
du Cap Vert auprès de la FAO
Ambassade du Cap Vert
Viale Algeria, 85
00144 Rome
Italie

Cape Verde

Maria de Lourdes Duarte
Attaché agricole
Ambassade du Cap Vert
Viale Algeria, 85
00144 Rome
Italie

Chad

Michel Ngaromillet
Directeur de la Protection
des végétaux
Ministère de l'agriculture
B.P. 441
N'Djaména
Tchad

Cyprus

Chrysanthos Loizides
Agricultural Attaché
Permanent Representation
of Cyprus to FAO
Piazza Farnese, 105
00186 Rome
Italy

Egypt

A. El Monem Haykal Kamel
Chief
Section of Locust Control
Ministry of Agriculture
Dokki, Cairo
Egypt

Ethiopia

Sisay Gebregeorgis
Vice-Minister of Agriculture
Ministry of Agriculture
P.O. Box 62347
Addis Ababa
Ethiopia

Tibebu Tessema
Head Crop Protection Division
Ministry of Agriculture
c/o FAO
Addis Ababa
Ethiopia

Finland

Gunilla Kurtén
Deputy Permanent Representative
of Finland to FAO
Embassy of Finland
Via Lisbona, 3
00198 Rome
Italy

France

My Hank Launois-Luong
Acridologue
PRIFAS
Ministère des affaires étrangères
B.P. 5035
34032 Montpellier Cedex
France

F.R. Germany

Brigitte Lindner
Scientific Secretary
ATSAF
Federal Ministry of Economic
Cooperation
Hans-Böckler Str. 5
D-5300 Bonn 3
F.R. Germany

Stephan Krall
Locust Coordinator
GTZ
P.O. Box 5180
6236 Eschborn 1
F.R. Germany

Greece

Penelope Batzia-Manolitsakis
Agronomist
Permanent Representation
of Greece to FAO
Viale Liegi, 33
00100 Rome
Italy

Joanna Karanikolou-Papadopoulou
Agronomist
Ministry of Agriculture
Division of Plant Protection
Ippokratous 3-5
Athens
Greece

India

V.K. Sibal
Deputy Permanent Representative
of India to FAO
Embassy of India
Via XX Settembre,
00187 Rome
Italy

Iran

Reza Arjmandy
Director General
Plant Protection Quarantine
Organization
Ministry of Agriculture
Teheran
Iran

Jalaladdin Habibi
Research Member in Plant Pests
and Diseases Research Institute
Ministry of Agriculture
Teheran
Iran

Abdalreza Tabib Nezhad
Ministry of Agriculture
Teheran
Iran

Iraq

Jawad Sultan
Pest Control Manager
Ministry of Agriculture
Abu-Ghraib
Iraq

Italy

Augusto Scirocchi
Expert
Ministère des affaires étrangères
Direction générale coopération
pour le développement
Via Contarini 25
00194 Rome
Italie

Pasquale Mainolfi
Primo Dirigente
Servizio Fitopatologico Italiano
Ministère de l'agriculture
Via XX Settembre, 20
00100 Rome
Italie

Italy

Salvatore Rizzato
Perito Agrario
Ministère de l'agriculture
Via XX Settembre, 20
00100 Rome
Italie

Japan

Masayuki Komatsu
Alternate Permanent
Representative of Japan to FAO
Embassy of Japan
Via Quintino Sella, 60
00187 Rome
Italy

Kenya

Patrick M. Nzue
Alternate Permanent
Representative of Kenya to FAO
Kenya Embassy
Via Icilio, 14
00153 Rome
Italy

Andrew Lucas Rosana
Counsellor
Kenya Embassy
Via Icilio, 14
00153 Rome
Italy

Libya

Mustafa Aliesh
Ministry of Agriculture
Tripoli
Libya

Faraj Karra
Member of Desert Locust Control
Committee
Tripoli
Libya

Mauritania

Birante Soumaré
Directeur adjoint
de l'agriculture
Ministère du développement rural
B.P. 180
Nouakchott
Mauritanie

Morocco

Thami Benhalima
Chef du Centre national de lutte
antiacridienne d'Aït-Melloul
Ministère de l'intérieur
B.P. 125 Inezgane
Maroc

The Netherlands

Hein Copper
Alt. Permanent Representative
of the Netherlands to FAO
Via delle Terme Deciane, 6
00153 Rome
Italy

Niger

Haladou Salha
Représentant Permanent
du Niger auprès de la FAO
Ambassade du Niger
Via Antonio Baiamonti, 10
00195 Rome
Italie

Saleye Hassane
Directeur adjoint de la
protection des végétaux
Ministère de l'agriculture
et environnement
B.P. 323
Niamey
Niger

Nigeria

Ja'afaru Ladan
Deputy Director
Pest Control Services
Federal Ministry of Agriculture,
Water Resources and Rural Dev.
Federal Livestock House
Mondo Rd.
Kaduna
Nigeria

Oman

Abdul-Munim Al-Mjeni
Plant Protection Expert
Ministry of Agriculture and
Fisheries
P.O. Box 467
Muscat
Sultanate of Oman

Pakistan

M. Saleem Khan
Agriculture Counsellor
Alternate Perm. Representative
of Pakistan to FAO
Embassy of Pakistan
Via della Camilluccia 682
00135 Rome

Saudi Arabia

Salem Bamofleh
Director General
Agricultural Research Centre
Ministry of Agriculture and Water
Jeddah
Saudi Arabia

Rashed Alkhedher
Director
Plant Protection Service
Ministry of Agriculture and Water
P.O. box 22257
Riyadh 11495
Saudi Arabia

Mohammed Al-Harbi
Director of Report and
Forecasting
Agriculture Research Centre
Ministry of Agriculture and Water
Marrah Road 10 km
Jeddah
Saudi Arabia

Senegal

Daouda Diagne
Directeur de la P.V.
Ministère du développement rural
SICAP Liberté 4
Ville no. 5005
Dakar
Sénégal

Spain

Juan Ignacio Calvo
Director de Programa
Ministerio de Agricultura, Pesca
y Alimentación
Juan Bravo 03-B
28006 Madrid
España

Spain

Fernando Robredo-Junco
Asesor Técnico
Ministerio de Agricultura, Pesca
y Alimentación
Juan Bravo 03-B
28006 Madrid
España

Sudan

Hassan Abbas Ahmed El-Tom
Director
Plant Protection Department
Ministry of Agriculture
P.O. Box 14
Khartoum North
Sudan

Munir Gabra Butrous
Head Locust Control
Ministry of Agriculture
P.O. Box 14
Khartoum North
Sudan

Sweden

Staffan Wikteliuss
Swedish Agricultural University
P.O. Box 7044
S-75007 Uppsala
Sweden

Tunisia

Amor Ben Romdhane
Représentant Permanent de la
Tunisie auprès de la FAO
Via Asmara, 7
00199 Rome
Italie

Turkey

Yusuf Salcan
Deputy Director
Ministry of Agriculture, Forest
and Rural Affairs
Akay Cad. No. 3
Ankara
Turkey

Turkey

Gültekin Ünal
Pest Management Specialist
Plant Protection Research
Institute
Bagdat Caddesi No. 250
Ankara
Turkey

United Arab Emirates

Khalid Shehil
Second Secretary
Embassy of the United Arab
Emirates
Via S. Crescenziano 25
00199 Rome
Italy

United Kingdom

Joyce Magor
Locust Specialist
ODA/ODNRI
Central Avenue
Chatham Maritime
Chatham, Kent MG44TB
United Kingdom

J. Mark Ritchie
Locust Specialist
ODA/ODNRI
Central Avenue
Chatham Maritime
Chatham, Kent MG44TB
United Kingdom

United States of America

Carl Castleton
Area Director (Africa)
USDA/APHIS
Federal Building Rm 657
6505 Belcrest Road
Hyattsville, Maryland
USA

David Joslyn
Alternate Perm. Representative
of the USA to FAO
US Embassy
Via Aurelia 294-A
00165 Rome
Italy

United States of America

Walter I. Knausenberger
Pest Management Specialist
USAID/AFR/TR
Building SA-8A, Rm 310
Washington, DC 20523-1515
USA

OBSERVERS

Desert Locust Control Organization for Eastern Africa (DLCO-EA)

Abdel Moneim Karrar
Director of Operations
DLCO-EA
P.O. Box 4255
Addis Ababa
Ethiopia

Mohamed Osman Nurein
Director, Scientific Research
DLCO-EA
P.O. Box 4255
Addis Ababa
Ethiopia

International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA)

Austin Casper Zivanayi Musuna
Chief Scientific Officer
IRLCO-CSA
P.O. Box 240252
Ndola
Zambia

Islamic Development Bank

Ahmad Mahmoud
Senior Project Officer
Islamic Development Bank
P.O. Box 5925
Jeddah
Saudi Arabia

Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV)

Lassana Soumaré
Directeur Technique
OCLALAV
B.P. 1066
Dakar
Sénégal

OAU/Conseil Phytosanitaire Interafricain

Abel L. Mbiele
Secrétaire scientifique du Conseil Phytosanitaire Interafricain de l'OUA
Organisation de l'unité africaine
B.P. 4170
Yaoundé
Cameroun

WMO

Nicholas Gbeckor-Kove
Scientific Officer
World Meteorological Organization
P.O. Box 2300
CH 1211 Geneva 2
Switzerland

FAO STAFF

C.H. Bonte-Friedheim
Assistant Director-General
Agriculture Department

Lukas Brader
Director
Plant Production and Protection Division

Jeremy Roffey
Senior Migratory Pests Officer
Plant Production and Protection Division

Abderrahmane Hafraoui
Agricultural Officer
Plant Protection Service
Plant Production and Protection Division

Hilde Niggemann
Agricultural Officer
Plant Protection Service
Plant Production and Protection Division

Michel Cherlet
Remote Sensing Technical Officer
Research and Technology Development Division

REGIONAL STAFF

Ahmed Khasawneh	FAO Regional Locust Officer, Jeddah
Nézil Mahjoub	FAO Regional Locust Officer, Algiers
Wolfgang Meinzingen	Project Manager, FAO/RAF/38/033, Nairobi
Alioune N'Diaye	Conseiller technique, Dakar
Carin Birgitta Seveborg	Programme Officer, Addis Ababa

CONSULTANTS

Rafik Skaf	Rome
Saïd Zitoune	Nouakchott
Phil Symmons	Rome
H. Van der Valk	Rome
Messaoud Cherief	Rome
George B. Popov	
Bachir Chara	

AGENDA

1. Opening of the Session
2. Election of the Chairman and Vice-Chairman
3. Adoption of the Agenda
4. Election of the Drafting Committee
5. The Locust Situation June 1988 - June 1989 and Outlook to December 1989
 - a) Desert Locust
 - b) Other Species
6. Control measures undertaken, June 1988-June 1989
7. Assistance provided to countries and regional organizations
8. Review of existing control potential
9. The International Desert Locust Task Force
10. Medium-term project for preventive control in West and North-West Africa
11. Status of regional locust commissions and organizations
12. Desert Locust Research
 - a) Remote Sensing applications
 - b) Population dynamics and modelling
 - c) Pesticides and their application
 - d) Long-term biological research
13. Training
 - a) Review of current programmes
 - b) Recommendations for future training
 - c) Coordination
14. International Trust Fund 9161: Contributions and Expenditures
15. Any Other Business
16. Date and Place of Next Session
17. Adoption of the Report

SUMMARY OF DISCUSSIONS

THE LOCUST SITUATION, JUNE 1988 - JUNE 1989 AND OUTLOOK TO DECEMBER 1989

The Desert Locust

General

1. The reporting period was marked by a further expansion of the Desert Locust plague, which was already at a high level, followed by a dramatic decline in the last quarter of 1988 and the first quarter of 1989. However, there are still numerous swarms in the Sahel and southern Sahara and if the 1989 summer rains are good there could be a rapid resurgence of the plague.

The main features

2. During the winter and spring of 1987-88 breeding was largely confined to Western Africa where the infestations were very heavy in the western part of the Sahara and northern Mauritania that is, further south than normal. Moreover the winter was exceptionally warm and wet so that breeding continued without a break.

3. As early as late January 1988 first generation swarms began to form. Some of these moved north and north-east into southern Morocco and later across northern-central Algeria reaching Tunisia and north-west Libya in early March and Egypt in late April and May. Despite very large aerial and ground control operations during which 5,000,000 hectares were treated there was widespread breeding and numerous swarms were produced.

4. Other swarms, however, remained to breed again in the western part of the Sahara and northern Mauritania and although these second generation infestations were partially controlled new swarms began to appear in mid-March. Under the influence of the Azores anticyclone these moved south and south-west to invade southern Mauritania, Senegal and Cape Verde, which was reached on 22 March. In early April the swarms started to move east, invading western Mali on 10 April and Guinea and Burkina Faso in early May.

5. In April and May there were further invasions of the Sahel from the north, Niger being reached in April and Chad and western Sudan in late May. These swarms spread rapidly eastwards resulting in a massive invasion of Sudan during July. Such a major easterly movement at that time of year is without precedent: usually swarms would be expected to be on the north side of the Inter-Tropical Convergence Zone and so be in an easterly wind-flow. Swarms continued to move eastwards and invaded northern Ethiopia and Yemen Arab Republic in late July. By August north-west Africa was finally clear of swarms.

6. Summer rains were heavy and widespread throughout the Sahel from Mauritania to Sudan. The swarms matured rapidly and laid so that many bands were present from July onwards in the west and from August onwards in the east. These in turn produced swarms which matured with great speed giving rise to a second generation of breeding in Mali, Niger and western Chad during late September and early October. At that

time some swarms from the Sahel started to migrate northwards across Algeria reaching Morocco by 10 October. Immediately afterwards a much larger invasion arrived from Mauritania. These necessitated another very rigorous aerial and ground campaign during which a further 1,700,000 hectares were controlled in Morocco including up to 100,000 hectares a day in early November. In Algeria 150,000 hectares were treated. Swarms from central and western Sudan and from northern Ethiopia moved first to the Red Sea plains and then across the Red Sea to the Central Tihama of Saudi Arabia where a large aerial and ground control campaign was mounted.

7. Swarms from Chad and areas to the west moved west. Many continued to move in that direction into the Atlantic Ocean so that during mid October locusts crossed the Atlantic and invaded the eastern Caribbean and northern coastal areas of South America on a front of some 1,500 km. Such a crossing is without known precedent. An enormous number of locusts must have perished. The locusts which reached the Caribbean were reported to have died quickly but there has been a recent report of hoppers in Dominica, which may be of Desert Locusts. There were several other unusual migrations out to sea during 1988 including invasions of Italy and Greece in March and May, and of the British Isles in October-November. It is not as yet known whether these unusually frequent and large-scale offshore movements were caused by exceptional weather conditions or exceptional swarm flight behaviour.

8. Swarms continued to form in the Sahel until late November and to migrate from there to north-west Africa. Swarms also continued to move eastwards in Sudan and across the Red Sea; some spread into central Saudi Arabia with a few swarms reaching southern Jordan and the eastern coastal areas of the Arabian peninsula, southern Iraq, Kuwait and south-west Iran in late October-early November. During late November a small number of swarms moved rapidly northwards across Chad and Libya and then swung east across the eastern Mediterranean. As a result swarms were reported in Libya, Egypt, the coast of Syria and Lebanon, and for the first time on record, in south-western Turkey.

9. By the end of 1988 swarms were effectively restricted to four areas: north-west Africa and especially Morocco; the Red Sea coastal plains on both sides of the Red Sea and the interior of Arabia; the southern Sahara where breeding continued throughout the winter in north-west Niger and north-east Mali, and in southern Mali, Senegal and extreme southern Mauritania. In West Africa the swarms which moved south with the retreating ITCZ in late 1988 spread even further south in early 1989, reaching Guinea Bissau and Guinea during February and March. There were confirmed reports of swarms from southern Cameroon 300 kilometres south of the limit of the invasion area known from previous plagues.

10. The winter and early spring of 1988-89 was, by contrast with 1987-88, exceptionally dry. A blocking high pressure system over southern Europe persisted from December until late March so forcing rain-producing depressions to track northwards. Conditions were unfavourable for breeding in north-west Africa, on the Red Sea coastal plains and in the northern interior of the Arabian peninsula. Virtually no breeding occurred in those areas. The combined effect of unfavourable condition and vigorous control campaigns rapidly reduced the locust populations although a few swarms did reach the United Arab

Emirates, Qatar and Kuwait before being destroyed. By March no substantial infestations were known to exist in Arabia. Heavy rain occurred during late March and April in north-eastern Africa and Arabia. The occurrence of some hopper bands in Djibouti in late May, however, indicated that some pockets of gregarious locusts persist in the Central Region. Since the end of January only a small amount of control has been carried out. The number of swarm reports remained low in April but in May there was a rapid increase in the numbers of immature swarms reported in southern Mali, Burkina Faso and south-west Niger as the swarms became active with the return of the Inter-Tropical Convergence Zone.

Outlook to December 1989

11. The largest populations are probably those recently reported in Niger, Mali, Burkina Faso and Mauritania. These have two origins: those in southern areas are the result of late 1988 summer breeding in the western Sahel and those in the north are the result of 1988-89 winter and spring breeding in the southern Sahara. Populations to the north of the ITCZ are likely to continue to move westwards and those to the south to move eastwards, possibly reaching as far east as Sudan.

12. The main concern is now to be on the alert for the start of a chain of events which could, if unchecked, lead to the resurgence of the plague. Such a resurgence will require substantial rain and consequent successful breeding, in a sequence of areas within the normally arid recession distribution area. Every past sequence has been different so it is not possible at present to predict where and when the next sequence will occur. The main survey effort should be concentrated in the southern fringes of the Sahara and in the Sahel, the central belt in Sudan, the southern parts of the Arabian peninsula and the Indo-Pakistan desert and surrounding areas in the Eastern Region. The possible areas which may have to be controlled in 1989 are given in Appendix III.

African Migratory Locust

13. The species was active in 1988 mainly in Botswana where 90,000 hectares were sprayed, although a much larger area was infested, in Zambia (mixed with Red Locust) and in Zimbabwe.

Red Locust

14. In 1989 the most active Red Locust outbreak areas were the Wembere and Iku-Kitavi plains in Tanzania where 13,000 hectares of infestations were treated. There were also sprayable concentrations in irrigated wheat in Zambia.

Brown Locust

15. There was an upsurge in activity late in the 1987-88 season and numerous swarms were reported in the main outbreak area in the Karroo but also extending eastwards towards Lesotho.

Moroccan Locust

16. New upsurges occurred in north and north-west Afghanistan and also in north-eastern provinces of the Islamic Republic of Iran where

20,000 hectares of gregarious hoppers were controlled in May 1989. In Morocco, an upsurge was observed in 1988 and 1989 in association with other grasshoppers, in provinces of the Middle Atlas. Control was undertaken over 8,000 hectares in 1988. In 1989 areas requiring control are expected to be higher.

Tree Locusts

17. There have been numerous reports of swarms and of damage by Tree Locusts in Sudan and in some countries of west and central Africa.

Grasshoppers

18. There have been heavy infestations of Ruspolia sp. (formerly Homorocoryphus sp.) in Malawi, Botswana, Zambia, Zimbabwe and Tanzania, which have caused locally severe damage to rice in Malawi.

19. In Chad, there are infestations of several species of grasshopper in Ouaddai including Ornithacris turbida, Diabolo catantops axillaris, Catantops stramineus and Oedaleus senegalensis.

Control measures undertaken by countries and regional organizations

20. Control operations undertaken against the Desert Locust between June 1988 and June 1989 are shown in Appendix IV. They are based on information provided by the countries and regional organizations in their regular reports, supplemented by information provided at the meeting by delegates and observers.

21. The Committee recognised that the control measures undertaken against the Desert Locust had been a decisive factor in the dramatic decline in the plague in late 1988 and early 1989. The contrasts with the previous year were startling. Thus, whereas in spring 1988 breeding in the western part of the Sahara and northern Mauritania gave rise to swarms which invaded Morocco and Algeria on a large scale and later the Sahel zone, in winter-spring 1989 there was only very localised breeding in Niger, Mali and Mauritania in the southern Sahara, and North-West Africa is clear. The swarms available to breed in the summer rains in 1989 are only a small fraction of those present in 1988. In the Central Region the known populations in Djibouti are very much smaller and more restricted than those in Saudi Arabia and Egypt twelve months earlier.

Assistance provided to countries and regional organizations

22. The bilateral and multilateral assistance provided by donors to the Desert Locust campaigns from January 1988 to May 1989 is summarized in Appendix V.

23. The total assistance in 1988 amounted to US\$ 115,073,974 including FAO Technical Cooperation Programme assistance. In 1989 (up to the end of May) the total assistance amounted to US\$ 59,876,730.

24. Donor assistance covered various types of activities including equipment, technical assistance, pesticides, vehicles, radios, operating costs, flying hours, as well as training. It also started action in creating/strengthening national and regional locust control bases.

25. Donors also assisted in undertaking insecticide trials and environmental studies.

26. The Committee expressed its thanks to FAO for its role in calling for and coordinating the international assistance and in a large number of cases, for executing activities on behalf of donors through Trust Funds. The contribution of the Emergency Centre for Locust Operations (ECLO) in organizing planning and coordination meetings and the FAO Technical Cooperation Programme in providing assistance was recognised.

27. The Committee expressed its gratitude to the donor community for the very generous assistance which had been provided to countries and regional organizations. This has helped in undertaking successful control operations to protect crops and contributed to the decline of the plague. Furthermore it has directly resulted in strengthening plant protection and locust control organisations in all countries concerned. The Committee noted with appreciation the increasing number of donors from both developed and developing countries and the TCDC actions which prevailed between North-West Africa and West Africa sub-regions. It also appreciated that in 1989 an impressive amount of assistance has already been committed and/or pledged by donors.

28. In order to consider any additional assistance during 1989 campaign, the Committee recommended that affected member countries keep active the national coordinating committees in order to follow adequately all developments and needs according to the evolution of the situation.

29. The Committee agreed that future reviews of assistance should also include the contributions of the affected countries in the costs of the campaigns.

30. The Committee recognized the need for permanent survey and preventive control measures and requested donors to give full consideration to the provision of assistance during recession periods.

31. The Committee was informed that the Government of Sudan had prepared a special request to the international donor community and a joint Government of Sudan/donor meeting was held on 15 June 1989.

Review of existing control potential

32. Delegates were invited to provide the latest status of the locust control potential in their countries and regions. The latest and most complete information is shown in Appendix VI.

The International Desert Locust Task Force

33. The Committee reviewed the developments related to the International Desert Locust Task Force (ITF). A summary of the Working Paper presented to the meeting is shown as Appendix VII.

34. The Committee noted that, taking into consideration the significant decline of Desert Locust population levels in many areas, the revised proposals from the meeting of 3-4 April constituted an approach more adapted to the present locust situation than that which had been

elaborated and agreed at the meeting of 24-26 January. The Committee requested that focus be done on field surveys in complement to strengthening aerial survey/monitoring capabilities. It must be noted that phase I assistance are complementary to national survey and control plans.

35. FAO is studying the ITF intervention in collaboration with other donors operating in the region, including France (Ecoforce), Canada, Norway (Stromme Foundation) and with the Maghreb Task Force. Some funds were already made available through assistance from some donors (USA and Italy), and other donors (Switzerland and Netherlands) have expressed interest in financing the operation. This will permit FAO to start the implementation of Phase I within the coming few weeks, but additional funds are needed in order to secure adequate ground and aerial survey operations. Should the situation worsen, the expansion of the ITF will be explored with the assistance of the international community.

36. France presented its Ecoforce programme in the Sahel which will be based in Niamey and Dakar, consisting of 3 helicopters, 2 fixed wing aircraft, 4 technicians and logistic support at a total cost of FF7 million in 1989. In addition, an amount of FF11 million could be made available till the end of 1989 if the necessity arises. Ecoforce will give priority to the agricultural areas, covering basically the Desert Locust as well as other migratory pests. Activities in areas outside the agricultural zones are not excluded in case of emergency. Coordination will be based at Niamey.

Medium-Term project for preventive control in West and North-West Africa

37. The Committee was informed by the Secretariat of the various steps undertaken by FAO for improving the preventive control against the Desert Locust on a permanent basis within the whole recession area and more particularly of the inter-regional medium-term project covering West and North-West Africa.

38. The preparation of the programme for West and North-West Africa started in 1988 with a workshop held in Nouakchott in June 1988, followed by a working group meeting late July/early August in Rome. From October 1988 the responsibility of updating and finalising of the project was given to IFAD and FAO.

39. The final document will be ready in July 1989 for a quick evaluation and consultation between donors to be held around September 1989. The project should start in January 1990.

40. Basic principles

- Permanent surveys of outbreak areas localized in West and North-West Africa;
- complementarity of Sahelian and North African pregarisation zones and consequently the necessity of coordination among the countries concerned. OCLALAV and the FAO North West Africa Desert Locust Commission to ensure coordination between member countries.

41. Content of the project

- a) Creation or strengthening of national anti-locust units which implies:
 - the creation or strengthening of a central base;
 - the construction or rehabilitation of main bases, secondary bases and support stations;
 - the provision of vehicles and of survey, control and communication equipment;
 - pesticides for preventive control;
 - training at all levels;
 - technical assistance adapted to the needs of each country.
- b) Development of institutional coordination: OCLALAV/North-West African Commission/FAO.
- c) Support to locust research.
- d) Execution of joint surveys.
- e) Provision for emergency operations.

42. The proposed cost of the project will be from US\$ 20 to 25 million of external inputs over a 5 year period, to complement national efforts in implementing the long-term strategy for preventive control. It will be implemented through multilateral and/or bilateral assistance.

43. The Committee fully endorsed the rationale of the project and the urgency of its implementation in the shortest time possible. It was informed about the proposed role of IFAD in seeking donor funding. It insisted that FAO should have responsibility for technical aspects of the project and for operating the project. Several donors showed their interest and willingness to support the project after its submission and insisted on defining the role of IFAD in the matter. Several donors made it clear that their contributions in 1988 to several countries were meant to support the creation of the national units proposed in the project.

44. The Committee reiterated its earlier recommendations that such a project should only deal with the Desert Locust. Although it will indirectly help in strengthening the Plant Protection services in the countries concerned, strict attention should be paid to the principle that the equipment and supplies are kept for the preventive control activities against the Desert Locust in the remote areas.

45. The Committee recalled the earlier studies on the preventive control against the Desert Locust in the Central Region, which remains the most important breeding area during recession periods and the most frequent origin of Desert Locust upsurges. It therefore requested FAO to undertake similar studies with a view to preparing a project proposal for preventive control in the countries surrounding the Red Sea. The Committee also recommended that similar action should be undertaken for strengthening the preventive control in the Eastern region.

Status of Regional Commissions and Organizations

46. The Committee reviewed a document concerning the state of the FAO regional commissions and of the regional locust control organizations prepared by the Secretariat (see Appendix VIII).

47. Parallel to the priority given to strengthening the national units, the Committee recognized the need to strengthen the FAO regional commissions.

48. The Committee was informed that the Programme of Work and Budget for 1990-1991 has reintroduced the posts of the two regional locust officers in Jeddah and Algiers, who are the secretaries of the two commissions in the Near East and North-West Africa. As far as the post of South-West Asia Commission is concerned, the solution through the FAO Regular Programme is more difficult for the coming biennium and alternative ways of funding will have to be explored. Concerning the strengthening of the Commissions by additional staff, the Committee recognized that this equires additional financial support. It requested all countries to pay their contributions to the Trust Funds, in full and on time, and requested FAO to explore the possibility of obtaining additional assistance.

49. OCLALAV is now operational in its restructured form. It still needs sustained technical assistance and financial support.

50. DLCO-EA status was briefly highlighted and the Committee noted the critical situation of the arrears and its consequent effect on the operations. Some training for pilots and engineers has been requested from DLCO as well as on insecticide application by ground equipment. It was emphasized that there should be stronger cooperation between DLCO-EA and the FAO Near East Locust Commission.

Desert Locust Research

51. The secretariat presented a document (Appendix IX) on activities undertaken since mid 1988 concerning the promotion of Desert Locust research. This included a number of technical meetings, the results of which were considered by an FAO Research Advisory Panel which met in Rome during early May 1989. The report of the Panel was distributed to the participants during the Session. It suggested priorities for future research. The Summary appears at Appendix X.

52. The Committee was informed about certain specific research issues, i.e. remote sensing applications, population dynamics and modelling, pesticides and their application, environmental impact and long-term biological research (for details see Appendices XI and XII) and also about the locust research programmes of France, Federal Republic of Germany, United Kingdom and the United States of America (see Appendices XIII-XVI).

53. The following priorities were expressed by a large number of countries and experts:

- a) the need for developing non-polluting methods of control;
- b) the development of adequate ULV ground spraying equipment;

- c) the development of suitable protective clothing;
- d) the development of operational research.

54. It is clear that several parties are involved in the various programme of research proposal and their implementation, to be useful and effective will require a large amount of coordination, especially when the massive investment necessary for some lines of research to reach fruition is considered. The Committee was informed of the FAO proposal submitted to UNDP suggesting the establishment, for this purpose, of a joint FAO/UNDP/major donors Committee, supported by two secretariats:

- a) a financial secretariat (UNDP);
- b) a technical secretariat provided by FAO, guided by an independent review panel.

The above proposal will be discussed at the June 1989 UNDP Governing Council.

55. Participants expressed concern that national institutions and scientists have not been sufficiently involved in the research conducted to date. The Committee recommended an increased involvement of national research workers in all future research activities.

56. The Committee recalled that coordination of research and of all technical matters dealing with the Desert Locust was a basic mandate of the Desert Locust Control Committee. It expressed its concern about:

- a) the large number of research projects under consideration, mostly orientated to the mid and long-term approach;
- b) the amount of human and material inputs needed for their implementation.

57. Therefore the Committee unanimously recommended:

- a) that all projects be examined by the Research Advisory Panel and the countries concerned with a view to defining priorities and research options in space and time;
- b) that the execution of all these research programmes be combined with a vast programme of training at all levels aiming at forming an adequate scientific and technical staff able to secure the transfer of technology to the affected countries;
- c) that the Research Advisory Panel proposed by FAO include scientists from the Regions concerned;
- d) that research should be undertaken not only in the laboratory but also in the field when appropriate.

58. The Committee considered all above reports on research priorities emanating from initiatives sponsored by FAO, UNDP, affected countries, regional organizations and donor countries.

59. The Committee reaffirmed its long-established mandate to promote the coordination of policies on Desert Locust research. It further

stressed that it provides the central forum where affected countries, regional organizations, commissions, sponsoring agencies and donors regularly meet to review policy on research targets and priorities.

60. It welcomed the network of lasting contacts which the DLCC affords to create and cement collaborative programmes between researchers and control organisations.

61. The Committee welcomed initiatives by many agencies and donors to promote long term search for novel and environmentally safer control methods. But recognising the long (up to 20 year) period of extensive research, development and registration procedures which will precede the successful implementation of alternative methods of control recommends and urges that research directed toward refining existing control methods continues to be afforded high priority.

62. The Committee welcomes the proposal made by FAO to set up with co-sponsors a structure with appropriate financial and technical secretariats to promote, monitor and review projects improving existing methods of control and developing novel alternatives. It wished to be kept informed about the outcome of the discussions and insisted that these decisions should be in conformity with the mandate of the DLCC.

63. The Committee, therefore, calls upon FAO and international donor agencies to provide increased support needed by AGP Migratory Pests Group to fulfil its role as the secretariat of the DLCC.

64. The Committee also urges that consideration be given to reactivating the Technical Advisory Committee on Desert Locust Control or to create a panel of independent experts to prepare technical briefings for the DLCC.

Training

65. The committee listed the training activities which were undertaken since the last session in 1988 under the DLCC trust fund and other sources, notably FAO projects, UNDP, TCP and USAID (Appendix XVII).

66. The Committee was also informed that a regional training course for the Near East countries will be organized in July 1989 in Amman, Jordan, and that FAO has made arrangements to prepare a training package for the organization of further training courses.

67. In addition to activities mentioned above, training in migratory pest control is organized in Eastern Africa under the regional UNDP/FAO/DLCO-EA project RAF/88/033. Training in Remote Sensing is being provided by FAO under specific projects.

68. The Committee recalled the basic role of FAO in coordinating training activities and commended its continuing efforts in training and requested its assistance to governments in assessing their needs at all levels. This assessment should be done in detail in each country.

69. A number of participants expressed the basic needs of their country/organization. These would be announced in ECLO bulletins.

70. The Committee requested donors to undertake research on alternative control methods and environmental studies to train people from the developing countries in their institutions.

71. The Committee was informed of the possibility of undertaking in-service training. Morocco offered to provide the services of some of their technicians for training staff of other countries in their own countries. It was also announced that it is now possible to train pilots in the agricultural aviation centre now available in Tunisia at Borj.

International TF 9161: Contributions and Expenditures

72. The secretariat presented a statement on the budget and the accounts for 1988 and early 1989 (Appendix XVI(I)). The total expenditure in 1988 amounted to US\$ 245,986. The overall end of the year balance for 1988 was US\$ 92,278. Commitments in 1989 (as at 30 April) amounted to US\$ 53,686, leaving an unallocated balance of US\$ 58,592. Outstanding contributions amounted to US\$ 757,700 as at 31 March 1989, US\$ 207,300 for 1989-90, making a total of over US\$ 950,000.

73. The Committee accepted the budget and accounts as presented by the FAO Secretariat. It expressed deep concern about the low level of the balance and the decreasing interest of member countries in paying their agreed contributions. The amounts paid in 1988 and 1989 have almost been nil, which makes serious limitations in the coordination and solidarity role of the Fund which remains a vital task for DLCC activities and for initiating quick action and emergency operations. Governments were strongly requested to make a special effort to pay their arrears.

Any other business

74. The Committee noted with satisfaction and interest UN General Assembly resolution 43/203 of 19 December 1988 which recognized the overall role of the DLCC in coordinating the activities of locust control.

75. It requested the Director-General to undertake the necessary measures for revitalizing the role of DLCC in these activities, including the organization of frequent meetings of specialized groups of experts as foreseen in the DLCC terms of reference.

Date and place of next Session

76. The Committee agreed that the next session of the DLCC would be held at FAO Headquarters, Rome, after approximately one year, at a time to be chosen by the Director-General of FAO.

TERMS OF REFERENCE OF THE DLCC
(AS AMENDED BY THE FAO COUNCIL IN 1968)

- a) To keep the Desert Locust situation under review;
- b) to coordinate the Desert Locust control campaign in the Arabian Peninsula and other affected areas;
- c) to promote the overall coordination of work by various national and regional anti-locust organizations and commissions;
- d) to promote the coordination of national and international policies and preventive measures in Desert Locust and research;
- e) to provide the Director-General with technical and scientific advice on the Desert Locust situation and on the measures required to keep it under control. For this purpose, whenever there are scientific and technical matters to be discussed at the future sessions of the FAO Desert Locust Control Committee, they should be preceded by meetings of a small number of locust experts to study and report to the Committee on all relevant technical and scientific matters designed to improve and rationalize control of the Desert Locust;
- f) to give general policy guidance and to provide technical advice to the Director-General on, and review of, the work programme financed under the International Desert Locust Trust Fund No. 9161, and to review the annual and financial reports for the work performed under the above-mentioned Trust Fund.

WMO ACTIVITIES WITH RESPECT TO DESERT LOCUST CONTROL

1. Within the framework of the international activity triggered by the Desert Locust plague in Africa during 1988, several urgent steps were taken:

- a) In response to a request from Algeria, WMO helped to assure that essential meteorological products were sent from the European Centre for Medium-Range Weather Forecasting (ECMWF) and the UK Meteorological Office to the National Meteorological Centre;
- b) A joint UK/WMO mission by an Expert consultant was organized to Algeria:
 - (i) to define necessary actions for the transmission of meteorological products required for locust control from Algeria to FAO, using the special products received from the ECMWF and UK Meteorological Office and other data obtained from several WMO Members in WMO Regions I (Africa), II (Asia) and IV (Europe);
 - (ii) to assist in the further development of subregional meteorological activities in the fight against locusts;
- c) WMO assisted in the detachment of a suitable synoptic meteorologist to FAO to provide meteorological support at the FAO Locust Control Centre, Rome;
- d) WMO arranged for the preparation and distribution of a pamphlet summarizing current knowledge of meteorological aspects of locust control;
- e) WMO has reprinted WMO Technical Note No. 54 (WMO No. 138 TR 64) - Meteorology and the Migration of Desert Locusts, by R.C. Rainey (in English) for distribution to WMO Members in the invasion area. The French language version has been distributed to French speaking Members in the area; copies are available from the WMO Secretariat, Geneva.

2. A joint FAO/WMO workshop on the Provision of Agrometeorological Information for Locust Control was held in Tunis (July 1988). The workshop considered the data and information requirements, the mechanism for data dissemination within the invasion area and training needs. Action has been completed or is in progress on the implementation of the recommendations.

3. In order to facilitate the expedition and dissemination of locust information, arrangements have been made for the coding of locust observations for transmission on the WMO Global Telecommunication System (GTS) in much the same way as meteorological information is disseminated on the GTS. National Locust Control authorities are encouraged to contact their National Meteorological Services.

4. A project is being formulated for submission to UNDP for the strengthening of the meteorological observing network in locust breeding areas of Africa. The UK is considering providing US\$ 150,000 for meteorological satellite primary data user stations (PDUS) and USAID is considering funding the purchase and installation of automatic weather stations (about US\$ 300,000). Italy hopes to support the training component of the project through the activities of the World Laboratory. The project seeks contributions from UNDP national projects and trust fund projects.

5. WMO plans to contribute to the training of field meteorological observers on locust observations and reporting through short courses and roving seminars during the biennium 1990/1991. Draft training syllabi have already been prepared.

International Desert Locust Task Force

WMO favours the creation of this Task Force and is fully prepared to collaborate with FAO or any other organization charged with the responsibility for anti-locust activities, in particular through the provision of meteorological inputs to the work of the task force, within the available financial resources and as authorized under the Rules and Practices of the Organization and the WMO Financial Regulations.

POSSIBLE DESERT LOCUST CONTROL OPERATIONS
(hectares to be treated)

	June-Sept (first generation) scenarios		Sept-Nov (second generation) scenarios	
	best case	worst case	best case	worst case
Mauritania	10 000	50 000	20 000	500 000
Mali	20 000	50 000	20 000	500 000
Niger	20 000	50 000	20 000	500 000
Chad	20 000	50 000	20 000	500 000
Cameroon	0	0	0	50 000
Nigeria	0	0	0	200 000
Senegal	0	0	0	200 000
Gambia	0	0	0	50 000
Guinea-Bissau	0	0	0	10 000
Morocco	0	0	0	200 000
Algeria	0	0	0	50 000
Tunisia	0	0	0	10 000
Libya	0	0	0	20 000
Sudan	20 000	100 000	50 000	750 000
Ethiopia	20 000	50 000	50 000	250 000
Djibouti	10 000	50 000	20 000	100 000
Somalia	20 000	50 000	50 000	250 000
Saudi Arabia	10 000	20 000	20 000	100 000
Yemen A.R.	20 000	50 000	20 000	250 000
P.D.R. Yemen	20 000	50 000	20 000	250 000
Egypt	0	0	10 000	100 000
Jordan	0	0	0	10 000
Syria	0	0	0	10 000
Iraq	0	0	0	10 000
Kuwait	0	0	0	5 000
Bahrain	0	0	0	2 000
Qatar	0	0	0	5 000
United Arab Emirates	0	5 000	0	5 000
Oman	0	10 000	0	10 000
Iran	0	10 000	0	5 000
Pakistan	0	10 000	0	50 000
India	0	10 000	0	50 000
Afghanistan	0	0	0	0
	190 000	615 000	320 000	4 952 000

CONTROL MEASURES UNDERTAKEN BY COUNTRIES, REGIONAL ORGANIZATIONS AND DONORS June 1988-June 1989

COUNTRY	MONTHS	TYPE OF INFESTATION	AREA TREATED (SQ. KM)	PESTICIDE USED		METHOD OF APPLICATION	
				QUANTITY	TYPE	TYPE	APPLICATION
MOROCCO	JUL-DEC	Hoppers & Swarms	17,500 {	4,945,000 ULV (l)	(l)		air/ground
	JAN-MAY	Swarms	2,330 {	30,000 EC (l)	(l)		air/ground
ALGERIA	JUL-DEC	Hoppers & Swarms	1,400				
	JAN-MAY	Swarms	72				
LIBYA	JUL-DEC	Swarms	340 {	12,707 ULV (l)	(l)		
	JAN-MAY		0 {	220 Bait (t)	(t)		
MAURITANIA	JUL-DEC	Hoppers & Swarms	8,000 {	373,535 ULV,EC (l)	(l)		air/ground
	JAN-FEB	Swarms	760 {	1,960 Bait (t)	(t)		air/ground
SENEGAL	JUL-DEC	Hoppers & Swarms	19,400				
	JAN-FEB	Swarms	990				
CAPE VERDE	JUL-DEC	Swarms	200 {	2,860 Dust (kg)	(kg)		ground
	JAN-MAY		0 {	10,595 ULV,EC (l)	(l)		air/ground
			{	15 Bait (t)	(t)		ground
GAMBIA	JUL-DEC	Hoppers & Swarms	1,310 {	400 Dust (t)	(t)		
	JAN-MAY	Swarms & Hoppers	92 {	80,168 ULV,EC (l)	(l)		
GUINEA BISSAU	JUL-DEC	Hoppers	17.6	500 ULV (l)	(l)		ground
	FEB	Swarms	4.5	4,100 Dust (kg)	(kg)		ground
MALI	JUL-DEC	Hoppers & Swarms	4,100 {	340,177 Dust (kg)	(kg)		air/ground
	JAN-MAY		0 {	232,241 ULV,EC (l)	(l)		air/ground
BURKINA FASO	JUL-DEC	Hoppers	0.8				
	JAN-MAY	Adults	0.1				
NIGER	JUL-DEC	Hoppers & Swarms	9,600 {	493,138 ULV,EC (l)	(l)		air/ground
	JAN-MAY	Swarms	78 {	431,053 Dust (kg)	(kg)		air/ground

CONTROL MEASURES UNDERTAKEN BY COUNTRIES, REGIONAL ORGANIZATIONS AND DONORS June 1988-June 1989

COUNTRY	MONTHS	TYPE OF INFESTATION	AREA TREATED (SQ. KM)	PESTICIDE USED		METHOD OF APPLICATION
				QUANTITY	TYPE	
CHAD	JUL-DEC FEB	Hoppers & Swarms Hoppers	1,050 1.6	96,050	ULV, EC (I)	
SUDAN	JUL-DEC JAN-MAR	Hoppers & Swarms Hoppers & Adults	11,560 167	488,587 ULV (I) 94,636 EC (I) 55,145 Dust (kg) 453,447 Bait (kg)		
ETHIOPIA	JUL-DEC JAN-MAY	Hoppers	450 0	29,373 Dust (kg) 20,884 ULV, EC (I)		
DJIBOUTI	JUL-DEC JAN-MAY	Hoppers	50 0			
DLCO-EA	JUL-DEC SEP-DEC OCT-NOV	Hoppers & Swarms Hoppers & Swarms Hoppers & Swarms	559 129 54	26,410 ULV (I) 7,720 ULV (I) 1,300 ULV (I)		air (SUDAN) air (ETHIOPIA) air (DJIBOUTI)
SAUDI ARABIA	JUL-DEC JAN-FEB	Hoppers & Swarms Hoppers	8,000 8	536,425 ULV (I)		air/ground ground
YEMEN AR	JUL-DEC JAN-FEB	Hoppers Hoppers	550 { 600 {	42,300 ULV (I)		ground
YEMEN PDR	JUL-DEC JAN-FEB	Adults & Hoppers Hoppers	8 { 2.5 {	10,000 ULV (I)		ground
JORDAN	JUL-DEC JAN-MAY	Swarms	30 0			
EGYPT	JUL-DEC JAN	Swarms Hoppers	2,120 { 385 {	12,000 ULV (I) 109,000 EC (I) 70 Bait (t)		air/ground air/ground ground

CONTROL MEASURES UNDERTAKEN BY COUNTRIES, REGIONAL ORGANIZATIONS AND DONORS June 1988-June 1989

COUNTRY	MONTHS	TYPE OF INFESTATION	AREA TREATED (SQ. KM)	PESTICIDE USED		METHOD OF APPLICATION
				QUANTITY	TYPE	
SYRIA	JUL-DEC JAN-MAY		4.5 0			air/ground
TURKEY	JUL-DEC JAN-MAY	Swarms	1.4 0	70	EC (I)	
IRAQ	JUL-DEC JAN-MAY	Swarms	50 0			
KUWAIT	JUL-DEC JAN-FEB	Swarms Swarms	? 72			
QATAR	JUL-DEC JAN-MAY	Swarms Swarms	? 0			
UAE	JUL-DEC JAN-FEB	Swarms Swarms	80 64			
IRAN	JUL-DEC JAN-MAY	Swarms	50 0			
INDIA	JUL-DEC JAN-MAY	Hoppers	1.5 0			
TOTALS						
				92,243		

ASSISTANCE PROVIDED TO COUNTRIES AND REGIONAL ORGANIZATIONS
(FAO and Donors)

January 1988 - May 1989

Most of the very generous assistance provided by donor countries, institutions and non-governmental organizations from early 1988 to date was for the extensive campaigns organized in the countries against a major plague of the Desert Locust. Although some of the assistance given early 1988 had been included in the report of the 29th Session of the DLCC, 13-17 June 1988, it was found convenient to include in this paper all the assistance to the Desert Locust campaigns from January 1988 to May 1989. In several countries this assistance covered up to 95% of the campaign costs. It comprised:

African Development Bank

In 1988: US\$ 200,000 for strengthening national Desert Locust services in Chad, Mali, Mauritania and Niger.

In 1989: US\$ 619,700 for regional research programmes in West Africa and US\$ 5.4 million to various countries in east, north, north-west and west African countries, DLCO-EA and OCLALAV.

Algeria

In 1988: US\$ 130,000 pesticides and ground survey and control teams to Mauritania and US\$ 50,000 for locust control in Mali.

Australia

In 1988: Assistance to Ethiopia amounting to US\$ 205,000.

Austria

In 1988: US\$ 29,041 to the Near East Region.

Belgium

In 1988: US\$ 500,000 pesticides and aerial services to Morocco and Libya.

In 1989: US\$ 1,300,000 at FAO disposal for activities in Africa.

Canada

In 1988: US\$ 1.55 million to West Africa on a regional basis. US\$ 693,000 on a bilateral basis to Burkina Faso, Mali, Morocco and Niger.

In 1989: US\$ 260,000 to Mali and US\$ 83,000 to Sudan.

China

In 1988: US\$ 40,000 to Mauritania, Algeria, Cape Verde and Chad.

In 1989: US\$ 120,000 to Mauritania.

Denmark

In 1988: US\$ 2,013,068 to West Africa and Morocco and US\$ 800,000 to Sudan.

In 1989: US\$ 2.4 million to Sudan.

EEC

In 1988: provided substantial assistance mainly in the form of pesticides, aircraft flying hours, technical assistance and operating costs to the Maghreb, West Africa, Cape Verde, Sudan and Ethiopia, to the value of US\$ 9.6 million.

In 1989: provided US\$ 400,000 to Mali.

Finland

In 1988: provided assistance to Sudan valued at US\$ 8,455 and to Morocco US\$ 200,000.

In 1989: US\$ 75,000 to Ethiopia.

France

In 1988: contributed the equivalent of US\$ 6 million to the 1988 campaigns in North-West and West Africa, mainly in the form of spray aircraft, helicopters, flying hours, pesticide, technical assistance and operating costs.

In 1989: provided assistance valued at approximately US\$ 2.5 million to the Sahelian countries and at approximately US\$ 650,000 to ECLO.

F.R. Germany

In 1988: contributed US\$ 12 million to the 1988 campaigns in North-West Africa, West Africa, Pakistan and Jordan in the form of pesticides, application equipment, radio sets, helicopter flying hours, sprayers, vehicles and protective clothing.

In 1989: contributed US\$ 14.2 million to Algeria, Burkina Faso, Cape Verde, Chad, Jordan, Mali, Mauritania, Morocco, Niger, Senegal and Somalia in the form of pesticides, vehicles, spraying equipment, radios, camping equipment.

Greece

In 1988: assisted Tunisia with US\$ 160,000 for operating expenses.

Indonesia

In 1988: offered US\$ 25,000 to Chad for operating costs.

Iran

In 1988: offered US\$ 7,500 to Mali for operating costs.

Islamic Development Bank (IDB)

In 1988: contributed US\$ 14.4 million for anti-locust campaigns in 22 countries in North, North-West and West Africa, Near East, DLCO-EA, OCLALAV and the Magrebine Task Force in the form of vehicles, pesticides spraying equipment and operating costs.

In 1989: assisted Mali (US\$ 750,000), Niger (US\$ 294,000) and Sudan (US\$ 1 million).

Italy

In 1988: provided substantial assistance amounting to US\$ 3 million to North West Africa, West Africa, Cape Verde and Ethiopia, in the form of flying hours, pesticides, spraying equipment and technical assistance.

In 1989: US\$ 1 million (FAO project) to Sudan, Chad and Ethiopia.

Japan

In 1988: provided assistance to West and North-West Africa to the value of US\$ 2.8 million and US\$ 1.3 million to Sudan.

In 1989: an amount of US\$ 10.4 million was allocated to East African, North-West and West African countries plus US\$ 3,170,000 for Sudan. Promised additional help if the necessity arises.

Kuwait

In 1988: US\$ 1 million to Tunisia and Mauritania for operating costs.

Libya

In 1988: assisted Niger by providing aircraft and pesticides amounting to US\$ 462,000; Mauritania: US\$ 500,000 (cash); Maghrebine Task Force: US\$ 250,000.

Luxembourg

In 1988: assisted Niger, Mauritania and Gambia with an amount of US\$ 244,000 for helicopter flying hours and spraying aircraft.

Morocco

In 1988: provided pesticides to Mauritania to the value of US\$ 120,000, and aircraft services and technical assistance to Mali amounting to US\$ 200,000.

Multilateral regional fund (Commissions)

In 1988: US\$ 700,000.

Netherlands

In 1988: contributed US\$ 6.6 million to 1988 campaigns in Cape Verde, West Africa and Sudan in the form of technical assistance, flying hours, operating expenses and protective clothing.

In 1989: Pledged D. Fl. 4.5 million (US\$ 2.2 million) for procurement of pesticides at short notice and their airfreight, flying hours and servicing costs, depending on the locust situation.

Nigeria

In 1988: US\$ 400,000 to Niger in the form of 300 flying hours and 10,000 l of pesticides.

Non-governmental organizations (NGOs)

In 1988: assisted several countries to the amount of US\$ 1,111,000.

Norway

In 1988: provided aerial services to Mali to the value of US\$ 1.6 million.

In 1989: provided aerial services to Mali to the value of US\$ 2 million.

Organization of African Unity (OAU)

In 1988: assisted the 1988 campaigns in Chad with an amount of US\$ 300,000 for operating expenses.

OPEC

In 1988: contributed US\$ 9,000 to Cape Verde and US\$ 30,000 to Niger.

Portugal

In 1988: assisted Desert Locust control campaigns in Morocco (US\$ 500,000) and Cape Verde (US\$ 106,000) in the form of flying hours.

Qatar

In 1988: provided US\$ 12,000 to Sudan.

Saudi Arabia

In 1988: provided US\$ 2.86 million to Algeria, Morocco, Tunisia, Mauritania and Sudan in the form of pesticides and vehicles.

Spain

In 1988: assisted the campaigns in North-West Africa in the form of aircraft services and pesticides valued at US\$ 2,440,000.

Sweden

In 1988: provided US\$ 2.6 million to the 1988 regional programme in Africa in the form of aircraft services, technical assistance and operating expenses.

Switzerland

In 1988: contributed to the 1988 campaigns in West and East Africa in the form of various services amounting to US\$ 944,268.

In 1989: provided US\$ 25,000 to Mali and US\$ 313,000 to Sudan.

Tunisia

In 1988: offered pesticides to Mauritania valued at US\$ 90,000.

Turkey

In 1988: assisted the campaigns in North-West Africa at an amount of US\$ 500,000.

United Kingdom

In 1988: provided US\$ 5.8 million in the form of training, vehicles, equipment, pesticides, protective clothing and technical assistance to DLCO-EA, IRLCO-CSA, Algeria, Burkina Faso, Cameroon, Chad, Gambia, Jordan, Mali, Mauritania, Morocco, Niger, Nigeria, Senegal, Sudan and Tunisia.

In 1989: provided US\$ 207,000 in the form of equipment, training, technical assistance, vehicles and spares to DLCO-EA, IRLCO-CSA, Nigeria and Tunisia.

UNDP

In 1988: assisted the campaigns in North Africa, West Africa and East Africa amounting to US\$ 3 million.

UNEP

In 1988: contributed US\$ 48,000 to projects in Gambia, Mauritania and to an interregional project.

UNICEF

In 1988: assisted Burkina Faso with an amount of US\$ 10,000 for operating expenses.

United States

In 1988: contributed very substantial assistance in the form of pesticides, aircraft, flying hours, logistical support, technical assistance, radio sets, operating expenses to all affected countries. This consisted of US\$ 21.6 million.

In 1989: US\$ 12 millions. In addition USAID has pledged US\$ 14 million for 1989 campaign in North-West Africa and South-West Asia to be used if and when needed.

USSR

In 1988: assisted Algeria, Mauritania and Cape Verde in the form of technical assistance and aircraft services amounting to US\$ 1.3 million.

Summary

The total 1988 assistance amounted to US\$ 115,073,974 for Desert Locust campaigns, including FAO assistance mentioned below. In 1989 (till end May) the total assistance amounted to US\$ 59,876,730 (see page 40).

FAO

FAO, through its Technical Cooperation Programme, has contributed US\$ 4 million in 1988 and US\$ 610,000 in 1989, mainly in the form of technical assistance, pesticides, spraying equipment, operating costs to Mali, Morocco, Mauritania, Tunisia, Cape Verde, OCLALAV, Niger, Algeria, Ethiopia, West Africa, Iran, Guinea and FAO/ECLO at HQ. Through its Emergency Centre for Locust Operations, ECLO, FAO has provided the international coordination of the campaigns. A major ECLO activity was contact with donors and affected countries through various meetings and seminars on locusts:

- Desert Locust Technical/Planning meeting for the 1988 campaigns, FAO, Rome, 6-7 April 1988.
- Emergency meeting of FAO/Donors on the Desert Locust Campaign, FAO, Rome, 11 August 1988.
- Coordination and planning meeting of the Desert Locust Campaign 1988, FAO, Rome, 31 August-1 September 1988.
- Meeting on Desert Locust research: defining future research priorities, FAO, Rome, 18-20 October 1988.
- ECA Interagency Meeting on Locusts and Grasshoppers, Addis Ababa, 14-16 November 1988.

Other major ECLO activities have been:

- a) the organization, with UNDP assistance, of a technical workshop on the preventive control of the Desert Locust in West and

North-West Africa in Nouakchott, Mauritania. from 27-30 June 1988, with the view of preparing an interregional project to be financed by the international donor community. This activity is continuing in collaboration with IFAD;

- b) The establishment in OCLALAV, Dakar, with USAID assistance, of a regional Desert Locust information and forecasting centre.

The UN General Assembly, by its resolution 43/203 of 19 December 1988, recognized the overall role of FAO in coordinating the activities of Locust control.

SUMMARY OF ASSISTANCE PROVIDED BY DONORS
(in US dollars)

	1988	1989 (Jan-May)
African Development Bank	200,000	6,019,730
Algeria	180,000	
Australia	205,000	
Austria	29,041	
Belgium	500,000	1,300,000
Canada	2,243,000	343,000
China	40,000	120,000
Denmark	2,813,068	2,400,000
EEC	9,600,143	400,000
Finland	208,455	75,000
France	6,030,127	3,150,000
F.R. Germany	11,992,000	14,250,000
Greece	160,000	
Indonesia	25,000	
Iran	7,500	
Islamic Development Bank	14,400,000	2,044,000
Italy	2,994,675	1,000,000
Japan	4,100,368	13,620,000 *
Kuwait	1,000,000	
Libya	1,212,000	
Luxembourg	244,000	
Morocco	320,000	
Multilateral (FAO)	700,000	
Netherlands	6,592,347 *	
Nigeria	400,000	
NGOs	1,111,000	
Norway	1,615,000	2,000,000
OAU	300,000	
OPEC	39,000	
Portugal	606,000	
Qatar	12,000	
Saudi Arabia	2,860,000	
Spain	2,440,000	
Sweden	2,599,386	
Switzerland	944,268	338,000
TCP (FAO)	4,000,000	610,000
Tunisia	90,000	
Turkey	500,000	
United Kingdom	5,800,000	207,000
UNDP	2,926,332	
UNEP	48,405	
UNICEF	10,000	
USAID	21,599,859	12,000,000 *
USSR	1,376,000	
	115,073,974	59,876,730

* additional assistance pledged for 1989 campaign if necessity arises

LOCUST CONTROL POTENTIAL, JUNE 1989

REGION	COUNTRY	DATE	ULV (l)	EC (l)	TOTAL (l)	DUST (kg)	VEHICLES	RADIOS	SPRAYERS	A/C	HELICOPTER	STAFF
NW AFRICA	Morocco	Dec-88	2,410,500	30,000	2,440,500		180	100	1,750	10	*	300
	Tunisia	Mar-89			0					8	*	
	Libya	Dec-88	124,800	115,017	239,817	170,333				20	*	
	Algeria	Jun-89	1,500,000	500,000	2,000,000	1,500,000	100	38	1,800	8	*	
WEST AFRICA	Mauritania	Jun-89			259,905	565,590	40	30	4,260			
	Senegal	Apr-89	334,620	27,361	361,981	1,195,150	157	58	2,516			
	Gambia	Dec-88	5,000	520	5,520	200,000	15	34	1,262			209
	Guinea Bissau	Dec-88	8,000	15,000	23,000	8,000	3		146			30
	Mali	Mar-89	240,240	2,400	242,640	115,000	57		2,017	3		
	Niger	May-89	232,055	1,220	233,275	122,314	39	32	15,670	3		
	Chad	Mar-89	420,000	12,500	432,500	10,700	57	31	11,207			
	Burkina Faso		164,203	6,000	170,203	380,000	53	18	6,056			
	Cameroon		15,000	15,000	30,000	10,000	68	9	1,360			
	Nigeria	Jun-89			0					2		
E AFRICA	Sudan	Jun-89	552,552	125,251	677,773	992,975	255	154	2,705	3		2,278
	Ethiopia	Dec-88	56,400		56,400		15		9,028			
	DLCO-EA	Jun-89	198,960		198,960		58			8		
NEAR EAST	Saudi Arabia	Jun-89	536,435		536,435		200		250	*	*	129
	Syria	Dec-88	79,560	22,500	102,060				350	8		
	Yemen PDR	Dec-88	8,500		8,500	2,000	12	4				22
	Yemen AR	Dec-88	97,000		97,000	35,000	24	10	227			31
	Jordan	Jun-89	60,000	20,000	80,000		30		200	4		
	Kuwait	Jun-89	60,000		60,000		40			2		
	Qatar	Jun-89	30,000		30,000		30					
	UAE	Jun-89	50,000		50,000		50					
	Oman	Jun-89	40,000		40,000		20		26	2	2	
	Bahrain	Jun-89	10,000		10,000		10					
	Egypt	Jun-89	15,000	25,000	40,000		50	7				
	Turkey	Jun-89			0					5		

THE INTERNATIONAL DESERT LOCUST TASK FORCE

INTRODUCTION

1. The concept of an International Desert Locust Task Forces arose because on several occasions during 1987 and 1988 opportunities to prevent seasonal upsurges from developing into a generalized plague were lost due to the difficulty of timely mobilization of adequate resources or the inaccessibility of the target populations. To resolve these problems the participants at the International Conference on the Locust Peril (Fez, 28-29 October 1988) called for the establishment of an International Task Force. This idea was endorsed by the United Nations General Assembly Resolution 43/203 of 20 December 1988. The resolution called for the establishment of an international operational capacity to control locusts under UN auspices and the technical and organizational responsibility of the FAO; particularly in regions that are seriously infested and/or have difficult access. The purpose of the operational capacity would be to provide direct support to the affected countries and to coordinate locust control actions.

The UN resolution further requested that FAO establish an action-oriented working group to prepare a detailed plan to fight the locust infestation. The first part of this plan should be to delineate regions of strategic importance, to be followed by details of creating an International Task Force and establishing plans of work for 1989 and early 1990.

2. Accordingly a Working Group composed of affected countries and donors met in Rome from 16-20 January 1989. During this meeting the Desert Locust situation was reviewed and basic principles of the ITF were formulated. The proposals of the Working Group were reviewed at a planning meeting held in Rome from 24-26 January 1989 which formulated plans for the 1989 Desert Locust control campaign and the ITF. The work of the planning group was extended till early February in order to produce the final proposal of the ITF activities for 1989 and early 1990 which was then distributed to all parties concerned. It was emphasized that the concept of the ITF was to complement the work of the national crop protection services by operating in areas for which they do not have suitable resources.

SUMMARY OF ITF REPORT OF FEBRUARY 1989

3. The report defined "strategic" control and described strategic areas as being areas of hopper band build-up and those subject to invading swarms. ITF units will have to be created in regions where the frequency of locust breeding is highest or where access is difficult due to terrain, where cross-border operations are necessary, or in areas distant from supply centres. The sites of the ITF units (5 main units and 13 sub-units) were determined. Plans were also presented to cover adequately the cultivated regions, thus at the same time supporting the

national crop protection services. In this context, France presented its contribution to the ITF "ECOFORCES in Locust Control". Their activities would initially be concentrated in operations in cropping areas but they could eventually be made available to control infestations in the more northerly areas.

4. Problems covered by the study:

- Organization of the Task Force at the level of the host country and at the level of FAO.
 - Proposed structures.
 - Conditions preceding the establishment of an ITF.
 - Delegation of authority from FAO/ECLO to the field.
 - Future of Task Force resources.
 - Methods to be used.
 - Preliminary training.
 - The role of national plant protection services.
 - Planning of operations.
 - Regional facilities.
 - Financial provisions required and cost of establishing the ITF, including a proposed Moroccan participation in Mauritania.
- The total cost of the proposal was US\$77 440 000, including US\$8 million for investment and US\$69 million for operating costs and it included support to national plant protection services.

IMPLEMENTATION OF THE ABOVE PROPOSALS

5. At the time of the January 1989 meeting, which adopted the overall principles of the ITF, there was still a possibility that the plague would continue unabated and that large-scale control operations, perhaps comparable to those undertaken in 1988, might be necessary during 1989. However, it was apparent that there had been a significant decline in locust population levels in many areas and subsequently the Desert Locust situation has become much calmer and the potential scale of control operations to be carried out has since become much more limited.

6. As a result FAO called a meeting on 3-4 April 1989 in Rome to review the current Desert Locust situation, the current Desert Locust control potential and the proposals for the ITF in the light of the Desert Locust outlook and the resources available.

7. Although the control operations required might be of a very limited scale, the meeting recognised that it would be extremely difficult to predict to what extent they would be needed and in which particular countries and regions. However, these operations would be very essential to terminate the plague during 1989. The meeting considered it realistic and essential to revise the January 1989 plans and submit a scaled-down version to be considered as Phase I of the ITF and initially cover a three months period aiming at strengthening survey and early control capabilities of national units in strategic areas and training of national staff. Major emphasis would be placed on monitoring the existing residual populations which necessitate early and continuous surveillance/control operations in the strategic areas located outside cropping areas. For the cropping areas plans have been developed by the national authorities and will be complemented by the ECOFORCE units to

be established by France in cooperation with other donors and countries concerned. Implementation of Phase I of the ITF will be carried out jointly with the national authorities to ensure full complementarity.

8. Operations to be undertaken under Phase I of the ITF were defined as follows:

a) Aerial and ground survey from key locations:

- Aioun-el-Atrouss (Mauritania)
- Aguel'hoc (Mali)
- Agades (Niger)
- Abéché (Chad)
- El Fasher (Sudan)
- Northern Ethiopia
- Yemen AR
- Yemen PDR

In preparation for the activities to be carried out, the necessary staff are being trained and ground teams are already in the field in Mauritania, Mali, Niger, Chad. Additional needs for aerial surveys were assessed.

- b) Control: very substantial quantities of pesticides are available and more will be provided by donors.
- c) Strengthening national units' survey/control capability including rehabilitation of national aerial units.
- d) Training: a number of courses have already been planned under USAID, FAO and UNDP funded projects.

9. Proposals presented were estimated at US\$ 3.6 million for Phase I including activities in Mauritania, Mali, Niger, Chad, Sudan, Ethiopia, the two Yemens, Maghreb Task Force, OCLALAV and ECLO.

10. Actions related to general coordination remain as per original document of February 1989.

STATUS OF REGIONAL LOCUST COMMISSIONS AND ORGANIZATIONS

1. FAO Commission for Controlling the Desert Locust in the Near-East

The fourteenth session was held on 20-22 June 1988 in Rome with the participation of 10 Member Countries.

The Commission reviewed:

- the Desert Locust situation from September 1986 to June 1988 with control operations undertaken;
- the control potential available in the Region, which was considered inadequate;
- the training undertaken; it opted against long-term fellowships;
- research activities;
- assistance to member countries: vehicles to Egypt, Iraq, Yemen AR and Yemen PDR;
- the future of the International Centre and the necessity to keep and strengthen it;
- the programme of work and budget.

The next session of the Commission will be held in late 1989.

2. FAO Commission for Controlling the Desert Locust in North-West Africa

The fifteenth session was held in Tripoli, Libya from 17-20 March 1989 and was attended by all Member Countries, i.e. Libya, Tunisia, Algeria, Morocco and Mauritania (new member).

The Commission:

- reviewed the Desert Locust situation and concluded that it was unlikely that important invasions would occur in the region in 1989. However, the plague was not yet terminated and various dispersed populations were currently found in the Sahel;
- requested the strengthening of the Secretariat for securing the coordination activities for preventive control in the member countries and providing the necessary support to the Maghreb Task Force;
- asked the Executive Committee to prepare a proposal concerning the establishment and functioning of the Maghreb Task Force. An Ad Hoc Working Group was appointed to prepare the proposal;

- discussed the interregional project proposal for the strengthening of the preventive control of Desert Locust in North and North-West Africa;
- reviewed the pesticides and equipment used in the recent control campaigns;
- discussed the meteorological requirements with respect to Desert Locust forecasting.

The next Session will be held in October 1989 in Tunis.

3. Commission for Controlling the Deseert Locust in the Eastern region of its distribution area in South-West Asia

The seventeenth session was held in Teheran, Iran, on 7-10 November 1988 with the participation of Iran, India and Pakistan; Afghanistan did not attend.

The Commission:

- reviewed the Desert Locust situation, the future development of the plague and steps to be taken to control it: some 100 sq.m. of thin density swarms had invaded south-west Iran in early November 1988;
- reviewed the control potential in the region: 77 aircraft, 5 helicopters and large quantities of pesticide. These were considered to be inadequate to meet a large invasion and there is a shortage of trained personnel. However, all three countries present stressed that they had control resources which were available to countries outside the region. Pakistan had already sent 3 Cessna 185 to Kuwait;
- discussed coordination problems within the region;
- studied training needs at all levels: refresher training of core personnel; training of Iranian locust specialists, technicians and pilots in Pakistan;
- reviewed research needs: support to Bhawani station in Pakistan;
- reviewed financial problems of TF 9123. The purchase of three vehicles per country and telefax facilities was agreed. Iran requested three Micronair AU-7000 sprayers;
- strongly recommended the re-establishment of the seat of the Commission in Teheran and the appointment of a Regional Locust Officer from within the Region.

The next session will be held in October/November 1989.

4. The Desert Locust Control Organization for Eastern Africa (DLCO-EA)

- 4.1 The 33rd Regular Session of the DLCO-EA Council of Ministers was held in Addis Ababa from 2-4 June 1988 with the participation of all Member Countries and observers from UK, FAO, IRLCO-CSA.

The Council:

- reviewed the DL situation. The plague had developed rapidly in the Red Sea coastal area south of Port Sudan and in West Africa;
 - approved the programme of work and directed that DLCO-EA increase its involvement in the control of the Tsetse fly in affected member countries. It also approved the report of the Department of Scientific Research;
 - noted with concern that outstanding contributions had accumulated to US\$ 6.8 million;
 - approved a budget of US\$ 4.3 million for financial year 1988/89, a reduction of 11% of the previously proposed budget;
 - recommended training pilots from member countries in survey and control of migratory pests.
- 4.2 An Extraordinary Session of the DLCO-EA Council of Ministers was held in Addis Ababa on 18-19 July 1988 which appointed a new Director-General, Prof. Hoseakayumbo, and a new Director of Operations, Dr. Abdul Moneim H. Karrar.

The next regular sessions of the Council will be convened in Uganda or in Addis Ababa or Ethiopia.

5. Organisation commune de lutte antiacridienne et de lutte antiaviaire (OCLALAV)

- 5.1 The Council held an extraordinary session on 13-14 July 1988 in Nouakchott (Mauritania). It emphasized on the increasingly alarming situation of the Desert Locust plague in its member countries and took note of campaigns plans already prepared. It requested the mobilization of a transitory budget estimated at 432 million Franc CFA. It authorized the Director-General to follow up the finalization of the Project Document on strengthening the preventive control against the Desert Locust in West and North-West Africa.
- 5.2 The Council held a regular session from 9 to 13 December 1988 in Ndjamen (Chad) and repeated its appeal to Member Countries to pay their arrears and contributions in order to achieve the restructuring. It decided to convene an extraordinary Council in February 1989 to be followed by a Summit of Chiefs of States of Member Countries.
- 5.3 An extraordinary council of OCLALAV (conference of ministers) was held in Dakar 20-21 February 1989 preceded by a meeting of the committee of experts from 16 to 18 February 1989, with the purpose of preparing a Summit of Chiefs of State (23 February).

The Conference:

- reviewed the situation of the Desert Locust in West Africa and considered the best and worst scenarios, both requiring intensification of surveys and strengthening of control potentials;

- studied a plan of action on short, medium and long-term control;
- decided the immediate implementation of OCLALAV restructuring from 1 April 1989 with an annual budget of 80 million Franc CFA of which 177 million to be paid on 15 March 1989 and 80 million on 15 May 1989;
- reviewed the proposal concerning the preventive control of the Desert Locust in West and North-West Africa.

5.4 The Summit of Chiefs of State of OCLALAV Member Countries met in Dakar, Senegal, on 23 February 1989 with the presence of 7 Presidents and 3 Ministers from Member Countries, and observers (Ministers) from Cape Verde, Guinea Bissau and Tunisia and from a large number of donors and international agencies. The summit endorsed the decisions of the Ministerial Conference and launched an appeal (Appel de Dakar) to all parties concerned for supporting OCLALAV and the proposed Plan of Action.

6. International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA)

The 18th Ordinary Session of the Governing Council was held in Blantyre, Malawi, on 25-26 April 1988 attended by all member countries except Mozambique and observers from FAO and UK.

The Council:

- reviewed the locust situation: collapse of the Brown Locust plague; upsurges of Red Locust in the Kafue and Lukange swamps in Zambia (2000 ha sprayed) and in the Wembere outbreak area in Tanzania (7 000 ha); upsurge of African Migratory Locust in Botswana (90 000 ha treated); widespread infestations of the long-horn green grasshopper, *Homorocoryphus nitidulus* in Tanzania, Malawi, Mozambique, Zambia, Zimbabwe and Botswana;
- studied and accepted the report of the Donor Review Mission organized by FAO with the participation of UK(ODA) and IRLCO-CSA member states which visited five of the nine member states in February 1988. It requested FAO to convene a donor meeting at which the needs of the organization could be presented. This occurred on 23 May 1989 at Harare, Zimbabwe;
- reviewed recent donor assistance received and pledged, particularly from F.R. Germany, Japan, Switzerland and UK;
- requested FAO to prepare rationale for a new scale of contributions;
- reviewed the financial situation and approved a programme of work and budget for 1989 amounting to US\$ 3.9 million of which 2.2 million will be requested from donors.

The 19th ordinary session of IRLCO-CSA is scheduled for August 1989 in Tanzania or Zimbabwe.

DESERT LOCUST RESEARCH

There has been a resurgence of interest in locust research and especially research on the Desert Locust, as a consequence of the plague. This has been concerned as much with the desire to find a new approach which will be cheaper and environmentally more acceptable than what is done now, as with the improvement of current methods.

During mid-1988 FAO commissioned a Review of field and related research and an assessment of research priorities in the medium term (3-5 years). This formed the basis of a research meeting "Defining Future Research Priorities" held in Rome during mid-October. This general meeting was followed by meetings of small expert groups devoted to particular fields. Meetings in this series (partly financed by UNDP) have been held on Pesticide Testing, Pesticide Application, Environmental Impact, Forecasting and Population Dynamics, and Biology and Behaviour. The last one was mainly concerned with long term basic research which might lead to a new approach to the Desert Locust problem.

Meanwhile the more basic lines of research were considered also by UNDP- organized meetings at Tucson and Cairo, and at SPAAR meetings in Paris and Montpellier. National meetings of scientists have been held in UK and FR Germany.

The results of all these deliberations have been considered by an FAO Research Advisory Panel which met in Rome during early May. The report of the Panel is attached.

In the meantime FAO has launched a Desert Locust Research and Development Register. The first edition will appear shortly and later editions will be published at 6 monthly intervals. The aim is to let research workers and those concerned with locust control know what work is going forward and what is planned, and also to provide a basis for the assessment of what research is still needed.

FAO has also set up a Pesticide Testing and Vetting Scheme. Under this FAO will provide advice to those wishing to carry out trials of candidate pesticides, and as far as resources allow, cooperate in the planning and execution of trials. The results of trials with FAO participation will be submitted to a small independent Referee Group, and if passed, published in an FAO series. Trials not carried out with FAO's help can also be submitted for consideration for publication. The Group will meet shortly to go through the reports of trials carried out so far, in order to see what further trials are needed. FAO is in the process of establishing a further small group on which WHO will be represented. This Group will vet 'Data Sheets' which ECLO intends to produce for all the pesticides in common use for Desert Locust control.

A major problem with Desert Locust field research is the remoteness of the study areas and the transitory nature of the infestations. Much of the contemplated basic research will require the operation of

relatively sophisticated equipment in the field and at a field base. Many of the scientists involved are unlikely to know the particular area or even have had experience of working in remote parts of Africa. FAO is thus developing detailed plans for the setting up of a Field Research base in West Africa. It is realised that bases will in due course be needed in other parts of the recession area. The aim is, however, not to attempt to revive the chain of research bases set up in the 1960s. Each base must have a plausible research programme for the first 5 years, before the decision is taken to set it up.

The question of damage and crop-loss caused by the Desert Locust is raised frequently. FAO has just completed an assessment of what would be needed to estimate losses caused and prevented, and the cost and benefit of control, in a country. The report will be available shortly.

It must be said that despite the numerous meetings on Desert Locust research, relatively little new research has been started as yet. FAO, through ECLO, however, is initiating or cooperating in the following activities. In all of these, every effort is being made to involve research workers from countries in the invasion area.

- Pesticide trials in Mali
- Environmental impact assessment in Senegal
- Analysis of the migrations into the Atlantic during 1988
- Development of a swarm trajectory and locust breeding model
- Evaluation of helicopters for recession survey in Niger

ECLO also expects to work closely with ODNRI in an evaluation of the recent upsurge and plague.

DESERT LOCUST RESEARCH PRIORITIES
FAO, Rome, 2-5 May 1989

Summary

1. Priorities for research are assessed in the context of the need to develop effective, environmentally-responsible control methods for the Desert Locust.

2. Research topics are given priority if relevant either to the improvement of existing control methods to reduce the pesticide used or to the development of alternative environmentally-safe control methods.

3. Priority areas identified are:

- (i) further research on the relationship between size of pesticide droplets and collection efficiency on locusts;
- (ii) further development of air-to-air techniques for spraying flying swarms;
- (iii) retrospective analysis of recent upsurges and plagues;
- (iv) development of simulation models of migration and phenology;
- (v) development of airborne entomological radar systems;
- (vi) obtaining of "ground-truth" for remotely sensed estimates related to survival and breeding success of the Desert Locust;
- (vii) development of computer methods for storage, manipulation and retrieval of data used in forecasting;
- (viii) development of behaviourally interpretable assays for behaviour-modifying chemicals (pheromones, kairomones, feeding deterrents, etc.);
- (ix) isolation of, and biological studies on, oviposition pheromone;
- (x) the search for powerful attractants for Desert Locust;
- (xi) laboratory and field testing of juvenile hormone analogues and anti-juvenile hormone compounds against nymphs and adults of Desert Locust;
- (xii) isolation and biological studies on pheromones regulating phase transformation;
- (xiii) search for isolates of pathogenic protozoa, bacteria, viruses and fungi effective against the Desert Locust and enhancement of pathogenicity of viruses using molecular engineering;

- (xiv) research into the physiological basis of phase transformation;
- (xv) analysis of factors influencing migration in non-swarming adults;
- (xvi) genetics of locust populations;
- (xvii) studies of olfactory sensory system of the Desert Locust.

4. The importance of proposed pilot studies on the environmental side-effects of locust control and the analysis of its socio-economic impact is acknowledged.

5. An adequate infrastructure for Desert Locust research is required including several strategically placed field stations. There is also a need for mechanisms for information exchange through meetings, bulletins and the exchange of personnel between research institutions.

REMOTE SENSING APPLICATIONS

1. The Committee was informed by the secretariat of the progress made in operational remote sensing technique and the planned developments for supporting Desert Locust monitoring and forecasting. This included ARTEMIS system explained in the previous Session. At present a remote microcomputer terminal to the Artemis system is being installed in ECLO to enable direct access to ARTEMIS database and combination of data products with information from other sources, e.g. historical breeding records, current locust data and weather information in a geographic information system approach.

2. Planned developments are summarized below:

a) Upgrading ARTEMIS System

During 1989, the ARTEMIS system capability will be expanded with software for the processing of NOAA AVHRR data at full (1.1 km) resolution which is available from regional receiving stations, e.g. in Maspalomas, Canary Islands, Spain, since late 1987; the AGRHYMET Centre, Niger, from mid-1989 and the Kenya Meteorological Department from mid-1990. Also, the Government of Pakistan is implementing a NOAA receiving station which will provide regular coverage for the South-West Asia region. From 1.1 km resolution vegetation index data, considerably more detailed vegetation assessments can be made as a basis for the operations of field survey teams.

b) Calibration Studies for Vegetation Assessment

During the summer of 1989, FAO will undertake a multilevel data acquisition and processing/analysis programme in Tamesna, Niger, which is financially supported by the Government of Belgium. The objective of this programme is to undertake an in-depth study on the vegetation discrimination capabilities of both satellite and aircraft-based sensors in order to calibrate the operational remote sensing techniques on the ARTEMIS system. During the period July-October 1989, NOAA 4km and 1.1 km resolution data, Landsat TM (30m resolution) data, light aircraft video remote sensing data and ground observations will be acquired, followed by data processing, analysis and interpretation.

c) DIANA Telecommunications Development

Jointly, with the European Space Agency (ESA), FAO is undertaking a project for development and demonstration of a satellite communications system, DIANA (Data and Information Available Now in Africa). This system, which will be implemented from late 1990 onwards, will enable communications between (micro)computers at FAO Headquarters and microcomputer-based terminals at selected locations in Africa.

through the Intelsat satellite. During a one-year demonstration period, FAO and ESA will jointly demonstrate and test the DIANA system capabilities for a variety of applications, including transmission of ARTEMIS data products to users at regional and national levels, dissemination of FAO Information bulletins, e.g. the Locust Bulletin, GIEWS Bulletins, and general operations communications.

d) ARTEMIS Phase II Project

The first phase of the Trust Fund Project for the development and implementation of the ARTEMIS system terminates in June 1989. Following a positive review of the project in November 1988, FAO has prepared and submitted a three-year Phase II ARTEMIS Project to the Government of the Netherlands to support the operation and maintenance of the system, consolidation of the use of its products at Headquarters, regional and national levels in food security and migratory pest applications, training of users at regional and national levels and further development of system capabilities for other monitoring applications within FAO's mandate in agriculture, forestry and fisheries.

ENVIRONMENTAL IMPACT ASSESSMENT OF DESERT LOCUST CONTROL

The meeting noted that since the last DLCC Session new information on side-effects of chemical Desert Locust control on the environment had come available, but endorsed the recommendation of the Meeting on Desert Locust Research (October 1988) that more research in this field was still needed. It was informed of the pilot study planned to be carried out in summer 1989 to further study side-effects in Senegal which is to be carried out jointly by scientists from the Netherlands, the United Kingdom, the United States of America, Senegal and FAO.

The Meeting noted with concern that the large amounts of pesticides presently available in many countries throughout the DLCC region are posing problems with regard to storage and disposal. In some parts of the DLCC region, storage facilities are insufficient both in quality and capacity which may pose occupational health hazards but also causes a reduction in the efficacy of the pesticide through breakdown of active ingredient or formulation. Furthermore, increased levels of impurities may form in the pesticides which increase its mammalian toxicity. It was recalled, however, that, even under good storage conditions, the rate of breakdown of stored pesticides should be expected to be faster than in temperate climates, given the high temperatures encountered in the region during at least part of the year. This emphasizes the importance of proper pesticide stock management, including storage, stock registration, rotation of stocks, etc. with the objective to minimize outdated, ineffective and often dangerous pesticide stocks to be formed in a country.

The Meeting noted that there is an urgent need for proper and safe disposal methods for the destruction of already existing outdated stocks and of pesticide containers which are adapted to the specific conditions of the DLCC region.

PROPOSALS FOR DESERT LOCUST RESEARCH SUPPORTED BY FRANCE

PRIFAS (France) presented a review of its research activities. Concerning the Desert Locust:

- a) The specific biomodel is financed by EEC and France. The first prototype should be presented by July 1990. Validation is based on historical data 1984-89. Starting from environmental data, it is expected to follow the population dynamics and the number of locusts in any part of the distribution area of the Desert Locust in Africa; this will be at 10 days interval and one degree square resolution or perhaps a quarter of a degree square. Improvements could be made following the first prototype after one year, with the assistance of other partners.
- b) Acridometeorology project: it is a PRIFAS project where two scientists will be located at CILSS Agrhymet centre in Niamey from August 1989, probably for 3-4 years. Scientists will provide a regional contribution to the understanding of the main locust problems in the Sahel, including that of the Desert Locust.
- c) A plan of operation is being prepared on ecotoxicology in relation to the effects of locust control, to include one or two partners from southern Sahara and two or three partners from donors. This involves the appointment by PRIFAS of one ecologist and one acridologist who will undertake enquiries under real insecticides use conditions.

PROPOSALS FOR DESERT LOCUST RESEARCH
SUPPORTED BY THE FEDERAL REPUBLIC OF GERMANY

The Federal Republic of Germany informed the Committee of their decision to finance a German applied research project about alternative methods in locust control at a total cost of 5.9 million DM for a 3-year period, to be executed by several German institutes and universities in cooperation with international institutions and organisations in developed countries and in the countries affected by the Desert Locust. Subjects of studies comprise:

- a) Remote sensing: biotop mapping of locust breeding areas in selected regions of Eastern and Western Africa.
- b) Physiology: proof and analysis of a gregarisation pheromone. Synthesis of analog compounds. Understanding of effects on central nerval and the endocrine system. Practical field tests.
- c) Tests of effectivity of juvenile hormone analoga, research about influence on lipid metabolism.
- d) Effectivity tests of pyrrolicidin alkaloids as attractants of Zonocerus variegatus and locusts. Freeland tests with bait formulation.
- e) Control: screening on pathogens of locust and grasshoppers. Isolation, characterisation and tests in laboratory.
- f) Isolation and characterisation of natural repellents and growth regulators of Melia volkensii. Laboratory tests on locusts.
- g) Fieldtests of alternative compounds for locust and grasshopper control (e.g. Nosema spp., Teflubenzuron).
- h) Ecology: biomonitoring on side effects of the newly tested compounds for locust and grasshopper control.
- i) Investigation of unknown aspects on the bio-ecology of the Desert Locust (optional).
- j) Loss assessment: development of methods for loss assessment of locust damage. Economic calculation.
- k) Accompanying services: mass breeding of S. gregaria in two localities.
- l) Literature service.

PROPOSALS FOR DESERT LOCUST RESEARCH SUPPORTED BY THE UNITED KINGDOM

The United Kingdom Government has made additional funds available to ODNRI to facilitate training in the techniques of analysis developed by the ALRC and to utilise the historical Desert Locust archives to prepare case histories of the recent upsurge with a historical perspective. The objective will be to analyse the events of 1985-1989 with the active participation of personnel from the affected regions.

PROPOSALS FOR DESERT LOCUST RESEARCH SUPPORTED BY USAID

USAID expressed interest in research on environmental and circulated achievements already obtained with future plans and recommendations for projects. They deal with the following:

- a) biological control using pathogens, fungi;
- b) development of use of neem;
- c) disposal technologies;
- d) crop loss assessment;
- e) cost-benefit studies.

TRAINING

The tables below show training activities implemented since the 29th Session of the DLCC (June 1988).

1. Under Trust Fund 9161

1.1 International Training Course on Pesticide Application related to Locust Control, Montreux, Switzerland, 14-25 August 1988

Participants from the following countries attended the course: Mauritania, Niger, Guinea Bissau, Senegal, Cape Verde, Togo, Guinea, Benin, Chad, Côte d'Ivoire, Burkina Faso, Cameroon and Mali.

1.2 Short Course on Aerial Application of Pesticides, Cranfield UK, 5-16 September 1988

One participant from Ethiopia attended.

2. In addition to the above, training of Plant Protection/Locust Control staff at all levels has been carried out within Trust Fund, TCP/ECLO and UNDP projects:

2.1 UNDP/FAO/INT/88/705 - Workshop on Safe Use, Maintenance and Supervision of Aerial and Vehicle-mounted ULV Application Equipment, Niamey, Niger, 16-24 April 1989 (co-financed and co-organized by USAID)

The following countries have participated: Mauritania, Senegal, Mali, Niger, Chad, Gambia, Guinea Bissau, Cape Verde, Burkina Faso, Sudan, Cameroon, Nigeria, Côte d'Ivoire.

2.2 Training of National Farmers for Locust Control

Training courses are being implemented during the period April-June 1989 in the following countries: Mauritania, Mali, Niger, Senegal and Chad.

3. ECLO/RAF/019/USA

3.1 National Training courses for Survey Officers on Desert Locust Survey and Control

National courses have been conducted during April-June 1989 in the following countries: Mauritania, Senegal, Gambia, Mali, Niger, Chad.

4. TCP/RAF/7857

FAO Regional Training Course on Biology, Ecology and Control of Desert Locust in West Africa, Dakar 11-22 July 1988

19 participants attended from Burkina Faso, Cape Verde, Guinea Bissau, Mali, Mauritania, Niger, Senegal, Chad.

5. USAID Training Programmes

5.1 Training on ULV Spraying: see para. 2.1

5.2 Training on Use of Training Equipment, Niamey 23-26 April 1989

5.3 Training on Assessment of Losses, Banjul 19-20 April 1989

INTERNATIONAL TRUST FUND 9161
CONTRIBUTIONS AND EXPENDITURES

Financial Report

1. The above Trust Fund was established by the Director-General of FAO following the recommendations of the Ninth Session of the Desert Locust Control Committee. The Director-General, as Administrator of the Trust Fund, consults with the Desert Locust Control Committee which is responsible for the general policy guidance of the Trust Fund; the Committee also reviews the annual budget and receives financial reports from FAO.

Budget, Statement of Accounts for 1988

2. The annual budget of the Trust Fund is shown in Appendix A, together with the accounts for 1988.

3. The total expenditure in 1988 amounted to US\$ 245,986. The overall end-of-year position for 1988 showed an estimated balance of US\$ 92,278.

Budget and Accounts for 1989

4. A breakdown of expenditures and commitments for 1989 as at 30 April 1989 is also given in Appendix B.

Contributions

The scale of Government contributions to the Trust Fund is given in Appendix C. Details of outstanding contributions as of 31 March 1989 are given in Appendix D.

INTERNATIONAL TRUST FUND 9161

Budget and Statement of Accounts (in US\$)

Receipts	Approved Annual Budget	Expenditure 1988	Commitments/ Expenditures as of 30.4.89
Balance brought forward		266,130	92,278
Contributions from member countries (incl. interest)	192,820	72,134	20,000
TOTAL	192,820	338,264	112,278
<u>Expenditure</u>			
10. Personnel Services	35,000	49,194	20,002
20. Travel	20,000	76,817	23,847
30. Contractual Services	20,000	24,374	-
40. General Operating Exp.	5,000	60,133	2,280
50. Supplies	10,000	1,104	-
60. Equipment	35,000	-	-
80. Fellowships, Training	50,000	6,065	-
90. Project servicing costs (13%)	22,750	28,299	7,557
TOTAL Expenditure	197,750	245,986	53,686
Unallocated balance		92,278	58,592

INTERNATIONAL TRUST FUND 9161

Breakdown of 1988 expenditures and commitments
as of 30 April 1989

	Expenditures 1988	Commitments/expendit. as of 30.4.1989
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10. <u>Personnel Services</u>		
Consultants (preparation of the meeting and report on DL Research; assistance to the Govt of Turkey in DL campaign; photograph survey and control operations against DL in Morocco	26,328	13,464
Ad Hoc Meeting on International DL Task Force; meetings on DL Research	22,866	
Expert Consultation on Pesticide Application in Locust Control		6,538
	<hr/>	
TOTAL	49,194	20,002
20. <u>Travel</u>		
Non-staff		
- training course, Montreux	24,519	18,500
- planning DL campaign, April 88	3,062	
- Meteo data supplies for ECLO activities (Algiers, Mr Pedgley)	1,658	
- OCLALAV Conseil d'Admin., Mali	19,470	
- DL <u>Ad-Hoc</u> Meeting, Rome, Dec 88	24,274	5,347
	<hr/>	
TOTAL	72,956	23,847
Staff Travel		
- Headquarters staff	3,861	-
	<hr/>	
TOTAL Travel	76,817	23,847

Appendix B (contd)

	Expenditures 1988	Commitments/expendit. as of 30.4.1989
30. <u>Contractual Services</u>		
- Publications (Committee documents, forecasting bulletins, etc)	16,374	
- Liftair	8,000	(8,000)
TOTAL	24,374	
40. <u>General Operating Expenses</u>		
- Transport of Pesticides, Tunisia	295	
- Pesticide trial, Niger	1,795	
- Airfreight pesticides, Kenya	540	
- OCLALAV, Conseil d'Admin, Mali	12,803	
- Transport of pesticides, Niger	44,000	
- DLCO-EA Course		2,280
- Various	700	
TOTAL	60,133	2,280
50. <u>Library order</u>	1,104	-
TOTAL	1,104	
80. <u>Fellowships</u>		
- Balance of costs of participation at the training courses, Crainfield and Montreux, participants from ETH, KEN, SOM, GHA	6,065	
90. Project Servicing Costs (13%)	28,299	7,557
GENERAL TOTAL	245,986	45,686

Appendix C

SCALE OF GOVERNMENT CONTRIBUTIONS
TO THE INTERNATIONAL DESERT LOCUST TRUST FUND
NO. 9161 (MTF/INT/008/MUL)

<u>COUNTRY</u>	<u>SCALE (US\$)</u>
Afghanistan	3,480.00
Algeria	7,700.00
Bahrain	920.00
Cameroon	2,780.00
Chad	3,520.00
Djibouti	1,120.00
Egypt	5,740.00
Ethiopia	4,320.00
Gambia	2,420.00
Ghana	3,280.00
India	20,000.00
Iran	20,000.00
Iraq	7,440.00
Jordan	3,420.00
Kenya	3,580.00
Lebanon	3,060.00
Libya	10,640.00
Mali	3,600.00
Mauritania	2,900.00
Morocco	5,360.00
Niger	3,760.00
Nigeria	8,940.00
Oman	2,100.00
Pakistan	6,520.00
Qatar	1,760.00
Saudi Arabia	20,000.00
Senegal	3,520.00
Somalia	3,500.00
Sudan	3,980.00
Syria	4,520.00
Tunisia	4,460.00
Turkey	14,480.00
Uganda	3,380.00
United Arab Emirates	4,600.00
Yemen Arab Republic	3,580.00
Yemen, P.D.R.	2,920.00
TOTAL	207,300.00

Appendix D

TRUST FUND No. 9161.00 (MTF/INT/008/MJL)
INTER-REGIONAL DESERT LOCUST CONTROL PROJECT

STATUS OF CONTRIBUTIONS AS AT 31 MARCH 1989 (1)

Member Governments	Outstanding 1976/88	Received up to 31/3/89	Outstanding 31/3/89	Contributions due for 1989/90
Afghanistan	18,970.00	0.00	18,970.00	3,480.00
Algeria	38,500.00	0.00	38,500.00	7,700.00
Bahrain	920.00	0.00	920.00	920.00
Cameroon	11,567.05	0.00	11,567.05	2,780.00
Chad	33,720.00	0.00	33,720.00	3,520.00
Egypt	5,740.00	0.00	5,740.00	5,740.00
Ethiopia	27,140.94	0.00	27,140.94	4,320.00
France (Djibouti)	8,820.00	0.00	8,820.00	1,120.00
Gambia	14,520.00	0.00	14,520.00	2,420.00
Ghana	20,635.94	0.00	20,635.94	3,280.00
India	70,000.00	20,000.00	50,000.00	20,000.00
Iran	121,800.00	0.00	121,800.00	20,000.00
Iraq	44,640.00	0.00	44,640.00	7,440.00
Jordan	6,840.00	0.00	6,840.00	3,420.00
Kenya	22,554.41	0.00	22,554.41	3,580.00
Lebanon	11,728.12	0.00	11,728.12	3,060.00
Libya	67,480.00	0.00	67,480.00	10,640.00
Mali	4,813.00	0.00	4,813.00	3,600.00
Mauritania	29,025.09	0.00	29,025.09	2,900.00
Morocco	5,340.00	0.00	5,340.00	5,360.00
Niger	24,360.00	0.00	24,360.00	3,760.00
Nigeria	13,729.61	0.00	13,729.61	8,940.00
Oman	6,300.00	0.00	6,300.00	2,100.00
Pakistan	6,790.00	0.00	6,790.00	6,520.00
Qatar	9,630.00	0.00	9,630.00	1,760.00
Saudi Arabia	20,000.00	0.00	20,000.00	20,000.00
Senegal	23,686.42	0.00	23,686.42	3,520.00
Somalia	20,274.77	0.00	20,274.77	3,500.00
Sudan	-2,674.30	0.00	-2,674.30	3,980.00
Syrian Arab Republic	33,150.00	0.00	33,150.00	4,520.00
Tunisia	13,536.44	0.00	13,536.44	4,460.00
Turkey	-	-	-	14,480.00
Uganda	13,520.00	0.00	13,520.00	3,380.00
United Arab Emirates	9,200.00	0.00	9,200.00	4,600.00
Yemen Arab Republic	3,580.00	0.00	3,580.00	3,580.00
Yemen, P.D.R.	15,200.00	0.00	15,200.00	2,920.00
TOTAL	777,711.79	20,000.00	757,711.79	207,300.00

1. Turkey joined the Committee at the beginning of 1988 and will be requested to pay the contribution as from 1 June 1989 for the financial year 1989/90