REPORT OF THE

TWENTY-FIFTH SESSION OF THE FAO DESERT LOCUST CONTROL COMMITTEE

Held in Rome,
5-9 October 1981

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Meeting Report NO.
AGP/1981/M/7

REPORT OF

THE TWENTY-FIFTH SESSION OF THE

FAO DESERT LOCUST CONTROL COMMITTEE

held in
Rome, Italy
5 - 9 October 1981

Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, 1981

CONTENTS

CONTENTS (cont'd)

INTRODUCTION

The Twenty-Fourth Session of the FAO Desert Locust Control Committee, which was held in Rome on 3 - 7 November 1980, recommended that the next session of the Committee should be convened in Rome in October 1981. The Director-General invited the following Governments to be represented at the Twenty-Fifth Session:

Afghanistan
Algeria
Bahrain
Benin
Cameroon
Central African Republic
Chad
Djibouti
Egypt
Ethiopia
France
Gambia
Ghana
Guinea
India
Iran
Iraq
Israel
Ivory Coast
Jordan
Kenya
Kuwait
Lebanon
Libya
Mali
Mauritania
Morocco
Niger
Nigeria
Oman
Pakistan
Portugal
Qatar
Saudi Arabia
Senegal
Sierra Leone
Somalia
Spain
Sudan
Syria
Tanzania
Togo
Tunisia
Turkey
Uganda
United Arab Emirates
United Kingdom
United States of America
Upper Volta
Yemen Arab Republic
Yemen, People's Democratic Republic of

He also invited the representatives of the Desert Locust Control Organization for Eastern Africa (DLCO-EA), l'"Organisation commune de lutte antiacridienne et de lutte antiaviaire" (OCLALAV), the International African Migratory Locust Organization (OICMA) and the International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA). In addition, he invited the representatives of the United Nations Development Programme (UNDP) and the World Meteorological Organization (WMO) because of their continued interest in the Desert Locust Programme.

The Session was opened by Mr. O. Brauer, Director, Plant Production and Protection Division who, on behalf of the Director-General of FAO, welcomed the participants to the session and briefly reviewed the more important developments in the locust situation since the previous session, held in November 1980. The local upsurge in Mali and Niger extended into southern Algeria but control operations were undertaken in both areas and prevented the formation of any large swarms. Other gregarious breeding occurred in Sudan and in Saudi Arabia and in both cases national units were able to cope with the situation. The Desert Locust is in recession again. Control potential in the various member countries and regional organizations is being strengthened. Governments of the Near East Regional Commission accepted the principle of increasing their contributions to their regional trust fund.

In addition, field research is being reactivated in the Near East Region and the application of remote sensing technology to Desert Locust survey and control has continued to make good progress.

Mr. Brauer informed the meeting that UNDP has indicated its willingness to provide further support to the locust programme in the 1982-86 programme cycle and reaffirmed the interest of the Director-General in the activities of all locust regional organizations and commissions.

Officers of the Session

Chairman: Farid Uddin Ahmad (Pakistan)

Vice-Chairman: Ramdane Kellou (Algeria)

Drafting Committee

The Delegates of Algeria, Pakistan and Sudan and the FAO Secretariat. Mr. R. Skaf acted as Technical Secretary.

Acknowledgements

The Delegates expressed their appreciation and thanks to the Chairman for the way in which he conducted the deliberations of the Session and for his cooperative attitude which facilitated full and frank discussions. They also thanked the FAO Secretariat for carrying out their duties efficiently. They however regretted that the last days of the meeting coincided with a major Islamic holiday of Idd al Adha and hoped this would be taken into consideration in the future.

Obituary

The Delegates expressed their deep regret at the passing away in June 1981 of Mr. Ahmed Ali Shaqra (Audhali). Mr. Shaqra was a pioneer of locust survey and control in the People's Democratic Republic of Yemen since 1940. He spent all his active life in locust control in the southern parts of the Arabian Peninsula.

PARTICIPANTS IN THE SESSION

The following delegations from Member Nations of the Food and Agriculture Organization of the United Nations, the United Nations and Specialized Agencies, observers and members of the FAO staff participated in the Session and contributed to the discussions summarized in this report.

Delegates from Member Nations of FAO

Algeria

Ramdane Kellou
Directeur général
Institut national de la protection des végétaux
B.P. 80
El Harrach, Algiers

Bachir Chara
Chef de département intervention et coordination
Institut national de la protection des végétaux
B.P. 80
El Harrach, Algiers

Central African Republic

Clément Kokpavo
Permanent Représentative of Central African Republic to FAO
Embassy of Central African Republic
Via Pisanelli, 4
Rome

Chad

NDouba Todjirom Mbaïorbe
Chef, Service de la protection des végétaux
Direction de l'agriculture
N'Djamena

Egypt

Yousef A. Hamdi
Agricultural Counsellor and Alternate Permanent
Representative of Egypt to FAO
Egyptian Embassy
Via Salaria, 269
Rome

France

Nicolas Samuel
Ingénieur du génie rural et des eaux et forêts
Ministry of Agriculture
Paris

India

Ramadhar
Counsellor (Agriculture)
Embassy of India
Via Venti Settembre, 5
Rome

Islamic Republic of Iran

Mostafa Khalafi
Director General of Plant Protection Organization
Ministry of Agriculture
Teheran

A.A. Soltani
Plant Pests and Diseases Research Institute
P.O. Box 3178
Teheran

Iraq

Mustafa Hamdoun
Permanent Representative of Iraq to FAO
Embassy of Iraq
Via delle Fonte di Fauno, 5
Rome

Hazim Fadhli Najeb
Alternate Permanent Representative of Iraq to FAO
Embassy of Iraq
Via delle Fonte di Fauno, 5
Rome

Kenya

G. Mahinda
Senior Assistant Secretary
Ministry of Livestock Development
P.O. Box 30028
Nairobi

P.M. Amukoa
Alternate Permanent Representative of Kenya to FAO
Kenya Mission to FAO
Circo Massimo, 9
Rome

Nigeria

Jacob Ola Alabi
Permanent Representative of Nigeria to FAO
Embassy of the Federal Republic of Nigeria
Via Orazio, 14-18
Rome

Pakistan

Farid Uddin Ahmad
Plant Protection Adviser and Director
Plant Protection Department
Ministry of Food and Agriculture
Malir Halt
Karachi 27

Kingdom of Saudi Arabia

Salem Bamofleh Hadramy
Director General
Agricultural Research Centre
Jeddah

Somalia

Mohamed A. Sheikh
Director General
Ministry of Agriculture
Mogadishu

Spain

Juan Ignacio Calvo Gabas
Jefe de la Sección de Tratamientos
Servicio de Defensa contra Plagas e Inspección Fitopatológica
Ministerio de Agricultura y Pesca
c/- Juan Bravo 3B
Madrid 6

M.A. Cavero
Representante Permanente Adjunta
Embassy of Spain
Rome

Sudan

M.A.M. Ibrahim
Alternate Permanent Representative of Sudan to FAO
Embassy of the Democratic Republic of the Sudan
Viale di Porta Ardeatina, 1
Rome

Tanzania

Joseph S. Mtenga
Minister Counsellor (Agriculture) and
Alternate Permanent Representative of Tanzania to FAO
Embassy of the United Republic of Tanzania
Via Giambattista Vico, 9
Rome

Uganda

Erikana K. Byaruhanga
Director of Research
Namulonge Research Station
P.O. Box 7084, Kampala

United Kingdom

Cliff Ashall
Assistant Director and Head of Field Division
Centre for Overseas Pest Research (ODA)
College House
Wright's Lane
London W8 5SJ

David Pedgley.
Research Meteorologist
Centre for Overseas Pest Research
College House
Wright's Lane
London W8 5SJ

Nicholas D. Jago
Entomologist
Centre for Overseas Pest Research
College House
Wright's Lane
London W8 5SJ

United States of America

Frederick Whittemore
Environmental Coordinator
ST/AGR, AID
Washington, D.C. 20523

Yemen Arab Republic

Naser Muafa
Counsellor
Ministry of Agriculture
Sana'a

Observers

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

Daniel M. Wako
Director General
DLCO-EA
P.O. Box 4255
Addis Ababa, Ethiopia

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

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

M.E.A. Materu
Director
IRLCO-CSA
P.O. Box 37 and 38
Mbala
Republic of Zambia

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

D. Affoyon
Directeur technique
OCLALAV
B.P. 1066
Dakar, Senegal

United Nations Development Programme (UNDP)

Ake Nerman
Senior Regional Projects Officer
Regional Bureau for Africa
UNDP
1 United Nations Plaza
New York, N.Y. 10017
U.S.A.

FAO Staff

O. Brauer
Director, Plant Production and Protection Division
FAO, Rome, Italy

L. Brader
Chief, Plant Protection Service
Plant Production and Protection Division
FAO, Rome, Italy

R.M. Skaf
Senior Officer
Locusts, Other Migratory Pests and Emergency Operations Group
Plant Protection Service, AGP
FAO, Rome, Italy

J. Roffey
Agricultural Officer (Reporting and Forecasting)
Locusts, Other Migratory Pests and Emergency Operations Group
Plant Protection Service, AGP
FAO, Rome, Italy

H. Niggemann
Agricultural Officer (Operations)
Locusts, Other Migratory Pests and Emergency Operations Group
Plant Protection Service, AGP
FAO, Rome, Italy

J.U. Hielkema
Technical Officer (Remote Sensing)
Locusts, Other Migratory Pests and Emergency Operations Group
Plant Protection Service, AGP
FAO, Rome, Italy

R. Traboulsi
Programme Manager
Action Programme for Improved Plant Protection
Plant Protection Service, AGP
FAO, Rome, Italy

Regional Staff

A. Khasawneh - Near East Commission, Jeddah
N. Mahjoub - North-West Africa Commission, Algiers
S.S. Pruthi - South-West Asia Commission, Rome
M.A. Farah - FAO Regional Plant Protection and Locust Officer for Eastern and Southern Africa, Nairobi

Consultant

W. Moukarzel
Radio Communications Consultant, AGP
FAO, Rome, Italy

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. Desert Locust situation summary and forecast up to 31 December 1981
6. Anti-locust measures undertaken by various countries and regional organizations (1981)
7. Assistance provided to countries and regional organizations during 1981 (FAO and donors)
8. Review of the existing control potential at national and regional levels
9. Reporting and forecasting
10. Review of remote sensing applications to desert locust survey and control and suggestions for further activities
11. Review of work at desert locust field research stations and suggestions for future activities
12. Coordination with UNDP/FAO Action Programme for Improved Plant Protection
13. Training
14. Trust Fund 9161 - contributions and expenditure
15. New scale of contributions
16. Status of various desert locust regional organizations/commissions:
    (a) South-West Asia Commission
    (b) Near East Commission
    (c) North-West Africa Commission
    (d) DLCO-EA
    (e) OCLALAV
    (f) OICMA
    (g) IRLCO-CSA
17. Mandate of the Desert Locust Control Committee (DLCC)
18. Any other business
19. Date and place of next session
20. Adoption of the report.

SUMMARY OF DISCUSSIONS

The Desert Locust situation summary, October 1980 - September 1981 and forecast up to 31 December 1981

1. The Committee reviewed the Desert Locust situation from October 1980 to September 1981 (Appendix I). It noted that the potentially dangerous upsurge which had developed in the southern Sahara between June and November 1980 had been very considerably restricted by aerial and ground control operations undertaken by OCLALAV, Niger and Algeria. Some escapes had, however, occurred, which reached central Algeria, south-east Morocco, northern Mauritania and the Western Sahara. These bred in Mauritania between October and December 1980 and in Algeria in March-May 1981. Some 4 000 hectares were treated in Algeria and the scale of invasion of OCLALAV countries at the beginning of the summer of 1981 was on a small scale. There were good rains in parts of Algeria, Niger, Mali and Mauritania between June and August which provided very good breeding conditions locally. Control operations on a small scale were undertaken between July and September in OCLALAV countries and in September in Algeria. At the end of September, however, there were gregarizing populations of hoppers and adults over limited areas in Timetrine and the Bouressa basin in north-east Mali, against which control operations were in progress.

2. In the Central Region adult populations built up on the Red Sea coast of the Sudan and started breeding from October 1980. Control operations using BHC bait and dust commenced in the Tokar delta in November but in December hopper bands were found in the northern sector. Aerial control operations were mounted in the area in January but a number of small swarms were formed. Some of these apparently escaped and crossed the Red Sea to the Umm Lejj area of north-west Saudi Arabia and started to breed. A total of 4 867 groups of hoppers of all instars were controlled and two further infestations in the interior of north-west Saudi Arabia were controlled in May and June. Very good breeding conditions developed in September in the southern Tihama of Saudi Arabia and in northern Tihama of the Yemen Arab Republic.

3. Small numbers of adults were seen in the northern coast of the Somali peninsula, in July 1981. One report of locusts from a ship in the Gulf of Aden on 29 July proved to be a mixture of Anacridium, Locusta, Cyrtacanthacris and Catantops. The identity of the species in a swarm reported from a ship on 5 August is not yet known.

4. Summer breeding in India and Pakistan was on a small scale in 1980 and only small numbers of adults reached the winter-spring breeding areas in Baluchistan. There were no reports of breeding in the spring and the numbers of adults which reached the summer breeding area in 1981 were again small. Although there were very good rains in parts of the summer breeding area, breeding has been on a small scale.

Summary of forecast up to 31 December 1981

5. Rainfall has been generally above average in the summer breeding areas of India and Pakistan, and in parts of the Sudan, Niger, Mali, Mauritania and Algeria. The densities of adults reported to have reached the summer breeding areas were low and breeding has only been reported from Mauritania, Mali, Niger, Algeria and India. It is probable, however, that breeding has occurred in other areas. Swarmlets are likely to move from Niger and Mali and from Mauritania (where the situation is unknown) north and north-west in the second half of October and the first half of November. Breeding is almost certainly in progress in the interior of the Sudan and possibly the western lowlands of northern Ethiopia, and increasing numbers of adults will reach the Red Sea coast in October and start to breed. Some may cross the Red Sea and reach the Tihamas of Saudi Arabia and the Yemen Arabic Republic. Breeding will commence on the southern Tihama of Saudi Arabia and the northern Tihama of the Yemen Arab Republic and may lead to the formation of some small bands. Small numbers of emigrants from the Indo-Pakistan breeding areas will reach Baluchistan of Pakistan and perhaps south-eastern Iran.

6. A discussion arose on the possible establishment of a threshold figure for locust densities at which control operations should be undertaken. This proved to depend on total numbers of locusts available in an area, ecological conditions favourable for breeding and concentration and on densation. Early in the breeding season, when dealing with widespread solitary populations, with a high rate of reproduction and low mortality, this threshold may not exceed 100-250 adults per hectare. It is of primary importance for field operations to know the overall situation of locusts in the area in relation to surrounding conditions of breeding and concentration and the behaviour of the locust population. The Committee realized that data on the subject were already available in the Locust Handbook and various texts and works by several scientists. It however requested the FAO Secretarait to prepare a synthesis on the subject in collaboration with regional locust organizations and commissions.

7. The Committee expressed its concern about the lack of information on the locust situation in Mauritania and recommended that a special survey be undertaken in that country as soon as possible; the mode of execution will have to be discussed. It emphasized the importance of surveying and controlling locust infestations in all complementary areas. The Committee also expressed its concern about the lack of information from Chad, where no surveys had been possible for some 10 years. It requested neighbouring countries to assess what arrangements should be made to deal with possible infestations.

8. The Committee expressed again its deep concern about the lack of survey and control resources at OCLALAV, which is of direct consequence to the success or failure of the strategy of preventive control in West Africa and presents an immediate threat to the countries of North-West Africa. The large efforts currently being mobilized in North-West Africa may be overwhelmed by an incursion of swarms escaping from the OCLALAV zone due to insufficient survey and control operations as a result of the worsening financial situation of that Organization. It is therefore strongly recommended that FAO continue to explore all possible assistance to OCLALAV and the Committee appealed to the international community to pay special attention to this urgent problem.

Anti-locust measures undertaken by various countries and regional organizations, October 1980 - September 1981

9. The control operations undertaken against the Desert Locust between October 1980 and September 1981 are shown in Appendix II. They are based on information provided in the monthly locust situation summary, supplemented by information provided by Delegates.

Assistance provided to countries and regional organizations, October 1980 - September 1981 (FAO and donors)

10. The assistance provided by FAO and various donors between October 1980 and September 1981 is summarized below:

UNDP

(a) The Governments of Yemen Arab Republic and People's Democratic Republic of Yemen having approved the continuation of the locust project in the 1982-86 UNDP budget cycle in their IPF, UNDP agreed to finance 1981 costs of the project in order to avoid any interruptions.

- This amounted to $ 204 012 for 1981 in total (Yemen AR and PDR Yemen).
- The UNDP project for Yemen AR amounts to $ 256 000 for 1982 and 1983; that for the PDR of Yemen amounts to $ 146 000 for 1982 and 1983.

(b) The UNDP project "Assistance to OCLALAV for Desert Locust Control" (RAF/77/048) continued in 1981 with a budget of $ 123 000. The project terminates in December 1981.

(c) Under the project "Action Programme for Improved Plant Protection" UNDP financed the post of Regional Plant Protection and Locust Officer in Eastern and Southern Africa.

France

France continued to assist OCLALAV by providing the services of two technical advisers, two pilots and two aircraft engineers, with additional pilots and aircraft mechanics on a seasonal basis, and F CFA 50 000 000 for spare parts. The total amount of this assistance is estimated at $ 500 000 per annum.

Sweden (through FAO)

Emergency assistance amounting to $ 85 000 was granted to OCLALAV for the 1981 desert locust campaign, to serve for the procurement of tools, spare parts, spraying equipment and operational expenses.

United Kingdom

had provided the services of a Stores Procurement Officer to DLCO-EA for a period of one year.

USA

has provided the services of management and financial experts to DLCO-EA for a period of six months.

FAO

(a) FAO provided additional funds for the work of the ad hoc Committee on the merger of OICMA and OCLALAV.

(b) FAO assisted various countries and desert locust regional organizations using the various trust funds at its disposal.

11. Referring to the serious financial situation which faced OCLALAV, the Committee noted with appreciation the assistance provided by France and Sweden and recommended that further assistance should be given to OCLALAV to ensure that adequate field operations can be undertaken at appropriate times.

12. The UNDP Representative informed the Committee that UNDP would continue to support pest control measures in Africa and the Near East during the next programme cycle 1982-86. He pointed out that each country has an opportunity to request assistance from UNDP for pest control from the amount available under its country Indicative Planning Figure (IPF). He stated that UNDP will continue to support the Action Programme for Improved Plant Protection, which aims at stimulating each country to strengthen its plant protection services. The regional programmes, which interact and reinforce the Action Programme, would also be supported. However, the UNDP was also subject to inflation and contributions had not risen proportionately. He also pointed out that it is not the policy of UNDP to support projects on a permanent basis and that the international community cannot fill the gaps resulting from the lack or delays in paying contributions.

13. In a lengthy discussion on the need for international assistance to regional organizations on a continuing basis, it was emphasized that it was recognized that only these organisations were at present able to conduct large-scale survey and control operations in the generally remote breeding areas of the Desert Locust. It was also pointed that there needed to be a continuing assessment of the needs of national and regional organisations, and it was recognized that because there was a lot of competition for funds, project proposals would have to be better presented and with more justification.

Review of the existing control potential at the national and regional levels

14. In order to assess the available means for locust control in affected or threatened areas and to evaluate future needs, FAO tries to keep an up-to-date record of control potential in various countries and organizations. Such a record is given in Appendix III.

15. The Committee noted that the information on application equipment and vehicles in several cases relates to both locust control and general plant protection, and that some of the vehicles are quite old and will soon be out of service. It should also be kept in mind that the position of the stocks of insecticides is changeable The Committee considered that the stocks should be replenished and equipment maintained regularly and systematically in order to keep them in operational condition.

16. The delegates of Iran, Yemen Arab Republic and Somalia informed the Committee about their need to replenish their anti-locust material and equipment.

17. The Committee noted with satisfaction that private aerial spraying units were now available in the Kingdom of Saudi Arabia and that new large insecticide stores had been built recently in that country. It was also informed that a Locust Officer, financed by the trust fund 9409 of the Commission for Controlling the Desert Locust in the Near East, had recently taken up his duties in the United Arab Emirates. The People's Democratic Republic of Yemen had created a national locust control unit and the Yemen Arab Republic is strengthening its national locust control section.

Reporting and forecasting

18. The Committee studied the working paper which had been prepared by the Secretariat on the steps taken to implement the recommendations of the Twenty-fourth Session of the DLCC (Appendix IV).

19. The Committee appreciated the offer by the Government of Belgium of the services of a synoptic meteorologist and hoped that it will soon materialize.

20. After a long break the Reporting and Forecasting Unit will again have access to Meteosat imagery and digital data coverage in near-real time, starting in December 1981.

21. The Committee appreciated the efforts made by the Secretariat to implement the 1980 recommendations and requested the regional organizations to send regularly, and at least monthly, bulletins to other sister organizations and interested countries.

22. It recommended that special attention be given to strengthening reporting and forecasting facilities at national and regional levels, including assistance in the fields of meteorology and in training on all relevant factors.

23. The Committee took note of the special attention now being given by Algeria to strengthening meteorological facilities in the country and recommended that assistance to North-West African countries be explored in this respect.

24. The Committee learnt with interest and appreciation that COPR (UK) had just prepared for final distribution a Desert Locust Forecasting Manual. This was the result of many years of work by dedicated people and contained the experience of 40 years of research and analysis of data. The manual is mainly designed for forecasters and outlines the basic principles of desert locust forecasting. It contains basic knowledge of biology of the Desert Locust, biogeography and more than 50 case studies of locust movements in relation to weather, soil conditions and other environmental factors. The manual will be freely offered by UK at the end of 1981 to national and regional control services, meteorological services and to all other potential users.

25. The Committee emphasized the great value of the manual and appreciated the willingness of CCPR to cooperate in training field staff on the use of the manual, which is considered a good tool for training.

26. The Committee requested the Secretariat to explore the possibility of running a seminar/training course for field personnel responsible for locust forecasting in which the various problems could be discussed with the authors of the manual. It also recommended that the manual should be translated into French and Arabic.

FAO development project on remote sensing applications for desert locust survey and control

27. The Committee reviewed the activities undertaken during 1980/81 as shown in Appendix V.

28. The Committee noted with great interest the results and achievements of the project and thanked UNDP for having financed 1981 activities within the Action Programme for Improved Plant Protection, pending firm financing for Phase II, as explained at the 1980 DLCC meeting. It reiterated again the necessity of continuing this activity in order to secure more economical and more efficient surveillance and quicker and more complete coverage of suitable breeding areas during recessions.

29. The Committee noted with satisfaction that the USA was still considering the possibility of financing phase II, possibly in consultation and collaboration with UNDP, according to the last proposal presented by FAO which combined the development project on remote sensing application for desert locust survey and control with another on monitoring of drought.

30. Phase II of the project is aimed at introducing a fully operational largely satellite-base environmental monitoring and early warning system for the Desert Locust covering the entire recession area. It emphasized that the introduction of this system would not mean the abandoning of ground surveys for locust populations but it would allow a more rational and economic system for surveying locusts.

31. Provisional estimates of the cost of a fully operational system, to come into operation in 1984 at the conclusion of phase II, are some $ 350 000 per year or about US $ 0.02 a square kilometre of the recession area. The Committee recognized that it would be necessary as of now to explore all possible sources for continued financing of this activity at the conclusion of phase II.

Coordination with UNDP/FAO Action Programme for Improved Plant Protection

32. The Committee heard with great interest a statement on the UNDP/FAO Action Programme for Improved Plant Protection during the period October 1980 - September 1981 (Appendix VI).

33. Member countries and regional organizations expressed their appreciation for the work already achieved. The latter emphasised that strengthening national plant protection services will facilitate better supporting action to the national units. Delegates recalled that the programme had originated from the basic needs of the Desert Locust activities and that these should receive first priority in the programme projects. Permanent and successful survey can only be achieved if continuous training is secured.

34. The UNDP Representative noted with satisfaction the positive reaction of DLCC members to the activities of the Action Programme. He assured the DLCC that UNDP was willing to give priority to the Programme on the assumption that necessary steps will be taken at national and subregional levels to continue the control of various species of migratory locusts.

Review of work at Desert Locust field research stations and suggestions for future activities

35. The Committee learned that although the overall decline in the amount of research being undertaken at the field research stations (noted at the Twenty-Fourth Session) continued during the period under review, certain specific research was in progress. This included the determination of the toxicity of certain insecticides at the Jeddah Research Station and the evaluation of the physical characteristics of insecticides when applied by exhaust nozzle sprayers and knapsack sprayers in OCLALAV. In North-West Africa maps were being prepared which indicated areas where breeding and gregarization had occurred. Research activities have been reactivated at the Dokki Locust Research Station. Tests were being conducted by USAID in the Cape Verde Islands using a bran mixed with the protozoan Nosema locustae and carbaryl and USAID had made a grant to the Boyce-Thompson Institute to evaluate the fungus Entomophthora grylli in cooperation with ICIPE against locusts and grasshoppers in Kenya.

36. The Committee noted that although there were some comprehensive handbooks and manuals for field officers, there is still a large amount of information available at the regional level which needed to be analysed and collated so that it could be given to newly recruited locust personnel.

37. The Committee learned with regret that the international journal ACRIDA was going to have to cease publication in early 1982.

38. The Committee also heard with concern that COPR was no longer in a position to maintain the locust archives which had been established in London for 50 years. COPR wished to record its thanks to all those who had been involved in sending information for half of century and suggested that this had represented as good an example of international cooperation as anywhere. In turn the Committee wished to place on record its appreciation of all that had been achieved by the Anti-Locust Research Centre and its successor COPR and emphasized the need to continue similar research.

Training

39. The Committee reviewed the activities under the training programme (Appendix VII).

40. The need for additional training in the use and maintenance of radio equipment was emphasized by many countries and regional organizations. The Committee requested FAO to seek continuous support to this important element of training.

41. Iran expressed their needs in the following fields: spraying techniques, spraying equipment (mainly ULV), training in the testing of new insecticides and the handling of laboratory instruments, procurement of documentation, spare parts, vehicles and insecticides.

42. The Committee realised that needs for training in the various fields dealing with locust survey and control were still immense and the solution can only be sought by a global approach. This will require a proper programming to be undertaken in collaboration with regional commissions and organizations, together with a suitable approach to potential donors. The Committee stressed the rôle of Technical Cooperation between Developing Countries (TCDC) in training and urged FAO to strengthen it.

43. At the same time, it was considered that member countries should explore through UNDP Resident Representatives the possibility of financing individual fellowships and specialised training.

Trust Fund 9161 - contributions and expenditure

44. The Committee was presented with a statement on the budget, statement of accounts for 1980 and an estimate of expenditure for 1981 (Appendix VIII). The fund is being built up gradually but some countries continue to have arrears in payments for several successiv years. The Committee urged these countries once again to pay their contributions.

45. Expenditure during 1980 and early 1981 was on a much reduced scale in order to avoid creating a deficit, as occurred in 1979. The Committee was assured that for personnel travel the trust fund was only utilized at Headquarters after every other source of finance had been explored. The Committee, however, stressed the need for economy in expenditure on travel and documentation without detriment to efficiency and urged that more funds should be utilized for assisting the member countries for training and supply of equipment.

International Trust Fund 9161 - proposed new scales of contributions

46. The Committee reviewed the proposed new scales of contributions to the International Trust Fund 9161 (see Appendix IX) which had been placed before it at the 24th Session and of which a more elaborate version had also been circulated subsequently to all member governments, as requested at the 24th Session.

47. Unfortunately it transpired that most of the governments had not yet made a final decision as to whether they would support an increase in the total budget to US$ 200 000, or about their willingness to increase their individual contributions. It would now be necessary for delegates to return to their countries to request that a decision be made.

Situation of various regional locust commissions/organizations

48. The Committee reviewed a document prepared by the Secretariat concerning the status of various regional locust control organizations and Desert Locust commissions. The document, as amended by participants, including additional information received during the Session, appears in Appendix X.

49. The activities of the FAO Regional Commissions and of the regional locust control organisations were appreciated by the Committee. It was recommended that in future sessions the document on this subject should more clearly show the follow-up of recommendations taken at the annual meeting of these regional commissions and organisations.

Terms of reference of the FAO Desert Locust Control Committee

50. The Committee reviewed the document prepared by the Secretariat according to the recommendation of its 1980 session (Appendix XI).

51. The importance of migratory pests other than the Desert Locust was fully recognized. Due consideration will have to be sought to solve problems caused by these pests. The problem resides in determining how this goal could be best achieved and the rôle that the DLCC can or should efficiently play in this respect, taking into consideration the technical, legal, logistical, organisational, financial and administrative factors involved.

52. A lengthy discussion showed the magnitude and complexity of this problem. While recognising that FAO was already tackling other migrant pest problems and that the DLCC had restricted its activities to the Desert Locust, views diverged about the official rôle of the DLCC and the official extension of its terms of reference.

53. The Committee therefore recommended that an ad hoc working group of experts be formed by FAO as soon as possible in order to study this problem in detail and to report its conclusions to the next Session. The terms of reference of this group would be as follows:

- to define the migratory pest species involved, their distribution area and the countries concerned, compared with the area of the Desert Locust covered by the DLCC;

- to review the control tactics, strategy, logistics and organizations concerned with the migratory pest species both at national level and that of organisations dealing with their control;

- to assess the activities of the DLCC since it was established in 1955 and to identify the main constraints which prevent it fulfilling the activities assigned to it and expanding those activites;

- to study the future rôle which could be played by the DLCC in tackling the problems of migratory pests other than the Desert Locust without duplicating other activities already being undertaken by FAO;

- to study the feasibility of extending the terms of reference of the DLCC, the real advantages and disadvantages of such a change to the countries and organisations concerned;

- to determine the various legal, organizational, technical, administrative and financial implications of extending the terms of reference of the DLCC and to show how the problems could be overcome.

Date and place of next session

54. The Committee recommended that the Director-General of FAO convene the next session of the DLCC in October 1982 at FAO Headquarters, Rome.

APPENDIX I

DESERT LOCUST SITUATION SUMMARY AND FORECAST UP TO 31 DECEMBER 1981

THE DESERT LOCUST SITUATION, OCTOBER 1980 - SEPTEMBER 1981

The Main Features

1. The most important populations occurred in West Africa and North-West Africa. The breeding which began in Mali in early June 1980 following good rains in May extended to Niger and southern Algeria in August and September and resulted in the formation of hopper bands and swarms despite control measures. Considerable numbers of adults emigrated to Mauritania in October and to central Algeria and south-east Morocco in November. There was patchy gregarious breeding in Mauritania between October and December. There was moderate spring breeding in central Algeria between March and May 1981 and evidence that escapes reached Mali in June 1981. There were further good rains in the Southern Sahara in June but breeding is on a much smaller scale than in 1980.

2. In the Central Region winter breeding started on the Red Sea coast of Sudan in October and spread to the northern sector in December. Despite aerial and ground control operations a few swarms were produced between January and March. Some of these crossed the Red Sea and laid in north-western Saudi Arabia between late February and April. These infestations were controlled. Groups of adults were found on the coastal plains of north-western Somalia in July and August and an unconfirmed swarm was reported from the Gulf of Aden on 5 August. Elsewhere in the Central Region and in the Eastern Region only scattered locusts have been reported.

West Africa

3. Following good rains in May - June 1980 and good follow-up rains up to November, breeding which commenced in the southern Adrar des Iforas in Mali in late May - early June continued up to December. By October there were high density late instar hoppers, fledglings, immature and mature and laying adults, including five swarms, of the second generation in numerous oueds in Tamesna, southern, south-western and western Adrar des Iforas in Mali and large numbers of mature adults which had already laid were found in the Bouressa basin in north-eastern Adrar des Iforas. By November many of the populations in Tamesna, southern, south-western and western Adrar des Iforas had departed but there were high density populations of immature adults in northern Adrar des Iforas and high density breeding (representing a third generation) as well as immature adults in Timetrine. Little control was undertaken before October and it was subsequently estimated that only about 20% of the infestations were treated.

4. Only small numbers of adults were found in early 1981. In June there were moderate to good rains in south-eastern and northern Adrar des Iforas. Mature adults were found in several localities at densities of up to 50 per hectare and some green second and third instar hoppers were seen at Ifaghalal (1832N/0026E) and Aguelal (1845N/0225E) with a mixture of grasshoppers. On 10 June immature adults were found roosting on trees in oued Edjedem (2040N/0125E) at a density of 400/ha. From their behaviour it was thought that these represented immigrants. The first two decades of July were generally dry but there were moderately good rains in the third decade. First to third instar hoppers were found at densities of 1-2 per square metre in oueds Tin Biden (1925N/0220E) and Tihidjeren (1949N/0018E) with grasshoppers. Adults were present in south-eastern Adrar des Iforas but at lower densities than in June. In August conditions were favourable for breeding in north-western Adrar and Tilemsi but it was drier elsewhere. Control was undertaken against hoppers and adults over 300 ha in oued Tadeloc (1937N/0158E) and in northern Adrar against mature adults at 10-500 per hectare and solitaricolor hoppers at 500-2500 per hectare over an area of 2000 hectares in oued Irharhar (2014N/0158E). Immature adults at 10 to 15000 per hectare and hoppers at 500 to 5000 per hectare were found with Locusta and Oedaleus in the Bouressa basin.

5. In Niger, there were also good rains in June and August and in September in Tamesna and in October in Air. Only scattered adults were reported up to August but during the second decade of September mature, copulating and laying adults were found at densities of up to 150 per hectare over large areas of Tamesna. On 2 October the military post at Assamaka (1920N/0541E) reported the presence of locusts and a survey established that mature adults were present in almost all oueds between 1805N and 1854N and 0505E and 0703E at densities of 2500-100000 per hectare. The great majority were yellow and almost certainly were immigrants, probably from Malian Tamesna, but some were grey-brown and probably produced locally. There were also large numbers of hoppers of all instars and fledglings started to appear on 18 October. In aerial control operations from 6 to 19 October 63080 ha were treated with over 17000 l of insecticide and ground control operations were conducted over a further 8500 ha. Smaller infestations were also controlled in Air. In November control continued against hoppers and adults. Although some emigration to the west was observed, there were large areas of dead and dying insects and by December densities were reduced to less than one per hectare.

6. In early 1981 the situation remained calm. On 14 and 15 June a strong surge of the Intertropical Front (FIT) along the Kano-Agades axis produced cyclonic circulation in the Agades area and stormy weather. After 15 June the surge of the FIT continued over Niger with exceptional surges up to 21°N. The Agades and Iferouane areas registered over 40 mm in the second decade. In July hoppers were observed 25 km east of In Abangharit at densities of up to one per square metre. Control started on 30 July against third to fifth instar hoppers and young adults. During August there was further good rain in Air in the third decade and conditions were favourable for breeding in western Air but only very low numbers were present, while Tamesna became clear.

7. In Mauritania a ground survey in November - December 1980 obtained information that adults had reached the Aftouts de Faye area on 10 October and started to lay and a number of swarms were reported up to 28 November. The survey found several areas with bands of second to fifth instar hoppers and fledglings in the same area as well as some mature adults which had already laid. In January some adults persisted in the Tidjikja area. In February strong descents of polar air occurred during the first fortnight and their meeting with warm humid south-westerly winds resulted in extensive cloud from Morocco and Western Sahara to Gambia. Good rain fell in northern Mauritania and Western Sahara (Segueit-al-Hamra and the Adrar Soutouf). Al Afoun recorded 38 mm and Smara 32 mm, and the guide at Atar reported that nomads were moving north to benefit from the good grazing in northern Mauritania and Western Sahara. A swarm was reported at Al Afoun on 25 January and it is probable there was gregarious breeding in these northern areas. A swarm was seen north-east of Tidjikja on 16 March and another near Tichit on 4 April. Patchy rain fell in the central-west (Tidjikja and Atar) and eastern Hodh (Nema) in the first decade of May. There were further rains in June and in the last two decades of July and conditions became favourable for breeding in the triangle Atar - Boutilimit - Tidjikja. In August isolated adults were found copulating.

8. There were no reports from Chad.

North-West Africa

9. Following the reports by OCLALAV of the upsurge in Mali and Niger, ground surveys in the extreme south of Algeria in early October 1980 revealed the presence of numerous areas infested by hopper bands of all instars, and immature and mature adults at densities of up to 70000 per hectare in the area bounded by 1858N-1924N, 0341E-0404E. Three ground teams applied 20% malathion by exhaust nozzle sprayers over a total area of 6709 ha with good results against hoppers but with less good results against adults. A further 100 hectares were treated in early November. The origin of this infestation was undoubtedly north-eastern Mali where large numbers of adults of the first generation were produced in August.

10. In early November there was evidence that considerable numbers of adults were migrating northwards across southern and central Algeria and that some had reached southern Morocco. Fifty adults were captured at Errachidea (3157N/0427W) on 6 November and there were unconfirmed reports of swarms at Ghardaia (3230N/0337E) on 8 November. The migration was evidently on a wider front as adults were found settled on trees in oued Arrikine (2431N/1034E) over an area of 100 hectares in late November and were controlled in early December. Hoppers were also found in oued Ider (2135N/0251E) in early November.

11. The rains of November 1980 and to a lesser extent those of January and February 1981 created favourable conditions for concentration and breeding in central Algeria particularly around the Tademait plateau. At the beginning of March adults started to concentrate, mature and lay and control operations commenced on 19 March using exhaust nozzle sprayers. Densities ranged up to 15000 per hectare. Some 2000 hectares were treated in March mainly to the north-east of the Tademait plateau. In early April hatching commenced and control was undertaken against 933 hectares of hoppers and 1139 hectares of adults. There was no rain in the recession area in North-West Africa in April which resulted in a considerable reduction of the area suitable for breeding. Control continued in early May against hopper bands over a further 283 hectares. In mid-June there were unconfirmed reports of groups of adults in the Timimoun, Béchar and Adrar areas but these could not be confirmed by survey teams sent to the areas. Between 18 and 25 June central Algeria received unusually heavy rain, Tamanrasset recorded 50 mm, Laghouat 20 mm. Control operations were undertaken against hopper bands and adults in several localities in south-eastern Ahaggar, Ahnet and Mouydir in September.

12. After the influx of adults into southern Morocco in November 1980 only isolated locusts were seen in December and there have been no further reports.

13. In Libya there was a report of groups of locusts in the Nalud area in early March but there were no reports of any breeding, or of adults subsequently. There were no reports of locusts from Tunisia.

Eastern Africa

14. In Sudan only isolated hoppers were reported from the summer breeding area in 1980 but by September the number of adults started to increase on the Red Sea coast. In October isolated hoppers were found in the Tokar delta and by November there were groups of hoppers of all stages ranging in colour from green to black and yellow, fledglings and adults of mixed maturity and control operations using BHC bait and dust commenced. In December groups of hoppers and mature adults at densities of up to 12060 per hectare continued to be present in the Tokar delta over a total area of 18140 hectares and first instar hopper bands appeared on 23 December. In the northern sector of the Red Sea bands of second to fourth instar hoppers were found over an area of 800 hectares suggesting that the parent adults arrived in November. In January 1981 there were groups of immature and mature adults and first instar hopper bands in the Tokar delta, and in the northern sector an immature swarm covering 160 hectares settled at Jebel Hadarab (2201N/3647E) on 22 January. There were also groups of

immature adults at densities of up to 13420 per hectare over 600 hectares at Khor Haddai (2148N/3645E) and at densities of up to 36000 per hectare between Jebel Hadarab and Khor Kwareitri (2205N/3645E). First to fourth instar bands infested six localities and aerial and ground control operations were launched with excellent results. On 9 February an immature swarm measuring 600 hectares settled at Khor Mekrik (2151N/3637E) and on 21 February a thin density immature swarm covering 1200 hectares settled at Khor Safiya (2127N/3612E). There were also groups of immature adults at densities of 900-1200 per hectare over 2080 hectares and hopper bands and groups of hoppers and fledglings over 2815 hectares. Over 12600 litres of ULV Fenitrothion were applied over an area of 29570 hectares by air. Ground control continued and good results were obtained. On 1 March a thin density immature swarm covering 800 hectares settled at Khor Aglihok (2207N/3637E) and groups of immature adults were present at 11 localities in the northern sector. Only a few hoppers remained. Control operations continued throughout March and into April.

15. In May 1981 solitary adults were found at several localities along the western bank of the river Atbara in Nile Province. There have been no reports of breeding in the summer breeding area and no further reports of adults.

16. In Ethiopia one adult was captured at Asmara on 25 June 1981.

17. In Somalia six adults were found in December 1980 on the northern coastal and subcoastal plains. There were widespread rains in north-west Somalia, eastern Ethiopia and the Danakil depression between March and May. On 7 July a traveller reported scattered locusts between Silil (1059N/4326E) and Garisa (1036N/4327E) and on 17 July a survey party counted 1459 individuals in a 12 kilometre vehicle traverse in the same area. Scattered adults were also seen between Bulhar and Sabawanak (1030N/4407E) on 21-23 July. Further scattered adults were found between Garisa and Bulhar during the second week of August; these included old yellow and younger light greyish-brown individuals. A swarm was reported on 24 August 60 kilometres east of Las Khoreh but a ground party only found Tree Locusts.

18. There were no reports from Djibouti, Kenya, Tanzania or Uganda.

Near East

19. In the Kingdom of Saudi Arabia there were good rains on the Hejaz and Asir mountains and over much of the north-western part of the Kingdom in October 1980 but only a few isolated individuals were seen on surveys between Jeddah and Jizan. From 3 November there were further heavy rains in the Jeddah, Mecca and Taif areas in the north-west and along the Tihama, where conditions became suitable for breeding. There was evidence of an influx of locusts on a broad front during November, possibly from summer breeding areas in Sudan and representing an extension of the movement which took adults to the northern sector of the Red Sea coast of Sudan. On 6 November maturing adults appeared at lights at Rabigh and were later estimated at 100-150 per hectare, and in the same period maturing adults at a density of 150 per hectare were seen near Jeddah. On 19 November maturing adults were found over an area of 36 square kilometres at Yenbo El Nakhl; 90 were collected and started to copulate on 23 November. Adults were also found at three localities on the Qunfidah Tihama at densities of 50-150 per hectare. In December there was further widespread rain in northern and central parts of the Kingdom and along the southern Tihama. Scattered adults were found on the Qunfidah Tihama and in two wadis near Um Lejj. There was widespread rain in January 1981, particularly in the north-west where conditions were very favourable for breeding. Small numbers of first and second instar hoppers and mature adults were found around Yenbo and scattered adults were found at several localities on the Qunfidah Tihama.

20. On 25 February there were three reports of mature swarms, each $2\frac{1}{2}$ square kilometres, from the Um Lejj area during a period of southerly winds, so it is likely that they represented escapes from breeding on the northern sector of the Red Sea coast of Sudan. The swarms split up and laid over an area of about 900 square kilometres. Control measures using BHC bait were applied immediately. Hatching commenced on 19 March. Altogether 4867 groups of

all instars were controlled by April. Small numbers of adults continued to be found on the Qunfidah and Jizan Tihamas between February and April.

21. On 20 May adults and hoppers of all instars at a density of 4000 per hectare were found in cultivations over an area of 25 square kilometres at Judeidah (2612N/3720E). Control operations were undertaken using malathion 96% applied by exhaust nozzle sprayers. On 3 June another infestation of groups of late instar hoppers and fledglings and adults at a density of 600 per hectare were found over an area of 100 square kilometres at Shamli (2648N/4014E). This area was also controlled by 15 June. Small numbers of adults were also reported from Yenbo, Taima, Bal Joreishi and Jizan in May and from Jizan in June, which were controlled.

22. In Yemen Arab Republic small numbers of adults were reported from Wadi Hayran in October and November and from near Zuhrah in late November. These populations then disappeared. Two adults were reported in Wadi Siham in late February. Reports of swarms in April proved to be of Tree Locusts. In July adult desert locusts at a density of 10 per bush were found mixed with Tree Locusts near Zuhrah over a distance of about 3 kilometres, but by August their density had declined to 3 per kilometre.

23. In the People's Democratic Republic of Yemen only small numbers of adults were reported throughout most of the period under review. Between October and March these were confined to the coastal plains west of Aden. In March there were widespread heavy rains and many wadis flooded. In April low density adults were found in the Dathinah area (1402N/4615E). On 25 May a survey party found a population of adults at the Al Wahood farm in the Al Lajafah area (1450N/4630E) in Wadi Markhah. This population persisted in June but disappeared in July when it was thought to have migrated to Wadi Duan (1530N/4820E) where a similar population was reported by a scout on 30 July.

24. Isolated flying grey and yellow locusts reported in the Gulf of Aden by a ship on 29 July proved to be Locusta, Catantops, Anacridium and Cyrtacanthacris. Another report from a ship was of a swarm about 50 kilometres south of Mukalla on 5 August. Ground teams sent to the area east of Mukalla on 6-8 August were unable to find any traces of desert locusts. Locusts were, however, reported from Raydaah (1508N/4935E) on 22 August.

25. In Egypt scattered locusts were reported from Abu-Simbel, Abu-Hamad and Wadi Di-ib areas of the south-eastern desert in October and November. Adults persisted in the Abraq (2324N/3447E) and Wadi Di-ib areas at densities of 7 per square kilometre over an area of 50 square kilometres. In January mature adults and patches of hoppers were found in Wadi Di-ib where ecological conditions were favourable for breeding. In February and March joint surveys were undertaken with Sudanese teams in the border areas but no locusts could be found, and there have been no subsequent reports of locusts.

26. No locusts were reported from elsewhere in the Near East region.

South-West Asia

27. In Iran the population of locusts reported near Zabol in September 1980 proved to be of grasshoppers. There were no reports of desert locusts in 1981.

28. In Pakistan no locusts were reported from October 1980 until the second fortnight of February 1981 when five adults were observed in coastal areas of Baluchistan and in Las Bela district. Small numbers of adults were also found in late April and May in Baluchistan. In July there was widespread heavy rain in the Cholistan and Nara deserts and scattered adults at a maximum density of 3000 per square kilometre were recorded at 13 localities in the Sukkur, Cholistan, Nara and Tharparkar deserts and in Las Bela district. In the second week of August there were further heavy rains and adults were reported at two localities in the Rahimyar Khan district.

29. In India only scattered adults have been recorded throughout the period under review. The maximum densities recorded were 150 per square kilometre in October, 300 in November, 100 in December, 0 in January, 37.5 in February, 50 in March, 350 in April, 0 in May and 25 in June. In the second half of July there was heavy rain in parts of Rajasthan and a considerable increase in the number of locusts reported. In all, locusts were reported from 56 localities in Bikaner, Churu, Barmer, Jaisalmer, Jodhpur and Sri Ganganagar districts of Rajasthan and Banaskantha district of Gujarat, at a maximum density of 1125 per square kilometre. There was further patchy rainfall in the first half of August, when adults at a maximum density of 2625 per square kilometre were reported from 7 localities in Barmer, Bikaner, Jaisalmer and Jodhpur districts of Rajasthan and one locality in Banaskantha in Gujarat. In the second half of August scattered adults were recorded at 11 localities in Jaisalmer and 8 localities in Bikaner district. Fourteen first to fifth instar hoppers were found.

30. No locusts were reported from Afghanistan.

FORECAST TO 31 DECEMBER 1981

31. Rainfall has been generally above average in the summer breeding areas of India and Pakistan, and in parts of the Sudan, Niger, Mali and Mauritania. The densities of adults reported to have reached the summer breeding areas were low and breeding has only been reported from Mali, Niger, Algeria and India. It is probable, however, that breeding has occurred in other areas. The most important populations have been in Tamesna in Niger and in the Adrar des Iforas in Mali where control was undertaken in July and August respectively. Some hopper bands and swarmlets may form in these areas; any escapes are likely to move north and north-west in the second half of October and first half of November and reach western Libya, eastern, central and western Algeria, southern Morocco and perhaps northern Mauritania and the Western Sahara. Breeding is almost certainly in progress in the interior of the Sudan and possibly the western lowlands of northern Ethiopia, and increasing numbers of adults will reach the Red Sea coast in October and start to breed. Some may cross the Red Sea and reach the Tihamas of Saudi Arabia and the Yemen Arab Republic. Emigrants from the Indo-Pakistan breeding areas will reach Baluchistan of Pakistan and perhaps south-eastern Iran.

32. In West Africa breeding will continue in the Adrar des Iforas in Mali and may extend to the Tilemsi valley and Tamesna during September and early October. Some hopper bands may form in these areas and lead to the formation of swarmlets unless controlled. Most survivors of control operations are likely to move north and north-west into North-West Africa but some are likely to remain in Mali. In Niger good breeding conditions exist in Western Afr and, although the latest information indicates there are no locusts in Afr and Tamesna, the possibility of immigration from the west, as in 1980, and successful breeding, cannot be ruled out. Breeding is almost certainly in progress in central Mauritania and may result in the formation of some groups and even bands from late September. Adults may also reach northern Mauritania and the Western Sahara during October and November.

33. In North-West Africa breeding is in progress in central and southern Algeria. Adults produced as a result of this breeding will be augmented by those produced in adjacent areas of Mali and Niger and will move into western Libya, eastern, central and western Algeria and perhaps southern Morocco in late October and the first half of November, mainly at night. The scale of this invasion will be less than in 1980.

34. In Eastern Africa breeding is almost certainly in progress in the interior of the Sudan and possibly in the western lowlands of northern Ethiopia. Adults produced by this breeding will move to the Red Sea coastal plains of Sudan and northern Ethiopia and will concentrate in areas such as the Tokar delta which have received floods from summer rains over the mountains or early winter rains. Breeding will commence in September or October and is likely to result in the formation of hopper groups and even some small bands. Breeding on a small scale may occur on the coastal and subcoastal plains of northern Somalia as far south as the Nogal valley. It is just possible that considerable numbers of adults may reach the coastal plains from southern Arabia in November.

35. In the Near East numbers of adults are likely to increase on the Tihama of Saudi Arabi from October onwards due to immigration from the interior of Arabia and possibly from Sudan. They will tend to concentrate in areas which have received floods from summer rains over the mountains or early winter rains. Breeding is likely to start in October but is likely to be on a small scale. Small numbers of adults will persist on the Tihama of the Yemen Arab Republic and small scale breeding is likely to occur in areas recently flooded or which receive winter rains. If the ship report of a swarm on 5 August refers to desert locusts, breeding may be in progress in eastern People's Democratic Republic of Yemen or southern Oman, perhaps on a scale sufficient to produce a few small swarms. These are likely to move south-west to western coastal areas of PDR Yemen in November where breeding may commence. Small numbers of adults may reach Oman and the United Arab Emirates in late October or early November from the east, and small numbers of adults may reach the South-Eastern Desert of Egypt in late October or November.

36. In South-West Asia widespread scattered breeding is probably in progress in the summer breeding areas of Pakistan and India. In some areas a second generation may occur which could lead to the formation of some hopper groups and even small bands in October and early November. Most adults are likely to move west to coastal areas of Baluchistan in November and some may reach south-eastern Iran although their number is unlikely to be large.

APPENDIX II

ANTI-LOCUST MEASURES UNDERTAKEN BY VARIOUS COUNTRIES AND REGIONAL ORGANIZATIONS, OCTOBER 1980 - SEPTEMBER 1981

Country, Locality	Month, year	Types of infestation	Infested/ treated area (km^2)	Insecticide used	Method of application
Mali (by OCLALAV)					
Adrar des Iforas, Tamesna, Timetrine	Oct-Dec. 1980	Groups and bands of hoppers, groups and swarms of adults	640	7 955 l. dieldrin 5% 300 l. fenitrothion 96%	Ground
Adrar des Iforas	Aug-Sept. 1981	Groups of hoppers and adults	19	1 070 l. dieldrin 5%	Ground
Niger (by Plant Protection Service of Niger and OCLALAV)					
Tamesna, AÏr	Oct-Nov. 1980	Groups and bands of hoppers, groups of adults	873	9 280 l. dieldrin 5% 8 520 l. dieldrin 25% 6 275 l. fenitrothion 96%	Ground and air
Tamesna (by OCLALAV)	July 1981	Groups of hoppers and adults	3	250 l. dieldrin 5%	
Algeria					
Tamesna	Oct-Nov. 1980	Hopper bands, groups of adults	69.2	4 282 l. malathion 20%	Ground
Tassili-n-Ajjer	Dec. 1980	Adults	1	?	
Tademait	March-May 1981	Hopper bands, groups of adults	44	?	Ground
SE Ahaggar, Ahnet, Mouydir	Aug-Sept. 1981	Groups of adults and hoppers	7		Ground
Sudan (by Plant Protection Division of Sudan and DLCO-EA)					
Red Sea coast	Nov. 1980 - April 1981	Swarms, groups of adults, hopper bands and groups of hoppers	350	12 867 l. fenitrothion 96% 296 000 kg HHC bait 2 700 kg HHC dust	Air and ground
Saudi Arabia					
Umm Lejj	Feb-April 1981	Swarms, hopper groups	900	7 000 l. malathion 96% 6 000 l. dieldrin 20%	Ground
Judaida	May 1981	Groups of hoppers and adults	25	2 000 l. fenitrothion 96% 4 000 kg HHC dust	Ground
Shamli	June 1981	Groups of hoppers and adults	100		Ground

REVIEW OF THE EXISTING CONTROL POTENTIAL AT NATIONAL AND REGIONAL LEVELS

Country or Organisation	Insecticides (tonnes/litres x 10^3)							Sprayers			Dusters		Vehicles			Aircraft			Radios	Staff	
	Total in billions of lethal doses	Dieldrin 20% or equivalent	Fenitrothion 96% or equivalent	EHC liquid gamma 15%	EHC dust 25% or equivalent	EHC bait 0.1% gamma	Others	Exhaust nozzle	Manual	Power	Manual	Power	Light	Medium	Load carriers	Fixed wing, control	Fixed wing, transport	Helicopter		Technical	General
Cameroon																					
Central African Republic	1272.5	-	28.4	-	195	-	-	-	42	-	9	-	1	5	3	-	-	-		15	59
Gambia	800	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		6	43
Ivory Coast	Information not available																				
Mali	Information not available																				
Mauritania	1294	0.75	21	25	420	-	-	6	-	110	40	99	6	5	6	-	-	-		-	
Niger	678	6.6	9.9	3	150	0.8	-	3	360	10	2	20	5	2	-	-	-	-		-	
Senegal	3820	-	84	40	375	-	-	-	-	250	150	-	1	7	3	2	-	-		-	
Upper Volta	1802	30	14	-	615	-	-	10	314	450	600	205	10	15	2	-	-	-		-	
OCLALAV	396	-	5.9	-	200	-	-	11	-	100	-	-	2	-	-	-	-	-		-	
	1662	50	10.3	-	-	-	-	50	-	-	-	-	40	16	10	6	1	-		32	150
Algeria	26115		600		3000	485		20	1250	54	-	56	27	114	31	15*	3*	-		20	50
Libya	2713	25	48	30	60	500		35	-	15	-	18	23	-	11	*	-	-		-	4
Morocco	4566	4.6	78	-	1664	499	-	25	-	2	3	-	22	-	26	3	-	-		-	
Tunisia	920	-	15	-	400	-	-	13	116	67	275	80	4	2	1	6	-	-		-	6
Djibouti	190.5	2.5	2.5	-	40	-		3	-	5	50	-	2	1	-	-	-	-		-	-
Ethiopia	1997	20	21.4	12.5	130			14	4272	2333	-	-	-	-	-	-	-	-		-	-
Kenya	Information not available																				
Somalia	-	-	-	-	-	-	-	20	-	-	-	-	5	-	-	-	-	-		-	-
Sudan	1675.5	19.1	24.1		150	4300		20	700	500		40	40	-	50	4	2	1		15	70
Tanzania	Information not available																				
Uganda	Information not available																				
DLCOEA	6601.5	76	97.6	201.2	-	3.9	-	100	-	-	-	-	123	-	52	9	3	-		71	213
Bahrein	64	-	-	-	-	-	8	-	-	32	-	2	8	-	-	-	-	-		-	16
Egypt	193.7	3	2	5	16	250	-	5	-	50	40	8	30	40	8	can be chartered			10	90	300
Iraq	98	2	-	-	-	-	6	20	1000	20	-	-	50	-	-	10	-	-		50	100
Israel	20	-	-	5	-	-	-	-	-	10	-	-	10	-	1	*	*	*		*	*
Jordan	62.5	2.5	-	-	-	-	-	2	-	30	10	2	8	2	-	-	-	-		15	50
Kuwait	366.3	13	-	-	59	-	-	-	-	32	15	9	3	7	-	-	-	-		33	120
Lebanon	88	-	-	12	-	-	5	-	14	-	-	-	5	-	-	-	-	1		22	20
Oman	249.2	1	5.5	-	6	-	-	4	-	125	-	-	4	-	-	-	-	-		12	160
Qatar	100	4	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-		-	2
Saudi Arabia	5407	150	22.5	-	225	-	75	80	-	80	-	142	120	-	15	can be chartered				10	119
Syria	452	4.2	-	9.5	400	-	7.5	13	256	-	230	204	-	-	-	8	-	-			
United Arab Emirates	603.7	20	-	1	3	-	15	15	-	40	-	-	10	-	-	2	-	-		4	15
Yemen Arab Republic	1833	58	5	-	170	-	80	35	-	133	136	8	17	-	1	-	-	-		3	14
Yemen PDR	832.6	23	4	9	88	-	-	22	-	-	45	8	16	-	2	-	-	-		3	11
Afghanistan	-	-	-	-	-	-	-	10	50	30	100	1	21	2	10	-	-	-		64	45
India	2359	15	23	35	137.3	-	21.6	40	-	-	6057	187	100	-	9	32	-	3	70	123	140
Iran	607.1	-	-	10	8	-	-	32	1800	800	15	-	66	-	20	35	-	-		42	50
Pakistan	13751	150.8	240.2	60.6	182.1	108.7	-	64	-	-	145	3	95	-	16	22	-	-		164	330

* Available if necessary.

APPENDIX IV

REPORTING AND FORECASTING

Current Status

The following action has been taken in accordance with the recommendations of the Twenty-Fourth Session of the DLCC.

- a number of countries/regional organizations and commissions, notably India and DLCO-EA, have sent regular 10 or 15 day summaries of the locust situation by telex or through FAO offices, while others, including the Kingdom of Saudi Arabia, Sudan, Yemen People's Democratic Republic and the North-West Africa Regional Commission have sent cables when important developments have occurred;

- telex messages or cables have been sent from Headquarters to all regional organizations and commissions during the first week of each month;

- printing and distribution of the monthly summary and forecast has been speeded up;

- OCLALAV monthly summaries have been translated into English and sent to anglophone countries.

FAO has been informed by Belgium of its interest in supporting the reporting and forecasting service by providing the services of a synoptic meteorologist and it is hoped that a specialist will soon be appointed.

After a break of nearly two years the service will again have access to Meteosat imagery and digital data coverage in near-real time, starting in December 1981.

As regards the key rôle of telecommunications the following has been accomplished:

- one regional training course on locust control and radio operation and maintenance was held in Sana'a and Hodeidah, Yemen Arab Republic for 17 participants from the Near East Region;

- radio training courses for national locust control and plant protection staff were held in Bikaner (India), Tunis (Tunisia) and Cairo (Egypt);

- a transceiver has been installed at the North-West Africa Regional Locust Office in Algiers for communication with the national units in member countries;

- a request has been made to operate a transceiver at Headquarters on the same frequencies as those used by OCLALAV and the North-West Africa Regional Commission;

- technical assistance was provided to OICMA, Cameroon and Chad in order to strengthen telecommunications in the Lade Chad outbreak area of the African Migratory Locust;

- a survey was made of telecommunications requirements of countries in central and southern Africa subject to invasions and infestations of the African Armyworm under the aegis of the Action Programme for Improved Plant Protection. This survey was conducted as a preliminary step towards extending the Armyworm Reporting and Forecasting Service based in Muguga (Kenya) to Central and Southern Africa.

Planned activities in the future include:

- national radio training courses in India and Pakistan.

Requests for radio training courses have been received from Sudan, Somalia and the Near East Region and for technical assistance missions to Saudi Arabia, Jordan, the Gulf States, Yemen Arab Republic and People's Democratic Republic of Yemen.

FAO DEVELOPMENT PROJECT ON REMOTE SENSING APPLICATIONS FOR DESERT LOCUST SURVEY AND CONTROL

INT/79/902

1. INTRODUCTION

The Twenty-Fourth Session of the FAO Desert Locust Control Committee (DLCC), held in Rome from 3 to 7 November 1980 reviewed the activities and results of Phase I of the Remote Sensing Development Project, which was started in October 1979 with financial support from USAID. The Committee made the strongest recommendation to continue this project and fully endorsed FAO's proposal for the Phase II programme. The Phase II project proposal for 1981/82 was submitted to USAID. Pending the decision of USAID to continue the financial support for this programme, UNDP agreed to finance the planned activities of the Project during 1981, within the framework of the FAO/UNDP Action Programme for Improved Plant Protection. An amount of US $ 187 000 was allocated to the Project to ensure continuity of activities until implementation of the Phase II programme.

2. SUMMARY OF ACTIVITIES DURING 1981

As a continuation of Phase I and building on the experience gained during this period, the following activities were undertaken:

- formulation and implementation of a project component in Eastern Africa in cooperation with DLCO-EA. The following programme elements were initiated during this period:

  - remote sensing training for DLCO-EA staff in Hyderabad, India, and Nairobi, Kenya.
  - data collection/analysis for precipitation and vegetation monitoring technique development; establishment of test sites in northern Kenya, northern and southern Somalia.
  - software development for automated vegetation/free surface water monitoring using Landsat digital data.
  - field work programme for correlation studies.
  - development of relationships with potential support agencies for environmental data acquisition/analysis during future operational monitoring programmes in eastern Africa (e.g. Kenya Meteorological Department, ECOSYSTEMS Ltd.).

- formulation of a project component in West Africa in cooperation with OCLALAV:

  - regular acquisition of Landsat MSS and NOAA-AVHRR data for high frequency breeding areas in southern Algeria, northern Mali/Niger during June - October 1981 for operational testing of the automated vegetation monitoring technique.

  - organization of joint field survey between OCLALAV, the North-West African Desert Locust Commission and the project in October 1981 for correlation of the satellite observations with the actual conditions for desert locust population development and formulation of operational procedures for an ecological conditions monitoring scheme for West/North-West Africa.

- organisation/execution of a six-week training course in basic and advanced remote sensing for staff from DLCO-EA and the Plant Protection Departments of India and Pakistan by the National Remote Sensing Agency (NRSA), Hyderabad, India (19 January - 6 March 1981).

- further development of the regional/national programmes of the remote sensing laboratories in Algiers, Algeria; Jodhpur, India and Karach, Pakistan, through training, Landsat/NOAA data acquisition/analysis programmes and field work missions.

- testing of the software programmes for automated vegetation monitoring in different environments of the desert locust recession area and implementation of the programme on the FAO/IBM Computer System at Headquarters.

- development of satellite data acquisition/transmission procedures for future real time monitoring over large areas in joint experiments with the European Space Agency (ESA), the US National Aeronautics and Space Administration (NASA) and the US National Oceanic and Atmospheric Administration (NOAA).

- formulation of telecommunications procedures at interregional, regional and national levels for routine flows of processed information to the various operational levels.

3. OPERATIONAL STATUS

3.1 Techniques and facilities

During 1981 much emphasis was placed on making operational the various techniques developed during Phase I and further tested for a variety of environments during 1981.

As a result, the following remote sensing operations can now be executed routinely:

- real time monitoring of weather conditions in the recession area using Meteosat-II and/or TIROS-N/NOAA imagery and available meteorological station observations. The satellite data can be used for both qualitative broadscale monitoring of weather systems in the recession area, including cyclone activity in the Arabian Sea and systematic, quantitative assessment of location, quantity and intensity of rainfall following the method developed for the project by Dr. E.C. Barrett.

  The project has been invited by the European Space Agency (ESA) to participate as an end-user in an experiment to demonstrate the use of telecommunications satellites for high speed transmission of satellite remote sensing data from the receiving station to the user in real time. In this experiment, due to start on 1 October 1981, the project will have unlimited access to both Meteosat-I and II data archives and moreover the data will be available at FAO Headquarters on the day of acquisition in the form of either hard copy or video taped data.

- computer assisted automated and quantitative monitoring of vegetation biomass changes in the desert locust recession area where a capability for the reception of Landsat dat exists, i.e. northern Africa, the northern part of the Near East region, the United Arab Emirates, south-east Saudi Arabia, Qatar and Oman and South-West Asia.

  The application of the remote sensing technique for this purpose results in the near ream time availability of coordinate referenced potential breeding activity factor (PBAF) maps, based on the amount and condition of green vegetation in a given area, being a reflection of the amount of available soil moisture provided by precipitation and/or run-off. The potential breeding activity factor maps can be generated at relatively very low cost within five days of acquisition of the satellite data over the area of interest.

  The technique, based on band 7/5 ratioprocessing of multitemporal Landsat data, has been tested successfully for different environments of the desert locust recession area, i.e. hyperarid/arid in North-West Africa and semi-arid in eastern Africa and the monsoon dominated environment of north-west India.

  The maps are generated in such a way that relevant parts can be transmitted quickly by telex or radio, to serve as a tool for the planning of field operations.

  The computer software for these types of analyses has been implemented on the FAO/IBM Computer System in Rome and on a mini-computer system in Nairobi.

- remote sensing laboratories for handling, analysis and interpretation of the various types of satellite data and conventional environmental observations are now fully operational in Algiers, covering the North-West African Desert Locust Commission Region and in Jodhpur, India on a national level. A similar facility is being developed in Karachi, Pakistan and another ecological monitoring unit with regional, and likely interregional, monitoring responsibilities in eastern Africa and the Near East is being formulated within the organizational framework of DLCO-EA.

  During a joint remote sensing survey mission between OCLALAV, the North-West African Desert Locust Commission and the project in October 1981, the monitoring system and associated responsibilities will be formulated for North-West and West Africa.

3.2 Satellite data coverage

On 19 June 1981 the European Space Agency (ESA) successfully launched Meteosat-II with the French Ariane launching rocket. With Meteosat-II, geostationary environmental satellite coverage at half hourly frequency for Africa and the Near East has been restored. Its predecessor, Meteosat-I, launched in November 1977, developed a malfunction in its imaging system in November 1979. Meteosat-II imagery and digital data coverage will be available to FAO in real time from December 1981 onwards and will form an important input of the monitoring system for the desert locust. Polar orbiting environmental satellite coverage from the NOAA6/7 satellites is only available at present for northern Africa and South-West Asia from the receiving stations of the Centre de météorologie spatiale in Lannion, France, and the National Remote Sensing Agency in Secunderabad, India.

For reception of NOAA data outside the reception range of these two stations, arrangements have been made with the National Environmental Satellite Service of NOAA in Washington D.C. to acquire NOAA-AVHRR data for specific areas in southern Algeria/northern Mali/northern Niger during the period July-October 1981 with the objective of making an in-depth investigation of the potential of AVHRR data for vegetation monitoring.

Initial tests, undertaken during phase I, yielded positive results.

Landsat data coverage for operational purposes is at present still limited to northern Africa, the northern and eastern part of the Near East region and the South-West Asia region excluding western Iran, through the Italian and Indian receiving stations.

This situation will improve considerably during 1982/83 afther the launch of Landsat-D, at present scheduled for June 1982, and the establishment of regional receiving stations in Ouagadougou, Upper-Volta and Nairobi, Kenya.

4. COST ASPECTS OF AN OPERATIONAL MONITORING SYSTEM

In view of the lack of detailed reference data, it is difficult to make a precise estimate of the running cost of a largely satellite based environmental monitoring and early warning system for the desert locust, covering the entire recession area. Furthermore, there will inevitably be considerable differences from year to year, depending on the amount of data to be acquired, processed, analysed and disseminated as a function of the extent and duration of the seasonal rains in the various regions.

Based on the experience available at present, the following estimate of the components involved in a fully operational system, producing near real time, i.e. within ten days after the event, quantitative information on both rainfall and vegetation conditions in the recession area can be considered as realistic on an annual basis:

	US $
1. Personnel costs (including travel)	130 000
2. Data acquisition	
- meteorological data	5 000
- meteorological satellite data	25 000
- Landsat/NOAA-AVHRR data	50 000
	80 000
3. Data processing	
- computer services	80 000
- photographic services	10 000
	90 000
4. Data dissemination	
- telex, telephone	15 000
5. General operating costs	10 000
6. Equipment	
- capital investment (first year only)	100 000
- annual updates	50 000
- maintenance	10 000
	160 000
7. Supplies and materials	15 000
TOTAL	500 000

This cost projection is based on the operation of a system consisting of two main data processing centres in Rome and Nairobi, which feed information into the regional and national remote sensing laboratories for evaluation and dissemination of the information to the operational sections.

The data processing centre in Rome will be part of the Centralized Reporting and Forecasting Service at FAO Headquarters and its procedures will be closely integrated with those of the Service. The annual cost figure mentioned above includes expenditure for further developmental work, for instance the automatization of the rainfall monitoring technique. It is estimated that once these development activities are completed and also in view of computer processing costs and telecommunication costs becoming cheaper every year, an operational ecological information system covering the entire recession area could be operated on a budget of ± US $ 350 000 annually, i.e. at a cost of US $ 0.02/km^2 of the recession area.

5. CONCLUSIONS

After two years of activities of the FAO Development Project on Remote Sensing Applications for International Desert Locust Survey and Control, including technique development and testing, infrastructure development at international, regional and national levels and training, it may be concluded that it is perfectly feasible to implement an operational system for monitoring the ecological conditions for desert locustpopulation development in the recession area.

Satellite data coverage for rainfall and vegetation monitoring can be made available for most of the recession area within ± 5 days from acquisition. Data processing techniques for extraction of information on rainfall and vegetation biomass changes have been developed and tested on their operational applicability. Emphasis has been placed on computerization of the data processing/analysis techniques, in view of the volume of raw data involved and the requirements for objective and multitemporally comparable information which can be easily transmitted by rapid telecommunications methods.

Through the use of a monitoring and early warning system, including an efficient system for dissemination of the information to the field, considerable reductions can be expected in the cost of routine surveys during recessions. At the same time a more complete and comprehensive picture of the ecological conditions for the desert locust can be obtained this way, on the basis of which the risk of a serious upsurge can be calculated and appropriate and timely action planned accordingly.

The annual running costs of an operational monitoring system, after further developmental work and initial capital investment during Phase II of the project are estimated at US $ 350 000.

An appropriate mechanism will have to be formulated for ensuring continuity of the funding of an operational system. The most appropriate possibility would be through expansion of the existing International Trust Fund 9161 through regular contributions of DLCC member countries and/or other interested donors.

APPENDIX VI

COORDINATION WITH UNDP/FAO ACTION PROGRAMME FOR IMPROVED PLANT PROTECTION

1. The objectives of the Action Pro ramme and its relation with strengthening potentialities of members countries for the control of the Desert Locust have been already outlined at the 24th Session of the DLCC (Rome, November 1980).

2. Priority actions and guidelines having been defined at the first session of the FAO Committee of Experts on Pest Control (Rome, March 1980), contacts were then made at government level in the priority countries through UNDP/FAO Representatives, in order to introduce the scope of the Action Programme and explore existing interest for the improvement of the national plant protection services. As a result of these contacts and subsequent personal visits by the Action Programme Secretariat and the FAO Plant Protection and Locust Officers, 24 countries have responded positively, expressing their wish to participate in the Action Programme, of which 20 are members of the DLCC. Plant protection survey teams were sent to Sudan, Somalia, Kenya, Tanzania, Ethiopia, Congo, Morocco, Zambia, Sierra Leone, Cameroon and the Yemen Arab Republic.

3. Surveys on telecommunications and the African Armyworm have been conducted by the Action Programme in Kenya, Mozambique, Malawi, Botswana, Tanzania and Zambia.

4. FAO has recently been contacted by the International Red Locust Control Organisation for Central and Southern Africa (IRLCO-CSA) to explore the possibility of organizing a comprehensive study of the needs of member countries of IRLCO-CSA regarding the control of migratory pests. The Action Programme is now organizing a survey mission to visit the Region in November-December 1981.

5. Special activities recommended by the FAO Committee of Experts on Pest Control for promotion and support were carried out during 1980/81 by the Action Pro ramme. Those of particular interest to locust control are briefly reviewed below:

(a) Data base on plant protection containing information on the infrastructure, capabilities and major plant protection activities in participating countries.

(b) Involvement of decision-makers in participating countries.

(c) Awareness of assistance agencies.

(d) Coordination and support of activities aimed at the control of the Armyworm in East Africa. During 1980/81 the Action Programme contributed to the effort of the DLCOEA in setting up its Regional Armyworm Reporting and Forecasting Service by contributing funds for the position of an Armyworm Reporting and Forecasting Officer stationed at Muguga near Nairobi, for 18 months and by providing funds for his travel. The Action Programme also conducted preliminary studies for strengthening the reporting and forecasting system in Eastern Africa, the establishment of a similar system in Central and Southern Africa and providing the links necessary for establishing an effective interregional system of reporting and forecasting. This study was based on the findings of a survey team which visited many of the countries of Central and Southern Africa affected by the African Armyworm. The survey team, organized by the Action Programme, consisted of the Armyworm Reporting and Forecasting Officer of DLCOEA and a Telecommunications Consultant. As a result of this study, and in close cooperation with the FAO Locusts, Other Migratory Pests and Emergency Operations Group, a project proposal was prepared for an overall strengthening of the African Armyworm reporting and forecasting system in Eastern, Central and Southern Africa. It should be noted that any establishment of telecommunications mentioned in this project will not only serve to support Armyworm reporting and forecasting but will be of direct interest to other plant protection activities, in particular those related to grain-eating birds and migratory locusts.

(e) Remote sensing application development for international Desert Locust survey and control: the project, which was started with an initial grant from USAID, was funded during 1981 by the FAO/UNDP Action Programme for Improved Plant Protection.

6. Activities of the Action Programme for Improved Plant Protection will be presented in detail at the 2nd Session of the FAO Committee of Experts on Pest Control, to be held in Eschborn, Germany, from 19 to 22 October 1981. The meeting will also discuss strategies for the improvement of plant protection in developing countries, including strengthening of infrastructure, documentation inputs and communications, training and appropriate technologies. Special emphasis will be laid on locusts and grasshoppers.

APPENDIX VII

TRAINING

Training of Desert Locust officers has been continued at all levels under the Regional and International Desert Locust Trust Funds and UNDP.

The tables below show FAO fellowships, training courses and exchange visits implemented in 1980-81.

I. Fellowships

Wafa, A.U.	Afghanistan	-	University of Teheran	2.2.74 - 30.6.81
Ben Halima, T.	Morocco	-	University of Orsay, France	25.11.79 continuing
Harb, M.A.F.	Egypt	-	IARI, New Delhi	3.9.80 - Jan. 81
El-Ghamdi, S.A.W.	Saudi Arabia	-	Plant Protection Department, Sudan	Sept. to Nov. 80
Ashur, Y.	Saudi Arabia	-	London, U.K.	1.5.81 - 31.7.81
Bahakim, F.M.	Yemen (PDR)	-	University of Khartoum	15.11.79 continuing

II. Training courses/seminars

(a) Radio maintenance

		Participants
Bikaner (India)	16 Nov. to 11 Dec. 1980	15
Sana'a/Hodeidah (YAR)	30 March to 17 April 1981	17
Tunis (Tunisia)	15 May to 1 June 1981	9
Cairo (Egypt)	17 August to 12 September 1981	12
Karachi (Pakistan)	2 October to 26 October 1981	12

Requests for additional training courses on radio operation and maintenance continue to come from various governments, regional organisations and regional commissions.

(b) Locust survey and control

Gao (Mali)	March 1981	6 OCLALAV survey officers
Sana'a/Hodeidah (YAR)	April 1981	17 from Near East region

(c) Remote sensing

National Remote Sensing Agency (NRSA) Secunderabad (India)	19 Jan. - 7 March 1981	Desert Locust Field staff of India (2), Pakistan (2) and DLCOEA (3)
Nairobi, Kenya	14-15 April 1981	40 participants from Kenya

(d) Agricultural aviation

Cranfield (U.K.)	September 1981	Mohamed Nejm (Egypt) C.M. Singla (India) M.D. Mohsin (Pakistan)

III. Exchange visits

El Garhi, M.S. (Egypt)	to India, Pakistan, Ethiopia	Sept.-October 1981

APPENDIX VIII

INTERNATIONAL TRUST FUND 9161: CONTRIBUTIONS AND EXPENDITURE

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 1980 and Estimate for 1981

2. The annual budget of the Trust Fund, as approved by the Fourteenth Session of the Committee in October 1970, is shown in Appendix A, together with the accounts for 1980 and estimates for 1981, based on the present level of funds and pledges to be received.

3. A breakdown of 1980 expenditure is given in Appendix B. Expenditure was considerably reduced from 1979 levels, which had resulted in a deficit of $100,000. This was covered by transferring $100,000 from the multi-donor Trust Fund 9577. The heaviest expenditure was on staff and non-staff travel and on translation and printing of reports. These include the 24th Session of the DLCC and the monthly Desert Locust Situation Summary and Forecast.

4. A breakdown of expenditure and commitments for 1981 as at 31 August 1981 is also given in Appendix B.

Contributions

5. The scale of government contributions to the Trust Fund is given in Appendix C. Details of outstanding contributions as at 31 August 1981 are given in Appendix D. Arrears prior to 1980 were still outstanding from Chad, Djibouti, Lebanon, Mali, Mauritania, Senegal, Somalia, Sudan, Syria, Uganda and P.D.R. Yemen, whose governments are requested to bring their contributions up to date as soon as possible. In view of steeply rising costs, it is essential that all funds pledged should be available to meet the needs of the member countries. Member countries are therefore recommended to respond to the FAO call-in letter as promptly as possible.

6. Annex IX provides information about the proposals to change the scale of contributions to International Trust Fund 9161.

APPENDIX A

INTERNATIONAL DESERT LOCUST TRUST FUND 9161

BUDGET AND STATEMENT OF ACCOUNT (Expressed in US $ Equivalents)

		Approved Annual Budget	Expenditure 1980	Estimate 1981
Receipts				
	Balance brought forward (deficit)	-	(100 347)	78 518
	Contributions from Member Governments	80 916	121 784	145 728
	Transfer from TF 9577	-	100 000	-
		80 916	121 437	224 246
Cash Expenditure				
Code				
10	Personal Services	10 000	212	5 500
20	Travel	15 000	15 575	6 600
30	Contractual Services	10 000	19 896	25 000
40	General Operating Expenses	-	817	1 000
50	Supplies	4 100	1 088	1 100
60	Equipment	25 000	60	2 000
80	Fellowships and Training	5 000	-	5 900
90	Project Service Costs (14%)	9 674	5 271	6 594
	Total Expenditure	78 774	42 919	53 694
	Unallocated Balance	2 142	78 518	170 552

The Director-General of FAO was empowered by the 14th Session of the DLCC, 1970, to change the allocation of sums allotted to different chapters in order to meet the changing needs of the locust situation, subject to the total annual expenditure not exceeding the total budget.

APPENDIX B

INTERNATIONAL DESERT LOCUST TRUST FUND 9161

Breakdown of 1980 Expenditure and Commitments to 31 August 1981

		Expenditure 1980	Commitments & Expenditure to 31 August 1981
10.	Personal Services		
	Headquarters Staff	212	1 104
	Consultants (Remote Sensing/Training)		1 458
		212	2 562
20.	Travel on Official Business		
	Staff Travel	9 298	1 084
	Non-staff Travel	6 277	2 522
		15 575	3 606
30.	Contractual Services		
	Translation and Printing of Reports	19 896	6 988
		19 896	6 988
40.	General Operating Expenses		
	Radio Network	383	-
	Insurance	45	-
	Trilingual Glossary	389	-
		817	-
50.	Supplies		
	Books and Journals	1 088	583
		1 088	583
60.	Equipment		
	Radios		895
	Insurance	60	
		60	895
80.	Fellowships		
	Wambugu (DLCO-EA)	-	2 700
	Ahmed (Sudan)		3 200
		0	5 900
90.	Project Servicing Costs (14%)	5 271	2 875
	TOTAL:	42 919	23 409

APPENDIX C

SCALE OF GOVERNMENT CONTRIBUTIONS TO
THE INTERNATIONAL DESERT LOCUST TRUST FUND NO. 9161

Country	U.S.$
Afghanistan	1 910
Algeria	2 580
Bahrain	720
Cameroon	1 440
Chad	1 800
Djibouti	420
Egypt	3 920
Ethiopia	2 180
Ghana	1 950
India	10 000
Iran	3 690
Iraq	2 480
Jordan	1 730
Kenya	1 800
Kuwait	420
Lebanon	1 350
Libya	1 820
Mali	1 800
Mauritania	1 720
Morocco	2 990
Niger	1 800
Nigeria	3 650
Oman	830
Pakistan	5 860
Qatar	830
Saudi Arabia	1 830
Senegal	2 010
Somalia	1 450
Sudan	2 250
Syria	2 010
Tunisia	1 990
Turkey	5 350
Uganda	1 650
United Arab Emirates	5 500
Yemen Arab Republic	1 840
Yemen, People's Democratic Republic	120
	85 690

TRUST FUND NO. 9169.00 - INTERNATIONAL - DESERT LOCUST CONTROL PROJECT

APPENDIX D

Pledge Position at 31 August 1981

(Expressed in U.S. dollars)

	Outstanding 1970/71 1971/72	Outstanding 1976/77	Outstanding 1977/78	Outstanding 1978/79	Outstanding 1979/80	Contribution due for 1980/81	Contribution due for 1981/82	Total due at 31 August 1981
Afghanistan	-	-	-	-	-	-	1,910.00	1,910.00
Algeria	-	-	-	-	-	-	2,580.00	2,580.00
Bahrain	-	-	-	-	-	-	720.00	720.00
Cameroon	-	-	-	-	-	-	452.54	452.54
Chad	-	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	10,800.00
Egypt	-	-	-	-	-	-	3,920.00	3,920.00
Ethiopia	-	-	-	-	-	-	2,180.00	2,180.00
Djibouti	-	-	-	420.00	420.00	420.00	420.00	1,680.00
Ghana	-	-	-	-	-	-	(994.06)	(994.06)
India	-	-	-	-	-	-	-	-
Iran	-	-	-	-	-	3,690.00	3,690.00	7,380.00
Iraq	-	-	-	-	-	-	2,480.00	2,480.00
Jordan	-	-	-	-	-	-	1,730.00	1,730.00
Kenya	-	-	-	-	-	1,800.00	1,800.00	3,600.00
Kuwait	-	-	-	-	-	-	420.00	420.00
Lebanon	-	-	-	1,350.00	-	1,350.00	1,350.00	4,050.00
Libya	-	-	-	-	-	-	1,820.00	1,820.00
Mali	-	-	-	-	462.84	1,800.00	1,800.00	4,062.84
Mauritania	-	1,305.09	1,720.00	1,720.00	1,720.00	1,720.00	1,720.00	9,905.09
Morocco	-	-	-	-	-	2,990.00	2,990.00	5,980.00
Niger	-	-	-	-	-	1,800.00	1,800.00	3,600.00
Nigeria	-	-	-	-	-	-	-	-
Oman	-	-	-	-	-	-	830.00	830.00
Pakistan	-	-	-	-	-	-	5,860.00	5,860.00
Qatar	-	-	-	-	-	-	830.00	830.00
Saudi Arabia	-	-	-	-	-	-	1,830.00	1,830.00
Senegal	-	-	-	1,788.33	2,010.00	2,010.00	2,010.00	7,818.33
Somali Republic	-	-	1,661.80 a/	1,661.80 a/	1,661.80 a/	1,661.80 a/	1,661.80 a/	8,309.00
Sudan	-	-	2,250.00	2,250.00	2,250.00	2,250.00	2,250.00	11,250.00
Syrian Arab Republic	-	-	-	-	2,010.00	2,010.00	2,010.00	6,030.00
Tunisia	-	-	-	-	-	-	1,990.00	1,990.00
Turkey	-	-	-	-	-	283.38	5,350.00	5,633.38
Uganda	-	-	-	-	1,650.00	1,650.00	1,650.00	4,950.00
United Arab Emirates	-	-	-	-	-	-	5,500.00	5,500.00
Yemen Arab Republic	-	-	-	-	-	-	(2,384.00)	(2,384.00)
Yemen, P.D.R.	240.00	120.00	120.00	120.00	120.00	120.00	120.00	960.00
Total	240.00	3,225.09	7,551.80	11,110.13	14,104.64	27,355.18	64,096.28	127,683.12

a/ Expressed in U.S. dollars at current (623) UN rate although legal contribution is assessed in Somalian Shillings as follows:

1977/78	S.S.	10,353.00
1978/79		10,353.00
1979/80		10,353.00
1980/81		10,353.00
1981/82		10,353.00
Total	S.S.	51,765.00

APPENDIX IX

INTERNATIONAL TRUST FUND T.F. 9161 - PROPOSED NEW SCALES OF CONTRIBUTIONS

Background

The Trust Fund was established in 1964 to supplement and coordinate national and regional programmes in Desert Locust control and research and to continue certain activities initiated under the United Nations Special Fund Desert Locust Project. The activities included support for the Desert Locust Information Service, research projects of international significance, the collection, exchange and dissemination of technical material, reports and publications, training courses, fellowships and scholarships, panels of experts, advisory visits and to provide a reserve fund to assist member governments and/or regional organizations for control measures. The proposed annual budget was US $ 100 000. This was approved but the total currently pledged has decreased to US $ 85 690, not all of which is received regularly.

Due to increased costs the Trust Fund cannot meet all its current objectives and it is now proposed to increase its budget. This paper describes the principles used in calculating the proposed new scale of contributions, as requested by the Twenty-Fourth Session of the FAO Desert Locust Control Committee.

General principles for calculating new scales of contributions

The scale of contributions to the Trust Fund to be paid by the member governments is based on the same principles as those adopted when the Trust Fund was established in 1964, namely:

- the frequency of Desert Locust infestations,
- the area of arable land and land under permanent crops vulnerable to damage,
- the capacity of a member government to pay.

As an indicator of the first, the average frequency of occurrence of swarms and hopper bands, extended to the 40-year period from 1939-1978 inclusive, has been used. For the second, the area of arable land and land under permanent cultivation has been taken from the 1979 FAO Production Yearbook. For the third, the quota of each member government's contribution to the United Nations for 1978-79 has been used. The scale thus worked out was finally adjusted to a maximum contribution of 10% from any one country as at present, with a further adjustment to a maximum of 5% for consideration.

The proposed annual budget was doubled, from US $ 100 000 to US $ 200 000.

Index of potential damage by the Desert Locust (see table 1)

Column A Number of years with swarms, 1939–1978
Column B Number of years with hopper bands, 1939–1978
Column C Mean number of years with swarms and hopper bands $\frac{A + B}{2}$
Column D Total area of arable land and land under permanent cultivation
Column E Percentage of arable land and land under permanent cultivation subject to potentially serious locust damage.

These data are based on records of infestations.

Calculation of index of potential damage by the Desert Locust

Column F Column C x Column D x Column E provides an index of the potential damage by the Desert Locust for each country for the period 1939–1978.

Column G The logarithm of the figure in Column F was taken as the actual index of exposure to damage. This totalled 6.27607 for all countries. This was then converted proportionately to a percentage, which is the Relative Log Exposure to Damage.

Capacity to pay

Column H The capacity of a member country to pay to the Trust Fund is taken to be proportional to its contribution to the United Nations. The actual percentage contributions to the UN total 3.15% of the total of all countries to the UN. The figure in column H represents the relative contribution to the UN of each contributor to the Trust Fund (UN contribution x 31.746, rounded to two demical places).

Scale of contribution

Having determined the Index of Potential Damage by the Desert Locust (Column G) and the Capacity to Pay (Column H) the scale of contribution was determined by giving equal weight to the two factors, so that Column I is obtained by taking the mean of Columns G and H. The scale thus calculated was finally adjusted to a maximum contribution of 10% for any one country, Columns J and K (as agreed in 1964). A further adjustment to a maximum of 5% for any one country is put forward for consideration (Columsn L + M).

Basic Data for Calculating Scale of Governmental Contribution to the International Trust Fund, TF 9161

Country	Locust Frequency 40 Years 1939-1978			Arable Land and Land under Permanent Crops		Exposure to Damage CxDxE	Relative Log Exposure $(F)^K$ (%)	Relative Quota for Contrib. to UN 1978-79 (%)	Scale of Contributions to International Trust Fund TF 9161				
	Swarms	Hopper Bands	Mean	Total area '000 ha	% subject to serious damage				1/2(G+H) %	I adjusted to maximum % for any one Country			
										10%	amount US$	5%	amount US$
	A	B	C	D	E	F	G	H	I	J	K	L	M
Afghanistan	13	11	12.0	8 050	30	28 980	2.36	0.32	1.34	1.38	2 760	1.56	3 120
Algeria	23	19	21.0	7 845	100	164 745	2.76	3.17	2.96	3.04	6 080	3.45	6 900
Bahrain	7	3	5.0	2	100	8	0.48	0.32	0.40	0.41	820	0.47	940
Benin	3	0	1.5	575	50	431	1.40	0.32	0.86	0.88	1 760	1.00	2 000
Cameroon	4	0	2.0	7 390	20	2 956	1.84	0.32	1.08	1.11	2 220	1.26	2 520
Central African Republic	6	0	3.0	2 910	30	2 619	1.81	0.32	1.07	1.10	2 200	1.25	2 500
Chad	21	12	16.5	1 950	100	32 175	2.39	0.32	1.35	1.39	2 780	1.57	3 140
Djibouti	20	10	15.0	1	100	15	0.62	0.32	0.47	0.48	960	0.55	1 100
Egypt	21	12	16.5	2 838	100	46 827	2.47	2.54	2.51	2.58	5 160	2.92	5 840
Ethiopia	32	34	33.0	13 730	90	407 781	2.97	0.32	1.64	1.68	3 360	1.91	3 820
Gambia	7	0	3.5	265	100	927	1.57	0.32	0.95	0.98	1 960	1.11	2 220
Ghana	3	0	1.5	2 720	30	1 224	1.64	0.63	1.13	1.16	2 320	1.32	2 640
Guinea	7	0	3.5	4 170	40	5 838	1.99	0.32	1.16	1.19	2 380	1.35	2 700
India	29	27	28.0	168 500	20	943 600	3.16	21.58	12.37	10.00	20 000	5.00	10 000
Iran	28	20	24.0	15 950	80	306 240	2.91	12.69	7.80	8.01	16 020	5.00	10 000
Iraq	16	15	15.5	5 395	90	75 260	2.58	2.54	2.56	2.63	5 260	2.98	5 960
Israel	14	12	13.0	413	100	5 369	1.97	7.30	4.63	4.76	9 520	5.00	10 000
Ivory Coast	4	0	2.0	3 800	40	3 040	1.84	0.63	1.24	1.27	2 540	1.44	2 880
Jordan	18	15	16.5	1 370	100	22 605	2.31	0.32	1.31	1.35	2 700	1.53	3 060
Kenya	19	16	17.5	2 270	100	39 725	2.44	0.32	1.38	1.42	2 840	1.61	3 220
Kuwait	17	16	16.5	1	100	16	0.64	4.76	2.70	2.77	5 540	3.14	6 280
Lebanon	4	1	2.5	348	70	609	1.47	0.95	1.21	1.24	2 480	1.41	2 820
Libya	18	12	15.0	2 564	100	38 460	2.43	5.08	3.76	3.86	7 720	4.38	8 760
Mali	21	18	19.5	2 050	100	39 975	2.44	0.32	1.38	1.42	2 840	1.61	3 220
Mauritania	25	20	22.5	195	100	4 387	1.93	0.32	1.12	1.15	2 300	1.30	2 600

Country	A	B	C	D	E	F	G	H	I	J	K	L	M
Morocco	26	18	22.0	7 868	100	173 096	2.77	1.58	2.18	2.24	4 480	2.54	5 080
Nepal	2	0	1.0	2 319	10	232	1.25	0.32	0.78	0.80	1 600	0.91	1 820
Niger	24	20	22.0	3 112	100	68 464	2.56	0.32	1.44	1.48	2 960	1.68	3 360
Nigeria	14	3	8.5	23 990	60	122 349	2.69	4.12	3.41	3.50	7 000	3.97	7 940
Oman	24	15	19.5	36	50	351	1.35	0.32	0.83	0.85	1 700	0.97	1 940
Pakistan	33	31	32.0	19 990	90	575 712	3.05	2.22	2.64	2.71	5 420	3.07	6 140
Portugal (Madeira)	1	0	0.5	100	100	50	0.90	0.32	0.61	0.63	1 260	0.71	1 420
Qatar	7	3	5.0	2	100	10	0.53	0.63	0.58	0.60	1 200	0.67	1 340
Saudi Arabia	31	30	30.5	1 105	100	33 702	2.40	7.30	4.85	4.98	9 960	5.00	10 000
Senegal	16	9	12.5	2 404	100	30 050	2.37	0.32	1.34	1.38	2 760	1.56	3 120
Sierra Leone	4	0	2.0	566	50	566	1.46	0.32	0.89	0.91	1 820	1.04	2 080
Somalia	27	26	26.5	1 066	100	28 249	2.36	0.32	1.34	1.38	2 760	1.56	3 120
Spain	3	1	2.0	250	20	100	1.06	0.32	0.69	0.71	1 420	0.80	1 600
Sudan	31	32	31.5	7 515	60	142 033	2.73	0.32	1.53	1.57	3 140	1.78	3 560
Syria	12	10	11.0	5 588	100	61 468	2.54	0.63	1.58	1.62	3 240	1.84	3 680
Tanzania	11	8	9.5	5 140	80	39 064	2.43	0.32	1.38	1.42	2 840	1.61	3 220
Togo	1	0	0.5	1 420	50	355	1.35	0.32	0.83	0.85	1 700	0.97	1 940
Tunisia	13	11	12.0	4 415	100	52 980	2.50	0.63	1.57	1.61	3 220	1.83	3 660
Turkey	7	4	5.5	28 045	25	38 562	2.43	9.52	5.97	6.13	12 260	5.00	10 000
Uganda	11	4	7.5	5 610	50	21 037	2.29	0.32	1.31	1.35	2 700	1.53	3 060
United Arab Emirates	22	13	17.5	12	50	105	1.07	2.22	1.64	1.68	3 360	1.91	3 820
Upper Volta	6	0	3.0	5 633	100	16 899	2.24	0.32	1.28	1.31	2 620	1.49	2 980
Western Sahara	20	11	15.5	2	100	31	0.79	-	0.40	0.41	820	0.47	940
Yemen, Arab Rep.	26	20	23.0	1 570	100	36 110	2.41	0.32	1.36	1.40	2 800	1.58	3 160
Yemen, P.D.R.	29	26	27.5	265	100	7 287	2.05	0.32	1.19	1.22	2 440	1.39	2 780
TOTALS							100.00	100.00	100.00	100.00	200 000	100.00	200 000

APPENDIX X

STATUS OF VARIOUS DESERT LOCUST REGIONAL ORGANIZATIONS AND COMMISSIONS

Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia

1. The annual session of the Commission could not be held in 1979. The fourteenth session was held in Rome, Italy from 10 to 14 November 1980.

The Commission:

(a) reviewed the locust situation and the anti-locust measures undertaken in the Region during 1978-80;

(b) appreciated the joint meetings held between the Indian and Pakistani Locust Officers at the border and recommended that these should be continued in future, particularly during the summer breeding season;

(c) reviewed the survey and control potential available in the member countries;

(d) highly appreciated the action of the Government of Pakistan in strengthening the ground locust organization by sanctioning 195 additional technical posts which would enhance the ground capabilities of the national organization ;

(e) noted with great interest the achievements of the remote sensing applications to Desert Locust survey and control so far obtained in the Region and expressed its appreciation to FAO for the work undertaken;

(f) emphasized the need to undertake research programmes aimed at finding the most economical means of control;

(g) agreed that short-term fellowships be given priority and could be continued, particularly taking advantage of the courses organized in India and Pakistan for locust officers;

(h) appreciated the radio training courses held in India and Pakistan;

(i) agreed that exchange visits for senior officers could be arranged to permit such staff to acquaint themselves with locust research and control centres and organizations in other countries or regions;

(j) reviewed and approved the budget for 1978 and 1979 and adopted the budget for 1980/81.

It was proposed that the Fifteenth Session of the Commission be convened in 1982.

Commission for Controlling the Desert Locust in the Near East

2. The Twelfth Session of the Commission was held in Rome, Italy from 7-11 September 1981.

The Commission:

(a) decided that no special surveys be undertaken at the expense of TF 9409 due to the presence of adequate national locust units in the Region;

(b) appreciated the efforts made by Saudi Arabia, Yemen Arab Republic and People's Democratic Republic in strengthening their control units;

(c) agreed to organize a regional training course on locust control in 1982;

(d) agreed to strengthen further the research facilities at Dokki Research Station, Egypt, and to allocate $5,000 from the regional Trust Fund for this purpose;

(e) agreed to provide assistance to the People's Democratic Republic of Yemen to the value of US$20,000 in 1982;

(f) adopted a new programme of work and budget for 1983-87;

(g) decided not to establish an aerial spraying unit belonging to the Commission;

(h) agreed to keep unchanged the present status of the Commission.

The next session will be held in 1982.

Commission for Controlling the Desert Locust in North-West Africa

3. The Tenth Session of the Commission was held in Algiers, Algeria from [illegible] March 1981.

The Commission:

(a) reviewed the Desert Locust situation and noted with concern the [illegible] of populations in the south;

(b) reviewed the survey and control potential available in the member countries and expressed concern about the shortage of insecticides in the [illegible];

(c) expressed the need for training medium-level staff;

(d) recommended the preparation of a vegetation handbook in relation to locust ecology;

(e) recommended the continuation of remote sensing applications in the Region and the strengthening of the meteorological network;

(f) approved the 1980 budget and programme of work for 1981 and requested FAO to prepare a study on an eventual increase in the budget of the regional Trust Fund;

(g) recommended the organization of a joint survey with OCLALAV in October 1981.

The next session of the Commission will be held in Tripoli, Libya in May/June 1982.

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

4. The Administrative Council of OCLALAV took place in Nouakchott, Mauritania on 16-18 July 1981.

The Council:

(a) recommended strict vigilance in order to avoid the development of an upsurge in the Mali-Niger area;

(b) considered that grasshopper control should be principally the responsibility of national plant protection services and requested the preparation of a project document on grasshopper research to be submitted for **external** assistance;

(c) expressed satisfaction with the UNDP/FAO projects on the Desert Locust and grain-eating birds and the hope that foreign assistance could continue;

(d) expressed concern about the financial situation of the organization;

(e) adopted the budget for 1981/82 amounting to 540 million CFA;

(f) studied the last findings/proposals of the ad hoc Committee on the merger of OICMA and OCLALAV.

The next meeting of the Council will be held in Ouagadougou, Upper Volta in June 1982.

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

5. The 26th regular session of the DLCO-EA Council of Ministers took place in Mbale, Uganda on 12-13 May 1981.

The Council:

(a) reviewed the Desert Locust situation in the region;

(b) approved the programme of work and adopted the budget for 1981/82 amounting to $ 3.8 million;

(c) expressed concern about the financial situation; arrears now amounted to $2.3 million;

(d) expressed satisfaction with the execution of operations against other pests in the Region;

(e) requested FAO and ODA to support DLCO-EA's request to the EEC for assistance;

(f) reqested FAO to approve an extension for a further year of the Regional Armyworm Forecasting Officer's post.

The next meeting of the Council will be held in April 1982.

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

6. The Governing Council held its 11th Session at Lilongwe, Malawi from 12-14 August 1981.

The Council:

(a) agreed to admit Zimbabwe as a new member of the Organisation and the establishment of a locust unit at Salisbury to deal with all migratory locusts;

(b) agreed to create an aircraft renewal fund and to arrange for buying a new helicopter;

(c) requested FAO to support IRLCO-CSA's application to the EEC for assistance;

(d) increased salaries by 10% with effect from January 1982;

(e) supported FAO's proposal for a regional radio network and a regional armyworm reporting and forecasting service in the region;

(f) approved the programme of work for 1982 with a budget of 599 000 Kwashas;

(g) agreed that the functions of IRLCO-CSA should be expanded to include other migratory pests.

The next session of the Council will be held in Gaborone, Botswana, in August 1982.

International African Migratory Locust Organization (OICMA)

7. The 19th annual session of the Administrative Council was held in Freetown (Sierra Leone) from 28 to 30 September 1981.

The Council:

(b) reviewed the African Migratory Locust situation in the Mali and Lake Chad basin outbreak areas;

(b) insisted on the need to establish national anti-locust survey and control teams;

(c) thanked the international community for the assistance provided and requested the extension of the UNDP/FAO research project in the Lake Chad basin;

(d) approved a budget of F CFA 173 900 000 for the year 1982-83;

(e) deplored the financial situation of the Organization, which has never been so grave in the past. Contributions paid in 1981 only covered 40 % of the budget. Insecticides available can only treat 30 000 hectares;

(f) studied the problem of the merger with OCLALAV and expressed its wish to hold a third meeting of the joint OCLALAV and OICMA Councils before the end of March 1982;

(g) recommended that the mandate of the DLCC be extended to include Locusta;

(h) decided to take the necessary action to create the necessary infrastructure for anti-locust survey and control in Angola.

The next session of the Council will be held in Luanda (Angola) or Banjul (Gambia) in July 1982.

APPENDIX XI

TERMS OF REFERENCE OF FAO DESERT LOCUST CONTROL COMMITTEE

Background

The Director-General established the FAO Desert Locust Control Committee (DLCC) in January 1955 in accordance with the recommendations of a Working Party on Desert Locust Control held in Rome in September 1954 as an expansion of the previous Coordinating Committee for the Control of the Desert Locust in the Arabian peninsula. Its establishment was commended and formally approved by the 8th Session of the Conference in November 1955 when its terms of reference were defined as follows:

(a) to keep the Desert Locust situation under review;

(b) to coordinate Desert Locust control campaigns in the Arabian peninsula;

(c) to coordinate Desert Locust control campaigns elsewhere in the Desert Locust invasion area, as required;

(d) to promote the coordination of national and international policies for preventive action against the Desert Locust.

The membership of this Committee was defined by the Conference as "Representatives of all countries affected by the Desert Locust and of those participating materially in international campaigns to control the Desert Locust". Current membership is shown at Appendix A.

The Committee reports to the Director-General.

In addition to the DLCC, the FAO Technical Advisory Committee had been established in 1951 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 and to serve as an expert advisory body in relation to the implementation of the UNDP/SF Assisted Desert Locust Project.

In view of the concern which had been expressed over the multiplicity of regional bodies, especially those dealing with Desert Locust control, at the Eighth FAO Regional Conference for the Near East (Khartoum, 24 January - 2 February 1967), the DLCC at its Eleventh Session (Rome, 25-28 September 1967) examined the question and expressed the view that the FAO Technical Advisory Committee on Desert Locust Control should be dissolved and that the terms of reference of the FAO DLCC should be appropriately amended.

At its Fifty-First Session, the Council of FAO (1968, Resolution 3/51) amended the terms of reference of the FAO DLCC to read as follows:

(i) keeping the desert locust situation under review;

(ii) coordinating the desert locust control campaign in the Arabian peninsula and the other affected areas;

(iii) promoting the overall coordination of the work of various national and regional anti-locust organizations and commissions;

(iv) promoting the coordination of national and international policies toward preventive measures of desert locust control and research;

(v) providing 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;

(vi) giving general policy guidance and providing technical advice to the Director-General on, and review of, the programme of work financed under the UNDP(SF) Assisted Desert Locust Project and under the International Desert Locust Trust Fund No. 161 (now 9161), and reviewing the annual budget and financial reports relating to the work performed under the above-mentioned project and Trust Fund.

Current position

There having been no further amendments since the adoption of Resolution 3/51, the existing terms of reference of the DLCC are those adopted in 1968. Although these terms of reference refer specifically only to the Desert Locust, FAO through its Locusts, Other Migratory Pests and Emergency Operations Group at Headquarters and its Regional and National Locust Officers in the field devotes very considerable efforts to assisting organizations concerned with other migratory locust species such as the African Migratory Locust (OICMA, Appendix B) and the Red Locust (IRLCO-CSA, Appendix C) and to other migratory pests such as grain-eating birds and armyworms. In addition, representatives of these organizations and the two regional organizations concerned with the Desert Locust, DLCO-EA and OCLALAV, are invited to attend the DLCC as observers.

At the Twenty-Fourth Session of the DLCC (Rome, November 1980) a number of delegates drew attention to the fact that the mandate of the DLCC is limited to the Desert Locust, and it was recommended that FAO study as a matter of urgency the possible extension of the mandate of the DLCC to other migratory pests and at least other migratory locusts and that appropriate suggestions/proposals be submitted to the next session of the DLCC.

Implications of modifying the terms of reference of the DLCC

It is now widely recognised that many pests are migratory and include many species of aphids, plant-hoppers, moths, beetles and representatives of other major insect groups as well as locusts and grasshoppers. It is also probable that when more is known about certain pests they will also be found to be migrants although they are not now regarded as such. Thus to extend the terms of reference of the DLCC to all migratory pests would be to include a large number of more or less unrelated species, the control of which requires many different strategies and tactics. No justification for such an extension can be seen.

An alternative would be to include all migratory locusts, i.e. the African Migratory Locust, the Moroccan Locust, the Malagasy Migratory Locust, the Oriental Migratory Locust,

the Red Locust, the Central American Locust and the South American Locust. This would mean that the DLCC would be dealing with the same sort of problems as it does now but with a much wider geographical spread. It would however mean considerably expanding the membership of the DLCC to include:

for the	African Migratory Locust	Angola, Congo, Zaire
" "	Malagasy " "	Madagascar
" "	Oriental " "	China, Malaysia, Philippines, Thailand
" "	Red Locust	Botswana, Burundi, Lesotho, Malawi, Swaziland, Zambia, Zimbabwe
" "	Central American Locust	Belize, Costa Rica, Guatemala, Honduras, Mexico, Panama, El Salvador
" "	South American Locust	Argentina, Brazil, Chile, Paraguay, Uruguay

A third proposal would be to extend the terms of reference to include only migratory locusts in Africa, the Near East and South-West Asia.

Considering the third proposal there appear to be no advantages and several disadvantages.

1. Countries which would become eligible for membership of the DLCC are already members of the appropriate regional organizations, each of which holds Council, Executive Committee and Technical meetings at which all locust matters affecting the various member governments are discussed. Further discussion of such matters at the DLCC would represent a duplication of time and effort as regards preparation of working papers and other documentation and of no additional benefit to the member governments of OICMA and IRLCO-CSA. Such discussion would, moreover, be of little or no relevance to the 28 existing member governments of the DLCC (out of 45 affected countries) who are not members of OICMA or IRLCO-CSA.

2. The size, duration and therefore expense of holding DLCC sessions would be substantially increased due to the necessity of recruiting more interpreters, preparation of more working papers requiring translation and preparation of more copies of the Final Report of each session.

3. International Trust Fund 9161 was created to finance certain continuing aspects of the UNSF Desert Locust Project. It is administered by the Director-General who, in that capacity, consults the DLCC for guidance on general policy and technical advice. It is the means by which many permanent activities recommended by the DLCC are funded. If the ITF 9161 were to be expanded to include activities against other migratory locust species its budget would have to be increased substantially beyond that proposed at the 24th Session of the DLCC. New criteria for assessing the scale of contributions would have to be established.

4. FAO, through its small headquarters unit, already coordinates assistance to OICMA and IRLCO-CSA provided by UNDP, TCP and the international community, and it also coordinates assistance to governments and regional organizations concerned with certain other migratory pests e.g. African armyworm and Quelea quelea which are outside the scope of the DLCC.

5. It is also pertinent to note that the UNDP/FAO Action Programme for Improved Plant Protection seeks to plan and develop a comprehensive and sustained effort to devise long-term approaches on the part of various international bodies, donor countries and organizations and the developing countries. Coordination between the Locust Group at Headquarters and the Action Programme is very close and the Action Programme Secretariat acts as the channel through which donor support for strengthening anti-locust activities not covered by existing trust fund or bilateral assistance is explored. Activities under the Action Programme already under way include funding for a Regional Locust and Plant Protection Officer for Eastern and Southern Africa, temporary funding for a Regional Armyworm Forecasting Officer and funding

for Phase II of the Remote Sensing applications project, which is now being extended to testing techniques developed for desert locust breeding habitats to identification of nesting and roosting sites of Quelea quelea and armyworm breeding areas.

Finally, article (iii) of the present terms of reference of the DLCC includes "promoting the overall coordination of the work of various national and regional anti-locust organizations and commissions" so that provision already exists for discussion about other species should the need exist.

Recommendation to the DLCC

It is therefore recommended that, in order to avoid duplication, to conserve resources and to allow adequate discussion on the one species of migratory locust which is inter-regional continuously, the terms of reference of the FAO Desert Locust Control Committee remain as at present. If this recommendation is accepted by the DLCC no further action is required.

Appendix A

MEMBERSHIP OF THE FAO DESERT LOCUST CONTROL COMMITTEE

Afghanistan
Algeria
Bahrain
*Benin
*Cameroon
Central African Republic
*Chad
+Djibouti
Egypt
+Ethiopia
France
*Gambia
Ghana
Guinea
India
Iran
Iraq
Israel
*Ivory Coast
Jordan
+Kenya
Kuwait
Lebanon
Libya
*Mali
*Mauritania
Morocco
*Niger
Nigeria
Oman
Pakistan
Portugal
Qatar
Saudi Arabia
*Senegal
Sierra Leone
+Somalia
Spain
+Sudan
Syria
+Tanzania
Togo
Tunisia
Turkey
+Uganda
United Arab Emirates
United Kingdom
United States of America
*Upper Volta
Yemen Arab Republic
Yemen, People's Democratic Republic of

* member of OCLALAV
+ member of DLCO-EA

Appendix B

MEMBERSHIP OF THE ORGANISATION INTERNATIONALE CONTRE LE CRIQUET MIGRATEUR AFRICAIN (OICMA)

Angola
Cameroon
Central African Republic
Chad
Congo
Gambia
Ghana
Ivory Coast
Mali
Mauritania
Niger
Nigeria
Senegal
Sierra Leone
Togo
Uganda
Upper Volta
Zaire

Appendix C

MEMBERSHIP OF THE INTERNATIONAL RED LOCUST CONTROL ORGANISATION FOR CENTRAL AND SOUTHERN AFRICA (IRLCO-CSA)

Botswana
Kenya
Lesotho
Malawi
Mozambique
Swaziland
Tanzania
Uganda
Zambia
Zimbabwe