

1985/11/3

# REPORT OF THE

## SIXTEENTH SESSION OF THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE EASTERN REGION OF ITS DISTRIBUTION AREA IN SOUTHWEST ASIA

New Delhi  
2-5 December 1985

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Meeting Report  
No. AGP/1985/M/3

R E P O R T O F T H E

SIXTEENTH SESSION OF THE COMMISSION FOR  
CONTROLLING THE DESERT LOCUST IN THE  
EASTERN REGION OF ITS DISTRIBUTION AREA  
IN SOUTH-WEST ASIA

held in  
New Delhi, India

2 - 5 December 1985

Plant Production and Protection Division  
Food and Agriculture Organization of the United Nations  
Rome, 1986



## INTRODUCTION

The Fifteenth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia, which was held in Rome on 21-24 March 1983, recommended that the next Session should be held preferably in India or Pakistan.

At the kind invitation of the Government of India, the Director-General of the Food and Agriculture Organization of the United Nations convened the Sixteenth Session of the Commission in New Delhi from 2-5 December 1985. He invited the Member Governments of the Commission; Afghanistan, India, Iran and Pakistan, to be represented by delegates.

Following a welcoming address by Shri M. Subramanian, Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, Ministry of Agriculture, the Session was inaugurated by Sardar Buta Singh, Honourable Minister of Agriculture, who welcomed the delegates on behalf of the Government and stated that agriculture is the backbone of all four Member countries where considerable progress has been made in the last two decades in the sphere of agricultural development. Continued concerted action is needed to prevent upsurges of the Desert Locust which was one of the threats to agricultural development and fortunately this has been the case since 1951 under the auspices of FAO. The Minister described the efforts of India in the field of locust control and research since 1930. He particularly noted the marked change in intensity and pattern of locust infestations since the early 1960's which has changed from extended plague periods with brief intervals of recession to an extended period of recession with only brief plague upsurges. He congratulated FAO for evolving an effective long-term plague prevention strategy and the Governments concerned for its implementation through excellent collaborative efforts. He emphasized the necessity of keeping constant vigilance and of refining the present strategy so that frequency and duration of chemical control operations are reduced to the minimum. This would require the establishment/strengthening of Remote Sensing Programmes in the Region.

On behalf of the Director-General of FAO, the FAO Representative in India thanked the Government for its kind invitation, reiterated the importance of the Region during recession and plague periods and reconfirmed the high priority FAO has continued to give to locust control since 1951. He also recognized the achievements of the Governments and the successful cooperation in their efforts to combat the locust menace. After 35 years of experience, FAO has come to the conclusion that apart from regional and international cooperation, there remains a constant need for strong locust control organisations/plant protection services at the national level.

Officers of the Session:

The following officers were elected-

Chairman ... Dr. R.L.Rajak, India

Vice-Chairman ... Mr. Ziauddin Nassery, Afghanistan

The work of preparing the draft report was entrusted to Dr. Satish Chandra (India) and Dr. R. Skaf, FAO Technical Secretary.

Acknowledgements:

The delegates expressed their appreciation and gratitude to the Chairman, Dr. R. L. Rajak for the way in which he conducted the deliberations, which encouraged full and frank discussions. They thanked the FAO Secretary for his services to the Commission and the Government of India for its warm welcome and hospitality and for the excellent arrangements made to ensure the success of the session.

PARTICIPANTS IN THE SESSION

The following delegates from the Member Countries of the Commission and FAO staff participated in the Session and contributed to the discussions summarized in the report.

Delegates from Member countries:

Afghanistan

Mr. Ziauddin Nassery, Counsellor, Embassy of Democratic Republic of Afghanistan, New Delhi

India

Dr. R. L. Rajak, Plant Protection Adviser to the Government of India & Director (Locust Control)

Dr. Satish Chandra, Assistant Director (Locust Control)

Mr. Harish Chandra, Deputy Locust Entomologist, F.S.I.L., Bikaner

Mr. V.K.Yadva, Deputy Locust Entomologist, Locust Warning Organisation, Jodhpur

Iran

Mr. B. Behrooz, Attache, Embassy of the Islamic Republic of Iran, New Delhi

Pakistan

Mr. Fariduddin Ahmed, Plant Protection Adviser and Director, Karachi



FAO

Dr. R. Skaf, Senior Officer,  
Locusts, Other Migratory Pests and Emergency Operations, AGPP, Rome.

AGENDA

1. Opening of the Session.
2. Election of the Chairman and Vice-Chairman of the Commission.
3. Adoption of the Agenda.
4. Election of the Drafting Committee.
5. The Desert Locust situation during 1983/85 and forecast.
6. Review of the Desert Locust survey and control Activities carried out by the Member countries during 1983-85.
7. FAO assistance to the Member countries during 1983-85.
8. Anti-locust survey and control potential available in the Member countries of the Commission.
9. (a) Coordination of Desert Locust research in the Region.  
(b) Training and fellowships.
10. (a) Review of remote sensing applications to Desert Locust Survey and Control & preparation of ecological maps.  
(b) Desert Locust habitat mapping.
11. Accounts for 1983-85 and programme of work and budget for 1986-87.
12. Seat of the Commission.
13. Election of the Chairman and Vice-Chairman of the Executive Committee.
14. Any other business.
15. Date and place of the next Session.
16. Adoption of the Report.

SUMMARY OF DISCUSSIONS

The Desert Locust Situation during 1983-85 and Forecast for early 1986

General situation

1. The period was marked by an important seasonal upsurge in the summer breeding areas in India and Pakistan during 1983. Intensive ground and aerial control measures eventually terminated the infestations and the situation was calm in the Region during 1984 and 1985. In other Regions population levels have remained generally very low although some small scale control has been necessary in Ethiopia, Saudi Arabia and Mauritania during 1985.

Situation in South-West Asia

2. Only small numbers of adults over-wintered in the summer breeding areas during the winter of 1982-83. In the winter-spring breeding areas of Baluchistan (Pakistan) there was widespread heavy rain in February 1983 and again in the first half of April. Breeding commenced in February in Pasni, Khara and Gwadar areas, necessitating strip spraying of dieldrin in four localities and continued up to April. Considerable numbers of adults were produced and these started to reach the summer breeding areas in late April, maximum densities increasing from 925 per square kilometre in April to 5625 in June. There were widespread moderate pre-monsoon rains in the summer breeding area during April; Bikaner recording 64.1 mm, Sikar 56.1 mm, Ganganagar 86.1 mm, Jodhpur 37.0 mm and Jaisalmer 12.4 mm. There were further pre-monsoon rains in late May and late June. Breeding commenced in Jaisalmer district during May and continued in June.

3. Meanwhile, in Eastern Arabia winter breeding was reported in the United Arab Emirates, where there were widespread rains in February. Evidently there was further breeding in March-May for in late May an immature swarm was reported at Idhan. This was partially controlled and split up. Groups were reported in late May and June. Escapes from these operations and probably some other unreported populations apparently moved east into the Indo-Pakistan summer breeding areas in view of the widespread occurrence of scattered populations in July, and the arrival of swarms in Lasbela in late July and early August.

4. The summer breeding areas of Pakistan and India received widespread heavy rain in July 1983 and there were further good rains in August and September. The low density adult populations continued to increase during July when maximum densities reached 14550 per square kilometre in Pakistan and "Countless", i.e. over 20000 per square kilometre, in India and breeding became widespread, necessitating ground control measures in Jaisalmer and Bikaner districts in India and the Tharparkar and Nara desert in Pakistan.

5. In Lasbela district a 4 square kilometre mature swarm arrived on 30 July 1983 and three more swarms arrived in early August. Although ground control measures were immediately instituted, laying occurred and hatching took place from 12 August until the end of the month. Over 2,300 concentrations of first and second instar hoppers were subsequently controlled.



6. Further east, the hoppers were forming into groups and, despite intensive control measures, swarms started to appear from late August 1983 in Jaisalmer and Barmer districts of Rajasthan and Kutch district of Gujarat in India, and in Tharparkar, Nara and Cholistan deserts of Pakistan. Altogether there were 54 reports of mature swarms between 31 August and 26 September. All were sprayed by aircraft or ground teams but there was widespread laying. Intensive control operations continued in September and October against this third generation of breeding; 13.164 first to fifth instar bands being destroyed by ground and aerial operations and 895 square kilometres being strip-sprayed in Pakistan alone. Hopper/fledgling concentrations were destroyed in a total of 98 villages in Rajasthan (India). However, commencing on 14 October a new generation of swarms started to form and there were 69 reports of immature swarms up to 12 November when the last swarm was finally controlled. However, one small swarm reported from the United Arab Emirates probably represented escapes from the Indo-Pakistan breeding.

7. The monsoon rains finished in late September and there was no further breeding. Adult numbers rapidly declined and only small numbers of adults over-wintered in 1983-84.

8. In spring 1984 there was very small scale solitary breeding in Baluchistan (Pakistan) and preventive control was undertaken in only one locality.

9. Only small numbers of adults were reported from the summer breeding areas in 1984 and green hoppers were reported from two localities in Jaisalmer and Bikaner districts in Rajasthan.

10. There were again very few adults over-wintering in the summer breeding areas during the winter of 1984-85.

11. No breeding was reported in 1985 in the spring breeding zone.

12. Only small numbers of adults were present in the summer breeding areas in the summer of 1985 and only very limited solitary breeding was reported from a few localities of Rajasthan.

13. There were no reports of Desert Locusts from Iran or Afghanistan during the period.

#### Forecast for early 1986

14. The overall Desert Locust situation is calm. Numbers were probably lower in 1984 than in any year since systematic reports have been kept. There were more locusts in the Central and Western Regions in 1985 and control has been undertaken in Saudi Arabia, Ethiopia and Mauritania.

15. Early winter rainfall has been good in western Arabia and there is a possibility that some adults may reach South-West Asia from the west from late March. Depending upon the completeness of control measures in Arabia these could include some groups but probably not swarms.



16. Spring breeding may occur in Baluchistan but only on a small scale if there is no invasion from the west. Therefore only small numbers of adults may reach the summer breeding areas if populations from the West do not add to the numbers during spring-early summer of 1986.

17. The Commission concluded that the important locust events in 1983 in the Indo-Pakistan areas justify continuous alertness and vigilance and the necessity not only of monitoring local populations but also of following carefully the locust situation in the Arabian Peninsula where heavy rains have occurred in date 1985.

A review of Desert Locust survey and control activities carried out by the Member countries during 1983-85

INDIA:

18. Constant surveillance on the locust activities was maintained in the entire Scheduled Desert Area of India spread over 200,000 square kilometres in parts of Rajasthan, Gujarat and Haryana. Regular surveys at the rate of 4 to 5 per week as per schedule were carried out around each of the 34 locust outposts situated in the desert area. These were supplemented by cross-country tours, aerial reconnaissance, special border surveys and special random surveys of relatively more vulnerable areas. It is proposed to improve locust surveillance by making operational use of satellite data in future.

During summer-autumn 1983, a serious locust situation developed in Barmer and Jaisalmer districts of Rajasthan and Kutch (Bhuj) district of Gujarat necessitating control operations. 31 small to medium sized locust swarms were controlled by mounting operations both from ground and air. Besides, hopper and fledgling concentrations were controlled in 98 villages of Barmer, Jaisalmer, Bikaner and Jodhpur districts of Rajasthan. A total of 120325 kg of BHC 10% dust and 22625 litres of liquid insecticides, viz., Aldrin, Dieldrin, Malathion and Lindane were consumed during the operations.

PAKISTAN:

19. Locust surveillance was maintained in the winter-spring and summer breeding areas on a regular basis. In the summer of 1983, control operations by ground as well as by air against locust swarms/swarmlets and hopper bands/concentrations of various sizes were undertaken in Lasbela, Tharparkar, Nara and Cholistan deserts. In Lasbela district 4 swarms/swarmlets and 2392 first and second instar hopper bands were destroyed by ground teams. An area of 30 square kilometres infested with hoppers was cleared.

In the other monsoon breeding deserts of Nara, Cholistan and Tharparkar, a total area of 3815 square kilometres was cleared by ground as well as by aerial spraying. As many as 92 swarms and 19,553 concentrations/bands of hoppers of all instar were destroyed between August and mid-November 1983.

About 124 tons of liquid insecticides (109 tons of Dieldrin 10% and 15 tons of Sumithion 90%) and 43 tons of BHC 12.5% dust were consumed in the campaign.



In the winter/spring season of 1984, solitary hoppers in an area of 1.5 square kilometres in Pasni and Kharan were cleared using 25 kg. BHC dust as a preventive measure towards the end of April.

20. Indo-Pakistan special border surveys in the remote border areas were conducted both by India and Pakistan in September-October during 1983-85.

21. The fifth Indo-Pakistan Bilateral meeting between Heads of Anti-Locust Organisations of India and Pakistan was held in New Delhi during October 1984. The Locust situation, inter-regional, as well as related bilateral issues, were reviewed. It was decided to continue the border meetings between field officers of India & Pakistan between June and November at monthly intervals. It was also recommended to continue the wireless linkage between Jodhpur and Karachi during the locust season between June and November.

22. Table 1 shows the insecticides applied by country, month and year between 1 January 1983 and 31 October 1985.

Table 1

Country Locality	Month Year	Type of Infestation	Infested area (km)	Insecticides applied 1/kg	Method of application
<u>Pakistan</u> Gwadar	March- April, 1983	Hoppers	61	262 10% Dieldrin	ENS
Lasbela	July- August, 1983	Swarms, Hopper bands	30	2000 10% Dieldrin 200 96% Fenitrothion	ENS
Tharparkar, Nara, Cholistan	August- November, 1983	Swarms, Hopper bands	3815	102575 10% Dieldrin 13846 96% Fenitrothion 26512 12.5% BHC 25	ENS AIR }
Kharan	May 1984	Hoppers	1.5	12% BHC	Dusting
<u>India</u>					
Jaisalmer, Barmer, Kutch, Pokaran, Kolayat Phalodi	July- October, 1983	Hopper groups, bands, swarms.	561	120325 BHC dust 22625 ltr. Liquid Insecticides	Ground, Air

OTHER MIGRATORY LOCUSTS :

23. The Commission was informed of the large scale campaign undertaken in Afghanistan in 1985 against the Moroccan Locust Doclostaurus maroccanus in northern areas. It is recommended that full information about this endemic species in Afghanistan and Iran be presented at the next session.

FAO assistance to Member countries during 1983-85

24. Continuing Survey Activities

The financial assistance provided to India and Pakistan for Locust Survey activities at the Indo-Pakistan border continued in 1983-85. The yearly contribution amounts to US\$ 5.000 for each country.

25. Remote Sensing Activities related to Locust Forecasting

During 1983 two remote sensing experts from FAO visited the Region to assess the remote sensing facilities and frame-work in the Region.

In addition, remote sensing data covering the area of South-West Asia was purchased as an input for an improved desert locust forecasting system. These remote sensing activities proved most useful for Locust forecasting.

The funds spent for that purpose, US\$ 11.000 will now be reimbursed to the Trust Fund of the Commission as a new project for remote sensing activities related to agriculture is now being implemented by FAO, from which the funds will be recovered.

It is anticipated that through this project remote sensing data and interpretation will be made available in the future for improved Locust forecasting.

26. Expert visits to the Region:

Mr. J. Roffey visited Karachi in 1983 to give lectures at the national training course.

Mr. R. Skaf, Senior Officer and G. Popov, ex-Secretary of the Commission visited Karachi for discussions at the Plant Protection Department (February 1984).

The FAO Regional Locust Officer, Mr. Khasawneh, stationed in Jeddah, Saudi Arabia, visited Karachi and New Delhi in 1984 to exchange views on Locust survey and control strategies.

Mr. Manikowski, Secretary of the Commission since 1984 and Migrant Pests Specialist from FAO HQ visited Teheran, Iran in October 1985 to assess training needs in the field of plant protection and, in particular, bird control.

Mr. Van Hamme, Synoptic Meteorologist, stationed at FAO HQ and paid from the Belgian financial Trust Fund project for meteorology applied to Desert Locust activities visited New Delhi, Bombay, Pune and Karachi to establish better meteorological data links.



27. Radio Communication Network in the Region

Assistance to India:

Following a request from the Government of India US\$ 5.600 were made available for installation of radios in two aircraft for locust survey and control purposes.

One (SUNAIR) A SB-500 radio-transceiver costing approximately \$ 30.000 was supplied to India in 1983.

Various radio spare parts were provided.

For the forthcoming radio training courses to be held in India during during 1986, 3 radio sets costing a total of \$ 10.000 and radio training material will be supplied.

Assistance to Pakistan:

Radio spares.

28. Supply and maintenance of vehicles:

Assistance to India:

Spare parts for Toyota and Holden.

Assistance to Pakistan:

Spare parts for Land Rovers in particular.

29 Supply of pesticides:

Assistance to Iran:

From the regional buffer stock of fenitrothion, positioned in Quetta, Pakistan, 20 tons of fenitrothion 96% were transported to Iran in 1983 at the request of the Government of Iran. The transport costs were met by the Trust Fund.

A further transfer of 22 tons of fenitrothion from FAO's stock of pesticides supplied to the Region during the 1978 Desert Locust upsurge is being effected from India to Iran. The FAO Representative's office in India has been requested to take care of this transfer to Bandar Abbas or Konapak in Iran.

Assistance to Pakistan:

Under the Japanese financial Trust Fund Project: GCP/RAF/189/JPN "Assistance for Locust Control" the Government of Pakistan received 10.000 litres of fenitrothion 1000 in 1985.

Assistance of this kind to the Region from this project can be envisaged in the following years when requested.

30. Supply of sprayers, laboratory equipment and documentation

Assistance to Iran:

Upon the Government's request various documentation related to Locust control was made available to Iran.

Four kits of the micronair sprayer were supplied in 1983-84.

Assistance to Pakistan:

Two Porta Pak Hudson sprayers were delivered in 1984 and laboratory equipment in 1983.

31. Training:

Various types of training were carried out during the last 3 years. Two long-term fellowships awarded to Afghanistan are now scheduled to terminate in February 1986. Some short-term training, exchange visits and participation at various special courses organized by FAO and other institutions related to desert Locust control were provided.

Details of the training arranged in the last three years are given in paragraphs 44-45.

It is envisaged that there will be further training along similar lines in the future.



Anti-Locust survey and control potential available  
in the Member countries of the Commission

32. The following is the latest information on antilocust survey and control potential in the Member countries of the Commission.

<u>Potential</u>	<u>India</u>	<u>Pakistan</u>	<u>Afghanistan</u>	<u>Iran</u>
<u>Insecticides (Tonnes/Litres x10<sup>3</sup>)</u>				
Dieldrin 18%, 20% sol.	54	125		
BHC technical 80%	35	-		
BHC liquid 15%	-	61		
BHC dust 10%	1200	-		
BHC dust 25%	-	191		215
BHC bait 1%	-	109		
Malathion ULV	9	-		
Fenitrothion 98% ULV	-	15		23.5
Others	5	-		
<u>Sprayers</u>				
Exhaust Nozzle	43	64	10	44
Manual	-	-	40	
Power	-	3	10	
<u>Dusters</u>				
Manual	7100	-	50	
Power	198	-	1	
<u>Vehicles</u>				
Light	99	97	4	120
Medium	8	24	2	
Heavy	8	6	4	
<u>Aircraft</u>				
Fixed wing	27	22		75
Helicopters	5	-		
<u>Radios</u>	54	36	10	10
<u>Staff</u>				
Technical	120	259	64	166
General	133		45	366

33. At the request of the Government of Iran 22 tonnes of Fenitrothion 96% available as international buffer stock in India are being sent to Iran. Costs of transport will be met by the Commission. The delegate of Iran expressed his thanks for this assistance.

34. Available stocks of pesticides in the Region were considered adequate at present to face recession situations, mainly to control hopper infestations. The Commission felt that the pesticides for controlling adults are not sufficient in India where only a limited amount of Malathion ULV is available and a minimum of 20,000 litres of Fenitrothion 96% needs to be procured for adult control.

35. The problem of vehicles was carefully reviewed. Most of them in both India and Pakistan are very old and in a very poor condition, and hence completely inadequate for locust survey and control in the desert areas. The Commission expressed its concern about this problem and urged Member countries to seriously consider replacement of vehicles on a regular basis. At the same time it requested FAO, in conformity with the policy established on the occasion of 1978 upsurge, to assist as soon as possible in undertaking a comprehensive on the spot study of the minimum potential requirements of Member countries of the Region in the field of locust control.

#### Desert Locust Research in the Region

36. Research work done on Desert Locust in India from April 1983 to November 1985 appears at Annex 1. It covered the following subjects:

- Improvement in Locust Survey Methods
- Insect/Plant relationship studies
- Behaviour Studies
- Parasite and Predator studies
- Light Trap studies
- Toxicological studies.

37. The Programme of work for 1985-86 also figures in Annex 1.

38. The Commission was of the opinion that nonchlorinated hydrocarbon insecticides need to be tested in large scale field operations against hoppers and adults in the Region. This would include promising carbamates like propoxur and synthetic pyrethroids like fenvalerate. Such studies should assess not only the efficiency but the cost of application per unit area in comparison with the present insecticides. FAO was requested to assist in the matter. The Commission reiterated its concern about the status of dieldrin for hopper control and strongly recommended its continued use until a suitable substitute is found.

39. The Commission considered that the power take-off ULV sprayer, which was demonstrated at the 12th Session of the Commission in March 1977 deserved further attention, in view of its development and possible use in the Region and elsewhere. It requested FAO to assist in further testing for this purpose.



40. The relationships between meteorological conditions and locust breeding and movements are well recognised. The network of rain gauges in the Indo-Pakistan area is adequate. FAO was requested to establish a list of the basic requirements needed for each locust observation station and to provide to member countries samples of standard equipment required.

41. The Commission welcomed the proposal to hold a Regional Seminar on Meteorology applied to desert locust reporting and forecasting, to take place in India during 1986. FAO was requested to explore sources of funding to finance the seminar with the assistance, if necessary, of the Regional Trust Fund.

42. Within the same approach the Commission recommended that meteorologists from member countries be invited to the next session of the Commission.

#### TRAINING AND FELLOWSHIPS:

43. Following the recommendations of the Fifteenth Session of the Commission concerning:

- high-level fellowships in developing countries,
  - continuation of refresher courses for locust officers,
- the following activities have been carried out.

#### 44. Fellowships

Afghanistan: Mr. Ghafar, M. Sc. in entomology/locust pest control from 15 November 1982 to 15 February 1986 at the Punjab Agricultural University, Ludhiana, India.

Mr. Ghorbandi, M.Sc. in entomology/locust pest control from 15 November 1982 to 15 February 1986 at the Punjab Agricultural University Ludhiana, India.

#### 45. Short-term training:

(a) Workshop on needs and constraints in plant protection in developing countries, Wageningen, Netherland 13-20 November 1983

Mr. Fariduddin Ahmed (Pakistan)

(b) Short Course on the Aerial Application of Pesticides Cranfield, U.K., 2 weeks September/October 1983, 1984, 1985.

Mr. Ghaisi (Afghanistan) in 1983)

Mr. N. Pathak (India) in 1983)

Mr. Bami (Iran) in 1983

Dr. D.R. Rajak (India) in 1984

Mr. D. Raina (India) in 1985

Mr. Khawaja (Pakistan) in 1985) and subsequent tour to CIBA-GEIGY in Switzerland, DLCO-EA in Nairobi and the International Locust Centre in Jeddah, Saudi Arabia.

Accounts for 1983-85 and programme of work and budget for 1986-87:

Budget for the five year period 1980-84

53. The budget for the five-year period 1980-84 has been closed and the actual expenditure for these years is shown in Annex III, together with provisional expenditure for 1985. The reserve fund on 31 October 1984 amounted to US\$ 187.918.

Expenditure Against the Budget in 1982, 1983, 1984 and 1985:

54. The last accounts reviewed by the Commission were for the years up to 1981. A breakdown of the expenditure of the following years, 1982-84, and estimated expenditure for 1985 are shown in Annex IV. The expenditure in 1983 exceeded the yearly budget by US\$ 41.457, which however was largely covered by the substantial reserve fund.

55. Expenses of US\$ 11.448 related to locust remote sensing activities and previously approved by the Commission in expectation of the approval of the Remote Sensing project will be reimbursed to the project as the Remote Sensing Project was approved in September 1985.

Budget for the five year period 1985-89:

56. The Commission recommended maintaining the annual budget and scale of contributions at their present levels, as established in 1964.

57. The budget for the period 1985-89 appears as Annex V and was proposed for the approval of the FAO Finance Commission.

Contribution to Trust Fund 9123 of the Commission:

58. The position as at 25 November 1985 is shown in Annex VI. The Commission requested early settlement of contributions by Member countries.

Seat of the Commission

59. The Commission recommended the retention of the Seat within the Region at par with similar arrangements in FAO Locust Commissions in other Regions and recommended that the earlier Status quo may be restored.

ELECTION OF THE CHAIRMAN AND VICE-CHAIRMAN OF THE EXECUTIVE COMMITTEE:

60. The Commission elected India as Chairman and Afghanistan as Vice-Chairman of the Executive Committee for 1985-87.

DATE AND PLACE OF THE NEXT SESSION:

61. The Commission recommended that the next session should be held in 1987 at a date to be decided by the Director-General of FAO. The Commission welcomed the invitation of the Government of Iran to hold the Session in Teheran.



- (c) International training course on Ground and Aerial Application for plant protection and biotechnical products, Switzerland, 1982 and 1983 (2 weeks).

Mr. Sadiq (Pakistan) in 1982  
Mr. H. Chandra (India) in 1983

- (d) Training course on Desert Locust Reporting and Forecasting FAO HQ, 28 October to 22 November 1985

Mr. Khurshid Anwer (Pakistan)  
Dr. Satish Chandra (India)

46. The Commission appreciated the training activities already undertaken and emphasised the priority for short-term training. National radio training courses will be encouraged and also exchange visits for senior officers within and outside the Region.

47. The need for national refresher courses in India and Pakistan in the field of locust control was recognised and FAO collaboration and assistance was requested.

Review of Remote Sensing applications to Desert Locust Survey, Control and preparation of ecological maps:

48. The Commission fully endorsed the FAO policy in the matter as explained at the Twenty-Seventh Session of the FAO Desert Locust Control Committee, Rome, 11-15 June 1984, aiming at establishing within 3 years an operational system suited for technical transfer to developing countries and the technical capacity of FAO for the operational acquisition, processing, analysis/interpretation of Meteosat and NOAA satellite data. This will also necessitate development of organisational structures for routine utilisation of satellite-derived information by FAO field programmes in locust control and other agricultural fields at inter-regional, regional and national levels.

49. The Commission was happy to learn from the FAO Secretary that a 3-year project entitled "Establishment of an operational Satellite Remote Sensing system to support agricultural production and desert locust monitoring and forecasting", has been approved by the Government of the Netherlands and became operational in September 1985. The project plan of work includes training activities from 1987 in all the regions covered by desert locust.

Desert Locust habitat mapping:

50. A review of activities undertaken in West Africa and South-West Arabia was presented and appears as Annex II.

51. Similar maps showing the frequency of breeding during the recession period, 1963-83, were prepared in both India and Pakistan. However, this work needs further elaboration and improvement in order to establish detailed habitat mapping.

52. The Commission requested FAO to provide the services of Mr. G. Popov in May-June 1986 to initiate this work in both India and Pakistan in collaboration with national locust specialists.



Summary of research work done on the Desert Locust,  
Schistocerca gregaria (F.), from April 1983 to November 1985

1. Improvement in Locust Survey methods

In order to improve the reliability of estimates of the density of low density populations, it is necessary to have accurate estimates of the swath width from which locusts are flushed during foot surveys under various conditions. Therefore a large number of field surveys were undertaken in the desert areas of Western Rajasthan and the actual distance at which locusts flushed when disturbed by surveyors was measured. Based on a total of 950 observations it was found that on average locusts flushed within a swath of 4.4 meters.

2. Insect-Plant relationship studies

Twenty one desert plants were screened for feeding preferences against different instar hoppers and adults of this insect. It was found that first instar hopper liked Dhakra, Bekri (Indigofera linifolia), Khejri (Prosopis spicigera), Bharut (Cenchrus barbatus), Phog (Calligonum polygonoides) and Chapra plants. There was sustained feeding on them. None of the plants screened were rejected altogether. Second instar hoppers nibbled all the plants offered but sustained feeding was only observed on Dhakra, Ghantil (Dactyloctenium scindicum), Lana (Haloxylon salicornicum), Sata (Trianthema portulacastrum), Khejri, Jal (Salvadora oleoides) and Bharut plants. Third instar hoppers preferred Booh (Aerva persica), Dhakra, Lana and Tumba (Citrullus colocynthis) plants. They nibbled all the plants screened for food preference. Fourth instar hoppers also did not reject any plant tested. They did, however, preferred Booh, Murrant (Panicum turgidum) Dhakra, Phel (Dipterygium glaucum), Bekar (Indigofera cordifolia), Motha, and Jal as against others. Fifth instar hoppers preferred Booh, Murrant, Dhakra, Bekri, Motha, Sata and Jal. The adults rejected Murrant but nibbling was observed on all other plants, particularly Tumba, Jal and Khejri.

3. Behaviour studies:

I. The response fo different instar hoppers to vegetation was studied under field conditions. Locust hoppers were starved for 12 hours and then released singly on bare ground two metres to the east of the vegetation.

It was observed that the hoppers of all instars crawled or hopped in the direction of the vegetation and covered the distance of two metres within a period ranging from 3 to 16 minutes at varying dry bulb ( $25^{\circ}$ - $35^{\circ}$ C) and soil temperatures ( $32^{\circ}$ - $58^{\circ}$ C). Relative humidity varied from 6.3% to 33%. It is suspected that the hungry hoppers sense the odour of vegetation and move upwind in that direction.

II. The roosting behaviour of fifth instar hoppers was studied during September 1983. The hoppers roosted on Phog, Phel, Booh, Lana, Khip (Leptadenia spartium), Ghantil, Moth and dry Booh in that order during the mid-day period.



In the early morning (0630 hours) most roosted on Phog plants. In the evening (1730 hours) hoppers roosted on Phog, Booh, Sahwan (Elionurus hirsutus), Khip and Lana. It is felt that while roosting for the night hoppers preferred tall and large vegetation as it affords protection to them from their natural enemies. The purpose of day roosting on a number of annual plants might be for feeding purposes.

III. Take-off activities of Desert Locust adults were studied during October 1983. For this purpose adults were starved for 12 hours. Then they were marked with paint and released in batches of 12 near Booh or Phog plants. It was seen that the Desert Locust took short flights (3 to 60 metres) when the air temperature ranged between 19.0 and 33.8°C and the relative humidity ranged between 31 and 74%. The longest flight of 60 metres was observed when the air temperature was 20°C and the relative humidity was 74%. Some adults took to flight immediately after their release but some did not fly until an hour after their release (at 33°C and 33%).

#### 4. Parasite and Predator studies:

Parasites - The following parasites were recorded:

- (i) Aspergillus nigricana
- (ii) Pseudomonas aeruginosa
- (iii) Charltonia sp.

Predators -

(i) Desert Monitor. The desert monitor feeds on grasshopper, beetles and Uromastix in captivity. They prefer Uromastix over other animal foods.

(ii) Hedgehog. The average daily consumption of acridids varied from 34.1 to 297.2 weighing 21.71 g to 106.68 g.

(iii) The roosting behaviour of the Rosy Pastor, Pastor roseus, was conducted during the month of September 1983. It was found that they preferred Acacia tortilis trees for night roosting.

#### 5. Light trap studies:

Light trap observations on the pre-and post-midnight catches of different acridids were made during September and October 1983. It was found that catches of acridids were higher before midnight than after midnight. There was little difference in the meteorological conditions before and after midnight. It is suspected that the difference in the pre- and post-midnight catches might be attributed due to the moon.

#### 6. Toxicological studies:

(i) In insecticidal trials conducted in October 1983, against fifth instar hoppers in the Ghantiali area, it was found that fenitrothion (15 gm/ha) and Phozim (42.5 gm/ha) fell in the same group and they proved superior to all other insecticides tried, viz., Dursban (60 gm/ha) Zolone (375 gm/ha), DDVP (95 gm/ha), Phenthoate (325 gm/ha), Malathion (700 gm/ha) and Nuvacron (825 gm/ha).

Equipment

(ii) The hand held spinning disc (Turbaair) sprayer was calibrated. Its flow rate per minute was 30 ml. The droplet distribution of this equipment at different distances from sprayrun was studied with the help of droplet collectors. The average number of droplets per square centimetre at 1 and 6 metres distance was found to be 73.3 and 50.7 respectively. The swath width of the sprayer was calculated to be 6 metres.

7. Programme of work for 1985-86

I. Ecological and light trap studies of the Desert Locust, Schistocerca gregaria (F.), and arid zone grasshoppers:

- (i) Vegetation, soil, terrain and other characteristics of areas frequented by scattered populations of the Desert Locust.
- (ii) Surveillance of locusts and grasshoppers in the Rajasthan Canal area.
- (iii) Collection and identification of the flora of the locust habitats in arid and semi-arid regions of the western Rajasthan desert.
- (iv) Identification of chemical factors responsible for host resistance/susceptibility.
- (v) Identification of some important meteorological and ecological factors favouring the attraction of locusts and grasshoppers to light.
- (vi) Study of Bombay Locust habitats in Rajasthan.

II. Study of bio-agents causing population fluctuations of acridids.

- (i) Study of the bird fauna of Rajasthan.
- (ii) Studies of parasites and predators.

III. Toxicity/residue determination of various newer organo-phosphates/carbamates/synthetic plant derivatives and other pesticides against locusts and grasshoppers in order to find substitutes for the existing persistent locusticides.



DESERT LOCUST HABITAT MAPPING

It has long been known that the major Desert Locust breeding areas are located in areas which receive abundant seasonal rains or run-off because the eggs need to absorb their own weight of water from the soil in order to complete incubation successfully.

Traditionally the incidence of breeding during recession periods has been recorded at the degree square level and frequency maps for the 20 years recession period from 1964 to 1984 have recently been completed, but it was known, in particular in West Africa, that breeding was associated with habitats providing certain combinations of soils and vegetation.

With the advent of high resolution earth resources satellites capable of quantifying vegetative biomass it has become possible to correlate ground truth data on soils and the specific composition of vegetation throughout the Desert Locust recession area.

In 1983-84, Mr. G.B. Popov plotted all reports of breeding and gregarisation within the OCLALAV region against maps showing the specific composition of the vegetation. This revealed very clearly the close association between breeding sites and certain habitats.

In 1984-85, Mr. Popov conducted similar studies in South-West Arabia.

As a result of these studies, which it is intended to publish, the areas which need to be surveyed will be still further reduced and thus lead to an overall reduction in survey costs.

DESERT LOCUST HABITAT MAPPING AND REMOTE SENSING APPLICATION TO SURVEY AND CONTROL. SUGGESTIONS FOR FURTHER ACTIVITIES.

1. The need for an overall strategy for Desert Locust control has long been recognised. Expert Panels on the Desert Locust Control Strategy were convened by FAO in 1956 and 1959. The recommendations of these Panels were, however, based on the premise that most locust populations would be at high densities. In the meantime, apart from the major upsurges of 1968-69 and 1977-78, there were various regional and seasonal upsurges but the overall situation was characteristic of recession periods. As a result the need to assess the minimum control potential to prevent seasonal upsurges which could lead to plagues was strongly emphasized at various meetings including the FAO DLCO.

2. In 1983, therefore, FAO commissioned such studies in the Central Region which was known to have been the major source of the last three major plague upsurges. The need for such studies was also expressed on the fifteenth Session of the Commission for controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia in 1983.



3. The experience of such studies done in the Central Region may be extremely valuable in organising analogous studies in the Eastern Region. The activities were undertaken in three steps.

1. In order to assess the minimum control potential the next activities should be realised:
  - a. review of previous upsurges and their development within the region;
  - b. detailed examination of development of upsurges together with the control resources available;
  - c. collect of information on the nature, scale and frequency of occurrence of Desert Locust populations large enough to initiate a plague if uncontrolled;
  - d. assess resources required at national and regional levels to present seasonal upsurges developing into plagues.
2. Ecological studies of breeding and outbreak areas should contain:
  - a. extraction of information on Desert Locust activity during the last recession to date, from all available sources, including verbal information from agricultural and plant protection officers and farmers;
  - b. analysis of data and identification of areas of greatest locust activity during the period;
  - c. visit to the more important areas;
  - d. completion of an ecological Desert Locust map of the area.
3. The analytical phase of the study includes:
  - a. determination of geographical, ecological (botanical) and climatical factors correlating with distribution of Desert Locust;
  - b. modelisation of relations between appearance of Desert Locusts and intensity of factors correlating with their distribution;
  - c. organisation/optimalisation of forecasting and monitoring system of Desert Locust in South-West Asia, including usage of modern remote sensing techniques.

The first two steps can be achieved by action undertaken within each member country of the Commission. Although it is up to the discretion of the Members to reveal the results of compilation and mapping to the other members and/or the FAO, the large circulation of these preliminary data may have great beneficial and stimulating effects. In that case, some assistance from the FAO HQ may be provided mainly on the field of coordination and mapping.

Once the basic material is collected it is suggested organising a meeting with participation of specialists in remote sensing, Locust ecology and modeling to design detailed steps for the realisation of point 3.



It may be expected that realisation of both recommendations of the Fifteenth Session can really help to make the Desert Locust survey less expensive and still more effective than it is now.

The studies done in the Central Region allowed better understanding of the dynamics of recession populations and the complementarity and interdependence of different areas, as also of the location of breeding habitats. Good progress was achieved in application of remote sensing imagery for monitoring of the occurrence of rain and the development of vegetation in the potential locust habitats. Both elements increased the probability of encountering locusts and minimized unnecessary travel and unproductive surveys.

TF 9123 - COMMISSION FOR CONTROLLING THE DESERT LOCUST IN S.W. ASIA

Budget and Expenditure for the period 1980-1985

	Budget 1980-1984	Receipts/Expenditures 1980-1984					Receipt and Estimated Commitment/ Expenditure 1985
		1980	1981	1982	1983	1984	
<u>Receipts</u>							
Balance brought forward from previous year	-	125.534	112.019	147.326	161.023	167.490	187.918
Contributions	71.450	12.812	77.964	59.058	106.008	55.607	14.021 <sup>1/</sup>
Interest	-	12.895	17.449	16.532	13.366	15.044	-
Reimbursement (remote sensing)	-	-	-	-	-	-	11.448 <sup>2/</sup>
Total	71.450 =====	151.241 =====	207.432 =====	222.916 =====	280.397 =====	238.141 =====	213.387 =====
<u>Code</u>							
<u>PERSONNEL SERVICES</u>							
10 Short-term experts, casual labour	7.000	1.986	1.390	12.422	1.124	32	500
<u>TRAVEL</u>							
20 Sessions of Commission, survey teams, coordination	15.000	9.408	7.152	8.147	17.298	8.828	10.826
<u>CONTRACTUAL SERVICES</u>							
30 Translation, printing	1.810	1.767	560	1.212	288	86	289
<u>GENERAL OPERATING EXPENSES</u>							
40 Freight, incidentals, POL	2.000	368	446	331	1.175	240	1.000
<u>SUPPLIES &amp; MATERIALS</u>							
50 Insecticides, other supplies	7.000	6.630	4.766	4.896	18.740	10.436	8.889
<u>EQUIPMENT</u>							
60 Control, transport, radio, survey	20.000	8.328	27.966	20.094	35.403	5.122	9.906
<u>FELLOWSHIPS &amp; GRANTS</u>							
80 High level and other fellowships	12.000	7.100	13.029	9.439	29.723	20.803	29.215
Total	64.810 =====	35.587 =====	55.309 =====	56.541 =====	103.751 =====	45.547 =====	60.625 <sup>1/</sup> =====
<u>PROJECT SERVICING COST</u>							
90 5% of Codes 50 and 60 ) 13% of Codes 10,20,30,40 and 80 ) Unallocated balance	6.265 375	3.635 -	4.797 -	5.351 -	9.156 -	4.676 -	-
Total	71.450 =====	39.222 =====	60.106 =====	61.892 =====	112.907 =====	50.223 =====	-
<u>RESERVE FUND</u>	-	112.019	147.326	161.024	167.490	187.918	

<sup>1/</sup> As at 25 Nov. 1985.

<sup>2/</sup> Expected payment.



ANNEX IV

TF 9123 - BREAKDOWN OF 1982, 1983, 1984 EXPENDITURE AND ESTIMATED EXPENDITURE AND COMMITMENT IN 1985

	Expenditure			Estimated Expenditure including Commitments 1985 1/
	1982	1983	1984	
	----- US\$ -----			
<b>10. PERSONNEL SERVICES</b>				
Radio Consultant	12.422	1.124	32	
Session of Commission				500
<b>20. TRAVEL</b>				
Session of Commission	-	6.529	-	4.826
Survey teams (India/Pakistan)	8.147	-	2.326	6.000
Expert visits	-	2.404	6.067	-
Remote sensing visits	-	8.093	-	-
Various	-	273	435	-
	8.147	17.298	8.828	10.826
<b>30. CONTRACTUAL SERVICES</b>				
Reports, printing	1.212	288	86	289
<b>40. GENERAL OPERATING EXPENSES</b>				
India radio material	331	333	-	-
Session of Commission	-	114	-	1.000
Various and survey teams (Pakistan)	-	728	240	-
	331	1.175	240	1.000
<b>50. SUPPLIES AND MATERIALS</b>				
India: vehicle spares	549	-	-	-
Pakistan: vehicle spares and laboratory equipment	-	17.913	8.108	-
Iran: books and transport of pesticides	-	341	476	1.224
Survey supplies (India/Pakistan)	4.206	-	1.550	5.865
Remote sensing data	-	1.760	-	-
Miscellaneous, including radio training material	141	(1.274)	302	1.800
	4.896	18.740	10.436	8.889
<b>60. EQUIPMENT</b>				
India: 1 Toyota and spares, radio, lab. equipment	13.125	29.664	3.277	8.590
Pakistan: 1 Toyota and spares, radio spares and sprayers	6.655	-	168	1.306
Iran: 4 Micronairs	-	5.682	-	-
Remote Sensing equipment	-	-	1.595	-
Miscellaneous	314	57	82	10
	20.094	35.403	5.122	9.906
<b>80. FELLOWSHIPS AND GRANTS</b>				
Afghanistan: Ghafar	955	6.947	7.079	10.000
Ghorbandi	2.922	6.948	7.079	10.406
Ghaisi	-	3.366	-	-
India: Sinha	-	1.369	-	-
Pathak	-	2.807	788	-
Chandra	-	2.509	1.541	-
Rajak	-	-	3.353	-
Raina	-	-	-	3.618
Iran: Ibrahimi	-	661	-	-
Bami	-	2.856	630	-
Pakistan: Sadiq	3.168	-	-	-
Ahmed	-	1.526	-	-
Zafar	1.569	734	-	-
Khawaja	-	-	-	5.191
Miscellaneous	825	-	333	-
	9.439	29.723	20.803	29.215
<b>TOTAL</b>	<b>56.541</b>	<b>103.751</b>	<b>45.547</b>	<b>60.625</b>
	=====	=====	=====	=====





TRUST FUND 9123 OF THE S.W. ASIA DESERT LOCUST COMMISSION

PLEDGE POSITION AS AT 25 NOVEMBER 1985

	<u>Annual Contributions 1982</u>	<u>Outstanding Contributions 1983</u>	<u>Contributions 1984</u>	<u>Contribution due 1985</u>	<u>Outstanding as at 25 Nov. '85</u>
Afghanistan	2,750.00	-	2,750.00	2,750.00	5,500.00
India	27,000.00	1,192.38	217.34	27,000.00	28,409.72
Iran	25,000.00	24,929.00	25,000.00	25,000.00	74,929.00
Pakistan	16,700.00	-	2,679.00	16,700.00	19,379.00
	<u>71,450.00</u>	<u>26,121.38</u>	<u>217.34</u>	<u>71,450.00</u>	<u>128,217.72</u>
	=====	=====	=====	=====	=====

APPENDIX I

COMMISSION FOR CONTROLLING THE DESERT LOCUST IN S.W. ASIA

TRUST FUND No. 9123

Budget and Expenditure for the Period 1980-82

Receipts	Budget		Receipts/Expenditures		
	1980/81	1982	1980	1981	1982***
Balance brought forward from previous year	-	-	125 534	112 019	147 326
Contributions	71 450	71 450	12 812	77 964	59 058
Interest	-	-	12 895	17 449	16 532
<b>Total:</b>	<b>71 450</b>	<b>71 450</b>	<b>151 241</b>	<b>207 432</b>	<b>222 916</b>
<b>Code</b>					
<u>PERSONNEL SERVICES</u>					
10 Short-term experts, casual labour	7 000	7 000	1 986	1 390	12 422
<u>TRAVEL</u>					
20 Sessions of Commission, survey teams, coordination	15 000	15 000	9 408	7 152	8 147
<u>CONTRACTUAL SERVICES</u>					
30 Translation, printing	1 810	1 810	1 767	560	1 212
<u>GENERAL OPERATING EXPENSES</u>					
40 Freight, incidentals, POL, transportation	2 000	2 000	368	446	331
<u>SUPPLIES &amp; MATERIALS</u>					
50 Insecticides, other supplies	7 000	7 000	6 630	4 766	4 902
<u>EQUIPMENT</u>					
60 Control, transport, radio, survey reserves	20 000	20 000	8 328	27 966	20 094
<u>FELLOWSHIPS &amp; GRANTS</u>					
80 High level and other fellowships	12 000	12 000	7 100	13 029	8 258
	64 810	64 810	35 587	55 309	55 366
<u>PROJECT SERVICING COST</u>					
90 5% of Codes 50 and 60,					
14% " " 10,20,30,40 & 80 for 1981	6 640	6 265	3 635	4 797	5 351
13% " " 10,20,30,40 & 80 for 1982					
Unallocated balance	-	375	-	-	-
<b>TOTAL:</b>	<b>71 450</b>	<b>71 450</b>	<b>39 222</b>	<b>60 106</b>	<b>60 717</b>
<u>RESERVE FUND</u>	-	-	112 019	147 326	162 199

\*\*\*Estimated expenditure



APPENDIX II

TF 9123 - BREAKDOWN OF 1980, 1981 and 1982 EXPENDITURE AND COMMITMENTS IN 1983 (15.3.83)

	Expenditure		Estimated	Commitments	
	1980	1981	Expenditure 1982	1983	1984
10. <u>PERSONNEL SERVICES</u>					
Consultancy (Radio)	1 986	1 390	12 422	2 097	-
20. <u>TRAVEL</u>					
Session of Commission	2 484	1 073	-	5 380	-
Survey teams	6 924	3 779	8 147	-	-
Expert visits (India, Pakistan)	-	2 300	-	2 058	-
	9 408	7 152	8 147	7 438	-
30. <u>CONTRACTUAL SERVICES</u>					
Reports, printing	1 767	560	1 212	-	-
40. <u>GENERAL OPERATING EXPENSES</u>					
Session of Commission	200	-	-	600	-
Miscellaneous, radio training material	168	446	331	-	-
	368	446	331	600	-
50. <u>SUPPLIES AND MATERIALS</u>					
Survey supplies	4 225	2 286	4 206	-	-
India: vehicles, spares, tyres, equipment, radio spares	3 971	1 550	549	50	-
Iran: transport of pesticides, books	-	320	-	5 000	-
Pakistan: vehicle & radio spares	-	545	-	18 690	-
Miscellaneous, books	(1 567)	64	147	-	-
	6 630	4 766	4 902	23 740	-
60. <u>EQUIPMENT</u>					
Afghanistan: generator spares	1 654	-	-	-	-
India: Toyotas, land Rover spares	-	11 675	10 518	-	-
Transceiver, radio spares, installation power supply	5 843	1 595	2 717	37 678	-
Pakistan: Toyotas, land Rover and radio spares	717	13 784	6 655	-	-
Miscellaneous (insurance, radio spares)	114	909	204	-	-
	8 328	27 966	20 094	37 678	-
80. <u>FELLOWSHIPS AND GRANTS</u>					
Afghanistan: Wais	7 100	4 674	-	-	-
Chafar	-	-	955	14 045	8 000
Ghorbandi	-	-	2 921	12 079	8 000
India: Singla	-	3 808	-	350	-
Iran: Ibrahimi	-	-	-	1 794	-
Pakistan: Sadiq	-	-	3 168	991	-
Zafar	-	-	1 568	2 304	-
Din Moshim	-	4 547	75	275	-
Various	-	-	(431)	-	-
	7 100	13 029	8 258	31 838	16 000
<u>TOTAL:</u>	<u>35 587</u>	<u>55 309</u>	<u>55 366</u>	<u>103 391</u>	<u>16 000</u>