

**REPORT OF THE**

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

**Held in New Delhi, India  
9-17 March 1977**



**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**



*Earlier reports of the preparatory meetings on the establishment of the Eastern Region Commission for the Control of the Desert Locust and its regular sessions were issued as follows:*

- Special FAO Meeting on the Eastern Desert Locust Region, held in Tehran, Iran, 1-4 October 1962
- FAO Meeting of the Proposed Eastern Regional Commission for the Control of the Desert Locust, held in Rome, Italy, 2-3 May 1963
- First Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Tehran, Iran, 16-20 December 1964
- Second Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Tehran, Iran, 5-8 March 1966
- Third Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in New Delhi, India, 6-9 March 1967
- Fourth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Kabul, Afghanistan, 21-24 February 1968
- Fifth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Karachi, Pakistan, 10-13 March 1969
- Sixth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Tehran, Iran, 14-18 April 1970
- Seventh Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in New Delhi, India, 15-18 February 1971
- Eighth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Tehran, Iran, 3-6 June 1972
- Ninth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Rome, Italy, 10-13 December 1973
- Tenth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Rome, Italy, 11-15 December 1974
- Eleventh Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, held in Karachi, Pakistan, 8-12 December 1975.



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Plant Production and Protection Division  
Food and Agriculture Organization of the United Nations  
Rome, 1977

Meeting Report  
No. AGP/1977/12

AGENDA

1. Opening of the Session
2. Election of the Chair
3. Adoption of the Agenda
4. Adoption of the Draft
5. The Desert Locust Situation
6. Review of the Desert Locust Situation in the Member Countries of the Region
7. Co-ordination of Desert Locust Research in the Region
  - (a) Training and Personnel
  - (b) Satellite Application to Desert Locust Survey
  - (c) Progress Report on FAO/DAHIDA Project
8. Reports for 1975 and 1976, and Programme of Work and Budget for 1977
9. Anti-locust Survey and Control Potentials in the Member Countries of the Region
10. Special Surveys carried out in Southern Iran and South-Afghanistan during 1975 and Plans for the Future
11. Reports of the Chairman and Vice-Chairman of the Executive Committee
12. Other Business: Proposed Amendments to the Agreement for Establishment of a Commission for the Control of Desert Locust in the Eastern Region of its Distribution in South-West Asia
13. Date and Place of the Next Session
14. Adoption of the Report

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Rome, 1977



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INTRODUCTION

The Director-General of the Food and Agriculture Organization of the United Nations, at the kind invitation of the Government of India, convened the Twelfth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia in New Delhi from 9 to 17 March 1977. He invited the Member Governments of the Commission - Afghanistan, India, Iran and Pakistan - to be represented by Delegates and the Government of the United States of America by an Observer.

The Session was opened by Mr. K. S. Narang, Secretary to the Government of India, Department of Agriculture, Ministry of Agriculture and Irrigation, who welcomed the participants on behalf of the Government of India. In his inaugural address, Mr. Narang referred to the devastations of agriculture and consequent human misery caused by the Desert Locust since Vedic days; and how, in recent years, those losses have been avoided through modern methods of surveillance and timely control. He appreciated the role played by FAO in the field of locust control and called it a valuable contribution by the Organization. He expressed his earnest hope that the various activities started under the FAO Programme would be continued and the present status of recession in locust activity consolidated into a permanent feature. He also appreciated the contribution made by other member countries of the Commission in undertaking joint activities against a common enemy. He wished the participants a pleasant and useful stay in New Delhi.

In reply, Mr. J. van der Meulen, FAO Representative in India, thanked the Government of India for holding the Session in New Delhi and welcomed the Delegates and Observer on behalf of the Director-General of FAO.

He pointed out that the significant feature of the locust situation during 1976 was the good rainfall over three consecutive seasons which gave rise to gregarious locust populations in several countries. As a result, international news media had forecast the outbreak of another locust plague but FAO was not, however, so pessimistic about the locust developments and strongly believed that the situation would and must be contained within a safe limit. It was necessary to undertake timely control operations in as many as seventeen member countries to bring the situation under control. Mr. van der Meulen thanked the member countries of the Commission for their locust control efforts and emphasized the need for continued vigilance and building up of adequate control potential to face a possible locust emergency in the future. Although the international locust situation was relatively quiet, yet there were several areas where potentially dangerous populations were present.

Officers of the Session

The following officers were elected:

Chairman: Dr. S. N. Banerjee (India)

Vice-Chairman: Mr. Ali Ahmed Nekzada (Afghanistan)

The work of preparing the draft report was entrusted to the FAO Secretariat. Dr. J. S. Gill and Mr. S. S. Pruthi of FAO acted as Technical Secretaries and Mr. Gurdas Singh as Consultant.

Acknowledgements

The Delegates thanked the Government of India for holding the Session in New Delhi and for the provision of various facilities. They expressed their appreciation of the efficient and impartial manner in which the Chairman had conducted the proceedings. They also wished to record their appreciation of the FAO Secretariat for technical assistance and help in the preparation of the draft report.

They also thanked Dr. S. N. Banerjee, Plant Protection Adviser and Director, Locust Control, and his staff for their personal interest in making arrangements for the meeting and looking after the participants so well.



PARTICIPANTS

INTRODUCTION

The following Delegates from the member countries of the Commission, Observer from the United States of America and members of FAO staff participated in the Session and contributed to the discussions summarized in the report:

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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 1975/76 and Prospects for 1976/77
6. A review of the Desert Locust Control Strategy and Plans for the future
7. (a) Coordination of Desert Locust Research in the Region  
(b) Training and Fellowships  
(c) Satellite Application to Desert Locust Survey  
(d) Progress Report on FAO/DANIDA Project
8. Accounts for 1975 and 1976, and Programme of Work and Budget for 1977
9. Anti-locust Survey and Control Potentials Available in the Member Countries of the Commission  
17 March 1977
10. Special Surveys carried out in Southern Iran and South-West Afghanistan during 1976 and Plans for the future
11. Election of the Chairman and Vice-Chairman of the Executive Committee
12. Any Other Business: Proposed amendments to the Agreement for Establishment of a Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia
13. Date and Place of the Next Session
14. Adoption of the Report



11/28/75

AGENDA

The following Delegates from the member States of America and members of FAO staff are invited to attend the Commission's 1975/76 Session. The following Delegates are invited to attend the Commission's 1975/76 Session. The following Delegates are invited to attend the Commission's 1975/76 Session.

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 1975/76 and Forecast
6. A review of the Desert Locust Survey and Control Activities carried out by the Member Countries during 1975/76 and Plans for the Future
7. (a) Coordination of Desert Locust Research in the Region  
(b) Training and Fellowships  
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Observer

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SUMMARY OF DISCUSSIONS

Desert Locust Situation from December 1975 to February 1977

1. The Commission received from the FAO Secretariat a summary of the Desert Locust situation in the countries of the region. The information was supplemented by the Delegates.
2. In Afghanistan, no locust activity was reported up to April 1976. Scattered mature, low density, adults and first instar solitary hoppers from 1 to 4 per plant were recorded, mostly in low lying areas, in Spin Buldak - Chah-i-Surkh - Shorawak areas of Kandahar province during special survey in May. On a couple of occasions a few females were observed boring in the soil. Low density scattered adults were also observed in 'Poghdar Desert' in Helmand and Dashte Shahidan area of Farah province from 21-30 May. In June-July the situation in Spin Buldak area and Shorawak valley developed into a high population of immature adults and substantial number of II to V instar solitary hoppers against which control with BHC dust was carried out over a gross area of about 22,000 hectares from 23 June to 14 July. A few scattered adults, mostly immature, were observed in Shorawak valley during August. No locust activity was reported thereafter.
3. In India, locust control operations during 1975 were concluded on 21 November and there was no significant locust activity up to May 1976 except that low density scattered adults continued to be found in several localities of Rajasthan. There was isolated rainfall during May in western Rajasthan. In June mature and maturing adults were observed in increasing numbers in several localities of Rajasthan and Banaskantha district of Gujarat and the population was countless in Churu and Jaisalmer districts during June and in Jaisalmer and Jodhpur districts in July. A few II - III instar solitary hoppers were also detected in Churu district.
4. Widespread rains were received throughout the desert areas during July and August and the ecological conditions were highly favourable for locust breeding. The first locust swarm was reported from Pokaran tehsil of Jaisalmer district on 24 July. Another 10 sq. km. mature locust swarm was recorded from Pokaran tehsil in August and its movements were reported from a few localities on 5 and 6 August. No more locust swarms were reported thereafter.
5. Gregarious breeding was first recorded in August in Pokaran tehsil where locust swarms were sighted in late July and early August. Laying was patchy and diffuse. Emergence of hoppers of first swarm commenced on 5 August and that of the second swarm on 18 August. Widely scattered hopper bands and patches of I to V instar solitary hoppers were also reported from Jaisalmer district during September and October. The population of scattered adults considerably decreased during November and early December and was almost negligible thereafter.
6. In Iran, a 2 sq. km. pinkish grey loose swarm was reported from Chabahar on 4 December 1975. There was no significant locust activity from January to May apart from scattered adults and some solitary hoppers of different stages were reported from several places mostly in coastal areas of Baluchistan. South and south western parts of Iran received good to heavy rainfall during February/March and ecological conditions continued to be favourable for breeding up to April/May. In June, fairly high populations of adults of different maturities and solitary hoppers of various stages were recorded in a few localities of Baluchistan and Bandar Abbas provinces. In July and August, high population and concentrations of adults and advance stage hoppers were reported from Jaz Murian - Jiroft area. From September onward very low density adult population was reported from Baluchistan and Jiroft areas. Winter rains in general were very good.
7. In Pakistan, control operations concluded in the summer breeding areas during November 1975 and there was no significant locust activity in these areas until June 1976 when some increase in adult locust population was recorded in Bahawalpur and Sind deserts. However, scattered adults in appreciable numbers were reported from coastal areas of Mekran and Lasbella while low populations were recorded in the hinterland, Kharan and Kachhi areas from December to February. The winter/spring breeding areas received heavy and widespread rains repeatedly during February/March 1976.
8. In March, adult population decreased considerably along the coastal belt but stray adults were sighted in Kharan, Nushki, Khuzdar and Kachhi areas and a few green solitary hoppers of I to II instars were observed in wild vegetation in Lasbella district. In April, low population of mature scattered adults was reported from Lasbella, Panjgur, Turbat, Khuzdar, Kharan, Nushki and Quetta. I to III instar solitary hoppers were recorded in a few localities of Lasbella district and in Kulanch and Dasht



valleys. I instar solitary hoppers over an area of 30 sq. km. were also detected near Ormara. In May, high population of mature adults around Turbat, Sibi and Dhadar and low population in Lasbella, Panjgur, Khuzdar, Chaghai, Kharan and Bhag areas was recorded. Solitary hoppers of I to III instars in small numbers were reported from Kharan, Kulanch and Dasht valleys while solitary hoppers of all instars in a gross area of about 600 sq. km. were recorded in some localities of Bannu, Kharan, Nushki, Mekran and Lasbella districts. In Nushki, light localised showers were received and ecological conditions in other areas continued to be favourable for breeding.

9. In June, the adult population decreased considerably in coastal areas while it increased in the northern hilly regions of Baluchistan. Adult concentration in about 1.3 sq. km. was seen in Kharan and countless number of adults were recorded in several localities of Chagai, Zhob and Kharan districts. In Chagai district, cultivated fields and wild vegetation were heavily infested with fresh adults in about 1,200 sq. km. particularly along the north western border. Two swarms measuring 6 and 9 sq. km. were observed at Mand and Nushki, respectively. Scattered adults in increasing numbers were recorded in Cholistan and Tharparker deserts and the maximum population was 12,600 per sq. km. in Cholistan. In July, groups of fresh adults were found in Pishin, Dalbandin and Gulistan areas. In Kharan adults which escaped operations aggregated in cultivations in about eight hectares. Widespread and heavy rains were received in the summer breeding zone and adult locusts of all maturities were observed in almost all the rain fed areas of Tharparker, Nara and Cholistan deserts. A small group of adults was observed pairing in Uthal tehsil of Lasbella district in the last week.

10. In August, nine loose, mature swarms from 1 to 4 sq. km. and three mature groups of about  $\frac{1}{4}$  sq. km. each were observed pairing and laying in Uthal tehsil of Lasbella district. Non-swarmed mature and pairing adults were also observed in several areas in the summer breeding zone. A maximum population of 12,000 per sq. km. was observed in Bhag in cultivated fields. Emergence of hoppers commenced on 8 August in Uthal tehsil and 80 small concentrations were detected in 15 sq. km. Later fresh emergence in about 15 hectares, 80 concentrations of first instar hoppers and 128 hopper bands mostly I to III instars were located in Uthal tehsil. Gregarious breeding in about 35 sq. km. was also detected in Thatta district. Low density solitary hoppers of I to III instars were observed in 190 sq. km. in two different areas of Cholistan, II to IV instars in 225 sq. km. in Tharparker district and I to IV instars in 15 sq. km. in Nara desert. More rains were received in a few localities of Lasbella, Tharparker and Cholistan. In September, scattered mature adults were reported from Sind and Bahawalpur deserts and certain parts of Karachi suburbs. The population decreased considerably towards the end of the month. In Uthal, 62 hopper bands of I to III instars of various sizes and fresh hatchings of gregarious and solitary phase in about 6 hectares were observed. Solitary hoppers of all instars were also recorded in a gross area of 30 sq. km. in Thatta and Dadu districts and in considerable numbers in Nara and Cholistan deserts in 48 sq. km.

11. In October fresh adults in appreciable numbers were observed in Khipro and Cholistan deserts and loose groups were found in Mauripur and Drigh Road areas of Karachi. A few V instar hoppers were also detected in Mauripur. Low density adult population was observed in Kachhi area. These areas were sprayed in October/early November. No significant locust activity was reported after November and only low density scattered adults were observed in Kharan, Lasbella and Mekran districts.

#### Forecast

12. Considerable scattered breeding occurred in the Indo-Pakistan desert areas in August and September 1976 against which control operations were undertaken. These operations concluded in September in India and in early November in Pakistan. No significant locust activity was reported thereafter and only low density adult populations were recorded. It was noted that the locust populations present in the region during February/March 1977 were well below the locust numbers recorded during the same period in 1976. The winter/spring breeding areas of Pakistan and Iran received widespread rainfall in January. In the wake of subsequent rainfall and with the warming-up of the season, the locust activity is likely to increase. These areas should therefore be kept under constant surveillance.

#### Desert Locust Survey and Control during 1975/76 and Plans for Future

13. There was considerable locust activity in the region which necessitated control operations. The position with regard to each country is stated below:

##### Afghanistan

14. A special locust survey was carried out in south western Afghanistan during May/June 1976. A couple of additional surveys were also undertaken. During special survey in May/June, significant population of mature adults and scattered solitary hoppers of first instar was observed in Spin Buldak-Shorawak area of Kandahar province. Control operations were carried out in these areas by dusting



58,991 kgs. BHC 12% against II to V instar hoppers and immature adults from 23 June to 14 July.

India

15. Regular surveys of the desert areas were carried out, which were intensified during monsoon rains. With the financial assistance of FAO special surveys of strategic areas along the Indo-Pakistan border were also undertaken between August and November 1976. Gregarious breeding commenced in early August in Pokaran tehsil of Jaisalmer district and widely scattered hopper bands and patches were recorded in 30 villages of Jaisalmer and Ganganagar districts over a gross area of about 1,500 sq. km. Control operations were started on 8 August and concluded on 23 September. About 20,500 kgs. of 10% BHC dust and 1,717 litres 10-40% dieldrin were consumed in the operations.

Iran

16. In addition to the joint Iran/Pakistan special survey of southern Iran during April/May 1976, the desert areas of Baluchistan, Bandar Abbas and Jiroft in Kermān province were surveyed from time to time by the plant protection staff. A 2 sq. km. pinkish loose swarm was reported from Chabahar on 4 December 1975 against which control operations were carried out by baiting and exhaust nozzle spraying. Control by dusting, spraying and baiting was also undertaken against high populations of adults and solitary hoppers from June to August over about 10,149 hectares.

Pakistan

17. The winter/spring and monsoon locust breeding areas were regularly surveyed. With the financial assistance of FAO special surveys of the strategic areas along the Indo-Pakistan border were undertaken during the summer season.

18. No significant locust activity was reported from December 1975 to February 1976 except at Kandewari in Lasbella district where high population was observed in two hectares which was strip-sprayed. In April and May control by spraying was carried out against high population of adults and solitary hoppers in Lasbella, Mekran, Chaghai, Kharan and Bannu districts over a fairly vast area. In June control operations against two loose swarms by dusting BHC and spraying dieldrin were undertaken in Nushki and Mand and by spraying against advance stage hoppers and fledglings in 400 sq. km. in Nushki, Pishin and Zhob districts. An area of 1,200 sq. km. in Chaghai and Pishin districts was also strip-sprayed against high density population of adults and hoppers as a preventive measure. Control operations in these areas were continued during July 1976.

19. Widespread rains were received and there was an increase in the locust activity in Lasbella, Sind and Bahawalpur deserts in July. An area of 15 sq. km. was strip-sprayed in Cholistan against high density populations. In August control operations against mature swarms and hoppers were carried out in Lasbella, Sind and Bahawalpur deserts; the control continued in September and October. Fresh adults in appreciable numbers were observed in October in Khipro and Cholistan deserts, and these were air-sprayed in early November. Adult populations at Mauripur near Karachi were also sprayed. There was no significant locust activity thereafter.

20. The control data from December 1975 to February 1977 is given in Appendix I.

Reporting

21. The Commission appreciated the timely control operations undertaken by the member countries and emphasized the need for constant vigilance and speedy communication of information. It was further stressed that the information on locust incidence and rainfall be expeditiously transmitted to the Regional Locust Officer to enable him to issue locust situation reports promptly and keep all concerned apprised of the latest developments.

Use of Dieldrin

22. The Commission endorsed the recommendation made at the Nineteenth Session of the FAO DLCC (Report paragraph 62) concerning the use of dieldrin and agreed that dieldrin should continue to be used for locust control until such time that suitable alternate insecticide(s) equally effective and economical were found.

Coordination of Field Research

23. The Commission reviewed the research work done in India and Pakistan during 1976/77, a summary of which is given in Appendix II.



24. The Commission re-emphasized the need to intensify field research and recommended that the programme of work outlined at its Eleventh Session (Report paragraph 35) should be implemented as far as possible, especially the studies on the behaviour of scattered locusts in relation to weather conditions; and factors affecting gregarisation and dissociation.

25. The Commission heard with interest a brief report on the modifications of existing exhaust nozzle sprayer by Mr. Harish Chandra of FSIL, Bikaner, whereby the motive force for atomizing the spray liquid is provided by a power-take-off (PTO) mechanism instead of the exhaust gasses. In case the modified sprayer proved successful in further tests, the innovation would be useful in avoiding the damage to the engine of the vehicle which occurs sometimes under severe desert conditions; and the modified version of the exhaust sprayer might replace the present apparatus. The PTO could also be utilised to operate a power duster dispensing with the conventional engine and reducing the cost of the power duster and, thus, the operational expenses.

Training and Fellowships

26. The Inter-Regional Training Project in Crop Pest Control with special reference to Desert Locust Control and Research (INT/71/030) became operational at the end of January 1974 and was to last up to April 1977, but because of the UNDP financial crisis it was terminated prematurely with effect from 31 July 1976. The Commission, while appreciating the work done during the short life of the project, expressed regret that it had to be terminated earlier than scheduled.

27. Member countries of the Commission benefitted from various types of training under the inter-regional project as shown below:

(i) Training Courses

Crop Pest and Desert Locust Control Training Course  
Teheran 1974 Expenditure  
US\$

Afghanistan	3 participants	
India	2 "	
Iran	4 "	8,822
Pakistan	2 "	

Radio Maintenance Training Course  
Beirut 1974

Afghanistan	1 participants	
India	1 "	8,777
Pakistan	2 "	

Crop Pest and Desert Locust Control Training Course, Teheran 1975

Afghanistan	1 participants	
Iran	5 "	10,323
Pakistan	2 "	

Aerial Survey and Control Training Course, Nairobi 1975

India	1 participants	
Iran	4 "	11,058
Pakistan	2 "	

Radio Maintenance Training Course, Cairo 1976

Afghanistan	1 participants	
India	1 "	
Iran	1 "	7,825
Pakistan	2 "	



		Expenditure
<u>Aerial Survey and Control Training Course</u>		
Karachi 1976		b/f 46,805
Iran	4 participants	
Pakistan	4 "	8,999
		US\$ 55,804

(ii) Fellowships and Study Tours

		Expenditure	Committed
<u>Study Tour 1974</u>		b/f 55,804	
Afghanistan	M. Jan		
Iran	Nasr	6,124	-
<u>Short-Term Fellowships</u>			
Iran	Sadooghi	5,747	-
Iran	Zomorrodi	1,431	-
<u>Long-Term Fellowships</u>			
Afghanistan	Saboury	6,731	7,839
India	Chandra	-	24,000
India	Pant	7,326	19,674
Iran	Kaveh	4,686	-
Pakistan	Akhtar	13,535	7,594
Pakistan	Siddiqui	9,908	3,030
		US\$ 111,292	US\$ 62,137

Grand Total	(i)	55,804
	(ii)	111,292
		62,137
		US\$ 229,233



28. While discussing the future training programme, the Commission recommended that more emphasis should be laid on short-term practical training to meet the needs of the member countries; and the programme for high level training should be deferred until such time that sufficient reserve funds were built up in the Trust Fund of the Commission.

29. The Commission appreciated the training provided in the fields of aerial spraying and radio maintenance. Recognising that such training was too expensive to be organised at a regional level, the Commission requested FAO to look into the possibility of arranging training in these fields on an inter-regional basis, both for pilots/engineers and plant protection officers. Whilst organizing such courses, FAO should look into the possibility of bilateral donor assistance.

#### Satellite Application to Desert Locust Survey

30. The Commission noted with satisfaction that the satellite project had obtained valuable information in its initial experimental stage and there was a need to continue the Project. Referring to its earlier recommendation made at the Eleventh Session (Report, paragraph 61), the Commission agreed to allocate US\$ 10,000 from the survey component of its budget as its contribution for the second phase of the project.

31. Whilst formulating a comprehensive future project on satellite application on the basis of present feasibility studies (Paragraph 30), the Commission suggested that the draft project should be circulated to the member governments for their consideration and comments which they might like to make on the basis of the experience and expertise available in the countries.

#### Progress Report on FAO/DANIDA Project

32. There were some doubts about continuing the use of the organo-chlorine insecticides, BHC and dieldrin, for the control of the Desert Locust because these compounds had been found to persist in agricultural ecosystems, where they entered the food chain, and were considered to be a threat to mankind and his environment. The aim of this project was to find out the fate of these insecticides when used against locusts in the desert where climatic conditions, etc., might have a different effect on their persistence. Full details of the background, initiation and progress in the first year were presented to the Commission at its Eleventh Session held at Karachi in December 1975. There were some delays in the analytical programme because of the poor quality of the nitrogen gas supplies. Highly pure nitrogen gas was essential for the operation of the gas-liquid-chromatograph (GLC) used to determine the insecticide residues. A purifier was eventually obtained and connected to prevent this problem recurring in the future.

33. The Chemist-in-Charge visited Pakistan in April-May 1976 and surveyed three desert areas north west of Karachi along the coastal belt entering Baluchistan, which had received a variety of dieldrin treatments over the last 14 years. One hundred and thirty six composite samples of soil were collected and analysed at Teheran. He visited India in November 1976 and collected soil and vegetation samples from desert areas near Pokaran in Rajasthan which had been sprayed with dieldrin or power dusted with BHC in August-September 1976. The samples from India were being analysed.

34. The samples were all blended in the laboratory before withdrawing aliquots for extraction. Small aggregates were crushed, where necessary, and each sample was divided and recombined by pouring the two halves simultaneously into another container, repeating the process twice more. The aliquots were extracted by treatment of 5 g. portions with water, acetone and hexane. All glassware was thoroughly cleaned with acetone immediately before use and full precautions were taken to avoid any contamination risks. Aliquots, 5 ul., (equivalent to 1.66 mg. of the soil), of the extracts were examined by GLC in duplicate using two columns with different stationary phase to confirm the findings. The following results were obtained from these samples:

- (i) At least 75% of dieldrin applied as a 20% E.C. in the desert areas studied disappears within one year of application and at least 97% disappears within 3 years of application. These values for rates of loss are derived from the highest residues found and the true values are likely to be much higher because there might have been variations in the spraying rates.
- (ii) No evidence was obtained to show that dieldrin persists to any appreciable extent below the ground surface and the results indicate either retention of dieldrin and its photoisomers near the surface or migration of these compounds towards the surface.

The above conclusions rely upon assurances that the sprayed areas had been correctly identified. Large areas, ca. 1 km<sup>2</sup> in each case, had been comprehensively sampled to reduce the uncertainty in identifying



such areas. The higher residues of dieldrin were usually found in surface samples and were sometimes accompanied by residues of photodieldrin which is formed by the action of sunlight. It was likely that dieldrin at the surface would be lost by evaporation because of the high surface temperatures and wind action. The residues found were almost negligible and too low to pose any significant threat to the environment. It was noted during the sampling that there was an abundant population of ants, beetles, rats, etc., in the treated areas indicating no long-term biological effects from the spraying (this is, of course, a purely qualitative observation).

Future Work

35. Attention would be concentrated on experimental spraying studies to obtain more accurate values for the persistence of BHC and dieldrin under desert conditions.
36. Recognising the need for obtaining early results on the implications of residues of dieldrin and BHC, the Commission recommended that the FAO/DANIDA expert should now concentrate on collecting and analysing soil samples so that reasonably valid conclusions could be obtained on the problem of residue implications at the earliest.
37. In order to expedite the analysis work, the Commission recommended that analytical facilities already available in India and Pakistan should be utilised fully. These facilities need to be strengthened with the provision of additional GLC equipment.

Administrative Budget and Accounts - FAO Trust Fund 9123

Accounts for the years ending 31 December 1975 and 1976

38. The Commission examined the final and audited statement of accounts for the year ending 31 December 1975 (Appendix IV) and provisional statement for 1976 (Appendix V) and approved them.
39. All contributions up to 1973 had been paid. The position as on 1 January 1977 is shown below:

	<u>Yearly Contribution</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>Total Due</u>
Afghanistan	2,750	-	-	-	-
India	27,000	385	6,750	6,450	13,885*
Iran	25,000	-	-	25,000	25,000
Pakistan	16,700	-	-	-	-
	<u>71,450</u>	<u>385</u>	<u>6,750</u>	<u>31,450</u>	<u>38,885</u>

\*The delegate of India informed that payments up to 1975 have been made.

40. In 1975 expenditure exceeded the approved budget for personal services, contractual services, equipment and training chapters. The excess was balanced by lower expenditure under travel, operating costs and expendable supplies, and the total did not exceed the budget figure.

41. In 1976 expenditure exceeded the approved budget for personal services, official travel, contractual services and equipment. The overall budget figure was exceeded, and the surplus required was drawn from the unspent balance remaining in the Trust Fund from previous years as permitted by the Commission in approving the budget for 1975-79 at its Ninth Session.

Programme of Work and Budget for 1977

42. The Ninth Session of the Commission held in December 1973 approved the Programme of Work and Budget for the five years 1975/79 commencing 1 January 1975 (Appendix III) with the provision that it would be reviewed at the annual sessions of the Commission and that savings under any of the expenditure headings could be utilised to meet shortages under any other headings. Similarly, unspent surplus at the end of any calendar year would be available to supplement allocations under the same headings or any other headings as might be required. The Programme of Work and Budget was subsequently approved by the FAO Finance Committee in April 1974. Since no radical change in the locust situation was expected, the Commission adopted the budget for 1977 as approved at its Ninth Session.



### Survey and Control Potentials

43. The Commission reviewed the survey and control potential available in the member countries and brought this information up to date. (Appendix VI)

### Special Surveys

44. The Commission received from the FAO Secretariat an account of the special surveys carried out in southern Iran and south western Afghanistan during 1976. In view of the experience gained over the years, the area of survey was delimited and accordingly the period of survey was curtailed to about one month in each case. This resulted in economising the expenditure and other resources. It was decided that a brief report of the findings of the joint surveys should be sent to the member countries during and after the conclusion of the surveys. A summary of the surveys is given below:

#### Southern Iran

45. The survey commenced on 19 April and the areas of Iranshahr, Chabahar, Zarand, Chahshur, Ziarat, Jiroft, Bandar Abbas, Bandar Linge and Kerman between 25° - 32°N and 55° - 61°E were surveyed up to 12 May. The two teams left Kerman on 13 May; the Iranian team returned to Teheran and the Pakistani team and Mr. Rashid Ahmed, FAO Consultant, proceeded to Pakistan from Zahedan on 16 May.

46. A good coverage of Heliotropium sp., Chrozophora sp., Panicum turgidum and cruciferous annuals was observed in Chabahar, Jazmuriyan and Jiroft sectors. The locust habitats and environments in Aliabad, Husainabad and Kharposht areas of Jiroft sector and also the surrounding areas of Bandar Abbas have almost totally changed as large areas have come under cultivation. In Bandar Abbas many buildings are extending into reks.

47. During survey of the Chabahar sector, two fourth instar green hoppers were detected in the Bir area on Chrozophora and two fresh adults from Chabahar reks, from 21 to 24 April. Three mature adults were observed in about eight hectares in Sargorich area of Jiroft on 30 April. In the area between Bandar Abbas and Bandar Linge, one fifth instar green hopper was found at Isin (2719N 5617E) on 5 May and six maturing locust adults and four fifth instar green hoppers near Bandar Abbas airport and two more adults about 60 km. from Bandar Abbas on 6 May. On 8 May 31 fresh solitary adults in an area of about 3/4 km. approximately 50 km. from Bandar Linge along the coast, 20 fresh adults at Kahuristan and three in another area 50 km. from Bandar Abbas were located. On 10 May ten fresh adults and two fifth instar green hoppers were observed in an area near river Colman. Out of the locusts collected in this area, one specimen was gregarious according to E/F ratio. This area had a large number of Odaeleus grasshoppers also.

48. The weather remained calm, clear and bright except on 21 April when fairly strong winds were encountered in the evening. The temperatures ranged between 17°C to 38°C and relative humidity from 18% to 85%. The maximum temperature of 38°C was recorded at Nikshahr on 20 April and the maximum relative humidity of 85% on 21 April at Chabahar. Zahedan, Khash, Iranshahr, Chabahar, Zarand and Jiroft sectors received good winter rains and Jiroft also experienced good rains on 1 May.

#### South Western Afghanistan

49. The survey commenced from Kandahar on 5 May and the desert areas of Kandahar, Helmand and Farah provinces were examined. The team returned to Kabul on 3 June.

50. Spin Buldak (3101N 6624E), Chah-i-Surkh (3019N 6615E) and Shorawak (3150N 6421E) in south of Kandahar (3135N 6545E) along the Pakistan border were surveyed from 8 to 18 May. Scattered mature adults in some pockets at a population ranging from 800 to 3,400 per square kilometer in and around cultivated fields in low-lying areas were observed. It was reported by local people that scattered adults were noticed after a strong south westerly wind followed by a light thunder shower about a month earlier. First instar solitary green hoppers from one to four per plant were also observed in these areas. On two occasions a few females were observed boring. Solitary adults in very small numbers were also found in the Poghdar desert flanking the Helmand canal system on its eastern side and in Dashte-Shahidan area of Farah province between 21 and 30 May.

51. Afghanistan received good to heavy winter/spring rainfall almost all over the country during 1975-76, which created favourable ecological conditions for locust activity.



Plans for Future

52. The Commission appreciated the action already taken by FAO for 1977 surveys which were proposed to commence on 9 April and 1 May in case of southern Iran and south western Afghanistan, respectively, and agreed that these surveys should be continued during 1978. The Commission also recommended that the joint Iranian-Pakistan team should survey areas on both sides of the border, i.e. in Iran and Pakistan next year.

Strategic Survey

53. India and Pakistan carried out a number of surveys during the monsoon breeding season along the Indo-Pakistan border areas on their respective sides. These surveys proved very useful and the Commission recommended that such surveys should be continued and financed by FAO as usual.

Joint Indo-Pakistan Meetings

54. The Commission appreciated the joint meetings arranged between the heads of locust control departments and border meetings between its field officers in the past to discuss the locust situation and other problems of common interest. These meetings proved extremely useful for detailed mutual exchange of information and the Commission recommended that such meetings should be continued to be held in future, particularly during the active locust breeding season.

Election of Chairman and Vice-Chairman of the Executive Committee

55. The Commission unanimously elected Pakistan and Afghanistan as Chairman and Vice-Chairman of the Executive Committee respectively for 1977/78.

Proposed Amendments to the Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia \*

56. The Commission considered and unanimously approved the following amendments:

ARTICLE I

Membership

2. The Commission may, by a two-thirds majority of its [membership,] Members, admit to membership such other [Nations,] States, situated in the Region that are Members of the United Nations, any of its Specialized Agencies or the International Atomic Energy Agency, as have submitted an application for membership of the Commission and a declaration made in a formal instrument that they accept this Agreement as in force at the time of admission.

ARTICLE VI

Observers and Consultants

3. [Nations] States which, while not Members of the Commission nor Members or Associate Members of the Organization, are Members of the United Nations, any of its Specialized Agencies or the International Atomic Energy Agency may, upon request and subject to the concurrence of the Executive Committee and to the provisions relating to the granting of observer status to nations adopted by the Conference of the Organization, be invited to attend sessions of the Commission in an observer capacity.

ARTICLE X

Rules of Procedure and Financial Regulations

The Commission may, by a two thirds majority of its membership, adopt and amend its own Rules of Procedure and Financial Regulations which shall be consistent with the General Rules and the Financial Regulations respectively of the Organization. The Rules of Procedure and Financial Regulations of the Commission and any amendment thereto shall come into force upon approval by the Director-General of the Organization, and as from the date of such approval,

\*Words underlined to be added; words in square brackets to be deleted.



the Financial Regulations and amendments thereto being subject to confirmation by the Council of the Organization

DATE AND PLACE OF NEXT SESSION

57. The Delegates suggested that the next Session of the Commission be held in Teheran about mid-April 1978.

53. India and Pakistan carried out a number of surveys during the monsoon breeding season along the Indo-Pakistan border areas on their respective sides. These surveys proved very useful and the Commission recommended that such surveys should be continued in the future.

54. The Commission appreciated the joint meetings arranged between the heads of forest control departments and border meetings between the field officers in the past to discuss the forest situation and other problems of common interest. These meetings proved extremely useful for devising mutual exchange of information and the Commission recommended that such meetings should be continued in the future, particularly during the active forest breeding season.

55. The Commission unanimously elected Pakistan and Afghanistan as Chairman and Vice-Chairman of the Executive Committee respectively for 1978/79.

56. The Commission considered and unanimously approved the following amendments to the Agreement for the Establishment of a Commission for Controlling the Forests in the Eastern Region of the Distribution Area in South Asia:

- ARTICLE I, 197.42
- ARTICLE II, 27,779.95
- ARTICLE III, 40,415.04
- ARTICLE IV, 18,133.81

57. National States which, while not Members of the Commission nor Members or Associates of the Organization, are Members of the United Nations, Members of the International Atomic Energy Agency, or the International Labour Organization, and subject to the provisions relating to the granting of observer status to nations adopted by the Conference of the Organization, be invited to attend sessions of the Commission in an observer capacity.

Balance as at 31 December 1977 100,442.00

ARTICLE X  
The Commission may from time to time amend the Rules of Procedure and Financial Regulations which shall be consistent with the General Rules and the Financial Regulations respectively of the Organization. The Rules of Procedure and Financial Regulations of the Commission and any amendments thereto shall come into force upon approval by the Director-General of the Organization, and as from the date of such approval, words underlined to be added; words in square brackets to be deleted.



APPENDIX I

Anti-Locust Measures Undertaken by Various Countries  
from December 1975 to January 1977

LOCALITIES	MONTH & YEAR	TYPE OF INFESTATION Swarms/Adults/Hoppers	INFESTED AREA in sq. km.	INSECTICIDE USED		METHOD OF APPLICATION (Air or Ground)	REMARKS
				Liquid in lts.	Dust in kgs.		
<u>Afghanistan</u>							
Spin Buldak - Shorawak area	June/July 76	Adults, hoppers	220	-	58,991 12% EHC	Ground	
<u>India</u>							
Jaisalmer Ganganagar	Aug/Sept. 76	Hoppers, fledglings	1,500	1,717 10-40% dieldrin	20,500 10% BHC	Ground	
<u>Iran</u>							
Chabahar Iranshahar, Gawatar, Jask, Jiroft	December 75 June/Aug. 76	Swarm, adults Adults, hoppers	22 101	Spraying & BHC baiting Spraying, baiting and dusting BHC		Ground Ground	
<u>Pakistan</u>							
Lasbella	February 76	Adults	2 hectares	BHC & dieldrin used over patchy infestations as a preventive control measure		Ground and Air	
Nushki, Quetta, Kulanch, Cholistan, Tharparkar	April 76	Adults, hoppers		Strip spraying with dieldrin & BHC dusting		Ground and Air	
Chagai, Mekran, Lasbella, Pishin, Kharan, Bannu, Nushki, Pishin, Zhob	May/June 76	Swarms, adults, hoppers	620	Sprayed with dieldrin		Ground and Air	
Punjgur, Karachi, Cholistan, Lasbella, Tharparkar	July/Nov. 76	Swarms, adults, hoppers	820			Ground and Air	



A SUMMARY OF THE DESERT LOCUST RESEARCH WORK  
CARRIED OUT DURING 1975 - 1976 AND FUTURE PLANS

INDIA

Ecological Investigations

Field Conditions: Studies on the pattern of association of the Desert Locust with other Acridids in particular and other insects in general, in natural condition of the desert, by selecting different types of localities within 30 km. from Bikaner were commenced in 1973; findings up to 1975 were given in the previous Commission's report. The monthly observations recorded from November 1975 to February 1977 revealed that out of a total of 2608 Acridids collected from the ear-marked localities during the 16 months, 152 were Desert Locusts; percentage of the Desert Locust varied from 0.27% to 36.8% of the total number of Acridids collected and there was no co-relation between the maximum number of Desert Locusts to the maximum number of other Acridids collected. For example, one locality - Kanasar - recorded 107 locusts which is 36.8% of the total acridids (291) seen there, whereas the maximum number of Acridids recorded was in Gusainsar where the Desert Locust accounted for only 0.77%. Further studies were in progress.

Semi-Natural Conditions

Studies on population fluctuations of the Desert Locust: Long term studies on the behaviour of reproductive potential of Solitaria Desert Locust in semi-natural conditions that were commenced in 1971 were continued during 1976. 151 healthy adult locusts were released in September 1971 in field cages measuring 23' x 15' x 10' with wire gauze walls and roof; and mixed plants such as Tribulus, Sorghum, Castor were provided as food material. F1 generation adults appeared in May 1972, F2 overwintered and laid eggs in March 1973, F3 adults were produced in May 1973, and F4 adults fledged in January 1974. F5 fledglings were noticed in April-June 1974 and egg-laying took place in July; 31 adults of F6 were found in September 1974, which lived up to March 1975 through 6 generations over three years, the number of adults had decreased to 1/5 of the original number. Thus, contrary to the expectation of several fold increase in numbers under caged conditions which offered almost complete protection against natural enemies and offered much less harsh conditions than the real desert, there was a continuous decrease in the survivals. No disease symptoms were observed in the dead specimens. Details, such as the number of egg pods per female, number of eggs per pod, hoppers emerged per pod, etc., were recorded and would be further analysed to determine the causes of depletion of the population.

A fresh batch of 50 pairs of mature adults collected from the field were introduced into the cage during September 1975. They laid eggs in the second week of September. Emergence commenced in the fourth week of September and all F1 generation hoppers fledged by December. But these adults did not survive beyond 10 May. Another batch of 95 adults were similarly kept under observation since June 1975. These laid eggs in the last week of June and hoppers emerged on 9 July after 15-17 days of incubation, fledgling commenced on 9 August. The egg-pods gave an average of 33 hoppers, each 15-16 mg. in weight. Further studies were in progress.

Behavioural Studies

Observations on Swarm Behaviour: An immature swarm comprising 99.5% pink and 0.5% grey specimens measuring about 16 sq.km. was sprayed with Malathion ULV from a Beaver aircraft on 16 November 1975 between 16.30 and 17.45 hours when it was flying low in Ramgarh sector of Jaisalmer. The swarm settled by the evening 2 km. away from the site of application of insecticide, at Mian Ka Gaon in two parts over very high bushes and trees. In the morning it was observed that very few faecal pellets had been shed by the locusts, indicating no feeding activity in the night - perhaps as a result of the insecticide effect. Very few to 20,000 dead locusts could be collected below the trees, the higher number below tall trees such as Gumat (Acaccia sp.), Jal (Salvodara sp.), Kair (Capparis sp.), Khejri (Prosopis sp.), etc.

Toxicological Studies

Monitoring of Pesticide Residues in Soils Treated with Chlorinated Hydrocarbons: To ascertain the



persistance of organo-chlorine insecticides in desert soils, soil samples were taken after 6-9 and 15 months duration from plots sprayed with dieldrin (200 g a.i./ha) and lindane (100 g a.i./ha) on 8 April 1975. Analysis showed residues in traces in less than 0.05 ppm in the samples after 6 months and nil in those taken after 9 months.

Field Trials with Newer Insecticides: (i) Hoppers in tin sheet enclosures at places having green or semi-green vegetation of Crotalaria sp., Euphorbia sp. and Corchorus sp. were sprayed with dieldrin, malathion, phenthoate, fenitrothion, chlorophyrifos and dibrom at 30, 465, 120, 90, 90 and 45 g. a.i./ha. respectively, the dosage being 15 times the LD50 values which was taken as g/ha of each insecticide against V instar Desert Locust hoppers. Each insecticide was applied at a volume rate of 600 l/ha. There were 3 replications in each treatment including control in which case plain water was sprayed. Within 20 minutes, knock down effect was noticed in all the organo-phosphates and more than 80% mortality occurred within the first hour of treatment. In the case of dieldrin mortality started after one hour of treatment, 80% of the hoppers became moribund in 6 hours. The temperature during the experiments was 16°C to 35°C (air temperature) and relative humidity 59-89%. Soil surface temperature was 16-51°C. The experiments were repeated and almost identical results were obtained.

(ii) The efficacy of carbaryl, phenthoate and quinolphos dusts was compared with that of BHC by using hoppers in enclosed tin barriers and dusting them respectively at 450, 120, 67.5 and 130.5 g of a.i./ha. (dosage rate being 15 times the LD50 volume of each of the insecticides against V instar hoppers). Cent percent kill was obtained in 24 hours with BHC and carbaryl dusts; phenthoate gave 69% and quinolphos 57.7% mortality.

#### Biological Studies

##### (i) Trials with Bacillus thuringiensis

(a) Fresh castor leaves dipped for 15 minutes in 1% (i.e.  $2 \times 10^{10}$  viable spores per gram) Bacillus powder emulsion (using neogin CT as emulsifier) were air-dried and offered as food for 6 days to 60 numbers of Desert Locust adults (equal number in 3 replications) and equal number kept as control and given plain water washed castor of the same age and colour. No mortality occurred in any of the treatments including the control even for one month. The experiments were conducted at room temperature during the months of November-December 1975.

(b) Similar experiment was conducted with Bacillus powder mixed with wheat bran 1:100 both dry and wet preparations, given as food for 6 days to starved adults of the Desert Locust in groups of 20. No mortality occurred with treatment and control for a month in December 1975.

##### (ii) Pathogens

The nature of infection by Aspergillus flayus, a common fungus that attacks the Desert Locust in Bikaner laboratory, was studied. The infection appears in the form of pinkish to brownish black patches with hardening of the affected region, and paralysis and twitching of the legs. The fungus was isolated from the lesions and from other diseased parts, as well as from the air, floor and walls of the breeding cabin. The infection appeared exogenous with the fungus gaining access through surface and invading the deeper tissues.

#### PAKISTAN

##### Comparative Toxicity of Some Organic Insecticides to Adults of Schistocerca gregaria (Forsk)

The experiments were carried out to undertake fresh evaluations of insecticides by topical application on neck-membrane of the Desert Locust adults.

Adults of the Desert Locust were field collected from Lasbella district in the months of June to November 1975, and were predominantly of solitary phase. The insecticides tested were fenitrothion, cidal, dieldrin, rogor, malathion and lindane and these were all technical grade samples.

In all cases, LD50 values were determined. Fenitrothion was observed to be the most toxic compound followed by cidal, dieldrin, rogor, malathion and lindane, in descending order.



APPENDIX III

TRUST FUND No. 9123

BUDGET FOR THE FIVE YEARS 1975-1979

BUDGET EXPRESSED ACCORDING TO FAO EXPENDITURE CODES

Code		1975	1976	1977	1978	1979	Total
10	<u>PERSONAL SERVICES</u>						
	Short-term experts	4,416	5,888	1,000	1,000	1,000	13,304
	Casual labour	461	15,310	1,000	1,000	1,000	18,771
20	<u>TRAVEL</u>						
	Sessions of Commission	2,078	1,028	5,000	5,000	5,000	18,106
	Consultants	1,299	846	2,000	2,000	2,000	8,145
	Survey teams	11,211	22,952	10,000	10,000	10,000	64,164
	Co-ordination	-	2,954	3,000	3,000	3,000	11,954
30	<u>CONTRACTUAL SERVICES</u>						
	Translation, printing	1,527	5,415	1,000	1,000	1,000	9,942
40	<u>GENERAL OPERATING EXPENSES</u>						
	Freight	267	-	1,000	1,000	1,000	3,267
	Incidentals	116	335	1,000	1,000	1,000	3,451
	POL, Transportation	-	104	2,000	2,000	2,000	6,104
50	<u>SUPPLIES AND MATERIALS</u>						
	Insecticides	-	-	10,000	10,000	10,000	30,000
	Other supplies	5,613	5,844	2,000	2,000	2,000	17,457
60	<u>EQUIPMENT</u>						
	Control equipment	-	-	-	-	-	-
	Transport "	-	-	-	-	-	-
	Radio "	21,680	22,270	15,000	15,000	15,000	88,950
	Survey "	-	-	-	-	-	-
	Reserves "	-	-	-	-	-	-
80	<u>FELLOWSHIPS AND GRANTS</u>						
	High-level fellowships	1,482	3,327	7,000	7,000	7,000	25,809
	Other fellowships	13,890	5,807	3,000	3,000	3,000	28,697
90	<u>PROJECT SERVICING COST</u>						
	5% of Codes 50 and 60						
	14% of Codes 10,20,30,40 & 80	6,509	10,361	6,530	6,530	6,530	36,460
	<u>UNALLOCATED</u>	901	-	920	920	920	3,661
	<b>TOTAL</b>	<b>71,450</b>	<b>102,441</b>	<b>71,450</b>	<b>71,450</b>	<b>71,450</b>	<b>388,242</b>

Note : As agreed by the Fifth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia, the budget should be regarded as flexible (subject to the overall limit of expenditure and to the type of activities specified), in that the amount allocated for a particular purpose may be increased or decreased at the discretion of FAO to meet the changing needs of the locust situation.



REGULAR PROGRAMME TRUST FUND

Trust Fund No. 9123.00 - International - Commission for  
Controlling the Desert Locust in the Eastern  
Region of its Distribution Area in  
South West Asia

Statement of Account as at 31 December 1975  
(expressed in US dollar equivalents)

Receipts

Balance as at 1 January 1975		230,837.29
Various Governments	71,869.81	
Interest credited	9,485.50	
<u>Less : Transfer to TF 9462.00</u>	<u>(50,000.00)</u>	<u>31,355.31</u>
		262,192.60

Deduct :

Cash Expenditure 1975

Personal Services	4,877.44	
Official Duty Travel	14,587.14	
Contractual Services	1,526.72	
General Operating Expenses	383.17	
Supplies and Materials	5,613.14	
Furniture and Equipment	21,680.16	
Acquisition and Improvement of Premises	-	
Fellowships, Grants and Contributions	15,372.34	
	<u>64,040.11</u>	

Project Servicing costs - 5% of supplies and equipments  
14% on other items

6,509.21

70,549.32

Balance as at 31 December 1975

191,643.28

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APPENDIX V

REGULAR PROGRAMME TRUST FUND

Trust Fund No. 9123.00 - International - Commission for  
Controlling the Desert Locust in the Eastern  
Region of its Distribution Area in  
South West Asia

Statement of Account as at 31 December 1976  
(expressed in US dollar equivalents)

Receipts

Balance as at 1 January 1976		191,643.28
Amount received from :		
Afghanistan	5,500.00	
India	20,250.00	
Iran	6,250.00	
Pakistan	25,050.00	
<u>Less : Transfer to TF 9462.00</u>	<u>(50,000.00)</u>	
Interest credited	4,590.39	11,640.39
		<u>203,283.67</u>

Deduct :

Cash Expenditure 1976

Personal Services	21,197.42
Official Duty Travel	27,779.95
Contractual Services	5,415.04
General Operating Expenses	439.33
Supplies and Materials	5,844.27
Furniture and Equipment	22,270.65
Acquisition and Improvement of Premises	-
Fellowships, Grants and Contributions	9,133.81
	<u>92,080.47</u>

Project Servicing Costs - 5% on codes 50/60  
14% on other items

10,360.92

102,441.39

Balance as at 31 December 1976

100,842.28

Commitments were incurred in 1976 which will be liquidated in 1977 in the order of approximately \$ 45,000.



SURVEY AND CONTROL POTENTIALS IN THE MEMBER COUNTRIES  
OF THE COMMISSION 1975/76

<u>AFGHANISTAN</u>	
<u>Title and full address</u>	Department of Plant Protection and Quarantine Ministry of Agriculture Kabul
<u>President</u>	Mr. Ali Mohammad/Mr. M. Arif Noury
<u>Director General</u>	Mr. Ghula, Rasool Yahyai
<u>Director</u>	Mr. Ali Ahmad Naikzada
<u>Technical Staff</u>	40
<u>Administrative Staff</u>	4
<u>Transport and General Services Staff</u>	15
<u>Number of Locust Outposts</u>	6
<u>Transport</u>	
Light	5
Heavy	1
<u>Ground Machinery</u>	
Power duster	1
Hand dusters	100
Exhaust nozzle sprayers	10
<u>Wireless Sets</u>	10
<u>INDIA</u>	
<u>Title and full address</u>	Directorate of Plant Protection, Quarantine & Storage (i) N.H. IV, Faridabad (Haryana) (ii) Room No. 409, Wing B, Shastri Bhavan, New Delhi
<u>Director</u>	Dr. S.N. Banerjee
<u>Assistant Director (Locust Control)</u>	Mr. M.V. Venkatesh
<u>Locust Entomologist</u>	Vacant
<u>Field Station for Investigations on Locusts, Bikaner</u>	
<u>Deputy Locust Entomologist In-charge Locust Sub-Station, Jodhpur</u>	Mr. Jaswant Singh
<u>Other Technical Personnel</u>	146
<u>Senior Administrative and Transport Staff</u>	8
<u>General Service Staff</u>	168



Number of Locust Outposts including circle and zonal headquarters 34

Transport

Light 91  
Heavy 47

Ground Machinery

Power sprayers 74  
Power dusters 162  
Hand dusters 8123  
Hand and foot sprayers 62  
Exhaust nozzle sprayers 18

Wireless Sets 52

Spray Aircraft

	<u>Rotary Wing</u>	<u>Fixed Wing</u>	<u>Total</u>
Public Sector	5	28	33
Private Sector	16	8	24

Insecticides

Liquid 21,568 litres  
Dust 1,036,463 kg.

Note : For cultivated areas, the States maintain their own stock of insecticide and power and hand operated equipment for locust control and plant protection work.

IRAN

Title and full address

Plant Protection and Quarantine Organization  
Park Way, Ave. Daneshgah Melli, Evin, Teheran

Director

Dr. A. Zomorrodi

Other Technical Staff 42

Senior Administrative and Transport Staff 4

General Service Staff 46

Number of Permanent Locust Outposts 6

Number of Auxiliary Locust Outposts 10

Transport

Light 100  
Heavy 15

Ground Machinery

Power sprayers 800  
Hand sprayers 1800  
Hand dusters 15  
Exhaust nozzle sprayers 12

Wireless Sets 16



Spray Aircraft

Super Piper Cubs	16
Cessna	3
Thrush Commander	18

Insecticides

Liquid	115,000 litres
BHC (dust)	49,000 kg.

**Note :** The above mentioned vehicles are used for both plant protection and locust control and survey in the southern part of Iran. If any unforeseen situation arises, the vehicles and equipment from other provinces can be used. The vehicles are mostly driven by the technical staff.

PAKISTAN

Title and full address

Department of Plant Protection  
Jinnah Avenue, Malir Halt, Karachi

Director

Mr. Farid Uddin Ahmad

Technical Staff

144

Administrative and General Service Staff 305

Transport

Light	144
Heavy	18

Ground Machinery

Power dusters	31
Hand dusters	146
Bait mixers	12
Exhaust nozzle sprayers	99

Wireless Sets

39

Spray aircraft

19

Insecticides

Liquid	114,000 litres
Dust	36,105 kg.



Number of Locust Outposts including  
circles and zonal headquarters

Transport

Light  
Heavy

SUMMARY

Afghanistan India Iran Pakistan Total

Staff

Technical	40	146	42	144	372
Non-Technical	19	176	50	305	550

Transport

Light vehicles	5	91	100	144	340
Heavy vehicles	1	47	15	18	81

Insecticide

Liquid (in 1000 litres)	-	21.5	115	114	250.5
Dust (in 1000 kg.)	-	1036.5	49	36	1121.5

Aircraft

	-	33	37	19	89
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Power driven ground machinery

	11	254	812	130	1207
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Hand driven ground machinery

	100	8185	1815	158	10258
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Wireless sets

	10	52	16	39	117
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FAO Reserve of Insecticide (in litres)

Bandar Abbas :	BHC ULV 15%	4,500
Bandar Abbad :	Acrodel	1,894.5
Kerman :	Acrodel	405
Zahedan :	Acrodel	10,935
Ahwaz :	Ensodil	7,155
Teheran :	Diazinon 95C	500
Karachi :	Dieldrin 20%	17,887.5

Note : FAO Reserve needs verification

Staff

Technical Staff	40	146	42	144	372
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Administrative and Transport Staff

	19	176	50	305	550
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Service Staff

	4	47	15	18	81
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Number of Permanent Locust Outposts

	10	91	100	144	340
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Number of Auxiliary Locust Outposts

	1	47	15	18	81
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Transport

Light	5	91	100	144	340
Heavy	1	47	15	18	81

Ground Machinery

Power sprayers	11	254	812	130	1207
Hand sprayers	100	8185	1815	158	10258
Hand dusters					
Exhaust nozzle sprayers					

Wireless Sets

	10	52	16	39	117
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APPENDIX VII

List of Working Papers

- |                  |   |   |
|------------------|---|---|
| AGP:DL/SWA/77/1  | - | Programme of Work and Budget - Trust Fund 9123  |
| AGP:DL/SWA/77/2  | - | The Desert Locust Situation during December 1975 to January 1977 and Forecast   |
| AGP:DL/SWA/77/3  | - | Desert Locust Survey and Control Activities carried out by the Member Countries during December 1975 to January 1977            |
| AGP:DL/SWA/77/4  | - | A Summary of the Desert Locust Research Work carried out during 1975-76 and Future Plans  |
| AGP:DL/SWA/77/5  | - | Fellowships and Training  |
| AGP:DL/SWA/77/6  | - | Monitoring of Pesticide Residues in areas sprayed for the Control of the Desert Locust  |
| AGP:DL/SWA/77/7  | - | Survey and Control Potentials in the Member Countries of the Commission 1975/1976   |
| AGP:DL/SWA/77/8  | - | Special Surveys   |
| AGP:DL/SWA/77/9  | - | Proposed Amendments to the Agreement for the Establishment of a Commission for Controlling the Desert Locust in South-West Asia |
| AGP:DL/SWA/77/10 | - | Pilot Project on the Application of Remote Sensing Techniques for Improving Desert Locust Survey and Control                    |