

REPORT OF THE

Held in Rome, Italy
23-27 October 1972

**SIXTEENTH SESSION OF
THE FAO DESERT LOCUST
CONTROL COMMITTEE**



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

REPORT OF THE
SIXTEENTH SESSION OF THE
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Rome, Italy
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Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, 1972

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INTRODUCTION

The Fifteenth Session of the FAO Desert Locust Control Committee, which was held in Rome from 20 to 24 September 1971, recommended (Report, para. 79) that its next session should be convened in October 1972 to be preceded by a three-day meeting of technical experts. Accordingly, the Director-General of FAO convened the session from 23 to 27 October 1972. He invited the following Governments to be represented by delegates at the Sixteenth Session:

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

He also invited representation of the United Nations Development Programme (UNDP) and the World Meteorological Organization (WMO). The League of Arab States, the Desert Locust Control Organization for Eastern Africa (DLCO-EA), the Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV) and the International African Migratory Locust Organization (OICMA) were invited as observers. In addition, he invited the following Governments and Organizations to send technical experts to take part in the three-day meeting which preceded the main session of the FAO Desert Locust Control Committee:

Arab Republic of Egypt	Morocco
Ethiopia	Sudan
France	United Kingdom
India	United States of America
Iran	

and DLCO-EA and OCLALAV.

The Session was opened by Mr. F. Albani, Director, Plant Production and Protection Division, who welcomed all the participants and briefly reviewed the subjects to be discussed and the action taken by FAO on the recommendations of the last Session. Mr. Albani pointed out that FAO had kept constant watch on the locust situation and provided assistance wherever adequate arrangements did not exist for carrying out survey and control operations. He appreciated the timely action taken by DLCO-EA and the Governments of Iran and Pakistan for controlling the infestation which otherwise would have developed into unmanageable proportions. He believed that this policy of controlling the locusts at its very early stage of build-up could help to keep the recession in being.

Officers of the Session

The Committee unanimously elected the following officers:

Chairman: Dr. G.K.A. Buahin (Ghana)

Vice-Chairman: Mr. A. Faizyar (Afghanistan)

Drafting Committee: Delegates of Algeria, India, Mali, Saudi Arabia and Sudan and the FAO Secretariat.

Messrs. Gurdas Singh, R.M. Skaf, S.S. Pruthi, A. Khasawneh, N. Mahjoub and Miss C. Hemsted of the FAO Secretariat served as Technical Secretaries.

Acknowledgments

At the close of the Session the delegates expressed their warmest appreciation of the courteous and tactful manner in which the Session had been conducted by the Chairman. The delegates also thanked the FAO Secretariat for the efficient way in which it had performed its various duties.

AGENDA

1. Opening of the Session
2. Election of the Chairman and Vice-Chairman
3. Adoption of the Agenda
4. Election of the Drafting Committee
5. The Desert Locust Situation during 1971/72 and Forecast
6. Anti-Locust Measures Undertaken by Various Countries and Regional Organizations (November 1971 to September 1972)
7. Consideration of the Report of the Technical Consultation
8. Progress Report on the Proposed Project for Training
9. Status of Various Desert Locust Regional Organizations:
 - (a) South-West Asia
 - (b) Near East
 - (c) Eastern Africa
 - (d) North-West Africa
 - (e) West Africa
10. Other Business
11. Date and Place of Next Session
12. Adoption of Report

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

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SUMMARY OF DISCUSSIONS

Desert Locust Situation from November 1971 to September 1972

1. The Committee had before it a summary of the Desert Locust situation prepared by the Desert Locust Information Service (DLIS). This was brought up-to-date by additional information supplied by delegates.

General Features

2. Very few locusts were found in the invasion area in the second half of 1971 and the first months of 1972. However, in the north of the Somali Democratic Republic an exceptional sequence of rain allowed the build-up of a population, which required control on a considerable scale. Similarly, in Oman exceptional rains allowed a steady build-up in numbers which resulted in some swarms. In the interior of the south-west of the Arabian Peninsula population increase had probably also occurred. In the spring breeding area of Iran and Pakistan control was required in June and in the following month. In early July a number of swarms invaded the Indo-Pakistan summer breeding area. The situation remained calm in the summer breeding area of Sudan and throughout western Africa.

South-West Asia

3. In south-west Asia breeding in the Indo-Pakistan summer breeding area was on a very limited scale. Rains were above average in the early part of the summer but below average from July onwards. The locust population decreased in late 1971 with the westward migration of adults to the spring breeding areas of Iran and Pakistan. Widespread and heavy rain fell in January, February and March, 1972 in south-eastern Iran and adjacent Pakistan. Conditions for breeding appeared ideal but the populations present at the beginning of the season were very small; extensive surveys in both countries in March found very few locusts. In Pakistan low density populations, some of which were breeding, were found in the south in the Dasht and Kulanch valleys and further north near Chagai and Dalbandin in April and May. Low density populations were also found in May in the Jiroft area of Iran and near Shorawak in Kandahar Province of Afghanistan. The June reports showed for the first time that breeding had led to a considerable increase in numbers in some areas; control began in the Chahbahar area of south-eastern Iran and in parts of the Dasht and Kulanch valleys and in the Kharan district of Pakistan. At the same time, breeding by low density populations was continuing in the Bandar Abbas and Jiroft areas of Iran and near Shorawak in Afghanistan. In early July there were three reports of swarms, one measuring 4 sq.km., from India and also a considerable rise in adults not in swarms which at one place were described as countless. There were more reports of swarms later in July and one in early August. Hopper bands were reported in the Las-Bela district and Mekran of Pakistan in August and early September, and some adult groups were formed. Control was carried out against these infestations. Elsewhere in the Indo-Pakistan summer breeding area a few hoppers and adults of the new generation had been reported. Substantial rain fell at some places in July and August and more rain fell in September, but on the whole conditions were stated to have been unfavourable for breeding.

Near East

4. In the Arabian peninsula very few locusts were found throughout the winter on the coastal plains of the west and south-west. Small scale breeding was reported from the southern Tihamah of Saudi Arabia in December 1971; large numbers of locusts were found on the coastal plain of the People's Democratic Republic of Yemen on several occasions but even here numbers were very low.

5. During the summer of 1972 there had been indications that a substantial population build-up had occurred in the south-west of the Arabian Peninsula particularly in the interior. In July several groups of adults were found in the interior of the People's Democratic Republic of Yemen on several occasions but even here numbers were very low.

5. During the summer of 1972 there had been indications that a substantial population build-up had occurred in the south-west of the Arabian Peninsula particularly in the interior. In July several groups of adults were found in the interior of the People's Democratic Republic of Yemen. In August, second to fifth instar hoppers in concentrations and some in bands were located in about 14 sq. kms. in Wadi Masip against which control was carried out. In August also a loose swarm was reported near wadi Hadramaut in the People's Democratic Republic of Yemen. This report was not confirmed but several adult groups were found in the same area. In the same month groups of adults and fledglings, some needing control, were found at a number of places in the Asir of Saudi Arabia and at places to the south and east. On the coastal plain itself there had already been substantial breeding in the People's Democratic Republic of Yemen requiring control of hopper bands both in September and early October. Also scattered locusts had been found on the Tihamah of the Yemen Arab Republic and on the southern Tihamah of Saudi Arabia.

6. A significant population build-up had occurred in the interior of Oman. A tropical storm in late December brought heavy rain to the southern part of Oman. Further rain occurred in parts of the interior in every month from January to April inclusive and there was yet more rain at the end of June and the beginning of July. A special survey was mounted in March to check on the situation but very few locusts were found then. However, during a further survey in May and June extensive areas infested with hopper bands and fledglings were discovered. The largest area infested exceeded 80 sq. km. and contained groups of day-flying locusts. In another area three medium-size hopper bands were found. Yet another survey was carried out in late July but very few locusts were discovered. It was possible that most of the population had formed into swarms. Some swarms might have formed and emigrated to India and Pakistan. However, most swarms probably persisted and bred in areas which were not inspected as in September there were reports of two swarms and also of adults at high density.

Eastern Africa

7. In eastern Africa scattered breeding on a very small scale occurred in the interior of Sudan in the summer of 1971. By October, that area was effectively clear and it was likely that the resulting adults had moved to the Red Sea coastal plains of Ethiopia where a few locusts were found in late 1971 and to the coastal plains of Sudan. Adults were found in the Ethiopia sector in January and February 1972 and in the Sudan sector in February and April, but in all cases numbers were very small. A few locusts were found in the south-eastern desert area of Egypt in May and June.

8. In the Somali Democratic Republic scattered adults were found in small numbers in the northern coastal plain in November and December 1971. The population increased steadily in the first six months of 1972. Substantial rain occurred in at least some parts of this area in every month from November 1971 to June 1972 which resulted in producing a number of generations. No locusts were found during surveys carried out in January, but in February survey teams found both fledglings and mature adults. Breeding continued in March and April. One area of 20 sq.km. contained concentrations of fourth and fifth instar hoppers and control was undertaken. In April scattered hoppers and adults were found to the north in the French Territory of the Afar and Issa Peoples. In mid May in the Somali Democratic Republic there were widespread reports of scattered mature locusts; later in the month concentrations of hoppers were controlled in the north-west of the area, while further east, hoppers were present including one infestation covering 18 sq.km. In June the numbers of locusts reported increased markedly and air and ground control was carried out in all the infested areas. In the first half of the month hopper bands, groups of hoppers and young adults were controlled in the north-west of the area; also between Bulhar and Karin where in all 1,700 sq.km. were infested and between Mait and Adado where the area infested was 65 sq.km. Inland in the Meleden area of Bosaso Province over 100 small hopper bands were controlled; a quarter were medium density and most of the remainder were thin density. This infestation spread over a total of 60 sq.km. Breeding in the northern Somali Democratic Republic was clearly on a large enough scale giving rise to small swarms but timely control prevented swarm formation. Some of the surviving adults had persisted on the coastal plain particularly the eastern part, but it was likely that some had migrated to inaccessible areas in the north-east of the Somali Democratic Republic.

Western Africa

9. In western Africa breeding in the summer of 1971 in the areas to the south of the Sahara desert was on a very small scale only. The largest numbers of locusts were in eastern Mauritania, but even here only scattered populations were found. Very few locusts were found elsewhere in Mauritania or in north-eastern Mali and north-western Niger, or in central Chad.
10. In February and March 1972, rain sufficient to produce satisfactory breeding conditions fell in parts of north-western Mauritania and Spanish Sahara. No breeding was discovered.
11. In central Algeria good breeding conditions existed in some areas in February following rain which flooded many wadis. Hoppers in small numbers were found in every month from March until June. The only locust populations of some importance reported in 1972 were at the South of Tassili des Ajjers near Djanet in June, hoppers and adults in an area of 10 ha. at a density of $5/m^2$ and to the South West of the Plateau of Tadmaït at In Belbel very persistent populations were observed from January to May which remained at a very low density in spite of reproduction. At the North of Mouydir in the maâder Amselha observation from December 1971 to May 1972 indicated that an adult population due to prolonged reproduction had resulted in a very heterogeneous generation in respect of age, development and behaviour; gregarizations had occurred with colour spots and change of behaviour in individuals. An early degregarization had resulted in a quick dispersion of bands and had made control operations unnecessary.
12. Breeding in the area south of the Sahara had been on a very small scale in 1972 with only small numbers of adults and hoppers being found in Mauritania, Mali and Niger.
13. In Libya a few adults were found in Fezzan in September 1972 and in the same month a mixed population of hoppers and adults was seen at south of Cidra (2900N-1750E) in Tripolitania.

Forecast

14. In India there was no significant summer breeding whereas in Pakistan breeding took place on a considerable scale particularly in Lasbella, Kharan and Mekran areas where effective control was carried out. As such from there only scattered adults were likely to invade the spring breeding areas of south-east Iran and adjacent Pakistan. However, it was just possible that southern Iran would be invaded by one or two swarms from Oman before the end of 1972. Probably more swarms and scattered adults from Oman would move south-westwards. The swarms could reach the coastal plain of the Somali Democratic Republic, but it was much more likely that they would invade the coastal plains of the south-west of the Arabian Peninsula. Those coastal plains would also be invaded by substantial numbers of adults from the interior of the south-west of the Peninsula.
15. It was just possible that a substantial population would appear in the near future in eastern and north-eastern parts of the Somali Democratic Republic and start to breed. Otherwise, large numbers of Desert Locusts were unlikely to be found anywhere in eastern Africa unless there were swarm invasions from Oman.
16. Locust numbers were so low in Western Africa and the chance of substantial invasions so small that it was unlikely that large infestations would occur even if there was successful breeding in the spring of 1973.
17. The only situation which gave cause for concern was that in the south-west of the Arabian Peninsula. The present situation was similar in many respects to that in late 1967. In fact the reports indicated a larger population in this area at the present than had been the case at the start of the last upsurge. Whether or not an upsurge would develop would depend mainly on the winter rainfall on the coastal plains of the south-west of the Arabian Peninsula and on the effectiveness of control measures against any populations which develop there.

Anti-Locust Measures undertaken by Various Countries and Regional Organizations
(November 1971 to September 1972)

18. Recession conditions continued during the second half of 1971. However, in a number of countries, sequences of rain at the end of 1971 and during 1972 had allowed small initial populations to build-up to potentially dangerous levels. Immediate control operations were carried out wherever necessary and swarm formation on any significant scale was prevented. The Committee noted with appreciation that timely action taken by various countries and regional organizations had averted the beginning of another upsurge. On the whole, 15,385 ha. of infestation of both adults and hoppers were treated by using 5,535 kg. of dust, 73,000 kg. of bait and 11,652 litres of liquid insecticides, details of which are given in Appendix I.

19. The Committee emphasized the need for continuous vigilance during the coming months particularly in the winter-spring breeding areas of the Arabian Peninsula, the western Red Sea coastal plains, Iran and Pakistan. It would also be necessary to keep adequate control resources in readiness to deal with large populations and possibly swarms.

Resources Available for Anti-locust Operations

20. The Committee, at its Twelfth Session, had requested FAO to keep under review the availability of anti-locust resources with the various national and regional organizations. Accordingly, the information was collected and is given in Appendix II.

Emergency Action undertaken in Oman

21. In Oman a tropical storm at the end of December, 1971 brought heavy rain in the southern part of the country. Further sequences of rain during the first half of 1972 had created most favourable ecological conditions for possible breeding. A special survey was arranged in March 1972 by Centre for Overseas Pest Research (COPR) at their own initiative to check the situation, but very few locusts were found. Further surveys in May and June revealed extensive areas infested with hoppers, hopper bands and fledglings. In view of these developments FAO organized another survey in July/August and simultaneously decided to make adequate arrangements for control operations. Two Land Rovers, two exhaust nozzle sprayers, 1975 litres of dieldrin and 750 litres of aldrin were immediately moved from Qatar to Muscat. At the same time, the Government of Saudi Arabia was informed of the situation and requested for assistance to Oman. It had a quick response and the Government sent two Land Rovers fitted with exhaust nozzle sprayers, four power dusters, fifteen tons of dieldrin and one hundred tons of BHC dust. The FAO Regional Locust Officer, Jeddah, visited the area in early August to assess the situation for further action. Arrangements were also made for the leader of the Pakistan team, working in the United Arab Emirates, to visit Oman in order to assist in survey and control operations. During the survey in August very few locusts were observed; it was possible that most of the population had formed into swarms and migrated to Pakistan and India.

22. The Committee noted with appreciation the speed with which FAO had taken action to assist Oman where no arrangements for survey and control existed. In particular, the Committee wanted to place on record their thanks to the Government of Saudi Arabia for their generous and prompt assistance, which is an excellent example of international cooperation in the fight against the Desert Locust.

23. The Committee noted with satisfaction that arrangements had been made to undertake surveys regularly in future in Oman under the aegis of the Commission for Controlling the Desert Locust in the Near East by sending survey units from Saudi Arabia and Kuwait. These units would work in close cooperation with the visiting Pakistan locust mission, which during the current year had been a great help in this respect. The Committee was very appreciative of the continuous interest and substantial assistance provided by the Government of Pakistan for survey and control in the strategically important breeding areas of the eastern Arabian Peninsula and hoped that this valuable contribution would be maintained in future.

Technical Matters

24. The Committee considered various technical matters which were discussed in detail by a group of experts prior to its Session and adopted the recommendations contained in paragraphs 25 - 37.

Desert Locust Information Service (DLIS)

25. The Fifteenth Session of the FAO Desert Locust Control Committee (Report, paras. 75 and 76) reviewed the present status of the DLIS and requested FAO to get the whole question further examined by a special Expert Consultation to be established for this purpose.

26. Accordingly, an Expert Consultation comprising representatives from various regional organizations and other interested Governments was established. The following were selected on the basis of the experience they had for their respective regions and one representative from West Africa to represent non-member Governments of OCLALAV:

South-West Asia	-	Dr. Heshamul Huque
Near East	-	Mr. M.S. Hassanein
Eastern Africa	-	Mr. Adefris Bellehu
North-West Africa	-	Mr. Mustapha Labiod
West Africa	-	(i) Mr. F.J. Sangaret (ii) Dr. G.K.A. Buahin (Ghana) to represent non-member Governments of OCLALAV in West Africa.

27. The Experts met in Rome on 17 and 18 April 1972 and considered the background paper on DLIS prepared by COPR, London, and various matters including the terms of reference. They visited COPR, London, from 19 to 21 April and again met in Rome from 24 to 25 April for finalizing their report.

28. The Experts, after considering the background information on DLIS, the various aspects of the present system of issuing locust situation summaries and forecast and noting the views expressed during discussions in London made the following recommendations:

- (a) The idea of the DLIS was conceived with a view to having a rapid exchange of information which is important for any preparatory action a Government is to take in view of the prevailing locust situation in its neighbouring areas. During recent years this exchange is more rapidly covered by the receipt of information directly from the regional headquarters and from the inter-regional exchange of information. At the same time such information is much more precise and wherever a forecast is made, it is without any qualifying terms like "probably", "possibly", etc. As such, the present system of issuing DLIS summaries from London has lost its usefulness to the countries concerned and it was suggested that the present arrangements between FAO and COPR would not be continued after June 1973. Instead, regional organizations/Commissions should fully take up this function in future.
- (b) The regional organizations/Commissions should undertake to continue preparing the monthly locust situation summaries for their respective regions and ensure their rapid distribution to the countries within their regions and other regional organizations. In case of important

developments the information should be communicated by telegrams or radio communication to all concerned. This system of direct exchange of information, although more efficient, needs certain improvements, in particular concerning its standard of forecasting, for which regional organizations should make increased use of daily weather charts available from their local meteorological offices. There is need for further training in correlating these data with the locust situation. It is also necessary that the locust situation summaries, as they are to be produced in future at the various regional headquarters, should have more detailed information than the present ones.

- (c) During the intervening period FAO should organize a training course for several candidates from various regional organizations to gain knowledge on correlation of meteorological and other ecological data with locust movements and displacements of solitary locust populations, and procedure concerning the preparation of summaries. This would help to improve the forecasting of future events and would facilitate issuing locust situation summaries on uniform basis at the various regional headquarters. Such a course should be financed from Trust Fund 161 and should take place well before the expiry date of the present arrangements for issuing DLIS summaries, i.e., before the end of June 1973.
- (d) The Experts considered that it would be useful if a consolidated monthly summary of the locust situation covering all the area be prepared by FAO headquarters on the basis of the reports received from the national and regional organizations. Such a summary should be subsequently circulated to all Member Governments in due course for any use they might like to make. The Experts noted that, although the six-monthly summary issued in the Newsletter served the same purpose, the above proposed monthly consolidated summary having comparatively more information might be useful.

29. The Committee, having given very careful consideration to the Report of the Expert Consultation, endorsed the above recommendations and requested FAO to take appropriate steps to implement them. The Committee placed on record its appreciation and thanks to the Members of the Expert Consultation for the detailed study they had made of the matter and preparation of appropriate recommendations. The Committee also wished to convey their thanks to the Director of COPR and his staff for their cooperation and assistance in providing necessary assistance to the Experts during their visit to London.

30. While agreeing to the above, the Committee recommended that it would be useful if the COPR could continue to maintain the record of the locust situation reports, even in future, and requested Governments and regional Desert Locust organizations concerned to continue to send to COPR copies of their locust situation reports as heretofore. Such information would be properly plotted on maps and kept at the COPR for use as research material and there would be free access to this material by any national and/or regional organization, the necessary arrangements being made through FAO. COPR would prepare a six-monthly locust situation summary for use by FAO and would also prepare any locust situation reports for FAO whenever the need arose. The Committee very much appreciated the statement made by the U.K. delegation that such a service would be provided free by COPR for a trial period of two years as of 1 July 1973.

31. The Committee also learnt with interest that COPR would help in training appropriate staff from the regional organizations, in correlation of meteorological and other ecological data with locust movements and displacements of locust populations and procedures concerning the preparation of summaries. This would be done by arranging a three to four weeks' course to be followed by subsequent visits of appropriate experts to

the field. COPR would, in due course, undertake the preparation of a series of forecasting manuals for use of the regional organizations/Commissions. Any additional cost to COPR in respect of the above would be met by FAO from Trust Fund 161.

32. The Committee emphasized the need for availability of past records of locust incidence at various regional headquarters to serve as background material to facilitate forecasting and future research, and requested FAO to discuss with COPR the ways and means of transferring to the regional headquarters and other interested countries copies of such records as might be considered necessary for the efficient functioning of the regional reporting and forecasting services. A report to this effect should be submitted to the Committee at its next session for consideration.

33. The Committee appreciated the services rendered by ALRC (now COPR) in issuing the locust situation and forecast summaries for the past three decades.

34. The Committee noted that COPR had continued to issue monthly locust situation summaries during 1971/72 and also kept FAO and the countries concerned informed of special locust developments through cables and letters, as appropriate.

Migration and Persistence of Non-Swarming Adult Desert Locust Populations

35. The Committee reviewed with interest the document presented by COPR on the above subject and noted that there was evidence to confirm that the non-swarming populations migrate from one area to another, and in certain cases such populations seemed to persist in their initial breeding areas throughout the year. It was, however, not precisely known what circumstances and situations caused either migration or persistence.

36. Noting the importance of non-swarming Desert Locust populations and their rapid multiplication under favourable ecological conditions, the Committee recognized the need for research on the factors affecting flight, migration and persistence of such populations and requested FAO to prepare a detailed programme for field studies on this subject. This work could best be carried out by the various field research stations and regional organizations which might be duly supported both by technical personnel and any additional equipment which might be needed. The cost of additional support envisaged should be charged to Trust Fund 161.

Training

37. The Committee noted with interest the information concerning the studies undertaken in France by FAO fellows under the regional Commission for the control of the Desert Locust in North-West Africa. Mr. Zitoune (Algeria) was concluding his doctorate 3ème cycle in Animal Biology (Entomology) in the Laboratory of Experimental Entomology and Ecophysiology at the Faculty of Sciences, Orsay. Mr. Hafraoui (Morocco), who had recently arrived in France, had commenced his studies in Entomology; he would also follow training on insecticides and spraying. The Committee was also informed about the establishment of a laboratory for undertaking trials on locust insecticides at the Institut National Agronomique de Paris-Grignon in cooperation with INRA and the Faculty of Sciences, Orsay. Insecticides manufacturers had been invited to offer new products for experimentation against locusts. This laboratory would also serve for training future fellows.

Progress Report on the Proposed Project for Training

38. The Committee, at its Fifteenth Session held in Rome in September 1971, had considered a draft project on training (Report, paras. 49-56), unanimously supported it and requested FAO to approach the UNDP for provision of funds. While agreeing to the need for future training on various aspects of the Desert Locust, some member countries requested FAO to explore the possibility of extending the scope of training to cover other locusts and crop pests as far as practicable. At the same Session the UNDP Representative had suggested that in view of the magnitude of the proposal, the present financial stringency regarding UNDP funds for regional and inter-regional projects, and the desirability of

reviewing in detail the relevance of past training experience to future requirements, the proposal might first be examined by an Expert Group. On the suggestion of the UNDP, an Expert Group was convened with the following terms of reference:

- (a) to review in detail the relevance of past training experience to future requirements;
- (b) to review the various subjects in which training had been requested with special reference to the latest developments in locust survey techniques and control policies;
- (c) to design a programme leading to self-sufficiency in future technical competence required for survey, control and research;
- (d) to examine the relationship of training in Desert Locust control and research with general plant protection activities.

39. The FAO/UNDP Expert Group met in Rome from 3 to 9 May 1972 and examined the whole programme in relation to future requirements. The group recommended that the scope of training should be broadened to include those aspects of pest survey and control closely akin to anti-locust activities, e.g., work on the safe and proper use of insecticides, pollution effects, maintenance and operation of application equipment, aerial survey and spraying, because such activity would better serve the needs of governments in both the Desert Locust and general pest control and in closer integration of the two. The original proposal was modified accordingly after careful consideration of justifications and objectives of future training. It was agreed that the first phase of the project should be for three years and followed by a second phase for another three years; this extension being subject to the results of a review towards the end of the initial period.

40. The Committee, after considering the report of the FAO/UNDP Expert Group (Appendix IV) unanimously endorsed its various recommendations and the revised programme with its extended scope of the training which, in their view was a technically sound and administratively well planned programme and met their requirements for training in general crop pests and desert locust control. It was pointed out that:

- (a) the programme was designed to cover needs for training which were of regional and inter-regional nature and were normally not covered under the country programmes;
- (b) the existing established institutions, although in very limited number, would be utilized to the extent possible in the countries concerned for implementation of the training programme, and this factor was taken into consideration while preparing the draft proposals;
- (c) the host governments, where training centres would be established, would provide lecture-rooms, office accommodation, other ancillary services, transport for field trips of trainees, some technical and administrative staff and also lecturers wherever possible. In the original programme submitted to the 15 Session of the FAO DLCC (Report AGP:DL/DLC/71/6) an amount of \$650,000 was shown towards this item. It was also pointed out that a part of the cost of high-level training should be met from Trust Funds (Appendix IV, para. 15).

41. The UNDP Representative, after referring to the considerable assistance provided since 1960 by the UNDP for desert locust work, and to the previous intimations given to the Committee that further substantial assistance was unlikely to be forthcoming, informed the Committee that the UNDP was not in a position to contribute to the training project on the scale proposed by the FAO/UNDP Expert Group. However, the UNDP was prepared

to examine a request for assistance towards such a training scheme, in the form of experts and possibly, equipment, if the cost of the trainees were met by the governments from the resources available to them, including their country IPFs. He also pointed out that the present UNDP programming quinquennium will end in 1976, at which time, it was hoped, the Governments would assume responsibility for the training programme. When it received the Governments' responses, the UNDP would consider the matter further in the light of the views expressed by the Committee at this Session and of UNDP assistance being provided for other desert locust work.

42. The delegates pointed out that proposed counterpart contributions of governments and from Trust Fund both in cash and kind were substantial and that each participating government had already a heavy expenditure in maintaining its national anti-locust activities; this clearly indicated the interest of governments and their active participation. The delegates felt it unlikely that their governments would be in a position to pay any additional contributions. It was suggested that FAO should explore with the Governments the possibility of their making any contribution towards this training project such as bearing the travel, subsistence, and related expenses of trainees attending the proposed courses. In this connection only such Governments should be approached who had not indicated clearly their position in this respect. It was also suggested that as far as practicable FAO might make preliminary enquiries concerning facilities to be made available by Governments at various proposed centres so that the project could become operational soon after its approval by the UNDP.

43. The Committee emphasized that the programme, as outlined in the report of the FAO/UNDP Expert Group, should be financed as a whole in order to ensure proper impact. In their view, it would be wasteful to organize a training programme if there was poor attendance, which in the light of previous experience would probably result if trainee expenses were not met from within the scheme.

44. However, the members of the Committee indicated that they would convey the UNDP proposal to their Governments for consideration. At the same time the Committee requested that the UNDP would for its part give further consideration to supporting the recommendations of the FAO/UNDP Expert Group and to investigate all possibilities for early implementation of the project.

Status of Various Desert Locust Regional Organisations

South-West Asia

45. The Eighth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia was held in Teheran from 3 to 6 June, 1972. This was preceded by a three days Session of its Executive Committee.

46. The Commission reviewed the Desert Locust situation within its Member Countries and the neighbouring areas and noted with satisfaction that no significant breeding was likely to occur in any of the Member Countries during the coming 1972 monsoon breeding season. It was, however, recommended that continuous vigilance should be maintained in all the potential breeding areas during the appropriate seasons. At the same time the Commission emphasized the need for controlling any significant populations wherever these might be noted. The Commission considered the report of its Executive Committee and endorsed its recommendation on research programmes and future training.

47. The Commission discussed the question of existing stocks of insecticides with the various national anti-locust services and its possible deterioration through storage and decided that insecticide should be tested every year for verification of its active ingredients and effectiveness and the containers should be replaced wherever necessary. In view of the present recession, it was recommended that the existing stocks of insecticides stored for desert locust control might be used for other pest control work but the Government concerned would replace the insecticide used by fresh stocks.

48. The Commission reviewed the work of the special surveys undertaken during 1971 and 1972 in Afghanistan and Iran and noted that the surveys had produced very useful information and decided to continue these in future. It was also noted that the previous surveys had helped in pinpointing some of the important locust habitats and the same required more detailed study by the survey teams. In their future programmes more time should be devoted to such habitats.

Near East

49. The Third Session of the Commission for Controlling the Desert Locust in the Near East was held in Amman from 29 July to 1 August and was preceded by a three days Session of its Executive Committee.

50. The Commission discussed the Locust situation in the Near East and expressed its concern about the breeding reported from Oman. It noted with satisfaction that FAO is taking appropriate steps to keep the situation under watch and making arrangements for possible control operations. Field research work carried-out within the region was discussed and plans were prepared for future research. Suitable candidates for advanced training were selected.

51. The Commission recognizing the wisdom of long-term planning approved a five-years programme of work and budget, i.e. for 1973/1977 and agreed to provide special assistance to the People's Democratic Republic of Yemen for normal operations and to Oman for establishing a nucleus anti-locust service.

52. The Committee learnt with interest that Governments of Oman and Saudi Arabia had decided to become members of the Commission for Controlling the Desert Locust in the Near East.

Eastern Africa (DLCO-EA)

53. The Seventeenth Regular Session of the DLCO Council was held in Mogadiscio from 31 May to 1 June, 1972 and was preceded by a two days meeting of its Technical Committee.

54. The Council discussed the locust situation in Eastern Africa with particular reference to the developments in the northern part of the Somali Republic, considered the annual report of the Director and approved the programme of work and budget of the Organisation for the year 1972/73. The DLCO-EA continued to operate with usual efficiency and maintained excellent relations with FAO in matters of common interest.

North-West Africa

55. The First Session of the Commission for Controlling the Desert Locust in North-West Africa was held in Algiers, Algeria from 27-30 March, 1972 and was attended by all the four Member Countries and by observers from France and OCLALAV.

56. The Commission considered the locust situation within the region and noted with satisfaction that based on the available information the locust situation in North-West Africa was not dangerous for any Member country of the Commission.

57. In view of the present comparatively quiet situation and the advisability of programming over several years, the Commission proposed the adoption of a future programme of work and project almost on the basis as that of 1972 for a further period of five years (1973-77).

58. The Commission noted with interest that Mr. Zitoune of Algeria and Mr. Izzy of Libya had been admitted in foreign Universities for high level training leading to Ph.D. degree and further agreed to award two fellowships, one each from Morocco and Tunisia for similar studies and requested FAO to take necessary steps to secure admission in appropriate Universities.

59. The Commission established an Executive Committee composed of one representative (preferably a locust specialist) from each of the four Members of the Commission and decided that the Committee, in addition to its normal functions, will be responsible for co-ordination of research programmes, survey and training activities within the region.

West Africa (OCLALAV)

60. The Annual Session of the Administrative Council of the OCLALAV took place from 10 to 13 July, 1972 and reviewed the activities of the Organisation for the past year and approved the programme of work and budget for 1972/1973. FAO continued to maintain close relations with OCLALAV and provided assistance in training the field staff. The Organisation (OCLALAV) maintained its usual high standard of efficiency in surveys and reporting and kept itself in readiness for any control operations.

Regional Officers

61. The Committee expressed its appreciation of the contributions made by the various Regional Locust Officers in coordinating the work of locust survey, control and field research within their respective regions and considered that the continuation of such posts was essential for the proper functioning of the Commissions.

62. The Committee expressed its gratitude to the UNDP for their continued interest in the Desert Locust work and for having extended up to 1973 the posts of two Regional Locust Officers under the Inter-Regional Desert Locust Project, and the post of the Regional Locust Officer for North-West Africa from 1973 to 1975. The Committee strongly recommended the continuation of these posts in future.

DATE AND PLACE OF NEXT SESSION

63. The Committee recommended that the Director-General of FAO should convene the next Session of the Committee possibly in October 1973, to be preceded by a three-day meeting of technical experts, at a place and date to be determined by him.

APPENDIX I

ANTI-LOCUST MEASURES UNDERTAKEN BY VARIOUS COUNTRIES AND REGIONAL ORGANIZATIONS (September 1971-September 1972)

Country	Period	Locality	Type of infestation	Area treated (ha.)	Insecticides used	
					Type	Quantity
S O U T H W E S T A S I A						
IRAN	June-July 72	Chahbahar	IV-V instar hoppers and fledglings	3,650	Dieltin sol. 15% and 20% Aldrin E.C. 40% BHC bait	600 l 25 l 51 tons
PAKISTAN	June 72 July	Kharan, Makran Kharan Lasbella	Hoppers	34	BHC 5% dust	127 kg
			Adults	18	Dieltin 25%	22 l
	July-August	"	Hopper bands	106	BHC 5% and 12% dust	293 kg
			Swarmlets	128	Dieltin 20%	144 l
	August August	Makran	Hoppers	53	BHC 5% dust	165 kg
Sept.	Makran	Hoppers	16	Dieltin 20%	5 l 18 l	
N E A R E A S T						
PEOPLE'S DEM. REPUBLIC OF YEMEN	August 72	Wadi Masip (1335-4653)	Hoppers & fledglings	1,200	BHC 10% dust Acrodel 15% Bait	1.5 tons 200 l 1 ton
	Sept. 72	Trayha, Ramlah, Swad, Wadhia, Ahwar	Hoppers	250	BHC 5% and 10% dust	3.2 tons
SAUDI ARABIA	Sept. 71		IV-V hoppers	375	Bait	1.2 tons
	August 72		Adults	2,580	BHC dust	0.250
N O R T H W E S T A F R I C A						
LIBYA	Sept. 72	Garet Khor Al-Giffa (South of Gidar)	Hoppers & adults	500	Dry bait	?

APPENDIX I (cont'd)

Country	Period	Locality	Type of infestation	Area treated (ha.)	Insecticides used	
					Type	Quantity
D L C O - E A						
SOMALI REPUBLIC	April 72	Northern coast	All instar hoppers	?	?	2,313 l
	June 72	" "	Hoppers & adults	6,475	BHC oil Dieldrin 20%	225 l
	July	" "	" "	?	?	8,100 l

APPENDIX II

Resources Available with Various National and Regional Organizations in 1972 for Desert Locust Control

COUNTRIES	PERSONNEL		EQUIPMENT				VEHICLES		INSECTICIDES		AIRCRAFT	ANNUAL	BUDGET
	Technical staff	General staff	Power dusters	Power sprayers	Hand dust & sprayers	Exhaust sprayers	Light	Medium and Heavy	Oil c. litres	Dust M.T. M.T.			
NEAR EAST													
Bahrain*	3	19	8	9	35	2	4	2	-	1	-	-	9
Iraq*	105	-	-	150	-	10	40	55	150	65	100	BD	50**
Israel	3	1	...	24	14	...	3	...	289	...	...	1st	57.6
Jordan*	82	35	5	351	35	3	15	6	54	80	200	JD	47
Kuwait*	33	10	25	29	20	13	13	14	129	80	-	KD	not ltd
Lebanon*	15	37	5	16	50	-	...	...	20	20	-	...	...
Qatar	1	3	-	-	-	-	-	3	18	8	25	D	1
Saudi Arabia	16	97	56	234	125	45	343	146	2700	800	2000	SR	3000
P.D.R. Yemen	18	16	3	-	104	16	6	2	182	70	200	US \$	9.7
Syrian A.R.	120	40	150	70	-	6	90	20	600	400	300	...	...
Turkey	62	68	105	-	-	-	62	6	-	250	-	...	...
U.A.R.	70	259	13	8	97	13	32	65	514	57	42	£EG	150
Yemen	32	-	2	4	-	12	9	6	50	48	40	YR	54
Total	560	585	372	895	480	120	617	325	4686	1859	2907		
EASTERN AFRICA													
Ethiopia	27	40	-	5	310	20	14	6	1620	305	-	ETH\$	620
Kenya	2	12	-	-	-	2	-	-	1000	-	-	...	...
Somali Rep.	51	29	-	51	10	12	18	6	106	10	50	So.Sh.	962
Sudan	174	763	250***	-	200	25	55	59	1090	2000	1000	Sc	300
Tanzania.	4	11	2	10	2	2	4	2	40	-	-	...	...
Uganda	4	11	4	12	2	2	4	1	50	-	-	...	...
DLCO-EA	42	142	-	-	50	122	93	29	4446	31	-	KE	320
Total	304	1008	256	78	574	185	188	103	8352	2346	1050		
NORTH-WEST AFRICA													
Algeria	...	...	55	44	350	-	66	121	7600	2500	3300	DA	14600
Libya	28	4	-	9	-	50	24	5	135	28	1000	L£	50
Morocco	16	67	27	14	36	-	93	120	27000	1713	3500	DH	4775
Tunisia	65	68	110	20	250	-	26	127	100	800	100	DT	700
Total	109	139	192	87	536	50	209	373	34835	5041	7900		
SOUTH-WEST ASIA													
Afghanistan	46	51	10	-	440	10	20	15	3.10	203	-	...	...
India	159	193	261***	-	9658	21	69	77	469	1318	-	Rupee	4490
Iran	43	39	-	440	571	50	89	9	252	50	-	...	...
Pakistan	141	305	-	321***	679	99	92	12	3759	262	-	...	...
Total	389	588	271	761	11348	180	270	113	4483.10	1833	-		
WEST AFRICA													
Gambia	30	-	-	4	31	-	1	1	-	-	-	CFA.	5000
Mauritania	15	52	-	15	70	5	9	-	-	15	-	Fr.M.	1756
Mali	5	-	-	-	235	-	-	-	-	19	-	CFA	21621
Senegal	2	6	-	3	300	10	1	22	700	500	-		
OCLALAV	28	157	-	4	-	39	71	110	10778	17	-	CFA	310000
Total	80	215	-	26	636	54	82	133	11478	551	-		

*Resources for pl. prot. & loc. cont. ** For loc. cont. only excl. personnel and allowances. *** For both dusting & Spraying

APPENDIX III

LIST OF WORKING PAPERS

- AGP:LCC/72/1 - The Desert Locust Situation and Forecast (Aug. 1971 to July 1972 inclusive)
- AGP:LCC/72/2 - Anti-Locust Measures Undertaken By Various Countries and Regional Organizations (September 1971 to September 1972)
- AGP:LCC/72/3 - Migration and Persistence of Non-Swarming Adult Desert Locusts (submitted by COPR, London)
- AGP:LCC/72/4 - Report of the Expert Consultation on Desert Locust Information Service (DLIS)
- AGP:LCC/72/5 - Report of the Technical Consultation
- AGP:LCC/72/6 - Status of Various Desert Locust Regional Organizations
- AGP:LCC/72/7 - Copy of letter No. INT/71/030 of 11.7.72 from UNDP, New York, to FAO concerning the proposed Training Project
- AGP:LCC/72/8 - Annual Report of the Work of the Desert Locust Information Service (DLIS) (submitted by COPR, London)
- AGP:DL-May 1972- Report on the FAO/UNDP Expert Group on Training in Crop Pest Control with Particular Reference to Desert Locust Control and Research.

APPENDIX IV

REPORT ON THE
FAO/UNDP EXPERT GROUP ON TRAINING IN CROP PEST CONTROL
WITH PARTICULAR REFERENCE TO DESERT LOCUST CONTROL AND RESEARCH

held in
Rome, Italy
3 to 9 May 1972

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INTRODUCTION

Background

In response to an obvious need and at the request of several countries the FAO of the United Nations became involved in the field of international anti-locust activity in 1951/1952, and has since played a major part in stimulating in many different ways, the cooperation between nations in order to develop Desert Locust control along more economical and effective lines on a regional and inter-regional scale.

From 1960 to 1970 funds were made available by the UNDP for a Project, the overall purpose of which was to develop more effective and less expensive control of the Desert Locust in order to relieve all affected countries of the economic burden of control operations and crop damage. This purpose was to be achieved by an international approach and strategy involving locust surveys, establishment of field research stations and reporting and forecasting services, training courses and operational research. It must be pointed out, however, that training constituted only a small part of this major international effort in Desert Locust control and research.

At the end of the Project activity was continued on a much smaller scale from an International Trust Fund established by FAO.

It was soon apparent, however, that the training needs within the vast area involved, i.e. covering about 11 million square miles and some 60 countries required more substantial effort than had been possible previously. In 1969 the DLCC began to study the question and requested FAO to prepare a follow-up study of the past training and estimates of future needs which would form the basis of a request to the UNDP for support. These draft proposals were discussed and unanimously supported by the DLCC in September 1971, a copy having previously been sent to the UNDP.

While agreeing to the need for future training on various aspects of the Desert Locust, some Member Countries requested FAO to explore the possibility of extending the scope of training to cover other locusts and crop pests as far as practicable. At the same meeting the UNDP Representative had suggested that in view of the magnitude of the proposal, the present financial stringency regarding UNDP funds for regional and inter-regional projects, and the desirability of reviewing in detail the relevance of past training experience to future requirements, the proposal might first be examined by an Expert Group.

Expert Group

On the suggestion of the UNDP an Expert Group was convened with the following members:

Dr. T. Ajibola Taylor (Consultant)	-	Professor of Entomology University of Ibadan, Nigeria.
Mr. C. Ashall (Consultant)	-	Deputy Director, COPR, London.
Mr. M.S. Hassanein (Consultant)	-	Director Locust Research, Dokki, Cairo.
Mr. James J. Berna	-	Senior Technical Adviser UNDP, New York.

Messrs. Gurdas Singh and J.M. Meyour of the FAO Secretariat acted as Technical Secretary and Resource Officer respectively.

Terms of Reference

The terms of reference of the Expert Group were as follows:

- a) To review in detail the relevance of past training experience to future requirements.
- b) To review the various subjects in which training has been requested with special reference to the latest developments in locust survey techniques and control policies.
- c) To design a programme leading to self sufficiency in future technical competence required for survey, control and research.
- d) To examine the relationship of training in Desert Locust control and research with general plant protection activities.

The Expert Group met in Rome from the 3 to 9 May 1972 under the Chairmanship of Professor T. Ajibola Taylor. The meeting was opened by Dr. Lee Ling, Deputy Director of the Plant Production and Protection Division of the FAO.

In an introductory statement the UNDP member explained that he had been instructed to inform the Group that the financial situation regarding inter-regional funds was very tight, and that UNDP saw little prospect of assistance being available for a large-scale programme. In any case, no assistance could be expected before 1974, and UNDP could make no definite commitments at this stage. The Group took note of this statement and considered it as part of the background for its discussions.

Acknowledgements

The Expert Group wished to acknowledge with thanks the excellent facilities placed at its disposal by the FAO.

DISCUSSIONS AND RECOMMENDATIONS

1. The Group examined the terms of reference in relation to defining the objectives of the new training programme. It was felt that the term Plant Protection in the proposed terms of reference covered too wide a field and might involve the programme in widely divergent fields such as nematode control, weed control, phytopathology and many others which apparently was not intended. The Group unanimously agreed that within the framework of the proposed training programme only general principles and methods of pest control can be meaningfully integrated with Desert Locust control and research. It was therefore decided to substitute the words "General pest control" for "plant protection" in the terms of reference.

2. It was felt that whilst there would inevitably be a considerable overlap in discussion of the various points to be considered under the terms of reference, an effort should be made to present an account of the discussions and recommendations as far as possible under headings derived from the terms of reference.

Review of the previous training programme in relation to future requirements

3. The Group reviewed in detail the past training experience. It concluded that the main objective of the previous training programme carried out under the UNDP-assisted Desert Locust Project was in some cases to establish, in others to strengthen and maintain, viable locust survey and control services within the Desert Locust area. For some countries it was necessary to provide personnel to start new survey and control units, and to replace expatriates who were leaving. It was also necessary in many places to provide essential training in new methods of locust survey and control. A total of 430 persons were trained throughout the project period.

4. It was noted that a follow-up study had been made by FAO with regard to those who received training over the past ten years. The study covered 366 persons who received training under following headings: Exchange visits (24); Aircraft maintenance (3); Aerial spraying (13); Short-term research (8); Training courses (171); Survey and control organization (94); Plant Protection and Locust Control (3); Locust meteorology (19); Long-term Technical Training (10); Radio maintenance (23). The Group noted with satisfaction that a large number of trainees were still engaged in Desert Locust research, survey and control and/or crop pest control work. From a discussion based on the knowledge and experience of the previous project, there was a clear indication that a high proportion of the officers concerned had acquired a far better understanding of the Desert Locust problem following their training and were consequently more able to perform their duties.

5. It was also recognized that the training programme conducted under the UNDP-assisted Desert Locust Project, had apart from training individuals in several aspects of anti-locust work, brought together many trainees and experts of various nationalities and experience. They were able to discuss their common problems thus creating a much closer under-

standing and prospect of greater co-operation between them. Many of those who were trained had previously only local experience and discovered during their training that the most important objective of all anti-locust work, that of preventing locust plagues, could only be achieved by an international co-operative effort using modern techniques rather than by continued adherence to older procedures in isolation.

6. Whilst accepting and appreciating such advantages deriving from the training aspects of the Project the Group felt that there were certain weaknesses in that programme. These were identified as follows:-

- a) The training courses were probably too long and run too much on classroom academic lines, which routine was probably necessary due to the large numbers involved.
- b) The bilingual courses were not entirely satisfactory because of difficulties of simultaneous translation in technical subjects, and some trainees were unfamiliar with either of the languages used.
- c) The level at which the lectures were given was in some cases pitched far too high for many of the trainees.
- d) The curriculum should probably have been more broadly based with fewer lecturers involved so as to allow for a better integrated approach and more continuity.
- e) Both for the courses and the fellowships categories of training there could have been better selection of candidates in relation to the standard of training being made available.

Justification and Objectives of Future Training

7. The Group agreed that there was certainly a need for a major training programme if a resilient framework for locust and pest control was to be sustained and the goal of self-sufficiency reached. It defined the following justification and objectives for such a training programme:

- a) To further strengthen and sustain organizations in order that they can play their full part in the international locust effort, including the training of new people to replace those who leave pest control organizations for various reasons.
- b) To provide a training basis for the integration of locust control with other pest control activities applicable to national requirements.
- c) To provide special training and experience for those who will be responsible for training their own regional, national or local locust and pest control teams.
- d) To provide in-service and refresher training opportunities to keep field workers up-to-date in modern techniques of survey and control resulting from research.
- e) To provide high-level scientific workers on whom the progress towards self-sufficiency will largely depend.
- f) To cover those key areas which for one reason or another had been completely left out in the previous training programme, e.g. Oman, Qatar, Spanish Sahara, Abu Dhabi

8. The Group felt that any future programme of training undertaken should be established with the following principles:

- a) Only single language courses should be undertaken.
- b) The scope of training should be broadened to include those aspects of pest survey and control closely akin to anti-locust activity, e.g. work on the safe and proper use of insecticides, pollution effects, maintenance and operation of application equipment, aerial survey and aerial spraying, because such activity would better serve the needs of governments in both Desert Locust and general crop pest control and in the closer integration of the two. It was at the same time recognized that the training in desert locust control and research and in general pest control could not be completely synchronised as the latter was often confined to national needs which vary from country to country. While the syllabus which had to be prepared for training in the desert locust could be the same for all countries, the programme for training in pest control had to be planned carefully keeping in view requirements that will have wide applicability. In order to meet the need of the governments who might like to train the same people for both desert locust and other pest control, it would be necessary to prepare courses in such a way so as to embrace both subjects to the maximum extent possible. For example, as mentioned above, subjects like insecticides, application machinery, aerial spraying and pest survey and control involving regional action could be profitably included in the programme. It was not considered practicable within the scope of this programme to train people to deal with every kind of pest. It was, however, recognized that different countries and regions have different pest problems and there could be need for preparing appropriate training programmes to meet their particular needs and approaches.
- c) The use of intensive practical in-service type training to stimulate and help other vital anti-locust activities such as survey in important areas where the necessary facilities for such activity are limited should be encouraged.
- d) Special emphasis and attention should be given to training which would enable those trained to train others in due course.
- e) The Group noted that in relation to future training, there was probably no need to cover some subjects which had been fully dealt with in the previous training programme but that printed information on such subjects could be made available to the countries and trainees wherever needed.

9. The Group considered that a balanced programme capable of achieving the above objectives should include Regional Training Courses, Group Fellowships and Individual Fellowships at both the intermediate and high-levels. The Group also examined the need for Advisory visits as another avenue of training and decided that such visits were essential in that they allowed experts to advise on specific problems in both research and control and would also ensure more

continuous utilization of the training centres and resources. The Experts concerned would also provide information for ensuring that the best use is being made of training received as well as that regarding future training needs.

Subject areas of training

10. It was agreed by the Group that in any future training programme the broad subject areas to be covered should be as follows:

- a) Biological/Ecological bases for improving strategy and techniques for the survey and control of locusts and other pests.
- b) Radio operation and maintenance.
- c) Aerial survey and spraying techniques.
- d) Tactics and strategy, including organization and administration of locust and other pest control activities.

Levels of training

11. The Group considered that there was a need for training at all levels of field officers, including managerial and research workers, with responsibility for locust and other crop pest control. The Group considered the various levels at which training was required and felt that for the Group Training Courses the type of student would be limited to Field Officers with some experience in locust and/or pest control. For the Group Fellowships the requirements would be for more senior officers responsible for field teams. For individual Fellowships both short and long term, the persons chosen will be those responsible for organization and administration of larger units engaged in pest control and for applied research work. This training could lead to candidates obtaining first or higher degrees.

Suggested Programme of Training

12. Following the above discussions the Group took up the question, as requested in the terms of reference, of designing a programme leading to self-sufficiency in technical competence. They examined various approaches, including the proposals contained in the FAO document AGP:DL/DLC/71/6. It was felt that a programme along the following lines should meet the needs:

A) Group Training Courses

(i) General Locust and Pest Control Course

Course contents:

Biological-ecological basis of Desert Locust control and certain other pests. Modern survey and control techniques on locusts and other pests, including aerial and ground survey; ground and aerial application of ultra-low volume (ULV) spraying in pest control; new techniques and standardization of methods of reporting and recording procedures; tactics and strategy of control,

including organization and administration of pest control campaigns; selection and proper and safe use of pesticides; selection use and maintenance of pest control equipment.

<u>Yearly</u>	<u>Particulars</u>		<u>Coverage</u>
1) Twice	Language: Duration: No.of trainees: Location:	ENGLISH 4-6 weeks 10 - 15 Teheran	Afghanistan, India, Iran, Pakistan
2) Twice	Language: Duration: No.of trainees: Location:	ENGLISH 4-6 weeks 15 - 20 Jeddah	Bahrain, Egypt, Iraq, Jordan, Kuwait, Libyan Arab Republic, People's Democratic Republic of Yemen, Qatar, Saudi Arabia, Syria, Yemen Arab Republic.
3) Once	Language: Duration: No.of trainees: Location:	ARABIC 4-6 weeks 20 (Jnr. field off.) Cairo	Bahrain, Jordan, Kuwait, Lebanon, Libyan Arab Republic, People's Democratic Republic of Yemen, Qatar, Saudi Arabia, Sudan, Syria, Yemen Arab Rep.
4) Once	Language: Duration: No.of trainees: Location:	ENGLISH 4-6 weeks 10 - 15 Nairobi	Ethiopia, Ghana, Kenya, Nigeria, Somali Republic, (French territory of Affars Issas), Tanzania, Uganda, Sudan, DLCO-EA
5) Twice	Language: Duration: No.of trainees: Location:	FRENCH 4-6 weeks 20 - 25 Dakar	Algeria, Cameroon, Central African Republic, Chad, Dahomey, Mali, Mauritania, Morocco, Niger, Spain, Tunisia, Upper Volta, Togo, Ivory Coast, OCLALAV.
(ii) <u>Radio Operation and Maintenance Course</u>			
6) Once	Language: Duration: No.of trainees: Location:	ENGLISH 3 months 10 Teheran	Afghanistan, Ethiopia, India, Iran, Iraq, Jordan, Libyan Arab Republic, Pakistan, Somali Republic, Sudan, Syrian Arab Republic, Arab Republic of Egypt, United Republic of Tanzania.
7) Once	Language: Duration: No.of trainees: Location:	ARABIC 3 months 10 Cairo	Bahrain, People's Democratic Republic of Yemen, Qatar, Saudi Arabia, Oman and Federation of Emirates, Yemen Arab Republic.
8) Once	Language: Duration: No.of trainees: Location:	FRENCH 3 months 10 Algeria	Algeria, Chad, Dahomey, Mali, Mauritania, Morocco, Niger, Spain, Tunisia.

(iii) Aerial Survey and Spraying Techniques Course

<u>Yearly</u>	<u>Particulars</u>	<u>Coverage</u>
9) Once	Language: ENGLISH/FRENCH Duration: 10 days No. of trainees: 15 (Pilots and Senior Officers) Location: Asmara/Sudan	Algeria, Ethiopia, India, Iran, Iraq, Jordan, Morocco, Pakistan, Sudan, Syrian Arab Republic, Tunisia, Turkey, Egypt, Nigeria, DLCO-SA, OCLALAV, OICMA.

B) Group Fellowships (Yearly)

1)	Language: ENGLISH Duration: 4- 6 weeks No. of trainees: 10 (in groups of five) Places to be visited: Jeddah, DLCO, FAO Rome, COPR and other institutes, Subject: Locust survey and control, reporting and forecasting and general pest control.	Afghanistan, Bahrain, Ethiopia, Ghana, India, Iran, Iraq, Jordan, Kenya, Kuwait, Libyan Arab Republic, Nigeria, Pakistan, People's Democratic Republic of Yemen, Qatar, Saudi Arabia, Somali Republic, Sudan, Syrian Arab Republic, Uganda, Arab Rep. of Egypt, United Republic of Tanzania, Yemen Arab Rep.
2)	Language: ARABIC Duration: 4-6 weeks No. of trainees: 18 (in groups of 4-5) Places to be visited: DLCO, Cairo, Dokki Subject: Locust survey and control reporting and forecasting and general pest control.	Bahrain, Jordan, Kuwait, Lebanon, Libyan Arab Rep., People's Democratic Rep. of Yemen, Saudi Arabia, Sudan, Syrian Arab Republic, Arab Republic of Egypt, Yemen Arab Republic.
3)	Language: FRENCH Duration: 4-6 weeks No. of trainees: 10 (in groups of 5) Places to be visited: Algeria, Morocco, OCLALAV, Paris, FAO Rome. Subject: Locust survey and control reporting and forecasting and general pest control.	Algeria, Cameroon, Central African Republic, Chad, Dahomey, Lebanon, Mali, Mauritania, Morocco, Niger, Spain, Tunisia, Turkey, Upper Volta.

C) Individual Short-Term Fellowships (Yearly)

	<u>Particulars</u>	<u>Coverage</u>
1)	Language: ENGLISH Duration: 3-12 months each No. of trainees: 12 Places to be visited: India, Pakistan, DLCO, U.K., Jeddah, Cairo Subject: Locust control and organization research, aircraft maintenance, survey and control, radio maintenance.	Afghanistan, India, Iran, Pakistan, Near East countries, Dem. Republic of Somalia, Uganda, DLCO, OICMA.
2)	Language: FRENCH Duration: 3 - 12 months No. of trainees: 3 Places to be visited: Dakar, France	French speaking countries in North and West Africa and OCLALAV, OICMA.

D) Individual Long-Term Fellowships

1)	Language: ENGLISH Duration: 1-3 years No. of trainees: 13 Places of study: Cairo, U.K., Ethiopia. Subjects: Plant Protection and Desert Locust research, aircraft maintenance, radio maintenance.	India, Pakistan, Jordan, People's Dem. Republic of Yemen, Saudi Arabia, Sudan, Syria, Egypt, Nigeria, Ghana, DLCO-EA.
2)	Language: FRENCH Duration: 2 years Place of study: France Subjects: Plant Protection and Desert Locust Research. No. of trainees: 4 - 5	Tunisia, Upper Volta, OCLALAV.

E) Training Seminar

The Experts were of the opinion that it would be very useful if necessary provision was made in the Project to hold a training seminar for senior management personnel, to discuss problems of administration and organization for locust and pest control.

13. In the light of the above programme the Group prepared budget estimates which are given in Appendix I and II.

Observations and Explanations regarding the suggested programme

14. The Group considered again whether in the interests of economy it would be advisable to organize bilingual courses, thus reducing the number of centres and training staff, but felt that past experience had shown the value of informal as well formal communication between teachers and students sharing a common language. It was, moreover, recognized that a few larger courses at fewer stations would result in unmanageable numbers of trainees, particularly as the new emphasis was going to be on practical and in-service training, requiring direct supervision.

15. The Group had already agreed that the creation of a nucleus of high-level personnel was essential if the entire programme was to lead to self-sufficiency. It is also this group of highly trained personnel that the programme could look up to for improvements in techniques, strategy and innovations in locust and pest control practices. Consideration was given to the advisability of meeting the costs of such high level training partly from the FAO Desert Locust Trust Funds of the various Regional Commissions. This could result in considerable reduction of the amount set aside in the original budget. Provision need only be made for 4 to 5 high-level trainees per year for those countries not covered under such Trust Fund arrangements which would amount to approximately \$45,000. It should be stressed that the Experts were not suggesting any decrease in the need for such high-level training, but, merely that the costs can perhaps be met from various other sources. The Group having considered the purposes for which various Trust Funds were established, decided that it would not be possible to meet any other costs of the proposed programme from such funds.

16. The Experts also considered the possibility of financing such training under the Country IPF, but were of the opinion that this was probably not a viable proposition. This is because there are many competing demands within countries for training in various fields of agricultural development. There is also a danger that governments may not give priority to providing funds for training personnel specifically for an international responsibility even though the country concerned may be a key one in the co-operative effort required against locusts and certain other pests. The Group felt that international responsibility is required in meeting the training needs for a problem which involves the common protection of several countries from agricultural pests.

17. In considering the training in Radio Maintenance the Group considered as an alternative to courses the appointment of a travelling radio officer. It was decided that such an appointment could supplement but not replace the training through courses where detailed instructions had to be given in specially equipped workshops. The Group noted that an efficiently operated and maintained radio network was a fundamental need in any international programme of control of migratory pests. The network already established is shown in Map 1.

18. With regard to the scale on which training is required, the Group considered that short of a complete manpower survey or visits by the Group to all countries concerned, it was not possible to establish precisely the number of persons who need to be trained. Many variables affect this, including different operational structures prevailing in individual countries; varying needs for integration of efforts in pest control activities; different magnitude of pest problems; and size of area involved. In these circumstances, it was felt that estimates of numbers requiring training could only be based on a careful examination of the requests from governments evaluated against the experts' own knowledge of the situation prevailing in the area. In the light of such evaluation and taking account of the large number of countries involved, plus the need for broadening the training to include other pest control, the Group felt that the numbers proposed in the above programme are reasonable. The programme would provide training over a period of six years for an average per country of 13 - 17 locust and pest control field officers; 3 radio officers; 1 - 2 aerial spraying personnel; 1 - 2 short-term individual fellowship trainees; and an average of one high-level trainee for every 3 countries in the Desert Locust Area.

19. The Experts emphasized the need for careful and judicious selection of trainees particularly for any long term high-level training fellowships, so that full benefit could be derived from the funds invested. Previous procedures for such scrutiny of candidates should be strengthened. It was felt this could be best achieved by making selection the responsibility of the project staff concerned. The Group decided that it would be necessary to properly follow up more closely the utilization of trainees on return to their respective countries, by means of advisory visits and ensuring that trainees continue to receive up-to-date technical information.

Administration and Organization

20. The Group having decided that a future training programme was necessary felt that this could best be given by making permanent arrangements for training at certain appropriate centres to be established within the regions concerned (Map 2). It was understood that for such centres host countries would make available the necessary accommodation and certain other local facilities. Demonstration equipment, camp equipment, audio-visual aids and some transport would be provided under the programme envisaged. These centres could also be used for organizing other pest control training which might be considered necessary by either national or regional Plant Protection Organizations. Sometimes according to the locust or other pest situation it might be necessary to extend the field training activity to other countries but this would often be possible from the regular training bases.

21. The Group examined the organizational and administrative requirements of the programme proposed and alternative ways by which it could be implemented. One possibility examined was that of organizing the programme on a regional basis throughout and by regional organizations like DLCO-EA and OCLALAV. It was, however, felt that while these Organizations could provide substantial counterpart assistance in kind e.g. aircraft, some transport and equipment, it was decided that these organizations with their present facilities, responsibilities, and available resources and staff would be most unlikely to be able to undertake a training programme of this magnitude. As a consequence, the Group considered that a

headquarters for the planning and coordination of the training programme was necessary. It agreed that Cairo would be a suitable and central place for such a headquarters, but stressed that this field headquarters should have the maximum possible autonomy in making arrangements for the various kinds of training.

22. Considering the complexity and volume of work involved in running such a project it was felt that there was a definite need for a Director of Training supported by three Technical Officers, each responsible for a particular language sector of the programme, but whose appointment could only be justified provided they undertook a large part of the actual training themselves, thus, avoiding excessive costs on temporary recruited training staff.

23. With regard to the administrative work involved it was felt that a great deal of this could be handled by the Technical Officers themselves and there was no need to make provision for a professional post of Administrative Officer. Certain duties, however, would require administrative support for which an Administrative Assistant was considered adequate. Further the Group attached importance to the need for Technical Assistants at the courses, but recommended that such staff could be provided by the host countries. The Group noted that participation of such Technical Assistants would be a form of valuable in-service training helping to build up technical and training competence within the regions.

24. Bearing in mind their emphasis on practical in-service type training the Group proposed reduction of the number of trainees attending any particular course to allow manageable numbers to be taken into the field. However, in order to cater for the number of candidates needing to be trained, this would involve increasing the number of courses available at certain centres. At the same time as mentioned above, the Group desired to retain maximum economy in the programme by limiting the number of temporarily recruited training staff. Therefore, the Training Officers proposed in the Project staff should be so selected that they will be capable of carrying out a large part of the training themselves. Consideration was given to the desirable duration of the proposed programme. The Group decided that in order to implement a programme whose objective was self-sufficiency in locust and other pest control activities in the countries concerned involving a vast area and including aspects of pest control other than locusts, six years was probably necessary. However, in the present financial circumstances and in view of rapidly changing technical developments in pest control it was suggested that the programme could be phased with an initial period of three years and with the possibility of extension for a further period; this extension being subject to the results of a review towards the end of the initial period.

25. The Group noted that the need for further training had been under consideration for about three years which has left a gap in the continuity of training. They, therefore, recommended an early implementation. The Group thought that such a programme could have a stimulating effect on overall training in the Desert Locust and other pest control field and improvement of pest control services, thus ensuring better utilization of the results of research and development.

26. The Experts emphasized the need for maintaining flexibility in carrying out such a programme and recommended that the Executing Agency be able to switch funds from one type of training activity to another, e.g. from training courses to advisory visits if the situation warranted such change. The UNDP would be kept informed of any major switch of funds from one heading to another.

27. In considering the relationship of the proposed training scheme to similar activity in the past by the UNDP it was felt by the Group that the new programme does not constitute a Phase 2 complement to the UNDP-Assisted Desert Locust Project which had, as previously mentioned only a relatively small part of its funds set aside for training. It should rather be viewed as a new project.

28. The Group emphasized the specific character of the Desert Locust and certain other pest problems, and that certain countries having most strategic breeding areas have not much to suffer in the form of crop losses and may not express direct interest or give high priority to locust control. However, it is in those very countries that it is necessary for the United Nations to arouse the Governments' interest in this work in order to have the areas kept under permanent surveillance and to take action if outbreaks occur, in the interests of other countries whose economy is mainly based on agriculture. The Group stressed that the above aspect of the problem should be borne in mind when assessing expression of support from the Governments.

29. The Group considered the programme outlined in this report an integrated and balanced programme for training in locust and pest control and would wish to see it implemented as a whole in order to ensure a proper impact. Should there be financial limitations, the Group considered that the first priority was the field Group Training Courses. However, a separate implementation of this aspect would considerably weaken the programme as a balanced approach towards self-sufficiency at all required levels.

Appendix I

Budget Estimate for the First Year

1) Project Personnel

A. Experts

Director of Training	12 m.m	\$ 30,000
Technical Officers (3)	36 m.m	90,000
Consultants	6 m.m	15,000

B. Administrative Support Personnel

Administrative Assistant (1)	12 m.m	\$ 8,500	
Clerk, Stenographer	24 m.m	15,000	
		<u> </u>	\$ 23,500
			<u>\$158,500</u>

2) Sub-contracts

- Personal Services	20,000
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3) Training

- Individual Fellowships	\$ 73,700
- High-level Fellowships	45,000
- Group Fellowship Study Tours	46,400
- Group Training Courses (including travel and subsistence of lecturers and trainees)	244,200
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	\$409,300

4) Equipment

- Laboratory equipment (to be purchased during 1st year)	\$ 20,000
- Audio, visual " " " " " "	20,000
- Radio Maintenance training equipment (to be purchased during 1st year)	15,000
- Survey and Control Demonstration (to be purchased during 1st year)	15,000
- Miscellaneous, transport, and camping equipment, etc. (purchased 1st year)	70,000
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	\$140,000

5) Sundry

- Reports)	
- Postal and Cable Charges	(7,000
- Contingencies)	

TOTAL Project Costs - \$734,800

Appendix II gives a summary of the project costs over the six years duration.

Appendix II

Budget Estimates for the Proposed Training Programme

	First Phase			Second Phase		
	1st year	2nd year	3rd year	4th year	5th year	6th year
1. <u>Project Personnel</u>						
Experts	135,000	135,000	135,000	135,000	135,000	135,000
Administrative Support Personnel	23,500	23,500	23,500	23,500	23,500	23,500
	158,500	158,500	158,500	158,500	158,500	158,500
2. <u>Sub-contracts</u>						
Personal Services	20,000	20,000	20,000	20,000	20,000	20,000
3. <u>Training</u>						
a) Group Training Courses	244,200	244,200	244,200	244,200	244,200	244,200
b) Group Fellowships	46,400	46,400	46,400	46,400	46,400	46,400
c) i. Individual Fellowships	73,700	73,700	73,700	73,700	73,700	73,700
ii. High-level Fellowships	45,000	45,000	45,000	45,000	45,000	45,000
d) Seminar	-	10,000	-	-	-	-
	409,300	419,300	409,300	409,300	409,300	409,300
4. <u>Equipment</u>						
Equipment and Supplies	140,000	-	-	5,000	5,000	-
5. <u>Sundry</u>						
Reports	2,000	2,000	2,000	2,000	2,000	2,000
Postal and Cable Charges	2,000	2,000	2,000	2,000	2,000	2,000
Contingencies	3,000	3,000	3,000	3,000	3,000	3,000
	7,000	7,000	7,000	7,000	7,000	7,000
TOTAL Project Costs -	734,800	604,800	594,800	599,800	599,800	594,800

N.B. Increased mandatory costs for experts, travel and tuition which may be expected over the six years, are not included.

\$1,934,400
\$3,728,800

TOTAL for 3 years -
TOTAL for 6 years -

