

Meeting Report
No. PL:1969/M/5

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

Held in
Rome, Italy
from
6 to 10 October 1969

Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Rome, 1969

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INTRODUCTION

The Twelfth Session of the FAO Desert Locust Control Committee, which was held in Rome from 7 to 11 October 1968, recommended (Report, para. 104) that its next Session should be convened by the Director-General during October 1969. Accordingly, the Director-General invited the following Governments to be represented by delegates at the Thirteenth Session:

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

He also invited the representation of the United Nations Development Programme (UNDP), the World Meteorological Organization (WMO), the International Telecommunications Union (ITU), and invited the People's Republic of Southern Yemen, 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) to be represented by observers.

The Session was opened by Dr. O.E. Fischnich, Assistant Director-General, Agriculture Department, who, on behalf of the Director-General of FAO, welcomed the participants and emphasized the importance of the matters to be discussed. He congratulated the countries concerned for their concerted action in bringing the Desert Locust plague under control. He, however, warned the participants that this did not allow for any relaxation and stressed the need to continue to keep a constant watch on all areas and to make necessary arrangements to meet any eventuality. He pointed out that apart from various other matters the Committee should give its serious consideration to the proposals put up by FAO on the Long-Term Strategy of Desert Locust Control.

Officers of the Session

The Committee unanimously elected the following officers:

Chairman: Mr. Mas'Ud Taji El-Faruki (Saudi Arabia)

Vice-Chairman: Mr. Heshamul Huque (Pakistan)

Drafting Committee

Delegates of: Ethiopia, France, India, Mali, Tunisia, the United Arab Republic, the FAO Consultant and the FAO Secretariat.

Mr. Gurdas Singh, Mr. R.M. Skaf, Mr. M.F. Leheta, Mr. P. Tirot, Mr. S.S. Pruthi and Mr. A. Khasawneh of the FAO Secretariat served as Technical Secretaries.

Acknowledgements

The Committee unanimously expressed their thanks to the Chairman for the patience, skill and enduring good humour with which he had conducted its deliberations. The Committee wished to record their warmest appreciation of the most valuable services rendered by Dr. K. Lubani during his assignment with the UNDP(SF) Desert Locust Project. The delegates also thanked the members of the Drafting Committee and the FAO Secretariat for the way in which they had performed their various duties.

PARTICIPATION IN THE SESSION

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

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AGENDA

The Committee unanimously adopted the following 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 1968/69 and forecast
6. Progress report of the UNDP(SF) further assisted Desert Locust Project (1.5.68 to 30.4.69)
7. Anti-locust measures undertaken by various countries and regional organizations (November 1968 to September 1969)
8. Matters arising out of the Twelfth Session of the FAO Desert Locust Control Committee:
 - (a) Director-General's appeal for assistance and response of various donors
 - (b) Resources for Desert Locust control available with various countries and organizations, and intergovernmental assistance
 - (c) Crop damage
 - (d) Long-term strategy for Desert Locust control
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. International anti-locust campaign in the Arabian Peninsula during 1968/69 and plans for the future
11. Other business
12. Date and place of next session
13. Adoption of report.

SUMMARY OF DISCUSSIONS

Desert Locust Situation

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 information supplied by the delegates.

General Features from October 1968 to September 1969

2. During September and October 1968 many swarms existed in Sudan, Ethiopia, northern Somali Republic and the south-western part of the Arabian Peninsula and, at that time, it seemed likely that a plague capable of lasting many years had become firmly established. Energetic control operations were undertaken in all the infested areas. These operations were the chief cause of the decline in locust numbers and had contributed to the present situation, when no swarms or bands were known to exist.

South-West Asia

3. There was effective control followed by inadequate rainfall in the summer of 1968 in the monsoon breeding areas of India and Pakistan, with the result that virtually no locusts escaped. Since then, the locust situation in these countries as well as in Afghanistan and Iran had continued to be calm. The only locusts reported in 1969 in the spring breeding area were from Mekran, Pakistan, in April and three low density infestations in Afghanistan in May. Isolated adults were reported from a few places in Rajasthan, India, during July, August and September 1969 and solitary hoppers were found during late August and in September. In Pakistan, isolated locusts were reported in Bahawalpur during July, and in Pasni in August 1969.

Near East

4. In Southern Yemen, a ground control campaign was mounted during October and November 1968 against hopper bands within a total area of 1,800 square kilometres. No swarms or important populations which could be linked with this breeding were reported though adults, mainly at low densities, were reported in December 1968, January, February, May and June 1969. On 14 July a small swarm was reported in the south-western part of Southern Yemen but could not be confirmed. In August, isolated locusts were seen at two places in the west of Southern Yemen, and also on the Tihama of the Yemen Arab Republic.

5. On the Tihama of Saudi Arabia, laying groups and a hopper band were found east of Jeddah in December 1968, together with a few further bands in the same area in January and early February. In addition, adults in small numbers were found on the Tihama in every month from November 1968 to March 1969. Following heavy spring rains, breeding took place on the central and northern Tihama. Large-scale aerial control operations were carried out in March and early April which virtually eliminated existing populations on the central Tihama; without this control, one or two small swarms would probably have been formed. During April 1969, 675 square kilometres of hoppers and fledglings were controlled in the northern Tihama of Saudi Arabia by ground operations and on 26 April, small fledgling swarms were found and controlled in the Yenbo and Umlajj areas.

6. A large number of swarms, most of which were mature, were reported in October, November and early December 1968 in the south-eastern areas of the United Arab Republic. Control was carried out against these swarms, the subsequent hopper infestations and the surviving adults from November 1968 until early January 1969. A small swarm was controlled in this area in May 1969 and groups of hoppers were

controlled in April. No other country in the Near East was infested with any significant population during the period under review.

Eastern Africa

7. During September the swarms in eastern Africa were concentrated in two main areas; the first of these was in eastern Ethiopia and northern Somali Republic, and the second in northern Ethiopia and Kassala province of Sudan.

8. In October a total of 43 swarm reports were received from northern Ethiopia, the region of the Sudan border with northern Ethiopia and the Red Sea coastal plains. Swarm control was conducted in northern Ethiopia; about 150 square kilometres of swarms were sprayed from the air in the region of Keren using over 25,000 litres of insecticide. In addition, 25 swarm reports were received from Somali Republic, mostly from the northern region; most of these swarms were moving southwards towards the Ogaden of eastern Ethiopia. The survivors from summer breeding in northern Ethiopia migrated towards eastern Ethiopia. In Ethiopia and Somali Republic during October there were in all 59 reports of swarms covering an area of 475 square kilometres.

9. Rain on the Red Sea coastal plains of Ethiopia and Sudan in November rendered those areas suitable for breeding. Rain in significant amounts also fell in eastern Ethiopia and northern Somali Republic. Only small scale dispersed adult infestations and breeding occurred on the Red Sea coastal plains in November with the exception of a small swarm reported near Karora and two reports of mature swarms near Khor Ashat. However, in the northern region of the Somali Republic and in south-eastern Ethiopia wide-scale breeding occurred; 500 hopper bands were found and controlled, and there were four reports of mature swarms. In addition, in November, there were eight swarm reports from the Railway Area of Ethiopia, though no swarms could be discovered during subsequent aerial surveys. It was likely that most of the swarms dispersed and migrated eastwards into the Ogaden. However, a low density swarm seen at a point 100 kilometres north of Addis Ababa may have been derived from the populations reported in the Railway Area.

10. During the first fortnight of January, 24 swarm reports were received from south-eastern Ethiopia and northern Somali Republic. Most of the swarms were stated to be flying west north westwards. This direction of migration was the consequence of a lack of the usual northerly component in the wind. By 20 January the number of swarms had greatly decreased and the direction of movement had changed, resulting in an invasion of the Djigjiga, Dire Dawa areas, and the region south of Gabredare.

11. Between 1 and 15 January a total of 33 reports were received from northern Somali Republic and eastern Ethiopia, of young swarms covering approximately 500 square kilometres, and intensive aerial survey and control was organized. Ground control against late instar hopper bands and fledglings also continued until 25 January 1969. Subsequently, eastern Africa had been free from any serious locust infestations; there had been only small scale breeding and some unconfirmed reports of swarms.

12. The present quiet situation in eastern Africa could be largely attributed to the effective and extensive survey and control undertaken not only in eastern Africa but also in other parts of the invasion area.

Western Africa

13. In late September 1968, immature swarms began to move westwards through Chad and in the following month through Niger, Mali and southern Algeria. Some of these swarms invaded Mauritania and Spanish Sahara but almost all eventually reached southern Morocco. A swarm moved westward across northern Nigeria during November and December 1968 but probably did not survive and lay.

14. Breeding by adults not in swarms, surviving from spring breeding within western Africa, occurred in October and November 1968 in north-eastern Mali and north-western Niger. The control campaign in Mali and Niger was stated to have prevented swarm formation. Adults in very small numbers were found in Mali and Niger until February 1969. Breeding in these countries in the summer of 1969 had been on a small scale with the largest infestations being found in July in the Adrar des Iforas in Mali, where about 700 hectares of hoppers were treated. Up to the end of September numerous captures of solitary adults and hoppers were made there. Some small swarms were reported in north-western and western Mauritania in late December; subsequently only low density infestations were found in this area but these persisted until August 1969. Dispersed breeding over a large area had occurred during the summer of 1969 in southern Mauritania. The densest infestations of hoppers and solitary fledglings were controlled at the end of August and in early September over approximately 6,000 hectares. In the overall area of the Sahelian Sahara of west Africa ecological conditions remained favourable for breeding.

North-Western Africa

15. Control against fledglings and hoppers including some bands was carried out at a number of places in southern Algeria in November and early December 1968. Many swarms were found at that time in the Sahara of north-western Algeria but these probably moved west into Morocco. In Morocco, numerous small and medium-sized swarms were successfully controlled by aerial spraying during the months of October, November and December 1968. Two swarms were reported from Spanish Sahara and four small swarms from northern Mauritania during November 1968.

16. By the end of 1968 there had been a dramatic decline in the number of reports of locusts in north-western Africa. In southern Morocco, swarms were still being reported in January, but these were all small in size. Spring breeding was on a small scale; the only reported infestations were two hopper bands in March, groups of immature adults and III and IV instar hoppers in April and one small swarm, which was stated to have dispersed and scattered, in May. Two solitaricolour adults were captured at Ait Melloul in August 1969. In Algeria, low density populations of adults were found in north-western Sahara of Algeria near the Moroccan border in April and May 1969. In central and southern Algeria adults at very low densities were found in the spring of 1969 until late July and breeding on a small scale took place north-west of the Ahaggar mountains in August.

Forecast

17. Locusts had started to leave the summer breeding areas and this movement would continue. However, in many summer breeding areas scattered populations would persist though this persistence was of no immediate importance.

18. In western Africa, adults, probably in dispersed formation but possibly including one or two small swarms, would soon invade Spanish Sahara, north-western Mauritania and possibly the area of the border of southern Morocco and Algeria. Some swarms might reach southern Morocco. Only locusts invading Spanish Sahara might breed in the near future. Dispersed adults would move in the near future into southern and central Algeria and possibly breed in some of the wadis draining from the Ahaggar mountains. Breeding on a small scale might be occurring or might commence in some parts of the northern half of Chad.

19. In eastern Africa, locust adults in small numbers would invade parts of the Red Sea coastal plains of Ethiopia, Sudan and possibly south-eastern United Arab Republic. Breeding on a small scale was likely to take place in the Ethiopian coastal plain and southern sector of the Sudan coastal plain, and would possibly occur on the other more northern parts of the coastal plain. Locusts in very small numbers were likely to

occur and breed in the Borama and Silil areas of north-western Somali Republic. It was just possible that small swarms invaded northern Somali Republic in August. If this were the case they would soon move into south-eastern Ethiopia and adjacent areas, and breed there.

20. In the Arabian Peninsula, dispersed breeding on a very small scale was likely to occur in parts of the coastal plain of Southern Yemen, the Tihama of Yemen and the southern Tihama of Saudi Arabia, in the near future. Breeding on a similar scale might be occurring in parts of the interior of the south-west of the Arabian Peninsula and might have taken place in the interior of Muscat and Oman.

21. Breeding, which had been on a negligible scale, was coming to an end in the summer breeding areas of India and Pakistan. Scattered adults in very small numbers would have begun to move westwards into Baluchistan of Iran and Pakistan.

22. It was unlikely that any large gregariously behaving populations now existed. However, if there was successful breeding in the coming winter and spring, it was possible that some bands and swarms would be produced. These populations were very unlikely to be large enough to cause significant crop loss but could represent a potentially dangerous situation.

Special Features

23. The Committee discussed the possible reasons for the decline of the locust situation and was of the opinion that on the basis of the available information, while it was difficult to draw any precise conclusions on the subject, it was considered that the effective and well coordinated control operations undertaken in all the infested areas, particularly in eastern Africa, Saudi Arabia, Morocco and United Arab Republic, using the most modern techniques, had played an important role in bringing about the reduction of the plague to the present level. The Committee, however, requested FAO to collect all possible information on the various factors responsible for this decline and to circulate it to the member countries for their consideration and comments.

24. The Committee, recognizing the potential importance of the scattered populations and the danger of their build-up into major infestations as happened in early 1968, emphasized that the present situation did not allow for any relaxation of effort and recommended that a maximum degree of sustained vigilance should be maintained in the appropriate seasons and areas. At the same time, noting that timely and effective control operations could play an important part in checking a plague, the Committee recommended that all governments and regional organizations should take adequate measures to ensure control of any future infestations even those not of immediate economic importance.

Progress Report of the UNDP(SF) Further Assisted Desert Locust Project

25. The Committee reviewed the progress report from 1 May 1968 to 30 April 1969 on the above project. A summary of the main activities undertaken during the period under review is given in paras. 26 to 48 below.

Reporting and Forecasting

National

26. During the year ending 30 April 1969 the Radio Communications Officer spent about 220 days on visits to 12 different countries. In the case of certain countries, namely: Afghanistan, Algeria, People's Republic of Southern Yemen and the Yemen Arab Republic, it was found that the equipment originally requested by the Government was inadequate to establish an effective network covering their respective areas and

additional equipment was ordered for such countries and also for some of the countries having a more extensive area to cover, e.g. Mauritania, Saudi Arabia and the United Arab Republic. By April 1969 installation was complete and sets were operating satisfactorily in Chad, India, Iran, Iraq, Israel, Jordan, Libya, Mauritania, Niger, Pakistan, Sudan and Tunisia, but further visits were needed to the remaining 11 countries.

Desert Locust Information Service (DLIS)

27. The Desert Locust Information Service (DLIS) continued to provide regular information and forecasts to participating governments and organizations. According to the recommendation of the Twelfth Session of the FAO Desert Locust Control Committee, a circular regarding proposals for modifications of symbols for the DLIS summaries was sent to all member countries and organizations for their approval. After having received favourable replies from most governments, new symbols were applied on the DLIS maps as from April 1969.

Meteorological and Climatic Studies

28. The wind studies in eastern Africa and India (Anti-Locust Climatic Manual, Report No. UNDP(SF)DL/RFS/7-A.3 and 4) were published and the information for the number of days of rain of 10 mm. for the entire Desert Locust area was complete and the maps were being prepared for publication.

Survey and Reconnaissance

29. Under this chapter provision was made for surveys of approximately ten weeks each in 1968 and again in 1969 in five main regions in cooperation and with the participation of the national and regional organizations concerned. The following surveys were undertaken:

<u>Date</u>	<u>Area</u>	<u>Participating Teams</u>
April-June 1968	South-west Afghanistan	Afghanistan and India
August-October 1968	(Southern Algeria	Algeria
	(North-west Niger	OCLALAV
November 1968	Algeria-Niger-Chad	Algeria and OCLALAV
December-January 1969	Red Sea coast of Ethiopia	DLCO-EA
	Red Sea coast of Sudan	Sudan
January-March 1969	Southern Tihama of S. Arabia	Saudi Arabia
February-March 1969	South-west Iran	Iran and Pakistan
April-June 1969	South-west Afghanistan	Afghanistan and India

30. It was noted that special surveys of the important areas were being carried out in cooperation and with the participation of national and regional organizations in as economical a manner as possible. The surveys undoubtedly provided extremely valuable information.

31. The report of the south-west Afghanistan survey of April-June 1968 was published and circulated, and the other reports were in press.

Inter-Regional Officers

32. Provision was also included under the Survey and Reconnaissance chapter for the two outposted officers based in Beirut and Dakar for the purpose of coordinating and reinforcing regional programmes. Dr. Khalil Lubani was transferred from Rome to Beirut

in May 1968 and Mr. Pascal Tirot was released by the Government of France to take up his appointment in Dakar in August 1968. The wisdom of establishing these field posts was amply justified when the locust plague reached its peak, and liaison, not only between regions but also between countries, became more important. Both officers were available to travel at short notice when and where required and kept the FAO headquarters well informed of the developments, on the basis of which the overall situation was followed more closely and counter measures arranged.

33. The outposted officers also concerned themselves with long-term issues in anticipation of the situation after conclusion of the UNDP(SF) Desert Locust Project in 1970. It was in no small way that, due to their endeavours, the FAO Commission for Controlling the Desert Locust in the Near East held its first session in Baghdad, in February 1969, with representatives from 12 governments attending, and that the third session of the FAO North-West African Research and Control Coordination Sub-Committee, held in Tripoli from 2 to 5 June 1969, requested the Director-General to take steps for the establishment of a similar commission for north-west Africa. In the course of visits to different countries, problems were examined in more detail than had been possible otherwise, and useful work was done in the disposal or replacement of unsuitable equipment at the research stations and elsewhere. The Committee appreciated that both regional officers provided a valuable link between FAO headquarters and the national and regional locust organizations. The Committee recommended that these officers should include in their activities assistance in the coordination of work programmes of the field research stations within their respective areas.

Research

Coordination of Field Research

34. The Consultation on Desert Locust Field Research was held in Beirut, Lebanon, from 25 to 27 March 1969, in which 28 experts from various countries including FAO staff members participated. The Group of experts, having considered the report on the Desert Locust Field Research Stations and Coordination of Research (No. UNDP(SF)DL/M/10, August 1968) decided that it was not possible to consider the programme of work of each field research station individually and agreed that this could best be done at the annual meetings of the various regional bodies. Accordingly, it was decided to consider only such aspects of research as could be undertaken at regional and inter-regional levels, and the manner in which such programmes could be coordinated.

35. The Group of experts discussed in detail coordination of field research between the various regions and modified the recommendations in the report referred to above to suit the requirements of various regions in view of the changed locust situation. At the same time, the Group considered the inter-regional coordination of field research covering the entire distribution area of the Desert Locust and approved in general the recommendations contained in paras. 195 to 213 of the report UNDP(SF)DL/M/10 with certain amendments.

36. The Group of experts also considered the question of detection of Desert Locust by application of aerial photography and was of the opinion that this method of detection had a great scope and FAO should undertake further trials to ascertain if it could be applied. While implementing this project, consideration should be given to the behaviour of the solitary-living populations. The Committee noted that there would be a report on the aerial photography trial on the agenda of the technical meeting to precede the next FAO Desert Locust Control Committee (para. 96) and that it might also be possible that this report might be accompanied with material related to other matters of remote sensing.

Insecticide Spraying Trials

37. Laboratory trials had shown that dichlorvos (DDVP), although volatile, might well prove useful for locust control if applied under suitable conditions. Accordingly, field trials were undertaken in collaboration with the Government of Morocco and the Anti-Locust Research Centre. The results of the trials showed that dichlorvos was effective in controlling settled locust swarms. The kills were comparable with those of other compounds which had been used under similar conditions. In addition, the rapid knock-down action and short persistence of this insecticide should be of great value where crop areas were likely to be attacked. A detailed report of trials had been published (Report No. UNDP(SF)DL/V/13).

✓ 38. The Committee emphasized the importance of undertaking trials of new insecticides and also toxicity studies at the field research stations where facilities for this sort of work existed. The Committee noted with satisfaction that FAO, in collaboration with DICO-EA, had already started work on obtaining samples for analysis of pesticide residues and requested FAO to extend this work further to Morocco where large scale spraying had been undertaken in 1968/69, and to prepare a report for circulation to the member countries and interested organizations. It also pointed out that considerable work had already been done on pesticide residues and the reports on the subject were available. These reports could be made use of, while pursuing future studies in this respect.

Technical Series

39. In order to provide the required degree of coordination in the field research work being carried out at various field research stations, it was decided to publish the work done at all such stations in a technical series for circulation to all concerned. Four volumes had already been issued and further material was in preparation. There had been a very good response from the field research workers for the supply of technical material; this indicated the interest of the various research workers in publicising their work for the information of their colleagues elsewhere.

Training

Radio Maintenance

40. A training course for English-speaking radio technicians working with the various desert locust services was held in Baghdad at the ITU Telecommunications Training Centre from March to June 1969. Twelve participants from Afghanistan, India, Iran, Iraq, Jordan, Libya, Pakistan, People's Republic of Southern Yemen, Saudi Arabia, Somali Republic, Sudan and the United Arab Republic attended the course. The director of the course was Mr. K.H. Pophal, ITU radio expert.

41. A training course for French-speaking technicians was held in Algeria at the 'Ecole Nationale d'Etudes des Télécommunications', Algiers, from January to April 1969. The director of the course was Mr. Claveyrolas, ITU expert. Six participants from Chad, Morocco, Niger, Senegal, Syrian Arab Republic and Tunisia attended the course. It was hoped that these two courses would further help in proper maintenance of the radio network used in various countries for reporting on the Desert Locust situation.

42. In addition to the above training, arrangements were made with the various governments to designate competent technicians (if necessary from the Posts and Telegraphs or Civil Aviation Department) to be responsible for the proper upkeep and maintenance of the radio network. There were still some countries where such arrangements had not yet been finalized, mainly due to lack of technical personnel. The Committee noted with satisfaction the arrangements made with ITU for training in the use and maintenance of radios and hoped that ITU would make available similar facilities in future to serve the continuing needs in this respect.

High-Level Training

43. The following high-level fellowships were awarded:

- (a) Mr. Fuad Ramadhan Kalouttawy of Saudi Arabia was continuing his fellowship in Applied Entomology at the Imperial College and the Anti-Locust Research Centre in the United Kingdom;
- (b) Mr. Aboubacar M. Nacro of Upper Volta was pursuing his studies at the 'Muséum National d'Histoire Naturelle', Paris, and at the 'Faculté des Sciences d'Orsay';
- (c) Mr. Kamil Jama Musa of the Somali Republic and Mr. Abdel M.A.M. Karrar of the Sudan were appointed to fellowships for studies at the Imperial College and the Anti-Locust Research Centre in the United Kingdom. They had already started their studies in October 1969.

✓ 44. The Committee noted with interest the statement made by the delegate of France on training of research workers being carried out in his country for the benefit of different countries. The Committee agreed to the proposal to examine the requirements of the countries with regard to personnel of different levels and specialities, at its next session, so as to finalize a coherent plan for the training of this research and control personnel.

Advisory Visits

45. An advisory visit had been arranged to the field research station of Bandar Abbas, Iran, and further advisory visits were being arranged.

Disposal of Equipment

46. As at 30 April 1969, the situation regarding the disposal of equipment was as follows:

- (a) Countries to which title of equipment had been formally transferred: Afghanistan, Algeria, Iraq, Iran, Israel, Kenya, Jordan, Libya, Morocco, Saudi Arabia, Sudan and Tunisia.
- (b) Countries where documentation had been transmitted for transfer formalities but not yet returned: Chad, Ethiopia, People's Republic of Southern Yemen and Syrian Arab Republic.
- (c) Countries for which lists would have to be finalized: India, Mauritania, Niger, Pakistan, Somali Republic, United Arab Republic and Yemen Arab Republic.

✓ 47. The Committee recommended that the remaining transfers, including those relating to equipment subsequently supplied under the 1968/69 emergency, should be effected forthwith.

Publications

48. The list of reports published from 1 May 1968 to April 1969 is given in Appendix I.

Control Operations

49. By October 1968 there had been a general decline in the locust activity in the summer breeding areas, whereas locusts were getting active in the winter/spring breeding grounds where extensive control operations were undertaken by a number of countries of the Near East, Eastern Africa, North-West Africa and West Africa. The locust situation remained comparatively calm in the summer breeding areas of 1969. In Ethiopia, Mali, Mauritania, Morocco, Niger, People's Republic of Southern Yemen, Saudi Arabia, Somali Republic, Sudan, United Arab Republic and Yemen Arab Republic a total infested area of 13,675 square kilometres was treated using 1,098 tons of bait, 11.47 tons of dust and 333,710 litres of various liquid insecticides, as given in the summary below:

<u>Countries</u>	<u>Areas treated/infested</u> <u>sq. km.</u>	<u>Type</u>	<u>Insecticides</u> <u>Quantity</u>
Algeria, Ethiopia, Mali, Mauritania, Morocco, Niger, People's Republic of Southern Yemen, Saudi Arabia, Somali Republic, Sudan, United Arab Republic, Yemen Arab Republic	13,675	BHC bait	1,098.43 tons
		BHC dust	11.37 tons
		Aldrin dust	.10 tons
		Dieldrin 20% sol.	87,277.00 litres
		Dieldrin 10% sol.	24,584.00 litres
		Dieldrin 5% sol.	16,012.00 litres
		DDT-Lindane	10,600.00 litres
		Fenitrothion technical	1,450.00 litres
		Diazinon 95%	225.00 litres
		BHC 15% oil sol.	180,814.00 litres
		Malathion 95%	3,280.00 litres
DDVP 4%	10,000.00 litres		

50. Details of the operations undertaken by various countries are given in Appendix II.

Matters arising out of the Twelfth Session of the FAO Desert Locust Control Committee

A. Director-General's appeal for assistance and response of various donors

51. Following the recommendation of the 12th Session of the FAO Desert Locust Control Committee (Report, paras. 43 and 44) and subsequently endorsed by the FAO Council, the Director-General issued appeals on 22 November 1968 to:

- (a) members and associate members of FAO;
- (b) member nations of the United Nations not members of FAO;
- (c) the industry;
- (d) private aid agencies;
- (d) the UNDP.

52. The following governments and private organizations provided the assistance indicated below, thus supplementing the current assistance provided by other countries, details of which appear in Appendix III(b).

DONORS		RECIPIENT		DESCRIPTION	approx. VALUE
Govt.	Org.	Govt.	Org.		US\$
Canada			DLCO-EA	2 Beaver aircraft	175,000
West Germany (promised)			FAO	Insecticides:	
				Malathion - 2000 IGS-DLCO-EA	} 75,000
				2000 IGS-OCLALAV	
				1500 IGS-S.W.Asia	
				2000 IGS-S.Yemen	
				Acrodel - 6000 IGS-N.East	
				BHC dust - 25 tons-S.Yemen 10% (1.3 gamma)	
Italy		Ethiopia		Malathion LVC - 17000 kgs.	50,000
Kuwait		Yemen		Landrovers - 2	
				Insecticides - 25 tons	10,000
U.S.A.		S.Arabia		Operational cost of 3 spraying aircraft with crew (provided during March/April 1969)	200,000
Norway			DLCO-EA	N.Kr. 250,000 (in cash)	35,053
Spain (promised)			FAO	Pesetas 250,000 (in cash to be deposited in Trust Fund 161)	3,603
	Plant Prot. Ltd. (U.K.)		FAO	Offered reduced rates of Acrodel if large order is placed through FAO. A circular indicating the offer was sent to all concerned. No.Govt. or Org. has shown any interest in this offer.	
	Geigy (Switz.)		FAO	Diazinon - 4500 litres distributed to DLCO-EA, OCLALAV, S.W.Asia (Teheran), N.W. Africa (Rabat) and Near East (Jeddah)	18,000
				TOTAL US\$	571,656 -----

53. The Committee wanted to place on record their appreciation and thanks to the donors and hoped that such assistance would also be forthcoming in future to meet the needs of the countries whenever threatened by a Desert Locust plague beyond their resources.

B. Resources available with various countries and organizations for desert locust control

54. The FAO Desert Locust Control Committee, at its Twelfth Session, requested FAO (Report, para. 45) to keep under review the availability of personnel, supplies and equipment with the various national and regional organizations involved in desert locust control. Accordingly, information to this effect had been collected from various countries and regional organizations, compiled and is given in Appendix III(a), (b) and (c). In order to obtain at a glance an overall picture of the entire resources available for desert locust control, a summary is given below:

Regions/ Organizations	Personnel		Insecticides			Vehicles		Aircraft	
	Tech. Staff	Gen. Staff	Oil C. x 000 ls.	Dust MT	Bait MT	Light	Heavy	Owned	Rented
South-West Asia	321	439	423	2,288	947	288	97	47	
Near East	481	539	187	2,476	5,375	649	296	19	2
Eastern Africa	285	1,046	568	4,431	5,296	215	101	19	
North-West Africa	87	240	3,496	5,069	10,450	206	403	19	47
West Africa	68	209	968	716	4	60	109	5	
FAO Reserve	-	-	127	-	-	-	-	-	-
TOTAL	1,242	2,473	5,769	14,980	22,072	1,418	1,006	109	49

55. The Committee, at the same session, further requested FAO to undertake, as a continuing function, the preparation of estimates of assistance required, and to identify additional needs and availability of resources on a regional and inter-regional basis. Accordingly, keeping in view the locust situation, the response to the appeal of the Director-General in providing assistance and the resources available with various national and regional organizations, FAO had maintained a continuous review of the needs of countries and regional organizations in the overall interest of the countries of the whole Desert Locust area.

Emergency Assistance from UNDP in 1969

56. In the course of the above review, FAO advised UNDP in June 1969 that immediate additional assistance was needed in West Africa, Yemen Arab Republic and the People's Republic of Southern Yemen, and that the experimental use of aerial photography in the location of locusts should be undertaken probably in association with DICO-EA. This was agreed to by UNDP. After consultation with the above-mentioned governments, FAO and OCLALAV, the following detailed arrangements were agreed to be necessary:

<u>OCLALAV</u>	<u>US\$</u>	<u>Total</u>
Consultant - 3 months	4,000	
10 light vehicles	30,000	
Dornier aircraft (to be transferred from a UNDP supported Project in Sudan)	40,000	
Equipping aircraft with spraygear and flying to Dakar	10,000	
Fellowships for training of pilots 4 x 3 months	15,000	
Equipment for Gao field research station, Mali	<u>11,000</u>	110,000

YEMEN ARAB REPUBLIC

(a) Equipment:

i) 2 5-ton lorries	}	28,800
ii) 3 light vehicles (4 x 4)			
iii) 5 radios with spares and accessories			

(b) Operating costs, including travel within the country of an expert, drivers, mechanics, radio technicians and other local personnel; POL and maintenance of vehicles

10,000 38,800

PEOPLE'S REPUBLIC OF SOUTHERN YEMEN

(a) Personnel - 12 man-months	24,000
(b) Vehicles - 4 heavy trucks	34,000
(c) 2 radio sets	2,000
(d) Control equipment:	

i) 1 micronair spraygear	}	4,300
ii) 4 exhaust nozzle sprayers			
iii) 50 hand dusters			

(e) Insecticides:

i) 20 tons BHC dust	}	16,000
ii) 20% dieldrin IGS 600			
iii) 15% BHC liquid - IGS 2500			

(f) Operating costs including travel within the country of an expert, drivers, mechanics, radio technicians and other local personnel; POL and maintenance of vehicles

10,000 90,300

AERIAL PHOTOGRAPHY

Field trials in the detection of non-swarming settled locusts	40,000
Miscellaneous	6,000
Executing agency overhead costs on above	<u>23,700</u>

TOTAL 308,800

57. On 23 July 1969 the UNDP made a preliminary allocation of US\$ 213,100 in respect of the above. Of this amount US\$ 44,000 for OCLALAV was financed from the UNDP Administrator's Contingency reserve, and the remaining US\$ 169,100 (covering the full allocations to Yemen Arab Republic - US\$ 38,800; Southern Yemen - US\$ 90,300; aerial photography - US\$ 40,000) was financed from the UNDP Revolving Fund pending approval by the Governing Council of the UNDP in June 1970 at its 11th Session of a supplementary earmarking for the present UNDP(SF) Supported Desert Locust Project.

58. The Committee was unanimous in endorsing the need for this additional support for the purpose indicated. Recent locust reports indicated a potentially dangerous situation in the Mauritania/Mali area. Delegates noted that crop losses from locust infestation in the People's Republic of Southern Yemen had exceeded those of any other country during the past year and the strategic importance of both the Yemen Arab Republic and Southern Yemen to countries bordering on the Red Sea and the Gulf of Aden and beyond was generally recognized. The Committee, in endorsing the proposed supplementary earmarking referred to above, agreed that the expenditure was in the common interest and commended the initiative of FAO and the prompt response of the UNDP in this matter.

59. The balance of assistance recommended at the joint meeting would now be made available as follows:

(a) from the <u>UNDP Administrator's Contingency Allocation</u>	<u>US\$</u>
<u>OCLALAV:</u>	
- Fellowships for pilots - 12 man-months	15,000
- Equipment for new field research station at Gao (Mali)	<u>11,000</u>
	26,000
(b) from UNDP Revolving Fund (pending approval of the Governing Council in June 1970)	
<u>OCLALAV:</u>	
- Dornier aircraft	40,000
- Miscellaneous	6,000
- Agency overheads	<u>23,700</u>
	69,700

60. The Committee expressed their appreciation for the assistance provided by the UNDP.

61. The endorsement, by the Committee, of the application to the UNDP for a supplementary earmarking for the UNDP(SF) Supported Desert Locust Project would be drawn to the attention of the Administrator. The allocations from the Revolving Fund would permit immediate utilization of these funds pending their approval by the Governing Council in June 1970.

C. Crop Damage

62. As decided at the Twelfth Session of the FAO Desert Locust Control Committee (Report, para. 21), a questionnaire was circulated to the various countries and regional organizations to obtain information on crop damage caused by the Desert Locust during 1968. On the basis of the information received, there had been crop losses including orchards to the order of about half a million dollars in addition to some damage to grasslands. Details of the damage suffered by various countries are given in Appendix IV.

63. The Committee noted with satisfaction that damage suffered by all infested countries during the 1968 resurgence had been negligible as compared to losses caused by the Desert Locust in previous plagues which amounted to millions of dollars for a single country during one season.

The Long-Term Strategy of Desert Locust Plague Control

Survey

64. The Committee considered the proposals put forward by FAO on the long-term strategy on desert locust control (Appendix V). It recognized that in spite of considerable improvement in Desert Locust survey and control techniques during recent years a stage had not yet been reached where a total prevention of plagues could be accomplished. Further work had, therefore, to be continued for many years towards finding means to achieve this objective. The aim was, therefore, to pool all the available resources and knowledge and direct them under a planned rational strategy to check as far as possible the locust plagues whenever these occur and at the same time to continue working towards the ultimate aim of preventing recurrence of such epidemics in future.

65. It was pointed out that the present recommended method of survey was a combination of air and ground reconnaissance which offered the most rational means of detecting locust populations. This method was, no doubt, an improvement over the old conventional one, but still a considerable amount of time was required by ground units to check areas which were indicated by aerial surveys likely to harbour locust populations. As a step further, the Committee welcomed the introduction of trials of aerial photography to obtain information about locust populations in the shortest possible time and endorsed the recommendation made by the Consultation on Desert Locust Field Research, held in Beirut in March 1969, and requested FAO to undertake large scale trials in order to verify the efficacy of this method (Report, No. UNDP(SF)DL/M/11, para. 36). The Committee noted with satisfaction that the UNDP had allocated US\$ 40,000 for this purpose.

66. It was noted that no standard method had been applied for making objective estimates of locust populations though a number of techniques of varying validity and under different conditions were in use. The Committee, therefore, recommended that the various regions should send to FAO details of the method used in assessing and reporting locust populations in their respective areas. On the basis of this information FAO should appoint an expert (depending upon the availability of funds) to study the whole question and to recommend the best method which could be applied in all the regions without any particular disadvantage. This document should be discussed at a meeting of technical experts to precede the next session of the FAO Desert Locust Control Committee.

67. The Committee re-emphasized that special attention should be paid during a given time to particular areas which could be subject to rapid multiplication of locust populations due to favourable ecological conditions. Based on the past experience, the Committee recommended that the following areas should be paid special attention during the period mentioned against them:

South-West Asia

- December-March - Southern Iran (Bandar Abbas to Ahwaz, Bandar Abbas to Chahbar)
- April-May - Southern Iran (Hinterland)
- January-April - Pakistan (Kulach and Dasht Valleys)
- June-September - India and Pakistan (summer breeding areas: Barmer, Bikaner, Jaisalmer and Bahawalpur).

Near East

- January-February - Saudi Arabia (Jeddah, Gizan, Jeddah)
- February-March - Saudi Arabia (Jeddah, Yanbo, Weji areas)
- February-May - Saudi Arabia (Asir and the interior of southern Saudi Arabia)
- March-May - Saudi Arabia (Hejaz, Great Nefud and Qassim)
- December-March - Yemen (Red Sea coast)
- August-September - Yemen (interior)
- May-September - Southern Yemen
- October-January - United Arab Republic (south-eastern desert)
- March-June - United Arab Republic (south-eastern desert)

Eastern Africa

- November-March - Somali Republic (northern coast: Las Durah to French Territory of Afar and Issa)
- June-September - Somali Republic (south of the coastal escarpment)
- March-May }
July-September } - Eastern Ethiopia and French Territory of Afar and Issa
- November-April - Ethiopia and Sudan (Red Sea coast)
- May-September - Sudan (interior: Kordofan, Darfour and the northern Province)

North-West Africa

- October-April - Southern and central Algeria
Southern Morocco

West Africa

- June-September - Chad (Tibesti), Mali and Niger (areas adjoining the Algerian border), northern Senegal and parts of Mauritania and Spanish Sahara
- October-March - Northern Mauritania and northern Spanish Sahara.

68. The above recommended periods and areas should only be regarded as general guide-lines to look for locust populations. There would naturally be a lot of variation which would depend upon the time and distribution of rainfall during a particular year. The countries concerned were, therefore, in a better position to decide the actual time and areas of survey during a particular season. It was possible that in certain countries resources and technical staff might not be available with the national organization for survey of strategically important breeding areas. Under such circumstances, joint surveys, to be financed from regional funds, should be arranged to cover these important localities in the overall interest of the region. Such surveys could be organized on the same basis as had been done over the past years under the UNDP(SF) Desert Locust Project.

Control

69. It was realized during the recent years that intensified and expanded collective action based on the application of rational strategy and of the most modern techniques could play an important part in checking an existing locust plague. While it was difficult to state precisely the reasons for the present improved locust situation after about one year of the resurgence of the plague, the Committee was of the opinion that the concerted control operations undertaken by national and regional organizations under proper coordination had played an important part in bringing about the reduction of the plague. It was recommended that the present fortunate situation should be fully exploited and all possible measures should be taken under an effective control strategy.

70. The Committee appreciated the aerial operations undertaken by the Government of the United States of America in Saudi Arabia during March-April 1969. This exercise, along with the ground operations undertaken by the Government of Saudi Arabia, resulted in considerable reduction of locust populations along the Red Sea, thus eliminating the chances of locusts moving into central and northern Saudi Arabia during the following months. Based on this experience, the Committee welcomed and fully endorsed the proposals of FAO (Appendix V) for undertaking a trial purely on experimental basis in the high frequency areas on both sides of the Red Sea at the time when locust infestations were very much restricted and only covered a fraction of the total breeding area within the central region. At the request of the Committee, FAO also submitted a draft plan of operation for consideration of the governments and organizations concerned and the Committee was of the view that the availability of this document at this stage would facilitate an early implementation of the trial. The Committee recommended that FAO take appropriate follow-up action with the governments and regional organizations concerned for the implementation of the draft plan of operation and the results thereof be reported to the next session of the Committee. The Committee recognized that such a plan could not be solely implemented from national and regional resources and would need assistance from outside sources.

71. In case the results of such control operations were encouraging, consideration should be given to undertaking similar operations in other parts of the distribution area where the Desert Locust gets concentrated during a certain period of a year.

Financial and Administrative Arrangements - 1970 Onwards

72. The Committee considered proposals for financing FAO's programme after the termination of the UNDP(SF) Supported Desert Locust Project in June 1970, when resources available for this programme would be considerably reduced. The Committee noted that annual expenditure by FAO from all sources had until then been averaging approximately US\$ 1,000,000 of which US\$ 447,000 represented the average expenditure from the UNDP(SF) Project funds over the ten years 1960/70. A considerable part of this expenditure of US\$ 447,000 (approximately 50% of the total) was of a non-recurring nature such as in the strengthening or establishing of field research stations, radio networks for reporting and forecasting or on specific projects such as the Operational Research Aerial Unit. Nevertheless, there were other continuing activities and operations hitherto supported from the UNDP(SF) Desert Locust Project and these would have to be financed from other sources in the future.

73. Having taken into consideration the various developments, which took place during recent years, the Committee agreed to the following outline of a plan for financing various activities under the locust programme for the year 1970 and onwards: -

<u>Source of Funds</u>	<u>Amount available per annum (approximately)</u> <u>US\$</u>	<u>Activities</u>
(a) UNDP/TA	200,000	To meet the cost of HQ and regional staff, whose activities include: a. overall coordination of desert locust control programme in the countries concerned; b. coordination of field research; c. provision of technical assistance and guidance as may be needed by individual governments or regional organizations; d. servicing of various committees, sub-committees and sessions of regional commissions; e. publishing of reports, technical material, Newsletter and distribution; f. mobilizing of assistance in cash and kind from outside sources when existing reserves prove insufficient to cope with a particular situation; g. providing assistance under emergency through the Emergency Fund of US\$ 500,000 under establishment.

35

brought forward US\$ 200,000

(b)	TRUST FUND AGENCY COSTS	30,000	HQ staff to assist in activities mentioned under UNDP/TA and with particular reference to the activities concerning the African Migratory Locust, the Red Locust and other migratory locust species.
(c)	INTERNATIONAL TRUST FUND 161	76,000	<ul style="list-style-type: none"> a. contribution to maintenance of DLIS; b. convening high-level training courses and awarding of fellowships and exchange visits; c. panels of experts and arranging advisory visits; d. provision for research projects of international significance; e. Reserve Fund.
(d)	REGIONAL TRUST FUNDS: 123 169 409	<ul style="list-style-type: none"> 71,000 30,000 139,000 	<ul style="list-style-type: none"> a. Arranging joint surveys; b. coordination of research programmes within the region; c. maintenance of strategic reserves of insecticides and control equipment; d. arranging joint control within the region; e. assist and promote in any manner which it considers appropriate, any national, regional or international action relating to control or survey of the Desert Locust; f. Reserve Fund.
		TOTAL US\$ 546,000	

74. The Committee noted with satisfaction that the DLCO-EA and OCLALAV had independent annual budgets of about US\$ 6,000 and US\$ 1,240,000, respectively, for desert locust survey and control within their respective areas. Furthermore, the various organizations would carry out all possible measures to control desert locust plagues within the countries and to reduce crop damage by adopting at least the following essential procedures: -

- (a) maintaining a permanent locust survey and control service;
- (b) holding reserves of insecticides and application equipment;

- (c) encouraging and supporting such training, survey and research work including, where appropriate, the maintenance of national research stations for the study of the Desert Locust, as might be considered desirable by the regional organizations/Commissions and as were compatible with the resources of the country;
- (d) participating in the implementation of any common policy of locust control and prevention which might be approved by the regional organizations/Commissions and the FAO DLCC.

75. It was pointed out that all national organizations might not be in a position to maintain the above-mentioned services to the desired extent without outside assistance. As the locust knows no frontiers, the effectiveness of control measures in any given country was of international significance and, therefore, could not be ignored. For this reason, the Committee hoped that assistance would be forthcoming from FAO, the UNDP and other bilateral sources.

76. The Committee, while noting that since 1952 the UNDP/TA programme had been the only continuing source of funds for the Organization's locust programme, emphasized that the whole long-term strategy for international control was dependent upon FAO's coordinating role and strongly urged that UNDP/TA support be authorized on a five-year basis instead of from year to year as hitherto. Only in this way could realistic long-term planning be attempted and properly executed. The UNDP Representative stated that, in view of the continuing nature of these functions, the eventual absorption of a proportion of that cost by the FAO regular budget, particularly as regards headquarters' cost, would be a matter for further consultation between FAO and the UNDP.

Emergency Fund

77. The Committee noted with satisfaction the arrangements made for meeting any emergency in the future and strongly supported the proposals for the establishment of an emergency fund of US\$ 500,000, to be financed from the Working Capital Fund of FAO, and hoped that it would be finally approved by the next session of the FAO Conference. At the same time the Committee hoped that, as in the past, assistance would be forthcoming from the UNDP and bilateral sources whenever the situation so demanded.

Status of Various Desert Locust Regional Organizations

South-West Asia

78. The Fifth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia was held in Karachi from 10 to 13 March 1969 and was preceded by a three-day session of its Executive Committee. The Commission reviewed the locust situation within the region and in the neighbouring countries, and made special recommendations for keeping a strict watch over all the potential locust breeding areas within the region and for making adequate arrangements to meet any situation which might develop during the coming monsoon breeding season.

79. In view of the present locust situation, the Commission authorized FAO to incur expenditures from the unobligated funds, on insecticides, supplies, subsistence to aircrew and POL for aircraft provided by the member countries for aerial operations as the situation should demand during the coming months up to the amount of US\$ 80,000. The Commission approved the programme of work and budget for 1970/74. The Executive Committee of the Commission considered in great detail the field research work being undertaken within the member countries of the Commission and its coordination. The report of the Commission No. PL/1969/M/2 was printed and circulated.

Near East

80. The First Session of the Commission for Controlling the Desert Locust in the Near East was held in Baghdad, Iraq, from 1 to 4 February 1969. All the 12 countries of the Near East, in addition to Turkey and the United Kingdom, attended the session. The Commission discussed in detail the current anti-locust campaign in the Arabian Peninsula and in other countries of the Near East, and plans for the future. The Commission emphasized the importance of control operations, particularly in the Arabian Peninsula and made various recommendations. At the same time the Commission considered and approved the programme of work and budget for the year 1970 totalling to US\$ 139,540 and also agreed to the scale of contributions to make up the above amount. The report of the Commission No. PL/1969/M/1 was printed and circulated.

81. The Governments of Bahrain, Lebanon, Jordan, Kuwait, Qatar, Sudan, Syrian Arab Republic, the United Arab Republic and the Yemen Arab Republic had since become members of the Commission. The Government of the People's Republic of Southern Yemen had applied for membership and would automatically become a member when elected as a member of FAO during the forthcoming FAO Conference (November 1969). The Governments of Iraq and Saudi Arabia had not yet joined the Commission.

Eastern Africa

82. The Desert Locust Control Organization for Eastern Africa (DLCO-EA) continued to operate with its usual efficiency. Since the last session of the FAO Desert Locust Control Committee, the Council of the DLCO-EA had its 14th Session and made specific recommendations for strengthening the DLCO-EA to cope with the present locust situation. The Government of Sudan became a member of the DLCO-EA on 4 April 1969. The cooperation between FAO and DLCO-EA was continued in accordance with the Relationship Agreement between the two Organizations.

North-West Africa

83. The Third Session of the FAO North-West African Desert Locust Research and Control Coordination Sub-Committee was held in Tripoli from 2 to 5 June 1969. Some of the important recommendations are as follows:

- (a) The Sub-Committee's attention was drawn to the Report of the Second FAO Meeting of the North-West African Countries for Controlling the Desert Locust, held in Rabat in February 1965 (Report No. PL/1965/2, para. 24), in which it was stated that the establishment of this Sub-Committee was a beginning, with the ultimate objective of establishing a regional Commission within the framework of FAO under Article XIV of the FAO Constitution on the same lines as established for the Near East and for South-West Asia, and requested FAO to prepare a draft Agreement for circulation to the Member Countries. At the same time the Sub-Committee expressed the desire that the programme of work and budget for the proposed Commission should also be prepared by FAO and sent to the Member Countries for their consideration along with the draft Agreement.
- (b) The Sub-Committee emphasized the need and importance of high-level training and decided to authorize FAO to grant two fellowships per year during 1970 and 1971 in this respect, to be financed from the balance of the Trust Fund 169, and requested FAO to write to the Member Countries of the Sub-Committee for submission of suitable candidates.

84. The Committee welcomed the decision taken by the FAO North-West African Sub-Committee to establish a Commission for Controlling the Desert Locust in North-West Africa within the framework of FAO and requested the Director-General to take appropriate action to implement the recommendations of the Sub-Committee at the earliest.

West Africa

85. The Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV) continued to operate as an independent inter-governmental organization and kept FAO informed of its activities. The annual session of its Administrative Council approved the programme of work and budget amounting to US\$ 1,240,000 for the year 1969/70 and, in view of the present locust situation, emphasized the need for prompt payment of contributions. It stressed the need for the countries who were in arrears to expedite payments which could be partly utilized for building-up a Reserve Fund up to a maximum of one and a half million dollars.

International Anti-Locust Campaign in the Arabian Peninsula during 1968/69 and Plans for the Future

Survey Operations

86. The breeding areas of the Arabian Peninsula were kept under watch throughout the period under report. A special survey was also arranged from January to March 1969 of the southern Tihama of Saudi Arabia under the supervision of the FAO Regional Locust Officer.

Control Operations

87. No control operations were undertaken in 1968 from October to the end of the year, whereas in January 1969 control was undertaken by ground teams in the Jeddah-Mecca area and continued until mid-February 1969, controlling 185 hopper bands mostly of small size.

88. During late February, scattered hoppers and hopper bands were located along the Red Sea coast from Qunfida to Rabigh, against which aerial spraying was undertaken by the United States aircraft commencing on 16 March 1969. The area of Qunfida-Shaqa was sprayed by barrier spraying laying 3 barriers, 4½ km. apart, with each barrier having a swath of about 300 metres. Because of the intensity of infestation the area of Shawak-Lith was treated by blanket spraying. In addition, the Tuwal-Rabigh area also received a similar treatment, and the aerial operations concluded on 8 April 1969. During these operations three United States Air Force 123 B aircraft with crew, experts and supporting personnel participated. The Saudi Arabian Government provided insecticides, fuel and other ground facilities. In all, about 73,000 litres of dieldrin 20% were used for spraying about 400,000 hectares.

89. During April and May 1969, scattered hopper bands were located in another locality between Dhahaban and Yenbo and were controlled by ground teams by using about 4,790 litres of dieldrin, 18 tons of bait and 2½ tons of BHC dust. In other parts of Saudi Arabia the Desert Locust situation did not warrant any control.

Results and Comments on the 1968/69 Season

90. The operations of the United States aerial mission during March-April 1969 provided a considerable amount of experience for future work in this direction. These operations had helped to prevent the spread of locusts to other localities of Saudi Arabia and relieved the national anti-locust organization of a costly and long drawn-out campaign which otherwise would have had to be undertaken by ground teams. On the whole, control operations conducted both by ground and air along the Red Sea coast of Saudi Arabia were successful.

Participation

91. In addition to the work carried out by the survey units of the Government of Saudi Arabia, operations were supported by 8 locust officers, whose services were secured by FAO as an emergency and by the teams of the visiting missions. FAO locust officers surveyed the coastal areas between Gizan and the Jordan borders and wadi Sarhan in the North during December 1968 and February 1969. During March and April 1969 they surveyed northern Tihama, Asir and central areas. The Sudan mission kept Qunfida-Lith area under supervision, while a team from Kuwait reconnoitered eastern Saudi Arabia during May 1969. Accordingly, the whole of Saudi Arabia was kept under continuous supervision

Plans for the 1969/70 Campaign

92. The Committee learnt with satisfaction that in Saudi Arabia the national locust organization had taken appropriate steps for arrangements required for the 1969/70 campaign. The decision about the possible use of aircraft in the next campaign was considered a step forward and the Committee was pleased to learn that its implementation was receiving considerable attention of the Government of Saudi Arabia. Arrangements were also being made to cover the area of south Tihama by ground teams from October onwards. The Governments of Jordan, Kuwait, Pakistan and Sudan had indicated their willingness to participate in control operations in Saudi Arabia when required.

93. The Committee welcomed the statement made by DLCO-EA to help Saudi Arabia in aerial spraying on a repayment basis, if so requested by the Government of Saudi Arabia to the DLCO-EA Council. It was considered that, in view of the technical experience acquired by the DLCO-EA over the years in aerial spraying, such an arrangement, apart from being economical, would be very effective.

94. It was reported that ample quantities of insecticides (2,000 tons of bait, 500 tons of BHC dust 2.3% gamma, 400 tons of BHC dust 1.3% gamma and about 22,000 litres of dieldrin) were already available in Saudi Arabia. Furthermore, about 100,000 litres of dieldrin 20% and 67,000 litres of Malathion LVC were ordered for aerial operations. The future programme for the Arabian Peninsula would be discussed in more detail at the next session of the Commission for Controlling the Desert Locust in the Near East.

The FAO International Anti-Locust Centre, Jeddah

95. The Centre continued as usual its role in the planning, coordination and execution of locust control activities in the Arabian Peninsula. In an advisory capacity, the FAO Regional Locust Officer attended and participated in a number of meetings held in the Ministry of Agriculture, Riyadh, on matters relating to locust survey and control in the country.

DATE AND PLACE OF NEXT SESSION

96. The Committee recommended that the Director-General of FAO should convene the next session of the Committee possibly in October 1970, to be preceded by a three-day meeting of technical experts, at a place and date to be determined by him.

APPENDIX I

LIST OF PUBLICATIONS

(April 1968 to April 1969)

- Meeting Report UNDP(SF)DL/M/10 - Desert Locust Field Research Stations and Co-ordination of Research, August 1968
- Meeting Report PL/1968/M/1 (DL:SWA) - Fourth Session of the Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in Southwest Asia, February 1968
- Meeting Report PL/1968/M/2 (DL:NWA) - Second Session of the FAO Northwest African Desert Locust Research and Control Co-ordination Sub-Committee, April, 1968
- Meeting Report PL/1968/M/5 - Twelfth Session of the FAO Desert Locust Control Committee, October 1968
- TA 2500 - PL:AT/98 - Report to the Government of Madagascar
- FAO/SF:34/DLC - Desert Locust Project Final Report, 1968
- - Desert Locust Newsletter No.15
- - Desert Locust Newsletter No.16
- UNDP(SF)DL/TS/1 - Desert Locust Field Research Stations - Technical Series - Environmental conditions and their role in the phase dynamics of the Desert Locust (Schistocerca gregaria); laboratory experiments on oviposition behaviour of the Desert Locust (Schistocerca gregaria) in relation to soil environment; Field observations on oviposition behaviour of the Desert Locust in Saudi Arabia, Dec. 1968
- UNDP(SF)DL/TS/2 - Desert Locust Field Research Stations - Technical Series - Report on the Niger Mission 1965
- UNDP(SF)DL/TS/3 - Desert Locust Field Research Stations - Technical Series - Report on the Niger Mission 1966
- UNDP(SF)DL/SS/10 - Supplementary Survey of the Red Sea Coast of Ethiopia, October-December 1967
- UNDP(SF)DL/SS/11 - Report of the Fourth Special Reconnaissance Survey of Southwestern Afghanistan, April-June 1968
- UNDP(SF)DL/SS/12 - Report of the Supplementary Survey of the Red Sea Coast of Sudan, November-December 1967

- UNDP(SF)DL/SS/13 - Report of the Special Reconnaissance Survey of Southern Iran and Adjoining Area of Pakistan, April-May 1968
- UNDP(SF)DL/SS/14 - Report of the Special Reconnaissance Survey Mission in Saudi Arabia, January-May 1968
- UNDP(SF)DL/TC/16 - Report on the Locust Meteorology Training Course, January to April 1968
- UNDP(SF)DL/V/12 - Report of an Advisory Visit to Afghanistan April 1966
- UNDP(SF)DL/RFS/7-A.3 and 4 - Anti-Locust Climatic Manual - Monthly mean winds at about 500 meters above the ground at stations in East Africa and at six stations in India, 1968
- PL:AT/135 - Rapport à l'OICMA by Dr. Roy, 1969
- PL:TA/133 - Report to the Government of the Yemen Arab Republic, 1969

DATA ON CONTROL OPERATIONS UNDERTAKEN AGAINST THE DESERT LOCUST IN VARIOUS COUNTRIES (OCTOBER 1968-SEPTEMBER 1969)

Country	Period	Insecticides		Approximate total area infested in sq. km.		Method of application (Baiting, Dusting, Spraying by Air or Ground)
		Type	Quantity	Hopper bands (incl. Scattered Populations)	Swarms	
Near East						
Saudi Arabia	Oct/Dec 68	Ensodil 20, Dieldrin	16,200 galls	4,000		Aerial spraying
"	"	Ensodil	1,065 galls			Ground spraying
"	Jan/June 69	BHC Bait	18,000 kgs			Baiting
"	"	BHC Dust	2,500 kgs	675		Ground dusting
U. A. E.	Oct/Dec 68	BHC Bait	43,150 kgs.	1,500	1,550	Baiting
"	"	Cotton dust	1,500 kgs.			Dusting
"	"	D.E.T./Lindane (30/9)	10,600 litres			Aerial spraying
"	Jan/June 69	Dieldrin	7 litres	3	24	Ground spraying
"	"	BHC Bait	1,932 kgs.			Baiting
Yemen Arab Republic	Oct 68/June 69	BHC Bait	2,500 kgs.		36	Baiting
S. Yemen	Oct 68/June 69	BHC Dust 10%	5,700 kgs.	250	24	Dusting
"	"	Dieldrin 20%	180 litres	1,000	12	Exhaust spraying
"	"	BHC Bait	41,150 kgs.	600	14	Baiting
North West Africa						
Algeria	Oct 68/June 69	BHC Bait	5,700 kgs.	5*		Baiting
"	"	Malathion	400 litres		Ground Spraying	
Morocco	Oct 68/June 69	BHC Bait	600,000 kgs.		150	Baiting
"	"	BHC 15%	170,000 litres		450	Aerial spraying
"	"	D.D.V.P. 4%	10,000 litres			
West Africa						
Mauritania	Oct	Dieldrin 5%	4,180 litres	201*		Exhaust spraying
"	"	Dieldrin 20%	290 litres			
"	Aug/Sept. 69	Fenitrothion	950 litres	57*		"
"	"	Dieldrin 5%	2,700 litres			
"	"	Fenitrothion	500 litres			
Mali	Oct/Dec. 68	Dieldrin 5%	5,242 litres	18.35*		Exhaust spraying
"	end July 69	BHC 25%	625 kgs.	7.08		"
"	"	Dieldrin 5%	700 litres			"
Niger	Oct/Nov 68	Dieldrin 5%	3,190 litres	16.30		Air + Ground spraying
Eastern Africa						
Ethiopia	Oct/Dec 68	Dieldrin 10%	4,167 galls	1,011	1,410	Aerial spraying
"	"	Dieldrin 20%	484 galls			
"	"	Diazinon 95%	50 galls			
"	"	Malathion 95%	640 galls			
"	"	Gamma BHC	1,515 galls			
"	Jan/June 69	BHC Dust	693 kgs.			Ground dusting
"	"	Dieldrin 20% + Ensodil	278 galls	10	44	Aerial spraying
"	"	Dieldrin 10%	1,196 galls			
"	"	Gamma BHC 10%	513 galls			
"	"	Dieldrin 10% + Gamma	100 galls			
"	"	BHC Houry	16 galls			
"	"	BHC Dust	50 kgs.			Ground dusting
Somali Rep.	Oct/Dec 68	Various oil solutions	77 galls	20	10	Ground spraying
"	"	BHC Dust	150 kgs.			Ground dusting
Sudan	Oct/Dec 68	Dieldrin 20%	1,185 galls	268	310	Aerial spraying
"	Jan/June 69	Acrodol 15%	359 galls			"
"	"	Agrocide 7 (dust)	450 kgs.			Ground dusting
"	"	Aldrin (dust)	100 kgs.			"
"	"	Poisoned bait	386,600 kgs.			Baiting

* Including young adults

APPENDIX III (a)

Resources available with various National and Regional Organisations for 1968/69 for Desert Locust Control

COUNTRIES	PERSONNEL		EQUIPMENT				VEHICLES		INSECTICIDES		AIRCRAFTS		ANNUAL BUDGET i. 000
	Technical staff	General staff	Power Dusters	Power sprayers	Hand dust. & sprayers	Exhaust sprayers	Light	Heavy	Oil o. Litres	Dust M.T.	Bait M.T.	No. Type		Curr.
NEAR EAST													
Bahrain	1	19	8	-	-	-	1	2	-	-	-	-	RD
Iraq	80	-	-	150	-	10	60	-	200	100	100	8	ID
Israel	...	...	...	...	...	...	...	...	...	...	...	...	Isrl.
Jordan	82	35	5	351	35	3	15	...	54	60	400	2 (1)	JD
Kuwait	33	10	25	35	-	-	33	40	112	112	-	-	DK
Lebanon	14	37	187	16	-	-	...	...	40	40	-	3 (2)	...
Qatar	1	3	-	-	-	-	...	...	18	8	25	-	...
Saudi Arabia	16	97	313*	-	-	45	343	146	990	2,468	25	-	D
South Yemen	3	5	3	-	-	12	6	2	43	2,000	45	-	SR
Syrian Arab Rep.	120	40	150	70	-	6	90	20	600	400,300	4	4 (3)	D
Turkey	44	68	105	-	-	-	62	6	250	68	42	2	...
U. A. R.	55	225	13	-	-	13	30	65	2	68	42	2**	...
Yemen	32	-	2	4	-	12	9	6	50	48	40	-	...
Total	481	539	811	626	35	101	649	296	1,875	2,476	5,375	19	YR
EASTERN AFRICA													
Ethiopia	23	72	18	17	20	24	28	4	450	150	-	4 (4)	ETH
Kenya	2	12	-	-	-	2	-	-	1,000	-	-	-	...
Somali Rep.	29	25	1	1	12	12	21	6	177	763	590	-	...
Sudan	181	767	250**	200	200	25	55	59	630	2,000	4,706	7 (5)	SL
Tanzania	4	11	2	10	2	2	4	2	40	-	-	-	...
Uganda	4	11	4	12	2	2	4	1	50	-	-	-	...
DIGO-EA	42	148	-	6	50	122	103	29	3,331	1,518	-	8 (6)	KE
Total	285	1,046	275	46	286	189	215	101	5,678	4,431	5,296	19	...
NORTH-WEST AFRICA													
Algeria	...	...	55	44	350	-	66	121	7,600	2,500	3,300	9 ...	MF
Libya	...	...	-	45	-	-	24	5	161	4	550	-	...
Morocco	7	120	70	12	250	-	90	150	27,000	1,750	6,500	38**	MF
Tunisia	65	68	110	20	370	-	26	127	200	800	100	10 (7)	MF
Total	73	188	235	120	970	-	206	403	34,961	5,504	10,450	19	...
SOUTH-WEST ASIA													
Afghanistan	23	22	13	-	414	10	10	7	4	414	-	-	...
India	131	182	182	55	9,595	19	71	70	496	1,370	60	7 ?	...
Iran	27	30	-	1,010	871	50	115	7	1,370	947	30	8 (8)	...
Pakistan	140	305	31	191	679	99	92	12	2,359	444	-	10 (9)	...
Total	321	439	226	1,251	11,649	178	288	96	4,229	2,288	947	47	...
WEST AFRICA													
Mali	15	52	-	15	70	5	9	-	-	15	-	-	CFA
Senegal	16	-	40	-	312	6	3	20	700	680	-	-	CFA
OGADAN	32	157	-	4	-	42	57	89	8,983	17	-	5 (10)	CFA
Total	68	209	40	19	617	53	69	109	9,683	731	-	5	...

Notes (1) to (10) and (*), (**), (***) - see to be found on reverse page

.../...

- (1) 1 Piper Cub, 1 Helicopter
- (2) Helicopters Alouette
- (3) Piper Super Cubs
- (4) Piper Super Cubs
- (5) 2 Cessnas 180, 1 Cessna UTO6/206/A, 2 Piper Pawnees, 2 Piper Super Cubs
- (6) Beavers, Cessnas, 1 Aero-Commander
- (7) 3 Cessna Agwagons, 2 Piper Pawnees, 5 Piper P.A. 18
- (8) 3 Cessnas, 27 Piper Super Cubs
- (9) Beavers
- (10) 2 Piper P.A.18, 1 Piper Cherokee 235, 2 Cessnas 235

* Dual purpose: dusters and sprayers

** Dusters and sprayers

*** Rented aircraft.

APPENDIX III(b)

Inter-Governmental assistance for Desert Locust Control in 1968/69

DONORS		TYPE OF ASSISTANCE	VALUE	RECIPIENTS	
GOVERNMENTS	ORGANIZATIONS			\$. 000	GOVERNMENTS	ORGANIZATIONS
CANADA		2 Beaver aircrafts	175.0		DLCO-EA
	FAO/UNDP	Insecticides, vehicles, spare parts. Cash	67.0 1.3		DLCO-EA DLCO-EA
	" "	Insecticides	20.0		OCLALAV
	" "	Exhaust sprayers	.5	KENYA	
	" "	Micronair sprayers	2.7	JORDAN	
	" "	Micronair sprayers	2.7	SYRIA	
	" "	Insecticides and Micronair sprayers	22.8	SUDAN	
	" "	Vehicles	8.3	SOMALI REP.	
	" "	Insecticides, control equipment, vehicles Technical assistance	34.3 19.8	PEOPLE REP, SOUTH. YEMEN " "	
	" "	Insecticides, control equipment, vehicles Technical assistance	38.7 1.2	YEMEN ARAB REPUBLIC	
	" "	Insecticides, camping equipment Technical assistance	5.1	SAUDI ARABIA " "	
FRANCE		Technical assistance	152.0		OCLALAV
"		Equipment (unsp.)	240.0		
"		Cash	36.0		DLCO-EA
"		Insecticides	20.0	ETHIOPIA	
"		Insecticides	9.5	SOMALI REP.	
"		Insecticides	10.5	SUDAN	
FEDERAL REPUBLIC OF GERMANY		Unspecified	70.0	TUNISIA	
"		Insecticides	20.0	ETHIOPIA	
"		Insecticides	75.0		FAO (Promised)
"		Insecticides	9.0	SUDAN	
"		Insecticides	52.0		DLCO-EA

.../...

DONORS		TYPE OF ASSISTANCE	VALUE	RECIPIENTS	
GOVERNMENTS	ORGANIZATIONS		\$. 000	GOVERNMENTS	ORGANIZATIONS
	GEIGY S.A.	Insecticide	3.9		N.W. African Region
	" "	Insecticide	4.8		OCLALAV
	" "	Insecticide	2.9		Near East Region
	" "	Insecticide	3.9		DLCO-EA
	" "	Insecticide	1.9		Eastern Region
INDIA		Technical assistance	3.6	PEOPLE REP. SOUTH.YEMEN	
ITALY		Insecticides	51.0	ETHIOPIA	
KUWAIT		Technical assistance	8.0	SAUDI ARABIA	
NORWAY		Cash	35.0		DLCO-EA
PAKISTAN		Technical assistance	6.3	SAUDI ARABIA	
U. K.		Technical assistance	38.4		DLCO-EA
" "		Technical equipment	43.2		" "
" "		Aircraft	38.4		" "
U. S. A.		Aerial operations	200.0	SAUDI ARABIA	
U. S. A.		Technical assistance	75.0		DLCO-EA
		Equipment	200.0		DLCO-EA
U.S.S.R.		Insecticides	60.0*	ETHIOPIA	
"		Equipment	14.0	"	

* 125 tons of Aldrin 40%

APPENDIX III (c)

Aircraft available with various national and regional organizations for Desert Locust control

Country or Organisations	PIPER			CESSNA			BEAVER	AERO-COMMANDER (twin-engine)	HELICOPTERS	UH-SPECIF.	GRAND TOTAL	
	PA.18	Cub	Super Cub	Pawnee	Cherokee 235	UT/62 O6/A						
						180/185						Agragon
<u>NEAR EAST</u>												
Iraq									1	8	8	
Jordan		1							3		2	
Lebanon			4								3	
Syrian A.R.											4	
Turkey										2	2	
Total		1	4						4	10	19	
<u>EASTERN AFRICA</u>												
Ethiopia			4								4	
Sudan			2	2		1					7	
DICO-EA				2							2	
Total			6	2		1			1		19	
<u>NORTH-WEST AFRICA</u>												
Algeria	1			1							1*	
Morocco											38**	
Tunisia	5			2							9	
Total	6			3							10	
<u>SOUTH-WEST ASIA</u>												
India											1	
Iran			27								7	
Pakistan											30	
Total			27								10	
<u>WEST AFRICA</u>												
OGLIAY	2				1						5	
Total	2				1						5	
GRAND TOTAL	8	1	37	5	1	9	1	4	5	22	11	109

* Pilatus
 ** Chartered during the 1968/69 Campaign (not included in the total)

APPENDIX IV

DAMAGE CAUSED BY THE DESERT LOCUST DURING 1968

Country	Kind of crop	Kind of orchards	Grasslands	Quantity of loss: M.t.	Value of loss: \$	Remarks
Ethiopia	Sorghum	-	-	Slightly damaged	-	-
India	-	-	Grassland	Negligible	-	-
Morocco	-	Orchards	-	Negligible	-	Fringes of branches damaged
Mauritania	-	-	Grassland	Insignificant	-	Areas attacked by locusts in 1968 have been very much localized; efficient control has reduced a great deal the damage in these areas
Nigeria *	Immature Guinea corn, cotton, cassava, millet, groundnut	-	Cowpes	Insignificant	-	-
Saudi Arabia	Mixed	Mixed	Mixed	6,869	55,425	-
Somali Rep. *	Wheat, millet, maize	-	-	Very little damage	-	-
Southern Yemen	Millet, cotton, sesame, wheat	Vegetables, citrus, peaches, plums, dates, coffee	Grass	2,535	364,391	-
Sudan *	Cotton, millet	-	-	1,500 acres	Insignificant	-
E. A. R.	-	-	Vegetation and pastureland	-	80,000	Net area covered by swarms of hopper bands 1,900 sq. km. 20% of vegetation destroyed

* Information received from the Desert Locust Information Service (DLIS)

The following countries have reported "no damages": Algeria, Afghanistan, Iran, Iraq, Israel, Jordan, Kuwait, Libya, Mali, Niger, Pakistan, Qatar, Cameroon, Senegal, Sierra Leone, Syrian Arab Republic, Tanzania, Tunisia and Yemen.

THE LONG-TERM STRATEGY OF DESERT LOCUST PLAGUE CONTROL

Introduction

1. The objectives of the UNDP(SF) Desert Locust Project, as given in the Plan of Operation, are:

"The overall purpose of the Project is to develop more effective and less expensive control of the Desert Locust in order to relieve all affected countries of the economic burden presently imposed upon them by the costs of control operations and the extent of crop damages. This purpose is to be achieved through two concurrent main lines of approach:

- (i) the ultimate aim is to develop, through an overall international approach, a long-term policy of Desert Locust control, whereby the recurrence of devastating plagues may be prevented;
- (ii) while work in this direction proceeds, and as locust plagues will continue until the primary objective is reached, the second objective is to study and demonstrate how intensified and expanded collective action, based on the application of rational strategy and of the most modern techniques, can check an existing locust plague, it being appreciated that a similar approach may also be required to prevent the recurrence of future Desert Locust plagues."

2. It was in this context that the Desert Locust Control Committee at its Twelfth Session, requested FAO to prepare proposals on a long-term strategy of Desert Locust control and to submit the same at its next Session for consideration. Accordingly, an effort has been made to prepare a document on the subject to form a basis for discussions.

3. For many years the question of formulating plans for the permanent control of the Desert Locust, especially through preventive measures, has received considerable attention. Steps in this direction, however, could not be undertaken mainly owing to the insufficiency of funds and lack of adequate technical knowledge of the problem on the one hand, and the complexity of applying even this available knowledge and funds to the large number of countries spread over varied geographical areas. It was only during recent years that some concrete steps have been taken in this direction. In particular, the UNDP(SF) Desert Locust Project provided unique facilities to promote field research, to strengthen the communication system, to provide training and to

further our knowledge on the operational research and the ecological aspect of the problem. In spite of all these developments, a stage has not yet been reached where a total prevention of plagues can be accomplished. Further work has, therefore, to be continued for many years towards finding means to achieve this objective. While work in this direction proceeds, locust plagues will continue to occur in varying intensity until the primary objective is reached. The short and long-term aim is, therefore, to pool together all the available resources and knowledge and direct them under a planned rational strategy to check as far as possible the existing locust plagues and at the same time to continue working towards the ultimate aim of preventing recurrence of such epidemics in future.

4. The purpose of this report is to outline ways and means to fulfill the above objectives and to suggest the line of action to channel all the available resources towards one aim - the control of the Desert Locust.

Previous Panels of Experts on Long-Term Policy of Desert Locust Control

5. With a view to establishing an effective preventive policy of Desert Locust control, FAO has convened in the past two important panels of experts on the subject:

- (a) FAO Panel of Experts on Long-Term Policy of Desert Locust Control, London, April 1956;
- (b) FAO Panel of Experts on the Strategy of Desert Locust Plague Control, Rome, May 1959.

6. The 1956 Panel was mainly designed (i) to review the present knowledge of the factors affecting Desert Locust outbreaks and the build-up and recession of plagues; (ii) to prescribe those factors requiring particular investigations; (iii) to recommend the technical requirements needed to undertake these investigations; (iv) to plan organizational requirements needed to undertake these investigations; and (v) to propose arrangements for centralizing, analysing and disseminating the acquired results of such investigations.

7. The work of this Panel was mainly confined to promote research which was considered as a prerequisite for establishing an effective preventive policy of Desert Locust control. Its Report (Meeting Report No. 1956/11) was issued in English, French and Spanish and was widely distributed.

8. The 1959 Panel of Experts on the Strategy of Desert Locust Control Plague Control was convened by FAO as a follow-up of the 1956 Panel. It was designed to advise the Director-General of FAO on the most appropriate and effective manner in which FAO might apply its resources, and to recommend how national anti-locust organizations might best apply their services for controlling Desert Locust plagues to the greatest common benefit throughout the locust invasion area (Meeting Report No. PL/1959/5).

9. The deliberations of these Panels of Experts convened by FAO undoubtedly embrace a vast amount of technical and historical data never previously assembled, together with the combined views of international experts on the direction, along which it was considered, at the time of the Panels, future work to be developed.

10. The recommendations of these Panels are of lasting value. They have already contributed to the framing of national and international policies, and were taken into consideration at the time of drafting the Plan of Operation of the UNDP(SF) Desert Locust Project. Since then many developments have taken place which have considerably improved

our knowledge of this insect through ecological surveys and field research, and of the techniques of controlling it through advances in modern spraying with highly concentrated insecticide. The time would now seem to be ripe for elaborating long-term strategy of effective prevention of Desert Locust plague.

Long-Term Strategy

11. The planning of an international Desert Locust control strategy involves technical, financial and administrative problems. These factors are inter-dependent. The possibility of implementation of this strategy would remain unfulfilled if funds were not available to finance it. The expenditure of enormous sums by any Government on the most effective control measures will be of little avail if a neighbouring country fails to cooperate. Consequently, the strategy for 1970 onwards has to take into consideration the extent of financial and other resources available, the political realities of the 1970's as well as the practical possibilities of modern science.

Technical

12. Various important questions, such as (a) general and seasonal distribution of Desert Locust swarms' breeding areas and major swarm movements connecting them, (b) meteorological and ecological background of the behaviour movements of Desert Locust swarms, (c) annual and seasonal frequencies of infestations in different parts of the Desert Locust distribution region, and various other factors have been dealt with at length in several FAO Panels, reports and other published material. It is, therefore, not necessary here to go into details over these, which are more or less well established factors. This paper aims at indicating the lines along which the knowledge and experience gained over the years can be used to the maximum for the fullest benefit of all the countries concerned.

13. Surveys - Regular surveys during the appropriate seasons are a basic essential for every locust control organization. The importance of surveys has been emphasized in a number of FAO meetings, and various recommendations were made for improvement of survey methods and techniques over the past years.

14. The present recommended method of survey is a combination of air and ground reconnaissance which offers the most rational means of detecting locust populations. This method is, no doubt, an improvement over the old conventional one, but still a considerable amount of time is required by ground units to check areas which are indicated by aerial surveys likely to harbour locust populations.

15. In order to know within the shortest possible time, about the presence or otherwise of populations in the suspected areas spotted by aerial survey, trials were undertaken to detect populations by taking aerial photographs with a special camera. The results have revealed that this method could be used in finding out the presence or otherwise of locust populations although it may not be possible to estimate correctly their number because of the shielding effect of vegetation. Further field scale trials are considered essential in order to confirm that such a method could be used with advantage for future reconnaissance. The advantage of this particular method is that the aircraft, which is sent for aerial survey to detect ecologically suitable areas following the recent rainfall, can take at the same time pictures of such particular spots and collect the entire information during a single flight. If this technique is successful, it would be desirable to undertake the next logical step, e.g. to equip the same aircraft with spraygear and with a certain quantity of insecticides while going

on such reconnaissances. In case the locust populations are detected in certain areas, the aircraft, before returning to the base, might as well spray a few barriers in such areas depending upon the intensity of the populations detected. Since these trials have not yet been undertaken, it is rather too early to give any concrete evidence of success of this technique. But it is important to indicate at this stage the trends of development in survey and control methods, which will ultimately lead to more effective and less expensive control of the Desert Locust, thus relieving all affected countries of the economic burden still imposed upon them by the cost of control operations and by the extent of crop damages. Until such a technique is perfected and is applied on a large scale, it is necessary to carry on the present system of survey which is a combination of air and ground reconnaissance.

16. For the ground reconnaissance various methods and formulae are used in the assessment of locust populations in various regions. Urgent consideration needs to be given to evolving a standard method of assessing and reporting locust populations, to be used in all countries concerned. This question has been discussed a number of times, but so far a standard method has not been evolved. It is proposed that the various regions should send to FAO details of the method of assessing and reporting locust populations used in their respective areas. While doing so, the advantages and disadvantages of such a method should be clearly indicated. On the basis of this information FAO might appoint an expert to study the whole question and recommend the best method which could be applied in all the regions without any particular disadvantage. This proposal is being put up to the FAO Desert Locust Control Committee for its consideration and for providing guidance to the FAO Secretariat for further action.

17. It is a well established fact that the locust breeding area, both during recession and plague periods, coincides mostly with the drier part of the invasion area which is characterised by a low variable rainfall. That means that in any given season Desert Locust populations could be found in areas of rainfall which might involve only a fraction of the total possible seasonal breeding area. Again not all the areas which receive rains are equally suitable for locust breeding. Non-swarming populations, in particular, exhibit pronounced association with distinct types of habitat and with specific food and shelter plants. These ecological requirements have important implications in practice because areas of rainfall and locust breeding habitats are highly localized, and concentrating on them will substantially narrow down the areas to be searched and will increase the chances of finding locust populations. It is, therefore, necessary that, in addition to regular surveys, special attention be paid during a given time of the year to particular areas which could be subject to rapid multiplication of locust populations due to favourable ecological conditions. In the past such periods and areas were indicated in various reports. It may, however, be necessary to mention once again such periods of the year when particular attention is needed towards areas which could result into large locust populations over a short time in the various countries concerned. Based on the past experience, the following areas need special attention during the period mentioned against them:-

South-West Asia

December - March
April - May
January - April
June - September

- Southern Iran (Bandar Abbas to Ahwaz, Bandar Abbas to Chahbar)
- Southern Iran (Hinterland)
- Pakistan (Kulanch and Dasht Valleys)
- India and Pakistan (summer breeding areas: Barmer, Bikaner, Jaisalmer and Bahawalpur).

Near East

- | | |
|--------------------|---|
| January - February | - Saudi Arabia (Jeddah, Maldi, Jeddah) |
| February - March | - Saudi Arabia (Jeddah, Yenbo, Weij areas) |
| February - May | - Saudi Arabia (Asir and the interior of southern Saudi Arabia) |
| March - May | - Saudi Arabia (Hejaz, Nefud and Qassim) |
| December - March | - Yemen (Red Sea Coast) |
| August - September | - Yemen (Interior) |
| May - September | - South Yemen |
| October - January | - United Arab Republic (south-eastern desert) |
| March - June | - United Arab Republic (" " ") |

Eastern Africa

- | | |
|------------------|---|
| November - March | - Somali Republic (northern coast: Las Durah to Djibouti) |
| June - September | - Somali Republic (south of the coastal escarpment) |
| March - May | } - Eastern Ethiopia and Afar and Issa People |
| July - September | |
| November - April | |
| May - September | - Ethiopia and Sudan (Red Sea Coast) |
| | - Sudan (interior: Kordofan, Darfour and the northern Province) |

North-West Africa

- | | |
|-----------------|--------------------------------|
| October - April | - Southern and central Algeria |
| | - Southern Morocco |

West Africa

- | | |
|------------------|---|
| June - September | - Chad (Tibesti), Mali and Niger (areas adjoining the Algerian border), northern Senegal and parts of Mauritania and Spanish Sahara |
| October - March | - Northern Mauritania and northern Spanish Sahara |

18. The above periods and areas should only be regarded as general guide-lines to look for locust populations. There will naturally be a lot of variation which will depend upon the time and distribution of rainfall during a particular year. The countries concerned are, therefore, in a better position to decide the actual time and areas of survey during a particular season.

19. It is possible that in certain countries resources and technical staff may not be available with the national organization for survey of strategically important breeding areas. Under such circumstances, joint surveys, to be financed from regional funds, should be arranged to cover these important localities in the overall interest of the region. Such surveys could be organized on the same basis as has been done over the past years under the UNDP(SF) Desert Locust Project.

20. Control - It has been realized during the recent years that intensified and expanded collective action based on the application of rational strategy and of the most modern techniques can play an important part in checking an existing locust plague.

21. It is rather difficult to state precisely the reasons for the present (July 1969) improved locust situation after about one year of the resurgence of the plague. It could, however, be said that the concerted control operations undertaken by national and regional organizations under a proper coordination had played a major part in bringing about the reduction of the plague. It is, therefore, necessary that the present fortunate situation should be fully exploited and the policy of control and prevention, as recommended by the Eleventh Session of the FAO Desert Locust Control Committee (Report, paras. 75 and 76), should be strictly followed. At the same time it is desirable to develop an effective control strategy which could cope with the scale of the locust control problem without being beyond the financial resources of the countries, most of which are extremely poor.

22. During the current plague some new experiences have been gained which need to be given serious consideration for any future action. In this connection it is necessary to make special reference to the spraying done by the U.S. aircraft in Saudi Arabia during April and March 1969. This spraying was designed to control the scattered adult and hopper infestations in the areas along the Red Sea coast of Saudi Arabia, in order to check the spread of such populations, after successful multiplication, to central Saudi Arabia and to the northern part of the country. Depending upon the favourable conditions such populations can multiply to form large swarms which can subsequently invade U.A.R. and Sudan in the west, and Iran, Pakistan and India in the east.

23. The U.S. aircraft covered roughly 900,000 acres infested with scattered populations by barrier and blanket spraying. The subsequent evaluation of the effect of such spraying on locust populations in that area revealed a considerable reduction in numbers, thus eliminating the chances of escapes moving into central and northern Saudi Arabia. This exercise has provided a very useful information and new ideas which, if applied in the high frequency breeding areas at the appropriate time, can result in checking the Desert Locust plagues.

24. Resulting from the experience gained from the U.S. aerial spraying, it was considered desirable to find out the period of the year when locust infestations are very much restricted and only cover a fraction of its total breeding area so that the same spraying technique could be applied with advantage in all such areas.

25. The historical data of the last 25 years of the Desert Locust breeding reveal that the breeding is generally restricted during the months of November to February (Map 1) in the central area of the Desert Locust distribution area, as compared to the period from March to June (Map 2) and July to October (Map 3). If the area (Map 1) is sprayed during this particular period, it would result in the reduction of populations and subsequent summer breeding in the neighbouring countries. It is possible that such a spraying may not be able to provide lethal doses to most of the populations present in that area but certainly the survivors will get sufficient sub-lethal doses which can apparently be lodged within the female body and will be sufficient to destroy the progeny thus providing the possibility of stopping the outbreak more cheaply than ever before. The advantage of such a spraying and its cost has to be compared with the cost involved for large scale operations which governments would have otherwise to undertake during the following months plus the crop damage which might be suffered.

26. Such an operation needs a very careful planning on the basis of the available data and should include:

- (a) pre-spraying survey;
- (b) actual spraying operations;
- (c) evaluation and assessment of results.

27. After determining the area of concentration, arrangements should be made for pre-spraying survey of the area soon after the receipt of the first rainfall of the season with the view to assess locust populations and infestations which might be present. Such a survey could easily be undertaken by the national and regional organizations of the area concerned. Subsequent surveys might be undertaken if considered necessary. On the basis of results obtained, planning should be done for the method of spraying of such areas. In case the population is scattered of both adults and hoppers, it might be appropriate to treat the area by barrier spraying, whereas in case of heavier infestations a blanket spraying might be necessary. It might also be necessary to put barriers at the base of the hills in order to check the entry of the populations into inaccessible areas where control operations become difficult. All such decisions will depend upon the intensity of infestations and the type of the area involved. National and regional organizations can participate in the spraying wherever adequate resources are available. In other cases it would be necessary to ask for outside assistance, particularly for supply of aircraft with crew and insecticides.

28. In order to evaluate and assess the results of the operation, it would be necessary to carry on extensive surveys after the conclusions of operations. It is possible that such an evaluation survey could best be done by the technical staff of the various national and regional organizations under the expert advice of a specialist who should be made responsible for collection, collation of the entire information and compilation of the data into a report.

29. If such results are found encouraging, it would be worthwhile repeating the same operation for another year or two in order to assess its value for the long-term strategy of Desert Locust control. This proposal is being put forward to the Committee for its consideration and for providing guidance. In case the FAO Desert Locust Control Committee considers that such a proposal is technically sound and economically feasible, it would be necessary to prepare a detailed plan of operation keeping in view the latest developments in detecting locust populations and spraying techniques.

30. Broadly speaking, the long-term strategy on Desert Locust control would be based on:

- (a) improvement in survey techniques with special reference to the application of remote sensing;
- (b) application of the latest spraying techniques against locust populations in general and, in particular, concerted action against infestations when these are restricted in a comparatively small area during a certain period of the year;
- (c) concentration on field research work having a direct bearing on improvement of survey and control techniques;
- (d) maintenance of adequate resources for survey and control at national, regional and international levels both during recession and plague periods;
- (e) emergency operations.

Financial and Administrative Arrangements - 1970 Onwards

31. Having dealt with some of the important technical matters in very broad terms, it is necessary to state more precisely as to how the various available resources would be utilized to continue the international Desert Locust control programme in general, and some of the important aspects developed or strengthened during the UNDP(SF) Desert Locust Project, in particular. The FAO Desert Locust Control Committee, at its Ninth Session, agreed to establish an international Trust Fund to meet the cost of continuing certain activities initiated under the UNDP(SF) Desert Locust Project. Contributions for the year commencing 1.7.67 to 1.7.69 of this Trust Fund were, however, earmarked as cash counterpart contributions to the UNDP(SF) Desert Locust Project. From 1970 onwards its contribution of US\$ 76,000 per annum will be available for the objectives as envisaged by the Desert Locust Control Committee at its Ninth Session (Report, para. 79).

32. In the meanwhile there have been various other developments and new Trust Funds have been established at regional levels. It is, therefore, necessary for any realistic plan for long-term strategy of Desert Locust control to take into consideration all the possible resources that may be available to deploy such an overall strategy. However, the major problem of international strategy from 1970 onwards needs to be faced - how to manage with an annual revenue of approximately half a million dollars against an annual average of one million dollars hitherto spent during the last ten years.

33. The following is the source of funds and the purpose for which these have been so far utilized:-

Source of Funds	<u>Annual Budget</u> <u>1969</u>	(a)	(b)	<u>Continuing</u> <u>after 1969</u>
(1) UNDP/TA Inter-Regional Project	176,000	-	176,000	200,000
(2) FAO Trust Fund Servicing Costs	26,000	26,000	-	30,000
(3) UNDP/SF Project - Governments	140,000	140,000	-	-
(4) UNDP/SF Project - UNDP	337,000	-	337,000	-
(5) FAO International Trust Fund	76,000	76,000	-	76,000
(6) FAO Trust Funds of Regional Commissions/Sub-Committee	241,000	241,000	-	241,000
TOTAL US\$	996,000	483,000	513,000	547,000

(a) Contributions originating from countries in the infestation area

(b) Contributions from UNDP

Analysis of above by classification of expenditure

	<u>Regional Trust Funds</u> (2) & (6) above	<u>UNDP/SF</u> (3)(4)(5)	<u>UNDP/TA</u> (1)	<u>TOTAL</u>
Survey and reconnaissance	50,000	80,000	-	130,000
Field research	20,000	64,000	-	84,000
Reporting and forecasting	25,000	97,000	-	122,000
Control (including strategic reserves)	65,000	93,000	40,000	198,000
Training	30,000	63,000	12,000	105,000
Operational research	-	80,000	-	80,000
Coordination	77,000	76,000	124,000	277,000
TOTAL US\$	267,000	553,000	176,000	996,000

34. Taking the analysis of expenditure given above as a starting point it is possible to see certain areas in which some reduction of expenditure may be possible, namely:

- (a) The expenditure shown under Field Research, US\$ 84,000 and Reporting and Forecasting, US\$ 122,000 includes a fair amount of expenditure (say 50% of the total) on vehicles, radios and other equipment which does not have to be re-purchased every year.
- (b) The expenditure on operational research was concentrated over a two year period, 1962/64, with the Beirut based Operational Research Aerial Unit and although some operational research must continue a repetition of such a costly experiment is not at present contemplated.
- (c) Coordination at US\$ 277,000 is the largest item and at first glance would appear to offer scope for economies. Unfortunately this is not the case. Under this heading is included not merely the very modest locust unit at FAO Headquarters and the Regional Secretariats but also the support provided to certain countries and regional organizations which are not in a position to maintain their locust services without continuous financial support.

35. In this last connection it has to be borne in mind that of the some 50 countries in the locust infestation area more than half have acquired their independence since the UNDP(SF) Desert Locust Project was established in 1960. This means that on the one hand they lack trained personnel and experience to provide an efficient locust control service and such resources as they have are needed for other equally urgent needs. On the other hand the increase in the number of sovereign states that FAO has to deal with entails increased work in coordination. Likewise the establishment of the various regional organizations, important as it is in the frame-work of international locust control strategy, adds to the responsibilities of FAO as adviser and coordinator.]

36. Taking the above factors into consideration, the following is the outline plan for financing an international locust control programme for the year 1970 onwards:-

<u>Source of funds</u>	<u>Amount available</u> <u>per annum</u> <u>US\$</u>	<u>Activities</u>
(a) UNDP/TA	176,000	To meet the cost of HQ and regional staff, the activities of which include:- a. overall coordination of Desert Locust control programme in the countries concerned; b. coordination of field research; c. provision of technical assistance and guidance as may be needed by individual governments or regional organizations; d. servicing of various committees, sub-committees and sessions of regional commissions; e. publishing of reports, technical material, Newsletter and distribution; f. mobilizing of assistance in cash and kind from outside sources when existing reserves prove insufficient to cope with a particular situation; g. providing assistance under emergency through the Emergency Fund of US\$ 500,000 under establishment.
(b) TRUST FUND AGENCY COSTS	26,000	HQ staff to assist in activities mentioned under UNDP/TA and with particular reference to the activities concerning the African Migratory Locust, the Red Locust and other migratory locust species.
(c) INTERNATIONAL TRUST FUND 161	76,000	a. maintaining of DLIS; b. convening high-level training courses and awarding of fellowships and exchange visits; c. panels of experts and arranging advisory visits; d. provision for research projects of international significance; e. Reserve Fund.
(d) REGIONAL TRUST FUNDS:-		
123	71,450	a. Arranging joint surveys;
169	30,000	b. coordination of research programmes within the region;
409	134,940	c. maintenance of strategic reserves of insecticides and control equipment; d. arranging joint control within the region.

- e. assist and promote in any manner which it considers appropriate, any national, regional or international action relating to control or survey of the Desert Locust;

f. Reserve Fund.

37. DLCO-EA and OCLALAV, with independent annual budgets of about US\$ 600,000 and US\$ 1,240,000 respectively will continue to operate within their respective areas for survey and locust control including activities mentioned in para. 36(d). Furthermore, the various national organizations will carry out all possible measures to control Desert Locust plagues within the country and to reduce crop damage by adopting at least the following essential procedures:-

- (a) maintaining a permanent locust information and reporting service;
- (b) maintaining an adequate permanent locust control service;
- (c) holding reserves of insecticides and application equipment;
- (d) encouraging and supporting such training, survey and research work including where appropriate the maintenance of national research stations for the study of the Desert Locust, as may be considered desirable by the Regional Organizations/Commissions and as are compatible with the resources of the country;
- (e) participating in the implementation of any common policy of locust control or prevention which may be approved by the Regional Organizations/Commissions.

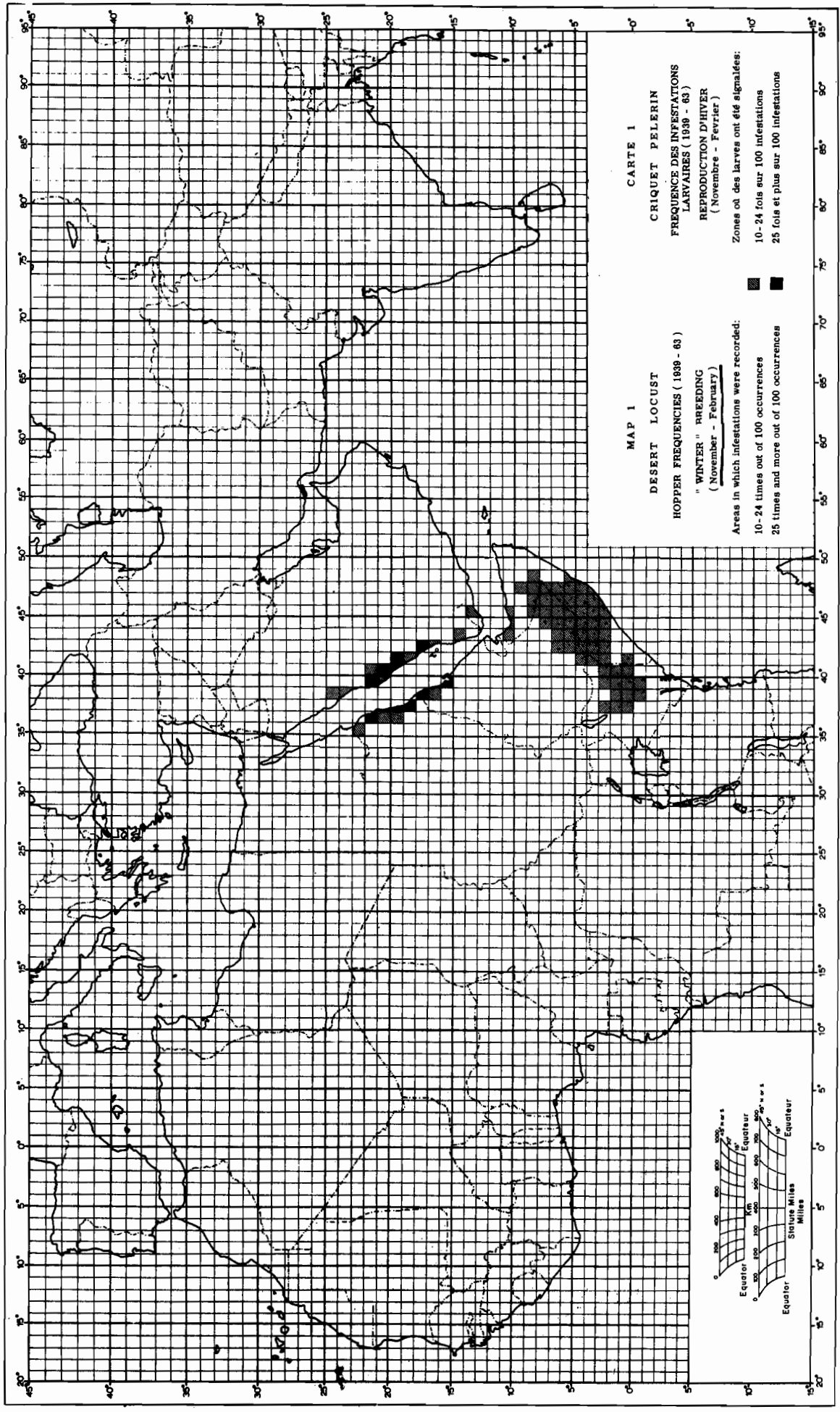
38. It may be admitted that all the national organizations may not be able to maintain the above-mentioned services to the desired extent without outside assistance. As the locust knows no frontiers, the effectiveness of control measures in any given country is of international significance and, therefore, cannot be ignored. In such cases, continued assistance from UNDP/TA, regional organizations and other bilateral aid is of vital importance.

Emergency Operations

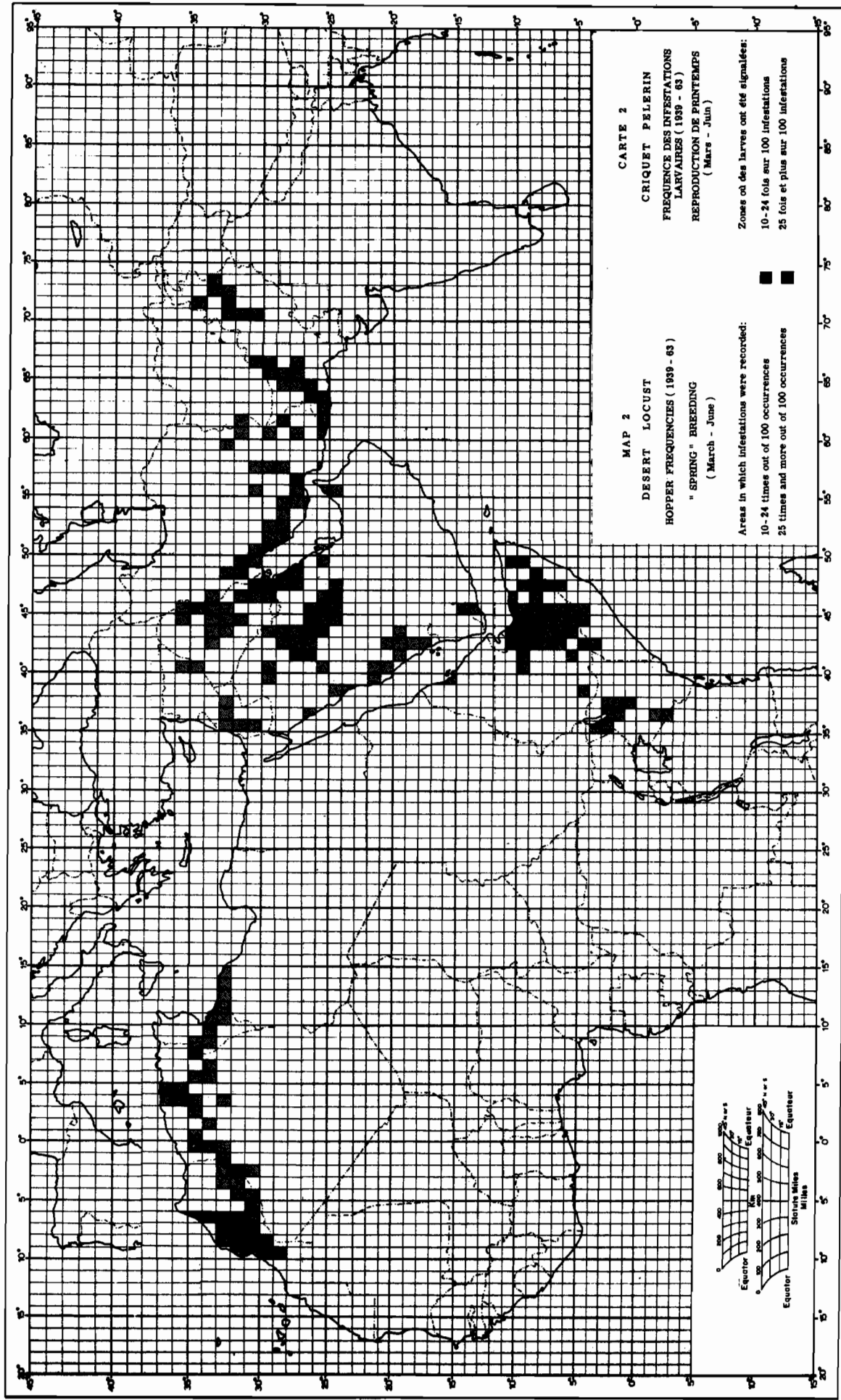
39. In the past every emergency has been dealt with by urgent appeals to the UNDP and to Member Governments for assistance. However, even though the response has often been prompt and generous, it takes time to mobilize the vehicles, insecticides and personnel to make them available where needed. By the time the locust situation has been assessed, requests for assistance formulated, transmitted to the UNDP and Governments for consideration, and finally the means made available, the locusts, unrestricted by such formalities or international conventions of any kind, have destroyed more and more crops. There has been in the past no emergency fund available to reinforce the efforts of governments when the situation became beyond their control.

40. The need for such an emergency fund has long been recognized when the International Trust Fund was established for the purpose of financing the continuation of certain aspects of the UNDP(SF) Desert Locust Project, the accumulation of funds for such a reserve was a major element in the programme. At the same time in the various

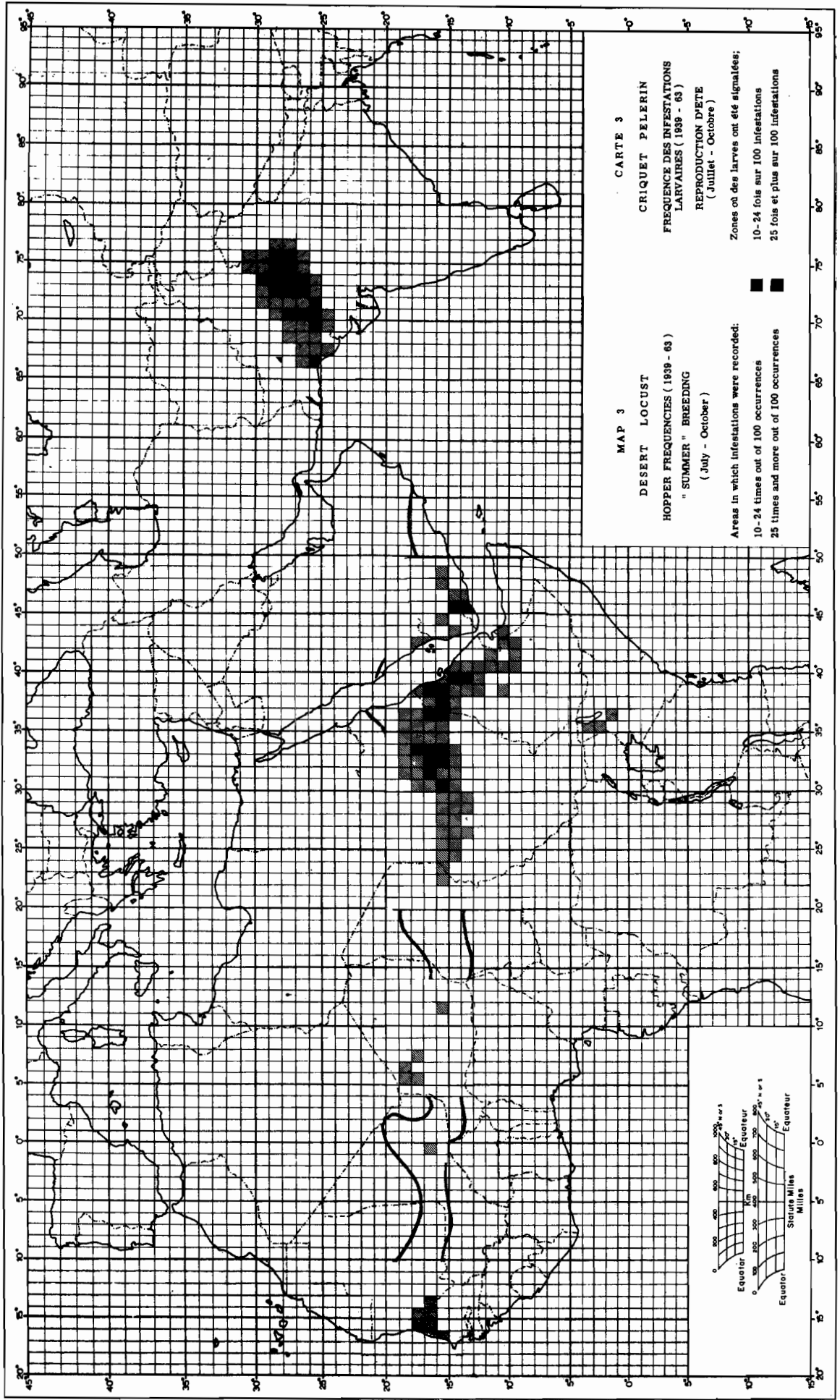
Trust Funds of the Regional Commissions every year the unallocated balance is being put in the Reserve Fund with the view to building up sizeable reserves for any emergency. Such accumulation of Reserve Funds are in no way adequate to deal with any emergency effectively, but certainly is a help if applied with other resources available for the same purpose. Accordingly, based on the recommendation of the Desert Locust Control Committee, the FAO Council will now be submitting to the 15th Session of the FAO Conference in November 1969 proposals for the establishment of an emergency fund of US\$ 500,000 to be financed from the Working Capital Fund of FAO. This will be available for emergency help in the event of any future resurgence of the plague. This Fund, together with the other reserves, would certainly provide an adequate amount to deal with any future emergencies. It being understood that this provision, while of great importance when the particular eventuality occurs, affords no relief to the normal cost of operating of the national and regional control programmes. Operations under this Fund will be planned and executed, under the advice of an expert panel to be appointed by the Director-General, after the final establishment of the Emergency Fund by the forthcoming session of the FAO Conference in November 1969.



Maps prepared on the basis of information supplied by the D. L. I. S.
 Cartes dressées sur la base des renseignements fournis par D. L. I. S.



Maps prepared on the basis of information supplied by the D. L. I. S.
 Cartes dressées sur la base des renseignements fournis par D. L. I. S.



MAP 3
DESERT LOCUST
" SUMMER " BREEDING
(July - October)

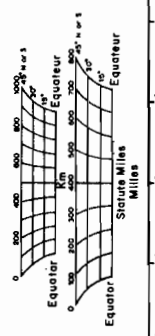
HOOPER FREQUENCIES (1939 - 63)

Areas in which infestations were recorded:
 10- 24 times out of 100 occurrences
 25 times and more out of 100 occurrences

CARTE 3
CRIQUET PELERIN

FREQUENCE DES INFESTATIONS
LARVAIRES (1939 - 63)
REPRODUCTION D'ETE
(Juillet - Octobre)

Zones où des larves ont été signalées;
 10- 24 fois sur 100 infestations
 25 fois et plus sur 100 infestations



Maps prepared on the basis of information supplied by the D. L. I. S.
 Cartes dressées sur la base des renseignements fournis par D. L. I. S.

APPENDIX VI

LIST OF WORKING PAPERS

- PL:DL/DLC/69/1 - The Desert Locust situation - October 1968 to July 1969
- PL:DL/DLC/69/2 - Progress report of the UNDP(SF) Further Assisted Desert Locust Project (1.5.68 to 30.4.69)
- PL:DL/DLC/69/3 - Matters arising out of the 12th Session of the FAO Desert Locust Control Committee:
- (a) Director-General's appeal for assistance and response of various donors;
 - (b) Resources for Desert Locust control available with various countries and organizations, and inter-governmental assistance;
 - (c) Crop damage.
- PL:DL/DLC/69/4 - The Long-term strategy on Desert Locust control
- PL:DL/DLC/69/5 - Status of various Desert Locust regional organizations
- PL:DL/DLC/69/6 - International anti-locust campaign in the Arabian Peninsula during 1968/69 and plans for the future
- PL:DL/DLC/69/7 - Annual progress report of the Desert Locust Information Service (DLIS)
- PL:DL/DLC/69/8 - Anti-Locust measures undertaken by various countries and regional organizations.