

September 2006

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

LIST OF DOCUMENTS

- AGP:DLCC 06/1** Provisional Agenda
- AGP:DLCC 06/2** The Desert Locust Situation (December 2004 to August 2006) and Forecast to Winter 2006 (**Cressman**)
- The Desert Locust emergency 2003-2005:**
- AGP:DLCC 06/3a** Review of the survey and control operations undertaken (**Cressman**)
- AGP:DLCC 06/3b** Review of the assistance provided to affected countries multilaterally and bilaterally, and made available from national resources (**Niggemann/Monard**)
- AGP:DLCC 06/3c** Review of the training provided to affected countries (**Monard**)
- AGP:DLCC 06/3d** Review of human health and environmental issues (**Everts**)
- AGP:DLCC 06/3e** Report of the tripartite Independent Evaluation Mission (**Brader**)
- AGP:DLCC 06/3f** Proposal for the establishment of an Emergency Fund for Desert Locust management (**Elliott**)

EMPRES Progress and Directions and the Locust Commissions:

- AGP:DLCC 06/4a** EMPRES/Western Region and Western Region Commission (**Ben Halima**)
- AGP:DLCC 06/4b** EMPRES Central Region (**Pantenus**)

AGP:DLCC 06/4c Central Region Commission (**Butrous**)

AGP:DLCC 06/4d South-West Asia Commission (**Cressman**)

Bilateral Assistance Programmes to Desert Locust management:

AGP:DLCC 06/5a The World Bank's African Emergency Locust Project (**Kristensen**)

AGP:DLCC 06/5b USAID's Emergency Transboundary Outbreak Pest Programme (**Belayneh**)

AGP:DLCC 06/6 Recommendations of the 37th DLCC Session (2003) and the Extraordinary Session (2004) (**Monard**)

AGP:DLCC 06/7 New technologies and publications (**Cressman**)

AGP:DLCC 06/8 Report on the Technical Group Workshop, May 2004 (**McCulloch**)

AGP:DLCC 06/9 Technical Group composition and future activities (**Secretariat**)

AGP:DLCC 06/10 International Trust Fund 9161: Contributions/Expenditure Workplan 2001/2002/2003 (**Cressman/Denis**)

AGP:DLCC 06/11 Pesticide Referee Group (**Matthews**)

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DESERT LOCUST CONTROL COMMITTEE

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PROVISIONAL AGENDA

1. Opening of the Session
2. Election of Chairman, Vice-Chairman and Drafting Committee
3. Adoption of the Agenda
4. The Desert Locust Situation (December 2004 to August 2006) and Forecast to Winter 2006
5. Comments and additions from locust-affected countries
6. The Desert Locust emergency 2003-2005:
 - (a) Review of the survey and control operations undertaken
 - (b) Review of the assistance provided to affected countries multilaterally and bilaterally, and made available from national resources
 - (c) Review of the training provided to affected countries
 - (d) Review of human health and environmental issues
 - (e) Report of the Multilateral Independent Evaluation Mission
 - (f) Proposal for the establishment of an Emergency Fund for Desert Locust management
7. EMPRES Progress and Directions and the Locust Commissions:
 - (a) EMPRES/WR and the Western Region Commission
 - (b) EMPRES Central Region
 - (c) Central Region Commission
 - (d) South-West Asia Commission
8. Bilateral Assistance Programmes to Desert Locust management:
 - (a) The World Bank's African Emergency Locust Project
 - (b) USAID's Emergency Transboundary Outbreak Pest Programme

9. Recommendations of the 37th DLCC Session (2003) and the Extraordinary Session (2004)
10. New technologies and publications
11. Report on the Technical Group Workshop, May 2004
12. Technical Group composition and future activities
13. International Trust Fund 9161: Contributions/Expenditure Workplan 2003-2007
14. Pesticide Referee Group
15. Any Other Business
16. Date of the next Session
17. Adoption of Report
18. Closure of the Session

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

PROVISIONAL TIMETABLE

Monday, 11 September 2006

Opening Ceremony (German Meeting Room – C269)

10:00 Opening of the Session (Assistant Director-General/Agriculture)

10:30 *Coffee break*

First Working Session (German Meeting Room – C269)

11:00 Election of Chairman, Vice-Chairman and Drafting Committee

11:15 Adoption of the Agenda

11:30 The Desert Locust Situation (December 2004 to August 2006) and Forecast to Winter 2006

12:30 *Lunch break*

Afternoon Session

14:30 Comments and additions from locust-affected countries

The Desert Locust emergency 2003-2005:

15:30 Review of the survey and control operations undertaken

16:30 Review of the assistance provided to affected countries multilaterally and bilaterally, and made available from national resources

17:30 *Cocktail welcome to participants*

Tuesday, 12 September 2006

Morning Session

9:30 Review of the training provided to affected countries

10:15 Review of human health and environmental issues

11:00 Report of the multilateral Independent Evaluation Mission

12:30 *Lunch break*

Afternoon Session

14:30 Discussion and Conclusions
17:30 *End of the day*

Wednesday, 13 September 2006

Morning Session

09:30 Proposal for the establishment of an Emergency Fund for Desert Locust management
10:15 Discussion
EMPRES Progress and Directions and the Locust Commissions:
11:00 EMPRES/WR and the Western Region Commission
12:00 EMPRES Central Region
12:30 *Lunch break*

Afternoon Session

14:30 Central Region Commission
15:15 South-West Asia Commission
Bilateral Assistance Programmes to Desert Locust management:
16:00 The World Bank's African Emergency Locust Project
16:45 USAID's Emergency Transboundary Outbreak Pest Programme
17:30 *End of the day*

Thursday, 14 September 2006

Morning Session

09:30 Recommendations of the 37th DLCC Session (2003) and the Extraordinary Session (2004)
10:15 New technologies and publications
11:00 Report on the Technical Group Workshop, May 2004
11:45 Technical Group composition and future activities
12:30 *Lunch break*

Afternoon Session

14:30 International Trust Fund 9161: Contributions/Expenditure Workplan 2003-2007
16:00 Pesticide Referee Group
16:45 Any Other Business
17:30 *End of the day*

Friday, 15 September 2006

Morning

Drafting Committee prepares report
Free for other meetings to be organized, eg. Donors meeting

Afternoon Session

14:00 Adoption of Report /Closure

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

THE DESERT LOCUST SITUATION (DECEMBER 2004 TO AUGUST 2006) AND FORECAST TO DECEMBER 2006 (Agenda Item 4)

NB. This paper contains information reported to FAO DLIS up to 30 June 2006. The situation and forecast will be updated during the DLCC.

1. OVERVIEW

The Desert Locust upsurge in the Western Region began to decline in late 2004 due to intensive control operations and unfavourable weather and ecological conditions in Northwest Africa. Consequently, swarms did not form during the spring of 2005 in Morocco or Algeria nor did they invade the Sahel in the summer. Several Southern Circuit swarms moved east across the southern Sahel in the spring of 2005 and bred along both sides of the Chad-Sudan border during the summer. In the Central Region, control operations were carried out against swarms that invaded northwest Egypt and reached the Red Sea coastal plains in late 2004 and early 2005. Operations were also carried out against Southern Circuit swarms and their progeny in western Sudan and Ethiopia during the summer of 2005. By autumn, the upsurge had ended in both regions. More than one million ha were treated in December 2004 and, thereafter, less than 800,000 were treated in 2005 compared to more than 11 million ha from October 2003 to November 2004. In South-West Asia, a small outbreak developed during the summer of 2005 along the Indo-Pakistan border. About 18,000 ha were treated by ground teams in India and Pakistan and the situation returned to normal by the end of the year. So far in 2006, the situation has remained calm in all regions, and only limited control operations have been carried out in Algeria.

2. WESTERN REGION

2.1. Northwest Africa spring breeding

Unusually cold temperatures during the winter of 2004/05 in the Maghreb did not allow the immature swarms that arrived from the Sahel during the autumn to mature nor to migrate to other areas. This gave control teams in Morocco and Algeria nearly six months to carry out spray operations before the temperatures began to warm up in March. From December 2004 to March 2005, Morocco treated 459,888 ha and Algeria treated 1,013,153 ha. Operations were also

conducted in Mauritania (59,987 ha), Libya (5,560 ha), Niger (2,535 ha), Tunisia (990 ha) and Cape Verde (530 ha) mainly against residual populations. Consequently, very few infestations remained at the beginning of spring 2005 and subsequent breeding in Morocco and Algeria was extremely limited due to poor rainfall along the southern side of the Atlas Mountains. As a result, locust numbers did not increase significantly during the spring and the Sahel was not invaded in the summer of 2005. By now it was clear that the upsurge had collapsed.

2.2. Southern Circuit migration

Late-forming first generation swarms mixed with a smaller second generation of swarms moved west in the Sahel during December 2004. These swarms subsequently reinvaded northern Senegal and moved south through Gambia to Guinea Bissau and Guinea by January 2005. The immature swarms over-wintered in the central highlands of Guinea. Control operations were carried out against swarms in Senegal (62,815 ha), Gambia (14,422 ha), Guinea Bissau (7,368 ha) and Guinea (24,350 ha) from December 2004 to March 2005. During April and May 2005, the remaining immature swarms moved east in the southern Sahel from southern Mali to Burkina Faso to southern Niger, northern Nigeria, northern Cameroon, central Chad and eventually reached eastern Chad and western Sudan where they matured and laid eggs in late May and early June. As the swarms were moving quickly through these areas, it was not possible to conduct control operations against them.

2.3. Summer 2005 breeding in the Sahel

As a result of early rainfall, solitary and *transiens* adults bred on a small-scale in the Tanout region in central Niger and 1,471 ha were treated in May and June. Southern Circuit swarms laid eggs in Chad, giving rise to a limited number of small hopper bands in June and July, mainly in the centre and east of the country where 5,592 ha were treated. Despite unusually good rains during the summer in the Sahel, solitary locust numbers remained low and only increased slightly as a result of limited breeding in west and northwest Mauritania, northern Niger and in the Algeria Sahara from September to November. Control operations were only required in Algeria where 8,510 ha were treated from June to November.

2.4. Autumn – winter 2005 breeding

Small-scale breeding continued in western Mauritania and southern Algeria as ecological conditions remained favourable longer than in most years. Ground control operations were conducted in both countries (1,001 ha in Mauritania and 425 ha in Algeria) against solitary and a few *transiens* hoppers and adults in December.

2.5. Situation in 2006

Locust numbers have remained low and insignificant in the region during 2006 with small infestations of solitary adults in the north of Mauritania, Mali and Niger as well as in the Algerian Sahara. Although limited breeding occurred in some of these areas, locust numbers did not increase significantly.

3. CENTRAL REGION

3.1. Winter 2004/05 breeding

The immature swarms that invaded Egypt and were not controlled in November eventually reached the Egyptian/Sudanese border near the Red Sea coast where they concentrated, matured and laid eggs in December. Ground teams treated small hopper bands and swarms that formed in February and March 2005 in Sudan (7,461 ha) and Egypt (1,795 ha). A few swarms crossed the Red Sea in April to the central coastal plains of Saudi Arabia where they laid eggs. The small hopper bands that developed were controlled in May and June 2005 (5,755 ha).

3.2. Invasion from West Africa

Several immature swarms associated with the Southern Circuit migration arrived in the Darfur province of western Sudan from eastern Chad in late May and early June 2005. These swarms

had formed the previous autumn in the western Sahel and over-wintered in the Guinea highlands. Most of the swarms remained in Darfur where they quickly matured and laid eggs, but a few swarms continued east across central Sudan and reached the Ethiopian highlands in Tigray and Amhara provinces in mid June. Hoppers bands started to form at the end of June in Darfur where survey and control operations could only be undertaken in the relatively secure Government-controlled zones during the summer. Sudan was able to treat 14,174 ha from July to September, and Ethiopia treated 264 ha from June to August. Despite the limited areas that were accessible to survey and control teams in western Sudan, there was only one report in November of a swarm forming in Darfur. This suggests that the invasion of the Southern Circuit swarms and the subsequent breeding was relatively small and confined to a limited area. Very little breeding occurred elsewhere in the summer breeding areas in Sudan in 2005. In Eritrea, ground control operations treated 20,135 ha of hopper groups and bands on the northern Red Sea coast resulting from local breeding from July to September that was probably not related to the upsurge.

3.3. Winter 2005 / spring 2006 breeding

Only small-scale and very limited breeding occurred during this past winter on the Red Sea coast in Sudan, mainly in the Tokar Delta, and on the northern Red Sea coast in Yemen. Consequently, locust numbers did not increase significantly during the winter or in the spring of 2006. By April, locust numbers declined on the Sudanese coast. Since then, there have been no reports of locusts in the region.

4. EASTERN REGION

South-West Asia was not affected by the 2003-05 upsurge and the situation remained calm until the summer of 2005 when good monsoon rains fell along the Indo-Pakistan border. Laying occurred in July, hatching and gregarization took place in August and swarms started to form in September. A second generation of breeding took place with hatching and band formation in October and new swarms forming in mid-November. By then ecological conditions had dried out and the few adults and swarms that were not controlled moved east towards New Delhi while others moved west towards the Indus Valley in Pakistan. Some adults reached the spring breeding areas in Baluchistan, western Pakistan in mid-December. By the end of the year, the situation was once again calm along the Indo-Pakistan border. During the campaign, India treated 13,922 ha and Pakistan treated 4,847 ha from September to December. During the spring of 2006, no significant developments occurred in western Pakistan or in eastern Iran, the traditional spring breeding areas, due to poor rainfall. This was confirmation that the control operations along the Indo-Pakistan border in late 2005 were successful.

5. Forecast to December 2006

The forecast is based on initial levels of Desert Locust populations in the summer breeding areas in the Sahel in West Africa and Sudan, in the interior of Yemen and along the Indo-Pakistan border and the expected distribution and timing of rainfall in these areas. Experimental seasonal forecasts of rainfall probabilities and anomalies are used to help predict rainfall in the next six months.

5.1. Summer breeding

Several scenarios are possible: (a) rainfall is patchy and ends in September or October, allowing only one generation of breeding and locust numbers do not increase significantly, (b) good rains fall over a widespread area, lasting until October or November that allows two generations of locust breeding so that there is a significant increase in locust numbers, or (c) unusually heavy rainfall occurs in one or more limited areas, causing conditions to remain favourable for several months to allow at least two generations of intensive breeding, causing an outbreak to develop in the autumn. Seasonal forecasts indicate that summer rains should be normal in most areas except during October in the central northern Sahel near the Mali – Niger – Algeria border and in

western Mauritania where there is a chance of slightly higher than normal rainfall. Below normal rainfall associated with this year's monsoon is consistently predicted along the Indo-Pakistan border during the summer. As of late June, only low numbers of locusts have been reported in parts of Niger and central Algeria. Consequently, only small-scale breeding is expected to occur during the summer and the likelihood of significant infestations developing in any region is assessed to be low.

5.2. Autumn – winter breeding

The forecast for breeding during the autumn and winter depends on the situation in the summer breeding areas. If two generations of breeding occur and locust numbers increase significantly, then more locusts would be available to take advantage of any rains that fall in the traditional winter breeding areas, that is, northwest and northern Mauritania, and the coastal plains along both sides of the Red Sea. So far it is too early to indicate with any precision the scale and timing of breeding during the last three months of 2006.

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DESERT LOCUST CONTROL COMMITTEE

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REVIEW OF THE SURVEY AND CONTROL OPERATIONS UNDERTAKEN ¹ (Agenda Item 6a)

1. SURVEY OPERATIONS

During the 2003-05 Desert Locust upsurge, national locust teams conducted survey operations by ground or air in 26 countries. Initially, the surveys were undertaken on the ground using four-wheeled drive vehicles due to the limited resources that were available and the relatively small infestations. As locust numbers increased and the situation deteriorated and as funding became available, aerial survey operations were mounted. Aerial surveys were conducted in 2004 and continued until the end of October 2005 in eight countries using helicopters or fixed-wing aircraft². All of the countries indicated that they were able to cover much larger areas with helicopters, including visiting remote places, in an easier and quicker manner than with vehicles on the ground. Helicopters were advantageous over fixed-wing aircraft because they could land frequently and the survey officer could get out and make a quick assessment on foot.

2. CONTROL OPERATIONS

2.1. Overview

Between October 2003 and December 2005, 23 countries³ treated 13.2 million ha of Desert Locust infestations by ground and air (see Annex 1). Nearly all of the control operations (12.7 million ha or 96%) were conducted in 14 countries in the Western Region while only limited operations were conducted in nine countries⁴ in the Central Region (nearly 0.5 million ha or 4%). In the Western Region, ten Sahelian countries⁵ treated nearly 3 million ha compared to 9.8

¹ The figures used in this paper are those reported by the countries to the FAO Desert Locust Information Service (DLIS) at FAO Headquarters where they were checked and corrected as necessary

² Algeria, Chad, Mali, Mauritania, Morocco, Niger, Saudi Arabia, Senegal

³ Algeria, Burkina Faso, Cape Verde, Chad, Cyprus, Egypt, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Israel, Jordan, Lebanon, Libya, Mali, Mauritania, Morocco, Niger, Saudi Arabia, Senegal, Sudan, Tunisia

⁴ Cyprus, Egypt, Eritrea, Ethiopia, Israel, Jordan, Lebanon, Saudi Arabia, Sudan

⁵ Burkina Faso, Cape Verde, Chad, Gambia, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal

million ha in the four Maghreb countries⁶. Initially, only small areas required treatment during the outbreak stage (7,446 ha in October 2003) but this rapidly changed as locust infestations increased in size and number during the upsurge (from 250,000 ha treated in January 2004 to 2.4 million ha in November 2004). Morocco and Algeria treated the largest area, 4.8 million ha and 4.5 million respectively, accounting for 71% of the total area treated during the upsurge. The majority of the control operations were undertaken in Northwest Africa against adult groups and swarms and their offspring (hopper bands) during the spring of 2004, and again in the autumn of the same year against invading swarms that developed in the summer breeding areas in the Sahel of West Africa.

2.2. Aerial operations

Aircraft sprayed nearly 6.8 million out of the 13.2 million ha treated during the 2003-05 upsurge. On a national level, aerial operations accounted for some 29% (Mali) to 88% (Morocco) of all control. Aerial treatments first began in November 2003 in Saudi Arabia and Morocco, followed by Algeria, Mauritania, Tunisia, Libya, Mali, Niger, Senegal and Chad in 2004 and early 2005. Aerial control operations in Morocco and Algeria were the determining factor in the success of the campaign in the Western Region. A fleet of 42 aircraft treated 83% of the total area controlled in Morocco during the nine-month campaign in the winter/spring of 2004 and 51 aircraft treated 93% of the total during the five-month campaign in the autumn/winter of 2004/05. Algeria mobilised 12 aircraft for the first campaign, and 52 for the second. In 2004, Saudi Arabia used four aircraft early in the year, Tunisia used seven aircraft during the spring, Senegal used 22 aircraft, Mauritania used 21, Mali used 13, and a lesser number were used in Niger and Chad. All aerial operations had concluded by the end of March 2005.

2.3. Pesticides

Most of the pesticides used in the control operations were products that have been shown to be effective against Desert Locust as indicated by the independent Pesticide Referee Group (PRG). The products were applied by national teams in the affected countries as full-cover applications according to standard methods indicated in the *FAO Desert Locust Guidelines* in which the pesticide must be applied directly on the locust. Aerial control operations mainly treated settled infestations and only a limited amount of air-to-air spraying of flying swarms was done. Barrier applications in which strips of pesticides were applied every 0.5-1.0 km, leaving untreated ground in between, were undertaken only in Mauritania where ground teams protected an estimated 137,132 ha from November 2003 to March 2004. The biological control agent, *Metarhizium anisopliae* var. *acridum*, was tested against hopper infestations in Niger (December 2003 – January 2004; October-November 2005) and Algeria (April-May 2005) with good results.

2.4. Difficulties

During the upsurge, affected countries faced several difficulties in monitoring and controlling locust populations. Despite intensive ground and aerial surveys, not all areas could be accessed and checked for locust infestations, making it impossible to determine precisely the extent of locust infestations in any given country. This led to uncertainty about the magnitude of the problem and the amount of resources required for its control. Control operations suffered initially from a lack of pesticides, sprayers, vehicles, aircraft and qualified technical personnel. Late arrival of the necessary resources greatly hampered operations and, in some exceptional cases, control had to cease. Despite the increased efficiencies of aerial control operations, the logistics of their support proved to be difficult to manage in most countries. Consequently, FAO deployed logisticians to help support aerial control operations.

Even in countries that are well prepared to conduct large-scale control operations, such as Morocco and Algeria, it was not possible to prevent swarm formation and migration to other countries, for example, the invasion of the Sahel in West Africa during the summer of 2004 by swarms produced in the spring breeding areas of Northwest Africa. Certainly control operations

⁶ Algeria, Libya, Morocco, Tunisia

reduced the scale of the invasion but it does raise the question of the ability to stop an invasion given favourable weather and ecological conditions.

3. CONCLUSION

As the 2003-2005 upsurge developed, control operations increased and expanded to include aircraft as locust targets became more substantial and sufficient funds were made available. These operations were initiated quicker in those countries that had ready access to the required resources. The DLCC should consider the following questions during the discussion:

- (a) FAO DLIS did not receive complete control data (hectares treated by ground and air, pesticides used) on a regular and timely basis during the campaign. Some data still remains incomplete. How can the collation and reporting of control data by affected countries be improved?
- (b) Should aircraft be deployed earlier in an upsurge for survey and control operations? If so, can countries maintain their own fleet of aircraft?
- (c) As Desert Locust infestations increase, should countries shift to aerial control, including air-to-air spraying, and rely less on ground control?
- (d) If additional resources would have been available in Northwest Africa during the spring of 2004, could the swarm invasion of the Sahel in West Africa during the summer have been prevented?

Annex 1. Number of hectares treated against Desert Locust, October 2003 – December 2005

These figures are those that were reported to FAO DLIS by affected countries. The figures have been checked and corrected whenever necessary. Countries are encouraged to check these figures and provide any updates or modifications to the Secretariat.

	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	total	corrected	% aerial	
Algeria	528	2,932	1,663	59	6,023	95,741	349,913	443,715	924,209	844,249	7,019	2,800	131,745	685,371	441,341	218,716	316,921	36,175	547	1,570	1,200	200	770	315	5,120	905	425	4,520,172	4,520,172		
Burkina Faso	0	0	0	0	0	0	0	0	0	0	200	12,247	14,712	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27,159	27,159	
Cape Verde	0	0	0	0	0	0	0	0	0	16	0	500	497	1,874	450	80	0	0	0	0	0	0	0	0	0	0	0	0	3,417	3,417	
Chad	0	0	0	0	0	0	0	0	0	0	0	8,801	8,423	0	0	0	0	0	0	0	4,272	1,320	0	0	0	0	0	0	22,816	22,816	
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	462	462		
Egypt	203	613	13	0	895	2,704	43	1,433	1,672	1,793	0	6	8,650	162,900	51,185	2,084	155	1,640	542	510	50	0	0	0	0	0	0	237,091	237,091		
Eritrea	0	0	0	0	1,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,933	11,117	85	0	0	0	22,055	22,055		
Ethiopia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	17	184	0	0	0	0	264	264		
Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,385	6,037	0	0	0	0	0	0	0	0	0	0	0	14,422	14,422		
Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,900	5,450	15,000	0	0	0	0	0	0	0	0	0	24,350	24,350		
Guinea Bissau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,368	0	0	0	0	0	0	0	0	0	0	7,368	7,368		
Israel	0	0	0	0	0	0	0	0	0	0	0	0	0	NR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	4,520	2,003	0	0	0	0	0	0	0	0	0	0	0	0	6,523	6,523		
Lebanon	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10		
Libya	0	900	0	800	0	0	28,961	72,670	59,147	3,095	0	1,060	4,925	44,646	5,340	220	0	0	0	0	0	0	0	0	1,005	0	100	222,869	222,869		
Mali	80	12,573	17,437	0	0	0	0	0	0	6,285	16,403	218,081	106,582	5,050	3,100	0	0	0	0	0	0	0	0	0	0	0	0	385,591	347,374	29	
Mauritania	1,612	12,702	50,056	135,010	81,749	24,728	14,627	1,527	1,194	5,071	34,636	202,112	458,366	312,368	59,987	0	0	0	0	0	0	0	0	0	0	0	1,001	1,396,746	1,396,746	71	
Morocco	0	8,873	13,796	26,622	97,354	446,936	346,202	452,593	736,750	724,913	5,433	505	459,033	1,075,260	384,796	68,412	6,110	570	0	47	6	0	0	0	0	0	0	4,854,211	4,854,211	88	
Niger	192	90	3,792	1	1,088	2,930	1,600	0	200	1,075	4,397	98,025	96,383	10,700	2,535	0	0	0	0	1,200	271	0	0	0	125	0	0	224,604	272,428	55	
Saudi Arabia	0	3,000	26,336	89,727	24,572	2,375	1,040	0	0	0	0	0	60	1,100	20	0	0	0	2,707	5,155	600	0	0	0	0	0	0	156,692	163,321	40	
Senegal	0	650	0	0	0	0	0	0	30	3,673	56,948	211,397	378,536	60,542	52,484	5,921	4,200	210	0	0	0	0	0	0	0	0	0	774,591	767,137	52	
Sudan	4,836	12,000	1,836	542	308	959	596	6	0	0	0	0	0	0	0	1,320	2,685	4,776	0	0	0	1,726	12,289	159	0	0	0	44,038	44,038		
Tunisia	0	0	0	0	0	0	0	79,943	NR	NR	0	0	14,185	11,606	0	630	350	10	0	0	0	0	0	0	0	0	0	106,724	241,550	45	
total	7,451	54,333	114,929	252,761	213,909	576,373	742,982	1,051,887	1,723,202	1,590,170	125,036	755,534	1,682,559	2,375,947	1,011,626	307,320	343,239	58,381	3,796	8,482	6,462	12,196	24,360	1,564	5,245	1,005	1,426	13,052,175	13,195,783		



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FAO DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REVIEW OF THE EMERGENCY ASSISTANCE PROVIDED TO AFFECTED COUNTRIES, MULTILATERALLY, BILATERALLY AND MADE AVAILABLE FROM NATIONAL RESOURCES DURING THE DESERT LOCUST CAMPAIGN 2003 TO 2006 (Agenda item 6b)

1. Funding of the campaign

The cost of the Desert Locust campaign is estimated at US\$ 280¹ million for the control and survey of the Desert Locust and related environmental activities including pesticide stock management and human health protection. Funds for the locust control campaign were mobilized by the countries affected contributing US\$ 149¹ million from their own resources, multilateral emergency assistance through FAO of US\$ 80.4 million and bilateral assistance amounting to a value of US\$ 50.5¹ million.

2. National resources

As mentioned, the locust affected countries contributed in total some US\$ 149 million to the locust campaign. The assistance mobilized by the two North-West African countries, Morocco, Algeria made up the majority of the total resources used for Desert Locust survey and control. These resources consisted of control inputs such as pesticides, control equipment and spray aircraft already available in country or were procured by the countries themselves. In addition, the running costs of national teams in Morocco and Algeria for survey and control operations were covered to a large extent through their national resources.

The many other locust affected countries mobilized themselves essential control means, ranging from vehicles to aircraft made available from their military support or other State Departments (Plant Protection). Further, countries procured themselves equipment and pesticide in addition to any existing pesticide stocks. Moreover, countries contributed partly to the running costs of their national survey and control teams.

¹ Source of information "Independent Multilateral Evaluation Report of the Locust Campaign".

3. Bilateral assistance

Bilateral assistance contributed significantly to the campaign by providing assistance worth some US\$ 50.5² million as reported in the Report of the Independent Multilateral Evaluation of the locust campaign. Again the Maghreb region alone, Algeria, Libya and Morocco, contributed significantly with control inputs worth some US \$ 32² million to the locust control operations in the Sahel. A part of this assistance, in addition to donor support mainly from USA and South Africa, funded the supply of some 2.6 million liters of pesticides mainly for control operations in Mali, Mauritania, Niger and Senegal. These pesticides were supplied in addition to the pesticides supplied through FAO.

Further, bilateral assistance funded aerial survey and control operations by loaning or donating aircraft to the locust affected countries. It is estimated that during the 2004/2005 Desert Locust campaign, 42 aircraft were made available to region, of which 14 were allocated to Senegal, 11 to Mali and 9 to Mauritania. Donors supporting these operations were mainly Algeria, Libya, Morocco and USA.

The assistance covered also control needs in terms of equipment such as vehicles, sprayers and radios, as well as financial support to the national control teams.

4. Appeals for donor funding and multilateral assistance through FAO

In response to the locust crisis, FAO alerted the donor community since October 2003 of the need to face the threatening locust situation and issued an appeal for funds to the donor community in February 2004 for US\$ 9 million. Due to the exceptional weather and ecological conditions favourable to the quick building-up of the Desert Locust populations and insufficient fund mobilization, the needs for controlling the rapidly increasing locust populations rose within months to US\$ 17 million by April and increased further up to US\$ 100 million in August 2004. FAO re-established its Emergency Centre for Locust Operations (ECLO) on 25 August 2004 to foster its response capacity in terms of fund-raising and assistance to the locust affected countries.

As the locust situation evolved quickly locust affected countries appealed for FAO's emergency funding through its Technical Cooperation Program (TCP). By August 2004 FAO had provided funding of US\$ 4.1 million through national and regional TCP projects. This budget increased further over the summer 2004 to US\$ 6.2 million managed through some 22 TCP emergency projects.

Donor response to FAO appeals was initially rather slow when only some US\$ 1.3 million were approved to FAO by April 2004. However, donor funding grew rapidly once the Desert Locust infestation increased considerably starting to menace food security and people's livelihood in the region. Between August and the end of December 2004 donors had approved US\$ 76 million managed through national and regional projects in 18 locusts affected countries. By the beginning of 2005 the donor funded portfolio increased even further up to US\$ 78.6 million reaching US\$ 80.4 million during the course of the year, handled through 68 projects, Graph 1 illustrates the situation of funds received against appeals.

Due to the changes of the Desert Locust situation, both in number and geographical distribution, changes in the overall assistance to countries due to bi-lateral contributions as well as the countries' own resource management, the FAO managed donor-funded projects required frequent revisions of the budget and project duration. These more administrative and financial constraints could be addressed by pursuing a more regional and multi-donor funded approach in the future opposed to the somewhat fragmented current approach focusing on single national and regional projects, which are often conditioned by a rather rigid budget. However, donors' general

² Source of information "Independent Multilateral Evaluation Report of the Locust Campaign".

support has been appreciated in adjusting budget and extension projects into 2006 allowing the implementation of an important environmental and human health program as part of the locust campaign and of its follow-up.

A remarkable development during this locust campaign was the close cooperation with the WB's emergency and development program for the control of locust in 7 West African countries. While the focus of project implementation is at the country level due to the nature of the WB funding arrangement of loans to the recipient countries, FAO appreciated the coordination mechanism established with the WB during the last 2 years. Upon completion of the emergency phase FAO intends to continue this fruitful cooperation with the WB as well as with bi-lateral partners including Regional Banks, as part of FAO's EMPRES program.

5. Allocation of funds to locust affected countries

As a result of the features of the Desert Locust upsurge and according to the needs of the locust affected countries, the majority of ECLC funding was allocated to the North and Western Region in Africa amounting to 79.5 million USD (99% of the total ECLC budget), the remaining US\$ 980 000 being allocated to the countries of the Central Region (graph 2).

Within the Western Region, 85.5% of the funds were allocated to the five Sahelian countries (Mauritania, Mali, Niger, Senegal and Chad), 11.3% to the four north-western African countries (Morocco, Algeria, Tunisia and Libya) and the remaining 3.1% to the southern circuit countries (Burkina Faso, Guinea-Bissau, Guinea, Gambia and Cape-Verde). Graph 3 illustrates this situation and graph 4 shows the budget allocation by Country of the Central Region of the Red Sea area.

Funds were budgeted originally for the current needs at country level. However during the course of the locust campaign budgetary allocations had to be adjusted to meet most essential needs to reduce the locust population and thereby reduce the risk of crop losses and food insecurity. In this context it should be noted that upon FAO's request some countries and donors preferred at times to re-allocate funds from locust control inputs to recovery of agricultural production as the food security was affected through the aftermaths of the locust infestations and droughts affecting some countries in the Sahelian region.

The change in budgetary allocation during the period October 2004 to August 2006 and the actual expenditure by type of inputs are presented in the following table³:

Major Inputs	Budget Oct. 04		Budget Aug. 06		Expenditures Aug. 06	
						% on allocated budget
	USD thousands					
Pesticides	40%	22,949	35%	28,299	18,188	64%
Sprayers	3%	1,868	2%	1,567	1,780	114%
Protective clothing	1%	729	1%	858	831	97%
Communication equipment	1%	794	2%	1,802	2,091	116%
Vehicles	1%	763	3%	2,130	2,384	112%
Flying hours	19%	11,134	15%	12,274	10,509	86%
Human resources	6%	3,683	8%	6,239	4,335	69%
Equipment related to Locust control	2%	1,099	5%	4,291	2,877	67%
Operating Expenses	18%	10,288	18%	14,441	10,900	75%
Project operating expenses and FAO technical services	7%	3,860	11%	8,590	6,515	76%
Total	100%	57,166	100%	80,490	60,410	

³ Data extracted from FAO's Field Program Information Management System (FPMIS) does not take into account latest approved budget revisions. For this reason, expenditures for vehicles, communication equipment and sprayers exceed the approved budget. However, taking into account donor approvals in reality expenses are within the approved budgets by major inputs and will be reflected in the final report of the DLCC.

At the beginning of the campaign funds were mainly allocated for control means such as, pesticides, aerial survey and control of locust, operating expenses for national control operations. Later on, with the scaling-down of the locust infestation, the emphasis shifted more towards environmental and human health related activities including the pesticide management and disposal programs of empty pesticide drums. This is reflected in the increase of the funds allocated to items such as “Other equipment related to Locust control”, “Vehicles” and “Human resources” in the above table.

Graph 5 demonstrates the change of budget allocations to major inputs during the Desert Locust campaign.

6. Assistance delivered through ECLC to the locust affected countries

Out of the US\$ 80.4 million available to the ECLC program, US\$ 60.4 were delivered as of August 2006 equivalent to 75% of the total ECLC budget.

The expenditure pattern, presented in graph 6 indicates that over 50% of the funds were spent for the procurement of pesticides (US\$ 18.2 million), hiring of aircraft (US\$ 10.5 million) and for operating expenses at the field level (US\$ 7.6 million). However, it should be noted that the budget for pesticides had to be used only up to 64% to meet countries’ needs due to additional pesticide supply through other sources and a reduced locust population. The attempt to re-allocate funds from pesticides to other activities has materialized only partially as funding conditions for some donors do not allow for sufficient flexibility to change the budget in these circumstances. In these cases unspent funds will be returned to the donor. However, the majority of donors approved re-allocation of funds particularly to address environmental and human health related needs.

During the Desert Locust campaign, FAO delivered a total of 2.6 million liters of pesticides for a value of US\$ 18.2 million. The main countries benefiting from the delivery of pesticides were Mauritania (US\$ 7.5 million), Senegal (US\$ 4.1 million), Niger (US\$ 2.1 million) and Morocco (US\$ 2 million). Thus, these 4 countries alone received 86% of pesticide supplied through FAO.

Regarding aerial services for locust survey and control operations, the cost of FAO’s contracted aircraft from commercial companies amounted to US\$ 10.5 million for a total of 3 659 flying hours. The countries benefiting from this assistance were Mauritania (US\$ 4.9 million), Niger (US\$ 1.6 million), Senegal (US\$ 1.4 million), Mali (US\$ 1.1 million) and Chad (US\$ 1 million). Funds spent on flying hours for these five countries represent 95% of the total amount spent for flying hours.

In summary, funds mobilized through FAO thanks to donor funding and FAO’s own TCP resources allowed contributing to a successful locust campaign in the north-west region of Africa as well the Central region in spite of some initially funding constraints.

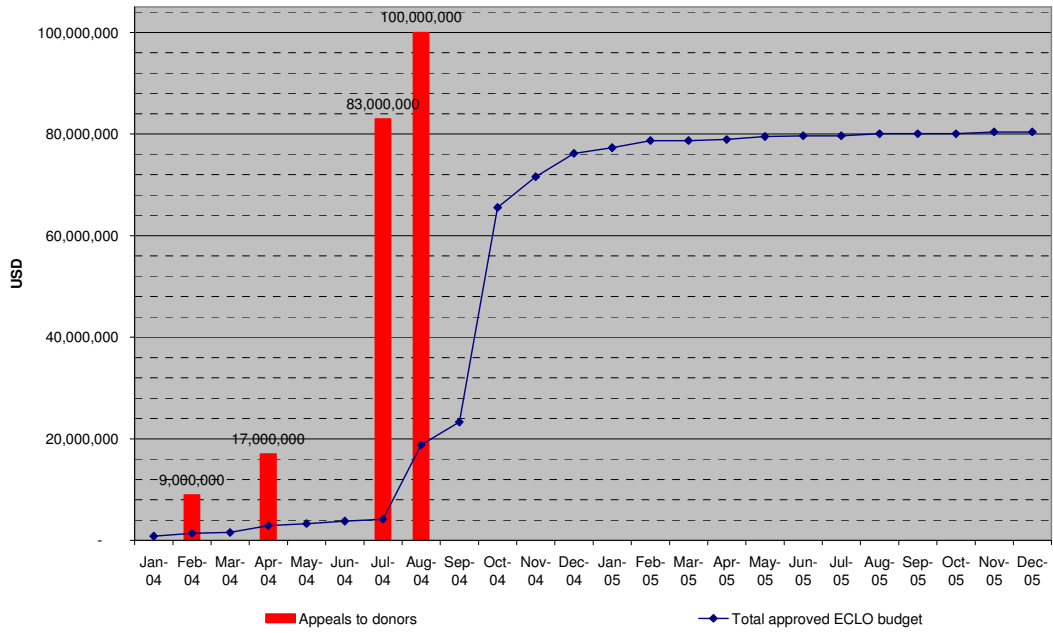
The findings of the Independent Multilateral Evaluation of the Locust Campaign may contribute to address these and other constraints experienced over this locust campaign.

7. Issues for consideration by the DLCC

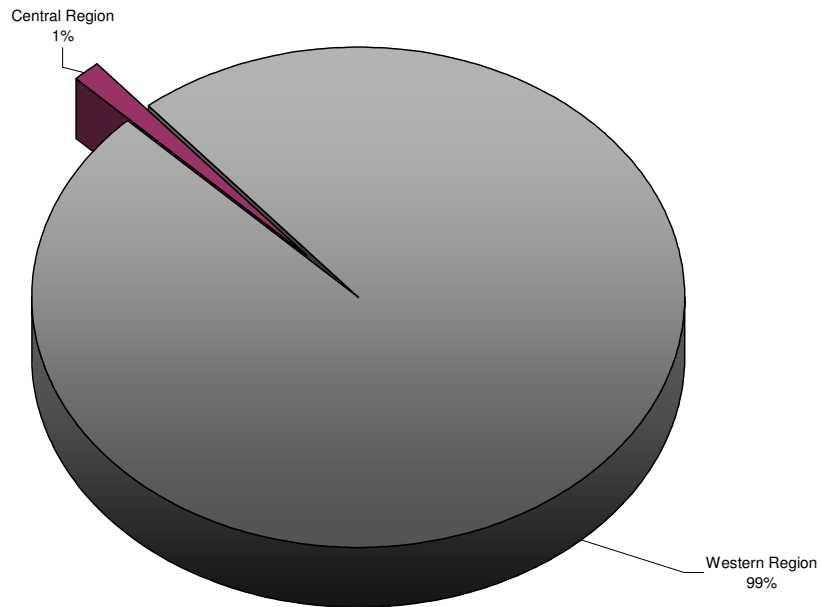
Programme rather than project approach for locust emergency funding: In view of the rapid development of Locust populations and administrative procedures required for setting-up a series of individual locust emergency projects, a programme rather than a single project approach would be more effective and efficient in terms of project management. Whenever this approach is acceptable to donors this approach should be more beneficial for smoother and more effective assistance to the locust affected countries.

Allocation of unspent project funds at the end of the locust campaign/ ECLO: It can be anticipated that some US \$ 2.1 million of donor funds will remain unspent by the end of 2006, by when most emergency projects will have been concluded. Subject to donors' concurrence, these funds could either strengthen the countries capacities for improved locust preparedness within the framework of the EMPRES programme for the Western Region or could be allocated to a special Desert Locust Emergency fund.

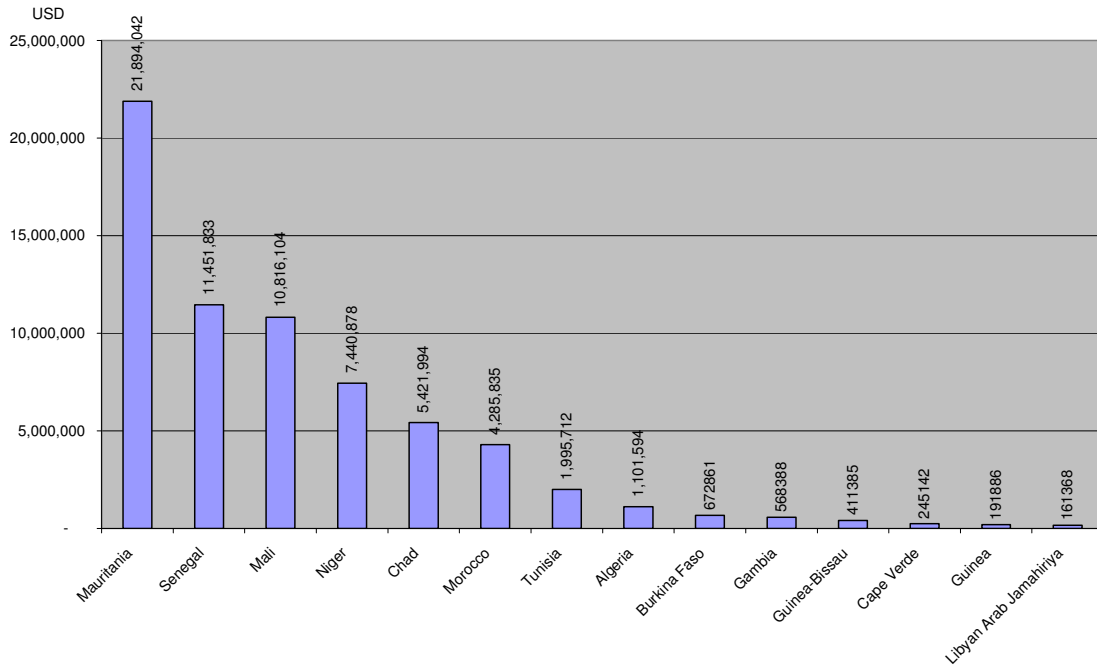
Graph 1: Funds received by FAO against appeals made for emergency assistance to the donor community



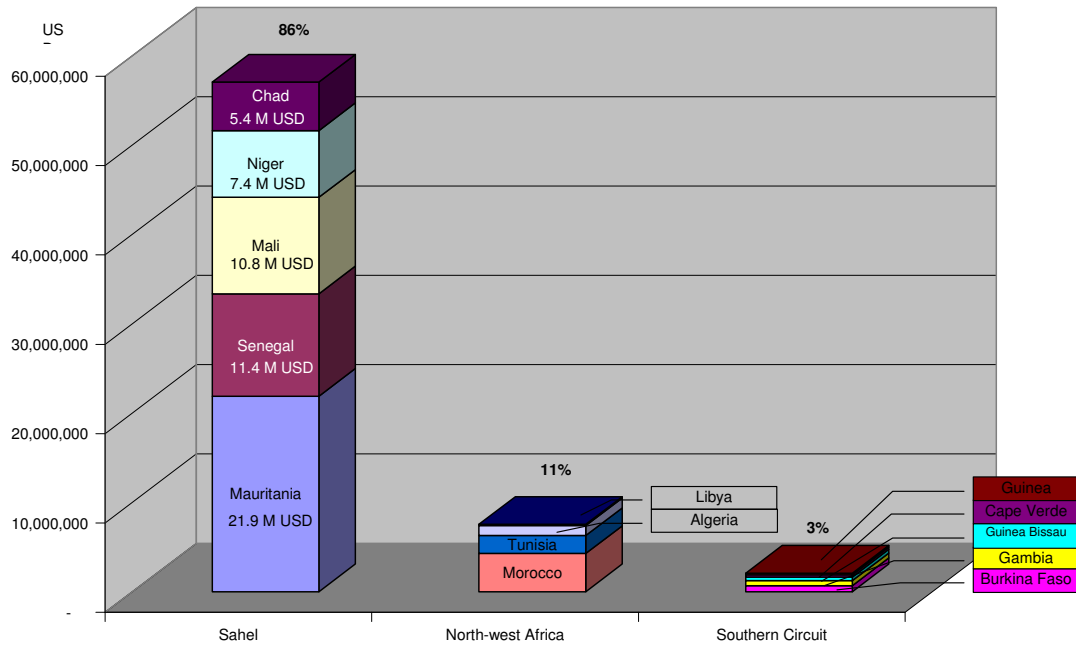
Graph 2: Distribution of the FAO/ECLO budget between the Western Region and the Central Region (DL affected countries in the Red Sea region assisted by FAO)

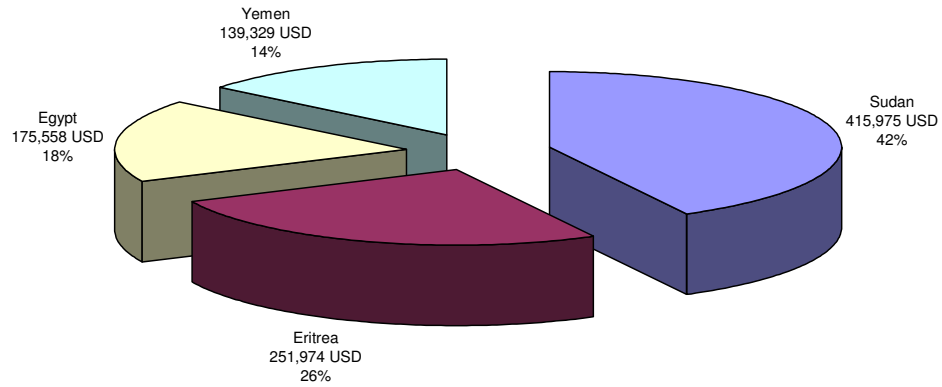
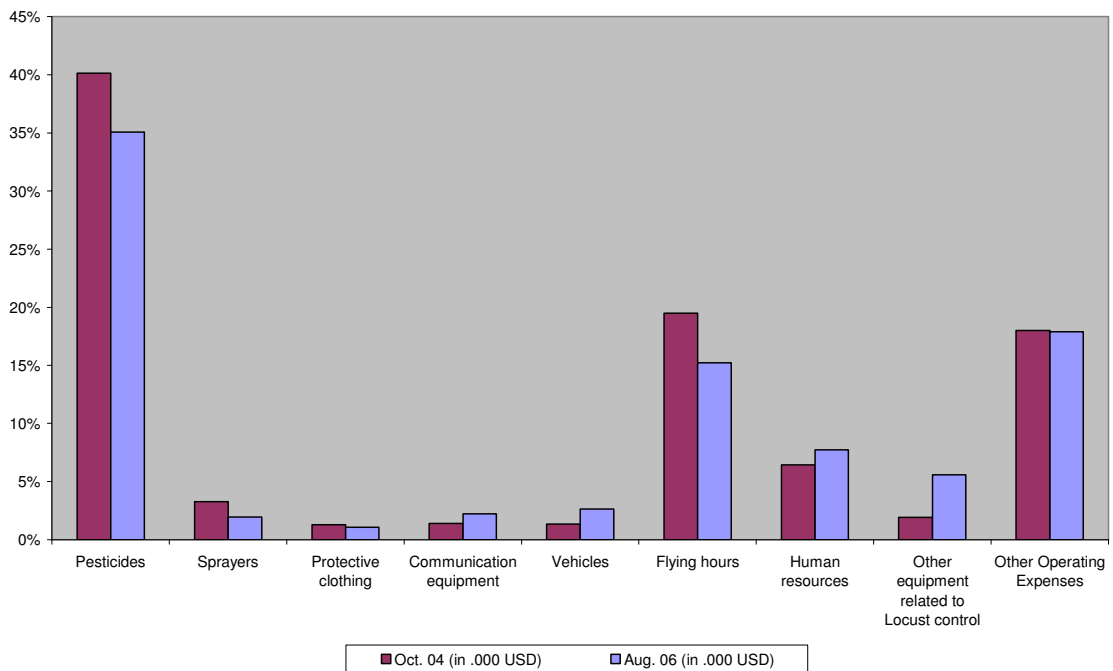


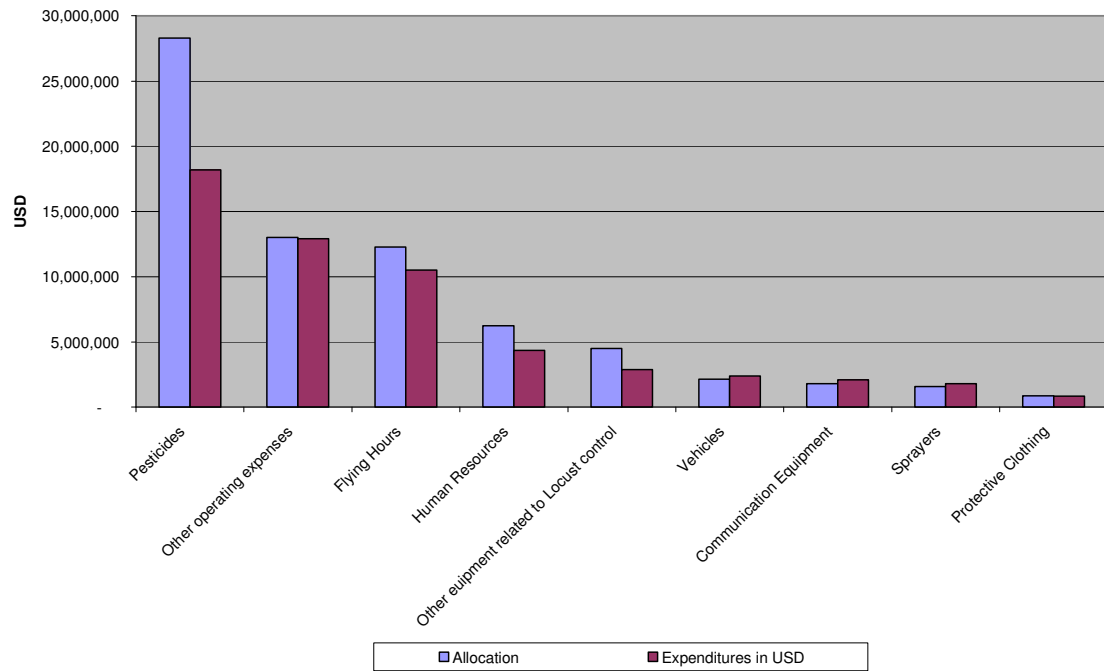
Budget allocated to the North and West African Region



Graph 3: Distribution of the US\$ 79.5 million FAO/ECLO budget allocated to the Western Region within the three sub-regions



Graph 4: Distribution of the FAO/ECLO budget allocated to the Central Region**Graph 5: Comparison of budget allocated to the various major inputs by FAO/ECLO in October 2004 and in August 2006**

Graph 6: Expenditure pattern by major inputs⁴

⁴ Data extracted from FAO's Field Program Information Management System (FPMIS) does not take into account latest approved budget revisions. For this reason, expenditures for vehicles, communication equipment and sprayers exceed the approved budget. However, taking into account donor approvals in reality expenses are within the approved budgets by major inputs and will be reflected in the final report of the DLCC.

September 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

DESERT LOCUST TRAINING PROGRAMME (Agenda Item 6c)

1. INTRODUCTION

The locust emergency that erupted in late 2003 in the Western Region of the Desert Locust distribution area and the ensuing large-scale mobilization of additional staff highlighted the insufficient number of trained personnel in the region and the inadequacies of Desert Locust knowledge and management. As a result and as part of the planning of locust control activities for 2005, a vast and ambitious training-of-trainers (ToT) programme was drawn up in November and December 2004 for the benefit of the ten countries of the Western Region, namely the four frontline Sahel countries (Chad, Mali, Mauritania, Niger) and Senegal and the five countries generally referred to as the Southern Circuit countries (Burkina Faso, Cape Verde, Gambia, Guinea, Guinea Bissau). The outline of a training strategy was also presented and agreed upon during the Extraordinary Session of the DLCC held in Rome from 29 November to 2 December 2004. This programme, which became operational before the beginning of the 2005 summer campaign, was designed to unfold in three successive stages: a regional master-trainer training session, national training sessions and national workshops to evaluate acquired know-how. It led to the qualification of 20 experts and technicians as master trainers and the basic or refresher training of some 600 technical staff of the agricultural services of the ten countries concerned.

2. PREPARATORY PHASE OF THE PROGRAMME

2.1. Context and preparation of the Programme

One of the major weaknesses to come to light during the locust control campaign of 2004 was the capacity of certain countries to manage a Desert Locust emergency. The number of experts and technicians with proper training in the various domains of acridology was in fact extremely limited in the Western Region and more particularly in the Sahel countries. The Desert Locust control units barely had the staff to deal with recession situations and had to call upon field staff from the plant protection and agriculture services. While some of the staff had already dealt with locust upsurge situations, the last Desert Locust upsurge had occurred in the late 1980s, since when their knowledge had remained largely unchanged.

The quality of a country's response to a locust emergency depends largely on its technical competence in the fields of locust surveys and information, locust control and campaign management, provided supplies and equipment are available and field staff have been trained in their use.

On the basis of these observations and the experience and results gained in the Central Region of the Desert Locust distribution area, an international consultant acridologist was recruited at FAO Headquarters for six weeks, in November 2004, and tasked with designing a detailed trainer-training programme with a heavy emphasis on practical exercises; with defining the topics that needed to be taught and transferred; and with compiling an inventory of training materials and facilitator profiles. Using the FAO Desert Locust Guidelines and the Master Trainer Manual prepared for the Central Region, the identified topics were placed into five modules:

- Bio-ecology and dynamics of Desert Locust populations (3 days),
- Surveys and information processing (5 days),
- Locust control: spray products and equipment (5 days),
- Eco-toxicity and human and environmental safety (5 days),
- Management of a control campaign (3 days),

subdivided into sub-modules (see Annex I) and to be delivered in 3 weeks.

The programme was to take the form of step-down training in three stages:

- 1) the training of 20 master trainers at a regional session lasting three and a half weeks;
- 2) the training, specialization or refresher training of some 600 field staff of the Desert Locust control units and the plant protection and agriculture services at five-day national sessions given by each master trainer to some 30 field staff before the summer control campaign; and
- 3) the validation of knowledge and the evaluation of training outputs at three-day national workshops, held after the 2005 campaign,

taking existing constraints into account, such as the already heavy training calendar, the need to tailor certain topics to country situations and the limited time before the theoretical start of the 2005 summer campaign.

Selection of the participants, the future master trainers, was done with the help of the FAO Representations in the ten countries concerned. The FAO Representations in the five Sahel countries (Chad, Mali, Mauritania, Niger and Senegal) were asked to identify, in close collaboration with the relevant national authorities (national Desert Locust control units and national plant protection services), six potential candidates from whom three would be selected per country on the basis of the following criteria:

- practical knowledge of certain aspects of Desert Locust control such as survey operations and methods of spraying,
- proficiency in French,
- pedagogical skills and experience in extension work,
- expressed desire to become a master trainer and corresponding availability (each trainer was expected to organize at least three national training sessions before the 2005 locust control summer campaign).

Similarly, a candidate from each of the five bordering or neighbouring countries (Burkina Faso, Cape Verde, Guinea, Guinea-Bissau and Gambia) was selected from the three potential candidates provided.

An international consultant was recruited for six months, based at Headquarters but with field missions, to help develop and implement delivery and the pedagogical monitoring of the ToT approach for the candidates, the facilitators and the regional session participants who would become master trainers at the national sessions and the field staff benefiting from the master trainers' acquired skills. There was consultation with all potential candidates from the very outset by means of a questionnaire on the objectives, content and methods of the regional session. The answers were rapidly processed to determine the needs and expectations of all the participants. This participatory approach was repeated during the regional and national sessions, with the body of compiled data analysed by a consultant at Headquarters.

2.2. Preparation of the training documents

The inventory of training materials indicated that these existed in English for two of the five modules (survey and information, and control). They had already been prepared for the Central Region in the form of a highly detailed Master Trainer Manual that accompanied the different levels of training and had been translated into French by the FAO Locust Group. Training aids for the other three modules in the form of CD-ROMs (available upon request) were commissioned from a university with recognized experience in pedagogy and entomology, and more specifically acridology.

2.3. Equipment for the regional and national sessions

The equipment needed for the training sessions was classified into three categories: essential equipment (video projector, printer, micro-computer...), complete kits for each module for the master trainers and basic kits for participants at the national sessions. The equipment for the practical exercises was also identified; for the regional session, a spray plane was even hired for the calibration of pesticide sprayers and the collection of droplets on oil sensitive paper. The necessary equipment was mainly procured through FAO Headquarters and was delivered to the FAO Representations in time for the training sessions.

3. CONDUCT OF THE SESSIONS

3.1. The regional sessions

The regional master-trainer training session of three and a half weeks was held at the ICRISAT Centre in Niamey, Niger, from 14 March to 6 April 2005. As in the case of the national training and evaluation sessions, it was co-financed by the Spanish project "Strengthening National Desert Locust Control Capacities in Affected Countries" involving ten countries: Burkina Faso, Cape Verde, Chad, Gambia, Guinea, Guinea-Bissau, Mali, Mauritania, Niger and Senegal; and the European Commission project "Emergency Assistance to a Desert Locust Control Programme" involving five countries: Chad, Mali, Mauritania, Niger and Senegal.

In order to distinguish this ToT regional session from academic ones and emphasize its pedagogical component, the session was entitled "What you need to know and what needs to be transferred about the Desert Locust". The aim was: 1) to raise the knowledge of all participants to the same level; 2) to teach them how to transfer that knowledge; 3) to enable them to design their own national training programmes; and 4) to help them plan the organization of those national programmes.

The session was supervised by an international consultant pedagogical expert, charged with monitoring the "knowledge transfer" aspect, and a facilitator/technical officer, acridologist and national official of the EMPRES Programme in Mauritania, also responsible for delivering module 2 "Survey and information processing". These were assisted by a national consultant for the organizational and logistical aspects. Four consultants were also recruited to deliver training modules 1, 3, 4 and 5: an acridologist, an environmental expert and two specialists in logistics, also familiar with land and aerial control and the organization of survey and control campaigns.

The opening of the session underlined the manifest interest of the government of the host country and the donors, represented respectively by the Minister of Agricultural Development, the Minister of Livestock Resources, the Ambassador of Spain (stationed in Abidjan), and a representative of the European Union.

Session activities included assessing the knowledge of participants before and after each module, providing theoretical and practical training based on pre-prepared training materials distributed to each participant and further elaborated by each facilitator, with an emphasis on practical field work, the active involvement of participants, activity round-ups and group work. A particular feature of the session was the immediate implication of the trainers in the technical and pedagogical process, through open discussion of individual experiences and a synopsis of aspects identified for transfer during the subsequent national training sessions. The participants were the key drivers of the training, through their expressed aspirations before the training and their national training projects presented at the end of the session. All participants and facilitators agreed that the session took place in good conditions thanks to its faultless logistical and technical organization and to its excellent preparation in Rome and *in situ*, for the final details, even though some of the participants might have been a little baffled by the highly participatory approach and the ongoing pedagogical monitoring, which were new to most of them.

The aim of the session was achieved: at its completion each master trainer (or group of master trainers) was able to use his updated and shared knowledge to present a national session plan (schedule, training location(s), detailed programme with a focus on aspects to be developed in the national context, modalities to identify field staff for basic or refresher training). Each participant received a stamped certificate with the logos of the two donors (Spain and the European Commission) and of FAO, in addition to a complete kit containing all essential implements needed for survey and control operations, together with a CD-ROM of all the documents distributed during the session.

3.2. The national training sessions

To the extent that work schedules permitted, a consultant or Headquarters expert attended at least one of the national training sessions in order to support the master trainers in their task of transmitting, in five days, the scientific and technical knowledge and pedagogical guidelines that they had received over a period of three weeks. The initial intention was for each master trainer to give a training session for 30 field staff. In practice, in the frontline countries and in Senegal, the three master trainers jointly gave three training sessions organized in such a way as to draw upon their complementarities and balance out their relative thematic strengths and weaknesses, for the benefit of each participant and the master trainers themselves.

Most of the national training sessions took place in May 2005 (the third and last session in Chad was held in early June) and were decentralized (except in Senegal where the most appropriate and accessible training centre was at the Directorate of Plant Protection in Dakar). A total of 29 sessions were organized in the ten countries concerned, with the training or refresher training of 547 field staff. Each agent received a basic technical kit comprising a GPS and vernier caliper; in addition, the Desert Locust control unit or plant protection service was provided with the video projector needed for the training. As required, the master trainers were recruited as national consultants to draft reports which were received within an average of one month after the sessions and which followed a standard format provided by the pedagogical supervisor.

3.3. The national evaluations

The third stage of the programme was the evaluation of training through a questionnaire on the content of the national sessions. This was issued a few months after the sessions and after the Desert Locust campaign so that at least some of the field staff could compare what they had been taught with reality on the ground. These evaluation sessions, which lasted from one to five days, were held between November 2005 and March 2006 in the different countries and involved all or some of the staff that had been trained in May 2005. They were supervised by all the master

trainers who were again recruited as national consultants (see summary table). In two countries, Niger and Mali, one of the sessions was followed by officers from the central office; in Niger, the questionnaire prepared by the master trainers comprised some 40 questions on the main aspects of control (identification of the Desert Locust, data to be collected during surveys and instruments needed for the collection and transmittal of data, spraying parameters, reduction of risk to human and environmental health...) to which correct and relevant answers were given. A number of issues were then openly discussed at a round table for trainees, trainers and other participants to exchange additional information and explanations.

The reports from the countries where this third stage took place show the same outputs, in varying degrees of detail: theoretical and practical training that had been taken on board, significant improvement in knowledge, and greater confidence in dealing with situations in the field.

3.4. Visibility

The media (press, radio, television) were contacted for the different stages of the training programme: invitation to the inauguration of the regional training session at the ICRISAT Centre in Niamey, with a programme summary; information through ECLLO bulletins from FAO Headquarters; invitations to attend the start of national training and evaluation sessions; and a video produced by FAO's Information Division and distributed to the master trainers, the FAO Representations in the countries concerned and the donors. This video is available in English, Spanish and French upon request.

4. CONCLUSION

The preparation and delivery of this master-trainers training programme and the organization of the regional and national sessions required significant human, material and financial investment that would not have been possible without the international contributions that were generated by the Desert Locust emergency. The results of the 2005 post-campaign evaluation sessions are satisfactory and confirm the validity of this approach, as was already demonstrated in the Central Region. However, they should on no account be viewed as an end in themselves, for the outputs in terms of improved pedagogical skills of master trainers, technical know-how of field staff and quality of training materials need to be constantly refined through regular refresher sessions, new training and the updating of training resources. After the countries of the Sahel and the Southern Circuit, the countries of Northwest Africa should also be able to benefit from such a programme. It is in fact part of the EMPRES mandate to conduct such activities with donor support. The ToT approach should also continue in the Central Region and extended to the Eastern Region. The endorsement of the Committee is needed for such national programmes of basic and refresher training to be renewed and pursued, and to encourage the Regional Commissions to contribute more to related national efforts.

- (a) Should this "Master-Trainer Training (ToT)" approach be pursued?
- (b) If yes, how can the different levels of training be provided and extended to other regions?
- (c) What improvements need to be brought to the training methods?

September 2006



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Agricultura
y la
Alimentación

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REVIEW OF HUMAN HEALTH AND ENVIRONMENTAL ISSUES (Agenda Item 6d)

The use of pesticides in Desert Locust control may lead to risks for human health and the environment. These risks concern the type of pesticides used, the way they are packaged/labelled and stored, the handling, and the application against the target. Guidelines accepted by the FAO Conference on pesticide management are found in the *International Code of Conduct for the Distribution and Use of Pesticides*.

Selection of pesticides

Recommendations on pesticides for Desert Locust control are made by the independent, international FAO Pesticide Referee Group (PRG), which recommends a number of active ingredients based on proven efficacy under field conditions and on the acceptability of the health and environmental risk of their use. The 9th report of the PRG is submitted to the DLCC for adoption.

During the last campaign, pesticides purchased by FAO were those recommended by PRG. Not all bilateral donors or affected countries followed the PRG recommendations.

Products should be in conformity with strict standards concerning composition, labelling and package, and they should/must be inspected before delivery. Only products that are registered in the country for the intended use should be purchased, unless the national registration authorities in recipient countries waive this obligation. It is not clear whether these policies have been followed by all partners.

During the 2003-05 Desert Locust campaign there were difference of opinion on the handling of pesticides by farmers. Given the high toxicity of pesticides in ULV formulations, FAO did not support their delivery to farmers.

The Committee may wish to:

- recommend that all parties follow the recommendations of PRG for the selection of pesticides;
- promote the registration of pesticides for Desert Locust control;

- *recommend that all parties ensure that national regulatory requirements are met when providing pesticides;*
- *recommend that all parties ensure that pesticides are properly labelled in the language of the country and that the quality is appropriate; and*
- *consider whether farmers should handle ULV pesticides for locust control and, if so, under which conditions.*

Storage, stocks

Lack of coordination among partners on the provision and purchase of pesticides during the recent campaign gave rise to an important over-supply. These pesticides have to be stored under conditions that meet international standards. An FAO officer dedicated to this task advises governments on storage. New stores are being constructed and old ones rehabilitated or destroyed, this in close collaboration with the World Bank. A regional workshop jointly organized by FAO and the World Bank took place in May 2006, in Bamako (Mali) to develop the coordinated management of the considerable pesticide stocks remaining after the 2003-2005 campaign, and to avoid their becoming obsolete. The report of the meeting is presented in a separate document. The main conclusions of the meeting concerning stocks are the following:

- the best possible use of the pesticide stocks would be against grasshoppers during the forthcoming summer campaigns, subject to their registration for this use and spray operations executed by authorized, well-trained staff;
- the storage and management capacity is insufficient, leading to misuse of the pesticides;
- a regional database on pesticide stocks should be established and concerned staff trained in pesticide management;
- the list of pesticides registered for locust control should be increased;
- quality analysis of the stored pesticides should be carried out in a systematic manner.

The Committee may wish to:

- *endorse the conclusions of the workshop concerning pesticide stocks and storage of stocks.*

Disposal of empty pesticide containers

As a result of the campaign vast amounts of empty pesticide containers are awaiting destruction. Metal drums need to be crushed in machines that combine rinsing with special solvents and the crushing. Drumcrushers have been delivered to Mauritania and Mali, and the same equipment has been ordered for Algeria, Chad, Morocco, Niger, Senegal and Tunisia. The machines are capable of reducing 200 litre steel barrels to 20 kg packages, the size of a small suitcase. These can be recycled in steel smelters. The disposal of plastic containers, which is more complicated because some pesticide is absorbed into the plastic, needs further research. Because of this complication, FAO has decided only to order pesticides in metal drums. Moreover, in future orders for pesticides the removal of the containers could be included.

The Committee may wish to:

- *recommend that plastic containers not be used for locust pesticides;*
- *recommend that FAO discuss with pesticide companies terms for contractual arrangements that include removal of containers.*

Development of alternatives

Most human health and environmental risks could be avoided through the use of products that are virtually non-toxic for non-targets, such as Green Muscle®, the active ingredient of which is the entomopathogen fungus *Metarhizium anisopliae* var. *acridum*. This product has recently been tested in large-scale field trials in Algeria and in Niger, with satisfactory results. Other options, such as phenyl-aceto-nitrile (PAN), which alters the behaviour of the locusts and also enhances the effect of pesticides and Green Muscle®, have not yet been sufficiently tested under operational

conditions. Trials are scheduled for 2006 and 2007. Little is known of the ecological risks related to the use of PAN. Environmental data on the product are a prerequisite for registration and for evaluation by the Pesticides Referee Group. In 2006 and 2007, toxicological and environmental trials will be carried out to provide these data. Non-target side effects of Green Muscle® concern essentially the non-target orthopterans whose populations, if affected, tend to recover within the same season.

The old practice of barrier spraying, which was the main application method used in the 1980s and employed the organochlorine dieldrin - since banned - in which only about 10% of the infested area is treated, is refined and adapted for currently available relatively persistent pesticides. These include Insect Growth Regulators and fipronil. Operational trials are foreseen with the emphasis on determining environmental side-effects that may result from the relative persistence of the products. All field trials are hampered by the lack of suitable target populations. Therefore, efficacy trials will also be executed in confined areas, using reared locusts. Training of field staff is also foreseen, as well as awareness-raising among decision makers, with respect to these alternatives to conventional organophosphate pesticides.

Alternatives to conventional methods have to be incorporated into control strategies. This requires that the speed of action of biological products be enhanced and that their stability, while kept and transported under field conditions, be improved. FAO is working, in collaboration with ICIPE and IITA, on the further development of biological products that better correspond with the characteristics needed for use in preventive control strategies.

In February 2007, in collaboration with the World Bank, a workshop will be held at Noukachott (Mauritania) on the issue of the perspectives of biopesticides in Desert Locust control. The objective is a work plan for the further development and the promotion of alternative methods, to be presented to Governments for implementation with the assistance from FAO and the World Bank.

The Committee may wish to:

- *call on donors to support the development of alternatives to chemical pesticides;*
- *call on locust-affected countries to cooperate fully with ICIPE, IITA, FAO and other relevant agencies and institutes in testing these compounds;*
- *request the FAO Secretariat to provide a full report on the outcomes of these trials at the next session of the Committee.*

Good practices in the application of pesticides

The *FAO Desert Locust Control Guidelines* include the correct application of pesticides against Desert Locust¹. The Good Practices described in the Guidelines aim to avoid the risk of contaminating workers handling pesticides, eliminate danger to rural populations and minimize side-effects on the environment. Volume 6 of the Guidelines concerns the safety procedures to be taken by any person directly involved in pesticide applications, as well as the measures to avoid contamination of non-target ecosystems and organisms. During the campaign, a few cases of effects on domestic animals were suspected to have occurred, however, research on the site indicated that there was no contamination. No other serious human or animal health incidents have been reported. Some spray operators who showed the first indication of poisoning had to be temporarily withdrawn from spray operations. There is, however, a lack of analytical methods to monitor intoxications other than those caused by organophosphates and carbamates. Research has started to develop biomarkers for the detection of exposure to pyrethroids.

The Committee may wish to:

- *call on all parties to fully implement good practices as described in the Guidelines;*

¹ Desert Locust Control Guidelines; 7 volumes. FAO, Rome, 2001 (available at www.fao.org/ag/locusts)

- *request FAO to continue, with the assistance of donor and within resources, the development of biomarkers.*

Monitoring of control operations

The proper implementation of Good Practices for Desert Locust control requires training, appropriate equipment and monitoring of control activities in the field. The training of operators has been reported elsewhere in this meeting. Monitoring of the applications is the task of Quality and Environment Surveys of Treatments (QUEST) teams who, during the campaign, have been specifically trained to check the technical quality of applications (e.g. spraying at the correct dosage, correct targeting, etc.), safe handling of the pesticides and to check the exposure of operators and others through measurement of blood cholinesterase (ChE) inhibition, which is an early indicator that a person has been contaminated. The teams also report on observations of environmental side-effects, if any, and, when deemed necessary, collect samples of soil and vegetation for residue analysis. QUEST teams have so far been established in Burkina Faso, Cape Verde, Chad, Mauritania, Mali, Niger, the Gambia, Guinea, Guinea Bissau and Senegal. The teams are composed of staff from three ministries (Agriculture, Health and Environment). In a few countries, such as Mauritania, Mali and Senegal, the institutionalization of the teams has been achieved or is in progress. In other countries no significant steps toward institutionalization have yet been made. It has to be determined to what extent the QUEST approach is sustainable and if it should be introduced in other countries.

The Committee may wish to:

- *call on members to institutionalize QUEST teams through assigning QUEST team members from the different ministries, ensuring replacement of members whenever required and ensuring training of QUEST team members;*
- *consider the extension of the QUEST approach to other regions.*

Improvement of the selectivity of application techniques

Lack of appropriate instruments that allow spray swathes to be spaced correctly and avoid non-target zones (such as water bodies) during aerial treatment may have resulted in pesticide wastage and has been the cause of a few environmental incidents. The use of Differential GPS (DGPS) Track Guidance Systems in spray aircraft, which is now required by FAO in all aerial spraying contracts, helps to eliminate these problems. Recently, equipment for track guidance has also been developed by FAO for ground applications by vehicle-mounted sprayers. The first results are promising and it is foreseen that the system should be widely tested before general introduction.

The Committee may wish to:

- *request all parties to ensure that spray planes/aircraft are equipped with the appropriate instruments to ensure precision spraying.*

Information and awareness raising

A brochure entitled *Fighting the Locusts....Safely: Pesticides in Desert Locust control – Balancing risks against benefits* has been produced in English, Arabic and French, and distributed widely to locust-affected countries, donors, and other interested parties. A series of posters and handouts on the risks of locust pesticides is ready to be field tested among the general public, especially the inhabitants of areas where treatment actions take place or where pesticides are stored. A workshop will be organized to further raise awareness concerning the hazard of conventional pesticides and to inform participants about the advantages, and limitations, of the use of alternative methods. Recently, an exhibit in the atrium at FAO Headquarters has been updated to include information on current activities addressing environmental concerns of locust control.

Field studies

A number of field studies aimed at monitoring side-effects of control operations were carried out in the early stages of the upsurge. Although each of the studies indicated that the use of conventional pesticides represents an environmental risk (numerous non-targets insects/arthropods killed; workers who had to be taken off work with pesticides for a few days, to recover from pesticide contamination), no serious incidents have been observed or witnessed. Other ongoing research is aimed at: refining the barrier technique; analysing the socio-economic benefit of using non-conventional pesticides; identifying geographical zones that are specifically sensitive to certain pesticides; and the development of more human biomarkers for the exposure to pesticides in addition to those already used (ChE analysis) for organophosphates. Funding is available to make a good start in each of the subjects.

Pesticide bank

Many proposals have been made in the past on pesticide banks. The objective of a pesticide bank is to make pesticides available at short notice in locust emergency situations. The simplest way to ensure such availability may be long-term standby contractual arrangements with suppliers of pesticides.

The Committee may wish to:

- *recommend that FAO explore the possibilities of contractual arrangements with manufacturers of pesticides, in order to have the products available in an emergency situation, in appropriate time and quantity, and at the place needed.*

Septembre 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REPORT OF THE MULTILATERAL INDEPENDENT EVALUATION MISSION (Agenda Item 6e)

1. The Extraordinary Session of the Desert Locust Control Committee in December 2004 provided a first opportunity to review the actions taken so far during the 2003-05 Desert Locust control campaign, what lessons had been learned and what recommendations and improvements could be made. The Committee recommended that these issues should be captured fully by an evaluation and assessment of the campaign, including effects on food security.
2. An independent evaluation took place from November 2005 to March 2006 by a team of six experts, led by Dr. Lukas Brader. It was overseen by a Steering Committee composed of the various stakeholders. The objective of the evaluation was to strengthen future response capacity of affected countries, donors, Desert Locust organizations and FAO in preventing and countering locust outbreaks and upsurges.
3. It was anticipated that the report of the evaluation would be considered at the 38th Session of the Desert Locust Control Committee. Therefore, the Secretariat herewith submits the Report to the Committee for its consideration.



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**Towards a More Effective Response to Desert Locusts and their Impacts
on Food Security, Livelihoods and Poverty**

Multilateral Evaluation of the 2003–05 Desert Locust Campaign

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April 2006

The evaluation was undertaken with the financial support of Australia, Canada, the European Commission, FAO, Finland, the Netherlands, the United Kingdom of Great Britain and Northern Ireland, the United States Agency for International Development and the World Bank.

For reasons of economy, this document is produced in a limited number of copies. Delegates and observers are kindly requested to bring it to the meetings and to refrain from asking for additional copies, unless strictly indispensable.
Most FAO meeting documents are available on Internet at www.fao.org

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Preface

- i. The proposal for an evaluation of the 2003–05 Desert Locust campaign was formulated at the extraordinary session of the Desert Locust Control Committee in December 2004. At that time, it was not yet evident that the ongoing campaign would soon come to an end. However, the purpose – to draw lessons from the current campaign for future control operations – remained valid. After various preparatory discussions, the evaluation was officially endorsed by all stakeholders in August 2005. In view of the broad interest of the various stakeholders, the terms of reference had to cover a wide range of activities and subsequently expanded the task of the evaluation team.
- ii. Special thanks are due to all the team members for their invaluable contributions to the evaluation and for accepting responsibilities above and beyond their original expectations. Over a period of four months, the team evolved from being somewhat heterogeneous to become a well-functioning group in which each member contributed conscientiously and effectively to the elaboration of the final report. The report and its recommendations are a team product, unanimously endorsed by all members of the evaluation team.
- iii. The evaluation could not have been undertaken without the strong support of all the stakeholders. During the country visits, in which a wide range of activities were undertaken in a short period of time, no efforts were spared by the various authorities to provide the team with the necessary information. These visits enabled the team to obtain an in-depth understanding of the range of practical aspects of the campaign. In particular, interviews with farmers and field staff showed that the campaign had been of a much larger magnitude than most team members thought. The countries, within the limits of their resources, had tried to address the Desert Locust invasion to the best of their ability.
- iv. The FAO staff involved in the campaign provided the team with a very wide range of information and ideas during the extensive and frank discussions at the beginning of the evaluation. In addition, follow-up queries were always handled in an efficient manner. The guidance and administrative support received from the FAO Evaluation Service were essential in the overall management of the evaluation. The desk studies undertaken by Luisa Belli and Patrick Tesha greatly facilitated the work.
- v. Without the financial support of some donors, this evaluation could not have been possible. In addition, various donor representatives provided valuable inputs to the evaluation through direct contacts and discussions, and by responding to a wide range of issues on questions in the questionnaire distributed by the evaluation team. The opinions, conclusions and recommendations expressed in the report represent exclusively those of the evaluation team, and do not necessarily represent those of the cooperating parties in the 2003–05 Desert Locust campaign.
- vi. On behalf of all the team members, I would like to extend my most sincere gratitude to all concerned. The evaluation proved to be a real challenge but, thanks to all your help, we have produced a document that we hope will contribute to strengthening the Desert Locust monitoring and control capacity. This would certainly be a big relief for the many African households that are destined to face recurrent Desert Locust invasions, without substantial means to stand up to the challenges they pose.

*Lukas Brader
Team Leader*

List of Acronyms

ADB	African Development Bank
AELGA	Assistance for Emergency Locust/Grasshopper Abatement project (USAID), formerly known as the Africa Emergency Locust/Grasshopper Assistance project
AELP	Africa Emergency Locust Project (World Bank)
AGP	Plant Production and Protection Division (FAO)
AGPP	Plant Protection Service (FAO)
CAP	Consolidated Appeals Process
CERF	Central Emergency Response Fund
CILSS	Comité permanent inter-États de lutte contre la sécheresse dans le Sahel (Permanent Interstate Committee for Drought Control in the Sahel)
CLCPRO	Commission de lutte contre le criquet pèlerin dans la région occidentale (Commission for Controlling the Desert Locust in the Western Region)
CRC	Commission for Controlling the Desert Locust in the Central Region
DGPS	Differential global positioning system
DLCC	Desert Locust Control Committee
DLCO-EA	Desert Locust Control Organization for Eastern Africa
DLIS	Desert Locust Information Service (FAO)
EC	European Commission
ECLO	Emergency Centre for Locust Operations
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning System Network (USAID)
FPMIS	Field Programme Management Information System (FAO)
GIEWS	Global Information and Early Warning System (FAO)
GIS	Geographical information system
GPS	Global positioning system
IASC	Inter-agency Standing Committee
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
CERES LOCUSTOX	Foundation CERES/LOCUSTOX Centre de Recherche en Ecotoxicologie pour le Sahel
NGO	Non-governmental organization
OCHA	Office for the Coordination of Humanitarian Affairs
OCLALAV	Organisation commune de lutte antiacridienne et de lutte antiaviaire (Joint Anti-Locust and Anti-Aviarian Organization)

OECD/DAC	Organization for Economic Co-operation and Development/Development Assistance Committee
OSRO	Office for Special Relief Operations; project symbol for extrabudgetary funded emergency projects
PCC	Poste de commandement central
QUEST	Quality, Environment, Health and Treatments
RAMSES	Reconnaissance and Management System of the Environment of Schistocerca
SWARMS	Schistocerca Warning Management System
TCE	Emergency Operations and Rehabilitation Division (FAO)
TCEO	Emergency Operations Service (FAO)
TCP	Technical Cooperation Programme (FAO)
UEMOA	Union économique et monétaire ouest-africaine (West African Economic and Monetary Union)
UNJLC	United Nations Joint Logistics Centre
USAID	United States Agency for International Development
WFP	World Food Programme

Executive Summary

1. The evaluation was undertaken from November 2005 to March 2006. This included planning activities to be carried out by the team, briefings by various stakeholders and by persons directly involved in the Desert Locust control campaign, collection and analysis of information from the affected countries and from donors through two questionnaires, desk studies and reviews of the activities carried out by FAO in relation to the Desert Locust control campaign (for which two consultants were employed), visits to a number of countries affected by the 2003–05 Desert Locust upsurge, and review of a range of publications relevant to the evaluation. The 2003–05 Desert Locust upsurge was almost completely limited to the Western Region, consequently the evaluation and recommendations are focused on this region.

(1) KEY ASPECTS OF THE CAMPAIGN

2. The evaluation team considers the following as the key aspects of the 2003–05 Desert Locust control campaign.

- a) Within a very short period, from June to December 2004, a very wide geographical area in the Western Region was invaded by large and very dense Desert Locust populations.
- b) The 2003–05 upsurge started in the Sahel region, while in the past swarms originating from the Central Region breeding areas, around the Red Sea coasts and in the interior of the Sudan and Saudi Arabia, have usually preceded Desert Locust population explosions in West and Northwest Africa.
- c) Donors generally considered that they were not adequately informed by FAO on the actions to be undertaken to address the Desert Locust invasion, and on the potential impact of the invasion on the food security situation, which led to delays in donor response. This delayed reaction may also be a sign of a lack of trust in the way Desert Locust emergencies are handled by the various parties concerned.
- d) Donors and affected countries believed that costs of the control operations would have been reduced, and the impact of the locust invasions more limited, had interventions started earlier.
- e) The control strategy focused on killing the maximum number of locusts and saving crops and pasture. The measures taken in a number of countries to minimize the impact of the control operations on the environment and human health were inadequate.
- f) The Desert Locust invasion had serious consequences on the food security situation of more than eight million people in the Sahel region, for whom food assistance and rehabilitation measures were not initially foreseen. However, in early 2005, a UN appeal was launched for Western Africa seeking funding for agricultural rehabilitation measures to address the combined effect of drought and locusts.
- g) Substantial costs were also incurred by the affected countries, which had not been foreseen in their national budgets, resulting in less resources being available for other national development activities.
- h) Algeria, the Libyan Arab Jamahiriya and Morocco were well prepared to face the invasion and also provided substantial assistance to countries in the Sahel during the campaign. The latter were generally inadequately prepared and unable to launch timely, effective control operations to minimize damage to crops and pastures.
- i) The effective control operations, especially aerial control undertaken during the autumn and winter of 2004 by Algeria and Morocco, combined with poor locust breeding conditions in northwestern Africa owing to unusually cool weather, led to the rapid decline of the upsurge in early 2005. This avoided renewed invasions of

- the Sahel countries in 2005 and demonstrated that Desert Locust invasions can be stopped with currently available techniques.
- j) The Sahel countries, depending on their state of alertness and the availability of resources, have contributed to the control campaign to the best of their ability. In all affected countries, staff, often working under harsh conditions, spent enormous efforts to limit the impact of the Desert Locust invasion.
 - k) There were large differences in the efficiency of the control operations carried out by the countries, resulting in control costs ranging from US\$13 to over US\$200 per hectare from one country to the other.
 - l) During the campaign, an estimated 12.9 million ha were sprayed with over 13 million liters of pesticides. More than 6.3 million liters of pesticides were left over at the end of the campaign. This was partly caused by the fact that, in a number of cases, additional quantities of pesticides were purchased towards the end of the campaign against the advice of technical staff. These pesticide stocks may represent a substantial disposal problem in the near future. This could have been avoided through better coordination, and if contractual arrangements for the rapid provision of pesticides had been in place.
 - m) Donors contributed generously to the campaign costs. The relatively late arrival of the bulk of the donor contributions and the early ending of the campaign have resulted in a significant amount of unspent financial resources. These could help strengthen the national locust control units in the frontline countries in the Sahel.
 - n) The total costs of control operations amounted to at least US\$280 million, most of which were provided by the affected countries, especially Algeria, Morocco and the Libyan Arab Jamahiriya. The so-called traditional donors and FAO contributed over US\$80 million. Considerable assistance was also provided to the affected countries by both traditional and non-traditional donors through bilateral means. In addition, more than US\$90 million were spent on food assistance, as well as for the rehabilitation of communities affected by the upsurge. Thus, the total costs of the campaign may be estimated at about US\$400 million.

(2) *PLANNING AND IMPLEMENTATION OF THE 2003–05 DESERT LOCUST CONTROL CAMPAIGN*

3. The primary responsibility for organizing the control campaign resides with the affected countries. Countries resort to the international donor community and FAO for support when they do not have the required resources to undertake the necessary surveillance and/or control measures. FAO and the donors endeavor to respond through a planned and prioritized approach. In this FAO takes into account governing bodies' policy directives and the advice of the Desert Locust Control Committee and of the Regional Locust Control Commissions.

4. Following a review of the various activities undertaken with respect to the planning and implementation of the 2003–05 Desert Locust control campaign,

It is recommended that:

1. FAO define, in clear terms, the different categories of emergencies and establish the criteria to decide which ones would make use of the Consolidated Appeals Process (CAP), for which guidelines have been published by the Office for the Coordination of Humanitarian Affairs (OCHA). When an emergency is not considered complex, the Organization should also spell out the specific rules that will apply and make them known to all concerned;

2. in future campaigns, in the affected countries, through the appropriate committees, effective exchange of information be ensured among the various stakeholders involved to avoid duplication of efforts and unnecessary high costs;
3. FAO initiate discussions with donors to arrive at a common format for both the funding agreements and the subsequent project document. Such formats should be as simple and user-friendly as possible, but detailed enough to ensure a clear understanding by all the interested parties of what is at stake;
4. FAO initiate discussions with donors on the opportunity of having, in future campaigns, only one or two multidonor projects, and those projects be deemed regional in geographical coverage to facilitate dealing with a pest that knows no national frontiers. Due attention should be given during the negotiations to how donor visibility and preferences, as well as applicable policy and regulatory requirements, would be factored into any multidonor arrangement that is reached;
5. the rather ad hoc procurement requirements be transformed by FAO into systems and methods that are specific to Desert Locust control and to similar emergency operations in which FAO is involved, as was also recommended by the Technical Group of the Desert Locust Control Committee (DLCC) in early May 2005 in its workshop on contingency planning for Desert Locust control;
6. the FAO Plant Production and Protection Division plan ahead and set up a well researched roster of dependable, experienced and qualified candidates to fill expert positions pertaining to Desert Locust control, especially in the field, and tries to ensure that their conditions are known and are acceptable to FAO;
7. delegation of authority for operational activities, lasting for the duration of the Desert Locust campaign, be given by FAO to the lowest possible level;
8. a single unified command and wide delegation of authority be bestowed in a future FAO Emergency Centre for Locust Operations (ECLC) and that it be recognized as an operational entity, with its own accounting code rather than that of the Office for Special Relief Operations (OSRO), to facilitate the identification of regular programme and extrabudgetary appropriations put at its disposal by the Organization;
9. FAO strive to present a clear strategy to the donors at the time of launching the appeals that is part of the relief–rehabilitation–development continuum, by focusing not only on the immediate problem of eliminating Desert Locusts but also on related humanitarian and livelihood protection issues.

5. The above recommendations require appropriate action from FAO to ensure that it is well prepared to address future Desert Locust emergencies. The necessary proposals should be prepared by both the technical and administrative units of FAO in consultation with relevant stakeholders.

(3) ANALYSIS OF THE CONTROL CAMPAIGN

Impact on the food security situation and livelihoods of affected communities

6. Officially, the impact of the Desert Locust invasions is considered to be very limited by the national authorities in almost all the affected countries. However, data collected by the evaluation team indicate that the invasions had a major impact on the food security situation and on the livelihoods of the affected communities. The control campaigns were focused mainly on the protection of regions with a high production potential. Consequently, regions with low agricultural potentials have suffered significantly from Desert Locust infestations, and losses to crops and pastures have resulted in (i) relatively severe food shortages; (ii) strong price movements in the markets; (iii) insufficient availability of grazing areas; (iv) selling of animals at very low prices in order to meet the subsistence needs of the households and to buy feed for the remaining animals; (v) early transhumance of the herds (migration to better grazing areas by pastoralists); (vi) severe tension between the transhumance pastoralists and the local farmers over resources, and heavy pressure of the animals on the transhumance zones; and (vii) extensive migration to urban areas.

7. The evaluation team came to the conclusion from information collected from various sources in the course of the visits to the affected countries that the number of people in the Sahel that have suffered to varying degrees from the Desert Locust invasions may be estimated at over eight million, distributed as shown in Table 1.

Table 1. Number of people affected to varying degrees by the Desert Locust invasions

Burkina Faso	500,000
Mali	1,000,000
Mauritania	1,300,000
Niger	3,000,000
Senegal	1,580,000
Chad	1,000,000
Total	8,380,000

8. The Desert Locust invasions have made the long-term food security of the local populations even more uncertain, by aggravating the poverty and vulnerability of households already living under very precarious conditions, in regions where food insecurity is almost structural. The impact of reduced and irregular distribution of rainfall on crops in 2004 was very strongly aggravated by the Desert Locust invasions; the locust passage changed the situation from limited crop losses to almost complete destruction. In response to this situation, pastoralists adopted the solution of early transhumance.

9. With respect to the incidence of the Desert Locust invasion on markets, it should be noted that the shortage of cereals had important implications on price levels, causing a significant increase, out of reach of a large majority of the households. For livestock the inverse movement occurred; the sharp drop in animal prices in the market resulted in a strong reduction of the value of the herds and of the purchasing power of the producers. The famine in the pastoral zone in Niger in 2005 is one of the most dramatic examples of the link between the drop in price of cattle, its influence on incomes and food availability at household level.

10. Completing the work undertaken by the evaluation team, a survey was carried out in Burkina Faso, Mali and Mauritania in February/March 2006 to determine the impact of the Desert Locust invasion on the food security and subsistence means of the rural populations. In Burkina Faso and Mali, three zones were selected, and in Mauritania four, and a total of 30 villages were covered by the survey in each country. This has led to the following conclusions.

11. The losses caused by the Desert Locust invasion in 2004 have been evaluated at 80 percent of the expected cereal production in the zones investigated in Burkina Faso, 90 percent in Mali, and 90–100 percent in Mauritania. For the staple leguminous crops (cowpea and

groundnut), losses were close to 85–90 percent of the expected production in 2004 in the affected zones in the three countries. One-third of the pastures were also lost in the same zones in Mali and Burkina Faso. The most important losses were observed in Mauritania, where they reached 85 percent of the fodder production. The majority of households were forced to decrease their food consumption, and the volume and number of daily meals were reduced.

12. In 2004, external aid to the areas surveyed in Burkina Faso, essentially in the form of food aid, was provided to 90 percent of the households, who each received on average 140 kg of cereals, representing 8 percent of their food deficit. In Mali, 75 percent of the households received on average 300 kg of cereals, covering 15 percent of their deficit. In Mauritania, 65 percent of the households received on average 130 kg of cereals, representing 10 percent of their deficit. Although the 2005 agricultural season has been relatively satisfactory, household food consumption has nowhere reached pre-locust invasion levels. The consumption of cereals and food legumes during 2005 was about 10 percent below the 2003 level in Burkina Faso and Mauritania. This persistence of the famine in 2005 concerned 30 percent of the households in Mali and 40 percent of the households in Burkina Faso, while at the same time external food aid tended to be withdrawn from the villages, because the crisis was considered finished.

13. In 2004, the average household expenditures for the purchase of food had to be multiplied by three or four depending on the zone studied. To face this increase, household heads had to reduce non-food expenditures: clothing, social expenditures, travel, and sometimes health and schooling. At the same time, they sought supplementary monetary revenues through departure to urban areas to seek employment opportunities or the development of non-agricultural activities. As these strategies proved insufficient to cover the food deficit, farmers had to sell part of their capital, such as their livestock. Women sold personal goods, in particular jewellery. They often incurred debts themselves through women's associations, became involved in extra-agricultural activities and reverted to gathering wild food products for the provision of food for the family (Burkina Faso). To address the food deficit, many household heads have also become indebted. Mauritania is the most affected, with 60 percent indebted households, followed by Mali (45 percent) and Burkina Faso (33 percent).

14. The long-term effects of the locust invasion were the same in all interview zones. They included the departure of young people, increased poverty of the households, reduction of the agricultural workforce and increase of food insecurity. The relative importance of the different types of impacts varies in the countries and zones surveyed. The departure of young people is perceived in all the village communities as the most important impact of the 2004 crisis.

15. In general, at the beginning of 2006, less than 10 percent of the households had reconstituted their livestock. More than 50 percent of the households in Burkina Faso, 30 percent in Mali and 40 percent in Mauritania have not yet been able to repay the debts contracted in 2004. Only 10–20 percent of the households so far have been able to reconstitute their cereal reserves. The security offered by livestock in case of a major problem has been strongly reduced, leaving the households even more vulnerable when facing future crises.

16. The consequences of the crisis still being visible in 2006, only sustained assistance can slow down the degradation of the socio-economic situation of many households. However, as noted by the evaluation team, given the scant attention paid to the socio-economic dimensions of the impact of the Desert Locust control campaign, the assistance provided so far has not always been targeted in an adequate and satisfactory manner.

17. On the basis of the foregoing,

The evaluation team recommends that:

10. strategies be adopted by the affected countries to ensure that locust control operations are carried out both in zones with high production potential and in zones with low production potential, where agriculture is usually practiced by farmers with very limited resources.

Economic benefits and costs

18. The total cost of the locust control campaign 2003–05, including food aid and rehabilitation projects, was about US\$400 million. Data on crops and pastures saved by the locust control operations have not been collected in a systematic manner in any of the affected countries. The campaign succeeded in protecting the subsistence means of some affected communities: in these cases, benefit/cost analysis shows a ratio of 1.5 to 1. The evaluation team did not have the means to carry out an in-depth macroeconomic study of the campaign; however, it addressed in particular the socio-economic impact at the community level.

19. For the determination of benefit/costs ratios of future locust control campaigns,

It is recommended that:

11. mechanisms be put in place by the countries concerned to estimate the total benefits of the control campaign (value of production saved and additional benefits);
12. relevant national structures be involved in the collection of the necessary data and in the preparation of these benefit estimates (agricultural statistics services, etc.).

Impact on human and animal health and the environment

20. As in preceding Desert Locust campaigns, chemical control remained the most utilized approach, if not the only one, during the 2003–05 campaign to address the locust invasions. Compared to previous campaigns, increased attention has been paid to human and animal health, and environment matters, during this campaign. However, the negative consequences of the pesticides used were not always easy to determine. Gaps exist between the official figures and the information collected in the treated areas, but, in the absence of monitoring of these impacts in a regular and timely manner, it was not possible to obtain reliable data.

21. The national locust control units in the Maghreb countries and in Mauritania have usually been able to ensure medical protection for and monitoring of the professional staff involved in Desert Locust control. In most Sahel countries, nearly all staff members from the Plant Protection Services who participated in the Desert Locust control operations had not undergone cholinesterase tests before the start of the campaign, although they were usually performed afterwards. However, without the availability of a pre-treatment reference, the determination of a possible effect of pesticide contamination on the cholinesterase level becomes erratic.

22. To minimize the risks to the safety and well-being of the populations, and to ensure the effective protection of the environment,

It is recommended that in the countries concerned:

13. the capacity of environment and health professionals be strengthened through training aimed at understanding and respecting norms and quality standards, environmental procedures and regulations, and precautionary, reduction and mitigation measures, and that these professionals be provided with logistics and financial means to carry out quality tests and field inspections;
14. those who apply pesticides be trained and sensitized to ensure that they fully understand and follow the rules and regulations pertaining to the use of pesticides;
15. medical surveillance of specialized staff involved in chemical control be ensured, including provision of adequate protection kits;
16. the involvement of village and phytosanitary brigades in the chemical locust control campaign operations be stopped on safety grounds, but their locust monitoring capacities be strengthened.

23. Only 30–80 percent of the empty pesticide containers were collected, according to information received from the Sahel countries. In the countries where village brigades were a key part of the chemical control operations, plastic containers of 1–5 litres have been provided to facilitate the handling of the pesticides. These containers are frequently used for domestic purposes and hence have often been a major source of contamination.

It is recommended that:

17. ordering and distribution of pesticides in containers of less than 50 litres be avoided by all parties concerned and that pesticides be purchased in metal containers of a large capacity (100–200 litres);
18. drum crushers be introduced in all countries affected by the Desert Locust for the destruction of metal containers and recycling of crushed containers by foundries be promoted by the national locust control units;
19. in collaboration with FAO and the Commission de lutte contre le criquet pèlerin dans la région occidentale (CLCPRO) member countries, an agreement be developed with pesticide manufacturers concerned for the recovery of their containers.

Institutional and organizational aspects

24. All partners have directly or indirectly supported the overall strategy for locust control during the campaign. This consisted of the timely detection of the different Desert Locust populations and elimination through chemical control. In the Sahel countries, owing to inadequate means, control operations were in general carried out after agricultural production areas had already been invaded. In Algeria and Morocco, these operations concentrated on eliminating the locusts before they reached these areas.

25. Countries differed considerably with respect to the type of personnel involved in the control operations. In some, control operations were exclusively carried out by well-trained professionals, in others they involved a wide range of people with limited or no experience. The affected countries are responsible for the planning and implementation of Desert Locust control

operations. To carry out these responsibilities in an effective manner, the frontline countries (Chad, Mali, Mauritania and Niger) should establish autonomous national locust control units and provide them with adequate resources. Coordination of the various activities at the national level varied considerably, from virtually no specific arrangements, to the establishment of a range of committees at different technical and political levels.

26. FAO has the following responsibilities with respect to Desert Locust forecasting and control operations: (i) as a forum for discussion for the development of appropriate policies, strategies, and plans; (ii) coordinating knowledge and information related to the distribution and abundance of Desert Locusts, covering the daily monitoring of locust and environmental conditions on a global scale, leading to regular bulletins, early warning, alerts and forecasts of timing, location and scale of breeding and migration; (iii) strengthening of National Locust Control Units and promoting collaboration at the regional level, within the framework of the Regional Desert Locust Control Commissions; and (iv) declaring Desert Locust emergencies, organizing international assistance and providing technical advice in support of the control activities to be undertaken.

27. However, the capacity of FAO to carry out these responsibilities effectively is limited. It should be emphasized that FAO does not coordinate the control operations at the field level. This is the responsibility of the countries, over which FAO has no direct control. The specific organizational aspects linked to the management of the 2003–05 campaign by FAO were characterized by appeals to donors since February 2004 and the re-establishment of ECLC in August 2004. However, ECLC was constrained by the established administrative and financial procedures, as it had not been given special delegation of authority for handling the Desert Locust emergency, as had happened during the 1986–89 campaign. Donor resources became available mainly during September to December 2004, when Desert Locust invasions were already taking place on a very large scale.

28. *A number of comments on the above matters have been received from donors through responses to a questionnaire. With respect to the implementation of Desert Locust control operations, 62 percent of the donors consider that FAO involvement should be limited mainly to coordination and information activities. Only one donor felt that FAO should be involved mainly in project execution; instead, 31 percent favoured involvement in both types of activities.¹ The evaluation team believes that FAO continues to be the logical choice for the implementation of multilateral Desert Locust control campaigns. However, it should try to do so in a much more effective manner and allow staff responsible for the various project activities to take decisions and carry out their responsibilities expeditiously.*

29. From an organizational and technical point of view, the campaign has suffered from a lack of effective contingency plans at the national, regional and international levels. The collection and transmission of data among the countries, the Regional Commission and FAO headquarters, has been handled reasonably well. It has also suffered from a lack of active involvement of all the relevant parties, especially donors and affected countries, in Desert Locust monitoring and control matters. The linkages between Desert Locust recession, the pre-emergency and emergency phases should be better understood by all stakeholders to allow for timely and effective reaction and action by all concerned.

Technical quality and adequacy

30. One of the most important constraints noted during the Desert Locust control campaign was the insufficient availability of well-qualified human resources in most of the countries concerned, in particular the Sahel countries. In a crisis situation, the staff of the control structures

¹ In the report, comments received from the affected countries and the donors through two separate questionnaires have been included. To facilitate the identification of these comments, they are presented in italics.

in these countries is strengthened by people from various departments, who generally do not possess sufficient knowledge to be able to undertake the monitoring and control activities appropriately.

31. With respect to pesticides, most of the products used during the Desert Locust control campaign are on the list of products recommended by the FAO Pesticides Referee Group. In a small number of cases, other products were used. Specialists agree that, in an invasion situation, the best means to return as quickly as possible to remission is still the utilization of conventional pesticides with a rapid knock-down effect. Alternative control means, such as entomopathogenic fungi and pheromones, are ecologically highly attractive, but do not kill locusts rapidly. Further tests are needed to determine how they can be used most effectively. The management of pesticide stocks has become a major preoccupation for the locust control authorities, who try through different measures to ensure better storage based on the available means, while waiting for the construction of the appropriate stores.

32. The effectiveness and efficiency of the control operations undertaken in the various countries are, to a large extent, expressed by the costs of the control operations per hectare. Based on the data collected from eight countries, it was shown that these costs ranged from US\$ 13 to over 200/ha. These costs are largely dependent on the effective planning of the campaign and the timely provision of the various campaign inputs. These data show that there is considerable scope for improvement in a number of countries.

33. Given the wide range of the costs of the Desert Locust control operations in the affected countries during the 2003–05 campaign,

It is recommended that:

20. a study be undertaken jointly by FAO and the countries concerned to identify the reasons for the high costs of Desert Locust control operations in some of the affected countries, as a basis for the development of guidelines for the more efficient control of locusts.

Overall appreciation of the effect and impact of the control campaign

34. The following impressions have in particular been obtained by the evaluation team in the course of the country visits. Donors, affected countries and populations are unanimous in their opinion with respect to the importance of the potentially devastating effect of the Desert Locust invasions and their negative repercussions, combined with those of drought, on the productive activities and on household food security. They also share the conclusion that costs of the control operations would have been less, and the impact of the invasion more limited, had control operations been launched in time to avert major invasions.

Affected populations

35. From the local populations' point of view, on balance the result of the campaign is mixed: while they recognize that the control operations have had an irrefutable impact, they were unhappy about the late start, which has entailed heavy consequences in terms of prolonged exposure to damage by locusts. Within a couple of hours, some lost a considerable part of their capital. Notwithstanding the severe losses of crops and other assets, there is general agreement among the local populations that the disaster might not have been avoided, but it could have been reduced, if assistance had been provided at the appropriate moment. These groups and communities, the appeals of which have not been heard, had the impression that they were abandoned by the authorities.

Affected countries

36. Agricultural losses, according to the majority of the countries affected in 2003–05, could have been less. The level of damage caused was linked to a certain number of factors, in particular the shortage of resources. Clearly, the importance of the development of the Desert Locust has been underestimated by the technical ministries, and the countries were taken by surprise by the rapid evolution of the events. Also, because of lack of preparedness, they depended largely on the assistance provided by the international donor community, and on that matter the affected countries were unhappy about the slowness in the provision of aid.

Donors

37. From the donors' point of view, notwithstanding the overall delay experienced in the provision of assistance, the control objectives have been met in general terms, and the campaign has been largely successful considering the fact that the control operations have contributed to a reduction of the locust populations and have limited the losses to crops and pastures. The donors recognize, however, that rural communities in certain places have been heavily affected and that there was a need to provide rehabilitation assistance. Donors agree with the affected countries that support for the control campaign has been provided late, but they differ in opinion on the reasons for the delays. Some mention the heavy bureaucracies and the lengthy administrative procedures within donor agencies; others note the weaknesses of the organization charged with this task.

(4) *SUSTAINABLE DESERT LOCUST CONTROL*

38. The evaluation team concluded that in future the frequency and impact of Desert Locust invasions can be significantly reduced, provided effective action is taken on the following general recommendations for which further elaborations are provided in the report. It has been suggested to prioritize these recommendations. However, the evaluation team believes that, to arrive at lasting improvements with respect to sustainable Desert Locust control, they must be handled as a comprehensive package that requires urgent attention and follow-up action by all concerned stakeholders.

39. Contrary to the current situation, effective Desert Locust control requires a much better awareness and more effective and joint involvement in the various activities to be undertaken by all groups concerned. These include FAO, the DLCC, the Regional Desert Locust Control Commissions, the affected countries and the donors. The transition from, and the linkages between, a Desert Locust recession situation, through a pre-emergency stage, to a full-scale emergency should be well understood by all stakeholders to allow them to take timely and effective action. These stages are all too often looked at as independent events. Better awareness of the above facts and appropriate institutional arrangements to address them are essential to the implementation of the recommendations listed in this report.

40. Given also the fact that this evaluation has covered only one of the three major regions of the Desert Locust invasion area, the evaluation team considers that, in addition to the implementation of the recommendations presented in this report, action should be taken on how they might affect Desert Locust survey and control efforts in the other two regions. FAO should take the lead on this in close collaboration with relevant stakeholders.

Preventive control strategy at country level

41. The Western Region, covering West and Northwest Africa, contains important seasonal breeding areas that can result, as shown by the 2003–05 events, in large-scale outbreaks and invasions when ecological conditions become favorable. The seasonal breeding areas in the Sahel are mainly located in the so-called frontline countries (Chad, Mali, Mauritania and Niger). Regular surveying and monitoring in these breeding areas would allow control of Desert Locust

populations at an early stage before they invade larger areas and become difficult to contain. So far, only Mauritania has established the necessary institutional framework for the implementation of a preventive control strategy.

21. It is recommended that:

- a) an effective preventive Desert Locust control strategy be put in place in all the countries of the Western Region where seasonal breeding areas exist to reduce the risk of future outbreaks and upsurges, through the timely detection of a pre-emergency situation. The implementation of such a strategy could avoid crop and pasture losses, and considerably limit control costs by intervening at an early stage with limited scale control operations, and allow implementation of safer and environmentally friendlier control means;
- b) an autonomous and operational national locust control structure, with the authority to take technical and administrative decisions as regards Desert Locust operations, be created in each of the frontline countries. This structure must be granted effective financial, material and policy support by the governments concerned. The structure should be able to take full advantage of the material, financial and technical resources received during the 2003–05 upsurge;
- c) an adequate national budget be allocated for the operation of the national locust control structure to ensure the sustainability of the preventive control strategy;
- d) the EMPRES programme in the Western Region be effectively supported by the CLCPRO member countries and by the donors;
- e) countries in the Sahel exposed to Desert Locust invasions maintain a capacity to control locusts within the Plant Protection Services and ensure that the experience gained during the 2003–05 campaign is captured, disseminated and preserved, through appropriate avenues such as training;
- f) the human capacity in acridology be strengthened for the timely replacement of the current Desert Locust specialists, many of whom will reach retirement age in the next 10–15 years.

42. Details of the requirements for the effective strengthening of the national locust control units in each of the frontline countries have been defined recently on the occasion of the first meeting of the Steering Committee of the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) programme for the Western Region, held from 4 to 6 March 2006 in Algiers.² For example, the minimum number of monitoring and control teams has been estimated at six for Mali, ten for Mauritania, five for Niger and four for Chad.

43. The total costs for the establishment and operation of the National Locust Control Units in each of the four countries over the period 2006–09 have been estimated at US\$21.9 million. From these estimates, it is evident that, for an average insurance premium of some US\$5 million

² Programme EMPRES en Région Occidentale. *Rapport de la Première Réunion du Comité de Pilotage*. Alger, Algérie, 4-6 mars 2006. FAO, mars 2006.

per year, a new Desert Locust outbreak may be either avoided, or certainly be of much less importance than during the 2003–05 upsurge.

Strengthening of the Commission de Lutte contre le Criquet Pèlerin dans la Région Occidentale

44. The CLCPRO is responsible, among others issues, for the strengthening of national locust control units, through its own programmes and in collaboration with the EMPRES Western Region programme. However, the limited role and responsibilities of CLCPRO in the Western Region with respect to Desert Locust control operations, compared with the activities undertaken in the past by the Organisation commune de lutte antiacridienne et de lutte antiaviaire (OCLALAV), undermines its visibility and recognition by the member countries and the units within them.

45. In order to enable the CLCPRO to carry out its mandates and responsibilities in the region in a more effective and efficient manner,

22. It is recommended that:

- a) the CLCPRO Secretariat role and responsibilities be reviewed and that it be provided with adequate resources to be able to effectively carry out its responsibilities in the medium and long term. The Secretariat should be the main contact with the countries in the region both during recessions and emergencies.
- b) in the case of a new emergency, additional financial and operational responsibilities be delegated to the CLCPRO Secretariat, by member-countries, donors and FAO;
- c) in order to strengthen the CLCPRO and ensure a more efficient execution of its activities, the different components of the EMPRES Western Region programme be realigned immediately within the domain of the Secretariat in much the same way the Central Region programme was incorporated into the Central Region Commission structure.

46. FAO should, as a matter of urgency, develop the necessary plans for the implementation of this recommendation, including the way in which the CLCPRO Secretariat should be strengthened during the period of an emergency, to be able to undertake such additional responsibilities effectively.

FAO responsibilities

47. The Desert Locust is a threat to agricultural production in countries in Africa north of the equator, the Near East and Southwest Asia. Considering FAO's overall mandate with respect to Desert Locust monitoring and control activities for more than five decades, it has a clear responsibility to provide the necessary services to these countries so that they can prevent Desert Locust outbreaks and control upsurges effectively.

48. For FAO to continue to carry out its responsibilities for Desert Locust prevention and control in an effective manner,

23. It is recommended that:

- a) as a first step, the human capacity of the Desert Locust Information Service, which is currently staffed by only one professional officer, be increased, while at the same time a review is undertaken of the critical mass needed in the Locust and Other Migratory Pest Group to carry out its wide range of responsibilities effectively;
- b) FAO and member countries provide adequate recognition and support to the DLCC and take full advantage of the Desert Locust Technical Group to review the needs for the development of improved Desert Locust survey and control means, and prepare appropriate proposals;
- c) arrangements be made to enable FAO representatives, in the case of a new Desert Locust emergency, to collaborate effectively with and assist the countries in the steps to be undertaken in coordinating and mobilizing the necessary international assistance by presenting well defined action plans and proposals on how to implement these plans, and by determining the international support needed for them.

49. FAO should develop the necessary plans and undertake the actions required to implement this recommendation. It should commit itself to ensuring that it is able to continue carrying out its mandated responsibilities with respect to Desert Locust forecasting and control in an efficient and effective manner. This will have budgetary implications, but the evaluation team considers that these are justified because this is a core FAO function, and thus should be paid for from its own resources. As a consequence, it may have to drop less essential activities.

Donor support for Desert Locust control

50. Effective control of a migratory pest such as the Desert Locust, which can move from one country to another within a matter of hours and days, requires flexibility in the planning and implementation of control operations. For the resources to be used most effectively, they should preferably be available for the control operations to be undertaken in the whole of the invaded region, and not restricted for activities in one particular country. Harmonization of project procedures, as recommended in the Organization for Economic Co-operation and Development/Development Assistance Committee (OECD/DAC) declaration of 2005, will also be an important element for the rapid implementation of control activities. A working document on alternative funding arrangements for Desert Locust control campaigns has been prepared by the FAO Secretariat for the next session of the DLCC.

24. It is recommended that:

- a) in case of a new emergency, opportunities be explored for the establishment of multidonor regional funds in support of regional control programmes facilitating the effective implementation of future Desert Locust control campaigns. Due attention should be given to how donor visibility and preferences can be factored into such a multidonor arrangement;
- b) FAO and donors explore the possibility of developing a mechanism that would allow flexibility in reorienting and reallocating donor funds at FAO with minimal administrative effort to respond effectively to emergencies as they surface or as the situation continues to

evolve. Such a tool should be put in place during the budget negotiation process so that the project documents will explicitly capture the importance of flexibility;

- c) in future, to assist affected populations, provisions be made in Desert Locust control project agreements, for part of the financial resources to be reserved for food aid and rehabilitation activities as needed.

51. FAO, in close collaboration with interested donors, should take advantage of the experience gained during this campaign to develop the necessary plans and agreements for the implementation of this recommendation. It should ensure, together with the international donor community and the affected countries, that it is able to continue to carry out its responsibilities with respect to Desert Locust forecasting and control in an efficient and effective manner.

Implementation of Desert Locust emergency campaigns

52. Addressing Desert Locust upsurges and plagues in an effective manner requires the availability of well-defined contingency plans at national, regional and international levels, which were mostly lacking during the 2003–05 campaign. These plans should preferably be developed as an integral part of the national food security risk management plans and ensure the permanent engagement of all stakeholders. Both the preventive and emergency control operations require the regular involvement and support of donors, the affected countries, FAO, the CLCPRO and other interested partners.

53. In order to be well prepared for an eventual new Desert Locust upsurge,

25. It is recommended that:

- a) contingency plans be developed for the medium- and long-term management of the Desert Locust risk, including action plans for locust monitoring and control at national, regional and international levels. These action plans should indicate: (i) the main activities to be undertaken (including those related to food aid and rehabilitation of the affected populations) and their provisional costs; (ii) the available financial resources, their origin (internal budgets, external resources) and the activities that will be covered by them; (iii) additional financial needs. These plans will be the basis for the preparation of annual work plans and budgets;
- b) in future emergencies, funding appeals be based on well-defined contingency plans and follow the principles and guidelines endorsed for appeals by the Inter-agency Standing Committee (IASC).
- c) strategies be adopted to ensure that locust control operations are carried out both in zones with high production potential, as well as in zones with low production potential, where agriculture is usually practiced by farmers with very limited resources.

54. With respect to FAO's operational procedures,

26. two options are recommended for future action:

- a) either FAO develops and introduces appropriate arrangements to address future Desert Locust emergencies in a more effective and expeditious manner;
- b) or opportunities for outsourcing most of the operational responsibilities should be pursued.

55. Given its specific responsibilities with respect to Desert Locust monitoring and control, FAO should take the leadership to develop the necessary contingency plans in close collaboration with the various stakeholders. In these plans, FAO should indicate how, in future emergencies, it will ensure that the Inter-agency Standing Committee (IASC) guidelines for appeals will be followed. At the same time, the Organization should reassess its capabilities to implement Desert Locust control emergency projects. If it is concluded that FAO should continue to be involved with this, then it should explore ways and means how this can be done in a more effective manner. Alternatively, it should develop plans for how these activities can be best outsourced.

Institutional arrangements

56. In the course of the evaluation, concerns have been raised on the effectiveness of the current institutional arrangements for Desert Locust control. Some of these have already been addressed in the above recommendations. From a more general point of view, it is essential that: (i) better recognition be given to the fact that Desert Locusts are a permanent major threat to the food security and livelihood situation of large numbers of people in countries that already require very substantial international development assistance; (ii) strong support is provided by the countries concerned and the international community to address the necessary Desert Locust monitoring and control activities effectively during the recession, pre-emergence and emergency phases; and (iii) that a productive partnership is created with the active support and trust of all concerned.

57. A much better understanding is needed of the role and responsibilities of all the stakeholders, the affected countries, the donors and FAO, and the way the DLCC and Regional Commissions promote and ensure effective Desert Locust monitoring and control. For example, the evaluation team had the impression that, with respect to the Desert Locust emergency, some affected countries seem to consider that action to be undertaken is in the first place a responsibility of FAO and the Regional Commissions. Also, donors and affected countries consider a Desert Locust emergency as a unique, stand-alone, event. It is essential to recognize that there is a continuum from recession, through pre-emergency to emergency. Limiting the frequency and importance of Desert Locust outbreaks and upsurges requires the involvement and support for the whole chain of activities related to these three phases.

58. To achieve this,

27. It is recommended that:

- a) the DLCC be transformed from an essentially technical committee into a mechanism in which all parties (affected countries, donors and FAO) determine their joint interests and activities, and deal directly with donors to determine joint work programmes;
- b) Regional Commissions meet regularly at a high level to ensure member country support for the decisions taken;

- c) a multilateral agreement for Desert Locust control be developed for the formal permanent engagement and support of all key stakeholders.

Assistance provided by Maghreb countries

59. A very special aspect of the 2003–05 control campaign was the solidarity demonstrated by the Maghreb countries towards neighbouring countries in the Sahel. The transboundary nature of the Desert Locust invasions calls for the countries to pool available resources for the mutual benefit of the whole region. The strong control capacity available in the Maghreb countries offers a unique opportunity to address eventual new Desert Locust outbreaks in the Sahel countries more effectively. These outbreaks always precede the movement of swarms to the Maghreb countries by a couple of months.

28. It is recommended that:

- a) an appropriate action plan and legal framework be developed for the joint use of the existing control capacity in the Maghreb countries within the Western Region, under the supervision of CLCPRO;
- b) agreements are established among the various countries in the region to encourage, organize, facilitate and implement joint cross-border operations.
- c) cost estimates are developed to determine the amount of donor assistance required to use the Maghreb control teams and aerial resources in the Sahel countries effectively in case of a new emergency.

60. CLCPRO should take the necessary initiatives for the establishment of such an integrated Desert Locust control system for the Western Region. This should include matters such as the operational modalities, the necessary legal arrangements, steps needed to call this control system into action, the financial requirements for such a force and the international support needed for its effective intervention in the frontline countries.

Socio-economic impact

61. It is generally accepted that gregarious Desert Locusts need to be controlled, notwithstanding the fact that precise data on the damage that can be caused have not been collected systematically. Consequently, the calculation of benefit/cost ratios of the control operations remains a speculative exercise. A World Bank discussion paper on Desert Locust management (Joffe, 1995)³ suggests that locusts are not particularly serious pests in aggregate, and that Desert Locusts are unlikely in modern times to trigger widespread food insecurity. However, the evaluation team noted that such impacts have been very significant at the level of the affected communities, especially in the Sahel countries. In these countries, at least eight million people have suffered destruction of all or part of their food crops.

³ Joffe, S.R. 1995. *Desert Locust management. A time for change*. World Bank Discussion Papers. Washington, D.C., World Bank,

62. The control campaigns were focused primarily on the elimination of locust populations, while little attention was paid to the impact on food security and sustainable livelihood aspects. These impacts could not be evaluated in a complete manner because of: (i) the absence of an agreed upon methodology to evaluate these types of impacts; (ii) the lack of a global intervention framework that takes into account the social, economic and nutritional aspects; and (iii) the insufficient involvement of the different competent technical services/structures.

29. It is recommended that:

- a) a jointly agreed methodology to evaluate the socio-economic impacts of Desert Locust invasions be developed by the different authorities concerned;
- b) a global intervention framework that addresses effective assessments of the socio-economic impact of Desert Locust invasions and control operations be established;
- c) in case of a new emergency, economic, social and nutritional impact studies, integrating a broader spectrum of relevant disciplines and competencies, be carried out in a timely, systematic and multidisciplinary manner.

63. The DLCC should establish a multidisciplinary working group to develop proposals for the implementation of this recommendation. This working group should pay special attention to the specific actions needed at the national level to plan for and carry out the necessary impact studies.

Human and environmental health

64. Human and animal intoxications and negative environmental effects have been noted in certain countries. It has not always been easy to determine the undesirable consequences of the use of pesticides. Most of the affected countries do not have an environmental impact research strategy, specialized laboratories or a sufficient number of qualified staff to follow the fate of the pesticides in the environment, and within the framework of a public health policy. Large quantities of pesticides are still available in the countries affected by the Desert Locust invasion. Estimated at 6.2 million liters, they are either leftover from the 2003–05 campaign or come from purchases made after the campaign in order to be prepared for an eventual new invasion. This was partly caused by the fact that in a number of cases additional quantities of pesticides were purchased towards the end of the campaign against the advice of technical staff. To address health and environmental concerns more effectively,

30. It is recommended that the affected countries:

- a) procure only pesticides registered with the Comité Permanent Inter-États de Lutte contre la Sécheresse dans le Sahel (CILSS) and create the necessary conditions for the appropriate use of these pesticides;
- b) take the necessary steps to strengthen environmental compliances and enforce the application of regulations and rules for the safer handling, use and storage of pesticides;
- c) avoid placing unnecessary pesticides orders and overestimating pesticide needs;

- d) strengthen the technical capacity of the QUEST (Quality, Environment, Health and Treatments) trained specialists in collaboration and agreement with the EMPRES Western Region programme and the CERES-Locustox in Senegal, and ensure their linkage to the national locust control units in order to undertake in-depth operational health and environmental reviews;
- e) pursue, in collaboration with FAO, CLCPRO, donors and pesticide producers, the establishment of pesticide contractual arrangements, including a pesticide bank mechanism, to reduce the accumulation of pesticide stocks and for the disposal of empty containers.

65. The countries affected by the Desert Locust should determine the steps needed to implement this recommendation under their specific circumstances and develop the necessary action plans. If an effective preventive control strategy is put in place, as recommended, the negative effects of chemical control operations on public welfare and the environment will already be strongly reduced.

Research

66. Research activities related to Desert Locust have not generated much interest over the last decades. However, without effective research there will be no improvements in Desert Locust control operations.

31. Consequently, **it is recommended that** research studies aimed at the following issues are encouraged:
- a) improving operational Desert Locust monitoring and control techniques;
 - b) developing alternative control means;
 - c) using technologies such as satellite imagery and differential global positioning systems (DGPS), that will greatly improve survey, monitoring and control operations;
 - d) gaining better understanding of population dynamics of the Desert Locust during the solitary phase; and
 - e) determining the overall impact of Desert Locust invasions on the economies of the affected countries.

67. FAO should determine, in consultation with the DLCC, Regional Desert Locust Commissions and research institutions, what specific steps are needed to move forward in these specific areas, which are of major importance for the further improvement of the efficiency of Desert Locust monitoring and control operations.

I. Introduction

A. BACKGROUND OF THE EVALUATION

68. Desert Locust, *Schistocerca gregaria* (Forsk.) is a major threat to agricultural production in countries in the arid and semi-arid regions of Africa mainly north of the equator, in the Near East and in Southwest Asia. In these regions, rural populations are already farming under very harsh conditions and encounter major difficulties in meeting their subsistence requirements.

69. The Desert Locust is a very opportunistic insect, once it has changed under favourable environmental conditions from the solitary into the gregarious phase, i.e. the phase when locusts group together in hopper bands and swarms. It can travel long distances and ravage whatever crop and pasture it encounters. The 2003–05 upsurge⁴ offers a classic example of this characteristic, which makes it so difficult to forecast accurately the development and spread of the Desert Locust, and subsequently undertake survey and control actions in a timely and effective manner.

70. In the past, according to available records, swarms originating from the Central Region preceded Desert Locust population explosions in the Western Region.⁵ However, the 2003–05 upsurge was the first in the Western Region in which swarms from the Central Region played no part. Within 12 months the situation changed from solitary locusts, scattered over the northern part of the Sahel region, where they caused no damage, into one where swarms were spreading into pasture and crop land over an area extending from Chad to Mauritania, and from Morocco to the Libyan Arab Jamahiriya. Thus, within a very short period of time, an extremely wide area was threatened by Desert Locust populations that were larger and denser than those encountered during the 1986–89 campaign. During the 1986–89 campaign, over a three-year period, 16.9 million ha were treated in the Central and Western Regions, compared to 12.9 million ha over some 15 months during the 2003–05 upsurge in the Western Region.

71. Swarms move with prevailing winds and can cover over 100 km per day. When the conditions in the newly invaded places are dry, and do not offer suitable conditions to feed and multiply, they continue to move. As such, in early summer 2004, in Mali and Niger, swarms moved straight to the centres of these countries because of dry conditions in the north. At the end of the summer, when crops and pastures dried up in most of the Sahel, the locusts moved to Mauritania where suitable feeding and breeding conditions were still prevalent.

72. Under suitable environmental conditions, adult Desert Locusts can start laying eggs after 4–6 weeks. However, in the autumn and winter of 2004, the large populations that had moved from Mauritania to the south of the Atlas Mountains in Morocco and Algeria encountered unusually cool conditions and stayed immature for several months. This created good

⁴ An outbreak is described as a marked increase in locust numbers owing to concentration, multiplication and gregarization, which, unless checked, can lead to the formation of hopper bands and swarms. An upsurge is described as a period following a recession marked initially by a very large increase in locust numbers and contemporaneous outbreaks followed by the production of two or more successive seasons of transient-to-gregarious breeding in complementary seasonal breeding areas in the same or neighbouring Desert Locust regions. A plague is described as a period of one or more years of widespread and heavy infestations, the majority of which as hopper bands or swarms. A major plague exists when two or more regions are affected simultaneously.

⁵ The Desert Locust invasion area has been divided into three major regions: Western, Central and Eastern Region. The Western Region consists of 23 countries in Northwest and West Africa, the Central Region contains 27 countries of East and Northeast Africa and the Near East, the Eastern Region consists of 6 countries in Southwest Asia from Iran to Bangladesh.

opportunities for the national teams in the two countries to control these locusts effectively, and to end the 2003–05 upsurge.

73. The 2003–05 upsurge has been addressed through a control campaign with survey and control operations carried out in 24 countries, and supported by 27 donors. During the special session of the Desert Locust Control Committee (DLCC) in December 2004, it was considered that the necessary lessons should be drawn from the current campaign for improving Desert Locust control. It was suggested that an evaluation of the whole Desert Locust campaign, including the activities carried out by FAO and all the other relevant institutions, should be organized. During a meeting of the stakeholders convened by the FAO Director-General on 29 August 2005, the evaluation was endorsed by all parties concerned. It was also decided to put in place a Steering Committee for the evaluation with representation from all the partners in the Desert Locust campaign.

B. OBJECTIVES

74. As stated in the terms of reference adopted by the Steering Committee, “the objectives of the evaluation are to serve the needs of all partners in the campaign (i.e. affected countries, donors working directly with affected countries and donors working through FAO, Desert Locust organizations, and FAO), in order to strengthen future response capacity. Based on a comprehensive evaluation of the efficiency, effectiveness and impacts of the roles and activities undertaken by all partners in the locust campaign, the evaluation should first and foremost provide findings and recommendations to be considered by all partners in strengthening future work to prevent and counter future locust outbreaks and upsurges. The evaluation will also provide accountability to all partners on the efficiency and effectiveness of resources deployed in the campaign”. The terms of reference are in Annex I.

C. APPROACH AND METHODOLOGY

75. The evaluation team was composed of the following experts:

Brader, Lukas	(Netherlands)	Agronomy/Crop Protection, Team Leader
Djibo, Hadiza	(Niger)	Sociology
Faye, Francois Gabriel	(Senegal)	Natural Resource Management
Ghaout, Said	(Morocco)	Locust Operations
Lazar, Mohamed	(Algeria)	Locust Operations
Luzietoso, Philippe Nguala	(DRC)	Rural Economics and Poverty
Ould Babah, Mohamed Abdallahi	(Mauritania)	Locust Operations

76. The evaluation was undertaken from November 2005 to March 2006. This included planning of activities to be carried out by the team, briefings by various stakeholders and by persons directly involved in the Desert Locust control campaign, collection and analysis of information from the affected countries and donors through two questionnaires, desk studies and reviews of the activities carried out by FAO in relation to the Desert Locust control campaign (for which two consultants were employed), visits to the countries affected by the locust upsurge, and review of a range of publications relevant to the evaluation. Furthermore, an in-depth survey aimed at assessing the impact of the locust invasion on food security and livelihoods was carried out during February and March 2006, in Burkina Faso, Mali and Mauritania. The full report is available as a separate document.

77. A questionnaire was prepared by the evaluation team for the affected countries, to obtain the following information: national structures, plans and guidelines for Desert Locust control;

organization of the control campaign; human and material resources available; training activities; type, amount and adequacy of assistance received; areas infested and sprayed; damage estimates including health and environmental effects and impact on livelihoods; and left-over pesticides and storage facilities. The questionnaire was sent to 19 countries, and 17 replied.⁶ The information gathered through the responses was integrated, where pertinent, in the present report.

78. Likewise, a questionnaire was prepared to seek information from donors concerning their involvement in the Desert Locust control campaign and the way they have perceived the overall management of the campaign, as well as suggestions for improvements. The questionnaire was sent to 39 donors and completed by 14 (36 percent).⁷ The 14 respondents had contributed in total, through FAO, US\$45 636 340, or 62 percent, of the total extra-budgetary funding received by FAO for the Desert Locust 2003–05 campaign. Seven of these donors had provided an additional US\$29 647 096 in the form of bilateral assistance directly to the affected countries. The information gathered through the responses was integrated, where pertinent, in the present report.

79. A stakeholder workshop was held on 11 November 2005 to seek the opinion of a broader range of partners for the identification of issues to be examined in the course of the evaluation, and of importance to the further strengthening of Desert Locust monitoring and control. It included representatives of the Australian Plague Locust Commission, the UN Office for the Coordination of Humanitarian Assistance (OCHA), the World Food Programme (WFP), the International Research Institute for Climate and Society – Columbia University and FAO. The following topics were discussed during the workshop:

- Overview of the 2003–05 Desert Locust upsurge
- Desert Locust monitoring and control strategy
- Raising funds for Desert Locust control activities
- Public health and environmental concerns
- The potential use of remote sensing in Desert Locust monitoring
- Communications and public awareness

80. On 14 November 2005, the Steering Committee endorsed the terms of reference of the evaluation, as well as the draft work plan prepared by the evaluation team. Discussions with various FAO staff members involved in the Desert Locust control campaign were held from 15 to 17 November 2005.

81. From 10 to 20 December 2005, field missions to Egypt, the Libyan Arab Jamahiriya, the Sudan, Saudi Arabia, Tunisia and Yemen were carried out. From 15 January to 5 February 2006, Algeria, Burkina Faso, Chad, Mali, Mauritania, Morocco, Niger and Senegal were visited. In these countries, discussions were held with the national authorities, staff involved in the Desert Locust survey and control operations, donor representatives, local communities directly affected by the locust invasion and non-governmental organizations (NGOs).

82. Country visits gave the evaluation team an excellent insight into how the various countries had addressed the locust invasion and into the problems encountered in the course of the control operations. In addition, through discussions at various levels, the evaluation team was able to collect more comprehensive data with respect to both the socio-economic impact of the Desert Locust invasion, and the human and environmental health impact. A report was prepared

⁶ This included 13 countries from the Western Region (Algeria, Burkina Faso, Cape Verde, Chad, the Gambia, Guinea, Guinea-Bissau, Mali, Mauritania, Morocco, the Niger, Senegal and Tunisia) and 4 from the Central Region (Eritrea, Saudi Arabia, the Sudan and Yemen). In the Western Region, all countries were affected by the Desert Locust upsurge; in the Central Region the upsurge was limited to Saudi Arabia and the Sudan.

⁷ Respondents were: African Development Bank (ADB), Austria, Canada, the European Commission, Finland, France, Germany, Morocco, the Netherlands, the Sudan, the West African Economic and Monetary Union (UEMOA), the United Kingdom/Department for International Development (DFID), the United States Agency for International Development (USAID) and the World Food Programme.

for each country visit, following a checklist and outline developed previously by the team. A summary of findings and conclusions of the evaluation team in each of the countries visited, is presented in Annex II.

83. The team assembled during the week of 20–24 February 2006 at FAO in Rome to discuss and agree on the main findings and recommendations of the evaluation, and to initiate writing of the draft report. The draft report was reviewed by a Peer and Stakeholder Workshop, 22–23 May 2006.

84. In addition to the terms of reference, the following general principles have been used as a benchmark against which to judge the effectiveness of the control campaign:

- a) The operational objectives of the Desert Locust control campaign 2003–05 were:
 - preventing the Desert Locust from invading cropping areas, and protecting the subsistence means of the affected populations to guarantee their food security; and
 - ending the Desert Locust upsurge.
- b) The control approach concerned primarily the elimination, through chemical treatments, of the gregarious populations in the Western and Central Regions of the Desert Locust invasion area.
- c) For the locust control campaign to be successful, it had to be undertaken in a well coordinated manner at three levels:
 - the affected countries have the primary responsibility for the survey and control operations. An effective national capacity is required for this, and needs to be supported and strengthened accordingly;
 - a regional approach is essential to ensure timely exchange of information and effective coordination and collaboration among the countries in the Regions; and
 - at the international level, whereby FAO, through its Desert Locust Information Service (DLIS), collects and analyses the data required for forecasting the expected Desert Locust developments, in order to be able to alert the countries concerned and the international community about the types and level of action and support required, and to organize the international assistance.
- d) All parties involved should respect the agreed rules and regulations on the appropriate use of the locust control means and monitor the effectiveness of the control operations, as well as possible human and environmental health effects.

85. Formal evaluations of earlier Desert Locust campaigns had never been undertaken. However, a detailed review of the 1986–89 campaign was carried out by Gruys (1991)⁸. The report of this review was not published as an FAO paper, and its recommendations were not presented to the DLCC. Consequently, action on these recommendations is not reported.

86. A review of the 1992–94 Desert Locust upsurge was carried out by McCulloch (1994)⁹. Again, this report was not published by FAO and was not reviewed by the DLCC. The review presents a set of lessons learned and some 50 recommendations.

II. The Desert Locust

A. THE DESERT LOCUST ENIGMA – AN OVERVIEW

87. In most years, the Desert Locust is a solitary insect that lives in arid regions that stretch from Mauritania in West Africa to western India, an area equivalent to 16 million km².

⁸ Gruys, P., 1991. Grasshopper and Locust Campaigns 1986–1989 and FAO's Role. A Review, 3rd Draft, 1 February 1991. FAO, Rome (unpublished paper)

⁹ Mc Culloch L., 1994. A preliminary review of the responses to the 1992–94 Desert Locust upsurge, FAO, Rome (unpublished paper)

This is known as the recession area. Under favorable conditions, when rainfall has led to the development of vegetation favored by Desert Locusts, they multiply rapidly and increase as much as fourteen-fold every generation, about every ten weeks. There are two stages that occur before a plague, outbreak and upsurge. Outbreaks occur locally in a single country or may occur simultaneously in several countries, when locusts breed and increase in number in relatively small areas. The behavior and physical appearance of the locust change as they become increasingly crowded and form ever-denser groups. If left uncontrolled and given favorable weather and habitat conditions, this gregarization process can continue, causing hoppers to form hopper bands and adults to form swarms. Outbreaks can eventually develop into upsurges that can affect an entire region.

88. Once locusts are fully gregarious, their maturation becomes synchronized and they behave as a single homogenous entity. If control is unsuccessful, a plague can occur that may affect part of a continent or the entire recession area. Not all outbreaks develop into upsurges, and not all upsurges develop into plagues. Even under optimum conditions, it usually takes at least a year or more before a plague develops. Some 40 countries spread over 32 million km² can be affected by locusts during a plague;¹⁰ under a major plague the number of countries infested can reach more than 60.

Desert Locust Control Approaches

89. Controlling Desert Locust populations is a complex matter and, while ways and means to achieve this have been discussed and studied for over 90 years, consensus among the various specialists on the best approach to address outbreaks has been emerging slowly.¹¹ Two factors are inherent to the success or failure of locust control strategies. Desert Locusts ignore international boundaries, so lasting solutions require international cooperation and intervention in all infested areas. In addition, locusts are an intermittent problem (Figure 1) and interest in, and funds for, control and research rise during severe outbreaks, upsurges or plagues, when swarms threaten major crop areas, and fall during recessions. This lack of sustained interest accounts for control teams being ill-equipped and ill-prepared to use the latest techniques each time an upsurge or plague begins.

¹⁰ Cressman, K. 2005. *A Desert Locust upsurge in West Africa: an initial review*. Unpublished paper. FAO, Rome.

¹¹ This chapter has been largely extracted from Magor, J.I., Ceccato, P., Dobson, H.M., Pender, J. and Ritchie, L. *Preparedness to prevent Desert Locust plagues in the Central Region, an historical overview*. FAO, 2005. A review commissioned by FAO EMPRES Central Region.

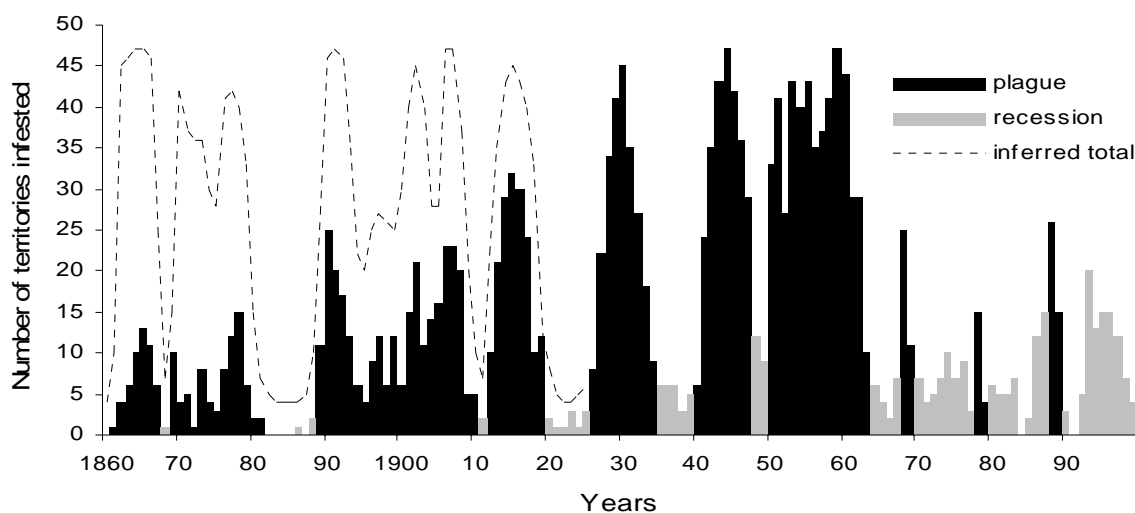


Figure 1. Territories infested by swarms during plagues and recessions 1860-1999 (after Waloff, 1976)

90. FAO convened an International Conference on Desert Locust Control in Rome in October 1951. This conference recommended that the general coordination of plans throughout the Desert Locust area could best be achieved through FAO. Consequently, the FAO Conference held later in 1951 established a Technical Advisory Committee on Desert Locust Control. This was later named the Desert Locust Control Committee (DLCC).

91. The long-term strategy for Desert Locust plague control was discussed at the Thirteenth Session of the DLCC held in October 1969. It highlighted that seasonal breeding areas in Chad, Mali, Niger, northern Senegal and parts of Mauritania and Western Sahara should be closely surveyed from June to September. In northern Mauritania and northern Spanish Sahara surveys should be carried out from October to March. The Committee was of the opinion that the concerted control operations undertaken by national and regional organizations under proper coordination played an important part in bringing about the reduction of plagues.¹²

92. Discussions have continued until today on the best timing of control operations. Research during the 1970s suggested that controlling initial gregarious populations might not end upsurge sequences, whereas controlling later populations that were gregarious and infested a much-reduced area did. Bands and swarms of gregarious locusts might occupy an area up to 1 000 times smaller than a similar number of solitary locusts. It had also been argued that delaying control until the late upsurge stage maximized efficiency in terms of kill per unit of insecticide. Since then, this concept has been widened by proposing that swarm control is more efficient than hopper control, especially when using non-persistent chemicals, because the area that needs to be sprayed is much smaller for swarms than it is for bands. However, waiting until the late upsurge stage requires countries to have the necessary capacity to treat large infested areas rapidly.

93. These differences of opinion on tactics to adopt for Desert Locust control remain unresolved, and in turn lead to different perceptions of the success or failure of the control strategy. However, the 2003–05 campaign has shown again that national authorities often have their own reasons for using certain control tactics against Desert Locust invasions. Further, during this upsurge, aircraft were not specifically used to control flying swarms, although on

¹² FAO. 1969. *Report of the Thirteenth Session of the FAO Desert Locust Control Committee*. Rome.

many occasions swarms were sprayed that included both flying and sedentary locusts. Late in the campaign, investigations were made into whether any of the contracted companies and their pilots would be willing to test the feasibility of deliberately spraying flying swarms. Agreement was obtained from those that had aircraft with rear-directed air intakes, but by then suitable opportunities did not materialize. Other companies/pilots were unwilling to try the technique, which was used successfully in the 1960s, because they considered it to too risky.

Desert Locust Monitoring and Forecasting

94. Locust forecasting is not a precise science and keeping track of the movements of Desert Locust populations is a difficult task in a system necessarily based on incomplete data. Populations in some areas may remain undetected for many months and forecasters have to assume the potential of such populations to multiply and change phase in areas where suitable rains fall.

95. The vast, sparsely inhabited recession area and the seasonal mobility of the Desert Locust present major problems for establishing the population dynamics of this species. Two reasons have been suggested as to why the early stages of outbreaks are rarely recorded and, by extension, why population studies have proved so difficult. First, solitary hoppers are easily overlooked, even by experienced observers, because they usually conceal themselves in the vegetation. In addition, first generation hoppers often develop in remote and inaccessible areas. Second, the change from this cryptic, sedentary behavior to visible, spontaneous marching occurs rapidly and can easily be missed between surveys. Current survey methodologies may be inadequate and may underestimate Desert Locust numbers present during rainy periods in green vegetation.

96. The 1986–89 plague was no exception to this. The first heavy rains fell in the summer of 1985. They gave rise to a few, very localized outbreaks as expected. A year later, in September and October 1986, a few weeks before the appearance of swarms, surveys across the Sahel found very few locusts despite habitats being recorded as highly suitable for breeding throughout the summer. As a result, no special warnings were issued.

B. FROM THE RECESSION PHASE TO THE UPSURGE IN 2003–05

97. Well before the 2003–05 upsurge, the weak capacity of Western Region countries to set up and carry out an effective preventive strategy to control Desert Locusts was well known. The proposal to extend the EMPRES programme to this region was formulated in 1997, and action was taken in 2001. Unfortunately, owing to lack of funding, the programme is not yet fully operational. At a meeting held in Paris in July 2003, donors acknowledged the incapacity of Western Region countries to tackle a new upsurge, as well as the need for a massive international emergency operation should this occur. This was what indeed happened only a few weeks later. During the summer of 2003, from July to September, there were exceptionally heavy and widespread rains in the region, including in the recession areas of the Desert Locust, creating optimal conditions for their development and reproduction. In Mauritania, substantial rainfall in October further enhanced the process.

98. The FAO Desert Locust Bulletin No. 299 (August 2003) issued by DLIS on 4 September 2003 indicated that if rains continue Desert Locust populations could become more significant and that it was important that all affected countries carry out regular surveys and report their results in a timely manner.

99. The Thirty-seventh Session of the DLCC was held at FAO in Rome from 22 to 26 September 2003. In the report, it is noted that vast areas of Desert Locust habitats had received good rains in the previous three months and were favorable to breeding. It was recommended that, in the short term, a special and urgent effort be made to study the immediate impact that exceptional rainfall conditions might have on the population dynamics of the Desert Locust and on the vegetation with which the species was associated.

100. In another recommendation, the Committee recognized that the conditions were very favorable for locust breeding over extensive areas of primary locust habitat in the Central and Eastern Regions, albeit locust populations were very low, and recommended that national locust units in key locust countries maintain vigilance and carry out regular surveys in the following months. In the report, it is also noted that the Desert Locust situation had remained calm since the last session of the DLCC, held in September 2001. However, the Secretary of the Western Region Commission commented that he and others in the region felt that the following two months could be critical.

101. The following two months proved indeed to be critical. Within one month, outbreaks were confirmed in Mauritania, Niger and the Sudan, and FAO issued an alert, expressing concern that the situation might deteriorate further and that an outbreak could also develop in Mali. In February 2004, FAO declared that a Desert Locust upsurge was taking place in West Africa. At the end of the month, the Organization appealed for international assistance on behalf of the affected West African countries. In the request sent to donors, it was stated that the upsurge could evolve into a major plague unless there was rapid reinforcement of control operations. Thus, at the beginning of 2004, the Desert Locust situation had changed from a recession that had started in 1998 to an upsurge.

102. The 2003–05 upsurge started with at least two breeding cycles occurring in southern Algeria, Mauritania, Mali and Niger during the spring and summer of 2003. One generation developed in Western Sudan and, during September–October 2003, another generation developed in Mauritania, Mali and Niger, causing locusts to increase in number and form groups in October. Further breeding also occurred in the Sudan.

103. During November 2003 to February 2004, locust swarms moved north from summer breeding areas in the Sahel and invaded southern Algeria and Western Sahara. A much larger invasion occurred in February 2004, reaching northwest Algeria, Morocco, Madeira and the Canary Islands. Swarms moved across the Red Sea from the Sudan and reached Saudi Arabia in November 2003, where another breeding cycle took place.

104. During March to April 2004, swarms spread out across Northwest Africa from Morocco and Algeria, invading Tunisia and the Libyan Arab Jamahiriya. Large-scale breeding occurred in Northwest Africa during the spring of 2004 and new swarms started forming in late May. A smaller movement took place from Saudi Arabia to the Sudan in March. Limited infestations persisted during the spring of 2004 in parts of Mali and Niger, where some breeding occurred, but in northern Mauritania they remained widely distributed. Control operations in the Sudan and Saudi Arabia carried out between October 2003 and April 2004 stopped the upsurge in the Central Region.

105. From June to August 2004, spring generation swarms invaded the Sahel in massive numbers from Northwest Africa, arriving in Mauritania, northern Mali, Senegal, Cape Verde, Mali, Niger, Chad and Burkina Faso. At least one breeding cycle occurred in all these countries during the summer.

106. From October 2004 to November 2004, summer generation swarms invaded Northwest Africa from the Sahel, arriving in the Libyan Arab Jamahiriya, Algeria, Western Sahara and Morocco, the Mediterranean coast of the Libyan Arab Jamahiriya and Tunisia. A few swarms reached the Canary Islands, southern Portugal and Madeira. Some swarms moved across the Libyan Arab Jamahiriya to the eastern Mediterranean, reaching Crete, northwest Egypt, Cyprus, Lebanon, Israel, the Sinai, Jordan, Saudi Arabia and the Syrian Arab Republic, eventually moving south along the Red Sea to northeast Sudan in December.

107. A small second generation occurred in late summer of 2004 in the Sahel and swarms reinvaded Burkina Faso and Senegal and moved along the southern circuit, invading the Gambia, Guinea Bissau and Guinea.

108. Details of the area treated in each country are presented in Annex III. Control operations increased with each season of breeding. Initially some 62 000 hectares invaded by the summer 2003 populations were treated, mainly in Mali and Mauritania (October– November 2003), followed by more than 1.1 million hectares of autumn-/winter-bred populations (December 2003–March 2004). Some 5.1 million hectares of spring-bred populations were treated in Northwest Africa (April–July 2004), and nearly 6.5 million hectares of summer 2004 population were treated in Mali, Mauritania, Senegal and, in particular, in Algeria and Morocco (August 2004–February 2005). During the whole campaign, 13 048 610 hectares were treated in all Desert Locust regions between October 2003 and December 2005¹³. Owing to the unusually cold weather conditions in Algeria and Morocco during the winter of 2004/2005, adult locusts remained immature for a long period, offering ample opportunities for effective control. These control operations, in conjunction with unfavorable weather conditions preventing renewed breeding, proved decisive in ending the Desert Locust upsurge.

C. DEVELOPMENT OF IMPROVED DESERT LOCUST CONTROL AND FORECASTING MEANS

Desert Locust Control Means

109. The plague during the 1940s saw the large-scale production and use of poisoned baits in coordinated campaigns that aimed to re-establish a recession. The 1949–63 plague saw spraying widely adopted, but dusting and baiting continued. Techniques developed during this plague were ultra low volume (ULV) spraying and its associated equipment, as well as spraying swarms in flight or when they are settled on the ground.

110. By the end of the 1966–69 plague, non-persistent contact pesticides began to replace dieldrin to protect users and the environment. Awareness that chemical pesticides might cause environmental pollution increased during the 1986–89 plague and led to the banning of organochlorine dieldrin and to moves to develop and introduce alternative control means, including biopesticides. Three of these, the insect growth regulator diflubenzuron, the phenylpyrazole fipronil and a myco-pesticide based on *Metarhizium anisopliae* var. *acidum* have shown promise for adoption in Desert Locust control, but they have yet to be fully tested and registered for use against the Desert Locust in the Western Region.

111. Most specialists agree that in an invasion situation the only means to return as quickly as possible to the recessions is the utilization of conventional pesticides with a rapid knock-down effect and kill. Alternative control means such as enthomopathogenic fungi and pheromones are environmentally highly attractive and could have a future in preventive control operations. Their effective use in emergency campaigns merits further testing.

112. FAO set up an independent body of experts known as the Pesticide Referee Group in 1989 to prepare lists of products based on trials carried out to show their effectiveness against locusts and grasshoppers, together with dose rates. Information on their speed, mode of action and environmental side effects is included as a guide for potential users.

Improved Desert Locust Forecasting

113. The basic features of the early warning system, collecting, transmitting and analyzing information on locusts, weather and habitat remain unchanged but, since the mid-1980s, the manual systems have been replaced with computer-based systems, and have become more precise since the introduction of GPS technology in the early 1990s. New operational products to estimate rainfall and vegetation include: (i) the interface to analyze long-term series rainfall estimates from remotely sensed data; (ii) the use of satellite data to identify vegetation

¹³ However, it should be noted that “area treated” is calculated on the basis of the amount of pesticide used divided by the recommended dosage rate, and may not always be a reliable estimate of “area treated”.

developing in remote areas; and (iii) experimental seasonal forecasts of rainfall and temperature six months in advance. These products are still being further developed and refined.

114. New tools have also considerably improved the timeliness and capacity to analyze field data to monitor Desert Locust developments and to forecast and provide up-to-date information on potential outbreaks. These include:

- eLocust, a hand-held computer and software to register and transmit locust, weather and habitat observations made during field surveys;
- a computerized Geographic Information System (GIS) for data management, analysis and research called SWARMS (Schistocerca Warning Management System) to replace the manual mapping and analysis techniques developed over the previous 60 years; and
- RAMSES (Reconnaissance and Management System of the Environment of Schistocerca), a less complex system than SWARMS, for use by the national locust information officers for storing data and producing locust distribution maps, as well as for the transmission of data to FAO for use in SWARMS. Since RAMSES does not allow data analysis, it would be useful to update it with that capability.

115. These new tools have led to a significant improvement of the DLIS as shown during the 2003–05 campaign. However, it should be emphasized that correct field data remain the most important input for the effective use of these new systems. For this, continued efforts need to be undertaken to equip and train national surveillance teams of the countries in the Desert Locust recession area. Under the current conditions, with limited capacity in certain key regions, it is still not possible to know exactly which area is infested.

116. Thus, notwithstanding these very positive developments, effective monitoring of locust populations and action preparedness remain key elements in Desert Locust control. At a workshop on contingency planning for Desert Locust control held at Nouakchott in May 2004, it was concluded that advance warning of outbreaks was still rather problematic and was probably only possible at one-month's notice with low reliability. Upsurges could only be forecast up to three months in advance with relatively low reliability, while the forecast period for the development of a plague was around six months, but reliability was higher. The short time available for advanced warning of the onset of locust outbreaks and upsurges reinforces the importance of having realistic contingency plans in place to enable countries to respond rapidly and adequately (FAO, 2004).¹⁴

D. ORGANIZATIONAL STRUCTURES FOR DESERT LOCUST CONTROL

117. National locust control units of the countries located in the Desert Locust recession area are the basic structures for survey and control operations. They are responsible for monitoring locust populations, for transmitting the necessary data to the DLIS managed by FAO and for control operations against gregarious locust populations.

118. Almost all countries in the recession area are members of one of the three Regional Commissions for Desert Locust control. These are the Commission pour la Lutte Contre le Criquet Pèlerin dans la Région Occidentale (CLCPRO), the Commission for Controlling the Desert Locust in the Central Region and the Commission for Controlling the Desert Locust in the Eastern Region. The obligations of members of the Regional Commissions are the following:

- Members undertake to maintain, through the Secretary of the Commission, a regular exchange of information on the current locust situation and the progress of control campaigns within their countries and, also, to transmit such information regularly to the FAO DLIS in Rome.

¹⁴ FAO. 2004. *Rapport Huitième Sessions du Groupe Technique du Comité de lutte contre le criquet pèlerin*. Atelier sur les Plans d'Action Prévisionnels pour la Lutte contre le Criquet Pèlerin. Nouakchott, Mauritanie, 2 au 7 mai 2004. Rome.

- Members undertake to carry out all possible measures to control plagues of the Desert Locust within their countries and to reduce crop damage by adopting jointly agreed procedures. These procedures include, among others, the establishment of an autonomous national Desert Locust control unit.

119. The Regional Commissions have been created under the DLCC, which currently has 65 member countries, and reports to the Director-General of FAO on policy and technical matters. The DLCC is a forum that brings all interested countries and organizations together once every two years, or more often in emergency situations. The purpose is described as being to keep the Desert Locust situation under review and to promote the overall coordination of work by various national and regional anti-locust organizations and commissions.

120. To bolster an effective approach to the locust problem, over the years FAO has been given the responsibility of providing member countries with technical advice and assistance to strengthen their capacity to prevent or mitigate the damage caused by Desert Locust invasions. This has been further strengthened since the mid-1990s through the EMPRES programme. An Emergency Centre for Locust Operations (ECLO) was set up in the 1980s to manage the 1986–89 campaign, and re-established in August 2004.

121. The Locust and Other Migratory Pests Group in FAO monitors the global Desert Locust situation, based on reports received from national locust units, and keeps affected countries and donors informed of expected developments. The DLIS builds this information into an analysis of the situation relating to possible locust outbreaks and upsurges at the national, regional and international levels. DLIS issues regular monthly bulletins, forecasts and warnings, and supplies countries with remote sensing images. Other locust species are also monitored but in much less detail and less systematically than the Desert Locust.

122. FAO has the following responsibilities with respect to Desert Locust forecasting and control operations:

- A forum for discussion for the development of appropriate policies, strategies and plans. This is mainly carried out through the DLCC, which is supported by the Desert Locust Technical Group and the Pesticides Referee Group, but also at the regional level through the Regional Commissions.
- Coordination of knowledge and information related to the distribution and abundance of Desert Locusts. This work is undertaken by DLIS, as described above, based on inputs received from the countries.
- Strengthening of National Locust Control Units and promoting collaboration at the regional level, within the framework of the Regional Desert Locust Control Commissions.
- Declaring Desert Locust emergencies, organizing international assistance and providing technical advice in support of the control activities to be undertaken.

123. However, the capacity of FAO to carry out its responsibilities effectively is limited, because headquarters staff consists of only four professionals, of which only one staff member is employed to operate the DLIS. Also, there is concern with respect to, for example, the lack of progress in the preparation of contingency plans, and the deficiencies in the development of improved Desert Locust survey and control means. It should be emphasized that FAO does not coordinate the control operations at the field level. This is the responsibility of the countries, over which FAO has no direct control.

III. Planning and Implementation of the 2003–05 Desert Locust Control Campaign

A. FUNDING OF THE CONTROL CAMPAIGN

124. The primary responsibility for organizing the control campaign resides with the affected countries. Countries resort to the international donor community and FAO for support when they do not have the required resources to undertake the necessary surveillance and/or control measures. FAO and the donors endeavor to respond through a planned and prioritized approach. In this, FAO takes into account governing bodies' policy directives and the advice of the DLCC and of the regional Desert Locust control commissions.

125. The current approaches and structural relationships by which FAO engages in major emergencies, such as that of the Desert Locust, are not well defined. The result is that communication on who does what and when is somewhat blurred and needs to be improved.

126. Requests for assistance received by FAO are appraised at administrative and technical levels. If a request is adjudged to merit a response and is in compliance with FAO's Technical Cooperation Programme (TCP) criteria, operational feasibility and within the financial possibilities of TCP, the Organization approves the assistance from its TCP resources pending the arrival of more substantive assistance from donors.

127. To address Desert Locust upsurges and plagues in an effective manner requires the availability of well-defined contingency plans at national, regional and international levels, which were mostly lacking at the beginning of the 2003–05 campaign. Such plans should, at the national, regional and international levels:

- articulate the problem, its implications for agriculture and food security, livelihoods of vulnerable populations and the national economy;
- describe the establishment of the national coordinating structures to ensure effective synergy among all actors and stakeholders, including donor coordination;
- define the steps to be taken to cope with the specific requirements of a Desert Locust emergency;
- determine the responsibilities of the various actors and stakeholders;
- provide the detailed technical specifications of the inputs needed for the campaign;
- outline the logistic support required during the control operations;
- indicate the national budget allocation for all the components of the control campaign and provide a cost estimate of the additional resources required, as well as potential funding sources;
- specify the actions to be taken for the rapid mobilization of existing/additional resources (e.g. aircraft, staff, pesticides) together with indicative estimates of the level of resources required under different scenarios; and
- identify critical issues likely to constrain the response and develop approaches to minimize/eliminate these constraints.

B. APPEALS FOR FUNDING OF CONTROL OPERATIONS AND MOBILIZATION OF RESOURCES

128. Requests for assistance to combat the Desert Locust upsurge were received by FAO in the course of 2004 from individual countries after the upsurge situation exceeded national resources. Subsequently, mainly following consultations among CLCPRO member countries, requests that had subregional, regional and interregional dimensions were also received. Subsequently, FAO approved 22 projects within the Technical Cooperation Programme, worth in total US\$6 million, in support of the Desert Locust campaign in the affected countries and regions.

129. Notwithstanding the concerted effort to respond to the various requests for assistance through FAO TCP, it soon became clear that the magnitude of the problem was far beyond the capacity of this programme. Consequently, FAO resorted to resource mobilization, on behalf of the affected countries, through specific appeals to donors. However, while the procedure for handling requests from affected countries for emergency assistance is well defined and adhered to strictly within the Organization's TCP, there does not appear to be such a clear-cut one for handling appeals to potential donors for resource mobilization for major emergencies.

130. Strictly speaking, the Organization on such occasions should follow the principles and guidelines endorsed for appeals by the Inter-agency Standing Committee (IASC), of which FAO is a full member. These guidelines describe the logical sequence of analysis of the crisis at hand, the assessment of needs, the building of scenarios, the setting of goals, the identification of roles and responsibilities, and the planning of the response culminating with the appeal for funds. There is no evidence that the current Desert Locust upsurge was at any time determined to be a major or a complex emergency by the IASC and subsequently taken on by the UN Resident Coordinators in the respective affected countries as meriting a response within the framework of the Consolidated Appeals Process (CAP).

131. Nonetheless, what started off to be an emergency of rather limited proportions, turned out to be a major one judging from the extent to which it involved senior FAO management in the launching of the appeals and subsequently in the planning of locust control operations. Since at the beginning of the campaign the main task was to scale-down the locust invasion, calling for technical support by FAO and not involving other UN agencies, it was not deemed to require a multisectoral response transcending the mandate of FAO. As part of FAO standard practices in addressing emergency situations, FAO contacted the Office for the Coordination of Humanitarian Affairs (OCHA) to obtain advance financing from CERF,¹⁵ as part of CERF's function to advance funds upon written confirmation of funding approved by a donor. This made it possible to take action while awaiting cash transfer of approved donor funding. The World Food Programme (WFP) was also requested to assist in the assessment of food aid needs and the damage caused to livelihoods of local communities.

132. Taking into account the technical nature of controlling the Desert Locust invasion, FAO decided to write and talk directly to donors to solicit support on behalf of affected countries. In this latter context, the Organization launched three appeals for assistance. The first, dated 23 February 2004, was in the form of a letter from the Assistant Director-General of the Technical Cooperation Department to various donor countries. This appeal was for a total of US\$9 million on behalf of Mauritania (\$6 million) and Mali, Niger and Chad (\$1 million each). While the letter acknowledged that the locust situation could deteriorate and become a major plague in West and North Africa, it only laid emphasis on the shortage of pesticides in these four countries. On 8 April 2004, the Director-General chaired a donors' meeting during which he issued a second appeal for US\$17 million – the original US\$9 million and US\$8 million for Morocco.

133. The third appeal was a letter dated 7 July 2004 from the FAO Director-General to heads of state of donor countries and heads of financial institutions. In his letter, he requested, on behalf of the affected countries, US\$30 million for a large-scale emergency response that would comprise measures to protect human health and the environment and avoid accumulation of obsolete pesticides.

134. The response to the first appeal letter was very limited (Italy with US\$370 029 and Norway with US\$143 351), in spite of the fact that it was followed up by various meetings with representatives of donor countries in Rome. It should be noted that at the time this appeal was

¹⁵ CERF is the Central Emergency Response Fund managed by OCHA to be used to meet interim appeal requirements to enable agencies and organizations to respond rapidly to an unusually urgent situation.

issued, more than US\$700 000 were already available from a United States Agency for International Development (USAID) regional grant to be used for this purpose.

135. At a ministerial meeting of affected countries convened in Algiers in July 2004, a scenario of needs ranging between US\$58 million and US\$83 million emerged, depending on the pattern of the evolution of the Desert Locust situation. Other meetings organized by the affected countries included:

- A meeting hosted by the President of Senegal on 31 August 2004 where funding requests were presented for Burkina Faso, Cape Verde and the Gambia for an amount of US\$8.2 million, and for Chad, Mali, Mauritania, Niger and Senegal for a total of US\$54.5 million.
- A meeting hosted by Tunisia on 6 November 2004 with participation of the Ministries of Agriculture of Algeria, the Libyan Arab Jamahiriya, Mauritania, Morocco and Tunisia, during which the estimated funding requirement for the winter campaign was established at US\$97 million.

136. The question arises as to why most donors did not react as desired when the first appeals were launched. From the responses provided through the questionnaire sent by the evaluation team, it can be concluded that the initial alerts did not provide adequate details concerning the plans to be implemented, activities to be undertaken and costs, and did not address environmental and human health concerns. It was also not clear how this initial appeal differed from Desert Locust appeals of previous years that did not lead to humanitarian crises. It was suggested that a realistic description could have been provided about the possible impact on the food security situation if appropriate action was not undertaken. Also, the involvement of donors at field level should have been encouraged through better communication via the FAO Representatives in the countries. Donors stated that decisions pertaining to the mobilization of resources for official development assistance are usually taken locally.

137. FAO's early warning system and appeals procedure were rated as less than satisfactory by 44 percent of the donors and as better than satisfactory by 56 percent. Details concerning various aspects of these activities are presented in Table 2.

Table 2

Question	Judgment
Timeliness of alert	Better than satisfactory
Quality of technical information provided in alerts	Better than satisfactory
Timeliness of appeals	Better than satisfactory
Rationale of funding requests	Less than satisfactory
Effectiveness of communication on appeals	Less than satisfactory
Specification of needs	Less than satisfactory
Specification of costs	Less than satisfactory

1–5 = less than satisfactory; 6–10 = better than satisfactory

138. Of the donors responding, 50 percent considered that the delay from the first alert in October 2003 to the start of wide-scale control operations in August 2004 increased the costs of the control operations greatly, 40 percent somewhat and 10 percent not at all. With respect to the locust damage caused, 56 percent believed that damage increased greatly owing to the delays.

139. Furthermore, donors considered that alerts and briefings outside Rome, for example through the Humanitarian Liaison Working Group or coordinating briefings, appeals and plans with key humanitarian partners such as OCHA, WFP and the UN Joint Logistics Centre (UNJLC) could have served to signal the UN humanitarian system's assessment and advise that

this was a humanitarian response. However, FAO failed to explain their appeal rationale, or the rapid increase in amounts appealed for, giving the donors a sense that they might be handling the situation opportunistically, which in turn bred scepticism and further delay.

140. Technical information and communications provided by FAO on the development of the locust situation during the campaign were rated as satisfactory by 75 percent of the donors. It was suggested that communications could be further strengthened through a more active involvement of the international media, national and rural radio stations, and television in the countries affected by the Desert Locust, as well as of donor representations in the field. Frontline countries should have means and equipment to conduct regular surveys and be able to raise alerts themselves in a timely manner. Donor visibility in the FAO projects should be improved.

141. The usefulness of the FAO DLIS was considered more than satisfactory by 93 percent of the affected countries that responded to the questionnaire; 87 percent noted that DLIS provided information in a timely manner. Technical advice provided by FAO was also rated better than satisfactory in 93 percent of the cases. A slight majority of the countries felt that the effectiveness of FAO in mobilizing resources was medium. The overall effectiveness of FAO was also considered medium. About half of the member countries of the Regional Commissions noted the lack of effectiveness of the CLCPRO.

142. In the early stages of the upsurge, donors stated that there did not seem to be a system in place in FAO where one could obtain a clear picture on actual needs, projected allocation and current mobilization of resources for locust operations. Improvements were seen later in the campaign with respect to the clarity and frequency of information dissemination including online access. A clearer picture should also have been provided of the specific roles and responsibilities of different actors in the campaign. More information on needs and donations should have been communicated throughout the campaign to the donor representations in the field. The flux of information from Rome was insufficient and often late.

143. The Desert Locust Bulletin was a good tool for communication, as well as the briefings organized by FAO, in the view of donors. The FAO Web site also provided good information, but a clear description of the potential locust impact on food security and national economies was missing. At the height of the Desert Locust upsurge the media were interested in the issue but, as usual, shifted soon to other topics. FAO should have continued providing the international media with material throughout the campaign and also assisting developing country authorities and press to access and utilize information on the issue. It was also suggested that the DLIS should be strengthened.

144. In the second half of 2004, donors reacted very positively, approving 46 projects with a total budget of US\$74.3 million. In addition, US\$6.2 million were approved from FAO's Technical Cooperation Programme under 22 projects. This positive reaction of the donors should not lead the Organization to complacency; rather, it should be a constant reminder of the need to package appeal processes in a much better way. At the same time, FAO could remind donors that it is their Organization, with the necessary technical competence, and that it is ready to continue to play the traditional role of a neutral and an honest broker in Desert Locust control operations.

Thus, it is recommended that:

1. FAO define, in clear terms, the different categories of emergencies and establish the criteria to decide which ones would make use of the Consolidated Appeals Process (CAP), for which guidelines have been published by OCHA. When an emergency is not considered complex, the Organization should also spell out the specific rules that will apply and make them known to all concerned.

C. MONITORING AND CONTROL OPERATIONS

145. Notwithstanding the fact that signals of an increase in Desert Locust activity were already observed in the summer of 2003, the frontline countries did not take adequate measures to address the problem. This was mainly due to:

- the absence of independent anti-locust control structures in several key countries;
- the insufficiency, or even absence, of human, material and financial means to start the campaign;
- the inaccessibility of certain seasonal breeding areas of the Desert Locust, mainly owing to insecurity;
- the lack of contingency plans to manage the risk at national, regional and international levels; and
- the delay in the implementation of the EMPRES programme in the Western Region.

146. At the beginning of the 2003–05 campaign, only 12 monitoring and control teams were operational in the whole of the Sahel region, including six teams in Mauritania, with a maximum control capacity of 1 000 hectares per day. These teams were able to carry out monitoring and control operations mainly thanks to financial assistance from CLCPRO, FAO and USAID grants provided through FAO. Subsequently, the worsening of the situation was confirmed and the need to strengthen the control capacity became a priority. A critical lack of qualified staff, vehicles, monitoring and spraying equipment, pumping material, GPS and maps, protective clothing, pesticides, aircraft and operational funds became apparent.

147. When donors became convinced of the seriousness of the situation and started contributing, in some cases the lack of effective planning and coordination led to a duplication of efforts, as in the case of pesticides and airplanes. For example, in Senegal, the number of airplanes reached 20 by mid-October 2004 while the spray targets had already considerably diminished because of swarms migrating to Mauritania and the Maghreb.

148. A donor coordination group was established in ten countries, or in over 80 percent of the affected countries reporting on this matter. However, donor coordination was considered poor in more than 50 percent of the countries. Fifty-four percent of the countries believe that the Desert Locust upsurge would have been controlled earlier if national control campaigns had started earlier. The situation would have been even better if control operations had started earlier in the neighboring countries. All countries are unanimous that this would have facilitated control of the Desert Locust upsurge sooner. In 83 percent of the cases, countries considered that control operations carried out in a timely manner in their own countries would have had a positive effect in the neighboring countries. These opinions confirm that effective Desert Locust control should be based on a well-coordinated regional approach.

149. Although delivered late, the contributions of the funding agencies met an important part of the needs, and made it possible to strengthen the capacities of the countries to control the invasion. For example, in Mauritania, the number of ground intervention teams reached a maximum of 32 in October 2004, and the number of aerial control teams increased from one to six during the campaign, with the result that the daily treatment capacity strongly improved to reach 41,000 hectares per day. This made it possible to treat, in total, 1,384,000 hectares, 80 percent of which by aircraft.

150. During the two control campaigns 2003/2004 and 2004/2005, treatments were carried out on some 12.9 million hectares requiring the use of a total quantity of about 13 million liters of pesticides in the ten countries of the Western Region. Algeria and Morocco alone sprayed 9,430,404 hectares, or 75 percent of the total area treated. The aerial control used by the two countries was an important factor in avoiding damage to the major cropping areas. In Morocco,

95 percent of the area treated was covered by a fleet of 46 airplanes during the first campaign and 62 during the second. Algeria mobilized 12 airplanes for the first campaign and 52 for the second.

151. The control operations have necessitated, for the whole of the Western Region, the mobilization of about US\$280 million for the acquisition of pesticides, deployment of aircraft, spraying and communications equipment, vehicles, protective clothing, etc.

D. EFFICACY OF THE CONTROL OPERATIONS

152. The objectives of the control campaign are to protect crops and pastures of the communities affected by the invasion, and to stop the invasion, by destroying the Desert Locust with pesticides and other means. At the level of the countries, the official information received by the evaluation team from the national services responsible for locust control shows that the losses suffered from the Desert Locust invasion are generally considered as limited. However, the team has noted that because of the strategies adopted by the countries and a lack of effective control means in the Sahel countries, serious losses occurred in various places and food security was ensured only for some of the affected communities in the Sahel countries.

153. Two different control strategies were implemented during the 2003–05 campaign:

- The Maghreb countries, especially Algeria and Morocco, have generally effective operational national units for locust monitoring and control. Thus, they carry out regular and effective monitoring activities, especially in spring during recessions, and throughout the year during emergencies. Tunisia and the Libyan Arab Jamahiriya increase the number of surveys when there is a threat of invasion. These surveys allow them to follow the locust situation in the seasonal breeding areas and, when necessary, to control Desert Locusts outside cultivated areas. The protection of crops in these countries was effective and virtually complete and losses suffered were generally very limited. However, substantial Desert Locust populations survived in uncultivated areas in the southern parts of these countries, which re-invaded the Sahel during June to August 2004.
- On the other hand, survey and control teams in the Sahel countries lacked sufficient resources and were unable to carry out regular monitoring and control operations. Overwhelmed by the large swarms, they were forced to focus control interventions on destroying locusts in the cropping areas. Although they later received external assistance, most of the affected farmers suffered relatively high losses owing to the late arrival of assistance.

154. According to figures provided by the authorities concerned, control activities undertaken permitted the saving of more than 24,000 hectares of food crops and over 75,000 hectares of pastures in Chad, almost 63,000 hectares of food crops and 49,000 hectares of pastures in Burkina Faso, and in Morocco protection of some 30,000 hectares of citrus plantations and 20,000 hectares of vegetable crops, mainly grown for export purposes. Algeria succeeded in avoiding losses in the major production areas in the northern part of the country.

155. Affected countries stated that locust damage estimates were carried out in 54 percent of the countries, especially where a high level of Desert Locust infestation occurred. Guinea, Niger and Senegal reported that the livelihoods of women and children were more affected by the Desert Locust infestations than those of men. In 70 percent of the cases, a reply was not given to this question. Only Mali, Morocco and Senegal reported that estimates were made of crops saved as a result of the control operations. In future, the monitoring of damage caused by locusts should be integrated into the countries' overall contingency plans.

156. The following working hypotheses may be formulated for the crops saved in Chad and Burkina Faso:

- Sorghum and millet are the most cultivated crops in the zones infested by the Desert Locust, and their average estimated yields are about 600 kg/ha: the campaign 2003–05 has avoided losses by Desert Locusts of about 14,400 tonnes of cereals in Chad and 37,000 tonnes of cereals in Burkina Faso.
- The carrying capacity of the pastures in infested areas is about one animal of 250 kg for 5 hectares: the campaign has saved pastures for about 15,100 animals in Chad and for 9,700 animals in Burkina Faso.

157. These results were only possible where the control operations were carried out in an effective and timely manner, immediately at the beginning of the invasion of the areas concerned. In most places infested by the Desert Locust, where these conditions have not been met, the late control has only served to avoid the further spread of the invasion. In these areas, crops and pastures have often been seriously damaged. For example, in certain provinces of the Sahel region of Burkina Faso, the losses caused by the Desert Locust have been estimated at 58 832 tonnes, including 49 049 tonnes of millet, 9 782 tonnes of white sorghum and 4 325 tonnes of cowpea. In Senegal, losses attributed to locust attacks were close to 47 500 tonnes.

158. During the visits to Algeria and Morocco, the evaluation team discussed the opportunities for using the control capacity in these countries to assist the frontline countries in the Sahel in a well-organized and timely manner in case of new emergencies. Such an approach and set-up could take advantage of the experience gained in the course of the assistance provided during the 2003–05 upsurge. In both countries, the idea was well received and it was felt that these suggestions merited further elaboration. Consequently, a recommendation on assistance provided by the Maghreb countries is presented in section V.

E. PUBLIC AWARENESS, COMMUNICATION AND TRAINING

Public Awareness and Communication

159. The control of the Desert Locust cannot be won without the involvement of local communities in the campaigns. Training, sensitization and communication are essential elements in this, as stated unanimously by the locust-affected countries visited by the evaluation team. Consequently, in the course of the 2003–05 campaign, information/sensitization activities were undertaken for the benefit of the populations, aimed at attracting attention to the risks linked to the use of pesticides and to provide the populations with details on the evolution of the locust threat, and on the zones to be treated.

160. According to country responses to the evaluation questionnaire, local populations were informed on environmental and human health risks in 82 percent of the 14 countries replying. The majority used radio and television, as well as printed materials and posters, for this purpose. It was felt that as a result of these activities 50–75 percent of the people concerned were aware of the potential problems, and 12 countries concluded that these results were better than satisfactory.

161. While the importance of the participation of local populations and communities in the control of the Desert Locust is recognized by all, on the contrary, the form that this participation should take has led to disagreement between those that are for and those that are against the involvement of the affected communities in chemical control operations. For the latter, the involvement of the populations must be limited to matters such as locust monitoring, informing the authorities concerned and mechanical control, as handling of pesticides is considered too dangerous to human health. In 2005, FAO established a policy discouraging the involvement of farmers/villagers in the application of pesticides. However, this policy has not been widely publicized outside the various locust fora.

162. Within the framework of the information and awareness campaigns, multiple and diverse means have been used, including radio and television (programmes in national and official languages), imams in the mosques, criers at markets and teachers in schools, as well as the press

and print notices, fliers, brochures and posters. The staff of the plant protection or extension services, and of the members of the monitoring and control teams, also directly passed the necessary instructions to the local populations. It is interesting to note that in Chad, in order to reach a female target group, women leaders received some training, and were equipped with radios operating without batteries, also distributed to other villagers.

163. The countries, while differing in the manner in which they handled information, differed also in the way they carried out their control campaigns. To illustrate these differences, two cases are presented: one where information was withheld and, at the other end of the chain, the wide-scale diffusion of information to the general public.

The example of Tunisia and the strategy of limited information to avoid alarm

164. This strategy consisted of working under the greatest secrecy, with severe instructions to “stay calm, be discrete and efficient”. In order to avoid the creation of alarming and unfounded rumors and their implications, the efforts to inform populations (in particular beekeepers and herders) in the infested zones were reduced to the strict minimum. In fact, the latter were only warned directly of the potential side effects of the treatments by the regional staff.

165. Control being considered a technical matter, the information was restricted to locust experts, and its distribution was limited as much as possible at the local, national and international levels. Consequently, neither FAO nor the media were informed at the beginning of the locust threat. The instructions to maintain silence were such that the campaign came to an end without, in certain cases, even the inhabitants of the infested zones and the staff of the Ministry concerned becoming aware of the events.

166. Locust control was carried out solely by the staff of the Plant Protection Service who, according to the statements of the authorities concerned, followed the FAO guidelines closely. The involvement of the rural communities was limited to the provision of tractors and water tanks.

The example of Mali and the choice of widely spread information

167. The strategy adopted in Mali consisted of:

- the creation of a special information space at the Office de la Radio et de Télévision du Mali for the daily transmission of information on the infested zones, the areas treated, the control means used and, finally, the contributions to the campaign of various people;
- the regular interventions by the Minister of Environment and Hygiene as spokesman for the government after each interministerial meeting to report on the situation and to announce new measures taken; and
- the organization of a press caravan to ensure that the realities encountered at the field level were well reflected and that a balanced view was presented on the efforts undertaken by the rural populations, the donors and the authorities.

168. From the two examples presented, it may be concluded that a well focused and limited sensitization and information campaign for the rural populations may prove to be effective in the case of an invasion of limited importance. On the contrary, in countries experiencing very high levels of locust infestation and having modest resources, it is necessary to establish intensive sensitization, communication and training programmes.

169. The sensitization/information campaigns have been carried out in the different countries in a more or less successful and efficient manner. However, the cases where a specific communication strategy was developed and where experts were called in to implement the campaigns were rare, resulting partly in the following insufficiencies:

- Impact studies have not been undertaken and, considering the lack of follow-up studies, it is barely possible to judge the real effect of the communication methods employed in

the course of the campaign. However, in certain cases when folders in French were distributed in places where most people were illiterate, one may question the real effect.

- Transport problems have, in certain cases, prevented information materials reaching their intended destination.
- With the exception of the Chad case mentioned above, there did not seem to be cases where women received information directly. The tendency was to provide it to the men and they were expected to transmit the messages to the women.

170. Greater efficiency of the information and sensitization campaigns requires the establishment of a communication strategy. This would permit, among others, identification of the best adapted channels to reach the target groups, women in particular.

Training

171. The availability of sufficient well-trained human resources constitutes an undisputed precondition for the successful implementation of locust monitoring and control activities. Each national locust unit must have a well-qualified and experienced team of management staff, technical personnel and field operators to carry out, in a regular and effective manner, the necessary monitoring and control operations. During the 2003–05 Desert Locust invasions, the shortage of qualified staff in all areas, but especially of experienced locust specialists, at national, regional and international levels, became very apparent. The main reasons for this are:

- inadequate interest of the countries to support training owing to the long time lapses between periods with high locust activity (10–20 years);
- absence of national preventive control strategies fostering the establishment and maintenance of effective national locust control units and promoting the development of specialized human resources;
- universities' current limited interest in this type of training; and
- lack of financial resources.

172. Few countries have organized training of village brigades, facilitating their involvement in chemical control operations, as in Burkina Faso. In this country, the management of the Plant Protection Service defends the idea that the campaign could not have been carried out in an adequate manner without the involvement of the village brigades.¹⁶ It is interesting to note that the team charged with the technical support of these brigades counted female technicians among its members. After an initial surprised reaction, they have been accepted without difficulties by the local communities.

173. Niger¹⁷ also opted for the involvement of phytosanitary brigades, but the evaluation team, in the course of its field visits in this country, was unable to collect the necessary information on training activities. In Senegal, a project supporting animal production has reserved an amount of US\$20 000, in the regions of Louga, Saint-Louis and Matam, for training of members of committees for the control of bush fires, which were transformed during the campaign into locust control committees. The project has also encouraged herders to participate in the control and to transmit the necessary information.

¹⁶ Given the fact that the question of village brigades divides opinions, the European Commission, to clarify the situation, has planned to carry out a study in March 2006 on the village brigades in the Niger, of which the objective is to identify the means needed to include the latter in certain plant protection operations for which privatization is planned.

¹⁷ In the Niger, the Plant Protection Service (PPS) has overseen the strengthening of the capacities of the phytosanitary brigades since their creation in 1974. While only 300 brigadiers participated in the locust control campaign of 2003–05, there are in total 40 000 in the Niger. The brigadiers are considered as an extension arm of the PPS at the village level. They are farmers specially trained and, according to the PPS, they handle the chemical control techniques perfectly.

174. In the Western Region, there are currently only some 20 locust specialists, of which half have the necessary experience. Moreover, the average age of senior staff and experienced field prospectors is about 45 years. Thus, during the next invasion in 10–20 years' time, almost all these experienced staff members will be retired. Their replacement can only be assured if training activities are strengthened immediately. To overcome this shortage at least partly, both CLCPRO and DLCC finance annually a Ph.D. fellowship. However, this is not sufficient to cover all the current needs. A larger programme should be established through special projects to train specialists and technical staff involved in monitoring and control operations. Such a programme would permit, over time, to:

- carry out monitoring and control operations in conformity with the required efficacy, quality and safety norms;
- update staff capabilities based on the results of scientific and technical progress made with respect to locust biology, insecticides, transmission of data, satellite imagery, GIS, etc.;
- develop a network of locust specialists in the region addressing the locust problem through a harmonized approach, while prioritizing, over time, prevention as the best control means;
- carry out research resulting in improved Desert Locust control; and
- have a pool of resource personnel for use at regional and international levels.

175. Drawing lessons from the 2004 summer Desert Locust control campaign, and benefiting from donor contributions, FAO has already prepared and implemented a large training programme for staff involved in Desert Locust monitoring and control operations in ten Sahel countries in accordance with recommendations adopted by the first meeting of the Executive Committee of the CLCPRO (Niamey, Niger, 16–20 June 2004). The details of this programme (see Annex IV), which is based on the training programmes developed by the EMPRES programme in the Central Region, were developed by an international consultant in close collaboration with FAO staff, and are aimed in particular at training master-trainers.

F. ROLE AND ACTIVITIES UNDERTAKEN BY THE AFFECTED COUNTRIES

176. The evaluation team visited all the countries affected by the Desert Locust 2003–05 campaign. Detailed reports have been collected in a separate document. The information below stems from the country visits and from the evaluation questionnaire that was sent to affected countries.

177. All countries in the Central Region have a national locust control unit. In the Western Region, this is the case for eight of the 13 countries, including the four frontline countries. However, in most cases these units are part of the existing plant protection structure and do not have the required operational and financial autonomy.

178. In all the frontline countries, a national coordinating structure was established and, in 90 percent of them, a national action plan was developed. In eight countries, this plan was updated at least once every three months, in one country at least once every six months, and in five at least once every year.

179. Seven out of 16 countries reported having emergency funds for Desert Locust control operations. These were Algeria, Eritrea, Morocco, Saudi Arabia, the Sudan, Tunisia and Yemen. According to the field missions, these funds enabled control operations to be carried out in a timely manner.

180. Nine countries reported having national contingency plans, including five countries in the Western Region that experienced heavy Desert Locust infestations.¹⁸ These plans are a major tool to address locust infestations more effectively. However, to undertake the necessary control operations effectively, reliable warnings on Desert Locust outbreaks, upsurges and invasions are a prerequisite, together with adequate human, operational and financial resources. This was not the case in the Sahel countries.

181. During remission periods, in countries with seasonal breeding areas in the Western Region, Desert Locust monitoring and control operations are carried out by the national locust control units, where these exist. The latter have been established in Algeria, the Libyan Arab Jamahiriya, Mauritania and Morocco. In Chad, Mali and Niger, such units have been set up within the Plant Protection Services, but do not have sufficient autonomy.

182. During invasion periods, the control campaigns are often managed centrally. The establishment of a “Poste de commandement central” (PCC) is the structure encountered in certain countries, especially in the Maghreb. This PCC has as its mandate to manage and coordinate all the monitoring and control operations, by providing the necessary resources and by taking appropriate measures for the effective use of the available ground or aerial locust control means. The PCC operates according to a closely defined schedule; at the height of the crisis often on a 24-hour basis. It calls upon the assistance of various government structures, including departments of the Ministries of Agriculture, Interior, Environment, Health and Transport, and of the Meteorology and Remote Sensing Services, as well as the army.

183. The PCC is usually headed by the Minister of Agriculture or his or her representative, but can also be placed under the responsibility of the “Gendarmerie royale” as was the case in Morocco, or the national locust control unit, as was done in Mauritania. These PCCs are complemented by regional control centers that have the primary responsibility of coordinating the control operations in specific areas. Sometimes interministerial committees are established under the chair of the Prime Minister, such as in Mali. Additional committees have been established, for example, to ensure a proper exchange of information between the national authorities and the donor community.

184. At the operational level, the locust control means are provided initially by the Ministry of Agriculture, the Ministry of Finance and sometimes by the army. The rural populations are involved in all the countries to signal the presence of the locusts. The latter have also been engaged in the chemical control operations, with the exception of Algeria, Mauritania, Morocco and Tunisia. Aerial and ground control teams from the Maghreb countries have helped in the control operations in the Sahel countries. It should be noted that the populations in Mali and Senegal have been mobilized in an exceptional manner and provided substantial financial and material assistance to the campaign.

G. SUPPORT PROVIDED FOR THE CAMPAIGN

185. The total multilateral assistance provided through FAO for the 2003–05 locust control campaign amounted to US\$74.3 million, of which US\$50.4 million were disbursed through FAO projects by the end of 2005, in addition to FAO’s own resources amounting to US\$6.2 million. Donor contributions, ranging from US\$40 000 to almost US\$30 million, were provided by the following donors: African Development Bank (ADB), Agence Intergouvernementale de la Francophonie, Australia, Austria, Belgium, Canada, the Czech Republic, the European Commission (EC), Finland, France, Germany, Greece, the International Fund for Agricultural Development (IFAD), Ireland, Islamic Development Bank, Italy, Japan, Luxembourg, the

¹⁸ The FAO Locust Group has ranked the countries with respect to the level of infestation during the 2003–05 Desert Locust control campaign as follows. Low: Cape Verde, Eritrea, Guinea Bissau and Yemen; medium: Burkina Faso, Chad, Egypt, the Gambia, Guinea, the Libyan Arab Jamahiriya, Saudi Arabia, the Sudan and Tunisia; high: Algeria, Mali, Mauritania, Morocco, the Niger and Senegal.

Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sweden, United Kingdom of Great Britain and Northern Ireland, United Nations Development Programme and the United States of America.

186. With respect to the multilateral assistance provided through FAO, the EC was the most important single donor with a budget of almost US\$30 million for emergency projects in five countries (Chad, Mali, Mauritania, Niger and Senegal), starting in October 2004. This very important contribution was possible due to the decision by each of the five locust-affected countries to use the funds earmarked under the so-called Enveloppe B of their National Indicative Programmes with the EC, which can be mobilized for emergency operations. In addition to the provision of locust control means and pesticides, and hiring of aircraft, the EC locust programme also included support for environmental and coordination activities.

187. Bilateral assistance was also provided to the affected countries, including from a number of African countries, for example the Gambia, Mauritania and Senegal. Responses to the evaluation questionnaire to donors, as well as information collected in the countries, indicate that donors providing only bilateral assistance included Brazil, China, the Republic of Korea, Morocco, the Sudan and UEMOA. The European Commission, France, the Netherlands and USAID provided both bilateral and multilateral assistance; while the ADB, Austria, Canada, Finland and the United Kingdom made all their contributions in a multilateral manner, through FAO. Details of two donors are missing. In a number of countries, different NGOs have made specific contributions to the control operations.

188. The total amount of bilateral assistance provided to the affected countries is difficult to ascertain with accuracy. The available data indicate that it was at least US\$50,543,838, or some 60 percent of the multilateral assistance mobilized by the donors through FAO, and practically the same amount as spent by FAO by the end of 2005. The bilateral aid was higher than in preceding campaigns.

189. The Maghreb countries, Algeria (US\$20 million), the Libyan Arab Jamahiriya (US\$4 million) and Morocco (US\$8 million) provided US\$32 million of bilateral assistance to the Sahel countries. This allowed the strengthening of various control actions from the beginning of the campaign in the autumn of 2003 until the end of 2004 and proved to be a crucial resource before the arrival of the multilateral assistance. It also allowed some teams to be retrained.

190. The World Bank financing to the Locust Campaign consisted of the following two contributions: **(i) The Africa Emergency Locust Project (AELP)** made available US\$60 million in IDA credits in September 2004 to seven countries (Chad, Niger, Burkina Faso, Mali, Mauritania, Senegal and the Gambia), using the Bank's Operational Policy for emergency relief operations (OP8.50). Government contribution to this project was estimated at US\$13 million. The decision to prepare the project was made on 9 September 2004 and, on 22 September, US\$12.4 million was immediately made available for disbursement to the countries as credit advances. The purpose of the project is *"to reduce the vulnerability of the concerned countries to prevent future infestations by supporting improved strategies for prevention, early warning, reaction and mitigation, both at the national level and at the regional level"*. The funds were made available for emergency locust control, emergency relief to restore agriculture productivity of affected populations, preventive control operations and project management. Provisions were made to allow speedy procurement, including single source selection and procurement through FAO. Countries prepared Pest Management Plans and Environmental and Social Impact Assessments as required under the World Bank's environmental and social safeguard policies. As part of the project legal agreements, countries committed to implementing the project in coordination with FAO, EMPRES and CLCPRO, as well as other countries in the region. The Bank coordinated the implementation of the AELP in close cooperation with FAO for major project needs, such as determining the amount of pesticides needed (on three occasions in 2004–05, the Bank objected to procuring pesticides because the needs were not substantiated sufficiently by the countries). **(ii) Within the existing Mali Agriculture Producer**

Organizations' Project (PASAOP), a reallocation of US\$3.7 million towards locust control was made in August 2005.

191. Responses to the donors' questionnaire indicate that two of the 12 donors considered that their own agency had reacted to the Desert Locust emergency in a less than satisfactory manner and ten (83 percent) as better than satisfactory (1-5 is rated as less than satisfactory, and 6-10 as better than satisfactory). Further details are provided in Table 3.

Table 3

Question	Average judgment	
	Number of replies	Rating
Appropriateness of the assistance provided	9	good
Timeliness of response	8	satisfactory
Speed in releasing funds	8	satisfactory
Quality of inputs	8	satisfactory
Attention to environmental aspects	8	satisfactory
Attention to human health aspects	8	satisfactory
Coordination with other donors	9	satisfactory
Connectedness to response to other emergencies including drought	9	good

Poor 1–3, satisfactory 4–7, good 8–10

192. Affected countries' statements through the evaluation questionnaire indicated that bilateral assistance was considered less than satisfactory in 45 percent of the cases, especially by countries experiencing a medium level of infestation. In many cases, the assistance was provided late and did not match the country's priorities. The same problems occurred with the assistance provided through FAO, which matched priority needs in only 23 percent of the countries, and arrived late in 45 percent of them. Delays were experienced especially in the provision of various inputs: pesticides, control equipment and aircraft. In a few cases, the inputs planned were never delivered. Affected countries were of the opinion that if assistance had been better streamlined and coordinated, most technical and logistic matters could have been addressed in a much more effective manner.

193. Actions by the Maghreb countries in support of the Sahel countries were a confirmation of the effective north–south relationships and regional solidarity, and are in line with the objectives of the CLCPRO. The Maghreb authorities are unanimous in that the best way to protect their countries against possible locust invasions is effective control in frontline Sahel countries. They consider that one hectare treated there at the appropriate time would save 10–15 hectares from treatment in their own countries. Thus, the Maghreb countries are willing to support the Sahel countries in the form of intervention teams and equipment, pesticides and flying hours, and to carry out joint operations in the border areas during remission periods. Algeria has also provided satellite maps, allowing the frontline countries to plan their campaigns better.

194. It was not always possible to obtain a detailed overview of the total campaign costs. Table 4 provides the figures collected during the field visits for most countries. They may be considered as the minimum amounts spent on control operations and strengthening of the national control facilities. By adding to these figures the approximate costs of the campaigns in the Libyan Arab Jamahiriya (US\$6 455 380) and Tunisia (US\$5 527 560), calculated on the basis of the area treated, it appears that the overall campaign costs for the whole of the Western Region

amounted to about US\$280 million. Substantial additional funds were spent by the countries concerned and the international community to assist the affected populations through additional food aid (over US\$90 million) and for the rehabilitation of subsistence means. Thus, the total campaign costs, including rehabilitation/post-upsurge assistance, are estimated to be in the order of US\$400 million.

Table 4

Country	Area treated (ha)	Total expenditures (US\$)
Algeria	4,600,000	101,000,000
Burkina Faso	24,865	1,621,556
Chad	27,265	4,700,000
Mali	339,764	10,173,000
Morocco	4,854,211	79,000,000
Mauritania	1,255,882	18,176,000
Niger	272,428	7,600,000
Senegal	765,987	42,400,000
Total	12,140,402	264,353,496

195. Where donor assistance was channeled through FAO, donors had no direct involvement in the activities undertaken. FAO operated the relevant projects in direct collaboration with the beneficiary countries. Donors generally felt that inadequate visibility was given by FAO to their specific contributions. Bilateral donors were involved more directly in rendering their assistance operational at the country level, in particular when Desert Locust control teams were dispatched to the beneficiary countries.

196. Much of the bilateral assistance was carried out independently of other ongoing efforts. This made it very difficult for FAO to know or coordinate action and avoid, for example, duplication of support efforts, non-compliance with standardized procedures and products, unnecessary accumulation of pesticides stocks, non-utilization of contracted flying hours. In a number of cases this resulted in unjustifiable high costs. This matter merits serious attention in future to ensure a better flow of information, planning, and synergy between activities carried out at the multilateral and bilateral level. Had there been a functional country (donor) coordination/steering committee, which could coordinate external assistance in line with the needs in each of the affected countries, this could have been avoided. In the case of Desert Locust operations, such a committee is normally created jointly by the host-country and FAO.

197. Again, responses to the donors' questionnaire show that some donors considered that a better response to the campaign could have been provided if an emergency fund had been established covering a range of agricultural disasters. The strengthening of networks among donors and various partners and the improvement of coordination at the regional level could also be of significance in this respect. Lack of reliable data and information constrained timely responses. In 50 percent of the cases, donors made use of their own experts for advice on technical matters related to Desert Locust control.

198. Given the demonstrated strong and positive interest of bilateral donors and African countries to provide assistance in the 2003-2005 Desert Locust campaign,

It is recommended that:

2. in future campaigns, in the affected countries, through the appropriate committees, effective exchange of information be ensured among the various stakeholders involved to avoid duplication of efforts and unnecessary high costs.

199. Further details of the assistance provided to the campaign are presented in Annex V.

H. ROLE AND ACTIVITIES UNDERTAKEN BY FAO

Project Management and Operations

Donor agreements

200. As listed above, in total 27 donors became involved in the Desert Locust control campaign through FAO and together they supported 46 projects for the benefit of 18 beneficiary countries at the national, regional and interregional levels. This entailed drawing up separate donor agreements for each of the 46 projects with a total budget of US\$74.3 million. In a number of cases, donors resorted to existing general agreements with the Organization as the conduit for the release of funds. This was the most efficient mechanism. In another group, specific donor agreements were drawn up to cater for the resources released for the Desert Locust emergency. A third category of donors entered funding agreements with FAO for the first time. This entailed a host of clearances covering legal, operational and financial aspects and the attendant lead time required to finalize them. Once the donor agreements were signed with FAO, the next stage was to translate these into operational documents in the form of project documents and a plan of operations.

Project documents

201. Some donors required that requests for funding be accompanied by a project proposal, containing sufficient detail to permit technical and, to some extent, operational scrutiny. The resulting project documents did not need to be signed by the donor if they emanated from an already signed donor agreement. They did however, need to be cleared for operational and financial consistency within FAO and subsequently signed with the beneficiary countries' authorities before being declared operational. However, in many cases, project implementation was started well before the project document was completed. The approach followed was to commit donor funding as soon as a written donor agreement had been received.

202. The Emergency Operations and Rehabilitation Division (TCE) is the designated operating division and the budget holder for emergency projects when they are declared operational. This division is therefore responsible, in close collaboration with other units in FAO headquarters and in the decentralized offices, for the effective delivery of the foreseen inputs and attainment of the project objectives.

203. The Emergency Operations Service (TCEO), which was the unit within TCE and ECLO responsible for the preparation of project documents and their subsequent submission for approval, did not consider there was any evidence of inordinate delays in the preparation and approval of project documents. Considerable gains in time for preparation and approval of project documents were made, by developing standard templates to suit each donor's requirements. Once those staff involved in initiating and clearing of project documents became familiar with the various templates, there was a relatively smooth flow of project documents.

204. In principle, project documents are signed between FAO and the beneficiary country concerned after a due process of consultation with the country when the document is being formulated to emphasize the principle of country ownership of the activities envisaged. The

requirement of obtaining the signature of the beneficiaries was not applied systematically for project documents prepared for regional or interregional Desert Locust control projects. This practice could be, and has been, challenged by the beneficiaries when they realized its implications *vis-à-vis* the ownership of the envisaged activities and their commitment to see them through.

205. A considerable amount of work could have been avoided if it had been possible to operate within the framework of a multidonor project set-up, instead of one project per donor as was the case. Possibly, if the donors had been sensitized on the benefits of contributing to a multidonor emergency response project, when the appeal letters went out, they would have responded positively.

206. Project documents were generally considered to be prepared in a satisfactory manner according to 75 percent of the donors. Good and poor judgments scored low on this matter. The appraisal of various project details is presented in Table 5; surprisingly, all are rated as less than satisfactory. Less than half of the donors commented on these questions.

Table 5

Question	Judgment
Quality of projects documents	Less than satisfactory
Timeliness of project formulation	Less than satisfactory
Level of detail	Less than satisfactory
Details on inputs	Less than satisfactory
Details on budget	Less than satisfactory
Flexibility on inputs	Less than satisfactory
Flexibility on duration	Less than satisfactory

1–5 = less than satisfactory; 6–10 = better than satisfactory

207. Four donors indicated that they had allocated funds for the emergency based on the understanding of the seriousness of the situation, and that a detailed project document was not a priority. The rest of the donors felt that the quality of the project documents should be improved, in particular by additional information on the adopted control strategies. It was also noted that project documents should be based on the real needs of the countries. Almost half of the donors (44 percent) stated they would be willing to contribute to a regional control programme without separate project documents for each of the donor contributions.

208. *One donor noted that in an emergency dealing with “moving targets” and a constantly changing situation, the definition of a strategy, control methods and instruments seems to be more important than detailed planning at the start of the project. Aspects not sufficiently taken into account were human health, training and environmental issues which turned out to be bottlenecks during implementation of the various activities. An emergency project document could have been prepared for each affected country, with an FAO project manager, rather than having a project designed for each contribution received.*

209. *Project objectives should be better defined as well as the real needs. Project documents should follow a results-based approach and have a log-frame with quantifiable indicators. One donor noted that it did not have the impression of really having received a project document based on detailed preparatory studies on which ex-ante financial evaluations had been made. However, it was noted by the same donor that this is not uncommon in emergency financing for which the normal donor project requirements are not suitable.*

210. To gain time in dealing with donor fund agreements and the subsequent preparation of relevant project document/plan of operations/memorandum of understanding for emergency operations,

It is recommended that:

3. FAO initiate discussions with donors to arrive at a common format for both the funding agreements and the subsequent project document. Such formats should be as simple and user-friendly as possible, but detailed enough to ensure a clear understanding by all the interested parties of what is at stake;
4. FAO initiate discussions with donors on the opportunity of having one or two multidonor projects, and that such projects be deemed regional in geographical coverage to facilitate dealing with a pest that knows no national frontiers. Due attention should be given during the negotiations to how donor visibility and preferences, as well as applicable policy and regulatory requirements, would be factored into any multidonor arrangement that is reached.

Work planning and delivery of inputs

211. The project document is the overall instrument governing project implementation and spells out the objectives of a project and the expected end-of-project results. Each project document usually includes a preliminary work plan, which is developed in greater detail once operational approval has been accorded.

212. Although managerial responsibility for the Desert Locust campaign was assigned, through ECLO, jointly to the Directors of TCE and the FAO Plant Production and Protection Division (AGP), when it came to designating a budget holder and assigning operational responsibilities for the related projects, FAO placed both responsibilities on the shoulders of the Director of TCE. One would conclude therefore, that TCE was to take the lead in the process of the preparation and updating of the detailed work plans but, by virtue of the special status accorded to the Desert Locust control emergency operations by the establishment of ECLO, the process became a joint effort of TCE and AGP.

213. To be able to start implementing agreed projects, the funds approved by the donor concerned should be available in the FAO bank account. However, in various cases, the time from the moment the project was signed to the deposit of funds into the FAO bank account was too long for an emergency. An analysis of 44 projects approved before 10 March 2005 showed an average time lapse of 58 days between the project approval date and the receipt of funds in the FAO bank account. For 22 projects it was less than 30 days, but for 8 projects it was more than 100 days.

214. Project implementation within the context of emergencies is very much an event driven process. In the case of Desert Locust control, it is always affected by rapidly changing situations to which, a purely input delivery approach response adopted without adequate technical backing, would be a recipe for disaster. The need to combine speed, timeliness, logistics, flexibility and technical quality makes the locust control operations, although entailing primarily the delivery of inputs, quite complex; they therefore merit careful planning.

215. At the field level, FAO representations generally lacked the necessary technical capacity to play a strong role with respect to coordination and technical support for the campaign. Project execution was completely centralized at FAO headquarters. This was partly overcome through

the recruitment by FAO in the course of the campaign of international locust/logistics consultants to assist the affected countries and to support the FAO representations. The shortcomings of the centralized FAO approach were frequently mentioned in the course of the various discussions with national authorities and donor representatives. With respect to the implementation of Desert Locust control operations, 62 percent of the donors stated through the questionnaires that FAO involvement should be limited mainly to coordination and information activities. Only one donor felt that FAO should be involved mainly in project execution; instead 31 percent was in favor of both types of activities.

216. There is a feeling though within ECLLO that because the Desert Locust menace evolves so fast and often in an unpredictable fashion, little would be gained by investing in detailed planning or programming for the corresponding control measures. The decision of FAO to constitute ECLLO contradicts that perception and points instead to the need for an entity vested with enough powers and resources to enable it to adopt a strategic and a planned approach to the Desert Locust control operations.

217. In spite of this underlying assumption, ECLLO does not appear to have acted on it. The result is that the campaign was waged using the modality applicable to any other emergency project that TCE handles. Even though TCE fully realized that the special situation pertaining to Desert Locust control operations required a common implementation strategy, programme and detailed operational plans, there were constant underlying difficulties in reaching technical decisions rapidly by AGP, allowing TCE to proceed with project implementation. ECLLO management seems to have been content to have the two entities that were brought together under its umbrella from the Locust Group in AGP and the Emergency Operations Unit in TCE to co-exist side by side with each other, with each entity doing their own thing. The fact that ECLLO is for the most part a headquarters-based entity with little or no field representation significantly contributed to the inability to provide rapid response and take swift actions.

218. The positive results achieved by ECLLO during this campaign seem to be due more to the dedication and efforts of all the staff involved, than by design. In fact, if ECLLO were to be challenged, it would be hard to show the blueprint it adopted in order to achieve the results and, more importantly, the catalogue of lessons learned and the way they could be used in strengthening measures to prevent and counter future locust outbreaks and upsurges.

219. In the absence of detailed project work plans, most of the collaborating units had either only a copy of the project document or the administrative from requesting action, to go by. It was not until the situation became clearer that more effort was deployed to define the specificity of the action and the expected lead time required for its accomplishment. At that point, the initiator was most probably already in a panic mode and drawing conclusions that the procedures of the organization on the matter were cumbersome and not user-friendly.

Procurement

220. It has been suggested that speedier procurement for emergencies requires FAO to accept running risks after weighing very carefully the levels of the risk/benefit it is willing to accept. A more perceptive culture of trying to ensure value for money as against sticking strictly to the rules spelt out in the Organization's manuals would go a long way in rendering the procurement process more proactive.

221. For 29 projects, data were collected to determine the time passed between the receipt of funds by FAO and the handing over of the inputs to the recipient country. For these projects, it took on average 48 days to deliver the inputs, and for five projects at the end of 2005, inputs had not yet been delivered after 125 days or more. For emergency projects, these delays seem to be excessively long.

222. These delays were to a certain extent due to the lack of an overall plan for the activities to be undertaken. In addition, some procurement actions had to be funded by more than one

project, requiring complex and time consuming financial management. Local procurement, which could have been undertaken for certain items, was not encouraged, partly because of the strict approach by the Plant Protection Service (AGPP) with respect to technical specifications.

It is recommended that:

5. the rather ad hoc procurement requirements be transformed by FAO into systems and methods that are specific to Desert Locust control and to similar emergency operations in which FAO is involved, as was also recommended by the Technical Group of the DLCC in early May 2005 in its workshop on contingency planning for Desert Locust control.

Personnel (operations)

223. Within TCE the onset of the locust upsurge meant that additional resources had to be mobilized, mainly by recruiting consultants and short-term staff to cope with the new operational requirements. Although this was coupled with a certain amount of internal shifting of staff within the division, it inevitably resulted in having a high turnover and a team that was not fully conversant with the nature and complexity of locust operations.

Personnel (technical)

224. As regards technical and professional support, the core team in the Locust and Migratory Pests Group of AGP is geared to deal with levels of activities during periods of remission rather than upsurge. When an upsurge occurs, additional technical human resources are sought from elsewhere by recruiting consultants and, in rare cases, fixed term experts, from outside FAO.

225. Given the very specialized, rather unique and intermittent nature of locust control and operations, the number of experts on the subject matter is limited to a circle of a few individuals. AGP should try to take a pro-active approach to stem this predicament by drawing up, well in advance of requirements and in close collaboration with TCE, an updated roster of potential experts and ascertain their availability and their terms. If their terms differ from the current personnel and administrative procedures, negotiations should be initiated up front in order to arrive at a *modus vivendi* and, where necessary, obtain any required waivers for them well ahead of the time they were likely to be fielded.

It is recommended that:

6. the FAO Plant Production and Protection Division plan ahead and set up a well researched roster of dependable, experienced and qualified candidates to fill expert positions pertaining to the Desert Locust control, especially in the field, and tries to ensure that their conditions are known and are acceptable to FAO.

Training

226. The irregular occurrence of Desert Locust upsurges underscored above would suggest that institutional memory within FAO, the donor community and at country level on how to handle such upsurges is also likely to be limited, particularly at the operational level. It was

therefore, imperative to ensure up front that those concerned and involved in the operations were well-informed of the latest state-of-the art techniques to combat the hazard and were of one mind on the subject matter. The ongoing investment by the Locust Group in ECLO on the training of trainers at country level is important to note, as well as the effort to organize at Dakar, albeit slightly late in the crisis, the meeting of the FAO Representatives in the locust-affected countries.

Procedures and Systems Functionality

227. Much has been said on whether FAO has a comparative advantage in handling the delivery of inputs in emergency operations, especially the logistics pertaining to a hazard such as the one posed by the Desert Locust that occurs in an almost unpredictable frequency. This includes the need to change administrative and personnel rules, regulations and procedures of the organization, to align them more closely to the requirements of operating emergency projects. During face to face discussions with staff involved in ECLO activities, it was difficult for those contacted to pinpoint specific operational, procedural or system bottlenecks that needed to be ironed out. The often repeated issues were the time it takes from start to end of a procedure because of the large number of clearances required and, the delays experienced in some of the steps.

228. Most procedures require time, which may be difficult to compress beyond a certain critical minimum. What is important is to ensure that the process flow does not get hindered by too many steps or runs into bottlenecks. With the current technological development and given that all staff in headquarters are networked, it should be possible to find ways to speed up the process and cut down the movement of hard copies through clearances. For example, in TCEO six clearances were needed to extend the assignment of a consultant in the field, while in AGP project documents required clearance by the Head of the Locust Unit, the Chief of AGPP and the Director of the Division.

229. As far as delays are concerned, it would appear that some of them are not due to procedural or system weaknesses, but are rather attributable to shortage of human and financial resources. FAO does have, however, a mechanism to provide advance funding to facilitate the initiation of Trust Fund project operations pending the deposit of funds by donors. Advance funding has been mobilized through CERF, as mentioned previously.

230. Purchasing of pesticides was handled in a more effective manner when market surveys were carried out to determine, prior to the issuance of the purchase orders, which providers were able to deliver the pesticides needed for Desert Locust control in a timely manner, and at an acceptable cost.

231. Good priority setting is perhaps one way of minimizing delays. While the staff members directly involved in ECLO knew where their priorities were, the same cannot be said of the other units in FAO involved in the campaign in an auxiliary capacity. In an emergency, all those concerned in the chain of operations must perceive things in the same way and thereby align their priorities to the ongoing emergency. When these administrative units were queried as to why they did not respond faster to demands made on them by ECLO, the answer was that they were short of staff. Nonetheless, the units affirmed that as soon as they realized that a request submitted to them for processing pertained to emergency operations, they gave it priority almost to the detriment of their everyday jobs.

232. Delegation is another essential ingredient necessary for speedy decision-making and hence effective planning. The further down it can be taken the better, particularly when operating in an emergency mode. In the case of the Desert Locust, the limited circle of experts and the fact that input delivery revolves around procurement of a narrow spectrum of pesticides, spraying equipment, tools and protective clothing, and that contracting is focused on hiring of aircraft and helicopters, would make it quite easy to define a specific framework for delegation of authority in these areas.

It is recommended that:

7. delegation of authority for operational activities, lasting for the duration of the Desert Locust campaign, be given by FAO to the lowest possible level.

ECLO as a Functional Entity

233. When ECLO was established by FAO in 1986 it was to deal with FAO's responsibility in the then ongoing campaign against the Desert Locust upsurge. The ECLO of 2004 was to strengthen FAO's response to an exceptional situation. The nuance between the two objectives may have led to the later ECLO being placed under dual direction and not having the "extensive delegated authority in order to permit fast decision and to expedite operations including the procurement of supplies" foreseen in the former.

234. ECLO does not appear to have exploited the opportunity of operating as a unified and seamless entity, which would in any event have been difficult with the dual direction (AGP and TCE). While the AGP staff directly involved in operations against locusts and other migratory pests were assigned to ECLO, the latter was, according to the terminology used in the Director-General's Bulletin establishing ECLO, only supposed to be supported by operational staff from TCE. Nonetheless, TCE staff did a good job of mustering, and eventually delivering on the substantial amounts of funds made available to wage the Desert Locust control campaign.

235. There is no doubt that if the ECLO directorate had been individual instead of dual and had had a similar *carte blanche* in terms of delegation of authority as in 1986–89, operational issues pertaining to recruitment of personnel, purchasing and contracting of control means for example, would have been less time consuming.

236. That would have also engendered an improvement in the process flow of some of the transactions initiated by operations officers as they would all gravitate to one focal point of approval instead of two. The situation whereby the Director of TCE as budget holder for Desert Locust control projects could not make commitments without technical clearance from AGP was overly cumbersome and unnecessary. It also led to turf protection tendencies.

It is recommended that:

8. a single unified command and wide delegation of authority be bestowed in a future ECLO and that it be recognized as an operational entity, with its own accounting code rather than that of OSRO, to facilitate the identification of regular programme and extrabudgetary appropriations put at its disposal by the Organization.

Monitoring and Reporting

237. Upon the establishment of ECLO at the end of August 2004, FAO's Field Programme Management Information System (FPMIS) was adapted to meet specific reporting requirements with respect to ECLO activities for FAO's senior management, representations and ECLO staff. Further donor-related funding information was made available regularly to the public through

FAO's Web site. Subsequently, access to the FPMIS locust projects was extended to include also countries affected by Desert Locusts and donors.

238. Many donors, in the quest for visibility and recognition of their contributions to the Desert Locust control campaign, were quoted in the media as having made contributions of funds to assist but, all too often, there was a gap between the public announcements of their contributions and the actual written agreement between the donor and FAO and the subsequent deposit of funds. Data extracted manually showed that a good part of the assistance came when the locust upsurge was at a very advanced stage suggesting that, if the assistance had come earlier, it might have been possible to contain the upsurge to lower proportions.

239. The other area of monitoring that was to be handled primarily from headquarters was that of measuring the rate of project delivery against approved budgets, prescribed inputs and the timeliness of the actions in respect of the agreed project start and ending dates.

240. This monitoring was also expected to keep an eye on the way the needs were being met as project delivery progressed and, based on the needs assessment drawn up at the start of operations, to forecast future needs and adjustments to be made in delivery plans as necessary to avoid in-country accumulation of pesticides and or other inputs such as aircraft flying hours. However, in the absence of an overall action plan for the entire campaign and detailed project work plans it has not been possible to translate this expectation into reality.

241. The following comments were received from donors on project implementation and reporting. FAO project implementation and reporting was considered less than satisfactory by 60 percent of the donors. Timeliness of inputs, quality of reporting, timeliness of reporting and visibility of the donor agency's contribution were all rated as less than satisfactory to poor. Project implementation could be improved through enhanced communication with the field, by delegating operational decisions to the country level, and by simplifying the FAO procedures.

242. Reporting has been perceived as weak by most of the donors. It should be improved by respecting the reporting schedules and by giving a better picture of all the actors. *Affected countries should be more involved in the reporting. One donor noted that very little reporting on the operation was received, even when FAO was requested to confirm that its contribution had been well utilized, no information was provided, even informally. It had been promised in early 2005, but did not arrive until October 2005. Another donor noted that their field monitoring reported that delivery of inputs, as well as technical support delivery, was less than optimal. They had not received formal project reports from FAO and therefore it was difficult for them to judge specifically how it could be improved.*

243. *It was noted that the quality of reporting in areas such as emergency pest operations often lacked analytical interpretations on impacts and/or implications on food security, human health, environment, host-country and regional capacities and others as applicable. This affected the quality of the reports, especially in areas where actual measurable results according to specific indicators could have made a significant difference.*

244. *Another aspect that needs closer attention is visibility of donor contributions. It is not uncommon to come across a national and/or regional beneficiary and hear that donor contributions are either absent or insignificant and that most of the assistance is coming directly from FAO. This issue has been raised and discussed at various venues but the donors still need their share of recognition.*

Project Revisions

245. Recognizing that complex emergencies especially those pertaining to biological phenomena evolve extremely rapidly and therefore lead to rapidly changing needs, provision should always be built in the donor agreements during negotiations to cater for possible shifts of the original scenario. This should also allow for flexibility for FAO to respond to such changes

through, for example, a simple exchange of an e-mail with the donor rather than undertaking lengthy negotiations.

246. Such a move is contingent, however, on the donors being kept well-informed of the evolving scenarios as they unfold and not be taken by surprise at or near the end of project date. Proposals for a revision should be seen by donors as indeed a response to changed circumstances and not as an afterthought that arises because the Organization finds itself with some unspent funds in hand.

247. The combination of effective control operations and unfavorable weather conditions in northwest Africa during the winter of 2004/2005, have led to a rapid suppression of the upsurge. This has resulted in an unspent amount estimated at US\$25 million by the end of 2005 out of the total US 74,160,068 that was available. This unspent money is spread over some 30 projects. Negotiations are now in progress with the donors to obtain their concurrence and approval to continue disbursing these funds to take care of elements such as strengthening the survey capacity of national teams during the remission period, to correctly dispose of pesticide containers, to continue the assessment of possible negative impact of the chemicals used on the environment, and to bolster research on more user-friendly control measures that can be used in any future upsurges.

248. Concern has been expressed over the limited attention being paid to the opportunity of deploying the unspent funds to improve the livelihoods of the pastoral and peasant populations re-establishing their productive capacities that were destroyed by the locust invasion. The fact that the appeals for locust control were not comprehensive enough and coordinated with other aspects of the relief-rehabilitation-development continuum strategies could make it difficult now to demonstrate to donors that there is a need to take advantage of the unspent funds to address that aspect during the ongoing project revisions.

It is recommended that:

9. FAO strive to present a clear strategy to the donors at the time of launching the appeals that is part of the relief–rehabilitation–development continuum, by focusing not only on the immediate problem of eliminating Desert Locusts but also on related humanitarian and livelihood protection issues.

I. KEY ISSUES FOR AFFECTED COUNTRIES AND DONORS

249. Responses from the questionnaire to affected countries indicate the following as key issues to improve Desert Locust control:

- creation of an emergency fund;
- timely mobilization of resources;
- improvement of regional coordination;
- training of staff in countries in the recession area; and
- preparation of national action plans.

250. On the other hand, the following areas are considered by the donors as high priority for the improvement of Desert Locust monitoring and control activities:

- strengthening of Desert Locust monitoring at national, regional and international level;
- strengthening Desert Locust control capacity nationally and regionally;
- improved contingency planning;

- coordinated framework for rapid response, including donors;
- greater attention to the environment;
- greater attention to human health;
- greater attention to effects on human livelihoods of locust damage and any rehabilitation needs;
- clearer definition of institutional roles;
- avoidance of the over supply of pesticides; and
- more effective procurement procedures in the affected countries.

251. In addition, donors stated that more research should be undertaken with respect to Desert Locust surveillance, population dynamics and control, environmental and public health protection, socio-economic impact, biological control, institutional mechanisms and control interventions.

252. Furthermore, a number of concluding questions were raised in the questionnaire to donors concerning key issues to improve future arrangements for Desert Locust operations. The replies received are summarized below.

253. **Is there sufficient clarity with respect to an effective Desert Locust control strategy?**

- a) *The preventive control strategy is the only strategy through which a Desert Locust invasion can be avoided. This strategy has been adopted by all the countries concerned during meetings of the DLCC and by the FAO Council through the EMPRES programme. Through this latter programme well-coordinated and effective control can be achieved.*
- b) *The strategy to overcome Desert Locust invasions should be clarified to both donors and recipient countries. However, the preventive control strategy is well defined, but should be implemented. It is necessary to ensure a better operational basis for the FAO strategy for Desert Locust control. The three phases of preventive control, invasion control and post-invasion activities should be better articulated, as well as the role of the different partners at the national, subregional/regional and international levels.*
- c) *Some donors noted that in any control strategy there should be more clarity on how economic, social and environmental matters will be addressed, and on how different options can limit the impact of the control operations in these areas.*
- d) *With a pest such as the Desert Locust and the vast areas it occupies, the much coveted strategies including integrated pest management (IPM) are often hard to implement. While the various components of this strategy have proven effective and applicable to some degree, the holistic approach is far from being operational. It is likely that this will remain so for some time. Efforts by FAO/EMPRES, the Assistance for Emergency Locust/Grasshopper Abatement project (AELGA – formerly known as the Africa Emergency Locust/Grasshopper Assistance project), national units in the Sahel, the Maghreb, etc., have yielded promising results and need to be encouraged and supported.*

254. **Desert Locusts can move rapidly from one country or region to another. Consequently, flexible control approaches are required. How can this best be addressed given the administrative procedures for allocating financial resources?**

- a) *The responses show that when well-documented requests for funding and budgets are submitted early there can be more flexibility. The creation of some form of a fund for emergency situations with the necessary flexible control procedures should be considered. This is not only a question of administrative constraints, but also a matter of donor priorities for certain countries and geographical areas. Reallocation of funds from one country programme to another is administratively very difficult. Therefore, Desert Locust control campaigns should be planned from*

the start on the basis of regional programmes, instead of on specific country programmes.

- b) *The regional and subregional organizations (CLCPRO) with good linkages at the national level and effective institutional relations constitute the best framework to coordinate the cross-border aspects of locust control and to carry out control operations in an effective and responsible manner.*

255. What were the main reasons for the delays in donors' reaction to the request for support for the control campaign and how could the availability of funding be speeded up?

- a) *Undoubtedly, at the beginning of the Desert Locust upsurge, there was insufficient awareness of the seriousness of the situation and of the potential spread of the risk. Facing many requests, donors have a tendency to react only when the crisis is really present and their public opinion has been sensitized by the international media. The main reasons also include donor's own decision-making and fund-releasing procedures. FAO rules should be changed to allow some actions to be taken based on pledges, and not wait for the actual disbursement of funds.*
- b) *At the beginning, there was a lack of publicity concerning the Desert Locust upsurge. Insufficient information and explanation were presented in documents sent to donors. Such documents should present information responding to the donors' development policies. In fact, this can be considered as a matter of how convincing the information will be and whether the "broader picture" is clear. In the absence of well-vetted national/regional/ international coordination, donors often go bilateral. Donors also may choose the bilateral route for political reasons.*

256. How can capacity be raised rapidly in response to a crisis?

- a) *Response capacity can be raised rapidly by establishing proper contingency plans and a pesticides bank. FAO should also establish a targeted intervention fund, with clear guidelines for its operation, so that it can rapidly undertake the necessary actions. Such a fund should solicit replenishment by donors upon submitting the necessary justifications.*
- b) *Planning in advance and building capacity in the affected countries is essential in this respect. Strengthening of institutional aspects should be undertaken and increased investments should be made in research and monitoring to ensure that outbreaks will be forecast in a timely manner. This should be based on a continuous dialogue between the research community and the end-users. Testing of new control methods between outbreaks should also be carried out.*
- c) *Standby mechanisms that are sensitive to this type of hazard, including the identification of experts, need to be established. Effective and efficient use of the Central Emergency Response Fund should be employed. The FAO operational capacity to carry out training programmes could be strengthened so that capacities are in place when required.*
- d) *Raising capacity can be adequately addressed if it is part of a more realistic and sustainable approach within the IPM strategy. The focus here should be on capacity development for a preventive strategy that could significantly reduce the need for delayed emergency operations. A well-thought-out IPM strategy could, in principle, not only contribute but enhance a rapid response capability of affected countries.*
- e) *One also needs to be more realistic in formulating short-, medium- or long-term response strategies. In most Sahel countries where technical, material or financial resources are often scarce, the likelihood and the need for emergency responses will continue to be more frequent. This will obviously require some sort of contingency plan to establish a surge capacity within the affected countries.*

257. The nine recommendations presented in this section require appropriate action from FAO to ensure that it is well prepared to address future Desert Locust emergencies. The necessary proposals should be prepared by both the technical and administrative units of FAO in consultation with relevant stakeholders.

IV. Analysis of the Control Campaign

A. IMPACT ON THE FOOD SECURITY SITUATION AND LIVELIHOODS OF AFFECTED COMMUNITIES

258. Officially, the impact of the Desert Locust invasions is considered by the national authorities as very limited in almost all the affected countries. However, the data collected by the evaluation team indicate that they have had a major impact on the food security situation and the subsistence means of the affected communities. Two major factors may explain this apparent contradiction.

259. First, the control campaigns concerned only to a limited extent the regions with low crop production potential, which are usually occupied by vulnerable, subsistence-level rural communities. The campaigns were focused in particular on the protection of regions with a high production potential such as the Souss valley in Morocco, which occupies about 200 000 ha and where citrus and vegetables are grown for export; the northern part of Algeria, which represents some 30 percent of the total country area and which is the main agricultural production area; and the Senegal river valley where irrigated agriculture is common.

260. Second, the total amount of losses caused by the Desert Locust to crops and pastures has not been evaluated systematically. This is due to the lack of a generally accepted methodology to determine losses as and when needed, and the insufficient involvement of the relevant national structures in the monitoring and evaluation of the economic, social and nutritional impacts.

261. The regions with low agricultural potential have suffered to a varying degree losses to crops and pastures resulting in (i) relatively important food shortages, (ii) strong price movements in the markets, (iii) insufficient availability of grazing areas, (iv) selling of animals at very low prices, in order to meet the subsistence needs of the households and to buy feed for the rest of the animals, (v) early transhumance of the herds, (vi) severe tensions between the transhumant pastoralists and the local farmers, and heavy pressures of the animals on the transhumance zones, and (vii) extensive migration to urban areas.

262. Based on the various data collected from various sources in the course of the visits to the affected countries, the evaluation team came to the conclusion that the number of people in the Sahel having suffered to varying degrees from the Desert Locust invasion may be estimated at over eight million, distributed as follows.

Table 6

Burkina Faso	500,000
Mali	1,000,000
Mauritania	1,300,000
Niger	3,000,000
Senegal	1,580,000
Chad	1,000,000
Total	8,380,000

263. The Desert Locust invasions have worsened the food situation of the local populations, by aggravating the poverty and vulnerability of the households already living under very precarious conditions. In fact, the locusts have in many respects considerably accentuated the chronic, even structural deficiency in most of the regions.

264. The Desert Locust invasions have not only increased the difficulties of the households to cover their food needs, but they have also created pockets of famine in all the Sahel countries, necessitating emergency interventions. A number of examples demonstrate the spread of this phenomenon. In Senegal according to a report of a WFP/FAO assessment mission undertaken in 2004, some 124,300 rural households, 20 percent of the total population, were in need of agricultural emergency assistance. During the same period following a WFP study in Mauritania, close to 60 percent of the households interviewed were either in a food insecure situation, or have become increasingly vulnerable to food insecurity; the number of people having received some form of assistance was as high as 400,000, or about one-seventh of the national population.

265. The households most heavily affected by the locust invasion were in most of the cases those with chronic vulnerability. While the evaluation team did not have the opportunity to carry out interviews with households headed by women, there is little doubt that these households, with a higher degree of poverty, find themselves in a more critical situation than those headed by men. This higher degree of poverty is a result of the lack of control over the productive resources and the resulting benefits.

266. The impact of the Desert Locust invasions in particular on crops has been worsened by shortage and irregular distribution of rainfall in 2004. The locust infestations combined with this climatic hazard, in these essentially rainfed agricultural production systems, had considerable consequences for cereal, leguminous (pulses) and vegetable production. After the locust passage the situation worsened from limited crop losses caused by rain shortage to almost complete destruction. In many cases, the losses of the principal food crops, millet, sorghum and cowpea, ranged from 60 percent to 90 percent, reaching even 100 percent. Although relatively modest within the context of the overall national economy, the damage and losses at the level of the affected communities turned out to be disastrous in many cases.

267. This is clearly shown by the following examples. Compared to 2003, during the month of November 2004, the production in the Sahel provinces of Burkina Faso experienced a reduction of 90 percent in Oudalan, 78 percent in Séno, and 74 percent in Soum province, mainly as a result of heavy Desert Locust infestations. The total production losses caused by the Desert Locust were estimated at 58,832 tonnes (millet 49,049 tonnes, white sorghum 9,782 tonnes and cowpea 4,325 tonnes).¹⁹

268. In Mali in the northern and northeastern part of the country, the dominant food crops cowpea, millet and sorghum have been heavily affected: for example, in the Nara district the losses have been estimated at 75 percent of the total production. For cowpea, the most important crop to cover the hunger period, the losses were 100 percent, while they ranged from 50 to 80 percent for the other staples.

269. In Mauritania, no region has been spared by the Desert Locust invasions, which resulted in a cereal deficit of 187,000 tonnes. While the spread of the losses varied, all crops including cereals, vegetables, and date palms suffered from the invasion. The losses caused to rain-fed crops have been estimated at more than 70 percent. For date palm production, a yield reduction of 80 percent compared to normal years, resulted from the invasion of Desert Locusts in many regions (Adrar, Inchiri, Tiris Zemour and Tagant).

¹⁹ Direction Générale pour la Provision de la Sécurité Alimentaire, Enquête dans les zones touchées par le criquet pèlerin du 5 au 14 novembre 2004.

270. In Niger, the combined effects of drought and Desert Locust invasions have caused food shortages in 3,755 villages which are located mainly in the northern regions of Tillabéri, Maradi, Zinder and Tahoua. The cereal deficit in 2004 was estimated at 27 percent, or about 223,487 tonnes. More than three million people in some 3,000 villages located in the agropastoral zones of the centre and the north of the country entered into a food insecurity situation.

271. In Senegal, the damage and losses caused by the locusts to rainfed crops, in particular millet and sorghum – and sometimes cowpea and groundnut – were serious but localized and ranged from 30 to 70 percent, affecting in particular the agropastoral regions located in the north and centre of the country. The most heavily affected regions were Louga, Matam, Dakar, Thiès and Diourbel. Luckily, the groundnut basin, and the Kaolack, Kolda, Ziguinchor and Tambacounda regions, as well as the Senegal river valley crucial for the production of rice and vegetables, were spared by the invasion, avoiding a major food crisis in the country. According to a GIEWS²⁰ report, the cereal production of the regions devastated by the Desert Locust represented only 20 percent of the national production.

272. Other production systems and dry season crops, especially fruit and vegetable production, practiced in particular by women, have also not been spared by the Desert Locusts. Complete harvests have been destroyed, depriving the producers of significant revenues in a couple of hours and aggravating the precariousness of their food situation. In general, vegetable crops constitute the second source of income for both the peri-urban and the rural population.

273. There are many examples of dramatic situations created by locust infestations of crops, but in particular one example will be cited of a women producers group in Mauritania met by the evaluation team. The losses of their small vegetable production fields (about 50 m²) were in the order of US\$ 200–300, leading to a significant reduction of their financial resources. Knowing that women have a very strong tendency to use their income for the improvement of the nourishment and well-being of the family, especially the children, the consequences of this loss of revenue are clear especially at the nutritional level.

274. The consequences of the Desert Locust invasion for animal production have been equally ill-fated, causing the destruction of pastures, as well as a reduction in harvest residues used for forage. For example, in Niger a reduction in forage production of 4,460,000 tonnes has been recorded in the infested areas. Towards mid-September 2004, two-thirds of the losses are estimated to have been caused by drought and one-third by Desert Locusts, by crop loss assessment missions. An additional negative effect of the invasion of pastures by locust swarms is the fact that cattle refuse to eat vegetation heavily contaminated by locust excrement.

275. In response to this situation and in certain cases because of fear that their animals might be poisoned by pesticides, nomads adopted the solution of early transhumance. However, this led to overgrazing, and generated and exacerbated conflicts between pastoralists and local sedentary farmers who had not yet completed their harvests. It has also entailed conflicts between herders competing for the use of water holes, pastures, and crop residues.

276. The loss of forest natural resources, in particular the destruction of *Balanites*, *Acacia* and *Ziziphus* widely consumed by women and children, had a major impact on the nutritional status of women and children. Reduced access to plants, fruits, leaves and other wild food products, which constitute a non-negligible source of vitamins and medicines, can seriously influence the nutritional and health status.

277. Completing the work undertaken by the evaluation team, a survey was carried out in Burkina Faso, Mali and Mauritania in February/March 2006 to determine the impact of the Desert Locust invasion on the food security and subsistence means of the rural populations. In

²⁰ Global Information and Early Warning System.

Burkina Faso and Mali, three zones were selected and in Mauritania four, and a total of 30 villages was covered by the survey in each country. This has led to the following conclusions.

Losses caused by the Desert Locust invasion

278. The losses caused by the Desert Locust invasion in 2004 have been evaluated at 80 percent of the expected cereal production in 2004 in the zones surveyed in Burkina Faso, 90 percent in Mali and 90–100 percent in Mauritania. For staple leguminous crops (cowpea and groundnut), losses are close to 85–90 percent of the expected production in 2004 in the three countries. One-third of the pastures have been lost in the affected zones in Mali and Burkina Faso. The most important losses were observed in Mauritania, in the range of 85 percent of the fodder production. With respect to forage trees and products collected for human consumption, losses have been close to 50 percent in Mali and Burkina Faso, and they were higher than 80 percent in Mauritania.

279. Moreover, the zones affected by the Desert Locust invasion suffer in a chronic manner from lack and poor distribution of rainfall. During 2004, pockets of drought were noted in the north of Mauritania. The distribution of rainfall has been geographically very irregular in Burkina Faso. In Mali, the beginning of the agricultural season was hampered by shortage of rainfall. In a number of situations, this led to the need to re-sow crops. However, the losses attributable to rainfall problems were limited in space (oases in Mauritania, zone of Gao in Mali). In more than 80 percent of the investigated villages, the Desert Locusts were the primary cause of the crop losses and the food crisis in 2004.

280. The majority of the people interviewed were rather critical of the efficacy of the locust control campaign. Problems mostly cited were the delays in the mobilization of resources by the authorities and the organizations concerned, the lateness of the insecticide treatments, often undertaken after the losses had been inflicted, the lack of and poor efficacy of the pesticides used, the lack of spraying equipment available for use by the populations. The treatment with hand-held equipment by the local populations was often seen as inappropriate considering the extent of the invasion, with the exception, however, of treatments carried out on small areas, such as the oasis of Atar in Mauritania or the vegetable zones of the Dogon area in Mali.

Food security situation

281. In 2004, the cereal deficit had reached 80 percent of the consumption of the villages surveyed in Burkina Faso, 85 percent in Mali, and 95 percent in Mauritania. Moreover, for the staple leguminous crops, groundnut and cowpea, the deficit was between 80 and 95 percent of the consumption needs. The shortage of food products has caused strong price increases in 2004 and a chronic shortage of certain basic products in the local markets.

282. The majority of the households were forced to reduce their food consumption. The volume and number of daily meals were reduced, certain traditional plates based on millet were no longer on the menu in Mali and Burkina Faso. In 2004, the consumption of cereals was generally reduced by between 15 and 17 percent in the countries studied. As a result of these restrictions, the individual consumption of cereals has been reduced to 145 kg/person/year in Mali, 155 kg/person/year in Mauritania, and 160 kg/person/year in Burkina Faso. These amounts do not satisfy the basic calorie needs in the Sahel countries, where cereals constitute the basis of the diet.

283. A strong disequilibrium in food rations was linked to the quantitative reduction of the meals. The consumption of groundnuts by the households fell by 67 percent in Burkina Faso, the consumption of cowpea was reduced by 35 percent in Mali and by 20 percent in Mauritania. In more than half of the households in the three countries studied, certain foodstuffs had to be rationed or left out. This was in particular the case for meat, fish, salads and vegetables, as well as certain food stuffs considered as luxury, such as coffee, tea and spices. Certain households had to give up milk and infant food products, oil and enriched flour.

284. External aid in the surveyed areas, essentially in the form of food assistance, was provided in 2004 in Burkina Faso to 90 percent of the households contacted, who each received on average 140 kg of cereals in 2004, representing 8 percent of their food deficit. In Mali, 75 percent of the households received on average 300 kg of cereals, covering 15 percent of their deficit. In Mauritania, 65 percent of the households received on average 130 kg of cereals, representing 10 percent of their deficit. Social solidarities (in different forms) have helped less than 10 percent of the households in Burkina Faso and Mauritania, and 20 percent in Mali. Family solidarities have been very active in Burkina Faso and especially in Mali, where about half of the households received benefit in the form of gifts of food or money. The evaluation team also gathered evidence that remittances from relatives in Europe were the main source of relief in many rural areas in Mali and Senegal.

285. Although the 2005 agricultural season was relatively satisfactory, food consumption in 2005 has not regained the level prior to the crisis. The consumption of cereals and food legumes has remained during 2005 about 10 percent below the level of 2003 in Burkina Faso and Mauritania. The average consumption of cereals has even continued to decrease in the affected zones in Mali, to some 20 percent below the level of 2003.

Loss of capital and debt burden of households

286. In 2004, the average expenditures of the households for the purchase of food had to be multiplied by three or four, depending on the zone. To face this increase, the household heads had to reduce non-food expenditures: clothing, social expenditures, travel, and sometimes health and schooling. At the same time, they searched for supplementary monetary revenues through departure to urban areas to seek employment opportunities or the development of non-agricultural activities, such as gold panning in Burkina Faso.

287. As these strategies proved insufficient to cover the food deficit, household heads had to sell part of their capital such as their livestock. Burkina Faso, where the number of animals per household was the highest in 2003, has been the most affected by de-stocking of animals. The sale of animals, which began in 2004 and continued into 2005, took place in 85 percent of the households. On average, more than half of the total cattle, goats, sheep, camels and poultry were sold. In Mali, the sale of animals affected 70 percent of the households and concerned in particular small ruminants and poultry, which decreased by about 35–40 percent; the number of cattle and camels decreased by about 20 percent. In Mauritania, the situation appears unclear. Massive sale of cattle, goats, sheep, camels and poultry occurred only in three of the zones studied, where total numbers decreased by 40–55 percent. However, it seems that in the fourth zone (Timbedra), certain agropastoralists have been able to profit from the food crisis by purchasing animals at a low price.

288. To address the food deficit, many household heads have also indebted themselves. Mauritania is the most affected with 60 percent indebted households, followed by Mali (45 percent) and Burkina Faso (33 percent).

Vulnerable groups: women and children

289. As vulnerability varied according to gender and social and economic status, the survival strategies and the operating margins were also different from one to the other. Whereas men often reacted with exodus, women used a range of diversified strategies. The survey indicates this took place mostly in Burkina Faso and Mali, where women have an increasingly important place in the management of the household. They sold their own animals, in particular poultry and small ruminants and sold personal goods, in particular jewellery. They have often incurred debts themselves through women's associations; they became involved in extra-agricultural activities – gold panning in Burkina Faso and handicrafts in Mali – and they reverted to gathering wild food products for the provision of the family (Burkina Faso).

290. The food shortages in 2004 and 2005 had important repercussions on their health and that of their children; 80 percent of the women interviewed in Mauritania, 40 percent in Burkina Faso and in Mali complained about loss of weight, a state of weakness due to malnutrition, tiredness due to excess work, and problems of pregnancy and childbirth in 2004. Depending on the zones and the countries, 40–70 percent of the children suffered weight losses and health problems linked to malnutrition. These effects were exacerbated by the fact that at the same time 20 percent of the households in Burkina Faso, 25 percent in Mali, and 12 percent in Mauritania had to reduce their health expenditures to purchase food.

The long-term impact of the locust invasion

291. The long-term effects of the locust invasion were the same in the different interviewed zones: they included the departure of young people, increased poverty of households, reduction of the agricultural work force, and increase of food insecurity. The relative importance of different types of impacts varies in the countries and zones surveyed.

292. The 2004 crisis provoked a massive and lasting departure of young people, in search of subsistence means in urban areas, and to escape from the agricultural activities of which the results are becoming too uncertain. This departure of young people was perceived in all the village communities as the most serious impact of the 2004 crisis.

293. In this respect, other sources indicate for Burkina Faso, a new phenomenon: during 2004 whole families moved on a large scale towards the cities. This proved fatal in a number of cases for people at an advanced age, for weak people and for small children. Moreover, these movements increase the risk of depopulation of the agricultural zones and exacerbate urbanization problems.

294. Impoverishment resulted from the general reduction of the household capital as a result of the use of all savings, and the sale of properties and animals. In general, at the beginning of 2006 less than 10 percent of the households had reconstituted their livestock. More than 50 percent of the households in Burkina Faso, 30 percent in Mali and 40 percent in Mauritania have not been able to repay the debts contracted in 2004.

295. The reduction of the agricultural production capacity of various households was in the first place the result of the reduction in the labor force, due to the departure of family members, in particular the younger ones, as well as to the persisting famine affecting work capacities. Locally, the reduction of the cultivated areas is exacerbated by the lack of seeds, production means or irrigation water. Overall, 40 percent of the households reduced the areas cultivated in 2005 in Burkina Faso, 25 percent in Mali and 15 percent in Mauritania.

296. The reduction of the production capacity was also the result of the impoverishment of the pastures and the degradation of the forest zones, initially caused by the invasion of the locusts and further aggravated by the following overexploitation of these resources.

297. So far, only 10–20 percent of the households have been able to reconstitute their cereal reserves. The household food consumption has nowhere reached the level prior to the locust invasion. This persistence of the famine in 2005 concerned 30 percent of the households in Mali and 40 percent of the households in Burkina Faso, while at the same time the external food aid had a tendency to be withdrawn from the villages, because the crisis was considered over. The security offered by livestock in case of major problems has been strongly reduced, leaving households even more vulnerable to face future crises.

298. With respect to the impact of the Desert Locust invasion on markets, the evaluation team's findings were that the shortage of cereals had important implications on the price levels, causing them to increase in a significant manner, out of reach of the large majority of households. According to a FAO/WFP assessment mission in the region of Kaolack in Senegal,

one kg of millet increased from US\$0.15 in September 2004 to US\$0.23 in October of the same year, and the price of maize increased from US\$0.14–0.16 to US\$0.20.

299. For livestock, the inverse movement occurred: lambs for which the price range was between US\$60–80 in 2003 were sold off on average for US\$30. The fall in animal prices in the market resulted in a strong reduction of the value of the herds and of the purchasing power of the producers, and the impossibility to purchase the necessary consumption goods. The famine in the pastoral zone in Niger in 2005 was one of the most dramatic examples of the link between the drop in price of cattle, its influence on the incomes and the availability of food for the households.

300. In spite of the multiple survival strategies adopted, these were not adequate to re-establish the food security situation, even progressively and slowly. Critical as it was, the situation required external assistance, which was provided to the countries by multiple technical and financial partners, in particular through emergency food aid or rehabilitation projects. It is regrettable that, in some of these projects, seeds provided by FAO were of poor quality and of the wrong varieties.

301. As the consequences of the crisis are still visible in 2006, only sustained assistance can slow down the degradation of the socio-economic situation of many households. However, as noted by the evaluation team, given the scant attention paid to the socio-economic dimensions of the impact of the Desert Locust control campaign, the assistance provided so far was not always targeted in an adequate and satisfactory manner.

302. On the basis of the foregoing,

The evaluation team recommends that:

10. strategies be adopted by the affected countries to ensure that locust control operations are carried out both in zones with high production potential and in zones with low production potential, where agriculture is usually practiced by farmers with very limited resources.

B. ECONOMIC BENEFITS AND COSTS

303. The evaluation team did not have the means to carry out an assessment of the macroeconomic impact of the Desert Locust upsurge. As discussed above it concentrated on socio-economic aspects. Anyhow, it is generally accepted that gregarious Desert Locusts need to be controlled notwithstanding the fact that precise data on the damage that can be caused have not been collected systematically. Consequently, the calculation of benefit/cost ratios of the control operations remains a speculative exercise. A World Bank discussion paper on Desert Locust Management (Joffe, 1995)²¹ suggests that locusts are not particularly serious pests in aggregate, and that Desert Locusts are unlikely in modern times to trigger widespread food insecurity.

304. An FAO study concluded that the current Desert Locust control strategies are risk averse and that affected countries and the international donor community are absorbing substantial net economic costs. This study has been criticized, among others for having excluded the social

²¹ Joffe, S.R., 1995. *Desert Locust management. A time for change*. World Bank Discussion Papers. The World Bank, Washington, D.C.

dimension of the locust threat (FAO, 2000),²² but at that time very little data on this aspect existed. A recent study to determine the economic costs and benefits of locust control in Eastern Australia considered the agricultural production at risk if locust control operations had not been carried out. It showed a benefit/cost ratio of 6.5.²³

305. A number of additional studies concerning the impact of Desert Locust invasions have not led to conclusive results. However, data collected in the course of this evaluation show that, in the Sahel countries affected by the recent invasion, 10-50 percent of the total population has been suffering serious losses, directly or indirectly.

306. Nevertheless, while questions remain with respect to the economic impact of Desert Locust invasions, agreement emerges that effective surveillance and control mechanisms can prevent, and thus drastically reduce the costs of controlling new locust invasions. Therefore, investments in maintaining effective early warning and control systems would have a high pay-off compared to the cost of controlling new upsurges and plaques.

307. For this reason the Desert Locust component of EMPRES was initiated in 1994. EMPRES is fully operational in the Central Region, and recently funding has been agreed for its implementation in the Western Region. The programme aims at strengthening the capabilities and capacities of the national, regional, and international components of the Desert Locust management system in the region to implement effective and efficient preventive control strategies based on early warning and timely, environmentally sound, control interventions.

308. In the Central Region, notwithstanding substantial locust activity in 2003 and early 2004 a locust upsurge was avoided. This may be seen as proof of the effectiveness of the EMPRES programme, but it has to be said that rainfall conditions in the Central Region were much less widespread and more limited in their distribution than in the Western Region. The potential benefits to be drawn from early warning systems were also the criteria used for the implementation from 2004 onwards of the World Bank-funded Africa Emergency Locust Project in seven countries in West Africa.

309. Data on crops and pastures saved by the locust control operations were not collected in a systematic manner in any of the affected countries during the 2003–05 campaign. Consequently, only two specific cases could be used to determine benefit/costs ratios, presented in Annex VI.

310. For the determination of benefit/costs ratios of future locust control campaigns,

It is recommended that:

11. mechanisms be put in place by the countries concerned to estimate the total benefits of the control campaign (value of production saved and additional benefits).
12. relevant national structures be involved in the collection of the necessary data and in the preparation of these benefit estimates (agricultural statistics services, etc.).

²² FAO, 2000. *Report on Desert Locust Economics Meeting*. FAO Rome, 28–30 June 2000. EMPRES Programme for the Central Region. Rome.

²³ Love, G. & Riwoe, D. 2005. *Economic costs and benefits locust control in Eastern Australia*. Report prepared for the Australian Plague Locust Commission, Canberra. Australian Bureau of Agriculture and Resource Economics.

C. IMPACT ON HUMAN HEALTH AND THE ENVIRONMENT

311. As in previous Desert Locust campaigns, chemical control remained the most utilized, if not the only approach, during the 2003-2005 campaign to address the locust invasions. The amount of pesticides used in all the affected countries was in the order of 13 million liters, sprayed over a total area of about 12.9 million hectares.

312. Currently, in the region there are no other effective and efficient control means to replace synthetic pesticides for large-scale Desert Locust control operations. The idea of carrying out certain control operations with alternative control means and at lower environmental costs is sometimes considered. However, biological control does not seem to be a viable option yet. It takes over ten days for locusts to die after being treated with currently available alternative bio-control means. Some of these new control means have been further tested in the course of the 2003–05 campaign and these tests will hopefully provide better insight under which conditions these products might prove effective.

313. According to the responses to the evaluation questionnaire for affected countries, national guidelines for the safe and effective use of pesticides against Desert Locust have been developed in 12 countries. All countries provided in-service training for their staff to strengthen their Desert Locust monitoring and control capabilities. Half of the countries reported that over 75 percent of staff members receive training each year. Training was generally rated as effective.

314. Environmental and health indicators were monitored in 64 percent of the countries; this reached a level of 100 percent in countries with high infestation. The number of instances of pesticide contamination was minimal according to the replies received. The main causes for the lack of environmental monitoring were the lack of rules and procedures, the absence of action plans, shortage of financial/logistical resources and expertise. Eight countries reported that they adhered to the necessary pesticide safety procedures. Six countries checked the incidence of exposure to pesticides and used cholinesterase tests. The use of protective clothing was rated as better than satisfactory by 13 countries (87 percent). Efforts were made to build awareness concerning environmental and health hazards, and for the development of guidelines for control operations. The evaluation team considers that in future, countries should strive to conform with and apply the rules and regulations that have been set.

315. Pesticide application rates were checked in 11 countries, the proper storage of pesticides was monitored in 12 countries, pesticide stocks remained in 12 of the countries, and pesticide quality was monitored in eight countries. Proper pesticide storage remains a problem, particularly in some Sahelian countries. In four out of 11 countries providing information on this matter, pesticides were stored in residential areas. The same number of countries indicated that pesticides were stored in the open air. There is a large quantity of left-over pesticides in the affected countries which constitutes a potential danger.

316. Half of the countries provided details on the collection of containers; on average 70 percent have been collected. In 30 percent of the cases these containers were stored without full security. Four countries reported that empty pesticide containers were destroyed; in three countries they were partially recycled.

317. Compared to previous campaigns, in 2003–05 significant progress was made with respect to human and animal health and environment matters. Following the creation of Ministries of Environment during the 1990s, strategies for improved health protection and management of the environment have, or are being developed, in many of the affected countries. Frameworks for compliance strategies and enforcement programmes have been initiated (national environment action plans, environmental codes, water codes, etc.) and during the 2003–05 campaign, technical rules and regulations were adopted, usually based on the DLCC-approved FAO Desert Locust Guidelines for locust control. All projects implemented by FAO had a human health and environmental component.

318. Indeed, at present procedures and rules have been put in place in the CILSS member countries to register pesticides used for locust control. Although these represent an essential framework of basic principles to develop successful environmental and public health management strategies, they are only a first step.

319. In some countries, regulations and rules on pesticides were not set through a process involving all responsible and concerned state ministries (agriculture, environment, health, etc.). For this reason, these regulations and rules are often inconsistent or even contradictory, making it difficult or impossible to apply them. In addition, some technical regulatory measures rely on expensive or unavailable technologies, making their adoption and application difficult.

320. The second essential step concerns compliance in implementation of the set of requirements. Compliance is achieved when the necessary pre-conditions are met and the desired health and environmental results are achieved.

321. During the Desert Locust campaign of 2003–05, most countries made an effort to overcome some of the barriers to compliance through different approaches. They usually provided training to strengthen human capacities. Technical assistance has also been provided to countries with limited resources in the area of public health and environmental quality management. Mass media have been used to educate the public about the potential threat to human health and the environment of the pesticides used for Desert Locust control. In Niger, where a low percentage of empty containers were collected, financial incentives were offered to encourage the phytosanitary brigades to comply with the requirements for reducing or eliminating the potential negative impact of these containers within the local communities.

322. Some Maghreb countries (Algeria and Morocco) have developed and implemented a compliance plan including monitoring, but most countries have yet to put in place systems to effectively consolidate their health and environmental management capabilities and to develop a comprehensive monitoring/evaluation plan as an integral part of good Desert Locust control practices. Furthermore, experience gathered in the affected countries has shown that promoting compliance alone does not result in effective public health and environmental protection, since compliance strategies require a mix of promotion and enforcement.

323. Enforcement is the third and last step to sustainable health and environment management and consists of a set of specific practices and procedures required by law to directly or indirectly reduce or prevent health and environmental risks. It includes actions (i) to achieve compliance by pesticide producers and chemical control operators and (ii) to correct or stop activities endangering environment and public health. In general, countries concerned by locust control, including most Maghreb countries, have not fully reached it yet.

324. Cases of pesticide poisoning and pollution were reported by local people in the countries concerned, in particular the Sahel countries. The negative consequences of the pesticides used were not always easy to demonstrate. Gaps exist between the official figures and the information collected in the treated areas, but in the absence of monitoring of these impacts in a regular and timely manner, it was not possible to obtain reliable data. Unlike the Maghreb countries, a good number of the Sahel countries do not have an appropriate strategy for environmental impact evaluation, and also lack specialized laboratories and well-qualified staff.

325. In certain affected countries such as Burkina Faso and Niger, Desert Locusts are a well-appreciated source of protein, and they are sold at a high price compared to staple food products, such as rice and millet. However, in the absence of proper controls due to the lack of laboratories assessing pesticide residue, there are no means to determine if locusts sold in the local markets are free of pesticides.

326. Considering the foregoing, to minimize the risks to the safety and well-being of the populations, and to ensure the effective protection of the environment,

It is recommended that in the countries concerned:

13. the capacity of environment and health professionals be strengthened through training aimed at understanding and respecting norms and quality standards, environmental procedures and regulations, and precautionary, reduction and mitigation measures, and that these professionals be provided with logistics and financial means to carry out quality tests and field inspections;
14. those who apply pesticides be trained and sensitized to ensure that they fully understand and follow the rules and regulations pertaining to the use of pesticides.

327. The involvement of all the concerned authorities in the planning and organization of the campaign and the preparation of contingency plans has often been lacking at the beginning of the control operations, especially in the Sahel countries. If environmental specialists and those concerned with registration and safe use of pesticides, as well as the communication experts and other experienced personnel had planned the work together before the start of the campaign, they could have integrated environmental and health concerns earlier in the formulation of the various programmes.

328. The national locust control units in the Maghreb countries and in Mauritania have usually been able to ensure the medical protection and monitoring of the professional staff involved in Desert Locust control. This was the case, for example, for the unit in Morocco, which employs a full-time medical doctor, who liaises with the physicians of the Ministry of Health at the decentralized level of the Wilayas (provinces) to ensure the medical surveillance of the staff based in the regional command posts for the locust control operations. In Algeria, the National Toxicology Centre is responsible for testing cholinesterase levels of professional staff.

329. In most of the Sahel countries, very few staff members from the Plant Protection Services who participated in the Desert Locust control operations have undergone cholinesterase tests before the start of the campaign, though this was usually done afterwards. However, without the availability of a pre-treatment reference, the determination of a possible effect on the cholinesterase level becomes erratic. The village brigades, because of their number and spread in the county, have worked under poor protection and medical surveillance.

330. To ensure the safety of staff involved in chemical control operations is well taken care of,

It is recommended that:

15. medical surveillance of specialized staff involved in chemical control be ensured, including provision of adequate protection kits;
16. the involvement of village and phytosanitary brigades in the chemical locust control campaign operations be stopped on safety grounds, but their locust monitoring capacities be strengthened.

331. Large quantities of pesticides are still available in the countries affected by the Desert Locust invasion. Estimated at 6.2 million liters, they are either leftover from the 2003–05 campaign or come from purchases made after the campaign in order to be prepared for an

eventual new invasion. This was partly caused by the fact that in a number of cases additional quantities of pesticides were purchased towards the end of the campaign against the advice of technical staff. These stocks are often stored under less than optimal conditions, particularly in the Sahel countries, which may have a negative impact on their expiry date. Thus, these products could increase the existing stocks of obsolete pesticides, which are already a challenge in terms of management and destruction in countries concerned. Some 20,000 liters of diflubenzuron provided by FAO are stored in Mali and Niger. They could not be used because of the corrosive effect on the aircraft spraying equipment.

332. In certain countries, such as Niger and Senegal, a drop in the quantity of leftover pesticides since the end of the campaign was noted. In Senegal, the stock has decreased from 877,700 to 672,760 liters from April 2005 to December 2005 and in Niger from 232,495 to 187,590 liters. An explanation was not provided to the evaluation mission.

333. To avoid the accumulation of large stocks, the establishment of a pesticide bank for the benefit of Desert locust operations has been discussed on various occasions. This could be in the form of contractual arrangements with pesticide producers to ensure that pesticides are available at short notice and delivered when and where needed. It could also include promoting triangular arrangements whereby, for example, FAO facilitates the transfer of a certain amount of pesticides from one country to another. Such arrangements, if successful, would reassure affected countries that pesticides supplies would be available in good time and would avoid accumulation of large quantities of pesticides that could later become obsolete. Another option could be to establish a special fund and procedures that would allow pesticides to be purchased at short notice.

334. Only 30–80 percent of the empty pesticide containers were collected according to information received from the countries. The highest levels of collection were attained with the 100–200 liter containers, in those countries where control operations were carried out by professionals only. In the Sahel countries where village brigades were a key part of the chemical control operations, plastic containers of 1–5 liter were provided to facilitate the handling of the pesticides. These containers were frequently re-utilized for domestic purposes and were often at the origin of contaminations. Sensitization efforts of the population showing the dangers of these containers and inviting the farmers to return them had some effect, but fell short of expected results.

335. The management of empty containers was also a preoccupation for the countries concerned. The storage of empty containers requires large spaces. Independent of how these containers are stored, in the long term they become a contamination source. An effective solution has been found for containers of 200 litres, through the use of drum crushers. A few countries affected by the Desert Locust have obtained crushers that wash, decontaminate and compress metal containers, for subsequent recycling in foundries. But this new technology cannot be used for plastic containers of any capacity.

336. Considering the above-mentioned aspects,

It is recommended that:

17. ordering and distribution of pesticides in containers of less than 50 liters be avoided by all parties concerned and that pesticides be purchased in metal containers of a large capacity (100–200 liters);
18. drum crushers be introduced in all countries affected by the Desert Locust for the destruction of metal containers, and recycling of crushed containers by foundries be promoted by the national locust control units;

19. in collaboration with FAO and the CLCPRO member countries, an agreement be developed with pesticide manufacturers concerned for the recovery of their containers.

D. INSTITUTIONAL AND ORGANIZATIONAL ASPECTS

337. All partners have directly or indirectly supported the overall strategy for locust control during the campaign. However, lack of experience and means did not allow most countries to carry out the necessary monitoring and control operations in an effective manner. Countries differed considerably with respect to the type of personnel involved in the control operations. In some it was exclusively done by well-trained professionals, in others it involved a wide range of people with very limited or no experience. The evaluation team considers that Desert Locust control campaigns should be carried out by appropriately qualified staff.

338. Coordination of the various activities at the national level varied considerably, from virtually no specific arrangements to the establishment of a range of committees at different technical and political levels. Countries may have different requirements in this respect, but as a minimum a national coordination committee should be established, preferably under the chair of the Minister of Agriculture, as well as a joint government/donor committee.

339. Donors were asked, through the questionnaires, what were, in their opinion, the main strengths and weaknesses of the international coordination of and support for the locust campaign, including coordination between the different donors and the affected countries. Their responses indicate the following.

340. *The role of FAO in locust control, given to it by its member countries, is to coordinate the control and to strengthen the information system at the international level. FAO became involved in project execution because of the lack of alternative mechanisms. For the Western Region this should be the CLCPRO, provided that it becomes an effective operational structure, which together with the national structures should manage the locust control operations.*

341. *Most of the affected countries, especially in the Sahel, are not able to effectively organize and execute large-scale locust control operations and the related logistics, be it preventive or invasion control. In addition, the FAO Desert Locust prevention and coordination programmes, for example EMPRES, are not fully operational in one of the two regions where it has been initiated. Consequently, there is often likely to be a gap that needs to be filled. If FAO were to engage in coordination, for which it has capabilities that many other bodies lack, or project execution only, then these gaps must be filled otherwise. The long-term aim should be that the countries themselves and their regional organizations would have the capacity to take the responsibility for the execution of projects.*

342. *Locusts are a regional problem, thus it is good that FAO and regional organizations are available to deal with these aspects. A weakness is the lack of clarity concerning the different roles of different actors, and how these relate to each other. This may result in duplication of efforts and waste of time and resources. In addition, the level and quality of information is not always sufficient. Weak points also include lack of qualified staff, lack of equipment for the national locust control units in the frontline countries and lack of an annual budget for locust control in the countries concerned to ensure preventive monitoring and control operations. The circulation of locust information between countries should be mentioned as a strong point.*

343. *Certain donors have not played the coordination game: little money passed through FAO and little information was provided on what they financed. The affected countries have sometimes also not played the game; they have chosen the multidonor card, meeting with the donors one after the other without providing information on what was discussed with the other,*

and have often preferred direct financing for more visibility with respect to the public opinion, or for other reasons.

344. *FAO has here a great role to play and it should somehow be able to strengthen its coordinating role among the international community, including non-governmental organizations. If FAO could place more emphasis on coordination and leave the execution wherever possible to other organizations, it could increase its credibility as a liaison agent and information distributor. In such a case the affected countries would rely more on FAO and report to it about all bilateral arrangements, as would be the case for donor countries and international organizations.*

345. *Considering the overall results with respect to locust control during the last campaign, the response of the international community, while somewhat late, has limited the damage. The coordination at the field level was not easy because of the many partners involved and the lack of an intervention framework. Proper appeal documents were not produced for the donors. The FAO field level capacity and operational presence were limited.*

346. *Coordination by itself is a daunting task when it comes to the Desert Locust given the areas it covers and its spontaneity. An absolute reliance on central coordination is unrealistic for the Desert Locust response. It is important to recognize that while the central coordination may work well for communicating with the field representatives, there is a justified need for initiating coordination efforts at the regional and national levels. FAO, regional organizations and national government efforts in organizing country/regional coordinating committees is an instrument that needs to be strengthened as it is the first line of communication with donors in areas where the actual problem can be described.*

347. The evaluation team believes that FAO should continue to be the logical choice for the implementation of multilateral Desert Locust control projects. However, it should try to do so in a much more decentralized manner, allowing staff responsible for the various project activities to take decisions and carry out their responsibilities in an expeditious manner.

Institutional arrangements

348. A much better understanding is needed of the role and responsibilities of all the stakeholders, the affected countries, the donors and FAO, and the way the DLCC and Regional Commissions promote and ensure effective Desert Locust monitoring and control. For example, the evaluation team had the impression that with respect to the Desert Locust emergency some affected countries seem to consider that action to be undertaken is in the first place a responsibility of FAO and the Regional Commissions. Moreover, donors and affected countries consider Desert Locust emergencies as a rather unique, stand-alone, event. It should be recognized that there is a continuum from recession, through pre-emergency to emergency.

349. Limiting the frequency and importance of Desert Locust outbreaks and upsurges requires the involvement and support for the whole chain of activities related to these three phases. Taking out an insurance contract when the house is already on fire is not a realistic and cost-effective approach. A more serious commitment to the various developments by the various stakeholders should ensure better preparedness when emergencies arise, and limit the type of financial and socio-economic consequences, such as occurred during the 2003–05 campaign.

350. Desert Locusts are and will stay a permanent threat to the food security and livelihood situation for the rural populations living in the harsh arid and semi-arid regions. Over the last 50 years monitoring and control means have been developed that allow to follow better the Desert Locust developments and to control locusts more effectively. As such the importance of this threat can be significantly reduced, provided conditions are created to use these means in an optimal and effective manner. To achieve this, the countries concerned and the international community must follow this threat on a regular basis.

351. As discussed in this report, there is a need to support and implement clear operational strategies and plans. In the Western Region for the short term this is to a large extent addressed through the EMPRES programme. But it should be ensured that the arrangements put in place are also adequately supported in the longer term. The EMPRES programme for the Central Region also needs to be adequately maintained.

352. The member countries of the CLCPRO must ensure that at the national and regional level effective monitoring and control operations are well sustained. The operational effectiveness of CLCPRO, and the other Regional Commissions, is determined by the commitment and engagement of their member countries. Given the economic situation in the Sahel, the donor community should be ready to provide complementary support to the inputs provided by the countries themselves.

353. It is essential that: (i) better recognition be given to the fact that Desert Locusts are a permanent major threat to the food security and livelihood situation of large numbers of people in countries that require already very substantial international development assistance; (ii) strong support be provided by the countries concerned and the international community to effectively address the necessary Desert Locust monitoring and control activities during the recession, pre-emergence and emergency phases; and (iii) that a productive partnership be created with the active support and trust of all concerned.

354. Specific recommendations on this matter are formulated later in the report.

E. TECHNICAL QUALITY AND ADEQUACY

355. One of the most important constraints noted during the Desert Locust control campaign was the insufficient availability of well-qualified human resources in most of the countries concerned, in particular in the Sahel countries. In a crisis situation the staff, which constitutes the backbone of the control structures in these countries, are strengthened by people from various departments who generally do not possess sufficient knowledge to be able to undertake appropriately the monitoring and control activities. The consequences have, in particular, been perceived in the course of the first part of the campaign by the quality of the information collected. This sometimes left much to be desired, in particular with respect to the areas infested and treated, and with details on the efficiency of the treatments, which were not always undertaken in an effective manner. The poor status of the equipment, especially the means used for ground control operations and sometimes even for aerial control (as in Niger) was not always sufficient to reach the anticipated results.

356. The lessons learned during the first part of the campaign permitted to undertake a series of measures to improve the technical quality of the interventions through training programmes organized by the countries themselves in the case of the Maghreb, and by FAO for most of the Sahel countries. These training activities have covered various themes linked to locust control, including environmental monitoring aspects.

357. To assist the Sahel countries to manage the Desert Locust crisis better, FAO with the financial support of the donors, made use of the services of 22 international consultants, nine of whom were employed in the frontline countries for technical advice and assistance. FAO also contracted 14 airplanes equipped with the DGPS track-guidance system to monitor the quality of the chemical control operations better. In addition to the provision of 50 four-wheel drive vehicles, a large number of new types of sprayers, better adapted to locust control, were mounted on vehicles. A significant amount of high-performance communication equipment has been provided to countries. This has improved in a very significant manner the collection and transmission of Desert Locust field data.

358. Regrettably, the majority of the countries involved in the Desert Locust upsurge did not have an effective contingency plan for the campaign. The DLCC had insisted in its extraordinary meeting, held from 29 November to 2 December 2004, on the importance of having such plans to

be able to respond accurately at different levels to the locust threat. Its technical group had organized a workshop on this topic at Nouakchott in Mauritania to assist the countries in the formulation of these plans. These plans have been further developed for the frontline countries on the occasion of a meeting organized jointly by FAO and the World Bank at Bamako, Mali, in April 2005.

359. With respect to pesticides, almost all used during the Desert Locust control campaign were part of the list of products recommended by the FAO Pesticides Referee Group. Chlorpyrifos, malathion, fenetrothion and deltamethrin were the most used. Deltamethrin has a more interesting knock down effect and degradation speed, but its relatively high price limits its use to special crop situations, such as in the case of Morocco.

360. While the Maghreb countries have bought with their own resources almost all the pesticides needed, the Sahel countries have received most of them through donations, either through FAO or bilaterally. FAO made sure that rules and regulations concerning the use of phytosanitary products were followed in the countries concerned and did not provide products not officially approved. This was not always the case with some of the donations received from local sources.

361. The management of pesticide stocks has become a major preoccupation for the locust control authorities, who tried through different measures to ensure better storage based on the available means, while waiting for the construction of the appropriate stores. The best example is Morocco which has storage conditions that meet agreed international standards.

362. The effectiveness and efficiency of the control operations undertaken in the various countries are to a large extent expressed by the costs of the control operations per hectare. Unfortunately, the evaluation team was unable to obtain a detailed overview of all the expenditures for all countries, particularly those related to capital costs. However, based on the data it was able to collect, the following table was composed for most of the affected countries. This should be taken as a first estimate, which compares country figures that may or may not include capital or mortgage costs. The costs for the control operations are largely dependent on the effective planning of the campaign and the timely provision of the various campaign inputs, in particular those for aerial treatments, but also the available infrastructure such as the distance between airfields and the areas to be treated. Table 7 shows that there is considerable scope for improvement in a number of countries.

Table 7. Approximate costs of the Desert Locust control operations carried out during the 2003–05 campaign

Country	Area treated (ha)	Total expenditures (US\$)	Control costs (US\$/ha)
Algeria	4,518,842	101,000,000	22.35
Burkina Faso	27,159	1,621,556	59.71
Chad	22,816	4,700,000	206.00
Mali	385,591	10,173,000	26.38
Morocco	4,854,211	79,000,000	16.27
Mauritania	1,383,499	18,176,000	13.14
Niger	224,604	7,600,000	33.84
Senegal	774,591	42,400,000	54.74
Total/Average	12,191,313	264,670,556	21.71

363. Control operations can also be further improved and costs reduced through research. The evaluation team considers that the principal research themes emerging from the 2003–05 campaign concern the following.

- improvement in the use of satellite images for the identification of favorable Desert Locust breeding areas, for effective preventive control;
- determination of the reproduction potential of the Desert Locust under natural conditions and the exact number of generations that it can produce under optimal conditions;
- understanding the behavior of the Desert Locust during the solitary phase, its population dynamics and the factors leading to gregarization;
- improvement of pesticide spraying techniques, including the reduction of dosages;
- enhancing the efficacy of biopesticides, and determination of their impact on public health and the environment;
- socio-economic impact of the Desert Locust invasions;
- causes of abortion in cattle after consuming Desert Locust excrements.

364. Given the wide range of the costs of the Desert Locust control operations in the affected countries during the 2003–05 campaign,

It is recommended that:

20. a study be undertaken jointly by FAO and the countries concerned to identify the reasons for the high costs of Desert Locust control operations in some of the affected countries, as a basis for the development of guidelines for the more efficient control of locusts.

F. EFFECT AND IMPACT OF THE CONTROL CAMPAIGN

365. The following impressions stem mainly from the evaluation team's country visits. Donors, affected countries and populations are unanimous in their opinion with respect to the importance of the potentially devastating effect of the Desert Locust invasions and their negative repercussions, combined with those of drought, on the productive activities and on household food security. They also share the conclusion that costs of the control operations would have been less and the impact of the invasion more limited, had control means been available earlier. Finally, they would like to see in case of another upsurge that countries are well equipped to conduct under better conditions the control campaigns against Desert Locust.

Affected Rural Communities

366. As mentioned above, whereas at the macroeconomic level crop and pasture losses were considered limited by the national authorities, at the microeconomic level, productive capabilities of the local populations have been profoundly affected.

367. Notwithstanding the existence of a latent fatalism, there is a strong conviction among the local populations that the disaster might not have been avoided, but it could have been significantly reduced if help had been provided at the opportune moment. These groups and communities, the appeals of which have not been heard, had the impression that they were abandoned by the authorities.

368. Opinions about the campaign's results at local level are mixed: while local populations recognize that the control operations had an irrefutable impact, they are unhappy about the late start which has entailed heavy consequences. Some lost within a couple of hours of invasion a considerable part of their capital. The example of animal losses experienced by many women in a

village (Damane) located in the region of Inchiri in Mauritania is significant in this respect; they lost more than one-third of their sheep. One can easily imagine the repercussions of such events on these destitute people and their families.

369. Far from accepting matters as they were, the populations have used all possible means within their reach (for example, digging trenches to collect the hoppers, and using fire to kill them), and those that had the financial resources have sometimes invested important amounts of money to purchase their own pesticides. For example, a farmer in the region of Louga in Senegal spent US\$500 to treat 79 hectares without satisfactory results. Certain producers traveled to request assistance from the agricultural services in their region, however, without obtaining the necessary help.

370. The quality of the assistance provided after the invasion has also justified complaints by the local populations: more than half of the households identified to receive food assistance are still waiting. The distribution of seeds not adapted to the local conditions and not corresponding to the needs of the beneficiaries is another example of inadequate support. With respect to agricultural emergency aid, doubts have been raised by the evaluation team on the equitable distribution of seeds between households headed by men and households headed by women.

371. Finally, the negative effects of chemical treatments need to be considered. The local populations interviewed mentioned that these treatments have entailed illness and even deaths among animals after eating locusts or treated vegetation, or through direct pesticide contact. However, for the moment it is not possible to confirm such assertions.

372. Considering the reality that another Desert Locust upsurge cannot be excluded, it is essential that in future campaigns, appropriate measures are taken for a better targeting of the interventions, taking care of gender differences, along with other concerns. In this respect, the recommendations presented in the chapter on the socio-economic impact should be properly considered.

Affected Countries

373. Losses according to the majority of countries could have been less. Their overall importance was linked to a certain number of factors, in particular the shortage of resources. Clearly, the importance of the development of the Desert Locust has been underestimated by the technical ministries, and the countries were taken by surprise by the rapid evolution of the events. Moreover, because of lack of preparedness, they depended largely on the assistance provided by the international donor community, and on that matter the affected countries have deplored the slowness in the provision of aid.

374. Some of the affected countries experienced great difficulties in informing the general public in a satisfactory manner concerning the delays experienced in the control operations. These were mainly due to the insufficient availability of logistic, human and financial means, which did not allow them to manage the locust invasions effectively. Consequently, at the beginning of the invasion, farmers short of other possibilities have undertaken traditional control methods while waiting for the arrival of the control teams. However, in many cases the teams arrived too late. Apart from the donors, FAO has also been pointed at as being responsible for the late start of the control operations. While technical staff acknowledged the shortcomings in the national locust control structures and capabilities, such arguments were not advanced during the discussions with government officials. In some countries the evaluation team almost got the impression that the affected countries considered that Desert Locust control was primarily the responsibility of FAO and the international donor community.

375. Besides the late provision of the control means, other insufficiencies have also become apparent. These insufficiencies are linked in particular to: (i) the manner in which in certain cases the sensitization and information campaigns have been managed, and (ii) to the lack of preparation and insufficient equipment and protection kits for the members of the village

brigades or the village control committees. The length and complexity of political bargaining have also been mentioned with respect to the delays in certain countries in the presentation of financial requests.

376. With respect to the after-crisis question, in many countries it has been admitted that this was not beyond criticism and the following matters have been mentioned:

- Within the framework of the actions undertaken to attenuate the effects of the crisis on the affected populations, such as the provision of food or seeds, efforts have been made to avoid any idea of favoritism, but these have not always succeeded. As a result, the most vulnerable households have not always been helped.
- Little attention has been paid in certain countries to environmental questions and to human health.
- The lack of a system of reliable agricultural statistics, as a basis for the evaluation of the impact of Desert Locust invasions.

Donors

377. From the donors' point of view, notwithstanding the delay experienced in the provision of assistance, the control objectives have been met in general terms, and the overall campaign has been successful considering the fact that the control operations have contributed to a reduction of the locust populations and have limited the losses to crops and pastures. The donors recognize, however, that populations in rural communities in certain places have been heavily affected and that there was a need to provide rehabilitation assistance. For this a whole series of joint missions have been undertaken in the Sahel countries. This included, for example, a mission to evaluate agricultural production and food availability conducted jointly by FAO, WFP, CILSS and the USAID Famine Early Warning System (FEWS NET), and accompanied by two observers from the EC and USAID, as well as representatives from different ministries.

378. The above-mentioned mission had as its objective to evaluate the impact of the locust infestations on crop, animal and biomass production and on the degree of vulnerability of households, and to evaluate the resulting overall food security situation. On this basis it should have been possible to determine the food aid needs for 2004/2005, taking into account the imports and food aid already provided by the international community. Following these missions, a certain number of interventions have been undertaken through direct food aid or rehabilitation projects. In relation to this, it is worth mentioning that according to certain donor representatives, determining the target groups was inspired sometimes more by political than by humanitarian considerations and the most affected communities and households were not always those identified for receiving help.

379. Donors agree with the affected countries that support for the control campaign was provided late, but they differ in opinion on the reasons for the delays. Some mention the heavy bureaucracies and the lengthy payment procedures of donor countries; others note the weaknesses of the organization charged with this task. Donors recognize that at the beginning they gave too little credit to the announcements made concerning the importance of the Desert Locust upsurge and have largely ignored the appeals launched by FAO. They admit that FAO had sounded the alarm bell early. However, effective publicity was lacking, especially with respect to the potential impact on the food security situation. Consequently, the donors were not in a position to appraise the seriousness of the situation, and felt no need to react.

380. When donors became aware of the unfolding crisis, which in certain countries took catastrophic forms, they were ready to provide the support requested. But a number of pre-conditions were not fulfilled relating to the necessary technical information and properly formulated appeals. From their point of view this situation was caused by various factors including the structural, institutional and operational weakness of the affected countries, which led in certain cases to a policy of wait and see, even immobility and inertia.

381. Donors consider that the absence of a clear response from the authorities in the affected countries does not seem to be unique to the locust situation, because the same type of attitude is also noted in relation to other emergencies such as cholera. It is possible that, for example, electoral motives explain the desire to underestimate the extent of a disaster. This way of addressing disasters has undoubtedly played a role in the non-availability of resources at the right moment and, consequently, in the delays encountered at the beginning of the campaign. Moreover, a majority of the affected countries did not engage the necessary financial and logistic resources that one might expect from them. With the exception of certain countries, they were not ready to face the crisis.

382. In some countries, donors consider that another reason for the delays was the inability of the FAO representation to play its coordination role, handicapped as it was by a shortage of human resources. In the best of cases the information arrived too late, and in the worst it was provided in a drop-wise manner and did not meet the needs. But in other countries the FAO representation was considered as an exemplary agency with a remarkable aptitude for awareness building, information sharing and mobilization matters.

383. All in all, the donors recognize:

- to have underestimated the importance of the threat as a result of lack of convincing information on the evolution of the Desert Locust;
- that most of them are not emergency institutions, and thus their rules are not adapted to a locust crisis; and
- to have paid inadequate attention to the environmental monitoring aspects.

384. Notwithstanding all these facts, the help provided to the affected countries in the form of financial, material or institutional support has allowed better control of the Desert Locust infestations and a strengthening of the control capacities of the countries.

385. In future, it is essential to:

- identify more sustainable means for Desert Locust control;
- do everything to be ready to react at the appropriate moment;
- integrate the consequences of the control operations in the technical assistance projects, to manage the post-crisis period better; and
- ensure that structures and means for effective preventive control are better supported, while keeping in mind that structures with capacities of this type, such as OCLALAV, have regrettably not survived, because of lack of support from their member countries.

V. Sustainable Desert Locust Control

386. The evaluation team came to the conclusion that in future the impact of Desert Locust invasions can be significantly reduced, provided effective action is taken on the following general recommendations for which further supporting information is provided in the report. It has been suggested to prioritize these recommendations. However, the evaluation team believes that to arrive at lasting improvements with respect to sustainable Desert Locust control they must be handled as a comprehensive package that requires urgent attention and follow-up action.

387. Contrary to the current situation, effective Desert Locust control requires a much better awareness and more effective and joint involvement in the various activities to be undertaken by all groups concerned. These include FAO, the DLCC, the Regional Desert Locust Control Commissions, the affected countries and the donors. The transition from, and the linkages between, a Desert Locust recession situation, through a pre-emergency stage, to a full-scale emergency should be well understood by all stakeholders to allow them to take timely and effective action. These stages are all too often looked at as independent events. Better awareness of the above facts and appropriate institutional arrangements to address them are essential to the implementation of the recommendations listed in this report.

388. Given the fact that this evaluation has been limited to only one of the three major regions of the Desert Locust invasion area, the evaluation team considers that, in addition to the implementation of the recommendations presented in this report, action should be taken on how they might affect Desert Locust survey and control efforts in the other two regions. FAO should take the lead on this in close collaboration with relevant stakeholders.

Preventive control strategy at country level

389. History has shown that the Central Region, mainly the seasonal breeding areas along the Red Sea coasts and in the hinterland in the Sudan and Saudi Arabia, has been the epicentre for Desert Locust outbreaks where swarms originate and invade the Western Region. However, the 2003–05 upsurge which originated in the Western Region independently from the Central Region is unusual in the development of Desert Locust outbreaks. The Western Region also contains important seasonal breeding areas, which can result, as shown by the recent events, in large-scale outbreaks and invasions when ecological conditions become favorable.

390. The seasonal breeding areas in the Sahel are mainly located in the so called frontline countries (Chad, Mali, Mauritania and Niger). Regular surveying and monitoring in these breeding areas would allow controlling Desert Locust populations at an early stage before they invade larger areas and become difficult to contain. So far, only Mauritania has established the necessary institutional framework for the implementation of a preventive control strategy. The EMPRES – Desert Locust component that pursues this objective has been put in place in the Central Region since 1997 and has led to very promising results. This programme contributed to the early action that avoided, with the help of less favorable rainfall, major Desert Locust outbreaks and invasions in the Central Region during the 2003–05 upsurge. In contrast, the EMPRES programme in the Western Region did not become fully operational during the recent upsurge; an opportunity missed in the region.

391. Considering the experience of the 2003–05 upsurge,

21. It is recommended that:

- a) an effective preventive Desert Locust control strategy be put in place in all the countries of the Western Region where seasonal breeding areas exist to reduce the risk of future outbreaks and upsurges, through the timely detection of a pre-emergency situation. The implementation of such a strategy could avoid crop and pasture losses, and considerably limit control costs by intervening at an early stage with limited scale control operations, and allow implementation of safer and environmentally friendlier control means;
- b) an autonomous and operational national locust control structure, with the authority to take technical and administrative decisions as regards Desert Locust operations, be created in each of the frontline countries. This structure must be granted effective financial, material and policy support by the governments concerned. The structure should be able to take full advantage of the material, financial and technical resources received during the 2003–05 upsurge;
- c) an adequate national budget be allocated for the operation of the national locust control structure to ensure the sustainability of the preventive control strategy;
- d) the EMPRES programme in the Western Region be effectively supported by the CLCPRO member countries and by the donors;

- e) countries in the Sahel exposed to Desert Locust invasions maintain a capacity to control locusts within the Plant Protection Services and ensure that the experience gained during the 2003–05 campaign is captured, disseminated and preserved, through appropriate avenues such as training;
- f) the human capacity in acridology be strengthened for the timely replacement of the current Desert Locust specialists, many of whom will reach retirement age in the next 10–15 years.

392. Details of the requirements for the effective strengthening of the national locust control units in each of the frontline countries have been defined recently at the occasion of the first meeting of the Steering Committee of the EMPRES programme for the Western Region, held from 4–6 March 2006 in Algiers.²⁴ For example, the minimum number of monitoring and control teams has been estimated at six for Mali, ten for Mauritania, five for Niger and four for Chad. The estimates of the total costs for the establishment and operation of the National Locust Control Units in each of the four countries are given in Table 8.

Table 8. Total costs Desert Locust preventive control (US\$)

Country	2006	2007	2008	2009	Total
Chad	2,258,230	519,384	615,184	834,884	4,227,682
Mali	2,962,205	642,895	770,895	840,135	5,216,130
Mauritania	4,766,544	988,974	1,306,654	1,382,934	8,445,106
Niger	1,592,607	659,483	753,603	864,123	3,869,816
Total	11,579,586	2,810,736	3,446,336	3,922,076	21,758,734

393. For 2006, most of the costs are already covered by ongoing projects, in particular those financed by the African Development Bank and the World Bank. The current shortfall for 2006 is US\$1 485 542, but this should be partly covered by the national contributions which have not yet been included in the current estimates. For the following years there is still a substantial need for additional donor contributions. The costs for 2006 include important amounts for equipment and constructions.

394. From these estimates, it is evident that for an average insurance premium of some US\$5 million per year a new Desert Locust outbreak may be either avoided, or certainly be of much less importance than the 2003–05 upsurge.

Strengthening of the Commission de Lutte contre le Criquet Pèlerin dans la Région Occidentale

395. The CLCPRO is responsible, among others, for the strengthening of national locust control units, through its own programmes and in collaboration with the EMPRES Western Region programme. However, the limited role and responsibilities of the CLCPRO in the Western Region with respect to Desert Locust control operations, compared to the activities undertaken in the past by OCLALAV, undermine its visibility and recognition by the member countries and the units within them.

²⁴ Programme EMPRES en Région Occidentale. *Rapport de la Première Réunion du Comité de Pilotage*. Alger, Algérie, 4-6 mars 2006. FAO, mars 2006.

396. In order to enable the CLCPRO to carry out its role and responsibilities in the region in a more effective manner,

22. It is recommended that:

- a) the CLCPRO Secretariat role and responsibilities be reviewed and that it be provided with adequate resources to be able to effectively carry out its responsibilities in the medium and long term. The Secretariat should be the main contact with the countries in the region both during recessions and emergencies.
- b) in the case of a new emergency, additional financial and operational responsibilities be delegated to the CLCPRO Secretariat, by member-countries, donors and FAO;
- c) in order to strengthen the CLCPRO and ensure a more efficient execution of its activities, the different components of the EMPRES Western Region programme be realigned immediately within the domain of the Secretariat in much the same way the Central Region programme was incorporated into the Central Region Commission structure.

397. The EMPRES programme for the Western Region of which the CLCPRO Secretary is the coordinator, has become operational in 2006. This already provides an opportunity for the CLCPRO to play a much more effective role in the preventive control activities in the Western Region. FAO had decided to station the second professional officer foreseen under the ADB project in Dakar. The evaluation team considers that such an arrangement does not make optimum use of the available human resources and recommends that all the components of the EMPRES programme be regrouped at the CLCPRO Secretariat. In that case, the CLCPRO Secretariat will have adequate human resources to carry out its various responsibilities until the end of the EMPRES programme in 2009.

398. FAO should as a matter of urgency develop the necessary plans for this, including the way in which the CLCPRO Secretariat should be strengthened during the period of an emergency, to be able to effectively undertake such additional responsibilities.

FAO responsibilities

399. The Desert Locust is a threat to agricultural production in countries in Africa north of the equator, the Near East and Southwest Asia. Given FAO's overall mandate with respect to Desert Locust monitoring and control-related activities for more than five decades, it has a clear responsibility to provide the necessary services to these countries so that they can prevent Desert Locust outbreaks and effectively control upsurges. While this involves activities at the national, regional and international level, the process has to start at the national level. This requires that the countries recognize Desert Locust prevention and control as a matter of the highest importance, that they take the necessary steps to effectively address the problem, and are able to decide when assistance is needed beyond their own capacities.

400. For FAO to continue to carry out its responsibilities for Desert Locust prevention and control in an effective manner,

23. It is recommended that:

- a) as a first step, the human capacity of the Desert Locust Information Service, which is currently staffed by only one professional officer, be increased, while at the same time a review is undertaken of the critical mass needed in the Locust and Other Migratory Pests Group to carry out its wide range of responsibilities effectively;
- b) FAO and member countries provide adequate recognition and support to the DLCC and take full advantage of the Desert Locust Technical Group to review the needs for the development of improved Desert Locust survey and control means, and prepare appropriate proposals;
- c) arrangements be made to enable FAO representatives in the case of a new Desert Locust emergency to collaborate effectively with and assist the countries in the steps to be undertaken in coordinating and mobilizing the necessary international assistance by presenting well-defined action plans and proposals on how to implement these plans, and by determining the international support needed for them.

401. FAO should develop the necessary plans and undertake the actions required to implement this recommendation. It should commit itself to ensuring that it is able to continue to carry out its mandated responsibilities with respect to Desert Locust forecasting and control in an efficient and effective manner. This will have budgetary implications, but the evaluation team considers that these are justified because this is a core FAO function, and thus should be paid for from its own resources. As a consequence, it may have to drop less essential activities.

Donor support for Desert Locust control

402. Effective control of a migratory pest like the Desert Locust, which can move from one country to another within a matter of hours and days, requires flexibility in the planning and implementation of the control operations.

403. During the 2003–05 campaign, the Maghreb countries supported all or the major part of the control activities at national level with their own resources, whereas most of the resources used for controlling Desert Locust invasions in the Sahel were provided by the international donor community and by the Maghreb countries. In the Sahel, the campaign was negatively affected by delayed action, which showed shortcomings of the current funding arrangements. To use such resources most effectively they should preferably be available for the control operations to be undertaken in all the areas infested by the Desert Locust, and not restricted for activities in one particular country. A working document on alternative funding arrangements for Desert Locust control campaigns has been prepared by the FAO secretariat for the next session of the DLCC.

24. It is recommended that:

- a) in case of a new emergency, opportunities be explored for the establishment of multidonor regional funds in support of regional control programmes facilitating the effective implementation of future Desert Locust control campaigns. Due attention should be given to how donor visibility and preferences, as well as applicable policy and regulatory requirements can be factored into such a multidonor arrangement;

- b) FAO and donors explore the possibility of developing a mechanism that would allow flexibility in reorienting and reallocating donor funds with minimal administrative effort to respond effectively to emergencies as they surface or as the situation continues to evolve. Such a tool should be put in place during the budget negotiation process so that the project documents will explicitly capture the importance of flexibility;
- c) in future, to assist affected populations, provisions be made in Desert Locust control project agreements, for part of the financial resources to be reserved for food aid and rehabilitation activities as needed.

404. FAO, in close collaboration with relevant donors, should take advantage of the experience gained during this campaign to develop the necessary plans and agreements, for the implementation of this recommendation. It should ensure, with the international donor community and the affected countries that it is able to continue to carry out its responsibilities with respect to Desert Locust forecasting and control in an efficient and effective manner.

Implementation of Desert Locust emergency campaigns

405. Addressing Desert Locust upsurges and plagues in an effective manner requires the availability of well-defined contingency plans at national, regional and international levels, which were mostly lacking during the 2003–05 campaign. These plans should preferably be developed as an integral part of the national food security risk management plans and should ensure the permanent engagement of all the stakeholders. Such plans at national, regional and international levels, should:

- articulate the problem, its implications on agriculture and food security, livelihoods of vulnerable populations, and the national economy;
- describe the establishment of the national coordinating structures to ensure effective synergism between all actors and stakeholders, including donor coordination;
- define the steps to be taken to cope with the specific requirements of a Desert Locust emergency;
- determine the responsibilities of the various actors and stakeholders;
- provide the detailed technical specifications of the inputs needed for the campaign;
- provide details of how the inputs will be used in terms of human health and environmental safeguards and how this will be monitored;
- outline the logistic support required during the control operations; and
- indicate the national budget allocation for all the components of the control campaign and provide a cost estimate of the additional resources required, as well as potential funding sources.

406. Consequently, in order to be well prepared for an eventual new Desert Locust upsurge,

25. It is recommended that:

- a) contingency plans be developed for the medium- and long-term management of the Desert Locust risk, including action plans for locust monitoring and control at national, regional and international levels. These action plans should indicate: (i) the main activities to be undertaken (including those related to food aid and rehabilitation of the affected populations) and their provisional costs; (ii) the available financial resources, their origin (internal

budgets, external resources) and the activities that will be covered by them; (iii) additional financial needs. These plans will be the basis for the preparation of annual work plans and budgets;

- b) in future emergencies, funding appeals be based on well-defined contingency plans and follow the principles and guidelines endorsed for appeals by the Inter-agency Standing Committee (IASC).
- c) strategies be adopted to ensure that locust control operations are carried out both in zones with high production potential, as well as in zones with low production potential, where agriculture is usually practised by farmers with very limited resources.

407. For contingency plans to be executed successfully it is essential that the project activities, undertaken in support of them, are carried out in the most expeditious manner, under effective leadership and with delegation of authority to the lowest possible level. FAO encountered difficulties in meeting such criteria during the 2003–05 campaign, notwithstanding the tremendous efforts undertaken by all concerned.

26. Two options are recommended for future action:

- a) either FAO develops and introduces appropriate arrangements to address future Desert Locust emergencies in a more effective and expeditious manner;
- b) or opportunities for outsourcing most of the operational responsibilities should be pursued.

408. Given its specific responsibilities with respect to Desert Locust monitoring and control, FAO should take the leadership to develop the necessary contingency plans in collaboration with the various stakeholders. In these plans FAO should indicate how, in future emergencies, it will ensure that the IASC guidelines for appeals will be followed. The Organization should at the same time reconsider its capabilities to implement Desert Locust control emergency projects. If it is concluded that FAO should continue to be involved with this, then it should explore ways and means to do this in a more effective manner. Alternatively, it should develop plans for how these activities can be best outsourced.

Institutional arrangements

409. In the course of the evaluation, concerns have been raised on the effectiveness of the current institutional arrangements for Desert Locust control. Some of them have already been addressed in the above recommendations. From a more general point of view, it is essential that (i) better recognition be given to the fact that Desert Locusts are a permanent major threat to the food security and livelihood situation of large numbers of people in countries that already require very substantial international development assistance; (ii) strong support is provided by the countries concerned and by the international community to effectively address the necessary Desert Locust monitoring and control activities during the recession, pre-emergence and emergency phases; and (iii) that a productive partnership is created with the active support and trust of all concerned.

410. A much better understanding is needed of the role and responsibilities of all the stakeholders, the affected countries, the donors and FAO, and the way the DLCC and Regional

Commissions promote and ensure effective Desert Locust monitoring and control. For example, the evaluation team had the impression that with respect to the Desert Locust emergency some affected countries seem to consider that action to be undertaken is in the first place a responsibility of FAO and the Regional Commissions. Also, donors and affected countries consider Desert Locust emergencies as a rather unique, stand-alone, event. It is essential to recognize that there is a continuum from recession, through pre-emergency to emergency.

411. To achieve this,

27. It is recommended that:

- a) the DLCC be transformed from an essentially technical committee into a mechanism in which all parties (affected countries, donors and FAO) determine their joint interests and activities, and deal directly with donors to determine joint work programmes;
- b) Regional Commissions meet regularly at a high level to ensure member country support for the decisions taken;
- c) a multilateral agreement for Desert Locust control be developed for the formal permanent engagement and support of all key stakeholders.

412. FAO should take the leadership on the implementation of this recommendation in close collaboration with relevant stakeholders. The various structures exist already, but their terms of reference should be reviewed to make them more effective tools in managing the Desert Locust threat. It will also require that each of the responsible groups, national units, FAO, DLCC and CLCPRO be provided with the means to carry out their tasks effectively. The donors should take steps to follow the developments more closely than in the past and commit themselves to provide the necessary assistance. Direct financial support to the national units in the front-line countries could be an important element in this respect, provided there is strong long-term commitment of the national authorities.

Assistance provided by Maghreb countries

413. A very special aspect of the 2003–05 control campaign was the solidarity demonstrated by the Maghreb countries towards neighbouring countries in the Sahel. The transboundary nature of the Desert Locust invasions calls for the countries to share available resources for the mutual benefit of the whole region. The strong control capacity available in the Maghreb countries offers a unique opportunity to address new Desert Locust outbreaks more effectively in the summer breeding areas in the Sahel. These outbreaks always precede the movement of swarms to the Maghreb countries by a couple of months.

414. To strengthen the Desert Locust control capacity in the Western Region,

28. It is recommended that:

- a) an appropriate action plan and legal framework be developed for the joint use of the existing control capacity in the Maghreb countries within the Western Region, under the supervision of the CLCPRO;

- b) agreements are established among the various countries in the region to encourage, organize, facilitate and implement joint cross-border operations;
- c) cost estimates are developed to determine the amount of donor assistance required to use the Maghreb control teams and aerial resources in the Sahel countries effectively in case of a new emergency.

415. CLCPRO should take the necessary initiatives for the establishment of such an integrated Desert Locust control system for the Western Region. This should include matters such as the operational modalities, legal arrangements, steps needed to call this control system into action, the financial requirements for such a force and the international support needed for its effective intervention in the frontline countries.

Socio-economic impact

416. It is generally accepted that gregarious Desert Locusts need to be controlled notwithstanding the fact that precise data on the damage that can be caused have not been collected systematically. Consequently, the calculation of benefit/cost ratios of the control operations remains a speculative exercise. A World Bank discussion paper on Desert Locust Management (Joffe, 1995)²⁵ suggests that locusts are not particularly serious pests in aggregate, and that Desert Locusts are unlikely in modern times to trigger widespread food insecurity. However, the evaluation team noted that such impacts have been very significant at the level of the affected communities, especially in the Sahel countries. In these countries at least eight million people have suffered the destruction of their food crops. In addition substantial costs were also incurred by the affected countries which had not been foreseen in their national budgets and which resulted in fewer resources being available for certain national development activities.

417. The control campaigns were primarily focused on the elimination of locust populations, while little attention was paid to the impact on food security and sustainable livelihood aspects. These impacts could not be evaluated in a complete manner because of: (i) the absence of an agreed on methodology to evaluate these types of impacts; (ii) the lack of a global intervention framework that takes into account the social, economic and nutritional aspects; and (iii) the insufficient involvement of the different competent technical services/structures.

29. Consequently, it is recommended that:

- a) a jointly agreed methodology to evaluate the socio-economic impacts of Desert Locust invasions be developed by the different authorities concerned;
- b) a global intervention framework that addresses effective assessments of the socio-economic impact of Desert Locust invasions and control operations be established;
- c) in the case of a new emergency, economic, social and nutritional impact studies, integrating a broader spectrum of relevant disciplines and competencies, are carried out in a timely, systematic and multidisciplinary manner.

²⁵ Joffe, S.R. 1995. *Desert Locust management. A time for change*. World Bank Discussion Papers. The World Bank, Washington, D.C.

418. The DLCC should establish a multidisciplinary working group to develop proposals for the implementation of this recommendation. This working group should pay special attention to the specific actions needed at the national level to plan for and carry out the necessary impact studies.

Human and environmental health

419. Human and animal intoxications and negative environmental effects have been noted in certain countries. It has not always been easy to determine the undesirable consequences of the use of pesticides. Most of the affected countries do not have an environmental impact research strategy, specialized laboratories, or a sufficient number of qualified staff to follow the fate of the pesticides in the environment, and within the framework of a public health policy. Large quantities of pesticides are still available in the countries affected by the Desert Locust invasion. Estimated at 6.2 million liters, they are either leftover from the 2003–05 campaign or come from purchases made after the campaign in order to be prepared for an eventual new invasion. This was partly caused by the fact that in a number of cases additional quantities of pesticides were purchased towards the end of the campaign against the advice of technical staff. To be able to address human health and environmental concerns more effectively,

30. It is recommended that the affected countries:

- a) procure only CILSS-registered pesticides and create the necessary conditions for the appropriate use of these pesticides;
- b) take the necessary steps to strengthen environmental compliances and enforce the application of regulations and rules for the safer handling, use and storage of pesticides;
- c) avoid placing unnecessary pesticide orders and overestimating pesticide needs.
- d) strengthen the technical capacity of the QUEST (Quality, Environment, Health and Treatments) trained specialists, in collaboration and agreement with the EMPRES Western Region programme and the CERES-Locustox in Senegal, and ensure their linkage to the national locust control units in order to undertake in-depth operational health and environmental reviews.
- e) pursue in collaboration with FAO, CLCPRO, donors and pesticide producers, the establishment of pesticide contractual arrangements, including a pesticide bank mechanism, to reduce the accumulation of pesticide stocks and for the disposal of empty containers.

420. The countries affected by the Desert Locust should determine the steps needed to implement this recommendation under their specific circumstances and develop the necessary action plans. If a preventive control strategy is put in place, as recommended, the negative effects of chemical control operations on public welfare and the environment will already be strongly reduced.

Research

421. Research activities related to Desert Locust control have not generated much interest over the last decades because of:

- the episodic nature of the invasions which does not permit production of biological materials in sufficient quantity to carry out research on the viability and efficacy of new products;
- the harsh working conditions in the desert areas that often discourage many researchers from dedicating themselves to the lengthy periods in the field necessary for such studies;
- the lack of sufficient funds to undertake the costly activities associated with research in remote and sometimes insecure areas.

422. However, the development of such research activities is one of the most important means to improve Desert Locust control tools.

31. Consequently, it is recommended that research studies aimed at the following issues are encouraged:

- a) improving operational Desert Locust monitoring and control techniques;
- b) developing alternative control means;
- c) using technologies such as satellite imagery and differential global positioning systems (DGPS), that will greatly improve survey, monitoring and control operations;
- d) gaining better understanding of population dynamics of the Desert Locust during the solitary phase; and
- e) determining the overall impact of Desert Locust invasions on the economies of the affected countries.

423. FAO should determine in consultation with the DLCC, Regional Desert Locust Control Commissions and research institutions what specific steps are needed to move forward in these specific areas, which are of major importance for the further improvement of the efficiency of Desert Locust monitoring and control operations.

Annex I: Terms of Reference

Independent Multilateral Evaluation of the 2003-05 Desert Locust Campaign Towards a More Effective Response to Desert Locusts and their Impacts on Food Insecurity, Livelihoods and Poverty

A. INTRODUCTION

1. The current upsurge¹ of the Desert Locust was not wholly unexpected. The first signs of an outbreak were recognized as early as September 2003, and FAO issued the first alert on 17 October 2003. However, it was largely towards the latter part of the summer of 2004, following repeated appeals for international assistance, that substantial assistance was mobilised. By that time a major Desert Locust upsurge was in progress. The evaluation will examine the extent to which the delay increased the costs of the campaign, if this permitted greater damage by locusts and whether this was an additional causal factor in the increased food insecurity in certain parts of the Sahel.
2. The eventual response to the locust upsurge has involved FAO in a major coordinating and implementing role, significant direct support to affected countries by several donors and major efforts by the affected countries themselves which included substantial assistance to other affected countries.
3. If future locust outbreaks and upsurges are to be combated more successfully, the strong and weak points of the present institutional and technical provisions need to be evaluated on the basis of recent experience for: monitoring and forecasting systems; rapid and flexible provision of emergency assistance; the control tactics and measures employed; and the assessment of locust damage to livelihoods and subsequent needs for follow-up support to the affected human populations.
4. In carrying out the evaluation, it will be essential to keep in mind the characteristics which distinguish a locust emergency from many other types of emergency, including: the potential for a rapid increase in the scale of the emergency; the mobility of the locust swarms which respect no national boundaries often in difficult and remote terrain; and the uncertainty of the duration of the emergency, depending upon seasonal weather conditions and the effectiveness of control measures. It will also be important to recognise that desert locust outbreaks and upsurges occur after lengthy recession periods (normally in excess of 10 years). This too has implications for the characteristics of the capacity which needs to be in place to respond. Climate change may also have implications for future Desert Locust activity.
5. During the special session of the Desert Locust Control Committee (DLCC) in December 2004, it was suggested that an independent evaluation of the whole Desert Locust campaign, including the activities carried out by FAO and all the other relevant institutions, should be organized. The Netherlands followed up in initiating the process and during a meeting of the stakeholders convened by the FAO Director-General on 29 August 2005, the evaluation was

¹ An **outbreak** is described as a marked increase in locust numbers due to concentration, multiplication and gregarisation which, unless checked, can lead to the formation of hopper bands and swarms.

An **upsurge** is described as a period following a recession marked initially by a very large increase in locust numbers and contemporaneous outbreaks followed by the production of two or more successive seasons of transient-to-gregarious breeding in complimentary seasonal breeding areas in the same or neighbouring Desert Locust regions.

endorsed by all parties concerned and a decision taken to put in place a Steering Committee for the evaluation with representation from all the partners in the Desert Locust campaign.

B. OBJECTIVES OF THE EVALUATION

6. The evaluation is designed to serve the needs of all partners in the campaign in order to strengthen future response capacity (i.e. affected countries; donors working directly with affected countries and donors working through FAO; Desert Locust organizations; and FAO). Based on a comprehensive evaluation of the efficiency, effectiveness and impacts of the roles and activities undertaken by all partners in the locust campaign, the evaluation will first and foremost provide findings and recommendations to be considered by all partners in strengthening future work to prevent and counter future locust outbreaks and upsurges. The evaluation will also provide accountability to all partners on the efficiency and effectiveness of resources deployed in the campaign.

7. The report of the evaluation together with the consolidated individual responses of the various parties to the evaluation will be provided for the consideration of the appropriate authorities and organs of the desert locust affected countries, desert locust organizations, donors and concerned international organization, including FAO².

8. The evaluation team will address the following issues and others it may identify as being pertinent:

- a) locust monitoring and early warning, including the role of national authorities, EMPRES and Desert Locust organizations for the early detection of outbreaks;
- b) capacities and arrangements for preventative control measures;
- c) institutional arrangements for rapid response in addressing locust outbreaks and upsurges, including the criteria for deciding on scale of justifiable response, launching an appeal and the rapid availability and deployment of adequate financial; physical and managerial resources (inter alia including need for pesticide prepositioning, maintenance of standing locust control infrastructures and options for ensuring adequate financial resources can be immediately available including the organization of international appeals);
- d) operational activities including coordination arrangements and implementation;
- e) the control strategy and measures employed, coordination of technical approaches and the availability of technical support;
- f) reduction of negative impacts from locust control operations, including those from use of pesticides (environment, human and animal health) and the potentials for the use of available alternative and safer locust control interventions that will help minimize environmental and health risks;
- g) assessment of locust damage and assessment of the implications for human livelihoods, poverty and any rehabilitation needs; and
- h) additional research needed to support further development of locust management, control and damage assessment and its implications (including biological control and the use of remote sensing).

C. COVERAGE OF THE EVALUATION

9. The evaluation will document the resources deployed and the roles played by the different groups of partners (affected countries, donors including developing countries assisting their neighbours, Desert Locust organizations, FAO). This will include detail of the financial resources, and inputs in terms of pesticides, logistics and human resources deployed and the funds made

² It is also envisaged that the report and consolidated comments will be considered by the Desert Locust Control Committee (DLCC) meeting in March or April 2006

available directly to countries and regional organizations (for aircraft hiring, pesticides, technical assistance, capacity-building, etc.).

10. It will examine efficiency, impacts, quality of work and cost and socio-economic effectiveness with respect to:

- a) **Social, economic and environmental costs and benefits**, including:
 - i) overall costs and benefits of the campaign (including impact on food security and sustainable livelihoods) and the cost-benefits of the campaign in comparison with other types of potential intervention;
 - ii) impact on the livelihoods of affected populations/communities with particular respect to, the poorest and most disadvantaged sections of those populations, including the gender dimension and the social structure/fabric (migration, conflicts between and among agricultural and pastoral/nomadic communities, effects on markets, etc.);
 - iii) cost and benefit implications of timing and timeliness in control measures;
 - iv) assessment of alternative approaches and techniques including locust control operations managed by farmers;
 - v) need for follow-up assistance to overcome food insecurity and maintain livelihoods, including any potential role for crop and livestock insurance;
 - vi) health and environmental concerns:
 - 1) implications for human health of various approaches to control including pesticide treatments, and use of different types of pesticides;
 - 2) implications for the environment of various approaches to control including pesticide application, and use of different types of pesticides (i.e. effects on biodiversity, pollinators, natural pest control, migratory birds, fish and water resources); and
 - 3) health and environmental considerations of locust operations managed by farmers.

- b) **Institutional and organizational aspects** including the roles played by national institutions, FAO, donors and locust organizations (CLCPRO, CRC, OCLALAV and DLCO-EA³) and the efficiency and effectiveness of all processes including:
 - i) coherence of strategies for locust management and control pursued by the various partners (donors, affected countries and FAO);
 - ii) coordination arrangements for the campaign;
 - iii) arrangements for ensuring availability of all types of information in easily utilisable form to partners and implementation units at all levels; including the role of FAO, regional Desert Locust organizations (CLCPRO, CRC, OCLALAV and DLCO-EA) and bilateral cooperation;
 - iv) the necessary flexibility, speed and inclusiveness, with respect to:
 - 1) ensuring monitoring and early warning;
 - 2) ensuring preparedness for outbreaks;
 - 3) contingency and response planning with particular relevance to rapid response capability (surge capacity) to mitigate outbreaks and potential upsurges;

³ CLCPRO: Commission de Lutte contre le Criquet Pèlerin dans la Région Occidentale (Commission for Controlling the Desert Locust in the Western Region); CRC: Commission for Controlling the Desert Locust in the Central Region; OCLALAV: Organisation Commune de Lutte Antiacridienne et de Lutte Anti-aviaire (Joint Anti-Locust and Anti-Avian Organization); DLCO-EA: Desert Locust Control Organization for Eastern Africa

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- 4) availability of local and national funds, emergency appeal and its relation to the UN consolidated appeal procedure, and possibilities for any form of standby or call-down funding;
 - 5) arrangements in FAO and donors for handling project formulation, revision, etc.;
 - 6) arrangements by all partners for contracting, procuring and deploying technical resources, as well as materials and supplies;
 - 7) operational activities, including those by FAO, bilateral donors, and affected countries in support to their neighbours and other countries;
 - v) arrangements for pesticide stewardship, including recovery and rehabilitation of excess left-over stocks and empty containers; and
 - vi) capacities and systems for assessments of locust damage and its socio-economic and livelihood and environmental implications and linking that to wider livelihood assessment.
- c) **Technical quality and adequacy**, including:
- i) locust detection and early warning activities;
 - ii) immediate reaction after detection;
 - iii) contingency plans in place for locust operations prior to, and during the current locust campaign;
 - iv) locust survey and control tactics during the upsurge including the treatment of different types of targets and the “work rate” of different control tactics, and their impact on various types of locust populations;
 - v) data collection and transmission of survey results;
 - vi) information on locust populations, areas treated and effectiveness in eliminating locusts;
 - vii) information to populations at risk from locusts/awareness-raising;
 - viii) pesticides:
 - 1) types of pesticides used, quantities, distribution and criteria for selection;
 - 2) pesticide storage and stock management, pesticide banks, management and disposal of empty containers, quality control of applications, handling and disposal of leftover stock and obsolete pesticides;
 - 3) applicability, effectiveness and efficiency of alternative locust control agents, such as insect growth regulators, entomopathogens (Green Muscle), and pheromones;
 - 4) availability of and capacity to implement techniques for assessing health and environmental risk and damage;
 - ix) assessment of crop and pasture damage and its implications on the food security and poverty situation.

D. THE EVALUATION REPORT

11. The evaluation report is the responsibility of the evaluation team and although the views of all partners in the locust evaluation should be sought by the team, the findings and recommendations of the evaluation will reflect the considered and independent views solely of the evaluation team.

12. The report will cover all the points detailed in these terms of reference including the points indicated under section B for the findings and recommendations. It may also include other issues identified as important by the evaluation team. The report will include an executive summary which will summarize key findings, conclusions and recommendations.

13. The conclusions and recommendations should be presented in clearly operational terms prioritising clearly the problems and issues to be addressed for future improvements of performance in prevention, monitoring between outbreaks, mitigation, control and follow-up to

locust outbreaks and upsurges that undermine the livelihoods of affected communities and pose serious threats to the environment. It should also address the link between locust damage and any necessary rehabilitation measures. Scenarios and alternatives for consideration should be presented as appropriate including attention to mechanisms for funding locust monitoring and prevention and early and coordinated response to locust upsurges and outbreaks.

E. THE EVALUATION TEAM

14. The evaluation team members will be selected on the basis of technical competence. Some of the team including the team leader should have competence in evaluation. No team member will be involved directly in the evaluation with respect to the actions of their own country or an agency from their country of origin. They will be required to cover the following areas of expertise as a group:

- a) organization, institutions and coordination;
- b) locust control operations management;
- c) programming, budgeting and project operations;
- d) monitoring, surveillance and early warning;
- e) environmental and health issues;
- f) communication and access to information;
- g) rural economics and economic analysis;
- h) social analysis and gender issues;
- i) implications for poverty;
- j) food security assessment; and
- k) rehabilitation and maintenance of livelihoods.

15. The team will be supported by research assistance for the desk reviews and questionnaires and some secretarial and operations support has also been budgeted. The team will divide into groups for visits and interviews.

F. EVALUATION WORKPLAN

16. The evaluation workplan and overall methodology will be presented in a timely way defined by the evaluation team leader to the steering committee for its approval. The team members will not all be employed continuously and teams for visits to affected countries and donors will split up. The evaluation will include the following activities:

- a) Desk review of documentation from FAO and other partners, including the main bilateral donors. This will include documentation of: actions taken by the various partners for the benefit of individual countries; an analytical review of the international appeal process; project document flows; pledge and receipt of resources; and timelines in contracting, delivery and operations (October-December 2005);
- b) Design and distribution of questionnaires to all partners (November 2005) and analysis of questionnaire responses (December 2005);
- c) Designation of countries for country studies and preliminary visit to organize field impact studies (December 2005);
- d) Stakeholder workshop to identify major issues (11 November 2005);
- e) Visits to all affected countries and field investigations in a representative sample, including visits to a sample of local surveillance and control teams in the field and discussions with locust-affected populations, including review of the results of impact studies (December 2005-January 2006);
- f) Contacts with donors for information and discussion (December 2005-January 2006);

- g) Preparation of a draft evaluation report, presentation of main findings and conclusions to a stakeholder workshop (and possibly a peer review) followed by circulation for comments (February 2006);
- h) Production of final evaluation report (March 2006); and
- i) Distribution of the report together with the consolidated comments of all parties to the evaluation (April 2006).

G. ORGANIZATION OF THE EVALUATION

17. A Steering Committee composed of representatives of the affected countries, the donors, concerned international organizations and FAO will provide oversight of the evaluation. Assistance in the coordination and organization of the evaluation will be provided by the Committee Secretariat (FAO Evaluation Service). The Evaluation team leader supported by the evaluation team will have full responsibility for the conduct of the evaluation, including full responsibility for the findings and recommendations of the evaluation report.

Annex II: Summary of Country Visit Reports

Algeria

Algeria has been able to effectively address the invasions of the Desert Locust using its own financial and human resources. The use of a system of data treatment and analysis incorporating satellite, terrestrial and meteorological data has facilitated the management of the Desert Locust control activities. The National Toxicology Centre has played a key role in monitoring the health status of all agents implicated in the control operations.

Algeria has supported in a significant manner, immediately at the beginning of the campaign, the Sahel countries affected by the Desert Locust.

Algerian authorities consider that a more effective application of a preventive control strategy in the Western Region would have reduced the extent of the 2003-05 invasions, resulting in a drastic reduction of the area to be treated. The Western Region is characterised by the presence of several seasonal breeding areas. It has also experienced the disappearance of OCLALAV. Consequently, the CLCPRO requires an immediate strengthening of its operational and technical capacities to endow the region with an effective regional coordination structure.

A pesticides bank at the regional level is indispensable to start treatments when needed; this would also avoid the accumulation of important leftover stocks. The recovery by local formulators of empty pesticide containers as practised in Algeria, constitutes an example to be followed in pesticide purchasing contracts.

In future, the control campaigns would benefit from appropriate contingency plans to manage the risk at the national, regional and international levels. This would avoid the urgency and pressures experienced in the course of the 2003-05 campaign.

Given the experience of the 2003-05 campaign, Algeria could benefit from utilising more extensively aerial treatments right from the beginning of the campaign. The Pesticide Advisory Group and the Technical Group of the DLCC should develop recommendations for the use of emulsifiable concentrates of insecticides and the necessary application equipment.

Burkina Faso

In Burkina Faso, notwithstanding the early alert by FAO of a possible invasion of the country by the Desert Locust, necessary steps have not been taken in time to address the first swarms. The initial teams were mobilised too late, after the arrival of the first swarms, were insufficiently equipped and had little experience.

With respect to the coordination of the campaign, several sub-regional structures fell over each other trying to control the management of the crisis by attempting to create special committees and seeking financial support from the donors. Burkina Faso has recently become a member of the CLCPRO, but the Regional Commission merits to become better known by the various sub-regional structures involved in agricultural development matters.

The absence of an acridology consultant for technical assistance and coordination activities at the FAO representation and the Plant Protection Direction was strongly felt during the crisis. Criticism were formulated by certain donors concerning both the way FAO managed the crisis and the lack of visibility of their contributions in FAO-managed projects.

Training provided after the crisis has been appreciated; however, reservations have been expressed concerning the choice of an FAO consultant recruited to lead a national workshop, but who did not master the French language. Training of staff on technical matters, as well as refresher courses should continue during the remission period.

The authorities consider that the chemical control operations have been carried out effectively with respect to human and environment protection aspects. An environmental impact study has been undertaken by an independent consultant.

A national budget should be reserved for locust control operations in the country. The maintenance of equipment should be handled by qualified staff. Efforts should also be undertaken by the government for the rehabilitation of the centre for the decontamination of empty pesticide containers, built under a Canadian project, and which is unique in its kind in the region.

Chad

Control of the Desert Locust has started under difficult conditions marked by insufficient material, human and financial means to manage the crisis appropriately. The few teams used for the operations were inadequately equipped, lacked sufficient protective clothing, and could only cover a few infested areas.

Lessons learned during the 2004 campaign have helped considerably to improve the management of the locust problem. Better organisation of the Desert Locust campaign was also achieved through the effective support by the FAO Representation. The improved distribution and exchange of information at the national and regional level has also benefited work in Chad. The efforts to train various staff should be continued especially with respect to the use and maintenance of spraying equipment and to environmental monitoring.

In a crisis situation the central command post should be staffed in a permanent manner. Insecurity problems require that military escorts be paid. The generosity of the donors, prompted largely by the way the Desert Locust invasion and its possible impact on the food security of the rural population had been publicised in the country, has made it possible to carry out various control actions and to equip, although belatedly, the country with means to carry out control operations against the Desert Locust under more effectively.

The different government representatives and the development partners encountered highlighted the coordinating role played by the FAO representation, due to the dynamism of its staff, in particular the representative and various consultants.

Generally speaking, the objectives aimed at for the campaign have been reached because the interventions have contributed to a reduction of the locust populations and have limited the losses caused to crops and pastures.

Egypt

Egypt has endowed itself with all the necessary means to control the Desert Locust in an effective manner. It has a series of central and decentralised autonomous structures each with the necessary operational budgets. These structures combine the functions of control, information, training, research and toxicological analysis and have well qualified staff and modern and well maintained logistical means.

About 200,000 ha have been treated in the course of the 2003-05 campaign. No cases of intoxication and contamination have been detected. However, the evaluation mission notes that notwithstanding the concerns of the government to reduce the negative effects of pesticides on human health and environment, systematic impact studies have not been carried out. Because of the complexity of the farming systems in Egypt aerial treatments are practically impossible. For that reason, treatments are only carried out through ground teams.

Only a limited amount of pesticides has been left over from the campaign. The empty containers, plastic and metallic, have either been completely destroyed or stored in secure places.

Libyan Arab Jamahiriya

Libyan Arab Jamahiriya has established in 1974 a National Locust Control Unit which has been transformed in 1987 into a national autonomous commission charged specifically with Desert Locust control.

The first mature swarms invaded Libyan Arab Jamahiriya in November 2003 in the border areas with Algeria. The swarms encountered favourable ecological conditions for egg laying and breeding took place on a significant scale. Hopper bands were formed, but the control operations undertaken in January 2004 delayed their development. New massive invasions occurred from July 2004 onwards. Certain coastal areas were invaded by the Desert Locust for the first time in twenty years. Significant losses have not been suffered because of the speed of the control interventions.

A large information campaign has been implemented through television, radio and posters to sensitise the local population with respect to the threat of the locust invasion, the necessity to inform the regional authorities after locusts had been spotted, and finally the potential side effects of pesticides and the danger to utilise empty containers.

Libyan Arab Jamahiriya has provided assistance to five African countries, Chad, Guinea Bissau, Mali, Niger and Senegal. In total 100,000 ha have been treated in these countries. This operation has not always been successful mainly due to the lack of appropriate logistical support, including the non-availability of aircraft fuel. These problems could have been partly avoided if there had been more effective coordination efforts with FAO and the CLCPRO.

The Libyan Arab Jamahiriya authorities consider that the locust warnings arrived too late. They also believe that the circulation of information between the neighbouring countries should be improved. More effective operations require that mandates for the teams operating in the border areas are extended beyond these areas.

Mali

At the beginning of the 2003-05 campaign, there was no operational control structure in place in Mali. Consequently, the potential importance of the Desert Locust outbreak has been underestimated, both by the national authorities and the donors, because of the lack of adequate information on the evolution of the Desert Locust.

In the course of the Desert Locust upsurge, a mobilisation of the national population, unique in its kind, has been undertaken in Mali. This mobilisation proved salutary for the start of the campaign while waiting for external existence. It has been accompanied by an important political engagement.

Given the importance of the seasonal breeding areas in the northeast of the country, Mali should equip itself with an effective and autonomous national unit for Desert Locust control, disassociated from the National Office for Plant Protection. It must be assured that this unit can follow permanently the evolution of the Desert Locust in the country and undertake preventive control measures in an effective and efficient manner. This would be the only way to completely master the threat of Desert Locusts in any frontline country.

Village brigades should not be involved in chemical control of the Desert Locust; they can play a decisive role in mechanical control and in monitoring activities. To reduce the negative impact of insecticides on human and animal health and on the environment, the control operations must be carried out solely by specialised teams using officially approved insecticides.

The authorities in Mali have taken a certain number of measures related to human health and environmental protection. To that effect, a structure has been established within the Ministry of Environment and Hygiene. Due to the delays experienced at the beginning of the campaign this structure has not been able to carry out in a systematic manner the necessary monitoring activities.

It has not been possible to obtain adequate data on the economic impact of the Desert Locust upsurge in Mali. This was due in particular to the fact that agricultural production has at the same time suffered severely from drought. An evaluation of losses caused has been undertaken in the middle of the campaign. It estimates the overall losses resulting from the Desert Locust invasion at 4 percent. However, the evaluation team was informed that more than one million people (10 percent of the total national population) have been seriously affected. In the area heavily infested by the Desert Locust farmers lost the totality of their cowpea crops; the other food crops have been destroyed between 67 to 83 percent. This resulted in an increased cost of staple food in the local markets in the affected regions.

The aeroplanes mobilised for the campaign in Mali have only been used for 33 percent of the time for which they were contracted. Some have not carried out any treatment. In the meantime, these planes could have been used in Mauritania where there was an urgent need. To carry out effective aerial control operations against Desert Locusts, which can move rapidly from one country to the other, the spray planes should only be mobilised under a regional contract.

Mauritania

Like the other countries, Mauritania was also taken by surprise by the extent of the Desert Locust upsurge. The logistic, human and financial means available at the beginning of the campaign did not allow the mobilisation of sufficient teams to cover the whole country. However, enormous efforts have been undertaken by the country to overcome the problems encountered. For this, the country has been helped by various development partners, especially the Maghreb countries which were among the first to provide assistance to Mauritania.

Virtually, the whole country has been affected by the Desert Locust invasion. The damage caused to crops and pastures has resulted in an important food insecurity situation which, according to FEWSNET data, has affected some 1,256,000 people, or about half of the total population,. The food shortages have been partly compensated by an upwards revision of the food aid and the provision of animal feed provided to the populations.

The new status of the National Locust Control Centre, now established as a public structure with administrative and financial autonomy, shows the interest accorded by the Mauritanian authorities to locust control. In fact this is considered as one of the highest priorities in the country's development policies. Experience gained by the staff of the Centre over the last ten years with respect to Desert Locust monitoring and control activities, has permitted in general the effective management of the control operations during the crisis, once the necessary resources had been acquired. However, additional training should be pursued, in particular for reserve personnel from other departments.

With respect to the health status of staff employed and protection of the environment, laudable effective efforts have been undertaken. No serious accidents have been reported. Pesticides were handled in an excellent manner with a very high recuperation percentage of empty containers (98 percent) which are destroyed according to international standards. The relatively important pesticide leftovers could create, however, a storage problem. Actions have been initiated to construct an appropriate pesticides store. Thought should be given to the creation of a pesticide bank for the sub-region.

The absence of an aerial strike force with a large autonomy and appropriate landing strips in many regions of the country is a major handicap to intervene in a rapid manner in an emergency situation in Mauritania. The possibility of acquiring at least one aeroplane with a large autonomy for locust monitoring and control should be considered. The experience of the air force should be used for the management and maintenance of such an aircraft. New landing strips should be identified and put into proper shape to assure speedy interventions and to improve the benefit/cost ratio of the operations.

The research station at Akjoujt has been identified as a regional station by the CLCPRO. It offers facilities to carry out research on Desert Locust under natural field conditions. This station could serve to promote Desert Locust research and to study alternative control means.

The role of the CLCPRO as a regional structure charged with the coordination of the control of the Desert Locust in the Western Region is not sufficiently known by the majority of the partners. Its role is currently overshadowed by the EMPRES programme and the direct involvement of the Locust Group of FAO in regional coordination. This situation risks that in the long term the Commission will lose its credibility notably with the member countries. Consequently, the CLCPRO should be endowed with a larger autonomy in the management and coordination of the control activities against the Desert Locust in the Western Region.

Morocco

Morocco has organised itself in an exemplary manner to address the Desert Locust invasions. This concerns both the communication and control operations, as well as the safeguarding of human and environmental health. Additionally, Morocco has provided a substantial aid to Sahel countries. Morocco has clearly proven that it is possible to master invading Desert Locusts through the establishment of a well-managed and efficient control system.

Moroccan authorities consider that a well planned and organised decentralisation of responsibilities of Desert Locust control from FAO headquarters to the Regional Commissions should be studied, in order to strengthen the interactions between FAO and the countries affected by the Desert Locust. A more effective monitoring and control system should be put in place in all the countries with the potential for seasonal breeding during recessions in the Western Region. The CLCPRO should be strengthened to be able to provide effective operational support to preventive control operations in the frontline countries.

Morocco has succeeded in purchasing pesticides at the lowest price (US\$ 2.95 per litre) thanks to a negotiating system linked to reference prices in the international market. A similar approach merits to be considered by FAO to reduce campaign costs.

The visit to the Souss valley, a region with a very high production potential for cash crops, clearly demonstrated to the evaluation team the enormous risks run in case Desert Locust invasions are not controlled in a rapid and effective manner. Some farmers have seen their crops wiped out overnight by the Desert Locusts.

At the end of this campaign, there is a large stock of pesticides in Morocco (4 million litres), as well as an enormous quantity of empty containers a large part of which has been crushed. The evaluation team considers that Morocco should take the necessary steps to develop a solution to this problem.

Niger

Niger, one of the frontline countries, does not have an autonomous national locust control unit. The “Centre National Antiacridien” (CNA) at Agadez created in 2000, and recently transformed into “Base de Lutte Antiacridienne d’Agadez” is responsible for monitoring of the seasonal breeding areas in the Air and Tamesna. A locust control unit in Niamey falls under the responsibility of the Plant Protection Service. Overlaps in roles and responsibilities noted by the evaluation team may have affected the management of the control operations. In this respect Niger, given its importance in the Western Region with respect to Desert Locust outbreaks and invasions, should create an autonomous and efficient national locust control unit, independent of the Plant Protection Service.

Such a “Centre National Antiacridien” must dispose of the necessary human and logistic means, as well as financial resources for the effective and independent operation of at least six permanent Desert Locust monitoring and control teams.

Niger has a “Fonds Commun des Donateurs” which is one of the tools of the Programme for the Prevention and Management of Food Crises. The use of this fund at the beginning of the control campaign was very useful. It has provided a contribution of US\$ 1.6 million at the start of the control operations before the mobilisation of external aid. Such a financing mechanism merits to be considered by the other frontline countries in the Sahel.

Niger treated 272,428 ha out of a total of 750,000 ha foreseen in the emergency plan for 2004. The difference is essentially due to a shortage of insecticides, insufficient logistical and human means, limited involvement of different national structures including other ministerial departments, the inadequate organisation of the campaign, as well as the late arrival and poor state of aeroplanes provided by FAO.

In the north of the country, all the monitoring teams are accompanied by a military escort because of security reasons, which has implications for their mobility and costs. Data analysis and the transmission of information, supported by the use of satellite images are carried out in an effective manner by the Centre in Agadez.

The cereal deficit for 2004 is estimated at 27 percent or about 223,487 tonnes. In addition, a reduction in grassland production of over 4,460,000 tonnes has been registered in the areas invested by the Desert Locust, leading to an early transhumance of nomads and their herds. It has been estimated that two-thirds of the production losses have been caused by drought and one-third by locusts. However, these estimates were carried out before the end of the Desert Locust invasions.

The donors consider that the operational support provided by FAO to the control campaigns in the affected countries could have been done in a more effective manner, in case more responsibilities had been entrusted to the CLCPRO. The Regional Commission should be better known in the region. A more intensive collaboration with regional structures, such as AGHRYMET, has also been proposed.

The phytosanitary brigades are a key element of the system established by the Plant Protection Service for pest control. Because of their lack of efficiency with respect to the areas treated (2 percent of the total) during the campaign 2003-05, and of the impossibility to ensure their adequate protection, their involvement in the locust control campaign is not supported by all parties in Niger.

The Ministry of Environment was not able to carry out a monitoring and evaluation programme of the possible impact of Desert Locust control operations. Notwithstanding the sensitisation efforts undertaken by the Plant Protection Service to avoid the risk of using empty containers for domestic purposes, only 30 percent has been recuperated.

Saudi Arabia

During the 2003-2005 campaign Saudi Arabia received the first wave of swarms on 26 October 2003, in the winter breeding areas located on the Red Sea coast, in particular the region of Jeddah and Makka. The control means mobilised consisted of 34 control teams, 8 monitoring teams and 4 aircraft. In total 33 swarms have been treated over an area of 22,155 ha between 2003 and 2004. In addition, treatment of hopper bands has covered 141,146 ha. The total costs are estimated at US\$ 3,201,418.

Since then, the Desert Locust situation has remained relatively calm. It may be concluded that Saudi Arabia has effectively stopped the upsurge in the Central Region. However, it does not seem possible to repeat the Saudi experience in most of the other countries of the region, because the quantity of means mobilised for monitoring and control is well beyond the capacity of those countries. However, it might be worth considering how the capacity available in Saudi Arabia could be used in support of operations to be carried out in the neighbouring countries within the framework of the Regional Commission for the Control of the Desert Locust in the Central Region.

Senegal

At the end of June 2004, Senegal experienced unprecedented Desert Locust invasions. The very limited locust control means available in the country were concentrated in the department of Matam, which was infested the heaviest at the onset of the invasions. However, these control means were insufficient to prevent the worsening of the situation. There was a crucial lack of a wide range of matters, including qualified personnel, vehicles, spraying and pumping equipment, GPS, maps, protective clothing, as well as pesticides and aeroplanes. As a result, Desert Locusts breeding occurred in the whole northern half of the country.

The control campaign was undertaken initially only with ground teams (53); aeroplanes were used in large numbers (20) in the course of the second half of October 2004. The aerial control means while arriving late have nevertheless made it possible to reduce substantially the important potential of the locust populations. However, significant crop and pasture losses have been registered especially on groundnuts, cowpea and millet in the centre and northwest of the country and in the regions of Louga, Diourbel, Thiès, Saint Louis and Dakar. Approximately 15-20 percent of the subsistence farmers living in the affected regions has lost their entire production, part of these have benefited from food aid programmes.

In general, the pesticides used, in particular fenitrothion and chlorpyrifos, have given satisfactory results, as shown by the mortality percentages transmitted in various messages. These were usually higher than 80 percent. Lack of the effective evaluation of the impact of the control operations does not permit to obtain reliable estimates on environmental effects.

The authorities consider that the campaign objectives have been reached. The intensive treatments have succeeded in limiting losses and to protect the major groundnut production area. Training efforts should continue to further improve future control operations. Special attention should be paid to the maintenance of equipment and the management of pesticide stocks and empty containers. From April 2005 to January 2006, pesticide stocks remaining from the Desert Locust campaign have decreased by more than 200,000 litres from 877,700 to 672,760 litres. The fate of these pesticides remains unknown. At the same time, the evaluation team noted also a significant number of empty pesticide drums for sale in the local markets. Chemical analysis of pesticides, in particular the current leftovers, should be carried out periodically to check their validity. The urgency to construct a pesticide store is stressed by the evaluation team.

Sudan

Joint efforts of the government of Sudan and the donor countries, in particular, Saudi Arabia, have permitted the country to effectively address the Desert Locust threat. The management of the control campaign is the responsibility of the Locust Service supported by the Anti-Locust Steering Committee. Notwithstanding the abruptness of the invasion, the migration into almost the whole country and the breeding of the Desert Locust in certain areas, such as Darfur, the Sudanese authorities have maintained their calm. FAO made it possible to undertake monitoring activities in the Darfur area, notwithstanding the insecurity situation.

Apart from the strong technical support provided by FAO, the slowness of its financial procedures has seriously affected, at the beginning of the campaign, the release of funds allocated within the framework of the emergency project for Desert Locust control prepared by the Sudanese government under the FAO TCP.

The management of pesticide stocks, both those of good quality and obsolete products, as well as empty containers, is done under adequate storage conditions. Under the unfavourable climatic conditions in Sudan, pesticides deteriorate in about three year's time because of high temperatures, which excludes long-term storage. Therefore the security stock in Sudan is maintained at a low level and will be used before the expiry date of the pesticides. The evaluation

team considers that for empty containers the new recycling method based on decontamination, compacting and melting in foundries merits to be used in Sudan.

In the national control strategy, priority is given to safeguarding crops and pastures through the use of pesticides applied essentially with aerial means. A unit for the appropriate utilisation of pesticides exists at the level of the Pesticides Directorate with a clearly defined mandate. However, it should be noted that this entity has not been very active in the course of the last control campaign. The Government of Sudan has an outstanding programme for the homologation and demonstration of alternative bio-pesticides to try to mitigate the extensive use of conventional insecticides.

The system for Desert Locust control in Sudan is well structured. In fact, the Locust Centre is staffed with a large number of permanent staff which is based in the main stations and sub-stations. Appropriate control means are available in these stations which cover all the important areas of the country. The Centre disposes of an adequate autonomous budget allowing it, to be operational the whole year.

Tunisia

The locust control operations in Tunisia are undertaken by the Sous-Direction du Contrôle Sanitaire Interne, which falls under the responsibility of the General Direction for the Protection and Control of Agricultural Products.

The strategy adopted in Tunisia for the control operations from March 2004 onwards, aimed at maintaining the greatest secrecy in order to avoid unfounded concerns. The instructions to maintain silence were such that in certain cases the campaign came to an end, without the inhabitants of the infested regions and the staff of the Ministries concerned having been aware of it. Initially, neither FAO nor the media had been informed of the threat.

The beginning of the campaign was characterised by a certain number of insufficiencies related to control and communication means, and the lack of GPS, resulting in monitoring difficulties and the impossibility to dispose of the geographical coordinates of the locust monitoring data. Also the capacity of the control teams left to desire; certain teams had never seen locusts and sometimes training on the spot had to be provided. However, in the autumn of 2004 the situation had considerably improved.

The total area treated has been estimated at 276,378 ha. The ground and aerial treatments proved to be effective, except in some rare cases where only partial mortality was noted. The losses caused to agricultural production were minimal and concerned mainly fruit trees (almonds and figs).

A study has been carried out by the "Centre International des Technologies de l'Environnement" at Tunis on the environmental impact of the chemical control operations, which revealed no visible effects on fauna and flora. Human health tests were also negative.

Yemen

The locust situation in Yemen has been relatively calm with the exceptions of small infested areas totalling 500 ha. The development of the Desert Locust upsurge has been stopped in time. These excellent results are essentially due, on the one hand to the meteorological conditions characterised by low and irregular rainfall, and on the other to the actions undertaken with technical and financial support from FAO, by the Locust Monitoring and Control Centre based at Sana'a.

The positive performance of the Locust Control Centre in Yemen has been confirmed by a recent evaluation mission of the EMPRES Programme for the Central Region, which placed the Centre among the best in the Region.

Nevertheless, the evaluation mission was informed of up to 20 percent of losses in some cereal crops. The families affected have not been identified, neither compensated. The Locust Control Centre admitted that all the infested areas had not been controlled, in particular those with insecurity problems and those where beekeepers opposed chemical control. Impact of pesticide treatments has not been monitored systematically.

The Locust Control Centre in Yemen is an autonomous structure with its own staff, but without a proper budget. For example, during 2005 most of the survey activities have been financed by either the FAO TCP or the EMPRES programme. The government has contributed in total US\$ 12,000. The lack of resources has resulted in the non-renewal of decrepit logistic means, the poor state of equipment and infrastructure, as well as a lack of staff motivation.

To address the insecurity problems the Locust Control Centre integrates into its field teams members of the clans occupying the regions that have to be monitored, to serve as guides or resource persons, and/or armed military people to protect members of the field teams. Recently, an agreement to monitor and control jointly the border zone between Yemen and Saudi Arabia has been developed with the support of the EMPRES programme, and has been signed at a high level in the two countries.

The tensions between the monitoring and control teams and the beekeepers have been reduced by negotiating the transfer of the beehives to regions not infested by the Desert Locust, with vehicles of the Centre. The experience by Yemen offers ways to address insecurity problems and the co-existence of players having sometimes contradictory objectives, as well as the strengthening of cooperation between neighbouring countries for the monitoring and control of the Desert Locust.

Annex III: Area treated during the 2003-05 Desert Locust Upsurge

It should be noted that "hectares treated" as reported by the DLIS is often derived from the quantity of pesticide sprayed divided by the recommended dosage rate, especially for ground spraying. When aircraft equipped with a DGPS track-guidance system connected to the flow-meter are used, a more accurate measure of the hectares treated is available.

Table 1a: Hectares treated against the Desert Locust as reported to FAO/ECLD DLIS

	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04
Burkina Faso	0	0	0	0	0	0	0	0	0
Cape Verde	0	0	0	0	0	0	0	0	0
Chad	0	0	0	0	0	0	0	0	0
Gambia	0	0	0	0	0	0	0	0	0
Guinea	0	0	0	0	0	0	0	0	0
Guinea Bissau	0	0	0	0	0	0	0	0	0
Mali	80	12,573	17,437	0	0	0	0	0	0
Mauritania	1,607	12,689	50,209	134,201	81,59	26,476	13,918	2,049	1,292
Niger	192	90	3,92	1	1,088	2,930	1,00	0	200
Senegal	0	650	0	0	0	0	0	0	30
Algeria	528	2,932	1,663	59	6,023	95,41	349,913	443,715	924,209
Libya	0	900	0	800	0	0	28,961	72,670	59,47
Morocco	0	8,873	13,796	26,622	97,354	446,936	346,02	452,593	736,750
Tunisia	0	0	0	0	0	0	0	79,943	NR
Cyprus	0	0	0	0	0	0	0	0	0
Egypt	203	613	13	0	895	2,704	43	1,433	1,672
Eritrea	0	0	0	0	1,920	0	0	0	0
Ethiopia	0	0	0	0	0	0	0	0	0
Israel	0	0	0	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	0	0	0
Lebanon	0	0	0	0	0	0	0	0	0
Saudi Arabia	0	3,000	26,336	89,27	24,572	2,375	1,040	0	0
Sudan	4,836	12,000	1,836	542	308	959	596	6	0
Yemen	0	0	0	0	0	0	0	0	0
Total	7,446	54,320	115,082	251,952	213,619	578,121	742,273	1,052,409	1,723,300

Table 1b: Hectares treated against the Desert Locust as reported to FAO/ECLD DLIS

	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05
Burkina Faso	0	200	12,247	14,12	0	0	0	0	0
Cape Verde	16	0	500	497	1,874	450	80	0	0
Chad	0	0	8,801	8,423	0	0	0	0	0
Gambia	0	0	0	0	0	8,385	6,037	0	0
Guinea	0	0	0	0	0	0	3,900	5,450	15,000
Guinea Bissau	0	0	0	0	0	0	0	7,368	0
Mali	6,285	16,403	218,081	106,582	5,050	3,100	0	0	0
Mauritania	5,071	34,636	200,996	446,541	312,368	59,987	0	0	0
Niger	1,075	4,397	98,025	96,383	10,700	2,535	0	0	0
Senegal	3,673	56,948	211,397	378,536	60,542	52,484	5,921	4,200	210
Algeria	844,249	7,019	2,800	131,745	685,371	441,341	218,716	316,921	36,175
Libya	3,095	0	1,060	4,925	44,646	5,340	220	0	0
Morocco	724,913	5,433	505	459,033	1,075,260	384,796	68,412	6,110	570
Tunisia	NR	0	0	14,185	11,606	0	630	350	10
Cyprus	0	0	0	462	0	0	0	0	0
Egypt	1,793	0	6	60	50,000	47,675	1,941	11,042	2,053
Eritrea	0	0	0	0	0	0	0	0	0
Ethiopia	0	0	0	0	0	0	0	0	0
Israel	0	0	0	0	NR	0	0	0	0
Jordan	0	0	0	0	4,520	2,003	0	0	0
Lebanon	0	0	0	0	10	0	0	0	0
Saudi Arabia	0	0	0	60	1,100	20	0	0	0
Sudan	0	0	0	0	0	0	1,320	2,685	4,776
Yemen	0	0	0	175	0	0	0	0	0
Total	1,590,170	125,036	754,418	1,662,319	2,263,047	1,008,116	307,177	354,126	58,794

Table 1c: Hectares treated against the Desert Locust as reported to FAO/ECLC DLIS

	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05		Total
Burkina Faso	0	0	0	0	0	0	0		27,159
Cape Verde	0	0	0	0	0	0	0		3,417
Chad	0	0	4,272	1,320	0	0	0		22,816
Gambia	0	0	0	0	0	0	0		14,422
Guinea	0	0	0	0	0	0	0		24,350
Guinea Bissau	0	0	0	0	0	0	0		7,368
Mali	0	0	0	0	0	0	0		385,591
Mauritania	0	0	0	0	0	0	0		1,383,499
Niger	0	1,200	271	0	0	0	125		224,604
Senegal	0	0	0	0	0	0	0		774,591
Algeria	547	1,570	1,200	200	770	315	5,120		4,518,842
Libya	0	0	0	0	0	1,005	0		222,769
Morocco	0	47	6	0	0	0	0		4,854,211
Tunisia	0	0	0	0	0	0	0		106,724
Cyprus	0	0	0	0	0	0	0		462
Egypt	542	557	50	0	0	0	0		123,295
Eritrea	0	0	0	8,933	11,117	85	0		22,055
Ethiopia	0	0	28	45	158	0	0		231
Israel	0	0	0	0	0	0	0		0
Jordan	0	0	0	0	0	0	0		6,523
Lebanon	0	0	0	0	0	0	0		10
Saudi Arabia	2,707	5,155	600	0	0	0	0		156,692
Sudan	0	0	0	1,726	12,289	159	0		44,038
Yemen	0	0	0	0	0	175	0		350
Total	3,796	8,529	6,426	12,224	24,334	1,739	5,245		12,924,19

Annex IV: Training Activities undertaken by FAO in the Western Region

Multipurpose training treating various aspects: (i) the bio-ecology of the Desert Locust, (ii) locust survey and monitoring, (iii) locust control, (iv) preservation of human health and the environment, and (v) the management of a locust control campaign

First phase: the first regional training course of trainers on the major themes related to the management of the Desert Locust was held at the ICRISAT Centre at Niamey, from 14 March till 6 April 2005. It included a total of 21 participants from 11 countries affected by the Desert Locust, i.e. three participants from each of the four Sahel frontline countries (Chad, Mali, Mauritania, Niger) and from Senegal, one participant from each of the five Southern Circuit countries (Burkina Faso, Cape Verde, Gambia, Guinea, Guinea-Bissau) and one participant from Djibouti (within the framework of cooperation between the two Regions).

During the training course, in addition to the improvement and standardization of their respective knowledge and understanding of educational methods, with the support of a CD-Rom presenting the 5 above-listed modules, trainers developed their own national training programmes comprising three sessions of five days each, and to be organized in May 2005, before the starting of the summer campaign. Notwithstanding the very heavy programme, the participants enjoyed the training considering the proposed themes, the quality of the presentations made by four international consultants and the national professional officer of the EMPRES-WR Programme, and the overall organisation including the educational approach.

Second phase: a majority of the 20 new master-trainers (some have to dedicate themselves also to other tasks such as the preparation of the Desert Locust campaign) have carried out in May 2005 three national training courses, often with the help of an international consultant, assisting in these courses as an observer and resource person. These national courses were undertaken in ten Sahel countries and have permitted to strengthen the capacities of 600 national staff. They submitted joint reports on their training activities.

Third phase: (end 2005/early 2006) training sessions of two days, during which the master-trainers which had participated in the regional course at Niamey and taught later at national level, supervised an evaluation and monitoring exercise in the field with the staff previously trained. So far, these activities have been undertaken in eight countries (Cape Verde, Chad, Burkina Faso, Guinea-Bissau, Mali, Mauritania, Niger and Senegal). FAO staff attended two of these exercises, in Niger and Mali during January 2006.

Training related to the control of the quality of locust control treatments (QUEST)

First phase: FAO has organised from 13-23 April 2005 a regional workshop to train trainers. In total 21 persons from six Sahel countries participated, from Ministries of Health and Environment, and of Agriculture. The workshop dealt with the following matters: impact of locust chemical control operations on water bodies, fauna and flora, and the identification of the most vulnerable non-target species, which must be followed during the whole control campaign.

Second phase: national training sessions of five days each, organised between August and December 2005 in six countries (Chad, Burkina Faso, Mali, Mauritania, Niger and Senegal) bringing together about ten participants specialized in environmental health or plant protection. This training served as the basis for the establishment of the national teams charged with the control of the quality of the locust control treatments.

A regional technical workshop was organised from 5-15 December 2005 in Senegal involving 14 environmentalists/mathematicians. The workshop dealt with the recognition of species and treatment of data collected.

Other national training courses held in countries on specific topics

In the course of the 2003-05 control campaign FAO, with the help of various donor resources, contributed to the organisation and financing of the following national training courses related to various Desert Locust monitoring and control matters.

- Algeria: control strategy and transmission of locust data, 6-8 October 2003.
- Chad: monitoring techniques, July 2004.
- Guinea, spraying techniques for 16 participants from 23-26 November 2005.
- Libya: monitoring and control techniques, 27 March - 3 April 2004, and training sessions in various regions, March 2005.
- Mali: on the spot training on survey and data collection through a field mission carried out by two FAO staff. Courses of four days each, held between 26 February and 10 April 2005. In total 150 staff members have been trained in the bio-ecology of the Desert Locust and in monitoring and control techniques.
- Mauritania: management of locust information, August – October 2004.
- Morocco: monitoring of cholinesterase levels for the protection of control operators, 26 September - 1 October 2004.
- Niger: eight higher level technical plant protection staff members at the AGHRYMET Centre during 2004. On the spot training re survey and data collection through a field mission carried out by two FAO staff.
- Senegal: management of locust information (use of new technologies), 24-29 May 2004.
- Tunisia: monitoring techniques 11-12 October 2004, use of GPS, 30 November - 3 December 2004, and control of the quality of locust control treatments, 7-15 September 2005.

Annex V: Details of bilateral assistance provided to the 2003-05 Desert Locust Control Campaign

The Algerian assistance to the Sahel countries included 105 monitoring and control teams, 211,000 litres of pesticides, 800 knapsack sprayers and 800 monitoring and protection kits. This assistance involved the mobilisation of 300 staff members.

The assistance provided by Morocco included the sending of two ground teams to Mauritania in November 2003, and in addition eight aeroplanes and 20 vehicles, spraying and communication equipment, and some 350,000 litres of pesticides during 2004. Similar support, in qualitative terms, has been provided to Senegal. Flying hours and pesticides have also been provided to Cape Verde, and pesticides to Mali.

Among the beneficiary countries Mauritania has received an important support from neighbouring countries, in the form of ground intervention teams (Algeria, Gambia, Morocco, Senegal), pesticides and protective clothing (Algeria, Morocco and Tunisia) and spraying equipment and flying hours (Morocco). The approximate value of these gifts is as follows.

Country	Assistance	2004	2005	Total in US\$
Algeria	Pesticides and protective clothing	216,000		216,000
Morocco	Vehicles	200,000	250,000	450,000
	Radios	50,000		50,000
	Flying hours	317,500		317,500
	Sprayers and protection kits	195,796		195,796
	Pesticides	400,000	2,000,000	2,400,000
Tunisia	Pesticides	80,000		80,000
				3,709,296

Algeria, Libyan Arab Jamahiriya and Morocco have provided significant assistance to Senegal in the form of pesticides, spray planes and ground intervention teams.

Mali has mainly benefited from assistance by African countries in the form of:

- pesticides: South Africa (84,800 litres), Algeria (60,550 litres), Libyan Arab Jamahiriya (44,600 litres), Morocco (5,000 litres), and Tunisia (5 000 litres);
- flying hours; South Africa (200), and Libyan Arab Jamahiriya (300); and
- vehicles: Algeria (6 4x4, 6 lorries, 6 UNIMOG), Burkina Faso (3 4x4), Libyan Arab Jamahiriya (20 4x4, 2 lorries).

Chad has benefited from the following aid:

- Algeria: pesticides 10,000 litres and 100 knapsack sprayers and protective clothing;
- Libyan Arab Jamahiriya: pesticides 5,000 litres, monitoring teams and two aeroplanes; and
- Sudan: pesticides 6,800 litres.

A number of countries which are not members of the CLCPRO (Cape Verde, Gambia, Guinea Bissau and Guinea Conakry) have also received help from other African countries.

Important assistance has been provided from outside the sub-region in a bilateral manner to the countries affected by the invasion. Brazil (US\$ 269,000), China (US\$ 184,825) and France (US\$ 18,825) have provided assistance to Senegal. Morocco has received bilateral support from USAID (US\$ 3 million), Spain (US\$ 2,800,000), Netherlands (US\$ 1,800,000) and Korea (US\$ 1 million). Mali received assistance from the EC (US\$ 2,120,00). Seven countries in the Sahel received emergency assistance through the World Bank Africa Emergency Locust Project which totalled US\$ 11 million for the campaign.

The resources provided through FAO to the affected countries, in percentage of the total costs, included pesticides (44 percent), sprayers (4 percent), protective clothing (1 percent), communication equipment (5 percent), vehicles (4 percent), flying hours (22 percent), human resources (7 percent), and other inputs (14 percent).

Annex VI: Benefit/costs ratios

The objective of the control campaign was to protect crops and pastures to safeguard the food security situation and revenues of the communities affected by the Desert Locust invasions. For this purpose equipment, inputs and services have been provided. Different types of food aid for people and animals, and rehabilitation activities such as the distribution of seeds, and agricultural equipment and veterinary products, as well as the improvement of small vegetable parameters, have been undertaken for the relief of the affected communities. From this point of view, the cost of the campaign must include the totality of the expenses for the control campaign, as well as the additional economic effects of the invasions and the control campaign.

The control campaign has saved crops and pastures in the infested countries. Control capacities in these countries have been strengthened; infrastructures have been rehabilitated or set up, employment opportunities (increase of the number of monitoring and control teams, etc.) have been created, etc. In addition, local enterprises have obtained contracts within the framework of the control operations thus increasing their turnover. The equipment received has facilitated the work of the monitoring and control teams. The economic and social benefits of the campaign must ideally be calculated on the basis of the value of all the above factors. However, an important part of these benefits could not be evaluated and quantified due to lack of data. Consequently, benefit/costs ratios can only be calculated in an approximate manner, and two examples, based on data collected by the evaluation team, are presented in the following.

The 2003-2005 campaign has protected losses linked to the Desert Locust of:

- some 14,414 tonnes of cereals in Chad and about 37,603 tonnes in Burkina Faso. At a price of US\$ 0.30 per kilo their value would be about US\$ 4,323,780 in the case of Chad and US\$ 11,281,140 in the case of Burkina Faso;
- pastures for about 15,137 animals in Chad and 9,761 animals in Burkina Faso. With weight losses estimated at 150 gr/day/animal during five months of food shortage per year, and an average market price per living animal of about US\$ 1 per kilo, the equivalent of US\$ 2,886,702 for Chad and US\$ 2,220,627 for Burkina Faso has been saved.

Consequently, the value of the subsistence means saved is about US\$ 7.19 million for Chad and US\$ 13.50 million for Burkina Faso. These two countries have spent for the control campaign US\$ 4.7 million and US\$ 1.6 million respectively. Thus the benefit/cost ratio can be estimated at 1.5 for Chad and 8.4 for Burkina Faso. If one takes into account the food aid provided to Burkina Faso, which is evaluated at US\$ 8.28 million, the benefit cost ratio for this country would become 3.2.

The total cost of the locust control campaign 2003-05 was about US\$ 280 million. The campaign has permitted to protect the subsistence means of some of the affected communities. The above benefit/cost ratios show that in these cases benefits of at least 150 percent of the expenses have been realised. The benefits of the campaign are probably much more important than shown by this percentage, because they must also consider the development of the human capital following the various training activities undertaken during the campaign, as well as matters such as the new employment opportunities created, and the increased turnover of local businesses carrying out activities within the framework of the Desert Locust control campaign.

Septembre 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

PROPOSAL FOR AN EMERGENCY FUND FOR DESERT LOCUST MANAGEMENT (Agenda Item 6f)

1. INTRODUCTION

The first review of lessons learned from the 2003-2005 Desert Locust emergency was made at the Extraordinary Session of the DLCC in November/December 2004. This review identified the late arrival of funding as a major constraint in the execution of the control campaign. The DLCC discussed the issue and recommended that FAO, in consultation with donors, should consider establishing a substantial emergency fund that could be drawn on at the beginning of a Desert Locust upsurge.

This conclusion was reiterated at the internal After Action Review held in Rome in March 2005, and in a series of meetings involving representatives of locust-affected countries, including the Session of the Commission for Controlling the Desert Locust in the Western Region (CLCPRO) in June 2005, a specialist workshop on pesticide stocks jointly sponsored by the World Bank and FAO in May 2006, and at the Session of the Commission for Controlling the Desert Locust in the Central Region (CRC) also in May 2006. The Multilateral Evaluation of the 2003-2005 Desert Locust Campaign found that locust-affected countries listed the creation of an emergency fund as the first of key issues. The Evaluation also recommended that FAO establish a “targeted intervention fund, with clear guidelines for its operation, so that it can rapidly undertake the necessary actions.”

The locust-affected countries have taken a further step in underlining their support for an emergency fund by proposing that consideration be given, in the Western Region, to the design of a “locust management financing mechanism”, and possibly placing any eventually unspent funds from the World Bank African Emergency Locust Project (AELP) in some sort of emergency fund. Part of the motivation for this proposal was to have funds available for: i) the rapid purchase of pesticides, so that it would not be necessary to hold a stock of pesticides in-country that risked becoming obsolete; and ii)

access to funding for emergency relief to people affected by locusts. In the Central Region, agreement in principle was given by the member countries of the Commission to allocate between US\$ 0.5 and 1 million from their own Commission Trust Fund to an emergency fund. The motivation for this was to provide assistance to resource-poor countries in the Region that were affected by an upsurge in locust populations, enabling them to carry out control and prevent the locusts from invading neighbouring countries. The details of how the emergency fund would function and how decisions would be taken to use it were to be developed by the Commission Secretariat, screened first by the Executive Committee and then presented to the full Session in 2008.

2. THE PURPOSE OF AN EMERGENCY FUND

It cannot be expected that all the Locust Control Units, even when they have development support provided by EMPRES, AELP, ADB and other donors, will have the necessary capacity to prevent all upsurges and plagues and meet the costs of the necessary measures to protect their crops when such emergencies occur. When meteorological conditions are favourable over very large areas of suitable locust habitat for a sufficiently extended time, allowing several generations of locusts to breed, national capacity may easily be overwhelmed. For example, if the national capacity in the Western Region had been strengthened to a sustainable level prior to the 2003/2005 locust emergency, outbreaks might have been discovered earlier in Mauritania, Mali and Niger, and the resulting upsurge might have been less severe. Nevertheless, the rapidity of the development of each outbreak and the subsequent upsurge, the extensive and inaccessible areas involved and the favourable weather conditions made it highly unlikely that any action in late 2003/early 2004 could have successfully stopped the upsurge.

On the other hand, if sufficient funds had been immediately available in late 2003 and early 2004, earlier planning for the summer campaign in the Sahel and pre-positioning of resources to treat the incoming swarms (June 2004) and their progeny could have been achieved. This would have protected crops better substantially reducing crop losses, and would have allowed a campaign against the first generation of hoppers which would most likely have led to fewer swarms forming and emigrating northwards and southwards during the autumn.

In the future, it can be expected that improvements in the LCUs, under EMPRES, will allow small outbreaks to be successfully controlled by the countries themselves, perhaps with some help from within the region. Such was the case in the Central Region in 2003/2004 where the combined efforts of Sudan and Saudi Arabia, coordinated by the CRC/EMPRES, succeeded in containing the outbreak that began in Sudan. Almost all the resources came from within the Region, with the Sudan contributing its own funds and pesticides and receiving bilateral assistance from Saudi Arabia worth US\$ 2 million.

If the LCUs, with the support of EMPRES and the Commissions, can address most outbreaks, it follows that an international emergency fund is needed to ensure the immediate availability of resources when large outbreaks and early upsurges occur. In the case of large outbreaks, upsurges and plagues, funds are mainly needed for survey helicopters, pesticides, spray aircraft, operational costs for survey and control, various equipment, safeguarding human health and the environment, and additional expertise. Funds are also needed to provide humanitarian relief to people who have been severely affected by locust damage to their crops and pastures. All of these items need to be

provided quickly when an emergency situation begins to develop or, in the case of humanitarian relief, very soon after the damage has been done.

A locust emergency action fund would provide key inputs for resource-poor countries in the expectation that the fund's resources would be sufficient to protect crops immediately against Desert Locust and, if conditions permit, contribute to the decline of the upsurge and provide time to mobilize additional funds as required. This would avoid the situation that occurred during the last upsurge when substantial funding only became available seven months after the first Appeal was issued in February 2004.

3. OTHER EMERGENCY FUNDS

3.1. National Emergency Funding

At the 3rd CLCPRO Session in June 2005, a recommendation was made that countries should establish their own national emergency locust funds. Those that are better resourced, such as Algeria, Libya and Morocco, in the Western Region, and Saudi Arabia and Oman in the Central Region, already have such funds and can draw on them at short notice. The Sahelian and resource-poor countries in other Regions have much more limited possibilities but can access some of their national resources. For example, Mauritania was able to meet in part the cost of surveys and control in 2003/2004, mainly covering the salaries of the many extra staff that were recruited to support the campaign, but also the cost of fielding a spray aircraft to help with operations (the equivalent of US\$ 1.2 million). Such resources, available nationally, are useful for early reaction against locust populations, but are generally not nearly sufficient for any major campaign. Although the amounts available may increase through the interest in preventive control created by EMPRES and the Commissions, it is inevitable that outside assistance will be needed for locust emergencies in the Sahel and other resource-poor countries for the foreseeable future.

3.2. Regional Emergency Funds and Assistance

Action to initiate a regional emergency fund has been taken in the 25th Session of the CRC, using unspent funds accrued from previous years. The CRC has also habitually allocated US\$ 100,000 per biennium for emergency purposes. During the 2003-2005 emergency, Saudi Arabia provided US\$ 2.3 million bilaterally to strengthen Desert Locust control capacity in Sudan and Eritrea. In the Western Region, assistance provided by the Northwest African countries to their southern neighbours is estimated to have been worth about US\$ 20 million. It involved pesticides, spray aircraft and ground control teams. The EMPRES Western Region programme has identified the need to establish a protocol for cross-border survey and control teams as part of its 2006 work plan. As a follow-up, members of CCLPRO may wish to consider the establishment of a regional emergency fund in the future.

4. CONSIDERATION OF AN INTERNATIONAL EMERGENCY FUND

The DLCC may, as a follow-up to the recommendation of its extraordinary session and in line with the recommendation of the independent evaluation, consider further the establishment of an international trust fund, taking account of:

4.1. Size of an international trust fund

Based on the experience of the 2003-2005 Desert Locust upsurge, an emergency fund of about US\$ 30 million would be needed to provide emergency support to resource-poor locust-affected countries. This amount would allow nine countries each to receive: up to 100,000 litres of pesticide (total: US\$ 9 million at US\$ 10/litre including transport); two survey/spray helicopters or fixed-wing spray aircraft for 200 flying hours (total: US\$ 9 million at US\$ 2,500/hr including logistics); up to US\$ 500,000 to cover operational costs, equipment and expertise (total: US\$ 4.5 million); up to US\$ 500,000 for humanitarian aid; leaving about US\$ 3 million for handling/support cost charges. Within these overall costs, appropriate provisions would be made for the protection of human health and the environment.

In the event of a major upsurge such as that of 2003-2005, US\$ 30 million would cover the initial stages of a control campaign. The Multilateral Evaluation estimated that the total cost of the 2003-2005 campaign was US\$ 400 million including humanitarian food aid costs. International donors provided about half of the total. The expectation would be that an emergency fund of the size suggested would provide sufficient resources to allow for immediate purchase of pesticides, contracting of spray aircraft, operational funds and international expertise. This would provide time to start control activities as early as possible and limit damage to crops. It would also allow appeals to be made to the international donor community, if required.

4.2. Administration and Governance of an international trust fund

The organization entrusted with the administration of an international locust emergency action fund (LEAF) should be carefully chosen to ensure a clear and transparent administration, the absence of conflicts of interest, clearly defined conditions under which expenditure can be incurred and the immediate availability of resources when needed.

The conditions under which countries and other operators would have access to the fund would need to be clearly defined. A mechanism may be required to declare a locust emergency that would allow access to the fund. The DLCC may consider the establishment of a Committee that might include representatives of the country or each of the countries affected, representatives of the donors that support the Emergency Fund, independent locust and entomological expertise, the Secretariat of the relevant Regional Locust Commission(s) and the Locust Group at FAO Headquarters.

In order to make a decision, the Committee would need to be informed of the current locust situation and forecast, and the resources available from national and regional emergency funds. It would also need to be fully informed about any bilateral contributions from donors. Due to the mobility of locust swarms, resources would not be assigned to countries but would be available to a region or sub-region.

Operations provided for by the fund should meet latest best practices including application techniques, choice of equipment and pesticides, and protection of human health and the environment. As well as funds, the mechanism should provide for planning, supervision and monitoring to ensure effectiveness and consistency of the control operations. In this respect it should be recalled that parallel national, regional and donor funded emergency operations should complement, not duplicate, each other and that careful coordination and cooperation is a prerequisite of locust control.

The administration and access mechanism might be part of an overall Governance structure of the fund, which ensures oversight, the monitoring of availability of resources, their use and replenishment and evaluation.

4.3. Replenishment of an international trust fund

The size of the trust fund, and its replenishment should be considered at regular intervals. The DLCC may consider options for the replenishment of an international trust fund.

5. SUPPORT FOR AN EMERGENCY FUND

The creation of an emergency fund depends on the support given by the locust-affected countries and by the international donor community. If affected countries decided to place any eventually unspent AELP funds in an emergency fund, this would provide direct support to the fund. Alternatively they could approach donor representatives in their countries to contribute to such a fund. Some donors may be reluctant to contribute funds for emergency purposes if the funds are not going to be used immediately, on the grounds that funds would have a better economic return by being invested in other projects (irrigation, private sector). Others might first wish to agree on the regulations that would control the fund's use before supporting it.

6. ALTERNATIVES TO AN EMERGENCY FUND

6.1. Making greater use of the Special Fund for Emergency and Rehabilitation Activities (SFERA)

SFERA is a system of advance funding against committed donor contributions, i.e. if FAO receives confirmation in writing that a recognized donor will contribute a certain sum to an emergency, SFERA can advance these funds pending the arrival of the monies in FAO accounts. According to the FAO Finance Committee working paper FC110/11 of September 2005, very little use was made of SFERA for the recent locust emergency, only US\$ 100,000 being advanced in support of an emergency coordination unit in Senegal. Subsequently SFERA contributed a further US\$ 200,000 for needs assessment and coordination. At the time SFERA had a total budget of US\$ 2 million, but the absence of firm commitments from donors in support of the locust emergency prevented the use of the Working Capital component of SFERA. Plans are now being made for SFERA's expansion up to about US\$ 20 million. However, since there are likely to be substantial delays even in obtaining written commitments from donors for a locust emergency, the advance mechanism of SFERA may be of limited interest.

6.2. Making use of CERF:

The Central Emergency Response Fund (CERF) was established at the UN General Assembly at the end of 2005 to provide emergency, life-saving assistance to victims of disasters and conflicts. As of June 2006, CERF had received US\$ 158 million in contributions and commitments, and a further US\$ 105 million in pledges. According to the CERF website, applications for grants need to be field-driven, require a needs assessment, and must be approved by the UN Humanitarian Coordinator or Resident Coordinator. Furthermore, applications "must verify that the CERF is an emergency

funding source and that all other donor leads, country-level or relevant agency stand-by funds appropriate for immediate disbursement (whether revolving or not) have been exhausted.” Funds are limited to a maximum of US\$ 30 million for any given emergency and have to be used within three months. Whether an application to CERF concerning a locust emergency would comply, even with the highly summarized details given above, is open to question. Locust emergencies may not directly threaten people’s lives, it is unlikely that it could be proved that all other donor leads had been exhausted, and most locust emergencies last considerably longer than three months. Perhaps experience with other emergencies will allow FAO to assess how CERF performs in practice, and therefore whether its use would be appropriate for locusts. The use of CERF for loans against donor pledges should also be explored.

6.3. Advance funding agreements with donors:

Another possibility would be for FAO to draw up agreements in advance with the donors that have traditionally supported locust emergencies, preferably for contributions to multi-donor Trust Funds that have the maximum flexibility. The agreements would be signed and approved in advance so that, in the event of a locust emergency, the funds could be committed within days. Each agreement could have a fixed duration, for example five years. There could be the possibility of extension of the duration, or provision for a new identical agreement to replace it for an additional five years. Donors may prefer this system as the money for a locust emergency would remain in their treasuries, rather than be in an emergency fund that may not be used for several years, as long as Desert Locust populations remain in recession.

At the onset of a locust crisis, SFERA and the Loan Component of CERF could be used to make funds immediately available (to a probable limit of US\$ 15 million) against signed donor commitments. Despite the availability of this money, speed of commitment would be very important to avoid delay while the funds are converted into the spray aircraft/ helicopter contracts, pesticide orders and other essential inputs.

The establishment of advanced Funding Agreements, either on their own or in combination with an emergency locust trust fund, would also require several of the provisions of the locust emergency trust fund, including the mechanism for declaring an emergency and subsequent activation of the Agreements.

7. CONCLUSIONS/POINTS FOR DISCUSSION

The need for emergency funding for combating the Desert Locust is widely recognized in locust-affected countries and by FAO. Action is already being taken at the national and regional levels to establish such funds, but they are unlikely to be large enough to address a major locust threat. The DLCC at its extra-ordinary session in 2004 discussed the issue and recommended that FAO, in consultation with donors, should consider establishing a substantial emergency fund that could be drawn on at the beginning of a Desert Locust upsurge. In its further deliberations on the desirability of the establishment of a trust fund and, if considered appropriate, on the options and modalities of operation of such trust fund, the Committee may wish to consider:

- (a) the purpose of a Desert Locust Emergency Action Fund;
- (b) the appropriate size of a Desert Locust Emergency Action Fund;
- (c) the Administering Organization of a Desert Locust Emergency Action Fund;

- (d) the conditions and mechanism that would govern access to the fund;.
- (e) operational arrangements of activities provided under a Desert Locust Emergency Action Fund;.
- (f) the need, if any, for Governance structure for the fund;:
- (g) replenishment of fund;
- (h) evaluation mechanism and indicators;
- (i) procedure for establishment of the fund and timing of its establishment including whether to recommend to the FAO Conference, through the FAO Council, to consider the establishment of a Desert Locust Emergency Action Fund.

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

ACTIVITIES OF THE CLCPRO AND PROGRESS OF THE EMPRES PROGRAMME IN THE WESTERN REGION DECEMBER 2004 – AUGUST 2006

(Agenda Item 7a)

1. Introduction

Since the Extraordinary Session of the DLCC held in Rome from 29 November to 2 December 2004, the major upsurge has been checked and, as was anticipated by the CLCPRO Secretariat in late October of the same year, there has been a gradual return to a state of recession. The year 2005 was marked by the shift from major upsurge to recession, with the last swarms having been treated in March 2005 in Algeria and Morocco. There has been no large-scale spring breeding in Northwest Africa, no massive return of swarms to the Sahel and no significant summer breeding in the frontline countries.

The CLCPRO Secretariat/ EMPRES-WR Coordination*, the EMPRES-WR Programme Liaison Officers and FAO Headquarters worked closely together during the crisis to harmonize the equipment needed for the emergency (vehicles, survey, spraying and camping equipment...) and for its subsequent (post-crisis) use to reinforce the National Locust Control Units and their preventive control capacity.

Regarding the funding of the EMPRES Programme in the Western Region, all the conditionalities of the AfDB grant were met in 2005. FAO received the first disbursement on 22 November 2005, the date from which the project was considered operational. However the AfDB has still not given its clearance of the detailed programme of work and budget for 2006 (see 2.1.). Other notable features of 2005 were the World Bank's commitment to harmonize the activities of its AELP project (loan to seven Sahel countries) with those planned under the EMPRES-WR Programme and France's approval of two EMPRES-WR support projects, with a total value of 3 million euros.

* The Secretariat of the CLCPRO (Commission for Controlling the Desert Locust in the Western Region), based in Algiers, is also responsible for coordinating the EMPRES Programme in the same region. It receives coordination support from Lemine Ould Ahmedou, EMPRES NPO in Mauritania; Laetitia Lienart, Programme Officer in AGPP, Rome; Annie Monard, Locust Officer at AGPP Rome; and, since January 2006, Christian Pantenius, Senior Officer in Dakar.

2. Synopsis of activities of the CLCPRO Secretariat/EMPRES-WR Coordination

2.1. Main activities conducted in 2005 and 2006 under the CLCPRO and EMPRES-WR

These activities can be summarized as follows:

- Participation in the International Scientific Locust Seminar held in Dakar, Senegal, from 11 to 13 January 2005, and introductory presentation in plenary of a paper entitled "Current control strategies and preventive methods to control the Desert Locust".
- Organization of/participation in the 3rd EMPRES-WR Liaison Officers Meeting in Dakar, Senegal, from 7 to 11 February 2005. An important feature of this meeting was the participation of five donors: WB, France, Japan, European Commission and USAID.
- Participation at FAO Headquarters in Rome (20/2-05/3/2005) in i) the workshop on lessons learned from the aerial operations organized by FAO to control the Desert Locust in 2004 and ii) the workshop for the after-action review of ECLO activities.
- Finalization i) of the agreement entrusting to FAO the management of the AfDB support project for the EMPRES-WR Programme and ii) the terms of reference of the Steering Committee of this programme. These two documents were approved by the countries concerned (Chad, Mali, Mauritania and Niger) and by the AfDB, then signed in September 2005 by the four beneficiary countries and FAO.
- Discussions with several potential donors of the EMPRES Programme in the Western Region, notably AfDB, WB, France, IsDB and the African Union.
- Contribution towards establishing the master trainers training programme in the Western Region and its implementation modalities (see agenda item 6c).
- Participation in the regional workshop to plan the Desert Locust control campaign 2005 in the Sahel and the FAO/World Bank donor coordination meeting jointly organized by FAO and the World Bank in April/May 2005 in Bamako. Although these two meetings dealt with managing the crisis, the CLCPRO Secretariat/EMPRES-WR Coordination placed an emphasis on preventive control in presentations, group work and planning of country activities for 2005 to consider the impact of planning on sustainably strengthening national capacities.
- Participation in the Expert Workshop and Ministerial Meeting on the "Desert Locust Control Strategy" held in Dakar, Senegal, from 15 to 17 May 2005. The meeting gave the CLCPRO Secretariat/EMPRES-WR Coordination an opportunity to advocate preventive control before the President of the Republic of Senegal and the ministers responsible for locust control in the CLCPRO countries. The meeting tasked the CLCPRO Executive Secretary with presenting a regional statement on the Desert Locust issue at the subsequent African Union Summit.
- Participation in the ECLO/WR FAOR Workshop held in Dakar on 18 and 19 May 2005, during which the FAO Representatives were briefed on the CLCPRO missions, the EMPRES-WR Programme objectives and the support they could provide to ensure continued preventive control.
- Organization of/participation in the 3rd Session of the CLCPRO from 12 to 16 June 2005 in Tripoli, Libya, held concurrently with the 2nd Meeting of its Executive Committee. Forty-three recommendations were adopted at this session. The Member States also unanimously accepted the official membership of Burkina Faso, making it the CLCPRO's tenth member. The decisions and recommendations of this session were presented by the representative of the Chairman of the Commission to FAO officials in Rome on 22 and 23 January 2006.
- Participation, in a delegation accompanying the FAO Director-General, at the African Union Summit, held in Sirte, Libya, on 4 and 5 July 2005.
- Institutional strengthening of the Coordination of the EMPRES Programme in the Western Region through the creation of a CLCPRO/EMPRES subregional office in Dakar and the transfer to that office, from the end of December 2005, of Mr Christian Pantenius, former Coordinator of EMPRES in the Central Region.
- The organization in the frontline countries and Senegal of a mission to evaluate intervention resources currently available (material inventory) which could serve for preventive control

in the next years. This mission, which was carried out in December 2005 - January 2006 by Mr Mohamed Lemine, EMPRES-WR NPO, and Mr Said Lagnaoui, international consultant, produced a detailed inventory of equipment which the ministries responsible for Desert Locust control in Chad, Mali, Mauritania, Niger and Senegal duly assigned, thereby formally committing that equipment to the exclusive use of the preventive control of the Desert Locust .

- Contribution to the work of the independent mission to evaluate the locust control campaign 2003-2005 (in Rome in November 2005 and in Algiers in January 2006) and participation in the Steering Committee meeting on this evaluation (14/11/2005 in Rome).
- Establishment of the Steering Committee of the EMPRES-WR Programme and formal appointment of its members.
- Organization of a meeting in Tunis on 10 February 2006 to discuss the implementation modalities of the PALPCP-CLCPRO project (ADF/AfDB of US\$6 million) following developments in the region resulting from the locust crisis of 2003-2005. The FAO representation was made up of Mr Sinaceur, Mrs Monard, Mr Pantenius and Mr Benhalima; while the AfDB was represented by Messrs Tibaldeschi and Kacem.
- Organization of/participation in the 4th Meeting of the EMPRES-WR Liaison Officers in Algiers, Algeria, from 25 February to 1 March 2006 and the 1st Meeting of the Steering Committee of the Programme in Algiers, Algeria, from 4 to 6 March 2006.
- Participation in the regional workshop to develop a strategy to avoid the building of obsolete pesticide stocks, held from 15 to 18 May 2006 in Bamako, Mali.
- Preparation of the logo and web page of the CLCPRO and their approval by the 3rd Session of the CLCPRO.
- Implementation of the recommendations of CLCPRO and EMPRES-WR Programme meetings held in 2004, 2005 and 2006 and publication of their respective reports.

2.1. Effective start-up of the EMPRES-WR Programme

FAO had decided back in 1997 to extend the EMPRES Programme to the Western Region, a plan that failed to materialize because of a lack of funding. The actual start-up of the EMPRES-WR Programme could only take place in 2006 after FAO had received the first disbursement (US\$2.7 million) of the ADF/AfDB project in late November 2005.

Previously, a preparatory meeting for this important stage of the programme had been held in Rome from 4 to 17 September 2005. The main items discussed at the meeting and central topics of discussion at the 4th Meeting of EMPRES-WR Liaison Officers held in Algiers, Algeria, from 25 February to 1 March 2006, were:

- updating the capacity and intervention calendar (survey and control, coordination,...) of the four frontline countries: Chad, Mali, Mauritania and Niger;
- review of the estimated cost of activities;
- scheduling of short- and medium-term actions;
- environmental matters;
- modifications needed to the ADF/AfDB project to account for actions taken during the emergency;
- review of the planning for phase I (2006-2009) and the plan of action for 2006.

This meeting was immediately followed from 4 to 6 March 2006, also in Algiers, by the 1st Meeting of the Steering Committee of the EMPRES/WR Programme, which was attended by all the members of the committee, namely the nine countries concerned, the representatives of the Chambers of Agriculture of the frontline countries, the main donors contributing to the programme (AfDB, WB and France), the regional and international institutions (AGRHYMET, CERES-Locustox and CIRAD) and FAO. The CLCPRO Secretariat/EMPRES-RO Coordination acts as Secretariat of the Steering Committee. The planning for phase I (2006-2009) and the plan

of action and the budget for 2006, which had been reviewed and updated during the meeting of the Liaison Officers, were approved by the Steering Committee.

A request for clearance was submitted in April 2006 by FAO Headquarters (AGPP) to the AfDB for approval of the minor changes introduced to the ADF project. As the AfDB has not yet approved this request, implementation of the EMPRES-WR Programme could be affected. Equally noteworthy is the significant support of the World Bank's AELP project (components A and C) to the seven Sahel countries, especially the frontline countries. This support interlocks with the EMPRES-WR Programme.

Implementation of the plan of action for 2006 began with EMPRES-WR Programme missions in April/May conducted by the EMPRES Coordination in Niger, Mauritania and Mali (a similar mission is planned for Chad). The aim of these missions is to raise the awareness of national officers and development partners of the need to succeed in the preventive control of the Desert Locust at national and regional level, to put in place independent National Desert Locust Control Units (NDLCUs) in CLCPRO member countries and for the countries to gradually take over related recurring costs, to assign appropriate human resources to the NDLCUs, to earmark equipment from the 2003-2005 campaign exclusively for Desert Locust control; and to reflect, as early as possible, on long-term preventive control mechanisms.

3. Cooperation with the Central Region

Cooperation between the Western Region and the Central Region is improving and strengthening each year – between the two Commissions and within the EMPRES Programme.

In addition to the reciprocal attendance of the Secretaries of the two Commissions at their respective meetings, a protocol of cooperation and coordination between the CLCPRO and the CRC was adopted at the 24th Session of the CRC in April 2004 and at the 5th Session of the CLCPRO in June 2005.

The two regions have exchanged trainees and experts, and further exchanges are programmed in the next months.

4. Conclusion

The serious locust situation that devastated the Western Region between 2003 and 2005 led the CLCPRO Member States to make enormous efforts and develop exemplary intraregional cooperation in an attempt to limit the consequences. They were assisted in this endeavour by FAO and numerous donors. Their efforts helped break the cycle of invasion and permitted a return to recession.

With the recession now well implanted in the Western Region, implementation of the EMPRES Programme should become a priority of governments, the CLCPRO, FAO and donors wishing to help implement a preventive control strategy. The frontline countries will clearly be unable to implement long-term Desert Locust preventive control by themselves. Annual activities needed to achieve this objective should receive the ongoing support of the CLCPRO Member States during the recession period. Better still, a collaboration mechanism should be set up at ministerial level to render such collaboration "automatic" and ongoing. Donors should also be continuously involved in the implementation of preventive control.

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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

EMPRES CENTRAL REGION (Agenda item 7b)

1. CURRENT STATUS AND ROLE IN THE EMERGENCY

Since the 1986 – 1989 plague large scale control operations based on chemical pesticides have caused considerable concern in relation to their economic costs, the safety and environmental impact of the pesticides used, and the capacity of existing organizations to deal with the problems in an efficient and effective manner.

In response to this concern, the FAO Council endorsed a proposal in 1994 for the development of an Emergency Prevention System (EMPRES) for transboundary pests, with a major focus assigned to the Desert Locust. In 1997 the EMPRES Central Region (CR) Programme was initiated with the aim:

To reduce the risk of Desert Locust plagues emanating from the Central Region of the Desert Locust distribution area in order to mitigate food security, economic, and environmental concerns in the Central Region and beyond.

Pilot activities started in 1995, comprising nine countries around the Red Sea (Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen). Since then, the major focus of the EMPRES/CR Programme was on:

- Developing the human capacity of locust control staff of the national Locust Control Units (LCU) to better perform survey and control operations;
- Developing more effective national and regional locust information and early warning systems which are linked to the Desert Locust Information Service (DLIS) at FAO HQ;
- Developing early preparedness and contingency planning mechanisms;
- Assisting the EMPRES/CR member countries in introducing novel control technologies which are likely to reduce the environmental risks of Desert Locust control.

Phase I of the Programme became operational in January 1997 and ended in December 2000. Phase II started in January 2001 and ended by December 2003. The programme is currently in its Phase III which will end by December 2006. A fourth phase as a donor supported programme is currently being prepared.

Phase III has the objective to transfer the responsibility for the promotion and supervision of preventive Desert Locust management strategies in the Central Region to the Commission for Controlling the Desert Locust in the Central Region (CRC) and the member countries. With effect of the 1st of January 2006 the EMPRES/CR Programme is being managed by the Secretary of the Central Region Commission.

The EMPRES/CR Programme has been evaluated four times with the aim to provide donors, member countries and FAO with an independent and objective view of the implementation status. The first evaluation mission took place in July/August 1999. During Phase II the Programme was evaluated twice: the first time in August 2001 as part of an overall evaluation of the whole EMPRES Programme and for the second time in February/March 2003. Phase III was evaluated in September/October 2005.

The mission observed a generally positive trend in Desert Locust prevention in the Central Region, and concluded that particularly the early warning and early reaction capacities had improved significantly in most EMPRES/CR countries as a result of numerous EMPRES efforts. Although EMPRES has made major contributions to build national locust control capacities, the adoption rate of the recommended standard approaches and techniques varied from country to country and recommended a fourth phase of three years as a consolidation phase.

In view of the additional responsibility of the Commission to sustain preventive Desert Locust management in the Central Region, the mission also indicated the need to redefine the working mode and the necessary resources of the Commission, and recommended that the CRC member countries should determine the support to be provided by CRC Secretariat. It further pointed out that at least one regional technical assistant to the Secretariat should be appointed to secure technical backstopping and follow-up.

The findings of the 4th Evaluation Mission were presented in the 6th Consultative Committee Meeting for the EMPRES/CR Programme in Cairo in November 2005. The Committee welcomed the report and strongly recommended to clearly define the areas of future support particularly with regard to making full use of early warning technologies such as RAMSES, eLocust, and remote sensing. Based on the recommendations, EMPRES/CR submitted a proposal for assistance to preventive Desert Locust management in the Central Region to the Kingdom of Saudi Arabia which is currently being reflected by the Saudi Government.

In general the EMPRES/CR Programme could benefit from the relatively calm period from 1997 to 2003 to develop and introduce various standard procedures, technologies and approaches as part of the operational systems of the national Locust Control Units. A key element in this matter was the close interaction with the Commission for Controlling the Desert Locust in the Central Region in all strategic questions and contingency planning in particular during the second and third Phase.

The reliability of the preventive control approaches was first tested under real conditions during the emergency situation in 2003-2005, triggered by unusually heavy and widespread rainfall throughout the Sahel zone, which resulted in simultaneous Desert Locust outbreaks in the Western and Central Regions in autumn 2003. After the first alert was issued in October 2003, survey and control operations were immediately mounted in Egypt, Sudan and Eritrea, and teams were mobilized in Saudi Arabia and Yemen. The operations that followed were conducted in a comparatively more systematic and coordinated manner than in the past and succeeded in preventing the development of an upsurge in May 2004. However, in the following period the Central Region faced two major invasions of Desert Locust swarms coming from Western Region through Egypt in October 2004 and Darfur, Sudan in June 2005.

As part of the regional contingency planning EMPRES played a major role in brokering timely assistance to those countries with only limited resources, namely Sudan, Eritrea and Yemen in

collaboration with AGPP and the Commission. Most significant was the bilateral contribution from the Kingdom of Saudi Arabia to Sudan in 2004 and 2005 worth USD 2 million. This assistance essentially covered all predicted needs in terms of material and equipment as well as for operations.

Also the regional TCP project for Sudan, Eritrea and Yemen in May 2004, worth USD 390,000, added much to reinforce the level of preparedness of the Locust Control Units of the three countries. The project enabled Eritrea to shoulder first control operations against a local Desert Locust outbreak on the Red Sea coastal plains during the summer season in 2005. But because of the extent of the infestation there was a high risk of a rapid pesticide shortfall. The deficit was prevented by airlifting additional 25,000 litres donated by the Governments of Sudan and Senegal in an unusually rapid concerted action between the countries, EMPRES, WFP, TCEO and AGPP.

Other multilateral and bilateral assistance provided by FAO, IFAD, AfDB, UNDP and Saudi Arabia to Sudan, Egypt and Eritrea during the emergency amounted to a total of USD 1,393,000. It is also worthwhile mentioning that Sudan assisted Chad with 7,000 litres of pesticides and 20 sprayers.

One cornerstone in the event of managing the Desert Locust upsurge was the organisation of Ad-hoc Emergency Prevention Meetings held with the immediate concerned countries. Four meetings have been organised in collaboration with CRC and DLIS in October 2003, March and September 2004, and March 2005 to jointly analyse the situation and possible developments, and to convene appropriate countermeasures in the context of Regional Action Plans. Based on the regional action plans, more detailed National Action Plans were prepared and brought to the attention of the national authorities and local donor agencies.

The monthly National Locust Bulletins, with the aim to regularly inform the national authorities, the local donor community and the Commission of the locust situation, of actions taken and the status of the available resources, contributed much to the sensitisation and increased funding of the operations from the national budgets.

As a result of the pre-emptive actions, less than 300,000 ha have been treated during the control operations in the Central Region during the campaign 2003-2005 preventing damage to crops and the environment.

2. CONCLUSION

The events during the recent Desert Locust emergency clearly demonstrated that it is crucial to have standard approaches of preventive management in all the three Regions of the Desert Locust invasion area in place. The absence of preventive systems in one Region risks jeopardizing the approach as a whole.

Since the technological development is a continuous process, it is equally crucial to sustain what has been developed by EMPRES in the Central Region and to continue the efforts of introducing new technologies, particularly in the areas of early warning/detection and alternatives to chemical control. In addition, because of the limited capacity of the Secretariat of the Commission to follow up standards of preventive Desert Locust strategies in the member countries it is strongly recommended to find funds for appointing a Regional Technical Officer.

The experiences in the Central Region also confirmed that investment in human capacity building is worth the value for money and should continue as a long-term commitment to maintain a high standard of technical skills at the national Locust Control Units also during recession periods.

In order to sustain the early detection and early reaction capacities it is indispensable that the national Locust Control Units are autonomous from other plant protection activities and granted by their governments with enough funds for locust operations only.

The currently calm period should be used effectively by the countries, the Commissions, the donor community and FAO to extend and to further develop the Emergency Prevention Systems approach.

September 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REPORT OF THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE CENTRAL REGION DURING THE PERIOD 2004-2006

(Agenda Item 7c)

Introduction

A number of activities, either organized or supported by the Commission, have been carried out during the period January 2004-May 2006. Regular and close collaboration between the CRC and the EMPRES/CR Programme was one of the main achievements during Phase III of the programme till the end of December 2005. In view of the DL situation during early 2004 to early 2005 and in order that the countries in the Central Region were well prepared, the Commission, with EMPRES/CR, played an important role in combatting the Desert Locust outbreak/upsurge (of October 2003) up to April 2004 and the swarm invasion (of October 2004) up to January 2005. Measures taken against the Desert Locust were presented in the Extraordinary Session of the DLCC meeting, held in November 2004.

Other CRC activities are summarized below:-

I. Training on Desert Locust management:

Short-term:

- The **First Sub-regional training course** on aspects of Desert Locust biology, survey and control was organized and conducted in Amman, Jordan in May 2005; trainees were from, Egypt (2) Iraq (4), Jordan (9), Lebanon (4) and Libya (1). Trainers were the CRC Secretary and a co-trainer from Lebanon. The **Second Sub-regional training course** was conducted in Doha, Qatar in April 2006; trainees were from Bahrain (2), Iraq (4), Kuwait (3), Qatar (5) and UAE (3); co-trainers were from Oman and Sudan.
- A number of national training courses was organized, supported and conducted in 2004; in Egypt (1), Oman (1), Qatar (1), Sudan (3) and Yemen (2). In 2005: in Djibouti (1), Egypt (3), Eritrea (1), Ethiopia (1), Oman (1) Saudi Arabia (1), Syria (1), Sudan (4) and Yemen (1). Also a number of local training courses were conducted for labourers and farmers in Sudan (2) and Yemen (1).
- The Commission supported the participation of two co-trainers in the Yemen national training course and one Djiboutian in the Niger Regional Training Course. Also on-

the-job training was provided for RAMSES and eLocust in Ethiopia, Sudan and Egypt by using national expertise.

Mid-term:

The Commission, jointly with EMPRES/CR, has supported the Desert Locust Management Diploma course at the University of Khartoum, Sudan. The fourth group of students graduated in 2005 and the fifth group is expected to graduate in August 2006. This will bring the total number of students that have studied and graduated to 32, (Sudan 10, Egypt 6, Yemen 4, Ethiopia 4, Saudi Arabia 2, and one from each of Eritrea, Oman, Jordan, Syria, Libya and India). The sixth group of six students will hopefully be enrolled this year.

The Diploma course was evaluated in July 2005 by an independent consultant. The Final Report of the evaluation has been cleared and circulated. It was agreed that the general objective of the post Graduate Diploma was valid and that its continuation should be supported. A number of recommendations were made, addressing different issues that should be considered and implemented by FAO and the University.

Long-term:

The Commission funded one M. Sc. Fellowship for an Egyptian in 2004. He is currently in his 2nd year at the University of Khartoum, Sudan, and is expected to graduate in August 2006. One additional M. Sc. Fellowship is to be offered by the CRC to its member countries for 2007.

II. Research:

The current status of the research is:

- ◆ The research study (**Impact of pesticides used in DL operations on the honeybee and other non-target organisms in Yemen**) at the University of Aden in Yemen was completed in January 2004. Approval of the final technical report was given by Desert Locust Monitoring & Control Centre, Ministry of Agriculture and Irrigation.
- ◆ In May 2004 the research study (**Relationship between DL infestation, environmental factors and the impact on control measures**) at the University of King Faisal, Kingdom of Saudi Arabia was completed. Due to its poor quality, the report has neither been accepted by CRC/EMPRES nor the National Locust Center, Ministry of Agriculture. The study has been closed.
- ◆ The Commission, with EMPRES/CR, has followed up two research studies at the University of Khartoum in Sudan: The first started in August 2004 (**The effect of PAN on non-target organisms**), but since the researcher failed to fulfill his obligations, the study was closed in October 2005. The second started in May 2003 (**The distribution of Desert Locust in relation to herbage quality in the Red Sea coast of Sudan**). The final report was received in December 2005, and the Commission approved the final report. The researcher obtained his M.Sc.
- ◆ The research study (**Effect of Green Muscle on locusts and grasshoppers**) started in August 2003 under the supervision of the Research Institute in Egypt. The final report was received in December 2005. A final financial report is pending.
- ◆ The on-going research study: **Field evaluation of Green Muscle against grasshoppers in Ethiopia** under the supervision of the Desert Locust Control Organization for Eastern Africa (DLCO-EA) started in April 2005. The first progress report has been received and the research investigation will continue in 2006.

III. Joint-Survey:

Joint-surveys were supported and executed as follows:

- 2nd and 3rd joint-border-surveys between Saudi Arabia and Yemen during January 2004 and 2005;
- 4th joint-border-survey between Egypt and Sudan during February 2005; and the 5th in March 2006;
- 1st joint-border-survey between Djibouti and Somaliland during March 2004;

- 4th Saudi Arabia/Yemen and the 2nd Djibouti/Somaliland joint-border-surveys in 2006 were not undertaken due to changes in the set up of the locust units in Saudi Arabia and in Somaliland.

IV. Publications:

The Commission undertook the responsibility for the following publications:

- ◆ the routine translation of the FAO bulletin into Arabic and its wide distribution;
- ◆ Arabic translation of the Guidelines on Minimum Requirements for Agricultural Pesticide Application Equipment (Volume 4, Ground-based locust & grasshopper sprayers);
- ◆ CRC-EMPRES/CR produced English and Arabic Trainer's Manual Kit & circulated it widely;
- ◆ Campaign and training impact check lists of S & C operations were finalized and circulated;
- ◆ A work plan was prepared to produce a Desert Locust Glossary English/Arabic/French; a consultant was recruited; 1st stage of the Glossary is expected to be concluded by June 2006;
- ◆ CRC-EMPRES/CR produced a Website, intended to provide information on the member countries: profiles, activities, reports and references; provided with different applications and links. The website complements and does not duplicate the DLIS Locust Watch webpage.
- ◆ In collaboration with EMPRES, the Desert Locust Index Cards for Locusts and Grasshoppers was prepared and distributed widely in October 2005.
- ◆ In collaboration with EMPRES and DLIS, Standard Operating Procedures and a Poster for Radio Communication for Mobile Teams and Field Stations is under preparation.
- ◆ As recommended by the 27th Executive Committee Meeting in Khartoum, Sudan 2005, the Secretariat of the Commission has obtained several designs to select a new logo replacing the current logo; activity is in progress.

V. The Commission Membership:

Successful efforts had been made to encourage three EMPRES/CR non-CRC member countries to join the Commission.

- At the 23rd CRC Session in 2002, Djibouti officially became member # 14 of the CRC;
- At the 24th CRC Session in 2004, Ethiopia officially became member # 15 of the CRC;
- At the 25th CRC Session in 2006, Eritrea officially became member # 16 of the CRC.

Other Activities:

The Secretary of the Commission participated in and/or organized the following events (not mentioned in the previous activities):

1. The Commission organized and prepared for the 24th Session of the CRC in Saudi Arabia 2004, the 27th Executive Committee meeting in Sudan 2005, and the 25th Session in Qatar in May 2006;
2. Due to the increase in the number of CRC member countries (16), the establishment Agreement of the Commission was amended in 2005 in order to increase the number of the Executive Committee to 7 instead of 5.
3. 12th & 13th EMPRES/CR Liaison Officers meeting in Egypt and Yemen, 2004 and 2005;
4. 3rd and 4th EMPRES/WR Liaison Officers meeting in Senegal, Jan.2005 & in Algeria 2 Feb. 2006;
5. 6th Consultative Committee meeting, Egypt 2005;
6. Travelled to Mauritania, participating in the DLCC-TG meeting in 2004;
7. With EMPRES/CR Coordinator, evaluated the DL habitat in southern Egypt in 2005;
8. 1st Executive Committee and 3rd CLCPRO Session in Niger and Libya in 2004 and 2005;
9. With the CRC-Chairman, travelled in 2004 to Rome to present the 24th CRC report and to participate in the Extraordinary DLCC Session & the Extended Locust Group meeting in 2005;
10. Visits were made in 2005 to Bahrain, Kuwait, Lebanon, Eritrea, Yemen and Sudan to meet with Ministers of Agriculture and Ministry authorities to discuss various DL issues;

11. Transportation of 10 t of pesticides from Sudan and 15 t from Senegal to Eritrea in September 2005.
12. Organized jointly with DLIS, the NDVI work shop in March 2006 in Cairo; participants were from Egypt, Eritrea, Ethiopia, Saudi Arabia, Sudan, Yemen and DLCO-EA.
13. Organized jointly with DLIS, the FAO/World Meteorological Organization workshop in April 2006 in Muscat, Oman; participants from the Central Region were from Egypt, Ethiopia, Oman, Saudi Arabia, Sudan, and Yemen.

Septembre 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

SOUTH-WEST ASIA COMMISSION (Agenda Item 7d)

1. INTRODUCTION

The major event of the FAO Commission for Controlling the Desert Locust in South-West Asia (SWAC) was the holding of the Twenty-fourth Session in New Delhi, India in January 2005. Two major Commission activities took place in the Region during the past two years: the annual joint border survey between I.R. Iran and Pakistan in April of 2005 and 2006, and a regional workshop on the use of RAMSES, eLocust2 and remote sensing imagery held in Jodhpur, India in June 2006.

2. SUMMARY OF THE 24TH SESSION

The Member Countries made several important decisions and recommendations at the last Session of the Commission:

1. to improve the monitoring of the traditional summer breeding areas along both sides of the Indo-Pakistan border by increasing the coverage of surveys and by exchanging information between the two countries and FAO, in particular reports of monthly border meetings between India and Pakistan;
2. to improve the I.R. Iran / Pakistan Joint Border Survey by incorporating new technologies, and by training participants and equipping teams so that future surveys will be more effective;
3. to address the stocks of obsolete pesticides in India and Pakistan. So far, little progress has been made on this issue due to a lack of donor interest and financial resources;
4. to raise the issue of re-establishing the Secretary post of the Commission at the FAO Conference. For the past two decades, the Secretariat for this Commission has been provided by the AGPP Locust Group. Re-establishment of the Secretary post is mainly a financial problem that is compounded by the fact that there may not be sufficient work to warrant a full-time post for a Commission with a relatively small number of member countries. Given that FAO's resources continue to decrease, there is not much chance of establishing a new post. In the meantime, it was agreed that the country holding the Chairmanship should assist in distributing information to Member Countries and help promote the Commission's activities;

5. to translate the FAO Desert Locust Master Trainer Manual and the Standard Operating Procedures into local languages in India and I.R. Iran;
6. to incorporate new technologies and enhanced communication systems in the early warning and locust management programmes in the member countries;
7. to extend the EMPRES programme to the Eastern (South-West Asia) Region.

3. SUMMARY OF ACTIVITIES

3.1. Joint Survey

The annual 30-day joint survey was carried out by I.R. Iran and Pakistan in the spring breeding areas in southeastern Iran and western Pakistan in April of 2005 and 2006. Prevailing drought conditions in both years limited locust activity and no significant infestations were seen during the surveys. For the first time, eLocust2 and MODIS remote sensing imagery were used in the 2006 joint survey to record and transmit data and to detect areas of green vegetation, respectively. The joint survey results are used for planning the timing and scale of locust survey and control operations in the summer breeding areas along the Indo-Pakistan border.

3.2. Workshops

The FAO Desert Locust Information Service (DLIS) has initiated several new technologies to improve early warning in affected countries. DLIS organized and conducted a five-day regional workshop in Jodhpur, India in June 2006 for national locust information officers who are using these technologies. Participants were trained in using the latest version of RAMSES, the custom geographic information system (GIS) for managing and analyzing locust and environmental data, on eLocust2, the handheld device for field officers to record and transmit survey and control data, and on the use of remote sensing imagery to identify areas where rain may have fallen and where green vegetation may be present. After the workshop, participants will train survey and control officers in their country on using eLocust2.

Eight participants were invited to the workshop: one from I.R. Iran, two from Pakistan and five from India. Unfortunately, the Pakistani participants could not attend and were replaced by an additional two participants from India. The FAO Locust Forecasting Officer, K. Cressman, was the workshop trainer.

Another regional workshop was organized jointly between FAO and WMO to discuss the meteorological data needs of the national locust units for locust survey and control operations. The workshop was held in Muscat, Oman in April 2006 and a representative from the national locust unit and one from the national meteorological service attended from 11 countries. From the South-West Asia Region, representatives from India and Pakistan attended, funded from the Commission.

4. CONCLUSION

Despite the lack of a Secretary post, the Commission is very active and several important activities took place that have contributed to improvements in early warning and control in the member countries. The DLCC should consider the following questions during the discussion:

- (a) Is there a need to continue the annual I.R. Iran / Pakistan joint survey on a regular basis given the prevailing drought in the Region and the very few locusts seen during past surveys?
- (b) Is there a justified need to re-establish the Secretary post for the Commission if these services can continue to be adequately covered by the AGP Locust Group?
- (c) Should EMPRES be extended to the Eastern Region and, if so, how?

September 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

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THE WORLD BANK AND LOCUST CONTROL (Agenda Item 8a)

This paper describes the World Bank's support during and after the 2003-2005 locust invasions.

The World Bank has been active with investment operations and analytical work related to locust outbreaks for several years. This includes investment projects in Algeria and Madagascar, and analytical work that produced the provocative report "Desert Locust Management – a Time for Change" published in 1994. The Bank is also involved in other areas of pest management, and has a specific safeguard policy on Pest Management.

In response to the 2003 invasion, the World Bank committed more than US\$ 60 million to address the problem. This was a reaction to requests from UEMOA, FAO and countries, to fill in the short fall in necessary funds and to complement commitments from other donors. The Bank – as a lender of last resort – decided to make US\$ 60 million in IDA Credits available to several Sub-Saharan countries for the Africa Emergency Locust Project (AELP). On September 22, two weeks after the Bank's decision to engage, an advance of US\$ 12.3 million was made available to the seven Sub-Saharan countries. In addition, a budget of US\$ 3.7 million was reallocated from existing IDA Credit for the Agriculture Producer Organization Project in Mali.

The Africa Emergency Locust Project aims to assist the governments in preventing present and future locust invasions. The project was designed in a participatory fashion with beneficiary countries. The project includes four components: 1) Emergency Locust Management, 2) Emergency Agriculture Investments, 3) Prevention and Early Warning, and 4) Project Management. Beneficiary countries include: Burkina Faso, Chad, Mali, Mauritania, Niger, Senegal, and The Gambia.

The Bank reached out to other donors and the FAO to ensure that Bank financing was complementary and not overlapping with other planned financing. The Bank met with donors at several occasions. This donor coordination culminated at the 2004 DLCC meeting at which donors agreed to address four key issues: 1) Coordination and joint planning framework for EMPRES, 2) Pesticides, including investigations for feasibility of a "Pesticide Bank", 3) Contingency planning, including identification of a long-term financing mechanism, and 4) Monitoring, review and evaluation, including an independent multi-lateral evaluation of the 2003-2005 locust control campaign.

National level leadership is required to ensure long-term sustainability and ownership of the technical support and investments provided by donors and technical agencies. For this reason, the Bank supports the building of national level capacity and political commitment to national locust control units to which donors and technical agencies would play a supporting role.

Regional Integration and Coordination of locust operations are key a successful management of locust outbreaks. The Bank is very committed to making this work and believes that the CLCPRO, 'owned' by Sahelian and Maghreb countries, should be the coordinating body. EMPRES, co-financed by several donors, including parallel activities financed by the Bank, should be the vehicle for specific technical support.

Collaboration with technical agencies such as FAO is important. The Bank recognizes the unique role of the FAO in monitoring of the Desert Locust situation across all regions and providing the necessary technical support. The regional commissions like CLCPRO should coordinate regional activities such as contingency planning, prevention system, pesticide management issues, opportunities for bio-pesticides, etc. Presently, however, it isn't entirely evident that roles and responsibilities are clearly defined among the various entities. The Bank favors a sound analysis of the current institutional set-up and is keen to provide support to undertake an assessment of the institutional framework for regional locust operations.

The Bank supported the Multilateral Evaluation financially along with many other donors. The Bank hopes that countries, donors and technical agencies will examine the recommendations emerging from this work carefully, and support their implementation. A large portion of the recommendations can be implemented through the existing Bank financed country projects under the Africa Emergency Locust Project.

Chemical pesticides are at times necessary, and when they are, countries and partners must adhere to the FAO Code of Conduct on pesticide distribution and use to prevent overstock or misuse of pesticides. For the Bank's locust project, the Bank put in place the necessary procedures to ascertain that all requests for procurement of pesticides were based on technical needs and capacity to use and store. At several occasions, the Bank objected to procurement of pesticides. We believe that this "extra screening procedure" is needed to prevent overstock of pesticides, and had hoped that countries and donors would have applied the same level of rigor. That could have prevented a portion of the current overstock of pesticides available in the western region.

Biological pesticides could constitute an excellent tool in the countries' preventive strategy to minimize effects of locust control on sensitive ecosystems. Together with partners, countries supported by the Bank have started to collaborate with FAO and others to promote alternatives to chemical pesticides. It is the Bank's expectation that viable options are identified, and that these alternative biological pesticides are used where it is warranted from an ecological and cost-effective point of view.

It is too costly to ignore the risk of pesticides becoming obsolete. Countries and donors are both responsible for ensuring that build up of obsolete stocks is prevented. Along with many partners, the Bank is engaged in the Africa Stockpiles Program, which is providing grant financing to eliminate obsolete stocks. The Africa Emergency Locust Project is prepared to contribute to managing obsolete stocks. The Bank is keen to ensure that the best possible safeguard measures are applied to prevent risks to humans and the environment.

Early on, the Bank recognized the need to establish a financing mechanism (a 'Locust Emergency Fund') that would be available to immediately provide the cash money needed in case of an invasion. The UN appeals system did not work satisfactory in 2002-2003, which is illustrated by the slow donor response. The Bank fully supports the development of a new way to finance locust emergencies, and recommends that a working group be put together to flesh out what options exist for a financing or insurance mechanism. Such a group should include technical experts on locust,

operations, donors, regional organizations, finance, insurance, as well as representatives from countries that would manage and use such a fund.

The World Bank sees the following issues as immediate priorities to advance the preparedness of countries and the international community to prevent future invasions of Desert Locust:

1. Implementation of recommendations emerging from the Independent Multi-Lateral Evaluation of the 2003-2005 campaign.
2. Emergency Fund for Locust Control. All options for such a fund should be evaluated against a set of criteria determined by key stakeholders (countries, donors, FAO). The purpose of the fund, the triggers determining how countries could access the funds and the host of the fund should be examined as well.
3. Pesticide Bank. While some concepts exist, there is a need to examine options for setting up a virtual 'Pesticide Bank'. The study should be carried out in a setting including key stakeholder (Industry, countries, donors, and technical agencies)
4. Bio-Pesticides. A review of the state of existing knowledge on the matter (building on results of previous experiences and tests), and preparation of concrete action plans at the country and regional levels are needed to operationalize the efficient use of bio-pesticides.
5. Management of Surplus / Obsolete Pesticides. A meeting on this topic took place in May 2006 and resulted in recommendations for how to manage the situation. However, inevitably, a large portion of the stocks will soon become obsolete. An overall assessment of viable alternative uses as well as the cost of disposal of obsolete stocks emerging after the locust invasion should take place.
6. Method for Evaluating Socio-Economic Effects of Locust Infestation. Countries will be invaded by locusts in the future. It would be useful to prepare a methodology for rapidly assessing any compensation needs of affected populations following an invasion. This would enable donors or the new "financing mechanism" to respond much sooner to restore livelihoods of affected populations.
7. Research Agenda on Locusts. Representatives of countries, technical agencies, International research centers, and scientists should get together to establish a common agenda for applied research on topics relevant to improving locust control in the future.
8. Institutional Assessment. The institutional assessment is described in greater detail above. In order to create full ownership of this study by the involved stakeholders, it is proposed that the terms of reference be available for review by the DLCC meeting in September 2006, and that the study be completed by the CLCPRO meeting of ministers in May 2007.

The Bank has experienced exceptionally good collaboration with countries, FAO, and donors on issues related to locusts. We consider it to be best practice. We hope that all partners will continue this good collaboration, and that the 38th session of the DLCC results in specific and implementable recommendations.



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DESERT LOCUST CONTROL COMMITTEE

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Rome, 11-15 September 2006

FOLLOW-UP TO RECOMMENDATIONS OF THE THIRTY-SEVENTH SESSION (2003) AND THE EXTRAORDINARY SESSION (2004) OF THE DESERT LOCUST CONTROL COMMITTEE (Agenda Item 9)

The **Thirty-seventh Session** of the Desert Locust Control Committee (DLCC) held in September 2003 issued thirteen recommendations (Annex I); its Extraordinary Session in November 2004 made twenty-five (Annex II). Most of these recommendations were to be implemented by FAO but several called for measures by countries with permanent Desert Locust distribution areas. The follow-up given to the recommendations is described below.

1. Surveys were intensified during the last quarter of 2003 to assess the repercussions of the exceptional climatic conditions on the environment and the population dynamics of the Desert Locust. These were carried out within the limit of funds immediately available to FAO and of the material and human resources that could be mobilised in the countries of the Western Region that had received abundant rainfall from July 2003, with additional support from neighbouring countries in the framework of strengthened intra-regional solidarity. Limited control operations were conducted in October and November in Mauritania, Mali, Niger and Sudan. These were mainly in the form of ground operations as the outbreaks at the time were localized and small in scale. At the same time, FAO issued a first alert. The vigilance required of the countries concerned and the regularity of surveys during these months were directly affected by the scarcity of available national resources.
2. The outbreak that occurred after the 37th Session of the DLCC and that then developed into a major upsurge momentarily shelved long-term research activities, such as the impact of climate change on the population dynamics of the Desert Locust. This topic will be submitted to the expertise of the Technical Group.
3. The Secretariat and ECLC worked closely with the FAO Press Office throughout the upsurge, providing the international media and the public at large with regular press releases that had been technically validated by the Locust Group. At country level,

contacts were established and ad hoc staff sometimes recruited, through the FAO Representations, to make sure that clear and precise information was released on the locust situation. For their part, most of the national control units briefed the media on developments of the locust and locust control situation, often through the press office of the ministry of agriculture.

4. FAO staff stationed in Dakar, Senegal, for emergency and post-emergency operations contacted OCLALAV to determine the best way of safeguarding the extensive locust archives stored at its central office.
5. As far as possible, advantage was taken of the upsurge to conduct full-scale field trials of more environmentally friendly pesticides. The results of these trials will be sent to the Pesticide Referee Group for consideration.
6. The recommendation to extend the EMPRES Programme to the Eastern Region was duly noted. However, the emergency situation that occurred in the Western Region in 2003-2005 seriously delayed implementation of the EMPRES Programme, while highlighting the vital need for well managed preventive control in this Region; and as some of the requisite conditions for effective start-up of the Programme were only met in the last quarter of 2005, all efforts are still focused on this region. However, as soon as the Programme has gained momentum, its extension to the Eastern Region will be seriously addressed.
7. A fellowship awarded a student from Niger is enabling him to prepare a doctoral thesis provisionally entitled “Study of the ecological and health risk of two organophosphate pesticides used in the control of the Desert Locust (*Schistocerca gregaria*, Forskål 1775) (*Orthoptera, Acrididae*) in Niger”.
8. From late December 2003 to March 2006, successive temporary solutions were able to be found using emergency funding so that RAMSES and remote sensing data, which are crucial for early warning, could continue to be as comprehensive as possible to avoid disrupting the quality of flow of information to all countries affected by the Desert Locust and the international community and to continue disseminating new related technologies to countries still without them. Certain activities have had to cease since March 2006. In the long-term, one partial solution would be to establish a P-2 post within the DLIS, but funds would also need to be allocated to the automated distribution of MODIS images in a format that is easily accessible to countries.
9. In follow-up to the suggestion of the delegate from the United States, the advantages and drawbacks of a possible merger between the South-West Asia Commission and the Central Region Commission will be on the agenda of the 25th Session of the South-West Asia Commission to be held in Tehran, Iran, this November. It should however be noted that, in addition to the fact that each Commission was established to deal with the specifics of its region, the Central Region Commission now has 16 countries, with the recent adherence of Djibouti, Eritrea and Ethiopia. The addition of a further four countries might make the Commission very unwieldy. Although this issue was not discussed at the 25th Session of the Central Region Commission in May 2006, the countries were canvassed for their views which tended to concur that such a merger would create more problems than benefits.
10. The Secretariat consulted with the members of the Technical Group of the Desert Locust Control Committee who recognized that contingency plans were an essential element of preventive control. A workshop on this subject was held in Nouakchott, Mauritania, from 2 to 7 May 2004, attended by 18 participants from the countries concerned and FAO (see document DLCC 06/8). Detailed action plans for the 2005 Sahel summer season were also drawn up at a workshop jointly organized by the World Bank and FAO, in Bamako, in April 2005. These were then budgeted with the donors at a meeting immediately after.

11. The level of annual contributions has remained the same. The Islamic Republic of Iran paid its contribution for 2004 and 2005 but did not follow the Committee's recommendation concerning its arrears – nor indeed did several other countries. Firm decisions need to be taken as total arrears in December 2005 amounted to more than US\$1.5 million, which jeopardizes the activities of the DLCC. It should be noted, however, that many countries made an effort to pay their contributions in 2005 (see Agenda item 13 and document DLCC 06/10 for more details).
12. For the 2004/2005 biennium, there was no need to use the cash balance to bolster budgets for survey operations, the EMPRES Programme or training, as emergency funds also covered these needs during this period (see Agenda item 13 and document DLCC 06/10 for more details).

Many of the recommendations from the **Extraordinary Session** reiterated recommendations that had already been initiated, with modifications to reflect the prevailing emergency context. References are therefore given to avoid repetition.

Locust situation

1. The ongoing dialogue established between the Desert Locust Information Service of the Locust Group at FAO headquarters and all affected countries has been strengthened; in particular, dialogue with the EMPRES Programme Liaison Officers who are generally the National Locust Control Coordinators or the Heads of National Control Units or the Information Officers. The equipment sent through emergency projects has helped strengthen this dialogue. The Commissions have played a key role at the regional level in helping identify inadequacies in human and material resources for survey and control operations and rapidly bridging shortfalls through support from neighbouring countries (covered under Agenda item 6a in more detail; document 06/3a).
2. Training workshops on RAMSES, eLocust2 and the use of satellite imagery were held in the three regions during the first half of 2006, thanks to international funding which also covered the purchase of related equipment. More specific missions and on-the-job training during in-country consultancy work helped spread the use of new technologies, notably the GPS (covered under Agenda item 12 in more detail; document 06/7).

Control measures undertaken by affected countries

3. The EMPRES Programme for the Western Region is now fully operational. The African Development Fund (ADF) of the African Development Bank (ADB), a major contributor to the Programme, made a first disbursement in the last quarter of 2005 once conditionalities had been met. The first Steering Committee meeting was held in Algiers, Algeria, from 4 to 6 March 2006, immediately following the EMPRES-WR Liaison Officers meeting, where the objectives and expected outcomes of the first four-year phase of the Programme, its financial schedule and the plan of operation and budget for 2006 were presented and, as necessary, validated. The recommendations of the 4th Liaison Officers Meeting were endorsed by the Committee, with minor amendments (for more details, see the reports of the 4th EMPRES-WR Liaison Officers Meeting and of the 1st Steering Committee Meeting). Missions to launch the EMPRES-WR Programme were fielded in April and May in Mali, Mauritania and Niger to impress upon national decision-makers the need to establish autonomous Desert Locust control units and to make provisions for financial mechanisms that will ensure their long-term operation (see Agenda item 7a and document DLCC 06/4a for more details).
4. The Extraordinary Session led to the addition of two new regional projects for the North-West African countries to the 14 regional and national projects targeting this area.
5. A roster of experts in various fields of Desert Locust activity has been drawn up. There is clearly an insufficient number of experts to deal effectively with a crisis similar to that of

2003-2005 and their average age is more than fifty. There is a pressing need to beef up training in all the regions concerned.

Crop damage assessment

6. During the crisis, Quality and Environment Surveys of Treatments (QUEST) teams were set up in the affected countries. Their aim is not only to monitor the quality of locust control treatments but also to gauge any undesirable side effects on human health and the environment. Special attention was also paid to the fate of empty pesticide containers and to unused pesticide stocks: a workshop on these topics was jointly organized by the World Bank and FAO in Bamako, Mali, from 15 to 18 May 2006. As regards the assessment of damage to crops and pasture, protocols need to be established, which could be included in the agenda of the next DLCC Technical Group meeting.
7. The methodology employed by the Independent Evaluation Mission during its visits to countries affected by the Desert Locust crisis of 2003-2005 to estimate crop and forage loss could serve as a point of departure for such protocols and the results compiled as reference for future studies.

Assistance from FAO, Desert Locust Control Commissions and donors

8. Clarifications were introduced to avoid any ambiguity in released information between pledges and contributions actually received. Little international use was made of the televised media and one of the lessons from the 2004 campaign was the need to rapidly deploy FAO camera crews to the field; the related cost could be covered by a percentage allocation from each donor-funded project. On the other hand, there were more press releases to the international printed media and more radio interviews.
9. There were prolific discussions on this subject (see document DLCC 06/3f).
10. The Emergency Operations and Rehabilitation Division (TCE) is overseeing internal studies into establishing a command structure with more rapid procedures in emergency operations.
11. More human resources are being added to the Commission for Controlling the Desert Locust in the Western Region (CLCPRO). At the end of the third four-year phase of the EMPRES Programme in the Central Region, in December 2005, its coordinator, a senior FAO officer, was assigned to the Western Region. Two FAO officers were recruited in June 2006 (with ADF funding), one responsible for monitoring and evaluation, the other an acridologist, for two- and four-year terms respectively. A technical assistant made available by France is in the process of being appointed.
12. This recommendation addressed to donors was only partially followed in 2005. This has continued to create problems, in particular concerning pesticide stocks and their immediate and future management.
13. There needs to be streamlining of locust crisis management, which could be helped by devising and applying contingency plans.
14. Information in the form of ECLO operations reports, country briefs and press releases, together with information on funds received from donors and summaries of individual contributions, have been posted at: <http://www.fao.org/ag/locusts/en/info/tce/index.html>. The updating, detail and quality of presentation of this information improved throughout 2005.

Survey

15. While there is every justification for using aerial resources at the outset of an upsurge to carry out extensive surveys and early treatments in sometimes isolated areas, this option requires the immediate availability of funds, which can be a major constraint for many

countries. Their implementation therefore depends on the creation of national, regional and international emergency funds (see document DLCC 06/3f).

16. This point concerning difficulty of access to certain areas was raised with Mauritania. FAO has not looked specifically into the matter and awaits comments from individual countries.
- 17/18. Intra-regional solidarity has helped reinforce and increase border surveys, mobilizing the teams of the different countries concerned. Moreover, such surveys and interchanges between experts are included among the stipulated activities of the EMPRES-WR Programme.

Contingency planning

19. Reference is made to paragraph 10 of the follow-up to the recommendations of the 37th Session and to paragraphs 13 and 15 of the follow-up to the Extraordinary Session.
20. Workshops involving all partners, usually co-financed by the World Bank and FAO, were held in the countries to draw lessons from the completed locust control campaign and prepare for the next. Given the evolution of the locust situation, these have helped improve plans of action for the following campaign but have not yet had any impact on contingency planning.
21. ECLO is still operational and will probably continue to be so until completion of the last emergency project managed by FAO.
22. Only the Commissions for the Central and the Western Regions are involved in coordination with FAO headquarters, which takes place at different levels through regular, often daily, contact (email or telephone) with their Secretaries and joint participation in meetings and workshops. The only functioning regional organization is the DLCO-EA with which ECLO works closely, especially during locust infestations in Eritrea and Ethiopia.
23. Donor confidence in the goal shared with FAO of rapidly halting the Desert Locust upsurge was evidenced by the scale of multilateral contributions (over US\$74 million).

Research

24. The opportunity of conducting applied research activities requires better training of all staff. Such is the direction of FAO's vast, ambitious programme of training of master trainers, step-down training, *in situ* training by consultants and formation of QUEST teams. Whenever possible, full-scale trials of more environmentally friendly pesticides have been carried out (see paragraph 5 of the follow-up to the recommendations of the 37th Session).

Evaluation and monitoring

25. The eagerly awaited findings of the Independent Evaluation Mission should help to improve the management and monitoring of future campaigns.

ANNEX I**LIST OF RECOMMENDATIONS OF THE 37TH SESSION****(SEPTEMBER 2003)**

1. It being noted that the rainfall in 2003 had been altogether exceptional in the Western Region, with some countries having received more rain than the average for ten years, the Committee **RECOMMENDED** that, in the short term, a special and urgent effort be made to study the immediate repercussions that exceptional rainfall conditions might have on the population dynamics of the Desert Locust and on the vegetation with which the species was associated. In the longer term, it was **RECOMMENDED** that the DLCC Technical Group should study the possible links between climate change and Desert Locust population dynamics and distribution.
2. The Committee recognized that conditions were very favourable for locust breeding over extensive areas of prime locust habitat in the other two Regions, albeit that locust populations were very low, and **RECOMMENDED** that National Locust Units in key locust countries should maintain vigilance and carry out regular surveys in the coming months.
3. In respect of false reports of Desert Locust being issued by the Press, it was **RECOMMENDED** that National Locust Units should address the problem where it occurred in their National Press, and that the Secretariat should seek the assistance of the FAO Press Office in approaching the International Press, to encourage that it check with FAO before issuing reports on Desert Locust.
4. The Committee **RECOMMENDED** that the Secretariat, on behalf of the DLCC, approach OCLALAV with a view to creating an electronic database of OCLALAV's archives in the same way that had been done for the archives held by FAO, and that the DLCC contribute to the costs, subject to the availability of funds.
5. The Committee **RECOMMENDED** that member countries and the EMPRES Programme should continue to encourage research and operational trials using alternatives to chemical pesticides such as *Metarhizium* and PAN, and that the Pesticide Referee Group be asked to advise on their suitability.
6. The Committee **RECOMMENDED** that the EMPRES Programme should be extended to the Eastern Region as soon as possible.
7. The Committee **RECOMMENDED** that the awarding of Fellowships should continue.
8. The Committee, being informed that the current inputs being provided by the RAMSES/Remote-sensing consultant were coming to an end in December 2003, and expressing great concern that, without this support, these crucial elements of Early Warning may no longer function properly or be sustainable, **STRONGLY RECOMMENDED** that FAO should find the means by which such support could be maintained at least for the foreseeable future.
9. The delegate from the United States suggested that perhaps an option could be to merge the South-West Asia Commission into the Central Region Commission. After considerable discussion, it was **RECOMMENDED** that first the matter (of re-establishing a full-time Commission Secretary for South-West Asia) should be raised by the concerned countries at the FAO Conference. If that did not resolve the issue, the member countries of these two Commissions could consider the advantages and disadvantages of such a merger, at their upcoming Sessions in 2004. It was noted that there was no suggestion that the Central and Western Commissions should merge, and

that in general the existing Commissions had been created because each could address the specificities of the Desert Locust problem in its own region.

10. The Committee **RECOMMENDED** that the Secretariat should consult with the DLCCTG members both on the topics selected for discussion and on the proposed arrangements. The Secretariat should implement the consensus agreed to by TG members.
11. The Committee **RECOMMENDED** that the annual contributions of all member countries, including that of I.R.Iran should remain the same. In recognition of the difficulties that I.R.Iran had suffered, the Committee **RECOMMENDED** that, given the exceptional circumstances, Iran should be requested to pay off 75% of its arrears as quickly as possible, on completion of which the remaining 25% would be waived. The Committee warmly acknowledged and thanked those countries that regularly paid their contributions fully and had no arrears. It further **RECOMMENDED** that other member countries make an extra effort to pay their annual contributions in good time and to settle as much of their arrears as possible before the next DLCC, so that sufficient funds would be available to maintain the momentum that had developed between 2001 and 2003.
12. The Committee **RECOMMENDED** that any additional cash balances that might develop during 2004/2005, should be used to boost the budgets for survey operations, EMPRES and training.
13. The Committee supported the vote with acclaim, and **RECOMMENDED** that the DLCC invite Mr. Hafraoui to the next Session, and award him a medal.

ANNEX II

LIST OF RECOMMENDATIONS OF THE EXTRAORDINARY SESSION

(NOVEMBER 2004)

The Desert Locust Situation

1. All locust-affected countries should establish a dialogue with the Desert Locust Information Service (DLIS) at the Locust Group, FAO HQ, and with the Commission Secretariats, to verify whether sufficient detail was provided in the information being sent to FAO and, if not, where the gaps were. A great effort should be made to ensure that the gaps be filled quickly, so that the best quality of forecast would be issued by DLIS.
2. During locust emergencies, maximum use should be made of available technology including GPS, RAMSES, and eLocust, to make easier the task of dealing with large quantities of data. Where countries require it, training should be organized by DLIS.

Control measures undertaken by affected countries

3. Participants felt that the preventive strategy for locust control had been successful in the Central Region, but, in the absence of an EMPRES Programme in the Western Region, had not been implemented there. To cope better with the situation the EMPRES/WR should be launched as a full field programme with donor support as soon as possible.
4. Noting the considerable efforts to control locust infestations made by the North African countries using their own resources, participants urged the international donor community to add their support.
5. A roster of experts in the various locust-related activities should be established by FAO and should include experts from all the three Regions, for use in identifying expertise to be fielded during the emergency.

Crop damage assessment

6. Damage to pastureland, together with damage to crops and the environment, should be included in future assessments.
7. At least one dedicated team should be fielded in each affected country during future campaigns to collect data on damage to crops and pastures, and on the socio-economic impact on farmers.

FAO, the Locust Commissions, and donor assistance

8. Better publicity in the Press, with greater use of television, should accompany appeals made to the international donor community, in order to encourage a faster response. Care should be taken not to announce pledges until cash had been received.
9. FAO, in consultation with donors, should consider establishing a substantial emergency fund that could be drawn on at the beginning of an upsurge so that rapid reaction can follow early warning.
10. FAO should streamline its operations so that equipment, supplies, aircraft, consultants and operational funds can be provided more quickly to affected countries.

11. Given the numerous tasks allocated to the Secretariat of the FAO Commission for Controlling the Desert Locust in the Western Region (CLCPRO), including the coordination of the EMPRES Western Region Programme, participants recommended that the Commission be reinforced in respect of its human, material and financial resources.

12. Donors are encouraged to channel funding for locust control through FAO whenever appropriate. When donors choose to provide assistance bilaterally, they are advised to provide the FAO and other donors with full information well in advance of delivery, including an estimate of the monetary value of in-kind contributions. This will facilitate FAO's coordination role in tracking, timing and avoiding duplication in the provision of resources, and allow an estimate to be made of the total value of resources donated from all sources.

13. Affected countries should announce contributions, as pledged and received, on their website. The National Emergency Locust Steering Committees need to be timely and fully aware of both donor contributions and resources mobilized from national resources. FAO can provide models of how this can be done and provide some technical assistance if needed.

14. FAO should provide donors with up-to-date information about the spending of their funds. To facilitate the communication, the information could be put on a restricted website.

Survey

15. Early on in a locust upsurge, helicopters should be used to survey the infestations rapidly and to determine their extent/scale. Large infestations should be treated mainly by air in order to achieve the necessary coverage.

16. Investigations should be organized by FAO to determine how areas favourable for locusts in affected countries that were difficult to access could be surveyed.

17. The importance of border surveys was stressed by many participants of locust affected countries and should therefore be encouraged.

18. To strengthen national survey and control capabilities the use of such teams from other countries should be encouraged and facilitated.

Contingency planning

19. The elaboration of contingency plans at the national, regional and international level should be considered a priority in order to be able to respond accurately to different levels of locust threat. The countries should be assisted by FAO in preparing and improving contingency plans.

20. Workshops should be held in each country at the end of each campaign involving all partners to review all aspects of the actions undertaken and identify the lessons learned. The results will be needed to improve the contingency plans.

21. ECLC should remain operational and supported until the next remission of upsurges.

22. ECLC should strive towards greater coordination among the Commissions, the regional organizations and the affected countries of the invasion area.

23. The donors and ECLC should develop the means of necessary cooperation to achieve their common goal.

Research

24. The opportunity of having gregarious locust populations and large scale control campaigns at the moment should be used to carry out appropriate applied research, such as on: improved survey methods, evaluation of the effectiveness of control operations, appropriate application techniques, environmental monitoring and testing of environmental friendly products, such as IGRs, mycopesticides and other products.

Evaluation and monitoring

25. The lessons learned and to be learned of the campaign should be captured fully by evaluation, assessment and monitoring procedures. This also concerns the effect of the present and future campaign on food security.

September 2006



منظمة الأغذية
والزراعة
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联合国
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Food
and
Agriculture
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Organización
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para la
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y la
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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

USAID'S EMERGENCY TRANSBOUNDARY OUTBREAK PEST PROGRAMME (Agenda Item 8b)

Introduction

Agricultural production in sub-Saharan Africa lags behind other regions of the world. Per capita food production in most of these countries is declining due to agricultural and related sectors not keeping up with population growth. This is further exacerbated by recurring infestations of emergency transboundary outbreak pests (ETOPs), including locusts, grasshoppers, armyworm, grain-eating birds and rodents. The Desert Locust (DL), the most damaging ETOP known, has plagued Africa and the Middle-East throughout recorded history. The advances in survey and control technologies, successes and weaknesses in the 1986/89 and 2003/05 campaigns, and early interventions in 1992/4 that averted what could have become another plague, have all contributed to better understand ETOPs. However, the continued threats these pests pose require the development of more effective prevention, control tools, and strategies.

Program goal

➤ To improve food security, economic well-being and livelihoods of affected populations and help preserve and conserve natural resources and the environment of host-countries for sustainable development.

Strategies

The main focus of USAID's strategy for ETOP programs is to build upon the existing structures and capture the lessons learned to develop enhanced, effective, affordable, safer and sustainable means of addressing ETOP problems by:

- Supporting early warning and monitoring in breeding/outbreak areas;
- Establishing standards and criteria for effective control interventions;
- Providing technical, financial and material assistance for activities that fully embrace U.S. environmental concerns and regulations;
- Supporting adaptive and innovative research and advances and new technologies in pest identification, survey, early warning and control;

- Developing host-country and regional human capacity to reassert and maintain control of the threat posed by ETOPs;
- Promoting and encouraging collaborations among neighbouring countries in planning and implementing cross-border surveillance, control operations and optimizing resource utilization. USAID strategies recognize the importance of containing the initial emergencies and their contributions in getting through a crisis as well as the role of long-term programs such as integrated pest management (IPM) in addressing the ETOP problems. To execute these strategies, USAID created the Assistance for Emergency Locust/Grasshopper Abatement (AELGA), formerly known as Africa Emergency Locust/Grasshopper Assistance in early 1987 and to date, this is the only long-term bilateral donor program exclusively dedicated to ETOPs.

Emergency Operations: Donor collaborations and coordination

Many bilateral donors, international and regional organizations, and private and voluntary agencies, have been or may be working on ETOP related issues and have a unique contribution to make to address this problem. In this regard, USAID gives high priority to supporting inter-organizational networking, but maintains the right to take actions that may differ from those resulting from such collaborative efforts, if it feels that the networking process has not generated adequate and timely responses.

USAID recognizes that the primary responsibility for responding to ETOP invasions resides within the host-governments. It also believes strongly in the creation of a national Donor Coordinating or Steering Committee (DC/SC) whose actions must be accepted and approved by the host-government if and when external interventions are requested and assistance is provided. It sees DC/SC as a useful forum for the exchange of technical and financial information and developing coordinated responses. Generally it provides resources in response to country plans or programs approved by the DC/SC and which represent the policy of the host-government. FAO, an organization responsible for coordinating world-wide responses to the locust problem, often uses these programs for issuance of an appeal for donor support.

USAID Missions with an actual or potential ETOP problem prepare their own local Action Plans that take into account the requirements identified in the Country Plans of the Donor Coordinating Committees, and propose initiatives for USAID funding, over the short-, medium- and long-term. These plans are reviewed at the headquarters for adherence to policy guidelines, priorities established among competing demands, and appropriate resources are allocated within available funds.

Capacity building

Since its inception in early 1987, AELGA has been actively involved in a number of activities to strengthen national and regional capacities to address ETOP and related problems. Some of these activities include the three-phase Country-Focus Trainer-Training program and the Specialized Interregional Trainer-Training programs. From 1994 to 2005, AELGA trained some 2,500 crop protection officers, field agents and lead farmers in Botswana, Burkina Faso, Cape Verde, Gambia, Guinea Bissau, Eritrea, Ethiopia, Mali, Mauritania, Mozambique, Namibia, Niger, Senegal and Tanzania in identification, survey, prevention and safer control of ETOPs through its country-focus training program. Thousands more received training from AELGA and its partners, including FAO during the previous decade.

AELGA has provided specialized interregional training courses to more than 80 scientists, senior crop protection officers and researchers from Benin, Botswana, Burkina Faso, Egypt, Eritrea, Ethiopia, Gambia, Kenya, Guinea Conakry, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Senegal South Africa, Sudan, Uganda, Zambia, and Zimbabwe in biological control of L/G and vertebrate pest identification, monitoring, prevention and control. AELGA executes its training programs in collaboration with host-country and regional

organizations, FAO, international research institutions (e.g.; ICIPE, IITA), private sector, NGOs, and academia.

Adaptive, innovative research

USAID has been actively engaged in promoting, encouraging and sponsoring research in safer and affordable means of controlling Ls/Gs (e.g., biocontrol), crop loss assessments, economic studies of the DL, harmonization of L/G biopesticide registration procedures and many more.

Environmental safety awareness

USAID makes every effort to protect and preserve the environment and natural resources of countries for which it provides assistance. In line with this, AELGA has developed a comprehensive environmental documentation for the control of ETOPs in Africa and Asia. It has also prepared a dozen country-focus supplemental environmental assessments (SEAs), six amendments to the SEA and assisted a number of countries in raising environmental awareness of their staff and decision makers in ETOP operations.

Information Dissemination via electronic media

USAID/AELGA compiles current information on ETOP situations and disseminates it to its audiences, including USAID HQ and field missions, affected-countries, regional and international organizations, NGOs, private sector and other stakeholders. The reports (Sitreps) and updates are also posted on www.aelga.net

Obsolete pesticide disposal

USAID is actively engaged in supporting disposal and prevention of obsolete and dangerous pesticides around the world. It has played a crucial role in the removal of obsolete pesticides from Niger, Ethiopia, Pakistan, Tanzania, and other countries and remains committed to this cause.

Interventions

Since and including the last plague that ended in 1989, USAID contributed in excess of \$130 million to prevent, mitigate and control ETOPs. More than \$60 million of that was contributed to the 1986-89 L/G campaign and more than \$20 million was provided during the 2003-05 locust upsurges. A large portion of USAID's assistance for capacity development and mitigation activities is channeled through FAO with which AELGA has been partnering for over a decade and a half.

Disaster Assistance Response Team-Joint Operation Cell (DART-JOC)

USAID deployed a rapid response team - disaster assistance response team (DART), to Senegal and Mauritania to provide direct operational assistance in locust control to these countries. Supported and advised by a task force in OFDA/Washington, the DART deployed seven fixed-wing aircraft (6 spray aircraft - Air Tractors and one aircraft to support the spray operations), seven pilots, 36,000 litre-capacity fuel bladders for continuous supply of fuel, communication and safety equipment, PPE, generators, 450,000 l malathion 96% ULV and other materials essential for its operations. Additional DART members were also deployed to Mali, Mauritania and Niger to assist Ministries of Agriculture (MoAs).

The DART and MoA and MoD staff from Senegal and Mauritania who were already engaged in locust operations created a Joint Operation Cell (JOC) that planned and executed daily survey and spray operations from its bases in St. Louis and Podor in Senegal and Kaedi in

Mauritania. Spray operations commenced on 12 October, 2004 and treated close to 383,000 ha (282,000 ha in Mauritania and 101,000 ha in Senegal) before they were concluded on 10 November 2004. The JOC approach was lauded by the administration and the technical staff in the two countries as one of the most efficient and effective cross-border operations launched in the region in years. It was later tried by veteran DL experts and proven likewise.

Assistance from USAID bilateral Missions

USAID bilateral missions in Senegal and Mali as well as the regional program for West Africa (WARP) also provided assistance for ETOP operations during the 2003-05 upsurges. These Missions have also contributed more than \$5.6 million for relief and rehabilitation-related efforts for communities affected by the DL invasions and drought as well as for capacity development activities in these countries and the sub-region.

USAID's continued support for ETOP and related programs

Support for capacity building initiatives, the EMPRES programs, pesticide disposal as well as ETOP operations continue. In 2004, USAID signed a \$3 million, 5-year cooperative agreement with FAO to support these activities in affected-countries eligible for USAID's assistance.

Septembre 2006



منظمة الأغذية
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联合国
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Food
and
Agriculture
Organization
of
the
United
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Organisation
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pour
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et
l'agriculture

Organización
de las
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y la
Alimentación

DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

NEW TECHNOLOGIES AND PUBLICATIONS (Agenda Item 10)

1. INTRODUCTION

Desert Locust upsurges and plagues are often opportunities to introduce and evaluate new technologies under actual field conditions to improve survey, reporting, forecasting and control because of a heightened interest and the availability of extra-budgetary and external funds for locust control. Similarly, it is a time when new publications and other informative material are produced and disseminated to increase the awareness and understanding of Desert Locusts and emergencies.

2. NEW TECHNOLOGIES

2.1. Data management and transmission

eLocust2. Survey and control operations, campaign planning and implementation, forecasting, and requests for assistance all depend on high quality, complete field data received in a timely manner. This data represents the foundation of early warning and preventive Desert Locust management. In the past, data was haphazardly collected and recorded by field officers in locust-affected countries. It would eventually reach national locust centres, often late and incomplete. In 2000, the FAO Locust Group, specifically the Desert Locust Information Service (DLIS), developed a handheld device, called eLocust, for locust survey and control officers to record data in the field and transfer it via HF radio modem or download it directly to a computer. Although the concept was shown to be useful, the methodology needed improving. In 2005, eLocust2 was developed by the French Space Agency (CNES) that addressed the shortcomings of the original eLocust by improving its ruggedness, ease of data entry, data quality and data transmission via satellite in real time. eLocust2 was tested extensively in the field by field officers in several countries in the Western and Central Regions prior to its finalization. Some 160 units were procured and have been delivered to frontline countries. FAO is paying for the transmission costs, only incurred when data are sent via satellite rather than downloaded to a PC, during the first year. Thereafter, it is expected that the FAO Regional Locust Commissions will assume this responsibility. So far, the Central Region Commission has agreed to this at its last session in Qatar. It is intended that all survey and control teams are equipped with eLocust2 in locust-affected countries. This will not only improve the quality and timeliness of information from the

field but it will reduce the difficulty of managing large volumes of data during locust emergencies. Nevertheless, a mechanism will need to be developed to insure that additional eLocust2 units can be rapidly procured and delivered for use by the increased number of teams during upsurges and plagues. There should be a sufficient number of locust officers who already know how to use eLocust2 that can train new users in their country.

RAMSES. In 1998, FAO developed a custom geographical information system (GIS) called RAMSES (**R**econnaisance **A**nd **M**anagement **S**ystem of the **E**nvironment of *Schistocerca*) for locust-affected countries to manage and analyze locust and environmental data. RAMSES is to be used by the nationally designated Locust Information Officer in frontline countries. So far, the system has led to an improvement in the quality of the field data and better decision-making. Recently, a new version of RAMSES was developed based on user suggestions that is more powerful yet easier to use, and is able to import eLocust2 data and display high resolution satellite imagery.

SWARMS. IN 1994, FAO and the University of Edinburgh developed a similar but much more sophisticated GIS called SWARMS (*Schistocerca* **W**arning and **M**anagement **S**ystem) to allow DLIS to manage and analyze locust, weather and environmental data on a global scale. RAMSES data files sent to DLIS by affected countries are imported into SWARMS as well as data from other sources such as daily and decadal rainfall estimates (satellite-based from Columbia University's IRI Centre, and model-based estimates from Meteo Consult), rain station data (Meteo France), temperature estimates (Meteo Consult), seasonal temperature and rainfall forecasts (World Climate Service), meteorological data to operate models estimating egg and hopper development rates and locust migration trajectories, SPOT-VGT and MODIS satellite imagery to identify areas of green vegetation. SWARMS maintains historical locust records from the early 1930s onwards. The system is constantly being improved to allow the display of new data sets as they become available, including the linking of locust data to Google Earth and NASA's World Wind project. To assist with these developments, a GIS expert is currently based in DLIS until the autumn of 2006.

2.2. Remote sensing

MODIS. Since 2005, FAO DLIS has been providing locust-affected countries with high resolution (250m) MODIS satellite imagery to help detect areas of green vegetation. MODIS imagery is gradually replacing 1 km resolution SPOT-VGT imagery. This imagery is used to help guide survey teams to areas where locusts may be present and to reduce the large areas that must be monitored. Higher resolution imagery reduces the occurrence of false positive incidents, that is, where the image suggests that it is dry when in fact it is sufficiently green for Desert Locusts. The FAO Remote Sensing Centre will assume responsibility for distributing MODIS imagery every 16 days as country-defined windows in order to minimize the time required for downloading an image. MODIS imagery is best viewed within the RAMSES GIS.

Rainfall estimates. FAO and WMO jointly organized two regional workshops (Niamey, Niger (April 2005) and Muscat, Oman (April 2006)) that brought together locust directors and meteorological forecasters from affected countries to discuss the meteorological data requirements of national locust units for survey and control operations. In both workshops, locust personnel clearly indicated that they needed daily and decadal satellite-based rainfall estimates throughout the year supplemented by temperature maps and wind charts during emergencies.

Columbia University (USA) and the FAO Remote Sensing are developing rainfall estimate maps that will be provided to each country so that they can display and analyze them within RAMSES.

Seasonal forecasts. Within the framework of emergency assistance provided by The Netherlands and in collaboration with the World Climate Service (USA), FAO DLIS is experimenting with the use of seasonal forecasts that predict rainfall and temperature anomalies and probabilities up to six months in advance. These forecasts are being cautiously introduced into the six week and seasonal locust forecasts provided by DLIS, including the forecast presented at this session of the DLCC. So far, the accuracy of the seasonal forecasts is variable depending on the time of year and region. In any case, seasonal forecasts represent another tool that the DLIS forecaster can use to supplement other locust, ecological, weather and historical information.

2.3. Improved control

DGPS and track guidance. During the past few years, the precision of pesticide applications during locust control operations has improved significantly with the increased reliance on differential geographic positions (DGPS) and track guidance systems used to guide the operator when applying pesticide. Initially, these systems were limited to aircraft but they have recently expanded for use during ground control operations with vehicle-mounted sprayers. During the 2003-2005 upsurge, all aircraft contracted by FAO were required to have DGPS and track guidance systems. The use of these systems has contributed to a reduction in pesticide wastage and related negative effects on the environment.

Bio-pesticides. As part of FAO's continual search for alternative products to conventional pesticides for locust control, several field trials were conducted in 2004 and 2005 using *Metarhizium anisopliae* var. *acridum* against hopper bands. The positive results suggest that in some situations this product can replace chemical pesticides by effectively combating locusts but minimizing any effects on the environment. A workshop on bio-pesticides is scheduled to held in February 2007.

Alternate products. Other methods of reducing the impact of chemical pesticides on the environment is to use alternate products such as hormones (Insect Growth Regulators or IGRs), to spray strips instead of applying full-cover treatments or to reduce the amount of active ingredient (dose rate) of a conventional pesticide or improve the efficacy of a bio-pesticide by combining it with pheromones such as PAN (Phenylacetoneitrile). Further research and field trials are required before these methods become operational.

2.4. Improved information

LocustWatch. During the 2003-2005 upsurge, the Locust Group redesigned its website, called LocustWatch¹, and included updated information about the locust situation and emergency operations as well as locust-related activities, publications, reports, bulletins and other documents. DL Mapper provides interactive access to locust data and DL Chaser can be used to estimate swarm migration routes. Recently, a colour-coded warning system has been introduced to indicate different threat levels.

Google Earth / World Wind. eLocust2 data transmitted by satellite can be viewed on Google Earth, allowing national locust directors to monitor the situation and teams in the field. A similar system to display survey and control results via the Internet on World Wind² is under development in collaboration with NASA.

SMS updates. DLIS is investigating the possibility of sending out brief locust situation updates by SMS to mobile telephone users.

3. NEW PUBLICATIONS AND OTHER MATERIAL

Since the last session of the DLCC, the Locust Group has produced several new brochures and publications in English, French and Arabic that supplement existing material (Annex 1):

- Hunger in their wake: Inside the battle against Desert Locust (brochure)
- Fighting the locusts ... safely: Pesticides in Desert Locust control – balancing risks against benefits (brochure)
- Desert Locust Archives 1952 – 2005 (a CD/DVD containing all of the reports received by FAO since 1952)
- Standard Operating Procedures for Desert Locust survey, control and aerial control operations
- Grasshopper identification cards (English only)

¹ www.fao.org/ag/locusts

² worldwind.arc.nasa.gov

During the 2003-2005 upsurge, information about the campaign including situation updates and video footage was displayed in the atrium at FAO Headquarters. The display was recently changed to show post-emergency activities that focus on the environment.

4. CONCLUSION

FAO has developed a number of new technologies and publications that have been disseminated for use mainly by affected countries and other interested parties. The primary focus of these items is the locust-affected countries and relevant donors. The DLCC should consider the following questions during the discussion:

- (a) What gaps exist in current Desert Locust management that new technologies should address?
- (b) What additional publications or information material are required by affected countries and donors to improve Desert Locust management?

Annex 1. Available FAO Desert Locust publications

The following publications and information can be downloaded from the LocustWatch web pages (www.fao.org/ag/locusts – publications section):

- Atlas of Desert Locust Breeding Habitats (1997)
- Brochures
 - Hunger in their wake: Inside the battle against the Desert Locust
 - Fighting the Locusts... Safely
- Desert Locust Bulletins (1994 to present)
- Desert Locust Situation Briefs (1997 to present)
- Desert Locust Technical Series
 - No. 21: Trilingual glossary of terms used in acridology (FAO, 1980)
 - No. 27: Economic and policy issues in Desert Locust management (S. Joffe, 1998)
 - No. 29: Field tests on an integrated Differential GPS navigation and spray monitoring systems (P.S. Ottesen et al, 1999)
 - No. 30: Population dynamics parameters (J. Roffey & J. Magor, 2003)
 - No. 31: Biogéographie du Criquet pèlerin en Mauritanie (M.A. Ould Baba, 2003)
- Evaluation of Spray Equipment Used in Desert Locust Control (1994 and 2002)
- Guidelines
 - FAO Desert Locust Guidelines - Latest edition (2001-2003)
 - FAO Desert Locust Standard Operating Procedures
 - FAO Guidelines for Pesticides Trials on Desert Locust Hoppers
 - FAO Guidelines for IGR Barrier Trials
 - Ground-based Sprayers for Locust and Grasshopper Control
 - Contingency plans
- Locust forms
 - Desert Locust Survey & Control
 - Environmental Monitoring
 - Poisoning Incident
 - SPOT-VGT Validation
 - Spray Monitoring
- Meeting reports
 - Desert Locust Control Committee (DLCC) and DLCC Technical Group
 - EMPRES Central Region – Liaison Officer meetings, Consultative Committee, Evaluations, Programme documents, Progress reports
 - EMPRES Western Region – Liaison Officer meetings, Consultative Committee
 - Joint Surveys
 - Djibouti / N. Somalia
 - Egypt / Sudan Red Sea coast
 - Iran / Pakistan border
 - Sudan Red Sea coast
 - Yemen / Saudi Arabia Red Sea coast
 - Pesticide Referee Group
 - Regional Commissions
 - CLCPANO - Commission for controlling the Desert Locust in Northwest Africa
 - CLCPRO - Commission for controlling the Desert Locust in the Western Region
 - CRC - Commission for controlling the Desert Locust in the Central Region
 - SWAC - Commission for controlling the Desert Locust in Southwest Asia
 - Miscellaneous
 - Bio-pesticides
 - FAO/WFP Crop and food assessment (2004)

September 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

REPORT ON THE TECHNICAL GROUP WORKSHOP, MAY 2004 (Agenda Item 11)

1. INTRODUCTION

This working paper was prepared by a member of the DLCC Technical Group, L. McCulloch. The DLCC may wish to (1) adopt the report of the last meeting of the DLCC Technical Group and (2) determine how to address the follow-up to the various recommendations.

2. REPORT ON THE TECHNICAL GROUP WORKSHOP ON CONTINGENCY PLANNING FOR DESERT LOCUST CONTROL, MAY 2004, NOUAKCHOTT, MAURITANIA

Background

1. The Workshop on Contingency Planning for Desert Locust Control was organized by FAO following on from a recommendation by the 37th session of the Desert Locust Control Committee (DLCC).
2. The workshop was held in Nouakchott, Mauritania from 2 to 7 May 2004. Participants included representatives from national locust organizations in the Central, Western and South West Asia regions, FAO Headquarters and regional staff, three members of the Desert Locust Technical Group (DLTG) and the FAO consultant (Dr Symmons).

Objectives

3. The aim of the workshop was to assist countries in the formulation of contingency plans, to evaluate different control tactics, and examine the use of contingency planning as a tool to assist in mobilizing resources in the short time frames dictated by an emergency situation.

Contingency Planning

4. FAO indicated that advance warning of a Desert Locust outbreak was likely to be less than a month, for upsurges around 3 months whilst for plagues advance warning of up to 6 months was possible. These short time frames highlighted the need to have well developed contingency plans that could be activated quickly when a locust emergency developed.

5. Using the models developed for the workshop, contingency plans were examined separately for the Outbreak, Upsurge and Plague stages respectively. For each stage, participants attempted to determine the resources that would be required for control, to consider how these resources would be utilized and how the resources could be supplied within the often limited time period available
6. The level of resources (e.g. pesticides, vehicles and aircraft) for the outbreak, upsurge and plague stages was estimated by participants providing input data to an excel spreadsheet (“model”). Using this data the resources required, based on the input data and a number of assumptions contained within the excel spreadsheet, were calculated.
7. There was significant variance between participants in estimating some input parameters required by the exercises. For example, the time to search and delineate a target “block” for control. Similarly, for the outbreak stage, a critical estimate was the rate of success in detecting and controlling small patches/aggregations of hoppers. As there was no field data on this parameter a simulation exercise was undertaken to estimate this parameter.
8. Given that a number of the parameters required for the exercise impact to some degree on estimating requirements for planning purposes, individual countries and FAO should consider collecting this type of field data to enable more accurate planning estimates to be made.
9. The *outbreak* exercise generated significant debate since the results suggested that control measures would have a limited impact on reducing an outbreak population. This generated considerable debate on the validity of some of the assumed parameters used in the exercise.
10. There was a general consensus that *outbreak* control would normally only involve ground control of locusts with most of the control effort being directed at the nymphal stages.
11. The resources required to undertake *outbreak* control could be classified as significant, the likely “limiting” factor was likely to be the number of ground teams that could be mobilized.
12. Most, but not all, locust-affected countries indicated that they had sufficient national resources to undertake control of *outbreak* populations without the need to request external assistance.
13. A few locust-affected countries may only be able to undertake *outbreak* control with external assistance. This lack of immediately available resources could result in no, or only limited, control being undertaken.
14. The results of the *upsurge* scenario indicated that the resources required for *upsurge* control would be substantial and generally beyond the normal means of most locust-affected countries without external assistance.
15. In the early stages of an *upsurge* it was considered likely that there would be heavy reliance on ground control of bands with aerial control required in the later stages of the upsurge.
16. The results of the exercises indicated that the resources to control a Desert Locust *plague* population in the nymphal stages are substantial even when the vast majority of the population occurs in bands. Whilst the level of resources greatly reduces if control were only to be carried out against swarms, this was not seen as a feasible strategy in respect of flying swarms.
17. Similarly, the resources needed to detect and define nymphal targets by ground search in a *plague* are large. Detection of such targets by air would prove to be more resource efficient but most participants did not consider this to be feasible or feasible only under very particular conditions.
18. It was considered that barrier treatment of bands by both ground and air potentially offered effective and cost efficient control in a late upsurge and/or plague situations. However, additional large-scale trials using products such as fipronil and IGRs would need to be conducted to establish efficacy and to determine effective barrier application methods.
19. The elements of a contingency plan were also discussed by workshop participants. In addition to specifying additional resources it was also suggested that contingency plans also detail the various actions required to mobilize additional national and external assistance and information on the control systems/techniques to be used.

20. In addition to the exercises, presentations were made on contingency planning by several locust-affected countries and by FAO staff from the Western and Central Regions

Immediate issues

21. Due to the serious Desert Locust upsurge at the time of the workshop a number of issues of immediate concern to participants and also of relevance to contingency planning were discussed at the workshop.
22. These issues included resource mobilization, resource utilization and strengthening of existing structures for emergency response.

Recommendations

23. The Workshop report made a number of recommendations. In addition to several recommendations on contingency planning the report also contained a series of recommendations concerning the immediate issues at the time in terms of the planning and response to the major Desert Locust upsurge that was in progress in the region in May 2004.
24. In terms of contingency planning, it was recommended that:
- a. Follow up action should include an annual workshop and more comprehensive in-country backstopping should be accorded a high priority by FAO;
 - b. Contingency plans need to consider donor requirements;
 - c. The FAO Locust and Migratory Pests Group should develop its own contingency plans for responding to Desert Locust emergencies;
 - d. FAO (the Locust and Migratory Pests Group and regional commissions) should ensure databases on assistance provided and control resources available in affected countries are maintained;
 - e. Affected countries should provide details of on how available national (control) resources will be utilized including control systems and techniques.
25. The report also recommended that advantage be taken of the presence (in 2004) of major Desert Locust populations to undertake research in a number of areas including:
- a. Estimating the extent of hopper infestations;
 - b. Pesticide trials;
 - c. Applied research on the feasibility of aerial spraying of flying swarms;
 - d. Applied research on the detection of hopper bands by aerial survey;
 - e. Determining the proportion of hopper bands treated and the proportion not treated in target areas; and
 - f. Evaluating the efficacy of control measures.

Septembre 2006



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DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

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TECHNICAL GROUP COMPOSITION AND FUTURE ACTIVITIES (Agenda item 12)

A short historical perspective of the Desert Locust Control Committee Technical Group is presented prior to suggesting some possible mechanisms that might improve its usefulness to the DLCC and FAO.

1. BACKGROUND

In **June 1989**, the 30th Session of the Desert Locust Control Committee (DLCC) urged that consideration be given to reactivating the Technical Advisory Committee on Desert Locust Control that provided briefs to the DLCC on technical issues up until 1966.

In **June 1990**, the TAC reconvened to review the Desert Locust situation and several technical issues such as information, remote sensing, surveys, control, research and training.

In **September 1990**, shortly after the end of the last Desert Locust plague, the 31st Session of the DLCC recommended the establishment of a Desert Locust Technical Group to:

- study and report to the DLCC on all technical and scientific matters pertaining to the control of the Desert Locust;
- report and advise on specific issues referred to the Technical Group by the DLCC;
- oversee and follow-up recommendations of the DLCC;
- advise the Secretariat on the agenda for future meetings of the DLCC.

The composition of the Technical Group should be a small number of locust experts of the highest technical standing nominated for a period of two years. The Committee recommended T. Benhalima, S. Hadramy, A. Karrar, M. Shafi and L. Soumare. The Technical Group was given the authority to co-opt additional members according to specific matters to be discussed. FAO would provide the Secretariat and its activities would be funded from the International Trust Fund 9161. The Technical Group should meet twice a year.

In **February 1992**, the First Session of the Technical Group met and proposed that future meetings should be held on an annual basis rather than twice a year as recommended by the 31st Session of the DLCC.

In **January 1995**, the Third Session of the Technical Group proposed amending the composition of its membership. The 33rd Session of the DLCC, also in January 1995, requested that eight participants (B. Chara, S. Ghaout, C. Gueye, N. Mahjoub, A. Rassipour, M. Shafi, A. Showler and A. van Huis) review the Technical Group's terms of reference, duration and composition. Based on their review, the Committee adopted the following:

- Revised terms of reference
 - analyse and advise on specific issues as identified by the DLCC;
 - review and report on progress in carrying out the recommendations of the DLCC;
 - advise the Secretariat on the agenda for future meetings of the DLCC.
- Criteria for Technical Group membership
 - the Technical Group members be chosen on the basis of their individual ability, expertise and experience;
 - the membership among locust-affected countries should include as wide a range of geographic experience and interest in locust issues as possible;
 - the membership of the Technical Group will be expanded by three members from the donor countries;
 - the regional commissions and organizations be associated with the Technical Group as observers.
- Duration of the Technical Group
 - The Technical Group is permanent and half of its members will be changed every two years;
 - The Technical Group should convene normally once each year.
- Composition of the Technical Group
 - The Technical Group will be composed of five members from the affected countries and three donor countries.

The following experts were recommended for the Technical Group: B. Chara (Algeria), A. El-Gammal (Egypt), C. Gueye (Senegal), A.M. Karrar (DLCO-EA) and M. Shafi (Pakistan). It was noted that the Technical Group would be able to call upon specialized expertise when required.

In **October 1998**, the Sixth Session of the Technical Group recommended that a paper on the role of the Technical Group should be prepared for the 35th Session of the DLCC. It was further recommended that members of the Group should meet at the end of the DLCC, draw up an agenda for the next Group meeting, based on the DLCC recommendations and designed to promote technical discussion, allocate the preparation of papers to members, the Secretariat or consultants, and agree on which experts it would be useful to invite to provide specialist inputs.

In **May 1999**, the 35th Session of the DLCC addressed the future role of the Technical Group and its relation to the EMPRES/CR Consultative Committee. It was concluded that the Technical Group covered the whole range of the Desert Locust and served a distinct function from the EMPRES Consultative Committee that existed for the Central Region only. In an effort to ensure that Technical Group discussions focused on technical issues, it was proposed that towards the end of each DLCC, Group members should meet, identify technical issues worthy of discussion or which had been referred to it by the DLCC, and decide on who would be asked to prepare working papers on the topics funded, if necessary, by the DLCC Trust Fund.

Some DLCC participants were of the view that the Technical Group had not addressed enough technical issues at its last meeting, and papers were being presented for information rather than for technical discussion. Others felt that the functions of both the DLCC and the Technical Group had become somewhat blurred with some technical papers presented at the DLCC and some policy matters at the Technical Group. The Committee nevertheless unanimously agreed that the

Technical Group should continue to function and should hold one meeting per year. In order to ensure that discussions concentrated on technical matters, it was decided to ask a representative sub-committee to re-examine the terms of reference of the Technical Group and to report back to the DLCC before the end of the Session.

Based on the sub-committee's review, the Committee agreed to revise:

- the mandate of the Technical Group so as "to study and report to the DLCC on all technical and scientific matters pertaining to the control and management of the Desert Locust, as referred to it by the DLCC";
- the membership of the Technical Group so it "will be composed of five members to be chosen by the FAO Secretariat on the basis of their individual ability, expertise and experience relevant to locust management, augmented as necessary by outside expertise;
- the duration of the members of the Technical Group so they "will be nominated by the DLCC for a period of four years";
- the frequency of the Technical Group meetings to "once per year".

In **September 2001**, the 36th Session of the DLCC noted that the Technical Group was not meeting on an annual basis. The Secretariat proposed that Technical Group meetings be held in the year between the DLCC sessions.

2. DISCUSSION

The various sessions of the DLCC Technical Group, its membership and revisions are summarized in Annex 1. In practice, very little has changed regarding the role and membership of the Technical Group. From 1999 onwards, it ceased to review the status of recommendations made by previous DLCC sessions and to advise the Secretariat on the agenda for future sessions. This was to allow the Technical Group to concentrate solely on any technical and scientific matters pertaining to Desert Locust management and control. Yet, the last two sessions of the DLCC and the Extraordinary Session held in December 2004 have referred only three technical issues to the Technical Group: update the *FAO Spray Monitoring Form*, examine contingency planning and study the possible links between climate change and Desert Locust population dynamics and distribution.

It could be argued that some of the above items are not particularly appropriate for the Technical Group or beyond their means. Perhaps locust-affected countries and decision-makers should determine what information is required on the *FAO Spray Monitoring Form*. Research institutes may be more suitable for carrying out climate change studies.

Furthermore, the Technical Group was not consulted during the 2003-05 Desert Locust emergency by DLCC or FAO.

The Multilateral Evaluation of the 2003-05 Desert Locust Campaign recommended that full advantage be taken of the Technical Group to review the needs for the development of improved Desert Locust survey and control means, and prepare appropriate proposals. It is less clear whom these proposals should be addressed to.

Despite the recommendation of the 35th Session of the DLCC (1999) that the Technical Group should consist of five experts, the current membership contains six persons: a Member of Parliament from the Algerian Government, an ex-Director of the Australian Plague Locust Commission, a locust expert, a bio-geographer and two entomology professors.

The Technical Group has met twice in the past six years because there have not been enough suitable topics for discussion.

3. IMPROVEMENTS TO THE TECHNICAL GROUP

In order to improve the usefulness of the Technical Group, several options could be considered.

2.1. No change – the Technical Group's mandate, membership and frequency of meetings remains unchanged to that what was agreed by the 35th Session of the DLCC although the number of members should be clarified, either five or six. This option may not be very satisfactory if the Committee questions the usefulness of the Technical Group and believes that improvements are required.

2.2. Review and revise – a sub-committee could be established to propose changes to the mandate, membership and frequency of meetings of the Technical Group. This option is the approach that has been taken in the past with, perhaps, only limited results.

2.3. Expert advice – the Technical Group could be decommissioned and replaced by non-paid technical experts in, for example, communication and information systems, remote sensing, meteorology, control, environment, damage assessment, pesticide management, training, economics, planning, and new technologies, who could be appointed by the Director-General of FAO and be called upon to provide advice as needed. Internet-based tools (email, forums, network, etc.) could be used to facilitate such advice in a more timely and meaningful manner as well as to replace the formal conveying of meetings. It may be useful to maintain an updated roster of appropriate experts in key fields. The advice does not necessarily need to be limited to technical and scientific issues that arise in the DLCC but also in the Locust Group, the Regional Commissions and in EMPRES. In this case, it may be more practical that the Locust Group takes the lead in contacting these experts and seeking their advice. Such contacts could be reported to future DLCC sessions.

4. CONCLUSIONS

The question of the role of the Technical Group, its mandate, membership and usefulness is not a new one. These issues have been discussed repeatedly during the past 15 years at various sessions of the Desert Locust Control Committee. The standard recommendation has been to establish a sub-committee to review these issues and make suitable proposals that are then adopted by the Committee.

Taking the above into consideration, the DLCC should address the following questions during the discussion:

- (a) Does the DLCC and FAO currently profit from the advice provided by the Technical Group?
- (b) Is DLCC the right body to guide the Technical Group or should the Locust Group be allowed to address issues to the Technical Group as they arise?
- (c) Which of the options outlined above is preferred and for what reason?

Annex 1. Previous sessions of the DLCC Technical Group, its membership and revisions*Table 1. The dates and topics of previous Technical Group meetings.*

Session	Date	Topics discussed
1	18-20 February 1992	DL management strategies, research, training; 31 st DLCC recommendations; 32 nd DLCC agenda
2	13-17 September 1993	DL control strategies, research, pesticide disposal, environmental issues; 33 rd DLCC agenda
3	11-13 January 1995	Information system, control potential, preventive control, research, environmental issues, obsolete pesticides, training; Technical Group membership; 32 nd DLCC recommendations; 33 rd DLCC agenda
4	21-24 March 1995	DL economics, control strategies, EMPRES implementation and extension
5	25-28 June 1996	Communication systems, remote sensing, surveys, campaign efficiency; status of economic studies, research, EMPRES; environmental issues; 33 rd DLCC recommendations; 34 th DLCC agenda
6	5-8 October 1998	EMPRES progress, control potential, research priorities, DLCCCTG future, Locustox workshop; 34 th DLCC recommendations; 35 th DLCC agenda
7	12-15 June 2000	Updating DL guidelines, environmental monitoring, training and research network, GPS, APLC methods, DLCC mandate
8	2-7 May 2004	Contingency planning (Nouakchott)

Table 2. The members of the TAC and the Technical Group, 1990-2006.

Session	Members
TAC	S. Bamofleh, M. Bensalah, A.M. Karrar, A. Khasawneh, M. Launois, J. Magor, N. Mahjoub, L. McCulloch, I. Murshed, J. Roffey, M. Shafi, L. Soumare, W. Thomas
1	S. Bamofleh, T. Benhalima, A.M. Karrar, M. Shafi, L. Soumare
2	Y. Ashour, T. Benhalima, A.M. Karrar, M. Shafi, L. Soumare
3	Y. Ashour, T. Benhalima, A.M. Karrar, M. Shafi, L. Soumare
4	L. Bonneau, B. Chara, A. El-Gammal, C. Gueye, A.M. Karrar, J. Rosenberg, M. Shafi, A. Showler
5	L. Bonneau, B. Chara, A. El-Gammal, C. Gueye, A.M. Karrar, J. Rosenberg, M. Shafi, A. Showler
6	S. El Basher, S. Ghaout, S. Krall, M. Mohsin, P. Ottesen, A. van Huis
7	B. Chara, S. El Basher, G. Hamilton, M. Lecoq, J. Magor, A. van Huis
8	B. Chara, S. El Basher, L. McCulloch, M. Lecoq, J. Magor, A. van Huis

Table 3. Changes in the mandate, membership and frequency of meetings of the Technical Group, 1990 -2006.

Date	Mandate	Membership	Meetings
Sept 1990	<ul style="list-style-type: none"> • study and report to the DLCC on all technical and scientific matters pertaining to the control of the Desert Locust; • report and advise on specific issues referred to the Technical Group by the DLCC; • oversee and follow-up recommendations of the DLCC; • advise the Secretariat on the agenda for future meetings of the DLCC. 	5 locust experts nominated for 2 years	twice/year
Feb 1992			once/year
Jan 1995	<ul style="list-style-type: none"> • analyse and advise on specific issues as identified by the DLCC; • review and report on progress in carrying out the recommendations of the DLCC; • advise the Secretariat on the agenda for future meetings of the DLCC. 	5 affected countries + 3 donors; half of the members changed every 2 years	once/year
May 1999	<ul style="list-style-type: none"> • to study and report to the DLCC on all technical and scientific matters pertaining to the control and management of the Desert Locust, as referred to it by the DLCC 	5 experts chosen by FAO for 4 years	once/year

September 2006



DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

CONTRIBUTIONS, ACTIVITIES, EXPENDITURES AND PLAN OF WORK AND BUDGET 2003-2007 (Agenda Item 13)

1. INTRODUCTION

The Desert Locust Control Committee (DLCC) Trust Fund continues to support a number of activities that are of crucial importance to improved Desert Locust management, thereby bringing benefit to locust-affected countries. Major activities funded include training at the post-graduate degree level, at the diploma level and of Locust Information Officers. The production of the Desert Locust Guidelines in Arabic and French has been an important expense in 2004. The DLCC has also made a significant contribution to bringing remote-sensing images and new technologies into use as operational tools, to developing the RAMSES database, and to creating databases for archived locust reports and for locust pesticide trials. It organized the DLCC Technical Group in Mauritania in May 2004. The DLCC has supported EMPRES, with one DLIS General Service staff to provide documentary information to the countries when required. The details of the financial support provided to these activities are given below.

2. CONTRIBUTIONS

2.1. Data on the contributions received by the DLCC Trust Fund are provided by the Receipts, Payments and Treasury Service, AFFR of the FAO Finance Division. Tables 1 a), b), c) and d) show the contributions to the DLCC Trust Fund received for 2003 (the ones provided at the last Session were provisional), 2004, 2005 and provisional 2006. The contributions received in 2003 are amounting to USD 181,152, to USD 118,067 in 2004 and to USD 214,139 in 2005. An update on contributions received so far in 2006 will be provided at the time of the DLCC meeting. Payments were received in 2003 from 14 different countries, in 2004 from 11 countries and in 2005 from 15 countries. A few countries are regular in their contributions to the DLCC, paying them routinely over the past three years (India, Kenya, Pakistan, Saudi Arabia and Syria). The total membership at the end of 2005 was 32, of which 12 countries have not provided any contribution during 2003/2004/2005. It is noted that Iran made a substantial effort in 2005 to pay for that year and one year of arrears but this still falls short of the recommendation 11 from the 37th Session where it was requested to Iran to pay off 75% of its arrears, on completion of which

the remaining 25% would have been waived. Given the important activities supported by the Trust Fund and the global efforts being made to make preventive control practices into a sustainable reality through the EMPRES Programme, the need for more countries to contribute routinely is self-evident.

2.2. At the end of the year 2002, the cash available was USD 340,137. To this figure the contributions made in 2003, 2004, 2005 and 2006 totalling USD 513,867 should be added. The total interest earned on the account between 2003 and the 31st of May 2006 is USD 10,286, giving total cash available on 31st of May 2006 for the period 2003/2006 of USD 864,290. Against this, the total expenditure incurred in the same period up to 31st May 2006 was USD 727,416. The current cash balance (as at 31st May 2006) is therefore USD 136,874. This will permit planned DLCC activities up to the end of 2006 but will not cover the proposed budgets for the subsequent years. It should be noted that the accumulated cash balance will have been exhausted and future activities of the DLCC will be dictated by the level of incoming contributions. If member countries wish to maintain the level of activities seen during the last three years, more efforts to pay contributions will have to be made. The DLCC should make a strong recommendation on this matter.

3. EXPENDITURE

3.1. Expenditures during 2003, 2004, 2005 and 2006 are summarized in Table 2. It should be noted that the figures for 2003, 2004, 2005 are final, and for 2006 valid up to the end of May. Details about the use of funds is developed at paragraph 3.4., 3.5, 3.6 and 3.7.herebelow.

3.2. Compared with expenditures in the years reported at the last DLCC in 2003 (USD 806,757), the rate of usage of the Trust Fund has slightly decreased, due to the low level of expenditures in 2005 as a consequence of the Desert Locust upsurge and related emergency funding which covered many activities usually funded by the Trust Fund. The Secretariat considers that the Trust Fund must be seen as an important funding source towards improving locust management on a global scale as per its original intentions. It is hoped that this view is shared by the membership.

3.3. The budgets approved at the last DLCC were USD 699,980 for 2003/2004/2005, and the expenditures for these 3 years were USD 664,231. This means that 95% of the approved budget was spent, covering the costs of the 37th Session, the Pesticide Referee Group and the printing of the Arabic and French versions of the Desert Locust Guidelines.

3.4. DLCC Trust Funds were also used for the reproduction and distribution of the monthly **FAO Desert Locust Bulletin** and for the **DLCC Working Papers**, both in three languages. For the latter, a relatively high usage of the budget is incurred during years in which the DLCC is held (in 2003). Consequently, the expenditure in 2006 will increase markedly before the end of the year. However, the costs for the Bulletin are decreasing because greater emphasis is being placed on electronic distribution. For the **Desert Locust Guidelines**, the costs of the production, translation and printing of in French and Arabic were higher than expected, but this was mainly offset by an important reimbursement from Emergency Project funds for technical assistance during the recent upsurge, allowing some USD 50,000 ((*) in Table 2) be reimbursed into the Trust Fund in 2005. In addition to that, a contribution was also provided in 2005 to the Arabic translation of "Guidelines on Minimum Requirements for Ground Based Locust and Grasshopper". For **Desert Locust surveys**, most of the funds came from the Emergency projects to fit with the higher requirement for survey operations in the Western Region, while the EMPRES Programme in the Central Region had sufficient resources to cover their survey costs. For the coming years, the running costs of field teams in the Western Region will be co-funded by several donors supporting EMPRES/WR, especially the World Bank, ADB and USAID, and by the member countries themselves which will progressively increase their contributions to the recurrent costs of their national Desert Locust Control Unit. Given that the EMPRES funds available for the Central Region are reduced, the DLCC Trust Fund could support more activities in that region if required.

Concerning the recent **DLCC Meetings**, the Extraordinary Session in 2005 was financed out of the funds the Locust Group had at its disposal as counterpart for the technical support provided to the Emergency projects during the upsurge. The DLCC Trust Fund assumed the cost of the translation of the documents. The **training** expenditure reflects the continuation of a programme to train national Locust Information Officers, selected in rotation from the three Regions, for 11 months in the Desert Locust Information Service (DLIS) at FAO HQ. Training is provided on data management, processing, archiving and analysis as well as in using RAMSES, interpreting satellite imagery, and using eLocust2. Additional training is given in computer skills and English language, if necessary. Trainees from Pakistan (in 2003), Oman (in 2004) and Morocco (2005) have completed this programme and one from Algeria (end 2005 up to October 2006) is currently being trained. We note that the expenditures incurred in 2004 and 2005 for the participants of Oman and Morocco are very low, due to the fact that we had the possibility to finance the participants out of the Emergency Project funds for technical assistance that we had at disposal during the recent upsurge.

3.5. For Fellowships: in addition to funding M.Sc. and Ph.D. studies, fellowships have also been awarded for diploma studies in Desert Locust management at the University of Khartoum, Sudan. The candidates were from Libya, India, Sudan and Ethiopia (in 2003). In 2003, a candidate from Pakistan attended a 12 months research programme in Desert Locust control at NRI, UK. Funds are also financing a 3-year PhD candidate from Niger (in 2004 up to now) at the “Institut Vétérinaire Hassan II” in Agadir, Morocco.

3.6. The DLCC Technical Group met in Nouakchott in May 2004 as planned at the last Session of the DLCC held in 2003 where it was agreed that contingency planning for locust control was a high priority to be addressed by the DLCC-TG. The **Pesticide Referee Group (PRG)** meeting was held in Rome in October 2004, although it had been scheduled for December 2003 at the last Session. It was conveyed for the evaluation of field trials data on the efficacy and selectivity of insecticides on locusts and grasshoppers. As mentioned during the last Session, and recommended by the PRG, the Secretariat took the initiative to create an interactive Insecticide trials database on CD-ROM for all the pesticide trial information so far reviewed by the PRG. The work undertaken by the University of Wageningen was finalized in 2004. A Letter of Agreement is actually in the process to be finalized with the University of Wageningen for the updating of the insecticide trials database with the data submitted to the 9th Pesticide Referee Group Meeting held in 2004. It is also intended to carry out a detailed (re-)assessment of the efficacy data contained in the database, with particular attention to the differences in susceptibility between species, and the effect of environmental and pesticide application conditions on insecticide efficacy. Funds for **Consultancy Studies** have been used to provide a computer programme to control Desert Locust and to train locust staff in RAMSES in Saudi Arabia. A DGPS Demonstration session has been held in Ethiopia in April 2004, the training being done by a representative from Optron company South Africa.

3.7. Expenditure on behalf of the **EMPRES Programme** has focussed partly on supporting the development of remote-sensing as an operational tool for monitoring ecological conditions and guiding survey teams, partly in helping to make the RAMSES locust data management system more user friendly and more country-specific, and in improving member country access to information from DLIS including the production and distribution of an electronic archive of locust reports received by FAO from affected countries since 1952. A General Service Staff based at DLIS is providing this assistance. The expenditures incurred for 2004/2005 are reduced, due to the fact that we had the possibility to finance these activities out of the Emergency Project funds for technical assistance that we had at disposal during the recent upsurge.

4. BUDGET AND WORKPLAN FOR 2006/2007

4.1. It is proposed that the budget and workplan for 2006 and 2007 should not exceed the annual level of contributions (USD 183,880). The proposed budget for the biennium 2006/2007 is given in Table 3 (USD 367,760 for 2 years). It is suggested that any contributions received before the end of 2006 should be used to increase the funds available for the support of EMPRES. The fellow from Niger will pursue is fellowship at the “Institut Vétérinaire Hassan II, Agadir”, with the view to obtain a PhD in Desert Locust control. Two new candidates can be identified and initiate their fellowship as from August 2007 for the diploma studies in Desert Locust management at the University of Khartoum, Sudan. Under the rubric **Reproduction, Distribution DL Bulletin and DLCC Papers**: the cost for the reproduction and distribution of the Desert locust Bulletin will remain minimal for the coming two years. The translation and printing of the DLCC papers and the final report of the 38th Session will be covered by the budget 2006 for this rubric. The cost of the organization of the 38th Session of the DLCC will be covered by the budget 2006 under the rubric **DLCC Meeting, Desert Locust Guidelines** will be reprinted in 2006 in 3 languages. For **the training**, the DLCC will continue to finance up to October 2006 the training of the Algerian candidate, Locust Information Officer, at the Desert Locust Information Service (DLIS) at FAO HQ. Training is provided on data management, processing, archiving and analysis as well as in using RAMSES, interpreting satellite imagery, and using eLocust2. The candidates are selected in rotation from the three Regions. The candidate for the cycle November 2006-October 2007 will possibly be from the South-West Asia Region. A **PRG Meeting** will be organized in 2007. **Consultancy studies** will be done to continue the updating of RAMSES in the three Regions. **Support to EMPRES** for the two years will be pursued by improving member country access to information from DLIS including the distribution of an electronic archive of locust reports. A General Service Staff based at DLIS will pursue this activity.

4.2. If the level of contributions received is less than USD 183,880, cuts in the budget will have to be made. Even if all the member countries fulfil their contributions, expenditure must of necessity drop to about 50% of what was available in 2003/2004/2005. It is noted that some countries made an effort to settle their arrears or contributions such as Iran and Ghana, which settled 13% and 100% of their arrears respectively, and Iraq which paid his contribution in 2005. However, the arrears were still amounting on 31 December 2005 to USD 1.5 million. Decisions have to be taken for the arrears of the member countries which have the most important contributions to settle and who have not paid for many years. As at the end of December 2005, these countries were: Afghanistan (USD 48,720), Chad, (USD 93,560), Iran (USD 341,495), Iraq (USD 163,746), Kenya (USD 49,510), Mauritania (USD 68,336), Niger (USD 88,280), Somalia (USD 79,775), Sudan (USD 64,986), Tunisia (USD 88,756) and Yemen (USD 57,480). If a proposal is made to clear 50% of arrears with the other 50% to be paid, it remains doubtful that countries like Iran and Iraq will be in a position to clear up such large sums. However, if it is desirable to maintain a consistent level of activities, the annual budget of USD 183,880 is really a minimum to respect. The Secretariat firmly believes that a major effort has to be made to clear the arrears and that countries should pay their annual contributions on a regular and timely basis.

Explanation of notes for Tables 1 a), b), c) and d):

/a 95 : Nigeria withdrew from the DLCC in 1995

/b 97 : Turkey withdrew from the DLCC in 1997

/c : in 2006, it was confirmed that Oman was not a member of the DLCC

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Table 1-a)

Status of Contribution as at 31 December 2003 (expressed in US\$)

Member Governments	Outstanding 31/12/2002	Contribution due for 2003/2004 *	Received up to 31/12/2003	Outstanding 31/12/2003
AFGHANISTAN	38,280.00	3,480.00	0.00	41,760.00
ALGERIA	7,700.00	7,700.00	15,391.98	8.02
BAHRAIN	6,440.00	920.00	4,600.00	2,760.00
CAMEROON	4,837.49	2,780.00	0.00	7,617.49
CHAD	83,000.00	3,520.00	0.00	86,520.00
DJIBOUTI	24,500.00	1,120.00	0.00	25,620.00
EGYPT	0.00	5,740.00	0.00	5,740.00
ETHIOPIA	4,352.00	4,320.00	4,335.00	4,337.00
GAMBIA	36,949.50	2,420.00	0.00	39,369.50
GHANA	42,655.00	3,280.00	0.00	45,935.00
INDIA	0.00	20,000.00	20,000.00	0.00
IRAN, Islamic Rep. of	331,495.24	20,000.00	0.00	351,495.24
IRAQ	148,800.00	7,440.00	0.00	156,240.00
JORDAN	8.31	3,420.00	3,428.31	0.00
KENYA	62,150.63	3,580.00	3,832.12	61,898.51
LEBANON	31,005.98	3,060.00	0.00	34,065.98
LIBYA	1,028.22	10,640.00	9,587.81	2,080.41
MALI	16,479.60	3,600.00	0.00	20,079.60
MAURITANIA	59,636.09	2,900.00	0.00	62,536.09
MOROCCO	26,800.00	5,360.00	0.00	32,160.00
NIGER	77,000.00	3,760.00	0.00	80,760.00
NIGERIA /a (95)	67,369.61	0.00	0.00	67,369.61
OMAN	25,200.00	2,100.00	0.00	27,300.00
PAKISTAN	6,520.00	6,520.00	6,520.00	6,520.00
QATAR	27,230.00	1,760.00	28,112.16	877.84
SAUDI ARABIA, Kingdom of	-1,470.28	20,000.00	20,000.00	-1,470.28
SENEGAL	17,707.82	3,520.00	0.00	21,227.82
SOMALIA	69,274.77	3,500.00	0.00	72,774.77
SUDAN	53,045.70	3,980.00	0.00	57,025.70
SYRIA	19,478.12	4,520.00	9,040.00	14,958.12
TUNISIA	75,376.44	4,460.00	0.00	79,836.44
TURKEY /b (97)	0.00	0.00	0.00	0.00
UGANDA	58,927.60	3,380.00	46,540.89	15,766.71
UNITED ARAB EMIRATES	13,823.80	4,600.00	4,600.00	13,823.80
YEMEN	49,565.45	6,500.00	5,163.36	50,902.09
TOTALS	1,485,167.09	183,880.00	181,151.63	1,487,895.46

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Table 1-b)

Status of Contribution as at 31 December 2004 (expressed in US\$)

Member Governments	Outstanding 31/12/2003	Contribution due for 2004/2005 *	Received up to 31/12/2004	Outstanding 31/12/2004
AFGHANISTAN	41,760.00	3,480.00	0.00	45,240.00
ALGERIA	8.02	7,700.00	0.00	7,708.02
BAHRAIN	2,760.00	920.00	0.00	3,680.00
CAMEROON	7,617.49	2,780.00	6,257.58	4,139.91
CHAD	86,520.00	3,520.00	0.00	90,040.00
DJIBOUTI	25,620.00	1,120.00	0.00	26,740.00
EGYPT	5,740.00	5,740.00	0.00	11,480.00
ETHIOPIA	4,337.00	4,320.00	4,314.14	4,342.86
GAMBIA	39,369.50	2,420.00	0.00	41,789.50
GHANA	45,935.00	3,280.00	0.00	49,215.00
INDIA	0.00	20,000.00	20,000.00	0.00
IRAN, Islamic Rep. of	351,495.24	20,000.00	0.00	371,495.24
IRAQ	156,240.00	7,440.00	0.00	163,680.00
JORDAN	0.00	3,420.00	3,420.00	0.00
KENYA	61,898.51	3,580.00	15,845.57	49,632.94
LEBANON	34,065.98	3,060.00	0.00	37,125.98
LIBYA	2,080.41	10,640.00	12,707.47	12.94
MALI	20,079.60	3,600.00	0.00	23,679.60
MAURITANIA	62,536.09	2,900.00	0.00	65,436.09
MOROCCO	32,160.00	5,360.00	0.00	37,520.00
NIGER	80,760.00	3,760.00	0.00	84,520.00
NIGERIA /a (95)	67,369.61	0.00	0.00	67,369.61
OMAN	27,300.00	2,100.00	0.00	29,400.00
PAKISTAN	6,520.00	6,520.00	6,520.00	6,520.00
QATAR	877.84	1,760.00	0.00	2,637.84
SAUDI ARABIA, Kingdom of	-1,470.28	20,000.00	18,529.72	0.00
SENEGAL	21,227.82	3,520.00	0.00	24,747.82
SOMALIA	72,774.77	3,500.00	0.00	76,274.77
SUDAN	57,025.70	3,980.00	0.00	61,005.70
SYRIA	14,958.12	4,520.00	19,449.78	28.34
TUNISIA	79,836.44	4,460.00	0.00	84,296.44
TURKEY /b (97)	0.00	0.00	0.00	0.00
UGANDA	15,766.71	3,380.00	0.00	19,146.71
UNITED ARAB EMIRATES	13,823.80	4,600.00	4,600.00	13,823.80
YEMEN	50,902.09	6,500.00	6,422.52	50,979.57
TOTALS	1,487,895.46	183,880.00	118,066.78	1,553,708.68

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Table 1-c)

Status of Contribution as at 31 December 2005 (expressed in US\$)

Member Governments	Outstanding 31/12/2004	Contribution due for 2005/2006 *	Received up to 31/12/2005	Outstanding 31/12/2005
AFGHANISTAN	45,240.00	3,480.00	0.00	48,720.00
ALGERIA	7,708.02	7,700.00	15,408.02	0.00
BAHRAIN	3,680.00	920.00	4,600.00	0.00
CAMEROON	4,139.91	2,780.00	13,607.85	-6,687.94
CHAD	90,040.00	3,520.00	0.00	93,560.00
DJIBOUTI	26,740.00	1,120.00	0.00	27,860.00
EGYPT	11,480.00	5,740.00	5,740.00	11,480.00
ETHIOPIA	4,342.86	4,320.00	0.00	8,662.86
GAMBIA	41,789.50	2,420.00	0.00	44,209.50
GHANA	49,215.00	3,280.00	49,215.00	3,280.00
INDIA	0.00	20,000.00	20,000.00	0.00
IRAN, Islamic Rep. of	371,495.24	20,000.00	50,000.00	341,495.24
IRAQ	163,680.00	7,440.00	7,374.00	163,746.00
JORDAN	0.00	3,420.00	0.00	3,420.00
KENYA	49,632.94	3,580.00	3,703.06	49,509.88
LEBANON	37,125.98	3,060.00	3,030.00	37,155.98
LIBYA	12.94	10,640.00	0.00	10,652.94
MALI	23,679.60	3,600.00	0.00	27,279.60
MAURITANIA	65,436.09	2,900.00	0.00	68,336.09
MOROCCO	37,520.00	5,360.00	0.00	42,880.00
NIGER	84,520.00	3,760.00	0.00	88,280.00
NIGERIA /a (95)	67,369.61	0.00	0.00	67,369.61
OMAN /c (06)	29,400.00	2,100.00	0.00	31,500.00
PAKISTAN	6,520.00	6,520.00	6,520.00	6,520.00
QATAR	2,637.84	1,760.00	3,520.00	877.84
SAUDI ARABIA, Kingdom of	0.00	20,000.00	20,000.00	0.00
SENEGAL	24,747.82	3,520.00	0.00	28,267.82
SOMALIA	76,274.77	3,500.00	0.00	79,774.77
SUDAN	61,005.70	3,980.00	0.00	64,985.70
SYRIA	28.34	4,520.00	4,549.00	-0.66
TUNISIA	84,296.44	4,460.00	0.00	88,756.44
TURKEY /b (97)	0.00	0.00	0.00	0.00
UGANDA	19,146.71	3,380.00	6,872.20	15,654.51
UNITED ARAB EMIRATES	13,823.80	4,600.00	0.00	18,423.80
YEMEN	50,979.57	6,500.00	0.00	57,479.57
TOTALS	1,553,708.68	183,880.00	214,139.13	1,523,449.55

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Table 1-d)

Status of Contribution as at 1 June 2006 (expressed in US\$)

Member Governments	Outstanding 31/12/2005	Contribution due for 2006/2007 *	Received up to 01/06/2006	Outstanding 01/01/2006
AFGHANISTAN	48,720.00	3,480.00		52,200.00
ALGERIA	0.00	7,700.00		7,700.00
BAHRAIN	0.00	920.00		920.00
CAMEROON	-6,687.94	2,780.00		-3,907.94
CHAD	93,560.00	3,520.00		97,080.00
DJIBOUTI	27,860.00	1,120.00		28,980.00
EGYPT	11,480.00	5,740.00		17,220.00
ETHIOPIA	8,662.86	4,320.00		12,982.86
GAMBIA	36,835.50	2,420.00		39,255.50
GHANA	3,280.00	3,280.00		6,560.00
INDIA	0.00	20,000.00		20,000.00
IRAN, Islamic Rep. of	341,495.24	20,000.00		361,495.24
IRAQ	171,120.00	7,440.00		178,560.00
JORDAN	3,420.00	3,420.00		6,840.00
KENYA	49,509.88	3,580.00		53,089.88
LEBANON	4,743.28	3,060.00	3,017.85	4,785.43
LIBYA	10,652.94	10,640.00		21,292.94
MALI	27,279.60	3,600.00		30,879.60
MAURITANIA	68,336.09	2,900.00		71,236.09
MOROCCO	42,880.00	5,360.00		48,240.00
NIGER	88,280.00	3,760.00		92,040.00
NIGERIA /a	67,369.61	0.00		67,369.61
OMAN /c	31,500.00		(10,500.00)	
PAKISTAN	6,520.00	6,520.00	2,608.00	10,432.00
QATAR	877.84	1,760.00		2,637.84
SAUDI ARABIA, Kingdom of	0.00	20,000.00		20,000.00
SENEGAL	28,267.82	3,520.00		31,787.82
SOMALIA	79,774.77	3,500.00		83,274.77
SUDAN	64,985.70	3,980.00		68,965.70
SYRIA	-0.66	4,520.00		4,519.34
TUNISIA	88,756.44	4,460.00		93,216.44
TURKEY /b	0.00	0.00		0.00
UGANDA	15,654.51	3,380.00	783.00	18,251.51
UNITED ARAB EMIRATES	18,423.80	4,600.00	4,600.00	18,423.80
YEMEN	57,479.57	6,500.00		63,979.57
TOTALS	1,491,036.85	181,780.00	508.85	1,630,308.00

Expenditures from 2003 to 2006

Table 2

No.	Item	2003	Expenses	2004	Expenses	2005	Expenses	2006	Expenses
		Final		Final		Final		Interim	
		Budget		Budget		Budget		Budget	
1	Fellowships	68,000	71,349	30,000	44,667	30,000	41,178		13,347
2	Reprod.Distrib.DL Bulletin/DLCC Papers	25,000	26,558	5,000	3,807	25,000	933		
3	DL Guidelines	30,000	84,229	25,000	71,826	0	-48,485(*)		
4	DL Survey	30,000		20,000		0			
5	DLCC Meeting	50,000	42,008	-		50,000	11,213		
6	Training	10,000	29,680	25,000	1,971	25,000	5,189		19,755
7	Technical Group Meeting	1,000		30,000	57,237	0			
8	Technical Experts Meeting	20,000		0		0			
9	Pesticide Referee Group	-		0	24,206	25,000	1,708		
10	Consultancy Studies	10,000	15,697	0		0			
11	Support EMPRES (Desert Locust) Programme	50,000	74,454	27,726	15,065	7,726	13,325		22,813
	<i>Sub-Total</i>	294,000	343,976	162,726	218,779	162,726	25,061		55,915
13	Project Servicing Costs	38,220	44,717	21,154	28,442	21,154	3,257		7,269
14	Contingency/Emergency Fund				-	0	0	-	
	GRAND TOTAL	332,220	388,692	183,880	247,221	183,880	28,318		63,184

Table 3

**Desert Locust Control Committee
PROPOSED BUDGET (US\$)**

		2006	2007
No.	Item	Budget	Budget
1.	Fellowships	30,000	30,000
2.	Reprod.Distrib. DL Bulletin/ DLCC Papers	25,000	5,000
3.	DL Guidelines	10,000	-
4.	DL Survey	-	-
5.	DLCC Meeting	25,000	-
6.	Training	25,000	25,000
7.	Technical Group Meeting		
8.	Technical Experts Meeting	-	-
9.	Pesticide Referee Group	-	30,000
10.	Consultancy Studies	15,000	20,000
11.	Support EMPRES (Desert Locust) Programme	32,726	32,726
12.	Contingency/ Emergency Funds		20,000
	<i>Sub-Total</i>	162,726	162,726
13.	Project Servicing Costs	21,154	21,154
	GRAND TOTAL	183,880	183,880

September 2006



منظمة الأغذية
والزراعة
للأمم المتحدة

联合国
粮食及
农业组织

Food
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Agriculture
Organization
of
the
United
Nations

Organisation
des
Nations
Unies
pour
l'alimentation
et
l'agriculture

Organización
de las
Naciones
Unidas
para la
Agricultura
y la
Alimentación

DESERT LOCUST CONTROL COMMITTEE

Thirty-eighth Session

Rome, 11-15 September 2006

SUMMARY OF THE 9th REPORT OF THE PESTICIDE REFEREE GROUP (Agenda Item 14)

INTRODUCTION

This working paper was prepared by the Chairman of the Pesticide Referee Group, Dr. G. Matthews. The DLCC may wish to adopt the report of the last meeting of the PRG.

SUMMARY OF THE 9TH PESTICIDE REFEREE GROUP MEETING

The Pesticide Referee Group has now met on nine occasions, with the last meeting held in Rome 18 – 21 October 2004. This was the first time that the PRG had met during an upsurge of locusts, so there were several questions arising from the current control operations. In particular there was concern expressed by FAO that organophosphate insecticides were being used. This was said to be due to the alleged recovery of locusts, after knockdown, if pyrethroids were used.

Pyrethroids

The dosage set for deltamethrin had been discussed at previous meetings, at which it had been considered that the initially recommended dose of 15g a.i./ha could be reduced to 12.5 g a.i./ha as reports had indicated good efficacy at this rate. However it had been recognised that a higher dosage would be needed for fully grown hoppers. The 9th meeting was able to see data from a further trial which showed that the locusts failed to recover when treated with 17.5 g a.i./ha. Differences in efficacy were considered to be possibly due to temperatures in the field, as pyrethroids have a negative temperature coefficient, i.e. are more toxic at lower temperatures. Pyrethroids do act quickly, the 'knockdown' effect, but the poisoning symptoms observed may be reversed by raising the temperature of the insects, thus reducing mortality. Thus locusts knocked down early in the day may recover if their body temperature rises during the day. A higher dosage (17.5g ai/ha) allowed for application at higher temperatures. The PRG decided that both dosages should be listed and a choice made in relation to the stages of the locusts being treated and temperature conditions.

Fipronil

The use of this insecticide has stimulated considerable debate in view of significant adverse environmental effects after its use at a relatively high dosage in Madagascar. It was agreed that in future

fipronil would only be recommended for hopper control as a ‘barrier’ treatment, as environmental side-effects were generally lower using this technique, provided the gap between ‘barriers’ was sufficiently wide and not exposed to spray drift. It was also important that precautions be taken to avoid repeated treatments due to the persistence of deposits, which might lead to an accumulation of adverse effects and put the environmental premium of the barrier technique at risk. It was therefore recommended that the coordinates of all spray blocks should be recorded, and spatio-temporal spray histories of locust-infested areas be derived to manage this risk. Where fipronil was applied it should be at a much lower dosage than previously used, namely 4.2 g ai/ha within the ‘barrier’ which would be equivalent to 0.6g ai per protected hectare.

Insect Growth Regulators

The application of insect growth regulators such as diflubenzuron was also related to the discussion on barrier treatments, the aim of which is for hoppers to collect a lethal dose while crossing a treated strip. The width of a barrier (one or more swath widths) and distance between barriers that had to be used would depend on:

- a) mobility of the hoppers
- b) insecticide used (persistence)
- c) the terrain/vegetation (plant density)
- d) wind speed and direction during application
- e) height of application

The last two of these do not determine what width is required, they determine what width is possible or inevitable.

Precise application recommendations that were valid under all circumstances could not be given since they depended on local conditions, but when there was an effective single swath width of 100 m, a track spacing of 700 m was recommended. The PRG felt that the design and data analysis of barrier studies needed to be improved, and that some of the available data were not analysed optimally. It was therefore recommended that data should be re-analysed in order to complete the data base. The PRG further recommended that the conditions for barrier treatments be clearly defined and respected in operational control, and that the barrier technique should not be confounded with irregular blanket treatment, a technique also known as RAAT (reduced area-agent treatment *sensu* Lockwood & Schell, 1997). Although used primarily as barrier treatments, there is the possibility that IGRs might be used as a overall treatment but at a lower dose.

Metarhizium anisopliae

It was disappointing that the biological control agent *Metarhizium anisopliae* var. *acridum* isolate 330189 had not been tried on an operational scale in the early stages of the upsurge in West Africa, as a similar product was being used operationally in Australia. There was now one manufacturer of this biopesticide in Africa, who reported that formulation problems had been overcome, although there needs to be on-going verification. Limited new data on the efficacy and environmental impact of the biopesticide has shown no adverse effects on non-target organisms, although there is a possibility of adverse effect on non-target grasshoppers. It was noted that speed of kill with *Metarhizium* is slower when hot days were followed by cold nights, thus in using it, meteorological conditions must be considered. However in view of its importance in ecologically sensitive areas it was felt that FAO should attempt to facilitate the availability and use of this mycoinsecticide in other regions affected by the Desert Locust.

New insecticides.

The gap between the 8th and 9th PRG meetings had been due to the lack of new data on existing or new insecticides from manufacturers. This lack of data meant no insecticides, such as imidacloprid or spinosad, which have different modes of action to listed compounds, could be added to the recommendations for locust control.

Pheromones

It had been suggested that a pheromone of the Desert Locust (specifically phenyl acetonitrile) might be combined with an insecticide (“attract and kill”), but no data detailed field trial data has been provided

to the PRG. Although only very small quantities of the pheromone are said to be needed, the PRG did express concern about the mammalian toxicity of phenyl acetonitrile.

Environmental Considerations

Previous reports of the PRG had provided tables that indicated the risk of adverse effects on non-target organisms. These tables were updated where possible based on new evidence from field data and experience. The risk assessments were also brought into line with international criteria.

Field Operations

As organophosphate insecticides were being used operationally, the PRG reviewed human toxicity data as, apart from acute toxicity, there could be chronic effects after recovery from an acute intoxication. Exposure of spray operators when filling sprayers, especially with formulations of chlorpyrifos or fenitrothion could seriously reduce their acetyl-cholinesterase (AChE) level. Clearly operators must be trained and wear coveralls, gloves, boots and face shields. It was also felt that there should be mandatory health monitoring, so that operators were rested or given alternative work if the AChE level fell significantly. Chemical transfer by pumps with closed coupling to the container was essential to minimize exposure.

The interval between the last spray and harvesting of crops was discussed as it was important that insecticide residues should not be present, so industry was asked to provide the data. Pyrethroids with a quick action were preferred when crops had to be protected.

The PRG again felt that there was insufficient feedback concerning the efficacy of recommended insecticides under operational conditions. While it was recognised that in emergency situations it was difficult to assess the immediate effects of a treatment, it is important to correlate the advice based on trials with large scale operations. Advice had been given on application criteria, but it was not always clear whether the appropriate dose and track spacings had always been followed, despite on-going efforts to provide training. Further large-scale trials were advised to increase the information on recommended insecticides, especially the use of barriers and biopesticides. The possibility of convening a PRG meeting in a locust-affected country was raised.

The PRG expressed concern that the locust control campaign in West Africa had relied nearly exclusively on organophosphate insecticides. As these are considered among the more dangerous products according to the environmental and human health risk assessments it was recommended that a wider range of insecticides should be included in the Desert Locust control programme, with emphasis on the less hazardous products and more rapid deployment during the early stages of an upsurge.