



Food and Agriculture Organization  
of the United Nations



**Report of the  
FAO Commission for Controlling the Desert Locust  
in the Central Region**

**Thirtieth Session & Thirty Fourth Executive  
Committee Meeting**

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**Muscat, Sultanate of Oman  
24 – 19 February 2017**

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**Report of the  
FAO Commission for Controlling the Desert Locust  
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**Food and Agriculture Organization of the United Nations,  
Rome, 2017**

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**Participants of the Thirtieth Session and the Thirty Fourth Executive Committee Meeting of the Commission for Controlling the Desert Locust in the Central Region, Muscat, Sultanate of Oman, 19 – 24 February 2017**

## Summary of Recommendations

### Summary of recommendations

The 30th Session meeting agreed on the following recommendations:

1. The delegate of Djibouti is to follow up with his government on the payment of its contribution to the Commission.
2. Collaboration between the Commissions and Organizations: CRC, CLCPRO, SWAC and DLCO-EA in Desert Locust Management is to continue.
3. Participation in the Pesticides Storage Management System PSMS, to be held in Morocco, with member countries nominating the appropriate staff to participate.
4. The Secretary of the Commission is to re-address the concerned authorities (Agricultural Departments) at the Secretari at General of the Gulf Cooperation Council (GCC) to participate in a meeting organized by the Secretary of the Agricultural Departments of GCC to enlighten and clarify the important role played by the Commission in food security and to identify fields of cooperation.
5. Delegates of Member countries are to follow up with the Desert Locust Information Officers to send their contact details and available resources in their monthly bulletin.
6. DLIS is requested to send periodical reports to Member Countries on their Desert Locust reporting quality.
7. **Bahrain:** the Commission is to support the organization of a national training course on Desert Locust survey and control operations and on the repair and maintenance of spray equipment in Bahrain.
8. **Iraq:** the Secretary of the Commission is to visit Iraq to meet senior officials of the Ministry of Agriculture and other key stakeholders in support of collaboration between the Ministry and the commission and for organizing a national training course on Desert Locust survey and control operations, if possible.
9. **Jordan:** the Commission is to support the organization of a national workshop on the operation and maintenance of Desert Locust spray equipment.
10. **Kuwait:** the Commission is to support the organization of a national training course on Desert Locust Survey and control operations.
11. **Lebanon:** the Commission is to support the organization of a national training course on Desert Locust Survey and control operations.
12. **Oman:** the Commission is to support the organization of a national training course on Environment and Health Standards (EHS).
13. **Qatar:** the Commission is to support the organization of a training course on DL survey and control operations and a workshop on the operation and maintenance of sprayers used in DL control operations.
14. **Saudi Arabia:** the commission is to support the organization of a national train of trainers (ToT) training course in DL survey and control.
15. **Sudan:** the commission is to:
  - a) support the organization of a national train of trainers (ToT) training course;
  - b) support the rehabilitation and maintenance the Desert Locust camps in the Red Sea with the sum of US\$ 15000 (Fifteen thousand US\$);
  - c) support the PhD research study of Mahgoub Musa Bishara titled:  
*“Effective use of historic surveys information and taking advantage of modern technology to strengthen further the efforts to improve Desert Locust detection.”*
16. **Syria:** the Commission is to support with the following:
  - a) The provision of 10 AU8000 backpack sprayers for the Desert Locust Unit;
  - b) The organization of a national training course on DL survey and control operations, situation permitting;
  - c) The Secretary of the Commission is to visit Syria, situation permitting, to assist in drafting a proposal for the rehabilitation of the Desert Locust unit through donors.

17. The meeting approved the request presented by the Faculty of Agriculture at the Sudan University of Science and Technology to provide them with the requested equipment up to the sum of US\$ 5 000 (Five thousand US\$) to be used in the Desert Locust course.
18. The Commission is to organize a simulation of DL contingency planning in Egypt in 2018, for frontline countries.
19. The Commission is to provide frontline member countries with additional blood testing kit “Test Mate” and ACHE As say Kit.
20. Frontline countries should regularly provide the Secretariat of the Commission with information on DL staff blood testing results.
21. Frontline countries are to provide a work plan on the implementation of the Environment and Health Standards as per national priorities and implementation facilities (technically and financially) according to the recommendations of the third regional workshop held in Egypt in September 2016.
22. The Commission is to organize a regional workshop on the use of *Metarhizium anisopliae var. acridium* (Green Muscle®) in Desert Locust control operations, date and venue to be identified.
23. The Commission is to encourage member countries to register the *Metarhizium anisopliae var. acridium* (Green Muscle®) as a bio-pesticide for Desert Locust control, taking note of results already attained in the field of Desert Locust in FAO.
24. The Commission is to organize a regional workshop to assess the progress made in the implementation of the Environment and Health standards (EHS) in 2018.
25. The Commission is to organize a regional training course on Aerial spraying for Desert Locust control in cooperation with the Desert Locust Control Organization for Eastern Africa (DLCO-EA).
26. The member countries endorsed the amendments to the establishment agreement of the Commission.
27. The member countries endorsed the expenditure reports for 2015 and 2016.
28. The Session delegates agreed that delegates of member countries who are in arrears should follow up with their governments on its payment to the Trust Fund of the Commission.
29. The Chairman, the Chairman of the Executive Committee and the Secretary of the Commission are to visit UAE and Saudi Arabia to explain the reasons and provide clarification on the procedures followed by FAO regarding the doubling of the member countries’ contributions to the Trust Fund of the Commission.
30. The work plan for 2017-2018 was endorsed by the member countries.
31. The Secretary of the Commission is authorized, in consultation with the Chairman, to cover the cost of implementing any activities that are not reflected in the Commission’s 2017-2018 workplan.
32. The member countries unanimously endorsed the provision of the Budget Holder responsibilities to the Secretary of the Commission for the Trust Fund of the Commission subject to the rules and regulation of FAO.

# Report of the Thirtieth Session Commission for Controlling the Desert Locust in the Central Region Muscat, Sultanate of Oman, 19 – 24 February 2017

## **Introduction**

1. The Director-General of the Food and Agriculture Organization of the United Nations (FAO) invited member countries of the Commission: Bahrain; Djibouti; Egypt; Eritrea; Ethiopia; Iraq Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; Sudan; Syria; United Arab Emirates and Yemen, to attend the Thirtieth Session of the Commission for Controlling the Desert Locust in the Central Region in Muscat, Sultanate of Oman, 19–24 February 2017.

Invitations were also addressed to the Commission for Controlling the Desert Locust in the Western Region (CLCPRO); the Commission for Controlling the Desert Locust in South-West Asia (SWAC); the Desert Locust Control Organization for Eastern Africa (DLCO-EA), Republic of South of Sudan, Islamic Development Bank (IDB); the Cooperation Council for the Arab States of the Gulf (GCC); League of Arab States and United States Agency for International Development (USAID).

## **Opening Session and celebration of the 50th Anniversary of the Commission**

2. On 19th February under the auspices of H.E. Dr Fuad bin Jaafar Al-Sajwani, Minister of Agriculture and Fisheries, Sultanate of Oman, the 50th Anniversary celebration of the Commission and its 30th Session was opened, in the presence of Mr Abdessalam Ould Ahmed, Assistant Director-General and Regional Representative for the Near East and North Africa of the Food and Agriculture Organization of the United Nations, Dr Ahmed bin Nasser Al-Bakri, Deputy Minister of Agriculture, a number of Ambassadors of member countries to the Sultanate of Oman, Representatives of member countries in the Commission, consultants and Heads of Departments at the Ministry.
3. The celebration of the 50th Anniversary of the Establishment of the Commission for Controlling the Desert Locust in the Central Region comprised of speeches by the Ministry of Agriculture and Fisheries, Mr Abdessalam OuldAhmed (FAO), the Executive Secretary of the Commission Mr Mamoon Alsarai Alalawi, followed by a documentary film on the achievement of the Commission during the past fifty years in service of the member countries. A presentation on the book commemorating this occasion, prepared in English and Arabic, was provided. A trophy produced specially for the celebration of the 50th Anniversary was presented to the member countries, the Commissions, sister organizations, donors, consultants and the former Secretary of the Commission.
4. The 30th Session of the Commission took place during the period 20-24 February 2017, with the presence of delegates of member countries: Bahrain; Djibouti; Egypt; Eritrea; Ethiopia; Iraq; Jordan; Kuwait; Lebanon; Oman; Qatar; Saudi Arabia; Sudan; Syria and United Arab Emirates; Team Leader of the Locusts and Transboundary Plant Pests and Diseases Group at FAO headquarters; Secretaries of the Commissions for Controlling the Desert Locust in the Western and South West Asia Regions; Director of the Desert Locust Control Organization for Eastern Africa and a Senior representative from USAID and a number of consultants and observers. Yemen could not participate (Appendix 1).

## **Report of the Chairperson of the Commission**

5. The Chairman of the Commission in its Twenty-ninth session, Mr Heruy Ashgedom, thanked the Sultanate of Oman for hosting the 50th Anniversary celebration and the 30th Session and presented a detailed report on the activities implemented by the Secretariat of the Commission, pointing out that each activity will be discussed in details through the working papers during the session, wishing member countries' representatives good deliberations and appropriate recommendations. He also indicated the good collaboration between the member countries, the Desert Locust Commissions and Organizations and the Secretariat of the Commission. Finally Mr Ashgedom wished the participants a successful meeting and a good stay in Oman (Appendix 2).

## **Election of Chairperson and Vice Chairperson**

6. The delegate of Oman, Mr Saleh bin Mohamed Alabri, was unanimously elected as the Chairman of the 30th Session of the Commission, with Mr Mohamed bin Hussein Al Shamrani, the delegate of Saudi Arabia, as the Vice-Chairman.

## **Adoption of the Agenda**

7. The agenda was endorsed by the session members as per the following:

- Report of the Chairperson of the Commission
- Election of Chairperson and Vice Chairperson
- Adoption of the Agenda
- Election of the Drafting Committee
- Report of the activities of the Secretariat of the Commission and follow up of the recommendations of the 29th Session
- Desert Locust situation from November 2014 to February 2017
- Reports from the member countries
- Report of the activities of the Commission on;
  - a) Training, research and Publications;
  - b) Contingency planning, Environment and Health Standards (EHS) and pesticides stock management system (PSMS);
  - c) New tools and technologies.
- Joint activities with the Desert Locust Commissions and Organization;
  - a) The Commission for Controlling the Desert Locust in the Western Region (CLCPRO) report;
  - b) The Commission for Controlling the Desert Locust in South-West Asia (SWAC) report;
  - c) The Desert Locust Control Organization for Eastern Africa (DLCO-EA) report.
- Amendments to the Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Central Region (CRC)
- Election of members and Chairperson of the Executive Committee
- Accounts for 2015 and 2016
- Contributions and arrears of member countries to the Commission's Trust Fund
- Work plan and budget for 2017-2018
- Other business - Administrative and financial autonomy of the commission
- Date and place of the next Executive Committee and the Session of the Commission
- Adoption of the report of the 30th Session of the Commission
- Closure of the Session.

## **Election of the Drafting Committee**

8. The representatives from Qatar; Oman; United Arab Emirates and Jordan were elected as members of the Drafting Committee. The Commission took the responsibility of the secretariat.

## **Report of the activities of the Secretariat of the Commission and follow up of the recommendations of the 29th Session**

9. The Secretary of the Commission presented a comprehensive report on the activities and a follow up on the recommendations of the 29th Session of the Commission, including the achievements during the period from December 2014 to January 2017 (Appendix 3), of which the meeting discussed extensively, and the following recommendations were agreed up on:

**Recommendation 1:** The delegate of Djibouti is to follow up with his government on the payment of its contribution to the Commission.

**Recommendation 2:** Collaboration between the Commissions and Organizations: CRC, CLCPRO, SWAC and DLCO-EA in Desert Locust Management is to continue.

**Recommendation 3:** Participation in the Pesticides Storage Management System (PSMS), to be held in Morocco, with member countries nominating the appropriate staff to participate.

**Recommendation 4:** The Secretary of the Commission is to re-address the concerned authorities (Agricultural Departments) at the Secretariat General of the Gulf Cooperation Council (GCC) to participate in a meeting organized by the Secretary of the Agricultural Departments of GCC to enlighten and clarify the important role played by the Commission in food security and to identify fields of cooperation.

**Recommendation 5:** Delegates of Member countries are to follow up with the Desert Locust Information Officers to send their contact details and available resources in their monthly bulletin.

## **Desert Locust Situation from November 2014 to January 2017, outlook and reporting**

10. The FAO Senior Locust Forecasting Officer, at the Desert Locust Information Service (DLIS), Keith Cressman, summarized the Desert Locust situation since November 2014 (Appendix 4). Seven Desert Locust outbreaks developed from late 2014 to early 2017 in the Central Region as a result of unusually good rainfall, including two cyclones that brought heavy floods to southern Yemen. Control campaigns that were conducted by national locust centers successfully stopped the outbreaks from spreading to neighbouring areas except in Yemen where only limited survey and control operations could be carried out because of chronic conflict and insecurity throughout the country. Consequently, infestations spread from Yemen to the Horn of Africa, Saudi Arabia and the Eastern Region. During the period, nearly 245 000 hectares (ha) were treated by Eritrea 36 798 ha, Ethiopia 31 ha, Saudi Arabia 26 618 ha, Somalia 53 ha, Sudan 179 860 ha, and Yemen 734 ha.

The outlook until summer remains cautious as much depends on the success of the current survey and control operations in winter breeding areas, particularly in Saudi Arabia, and rainfall in the winter and spring breeding areas between now and May. In any case, there is a risk of small groups and perhaps a few small swarms forming on the Red Sea coast in Saudi Arabia that could move further north along the coast and to the spring breeding areas in the interior. A similar situation may exist in Yemen. Small scale spring breeding may occur in northern Oman if rains occur. In Eritrea, adults may move from the northern coastal plains into the neighbouring highlands to the western lowlands. In Sudan, adults are likely to appear near cropping areas in the Nile Valley prior to summer breeding.

There has been a general decline in reporting quality in 2016 compared to the previous three years. DLIS provided substantial feedback to countries concerning data quality and national bulletins. Frontline countries made good use of eLocust3 and RAMSES GIS in 2016 but continued training is required in the latter on analysis and new functionality.

**Recommendation 6:** DLIS is requested to send periodical reports to member countries on their reporting quality.

## **Reports from the member countries**

11. Delegates of Member countries presented their reports on the Desert Locust situation and the activities implemented during the previous period and their requests for 2017-2018;

### **Bahrain**

The representative of Bahrain presented his report mentioning that Bahrain was not affected by DL in 2015-2016. Bahrain participated in the 9th Sub-regional training course, held in Salalah, Oman, in 2015.

The Secretary of the Commission visited Bahrain and met with the Minister and other officials at the Ministry of Works, Municipalities Affairs and Urban Planning, where the importance of collaboration of Bahrain and the Commission was pointed out, in order to benefit from the workshops and training courses organized by the Commission for capacity building. The Secretary also pointed out the importance of participating in the Commission's sessions and the 50th Anniversary celebration of the Commission. The Minister requested the follow up of Bahrain's contribution and settlement of its arrears to the Commission.

With regard to the plan of action for 2017-2018, the delegate of Bahrain informed that they will maintain contact with the Secretary of the Commission in order to be updated with the latest Desert Locust information and also update the contingency plan. He also requested the commission to organize a national training course on Desert Locust survey and control operations and on the repair and maintenance of spray equipment.

**Recommendation 7:** The Commission is to support the organization of a national training course on Desert Locust survey and control operations and on the repair and maintenance of spray equipment in Bahrain.

## **Djibouti**

The representative of Djibouti reported that the Desert Locust situation was calm during 2015-2016, except for solitary locusts in southern regions on the borders with Ethiopia.

The Secretary of the Commission visited Djibouti from 22 to 24 March 2016 and met with the Minister of Agriculture, Livestock, & Fisheries and other officials with the outcome of conducting a national training course on DL survey and control operations in January 2017 for 12 trainees, including a training on the maintenance of spray equipment.

## **Egypt**

The representative of Egypt presented a comprehensive report explaining the Desert Locust situation for the period of 2015-2016, mentioning that although conditions were favourable for locust breeding, however, only solitary locusts were present near El Shazly area in March 2016 and again in November 2016 in Shazly, Marsa Alam, Abou Ramad, Alalaki and Alnokra in Aswan.

Regarding national capacity building, the Commission financially supported two training courses on DL survey and control Operations in April 2015 and 2016 for 16 trainees in each course. The Environment and Health Standards were introduced during these two training courses, in addition to a National workshop on Environment and Health Standards organized by the Commission, in August 2015 for 16 participants, with the Commission's financial and technical support.

The delegate of Egypt added that a number of trainees benefited from several training courses and workshops on DL survey and control operations and spray maintenance, organized in coordination with the Commission during 2015-2016. The delegate requested the commission to provide extra Cholinesterase Test System with its AChE Assay Kit.

## **Eritrea**

The representative from Eritrea presented a comprehensive report on DL situation during 2015-2016, in which he informed that the Desert Locust situation was relatively calm during that period while having DL invasions yearly, in which the Commission had an important role in its control by providing financial and technical support.

During the period November 2016 to February 2017, Eritrea had an outbreak on the Red Sea coast in Karoura, Sheab and Afabet that was successfully controlled by ground operations, thus protecting crops. Survey operations are regularly carried out on the Red Sea coast where environmental conditions are still favourable for locust breeding in most of these locations. In total approximately 1 900 000 hectares were surveyed during the mentioned period. A joint-border survey between Eritrea and Sudan took place in 2015, which indicated no threat of locust in both countries.

The delegate of Eritrea informed that the workplan is reviewed annually and followed up by the Minister of Agriculture, which includes a training plan for 150 Desert Locust staff. In addition, the process of registering the Green Muscle® has been completed. In coordination with the Commission, several training courses and workshops were conducted on survey and control operations, Environment and Health standards and operation and maintenance of sprayers for a number of DL staff.

With regards to financial and technical support, the Commission provided 20 000 liters of Malathion 96 percent Ultra Low Volume (ULV) from the Kingdom of Saudi Arabia and US\$200 000 from State of Qatar for which the Government of Eritrea is very thankful.

The delegate of Eritrea requested the following;

- A quick response from international organizations for the needed support during DL emergencies;
- Prioritizing the support required by the frontline countries;
- Effective communication process between central administration on a ministerial level with the survey and control teams in the field.

## **Ethiopia**

The representative of Ethiopia provided a presentation during the period 2015-2016 and informed that the Desert Locust situation was clam in 2015. Due to the change in climatic conditions, there were small Desert Locust swarms along the borders with Somalia in August 2016. A total of 12596 hectares were surveyed with

an infested area of 715 hectares. Ground control operations were conducted on 302 hectares using 153 liters of Malathion 95 percent ULV.

The delegate pointed out that 49 locust officers were trained in different aspects of Desert Locust biology, survey and control, sprayer's maintenance and environmental health standards during the period 2015-2016 through three training courses supported by the Commission and Desert Locust Control Organization for Eastern Africa (DLCO-EA), in addition to the training of about 112 local scouts and guides.

He also provided a brief report on the national contingency and survey plans expected to be carried out during 2017-2018 in view of the limited finances, human and equipment resources. For the next period, he requested technical and financial support from the Commission to strengthen the Desert Locust control program, including supporting a training course.

### **Iraq**

The representative of Iraq presented a report on the DL situation during 2015-2016 showing that there was no presence of locust, pointing out that the last presence of Desert locust in Iraq was in 1988. The delegate informed the session that the Ministry of agriculture is ready for locust control operations if the need arises as it has the appropriate control equipment. A Desert Locust control unit is currently being built in Karbala, south west of Iraq, with the required staff.

The delegate outlined the administrative and technical activities executed as follows:

- The participation of two Agriculture officers in the Sub-regional training course held in Salalah, Oman in 2015;
- Inspection and training of DL staff on survey and control operations on a regular basis.

A workplan has been prepared in which Iraq has been divided up into several sectors controlled by a central operations room.

The delegate requested the following items from the commission:

- The organization of a national training course in coordination with the commission to train a number of staff;
- In coordination with the Commission, the training of staff in training courses conducted in neighbouring countries to obtain the maximum benefit from the experience and to be updated on the latest tools and technologies in DL management.

**Recommendation 8:** The Secretary of the Commission is to visit Iraq to meet senior officials of the Ministry of Agriculture and other key stakeholders, in support of collaboration between the Ministry and the Commission and the organization of a national training course on Desert Locust survey and control operations, if possible.

### **Jordan**

The representative of Jordan presented a report during the period 2015-2016, informing that the Desert Locust situation was clam and the Ministry of Agriculture in ready for Desert Locust control if need be. A central operation room can be established for this purpose to coordinate with other control units in different governorates, where the following equipment has been provided by the Gulf aid;

- Different types of Ultra Low Volume Spray;
- Global Position System (GPS);
- Four 4x4 vehicles for Maa'n and Akaba governorates.

The delegate thanked the commission for its support in conducting a national training course on survey and control operations, requesting further training on aerial spray and operation and maintenance of spray equipment.

**Recommendation 9:** The Commission is to support the organization of a national workshop on the operation and maintenance of Desert Locust spray equipment.

## **Kuwait**

The Representative from Kuwait presented a report on the DL situation during 2015-2016 showing that there was no presence of locust, commending the Commissions efforts in the field of early warning and early reaction in emergency situations. The Plant Protection Division of the Public Authority of Agriculture Affairs and Fish Resources is the responsible authority for DL control, which is equipped with sprayer, through its regular rental for pest control operations, in which Desert Locust is a part.

The 2017-2018 workplan include the following:

- Follow up of the Desert Locust situation through the monthly DL bulletin;
- The availability of a stock of pesticides, distributed among the agriculture departments with regular circulation;
- The availability of equipment of up to 20 sprayers, supplemented with spray tanks and technicians can be use if needed;
- An Emergency Unit has been established, with the suggestion of including Desert Locust control;
- An emergency fund is available at the Public Authority of Agriculture Affairs and Fish Resources if the need arises.

**Recommendation 10:** The Commission is to support the organization of a national training course on Desert Locust Survey and control operations.

## **Lebanon**

The representative of Lebanon presented a report on the Desert Locust situation during 2015-2016 with no reported presence of Desert Locust since 2014, due to the geographical location and climatic conditions which do not favourable DL breeding. However, since Lebanon is close to Desert Locust breeding areas, it is necessary to cautious in case of any emergency situation, through training on the latest survey and control techniques. The representative of the Lebanon requested the Commission to continue providing national/ regional training courses.

**Recommendation 11:** The Commission is to support the organization of a national training course on Desert Locust survey and control operations.

## **Oman**

The representative of Oman presented a report on the Desert Locust situation during 2015-2016 indicating the calmness of the DL situation during 2015, where surveys were conducted at 296 locations with a total area surveyed around 4 400 ha. The results of the surveys indicated the absence of any activity of Desert Locust during 2015. The weather and environmental conditions were not favourable for breeding, despite rainfall that varied in several provinces in the country through different periods of the year.

The results of surveys also indicated the presence of Desert Locust activity on a small scale during the first half of 2016, where low densities of solitarious adults, in addition of low densities of different stages of hoppers, were seen in traditional breeding areas in Ibri, Bediya due to good rainfall that fell in the northern parts of the country during March and April. However, the calm situation continued during 2016, where 3 620 locations with 5 000 ha of surveyed area.

Light to heavy rainfall fell on the northern governorates of the country (North and South of Al Sharqiyah, North and South of Al Batinah, Al Dakhiliyah, Al Buraimi, Musandam and Al Dhahirah) during March and April, where 100 mm of rain were recorded on 10 April, thus ecological conditions improved in the northern traditional breeding sites. As summer season began temperatures became higher in May and hence ecological conditions became unfavourable for locust breeding due to dry vegetation which contributed to the cessation of breeding.

The representative of Oman informed the session members of the national training courses conducted during 2015-2016 on different topics: DL survey and control, operation and maintenance of sprayers used in DL control for a large number of Desert Locust Officers. He also mentioned that a number of national staff participated in regional training activities. In addition, Tariq AlMandhari DL officer acquired a M.Sc. degree through the fellowship provided by the Commission.

**He outlined the 2017-2018 workplan as follows:**

- Promoting the Desert Locust Control Center to a Department to enhance its technical and administrative staff;
- Develop a contingency plan for locust emergencies using DeLCoPA;
- Strengthen the technical and administrative capabilities of the center through the provision of chemical pesticides, control equipment and tools and the necessary personal protective equipment;
- Conducting a training course on the implementation of Environmental and Health Standards for national staff, in cooperation with the Commission;
- Conducting a national workshop for DL Information Officers on eLocust3;
- Conducting a National training course on Desert Locust survey and control operations;
- Participating in other member countries' survey operations.

**Recommendation 12:** The Commission is to support the organization of a national training course on Environmental and Health Standard (EHS).

**Qatar**

The representative State of Qatar presented a report of Desert Locust situation during 2015-2016, showing that Qatar was not affected by Desert Locust during the past two years, as the surveys showed. However, survey and control operations were conducted against African Migratory Locust: *Locusta migratoria*. The spread of the grasshoppers were at low to medium densities. Surveys were conducted with the cooperation of Plant Protection Department and farmers according to reports received. During the last two years, 457 location were surveyed and 94 locations were controlled by using 2 109 liters of pesticides, and by using ULV and traditional sprayers.

The representative of State of Qatar requested a national training course on DL survey and control, in addition of a workshop on the operation and maintenance of sprayers used in DL control operations.

**Recommendation 13:** The Commission is to support the organization of a training course on DL survey and control operations and a workshop on the operation and maintenance of sprayers used in DL control operations.

**Saudi Arabia**

The representative of Saudi Arabia presented a detailed report on the Desert Locust situation during 2015-2016. Hoppers and hopper bands were reported in Makkah and Madina in January 2015. The control teams treated 7 958 hectares using 7 922 liters of Malathion and Deltamethrin. Also DL hoppers were reported in Makkha area, in each of Aljmom, Khulais and Thule in February 2015 where 1 750 hectares were treated using 2 561 liters of Malathion and Deltamethrin.

In August 2016, survey operations were conducted in Jazan, Laith and Qunfudah and no locust was present. But DL were reported in the Piech and Almenzalh provinces with mature copulating and immature, in solitary phase which is extraordinary to be seen in August known for its high temperatures. Control operations were conducted in September and October 2016 in Piech province on hopper bands and immature and mature adults until mid of October were 6 429 ha treated using 6 429 litres of Fenitrothion and Malathion, in addition to 300 ha treated by aerial control. In December 2016 and January 2017 control operation continued against hopper and hopper bands where 6 942 litres of pesticides were used to treat 6 942 ha and 2 700 ha by air in Makkah, Asir and Jizan.

With regards to the development of the locust center, the representative informed that the process is in progress to enhance the control capabilities by providing more equipment and sprayers in case of emergencies. The pesticides storage and the maintain workshop have also been developed and well equipped. In addition the new building for the locust centre is in pipeline, with more airstrips for aircraft in DL areas. It worth mentioning that the Minister of Environment, Water and Agriculture decree to change the locust center name to be the **Locust Control and other Migratory pests Center**.

The delegate informed of a number of national and regional training courses and workshops conducted during 2015-2016 with a large number of locust officer participating in order to benefit from different training aspects inside and outside Saudi Arabia, in cooperation with the Commission, such as: survey and control

operations, maintenance of ULV equipment, EHS, DLIO and contingency planning workshop. Finally, he requested a national train of trainers (ToT) training course.

**Recommendation 14:** The Commission is to support the organization of a national train of trainers (ToT) training course on DL survey and control operations.

## **Sudan**

The representative of Sudan presented a comprehensive report for the DL situation during 2015- 2016. As a result of good environmental conditions during November 2014 and good rainfall in the breeding areas, a large numbers of immature adults migrated from the summer belt across the Nile River to the Red Sea coast and continued to the Red Sea coast where environmental conditions were favorable. During 2015-2016 when the environmental conditions improved in the winter and summer breeding areas, ground survey and aerial control operations were conducted in North Kordofan, Khartoum, River Nile, Kassala and the Red Sea coast, with a total of the surveyed area around 184 516 hectares.

The 2017-2018 work plan has been prepared, where six teams were assigned for each of summer and winter breeding areas and the required budget allocated to meet all possibilities. Resources were such as vehicles, spray equipment and pesticides were secured. Budget amounted to 3 294 480 Sudanese pounds, equivalent of US\$ 3 46 787, in case of an outbreak.

The delegate of Sudan requested the following:

- A train of trainers (ToT) training course;
- Support in the rehabilitation and maintenance of the Red Sea coast camps;
- Re-assigning the diploma course to the University of Sudan instead of Khartoum University;
- Support the PhD research study of Mahjoub Musa Bishara.

After extensive discussion the Commission meeting agreed on the following:

**Recommendation 15:** The Commission is to:

- a. Support the organization of a national train of trainers (ToT) training course in DL survey and control;
- b. Support the rehabilitation and maintenance of the Desert Locust camps in the Red Sea with the sum of US\$ 15 000 (fifteen thousand US);
- c. Support the PhD research study of Mahjoub Musa Bishara titled:  
"Effective use of historic surveys information and taking advantage of modern technology to strengthen further the efforts to improve Desert Locust detection."

## **Syria**

The representative of the Syrian Arab Republic presented a report on the Desert Locust situation during 2015-2016, reporting that the desert locust situation was calm and the Ministry of Agriculture and Agrarian Reform secures on a yearly basis pesticides as precautionary measure for any possible invasion of Desert Locust, taking into account the possibility of using these pesticides against "Sunna" pest which attacks wheat and barley crops on an annual basis in most provinces of the country, thus preventing the accumulation of these pesticides.

The Ministry of Agriculture - the Directorate of Plant Protection – follows up the Desert Locust information periodically through the monthly bulletin issued by the Food and Agriculture Organization and translated into Arabic by the Commission, as well as the media and direct contacts with the countries concerned and the Commission for Controlling the Desert Locust in the Central Region. The delegate informed that survey teams conduct surveys when it's needed.

He stated that the crisis faced by Syria caused many agricultural problems, especially in the fight against agricultural pests such as securing spraying machines, where the aircrafts used are now out of service, in addition to the loss of ground sprayer through theft in many provinces by more than 90 percent of the total equipment that was present.

The delegate requested the Commission support in the following:

- 15 AU8115 vehicle mounted sprayers;
- 20 AU8000 backpack sprayers;
- 5 pickup vehicles for sprayer operations.

After extensive discussion the Commission meeting agreed on the following:

**Recommendation 16:** The Commission is to support with the following:

- a. The provision of 10 AU8000 backpack sprayers for the Desert Locust Unit;
- b. The organization of a national training course on DL survey and control operations, situation permitting;
- c. The Secretary of the Commission is to visit Syria, situation permitting, to assist in drafting a proposal for the rehabilitation of the Desert Locust unit through donors.

### **United Arab Emirates**

The representative of the United Arab Emirates reported on the Desert Locust situation during 2015-2016 stating that the situation was calm during the previous period. Small groups of African Migratory Locust: *Locusta migratoria* were seen during the month of October 2016 in Nahel area in AI Ain which was contained.

A national training course was conducted in collaboration with the Commission for Controlling the Desert Locust in the Central Region on survey and control operations during the same year with the participation of 19 plant protection officers, which was successful. Currently, an action plan is being prepared with restructuring of the Group to deal with the locust situation in the event of an outbreak.

Following the training course, the Secretary of the Commission received a thank you letter from the Minister of Climate Change and Environment on the efforts of the Commission in the field of Desert Locusts in the Central Region.

### **Yemen**

A representative from Yemen could not participate in the Commission meeting but the Head of the Locust Centre sent a report on the locust situation for the 2015-2016 period. In general, there are two breeding seasons: winter- from October to April on the coastal areas of the Red Sea and the Gulf of Aden, an area of covering 16 000 square kilometers, and summer season from May to August in the interior areas included Jouf, Marib, Shabwa, Hadramout and Mahra covering up to 27 000 square kilometers.

Due to the El Niño phenomenon in 2015, the southern region of Yemen was hit by tropical cyclones. The first on the 30th of October, Cyclone Shibala, and the second on the 4th of November -Cyclone Meg- bringing heavy rain causing the environment conditions favorable for breeding up to 6 months.

Locust hoppers appeared on the coastal areas of Shabwa in March 2016, but no control operations conducted due to the security conditions and the bee hives existing in the region that led to small swarms which moved to the summer breeding areas in the provinces of Marib, Aljouf, Shabwa and Hadramout. As heavy rain fell in mid-April 2016, mating was reported in the area between Thamud and Wadi Hadramout, followed by reports of a new generation between Marib and Shabwa. The swarms appeared at the beginning of June 2016 as they moved into the coastal areas of the Gulf of Aden. In September, the second generation of locusts reached some coastal areas in Lahj province and north of Tihama in October and November 2016. In total, 609 hectares were controlled.

In this regard, the Commission supported Yemen with US\$ 10 000 for conducting surveys in the winter breeding areas in 2016, in addition to conducting a national training course for five participants in Hurghada, Egypt in December 2016. Yemen also received more than US\$ 100 000 from the Food and Agriculture Organization in support of the survey and control operations during 2016. Currently, the Desert Locust Center has no capacity for controlling Desert Locust as it lost all its vehicles and some equipment during the crisis.

## **Report of the activities of the Commission on:**

12. The Secretary of the Commission presented a comprehensive report on the activities implemented during November 2014 until January 2017, which included:

### **a) Training, Research and publication:**

- The Secretariat of the Commission technically and financially supported various training courses, the 9th Sub-regional, six national training courses on the Environment and Health Standards in Egypt, Eritrea, Ethiopia, Oman, Sudan and Saudi Arabia. In addition to conducting seven National training courses on Desert Locust survey and control operations in Djibouti; Egypt; Jordan; Oman; Saudi Arabia; United Arab Emirates and Yemen. Two national workshops were conducted on the operation and maintenance of sprayers in Ethiopia and Sudan, and one Train of Trainers (ToT) in Eritrea (Appendix 5a).
- Tariq Al Mandhari, from Oman, has acquired his M.Sc. degree from the University of Nottingham, sponsored by the Commission, for one year, titled:

#### ***“The impact of behavioural thermoregulation by the Desert Locust, *Schistocerca gregaria*, on development and longevity”***

- Marzouq Al Barakati, from the Locust Control and Migratory Pest Center in Saudi Arabia, is currently receiving training at the Desert Locust Information Services (DLIS) at FAO Headquarters in Rome from 8 November 2016 to 7 May 2017;
- The Secretariat of the Commission organized three regional training courses for frontline member countries on Contingency planning, Pesticides Storage Management System (PSMS) and Environment Health Standards (EHS);
- In coordination with the Commissions for Controlling the Desert Locust in the Western Region and South West Asia, the Commission organized and conducted two workshops for Desert Locust Information Officers (DLIO) and one on Desert Locust Contingency Planning Assistant (DeLCoPA);
- The Commission prepared a book in commemoration of its 50th Anniversary in Arabic and English languages which contained the history of the Commission's establishment, the outbreaks and plagues faced by the central region and its achievements during the 50 years. 1 500 copies of the Arabic version and 1 000 copies of the English version are in the printing process. The electronic version of the book can be obtained in Arabic and English through the following link:

#### **PDF URLs:**

<http://www.fao.org/3/a-i6853a.pdf>

<http://www.fao.org/3/a-i6853e.pdf>

#### **Card URLs:**

<http://www.fao.org/documents/card/en/c/8cca1d9d-f385-4c9d-90ec-f0c8398ca74e/>

<http://www.fao.org/documents/card/en/c/1dc43a44-d30e-4a9d-bd51-34f15f444600/>

- The Commission sponsored the research titled ***“Desert Locust as food for humans and animals”*** which is currently in progress at the Faculty of Agriculture at the University of Khartoum.

**Recommendation 17:** The meeting approved the request presented by the Faculty of Agriculture at the Sudan University of Science and Technology to provide them with the requested equipment up to the sum of US\$ 5 000 (Five thousand US\$) to be used in the Desert Locust course.

### **b) Contingency planning, Environment and Health Standards (EHS) and Pesticides Stock Management System (PSMS):**

The Secretary of the Commission presented the activities implemented in this field as follows:

- The Commission conducted the second regional workshop on Desert Locust Contingency Planning in Egypt from 15 to 19 February 2015, upon which the Desert Locust Contingency Planning Assistant (DeLCoPA), electronic assistance tool was updated to function without internet and to include the French language, in addition to Arabic and English. The new version can be found in the following link;  
<http://delcopa.herongroupplc.com>.

- Six national training courses on the Environment and Health Standards (EHS) were conducted in Egypt; Eritrea; Ethiopia; Oman; Sudan and Saudi Arabia;
- The third regional training course on the Environment and Health Standards in Desert Locust operations was conducted in Egypt in September 2016;
- The Commission provided each of the frontline countries: Egypt; Eritrea; Ethiopia; Oman; Sudan and Saudi Arabia with one unit of Cholinesterase Test System with its AChE Assay Kit for Desert Locust staff blood testing, (Appendix 5b).

**Due to the importance of the training programme the following recommendations were agreed upon:**

**Recommendation 18:** The Commission is to organize a simulation of DL contingency planning in Egypt in 2018, for frontline countries.

**Recommendation 19:** The Commission is to provide frontline member countries with additional blood testing kit "Test Mate" and ACHE Assay Kit.

**Recommendation 20:** Member countries should regularly provide the Secretary of the Commission with information on DL staff blood testing results.

**Recommendation 21:** Frontline countries are to provide a work plan on the implementation of the Environment and Health Standards as per the national priorities and implementation facilities (technically and financially) according to the recommendations of the third regional workshop held in Egypt in September 2016.

**Recommendation 22:** The Commission is to organize a regional workshop on the use of *Metarhizium anisopliae* var. *acridium* (Green Muscle®) as a bio-pesticide for Desert Locust control, date and venue to be identified.

**Recommendation 23:** The Commission is to encourage member countries to register the *Metarhizium anisopliae* var. *acridium* Green Muscle® as a bio-pesticide for Desert Locust control, taking note of the previous results already attained in the field of Desert Locust at FAO.

**Recommendation 24:** The Commission is to organize a regional workshop to assess the progress made in the implementation of the Environment and Health Standards (EHS) in 2018.

**Recommendation 25:** The Commission is to organize a regional training course on Aerial spraying for Desert Locust control in cooperation with the Desert Locust Control Organization for Eastern Africa (DLCO-EA).

### **c) New tools and technologies:**

- The members of the session discussed the recommendations of the Stakeholder workshop on the Procurement and Supply of Pesticides for Locust Control, held in Rome, Italy, 2-3 September 2015.
- The meeting also discussed the recommendations of the workshop on the Monitoring System of National Locust Control Preparedness - SVDN at the FAO regional Office in Cairo, Egypt, on May 26, 2016.
- The meeting discussed the potential use of drones in locust early warning and preventive control, organized by the Commission for Controlling the Desert Locust in the Western Region, held in Algeria on the 27th of April 2016, (Appendix 5c).

### **Joint activities with the Desert Locust Commissions and Organizations**

#### **a) Report of the Commission for Controlling the Desert Locust in the Western Region (CLCPRO)**

13. The Executive Secretary of the Commission for Controlling the Desert Locust in the Western Region, CLCPRO, Mohamed Lemine Hamouny gave a presentation on the Commission and the EMPRES programme activities where he informed that a sizable progress has been made during 2015-2016.

The proposed amendments to the agreement for the establishment of the Desert Locust Commission in the Western Region have been approved by two of the main bodies of FAO and will be submitted for final approval by the member states at its next extraordinary session to be held in Bamako in July 2017. The amended agreement shall enter into force upon its approval by the member states.

The Secretary informed that a meeting of CLCPRO Desert locust experts was held in February 2016 in Dakar, Senegal, to calculate the amount of the Regional Fund for Locust Risk Management (FRGRA). This Fund is to be made available to the UNLAs faced with a major resurgence or an upsurge, additional resources to finance the increasing number of survey and control teams, including aerial operations if necessary and equipment and related pesticides. The amount of the FRGRA has thus been estimated at six million US\$, which will cover the cost of mobilizing of the monitoring and control system able to treat a total infested area of 350 000 hectares in three months. It should be noted that CLCPRO member countries have decided to contribute to FRGRA by US\$ 100 000 per year and to make an ad hoc contribution of US\$ 1 million in 2016 from the Trust Fund. Voluntary contributions of CLCPRO member states are expected and the modality will be discussed during the CLCPRO executive committee to be held in July in Bamako, Mali.

Concerning the Western Region Intervention Force (FIRO), its creation is based on the fact that controlling Desert Locust outbreaks is the key to the success of preventive control and that unexpected budgetary constraints may hamper the necessary quick actions of countries affected by Locusts resurgences, which will increase the risk of plagues. It will supplement the efforts of the four frontline countries to control major outbreaks and the onset of an upsurge. Its creation has been approved by CLCPRO 8th Session and its funding will be supported by the trust fund of the Commission, voluntary contribution of CLCPRO member states and partners. By the end of 2022, FIRO will be composed of 12 teams of survey and control and one coordinating team, requiring a six-year investment of US\$ 1.5 million, of which US\$ 1 170 000 is allocated for vehicles procurement and US\$ 330 000 for camp equipment, communication and control operations.

Progress has been made in the other normative activities such as the implementation of regional training plan 2015-2018, regional research plan 2016-2019, regional communication strategy, Monitoring System of National Locust Control Mechanisms (SVDN - Système de veille des dispositifs nationaux de lutte antiacridienne), Environment and Health and Standards and Partnership.

#### **b) Report of the Commission for Controlling the Desert Locust in South-West Asia (SWAC)**

14. The Secretary of the Commission for Controlling the Desert Locust in South West Asia- SWAC, Keith Cressman, presented a report on SWAC activities, which is FAO's oldest regional Desert Locust commission, having been established in 1964. It has four member countries (Afghanistan, India, Iran, Pakistan) that contribute US\$ 107 000 per year. SWAC supports two types of activities: normative (the annual Iran/Pakistan joint survey of spring breeding areas since 1995, eLocust3 usage, national training, RAMSES and new technology development) and specific (bio-pesticides, regional Desert Locust Information Officer (DLIO) workshop, contingency planning mock exercise, Mac laptops for DLIOs).

SWAC has been the main funder of RAMSES GIS version 4 development, having contributed US\$ 30 000. Joint SWAC/CRC activities consist of the annual CRC/SWAC DLIO workshop, exchange visits for Iranian and Omani survey officers, and participation in the CRC session. The FAO Senior Locust Forecasting Officer is the Executive Secretary of SWAC.

#### **c) Report of the Desert Locust Control Organization for Eastern Africa (DLCO-EA)**

15. The Director of DLCO-EA, Stephen Njoka, gave a presentation in which he informed that DLCO-EA is a regional pest and vector management organization established in 1962 with its headquarters in Addis Ababa, Ethiopia. The nine member countries are Djibouti; Eritrea; Ethiopia; Kenya; Somalia; South Sudan; Tanzania and Uganda. Its mandate pests are Desert Locust, African army worms, *Quelea quelea* birds and Tsetse flies. Besides controlling these pests the organization also trains national and regional communities and also conducts research on its mandate pests. DLCO-EA collaborates with CRC/FAO/USAID and other development agencies in the fulfilment of its mandate.

#### **Amendments to the Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Central Region (CRC)**

16. The Secretary of the Commission provided feedback on updating the establishment agreement of the Commission in coordination with FAO Legal Office taking into consideration member countries' observations. The amendments to the establishment agreement of the Commission were discussed and endorsed by the session members, and requested the continuation of the amendments process as per the rules and regulations of the Food and Agriculture Organization of the United Nations.

**Recommendation 26:** Member countries endorsed the amendments to the establishment agreement of the Commission.

### **Election of members and Chairman of the Executive Committee**

17. The Executive Committee members have been unanimously elected to be: Egypt; Eritrea; Ethiopia; Jordan; Saudi Arabia; Sudan and United Arab Emirates. The representative of Saudi Arabia was elected as the Chairman of the Executive Committee and Jordan as Vice-Chairman.

### **Accounts for 2015 and 2016**

18. The Secretariat of the Commission reviewed a summary of expenditures for 2015-2016 which was endorsed by the session members, (Appendix 6).

**Recommendation 27:** Member countries endorsed the expenditure reports for 2015 and 2016.

### **Contributions and arrears of member countries to the Commission's Trust Fund**

19. On the status of contributions of member countries and the outstanding arrears to the Trust Fund of the Commission, the Secretary of the Commission presented the current status of contributions of some member countries over the past years. The session members agreed that delegates of the member countries that are in arrears should follow up with their governments on its payment to the Trust Fund of the Commission which amounted to up to US\$ 900 000, to enable the Commission's Secretariat execute its workplan. The delegate of Saudi Arabia informed that the payment of the contribution is currently being processed, (Appendix 7).

**Recommendation 28:** The Session delegates agreed that delegates of member countries who are in arrears should follow up with their governments on its payment to the Trust Fund of the Commission.

20. The session members discussed recommendation no. 28 of the 29th Session regarding the doubling of member countries' contribution to the Trust Fund of the Commission and they endorsed the recommendation for the following reasons:

- a. Insufficient annual contributions which have not been changed since 1980;
- b. The implementation of the Commission's activities stated in its work plan for the benefit of the member countries as the total sum of the member countries does not cover the implementation expenditure of the activities requested;
- c. The high cost of many of the services provided to the member countries;
- d. New technologies that has been introduced for the early warning and preventive control of Desert Locust in breeding and invasion member countries.

The delegates of the United Arab Emirates and the Kingdom of Saudi Arabia showed their reservations on the letter addressed to the concerned authorities in both countries in this regard. After extensive discussions, the session members appreciated the member countries that paid double its contribution while requesting the other member countries to continue the process of implementing recommendation no. 28, with the visit of the Chairman, the Chairman of the Executive Committee and the Executive Secretary of the Commission to the UAE and Saudi Arabia to explain the reasons and clarify the procedures followed at the FAO.

**Recommendation 29:** The Chairman, the Chairman of the Executive Committee and the Secretary of the Commission are to visit UAE and Saudi Arabia to explain the reasons and clarify the procedures followed by FAO regarding the doubling of member countries' contributions to the Trust Fund of the Commission.

### **Work plan for 2017-2018**

21. The Secretary of the Commission presented the work plan for the years 2017-2018 which was endorsed by the meeting after extensive discussion, (Appendix 8).

**Recommendation 30:** The work plan for 2017-2018 was endorsed by the member countries.

**Recommendation 31:** The Executive Secretary of the Commission is authorized, in consultation with the Chairman, to cover the cost of implementing any activities that are not reflected in the Commission's 2017-2018 workplan.

## **Other business**

### **Administrative and financial autonomy of the commission**

22. The Secretary of the Commission presented a paper on more administrative and financial autonomy to the Commission to enable its Secretariat implement its workplan with easiness and flexibility. After extensive and transparent discussion the session members unanimously endorsed the provision of Budget Holder responsibilities to the Executive Secretary of the Commission for the Trust Fund of the Commission subject to the rules and regulation of Food and Agriculture Organization.

Recommendation 32: The member countries unanimously endorsed the provision of Budget Holder responsibilities to the Executive Secretary of the Commission for the Trust Fund of the Commission subject to the rules and regulation of Food and Agriculture Organization.

### **Date and place of the next Executive Committee and the Session of the Commission**

23. The Chairman of the Session requested nominations from member countries to host the 31st Session of the Commission, where the delegate of Lebanon proposed to host it in November 2018 and the Secretary shall coordinate with the Government of Lebanon on completing the process as per Food and Agriculture Organization procedures.

### **Adoption of the report of the 30th Session of the Commission**

24. The report of the 30th Session and the 34rd Executive Committee Meeting of the Commission, held in Muscat, Sultanate of Oman, 19-24 November 2014, with the agreed amendments, was unanimously endorsed and approved by the participants.

### **Closure of the Session**

25. Finally and after the report endorsement by the Session members, the Chairman of the Commission thanked all the participants for their fruitful discussions and hard work which resulted in 32 recommendations covering many activities that concern the member countries in Desert Locust Management.

He commended member countries for their support to the Commission and also expressed appreciation to the Commission's Secretariat for their excellent organization and preparation of the session, the 50th Anniversary celebration, supported by the Ministry of Agriculture and Fisheries team. The Chairman also thanked the drafting committee and the translation team. And finally, he wished everyone a safe journey back home.

## Acknowledgements

The participants expressed their gratitude and thanks to the government Sultanate of Oman, represented by the Ministry of Agriculture for their warm welcome, generous hospitality, excellent arrangements which resulted in the success of this session.

The participants appreciated the auspices of H.E. Dr Fouad bin Gaafar Al Sajwani, Minister of Agriculture and Fisheries, Sultanate of Oman, to the 50th Anniversary celebration of the Commission and the opening of the 30th Session, and to Dr, Ahmed bin Nasser AlBakri, the Undersecretary, and the ministry staff.

Thanks were due to the Chairman of the Commission for his good management during the intense discussions of the Session on various subjects which produced positive recommendations supporting the Commission's goal for the benefit of its member countries in different Desert Locust issues.

Appreciations and thanks were extended to the Secretary of the Commission and the Assistants for their enormous efforts and valuable documents presented in the 50th Anniversary celebration and the Session and to all that have contributed to the success of this session, specially the Drafting Committee, the translator, and to Muscat Holiday hotel management.

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## Appendix 2: Report of the Chairman of the Commission

Dear Colleagues,

To begin with, on behalf of all the member countries delegates, our guests and myself, I would like to extend my sincerest appreciation to the Ministry of Agriculture and Fisheries of the Sultanate of Oman for hosting the celebration of the 50th Anniversary of the Commission along with the events of the thirtieth session. We would also like to thank all the other institutions involved in the good organization and preparations of the 50th Anniversary celebration. We would like to welcome Mr Yene Belaynah, USAID Senior Technical Advisor to be with in this Session.

I extend my sincere congratulations to all the member countries' governments on the occasion of the 50th Anniversary Commission and to the Commission's secretariat. The achievements realized by the Commission is the outcome of the true collaboration between the member countries and the Food and Agriculture Organization of the United Nations and I have high hopes that this tangible progress in the field of Desert Locust risk prevention in the Central Region shall continue for years to come.

For the thirtieth session of the Commission, I am pleased to present a brief report on the Desert Locust Situation as well as the activities carried out by the Commission's Secretariat that have been achieved during the period from November 2014 until January 2017.

The overall situation of Desert Locust in the central region was relatively calm due to the non-significant activity of Desert Locust most of the time. Despite the latter, the situation was worrisome because of a continued presence of small infestations, some of which resulted in outbreaks, in addition to the unclear locust situation that prevailed in Yemen.

Some infestations have developed into outbreaks in Eritrea, Saudi Arabia and Sudan, even though these outbreaks never developed further due to the earlier intervention of control operations, in addition to the lack of favourable conditions for locust breeding. In the case of Yemen, it was difficult to obtain all the information related to the outbreak progress. Locust Control operations were conducted in 6 countries (Eritrea, Ethiopia, Saudi Arabia, Sudan, Yemen and north Somalia) treating a total area of about 244,094 hectares from November 2014 to this report's date.

Such a situation confirms the continuing threat of Desert Locust in the region and the urgent need to take the necessary measures to activate the national contingency plans, in addition to the importance of the joint cooperation between all parties at the national and regional levels to react quickly to new developments in Desert Locust situations. Moreover, this situation highlights the great efforts of the frontline counties in dealing with locust infestations to prevent its outbreak, hence protecting other member countries.

In this regard, we should commend the valuable efforts of the Commission's member countries in supporting the control operations in the central region during the last two years, in addition to the role played by the Commission's Secretariat in the coordination between member countries and continuous follow up of the Desert Locust situation. The Commission also organized and conducted several workshops and training courses on Desert Locust survey and control and Environmental Health and Safety Standards.

We cannot forget to highlight the outstanding cooperation and coordination between the Commission's member countries in sharing information and reports, as well as finding solutions for some difficulties mainly in RAMSES programme and e-Locoust.

Close cooperation took place between the Secretariats of the Commission and the other two commissions, the Commission for Controlling the Desert Locust in the Western Region (CLCPRO), the Eastern Region (SWAC) and the Director of Desert Locust Control Organization for Eastern Africa (DELCO-EA) in the field of information exchange, training and other activities.

**The following are the main activities carried out by the Commission's Chairman and the Secretariat during the past two years:**

### **1- Visits:**

Based on the Commission's 29th Session recommendations, the Commission's Secretary visited some member countries to meet the concerned officials in the ministries and Locust Control Units to discuss common issues in the field of Desert Locust control as well as promoting joint cooperation. In this regard the Commission's Secretary visited Eritrea and Saudi Arabia 2015, in addition to joining me to the Food and Agriculture Organization headquarter in Rome to submit the 29th session report of the Commission as well as to discuss a number of recommendations with respect the Commission's workplan.

- The chairman also sent the proposed amendments to the agreement for the establishment of a Commission on 07/12/2015 to the FAO Director General through the FAO Representation in Eritrea. The FAO DG acknowledged receipt and sent the proposal to member countries of the commission for amendments on 20/12/2016 to respond to it no later than 120 days before the session of the commission to the FAO DG and the Chairman of the Commission.

In 2016, the Secretary visited each of Ethiopia, Djibouti, Jordan, Sudan, United Arab Emirates, Bahrain and Sultanate of Oman. The visits achieved their desired objectives, especially in Sudan, where a positive outcome in settling the contribution arrears was accomplished, in addition to the visit to Bahrain, which reactivated the mutual relations between the Commission and Bahrain.

## **2- Joint Cooperation with Regional Commissions:**

Aiming to strengthen and promote joint activities with other Desert Locust Commissions, the Secretary participated in the celebration of the 50th Anniversary of the establishment of the Commission for Controlling the Desert Locust in Southwest Asia (SWAC), attending also its 29th session in Iran during 16th -18th December 2014.

Regarding the cooperation with the Western Region Commission, the Secretary attended the meeting held on monitoring the national capacities required for locust control in the western region countries in Algeria, 28th September to 1st October 2015 and participated in CLCPRO regional workshop on applied research held in Tunisia from 23 to 27 November 2015.

## **3- Meeting:**

In addition to the Chairman and the Secretary of the Commission, representatives from frontline member countries participated in the Stakeholder Workshop on the Procurement and Supply of Pesticides for Locust Control held at FAO headquarters in Rome, 2-3 Sept 2015, which aimed at finding prompt and flexible mechanism to supply the affected countries with pesticides and other items in record time during emergencies. The Commission also organized a meeting on December 3rd, 2015 to discuss the preparedness of frontline countries to the potential development in the Desert Locust situation, mainly after the cyclones that affected Yemen.

The Secretary of the Commission participated in CLCPRO drone meeting in Algeria on the 27th of April, 2016.

## **4- The Regional Workshops:**

Given the importance of reporting the latest developments to the member countries and sharing effective information on Desert Locust situations, the Commission's Secretariat organized and held 3 regional workshops for frontline member countries on Desert Locust contingency plan, Pesticides Stock Management System (PSMS) and the implementation of Environmental and Health Standards in Desert Locust control operations.

## **5- Inter-Regional Workshops:**

The Commission's Secretariat, with the cooperation of the Desert Locust Commissions in the Western Region and Southwest Asia and the Desert Locust Information Service (DLIS), organized and held three workshops, two of which were dedicated for Desert Locust Information officers (DLIOs) and one for the assistant tools of Desert Locust Contingency planning.

## **6- Short-term Training:**

The Commission's Secretariat provided the required technical and financial support to conduct various training courses, the 9th Sub-Regional training course (Oman), 6 national training courses on the implementation of the EHS program in Oman, Egypt, Sudan, Saudi Arabia, Eritrea and Ethiopia.

In addition, 7 national training courses on Desert Locust survey/control/campaign organization in Djibouti, Egypt, Jordan, Oman, Saudi Arabia, United Arab Emirates and Yemen.

Also 2 national training courses on the operation and maintenance of sprayers used in DL control operations were conducted in Ethiopia and Sudan, as well as one national Training-of-Trainers course in Eritrea.

## **7- Long-term Training:**

- Tariq bin Mahmoud Al Mundhiri from Oman acquired a Master degree from the University of Nottingham in England, funded by the Commission. The studies lasted for one year (2015/2016) and were carried out on the following subject:

“The impact of behavioral thermoregulation by the Desert Locust, *Schistocerca gregaria*, on development and longevity”.

- Marzouk Al-Barakati from the National Center for controlling Locust and Migratory Pests in Saudi Arabia, is now receiving advanced training in DLIS in Rome from 8th November 2016 to 7th May 2017.

## **Miscellaneous activities:**

1. The Commission’s Secretariat updated the Desert Locust Contingency Planning Assistant (DeLCoPA) which is now available in Arabic, English and French languages, in addition to the availability of using it without internet.
2. The Secretary regularly ensures the translation and the issuance of the monthly Desert Locust Bulletin in Arabic and circulating it to the concerned authorities and organizations.
3. The Commission’s Secretariat provides Desert Locust data, information and newsletters in addition to information through social media sites through the Commission’s website in both Arabic and English languages, the domain of which has been updated to be: <http://desertlocust-crc.org/>
4. In order to improve the performance of Commission consultant were temporary contracted, Osama Rabie, in the field of locust information management (e- Locust3 & RAMSES), and Ms. Sarah Sadek in the field of media.

Finally, it is worth mentioning that all these activities have required great efforts and perseverance, which will be presented in more details by the Secretary of the Commission.

To conclude, I would like to extend my sincerest thanks to the Commission’s Secretariat for its outstanding and significant efforts that helped to facilitate my duties as the Commission’s Chairman during the past two years. Also, thanks to the Locust and Other Migratory Pests Group at FAO HQ and to all the member countries for their cooperation in facilitating the Commission’s activities and helping to overcome all the obstacles.

Wish you a fruitful session.

## Appendix 3: Report on the Activities of the Commission & follow up the Recommendations of the 29th Session

Upon the recommendations of the 29th session of the Commission, held in Dubai, United Arab Emirates, during 23-27 November 2014, the Secretariat of the Commission implemented several activities during 2014-2016.

The recommendations will be discussed in details in their individual working paper according to the time table. However, this working paper will discuss the summary of other recommendations that are not mentioned in the working papers, recommendations that have not been implemented or that that need clarification from the Secretariat of the Commission or member countries.

### **First: Recommendations related to Member States:**

No.	Recommendation	Action
4	The representative of Iraq is to inform the Secretariat of the Commission on the status of the devices equipment used in the Desert Locust Control.	No action was taken as the representative of Iraq was not present in the last session.
6	Front line countries are urged to use the minimum number of e-Locust devices as deemed necessary, in coordination with the Secretary of the Commission.	The Secretariat of the Commission undertook the following actions in this regard on a monthly basis: (1) addressed the issue to the officials to carry out this recommendation (2) followed up the usage regularly, (3) activate/deactivate the devices upon member countries' requests, according to the Desert Locust situation.
8	Delegates of Egypt, Oman and Yemen are to submit a report to the Minister of Agriculture, including the proposal presented to the IDB, to obtain the support of their representatives in the IDB council.	No action was taken in this regard.
9	The representative of Ethiopia and the Secretariat of the Commission are to communicate with the responsible authorities in Djibouti in order to activate their participation in various activities of the Commission and payment of annual contributions and arrears.	The Secretary of the Commission visited Djibouti and met with the Minister of Agriculture and other officials. A national training course on DL was conducted to the plant protection staff. However, the annual contribution of Djibouti has still not been settled.
13	The Secretariat of the Commission in the Central Region is to facilitate the joint border survey between Sudan and Eritrea in the locust breeding habitats.	A joint cross-border survey between the Sudan and Eritrea was organized and financially supported by the two countries.
14	Reactivate joint border surveys of the summer/ winter breeding areas between Yemen and Saudi Arabia, when feasible.	The current situation in Yemen did not permit this activity.

## **Second: Recommendations related to visits and meetings:**

No.	Recommendation	Action
12	The Secretary of the Commission is to visit member countries: Bahrain, Kuwait and Saudi Arabia, to meet with the concerned ministers to provide an overview on the Commission's activities and its role in the Central Region regarding Desert Locust management and present proposals to support of the Commission's activities.	<ul style="list-style-type: none"><li>- The Secretary and the Chairman of the Commission visited FAO HQ to submit the report of the 29th Session, and discussed some recommendations related to Commission's workplan, 21-23 April 2015;</li><li>- The Secretary visited a number of member countries to meet with the officials in the concerned ministries in order to discuss DL common issues and to strengthen joint cooperation, the visits included the following countries:<ul style="list-style-type: none"><li>- Eritrea, 11 – 16 January 2015;</li><li>- Saudi Arabia, 26 – 29 January 2015;</li><li>- Ethiopia and DLCO-EA, 21 – 22 March 2016;</li><li>- 27 May – 3 June 2016;</li><li>- Sudan Djibouti, 23 – 25 March 2016;</li><li>- Jordan, 21 – 24 August 2016;</li><li>- United Arab Emirates, 9 – 13 October 2016;</li><li>- Bahrain, 22 – 24 October 2016;</li><li>- Oman, 1 – 3 November 2016 for the initial preparations of the 50th Anniversary celebration and the 30th session.</li></ul></li></ul>
16	In collaboration with the FAO Representation in Yemen, the Commission is to obtain security clearance for the Chairman and the Executive Secretary to visit Yemen. In the negative case, invitations should be addressed to the Director of the Plant Protection and the Director of LCU to visit the Secretariat of the Commission in Egypt, in support of the LCU efforts in the DL control operations.	The visit was not implemented due to security issues. However, the Secretariat of the Commission invited the officials responsible for Desert Locust activities in Yemen to visit Cairo in support of the locust control center, in addition to the participation of Yemeni staff in some activities in Cairo.

## **Third: Recommendations related to cooperation with other Desert Locust Commissions and Organizations:**

No.	Recommendation	Action
11 & 20	The Secretariat of the Commission is to address invitations to the Secretaries of the Commissions of Controlling the Desert Locust in the Western Region and in South West Asia to participate in the Contingency Planning Workshop to be held in February 2015, in Egypt, which will include training on preparation of national contingency plans and the use of DeLCoPA for frontline countries.	The two Commissions for Controlling the Desert Locust in the Western Region (CLCPRO), in South West Asia (SWAC) and the Desert Locust Control Organization in Eastern Africa (DLCO-EA) were invited to attend the activities of the regional workshop on Desert Locust Contingency Planning, held in Hurgada, Egypt, during 15-19 February 2015.
17	Collaboration between CRC, CLCPRO and SWAC in Desert Locust Management is to continue.	<p>In this regard, the Secretary of the Commission participated in the 50th Anniversary of the establishment of SWAC and its 29th Session in Iran, 15 – 18 December 2014.</p> <p>In addition to participating in CLCPRO regional workshop on applied research, Tunis, 23 – 27 November 2015.</p>

- 21 A Workshop is to be held in Jeddah, Saudi Arabia, for Pesticides Stock Management System (PSMS) in the breeding countries, to be included in the DL Centers, in coordination with Pesticides Referee Group and the Commission for Controlling the Desert Locust in the Western Region.
- A regional workshop on Pesticide Stock Management System was held in Jeddah, Saudi Arabia during 18 – 21 October 2015, with the participation of CLCPRO.

#### **Forth: Recommendations related to Secretariat of the Commission:**

No.	Recommendation	Action
10	Second line member countries, especially UAE, are to introduce spray equipment for the use of Ultra Low Volume (ULV) pesticides for Desert Locust control and the Commission to provide the necessary support in this regard.	In this regard, the subject was addressed to the officials in the United Arab Emirates but the Secretary of the Commission did not receive a response.  <b>The delegate of UAE to shed some light on this.</b>
15	With regard to the assistances delivered to Yemen by the donor communities, amounting to 1,350,000 US\$, the meeting recommended that the Commission approach the concerned authorities in Yemen to preserve these assistances for the use for DL operations only.	This issue was followed up with the officials of MoA in Yemen, and H.E. the Undersecretary of the Ministry of Agriculture and Irrigation was addressed.
18	The Secretary of the Commission is to address the concerned authorities (Agricultural Departments) at the Secretariat General of the Gulf Cooperation Council (GCC) to participate in a meeting organized by the Secretary of the Agricultural Departments in GCC to enlighten and clarify the important role played by the Commission in food security of the region from the threats of Desert Locust and thence, request financial support to achieve the ambitious work plan of the Commission for Controlling the Desert Locust in the Central Region.	In this regard, the Assistant Secretary-General for Economic Affairs in the Council of GCC was addressed, and followed up for 2 years without any response from the competent department of the Council.
19	Recommendations related to Syria:	The MoA of Syria was addressed.

#### **Fifth: Recommendations related to Commissions' website:**

No.	Recommendation	Action
2	The Commission's name is to appear as the main website name only, without "EMPRES", and changing the Domain accordingly.	The domain of the CRC website was updated to be <a href="http://desertlocust-crc.org/">http://desertlocust-crc.org/</a> Instead of <a href="http://crc.empres.org">http://crc.empres.org</a>
5	Member countries are to send updated details on country information including the focal person, available resources and capacities available for Desert Locust Control operations to the Secretariat of the Commission in order to update the CRC website and other tools such as the "Electronic Locust Emergency Repair Tool" (eLERT). In addition, to include the updated information in the monthly bulletin.	The contact information as well as national resources are updated periodically, in the CRC and eLERT websites. However, member countries, especially front-line countries, do not update these data through the monthly bulletins.

## **Sixth: Recommendations related to the Budget:**

The recommendations that related to the budget will be discussed in details through the working papers accordingly with the time table.

No.	Recommendation	Action
28	The meeting agreed upon doubling the contribution rates of member countries, and the Secretary of the Commission to write to member countries informing them of the recommendation of doubling the contribution rates, to forward to the concerned minister and then submit it to the relevant authorities in the country for approval, with due attention to each country's correspondence process.	In this regard, member countries were addressed by the concerned department in FAO HQ for its implementation.
30	The meeting agreed on the roadmap for the implementation of financial mechanism for Controlling the Desert Locust in the Central Region and to establish a Regional Emergency Fund for Desert Locust Emergencies, with the allocation of US\$ 150,000 from the Commission's Trust Fund.	In this regard, the necessary action was taken and a Regional Emergency Fund to ease risks of Desert Locust was established.

### **Items that include:**

- 1- Training and workshops;
- 2- Publication and Research;
- 3- Modern Technologies.

Shall be presented and discussed in details through the PowerPoint presentations.

## Appendix 4: Report of Desert Locust situation from November 2014 to February 2017 and outlook until summer

### Overview

Seven Desert Locust outbreaks developed from late 2014 to early 2017 in the Central Region as a result of unusually good rainfall, including two cyclones that brought heavy floods to southern Yemen. Control campaigns that were conducted by national locust centres successfully stopped the outbreaks from spreading to neighbouring areas except in Yemen where only limited survey and control operations could be carried out because of chronic conflict and insecurity throughout the country. Consequently, infestations spread from Yemen to the Horn of Africa, Saudi Arabia and the Eastern Region. During the period, nearly 245,00 ha were treated by Eritrea (36 798 ha), Ethiopia (31 ha), Saudi Arabia (26 618 ha), Somalia (53 ha), Sudan (179 860 ha), and Yemen (734 ha).

### Locust situation in the Central Region

#### Late 2014 – April 2015: Sudan, Eritrea and Saudi Arabia outbreaks

Sudan. In November 2014, hopper bands continued to form in the Baiyuda Desert north of Khartoum as a result of good rains and subsequent breeding that had caused an outbreak to develop in October. By mid-November, most of the hoppers had fledged and an increasing number of immature adult groups and swarms formed that moved to the Red Sea coast, matured rapidly and laid eggs along a 350 km stretch of the coast between Bir Salalah in the north to the Eritrean border in the south. Hopper bands formed near Port Sudan from October breeding. Mainly scattered adults were present in W. Oko/Diib of the northeast. Control teams treated nearly 76 000 ha in the summer breeding areas of the interior and 7 000 ha along the Red Sea coast, of which about 64 000 ha were by air.

In December, adult groups and swarms that arrived on the coast last month from summer breeding areas in the interior continued to mature and lay eggs, causing widespread hatching and giving rise to hopper groups and bands. Hatching first started south of Suakin and then occurred elsewhere from north of Port Sudan to Tokar. This was followed by hatching on the southern plains near Aiterba and the Eritrean border where egg-laying continued until the end of the month. Control operations increased, treating nearly 12 000 ha of which 9 000 ha were by air. In the summer breeding areas, adults persisted in some areas and formed a few groups.

In January 2015, breeding conditions remained favourable on the southern coast even though very little rain fell and several swarms laid eggs. This was supplemented by mature swarms crossing into the area from the Eritrean coast where a separate outbreak was in progress. Hatching and band formation continued along most of the entire coast of Sudan. Control operations intensified, treating 25 848 ha of which 16 620 ha were by air.

In February, vegetation started to dry out along the coast because no significant rain had fallen for two months or more. Numerous groups of adults formed along the central coast while hopper bands were present on the southern coast and in some places north of Port Sudan. After mid-month, hopper bands and adults declined on the central coast while late instar hopper bands persisted on the southern coast where adults formed groups and several swarms. Intensive control operations continued to increase, treating more than 41 000 ha of which 27 000 ha were by air.

In March, the situation improved due to control operations and drying conditions. Ground and aerial control operations declined, treating mainly locally-bred adult groups and swarms on the southern coast. A few adults and swarms moved into this area from Eritrea.

**Eritrea:** Small-scale breeding commenced on the Red Sea coast near Shelshela in October 2014 and limited control operations treated early instar transients and gregarious hoppers. By November, an outbreak had developed as hoppers formed groups and bands on the central and northern coastal plains. Groups of copulating adults were present near the Sudanese border. Ground teams treated 6 943 ha.

In December, more hopper bands formed on the northern coast while adult groups and small swarms formed on the central coast where a second generation of breeding commenced by the end of the month. Ground teams treated 4 070 ha.

In January 2015, second-generation hatching caused locust numbers to increase further on the central and northern coastal plains where numerous hopper bands formed. Ground teams treated 10 247 ha.

In February, hoppers fledged and immature adults formed numerous groups and small swarms. Some of the swarms moved inland to the highlands towards Naro and Nakfa. Ground teams treated 3 870 ha.

In March, a few hopper bands and gregarious adults persisted on the northern and central coasts. More immature adults were reported on the eastern escarpment near Naro and a swarm was seen by mid-month in the western lowlands along Khor Baraka. Ground teams treated 1 354 ha. No further field operations were conducted after March.

**Saudi Arabia:** In November 2014, good rains fell in winter breeding areas along the Red Sea coast from Qunfidah to Yenbo and ecological conditions became favourable for breeding the following month. An increasing number of scattered immature and mature solitary adults were seen on the coastal plains from Lith to about 80 km south of Qunfidah in November and groups of adults were seen laying eggs close to the foothills of the Asir Mountains near Mecca where hatching occurred in mid-December and small hopper groups and bands formed. Scattered adults were present on the northern coast near Yenbo while adults already present on the central coast near Lith and Qunfidah continued to mature. A few groups of adults formed and laid eggs south of Qunfidah. Control operations were launched and treated 1 823 ha of which 1 200 ha were by air in December.

In January 2015, favourable breeding conditions persisted in most areas despite a lack of rainfall. A mature swarm and a few adult groups laid eggs during the first week on the northern coast between Yenbo and Umm Lajj. Hatching and band formation occurred on the central coast between Thuwal and Mecca, and near Lith and Qunfidah where, by the end of the month, fledging had commenced. Control operations treated 8 693 ha of which 300 ha were by air.

In February, hatching and band formation occurred in areas of previous egg-laying on the northern coast between Yenbo and Umm Lajj while hoppers continued to form small but numerous bands on the coast between Thuwal and Mecca. Groups of adults reportedly formed in a few areas about mid-month. Control operations treated 2 570 ha of which 440 ha were by air. The situation improved on the coast south of Jeddah where no locusts were seen during February.

#### **November 2015 – November 2016: Yemen outbreak and spread**

Despite good rainfall in the summer breeding areas of the interior in Sudan, the situation remained calm from June to October 2015. On 3 November, tropical cyclone Chapala, the second strongest storm on record for the Arabian Sea, landed on the southern coast of Yemen near Mukalla and subsequently weakened as it moved further inland. With winds exceeding 150 km/h, it brought several years' worth of rain in 2–3 days to coastal and inland areas of Shabwah and Hadhramaut governorates, leading to serious flooding, destruction and loss of life. Heavy rains also fell in coastal and inland areas of southern Oman. One week later, a second cyclone, Megh, formed over the central Arabian Sea and moved towards southern Arabia and the Horn of Africa, tracking slightly south of Chapala. It arrived on Socotra Island on the 8th with winds up to 200 km/h. The following day, it briefly made landfall on the tip of northeastern Somalia, causing heavy rains to fall in Puntland and as far west as Erigavo. It then continued to the southern coast of Yemen where it made landfall near Aden on 10 November but it had significantly weakened. The combined rains of the two cyclones allowed breeding conditions to remain favourable in southern Yemen for at least six months or more to summer 2016.

Four months after the cyclones, an outbreak developed on the southern coast of Yemen in March 2016 when numerous hopper groups and bands were seen along a 120 km stretch of coast during the first surveys of the year between Arkha and Bir Ali, southwest of Mukalla. Due to insecurity, the previous generation of breeding that occurred shortly after the cyclones was not detected. By the end of March, fledging was underway and adults were forming small groups and at least one swarm.

In April, groups of late instar hoppers continued to form on the coast between Arkha and Bir Ali. An increasing number of adults, groups and at least one swarm moved on strong southerly winds on 1–10 April into the interior and dispersed over a wide area between Marib, Al Abr, W. Hadhramaut and Thamud, including the numerous small wadis in the plateau north of W. Hadhramaut. Widespread rains ensured that breeding conditions were still favourable, egg-laying started at mid-month. Hatching commenced by the end of the month, and hopper groups and small bands formed. The full extent of the egg-laying and hatching could not be determined as most areas could not be surveyed due to insecurity and remoteness.

In May, the situation deteriorated further as ecological conditions remained extremely favourable for breeding, causing more hopper groups and bands to form in the interior as well as on the Aden coast. Egg-laying continued to about mid-May. Survey and control operations were severely hampered by insecurity, beekeepers and remoteness. Consequently, the full extent of the infestations was not well known but it appears that widespread breeding occurred within a large portion of the interior between Marib and Thamud as well as on the Aden coastal plains. Only limited control operations could be carried out near Bayhan (120 ha) and on the plateau west of Thamud (39ha), supplemented by burning hopper bands in some places.

In June, the situation remained extremely serious as hopper bands were present in the interior and new swarms started to form during the second week in Wadi Hadhramaut, on the plateau to the north, in Shabwah and near Bayhan. During the last week, some immature swarms moved west into the highlands and were also seen near Al Hazm. Crop damage was reported in Hadhramaut, Al Jawf and Marib. Only limited control operations (365 ha) could be carried out due to prevailing insecurity, beekeeping and logistical issues. Scattered hoppers and immature solitary adults were present along the southern coastal plains between Aden and Mukalla.

In July, an unknown number of swarms continued to form in the interior and there was a general movement to the west and south. At least one swarm appeared in the highlands near Taiz on 1-2 July and a large swarm was seen on the 28th, groups of adults appeared on the southern coast near Mukalla early in the month, and adults reached the northern Tihama coast of the Red Sea in late July. Survey and control operations could not be carried out; hence, the full extent of the infestations remained unknown. Heavy rains from 27 July to 4 August caused flooding on the Red Sea and Gulf of Aden coastal plains, the central highlands and in the interior. On about 18-23 July, at least one swarm migrated on strong southwesterly monsoon winds from the interior and reached the coast of Pakistan four days later. Several swarms crossed the Gulf of Aden to northwest Somalia and adjacent areas of Djibouti and eastern Ethiopia where they laid eggs in August, giving rise to numerous small hopper bands that were treated in Ethiopia (31 ha) and northern Somalia (53 ha) between August and October.

In August, another generation of breeding took place in the interior of Shabwah and Hadhramaut and on the southern coast near Aden that caused numerous small hopper groups and bands to form. By September, adult groups had formed and an increasing number of adults and groups arrived on the Red Sea coastal plains of Yemen, some of which probably continued to adjacent coastal areas in Saudi Arabia. Breeding is likely to have occurred in both areas. Only limited survey and control operations (50 ha) were possible.

In October, there were unconfirmed reports hopper groups on the northern coastal plains of the Red Sea in Yemen and, by early November, a local outbreak had developed. Farmers treated 40 ha of hopper bands and fledglings and ground teams treated 120 ha in December.

#### **October 2016: Sudan outbreak**

A short-lived outbreak developed in North Kordofan and the Baiyuda Desert in early October as a result of summer breeding and drying conditions that caused hoppers to form groups and bands. Hopper groups were also seen on the western side of the Red Sea Hills between Kassala and Derudeb. By the end of the month, fledging had occurred and immature adult groups were reported. Aerial control operations were mounted, treating 2,200 ha while ground teams treated 700 ha. During November, a few remaining adult groups were treated by air (800 ha) north of Kassala and the outbreak subsided.

#### **November 2016 – January 2017: Eritrea outbreak**

An outbreak developed on the Red Sea coast in November as a result of good rains that fell during July and August. It is likely that the first-generation egg-laying occurred in August with hatching during the last half of August and fledging during September but was not detected in July (no surveys), August (egg-laying had occurred and hatchlings were difficult to see during surveys) and September (no surveys on central coast). A second generation commenced in mid-October when hatching occurred and hopper groups formed. Fledging commenced by mid-November and immature adults formed groups. Ground teams treated 850 ha.

In December, groups of hoppers and maturing adults were present on the central coast during the first half of the month. Thereafter, infestations declined and only a few immature adult groups remained due to control operations (7 818 ha), drying conditions and a movement north along the coast towards Karora and adjacent coastal areas in Sudan. Control operations also prevented serious crop damage. On the Eritrean side, hatching and band formation started in the last week of December, which was a third generation of breeding for Eritrea.

In January 2017, breeding continued on the northern coast where early instar hoppers, groups and at least one band were present near the Sudanese border. Ground teams treated 106 ha.

#### **December 2016: Saudi Arabia outbreak**

An outbreak developed in December on the Red Sea coast because of good rains from July to mid-September that allowed two generations of breeding to occur. The situation was probably further exacerbated by adult groups arriving from adjacent areas of Yemen in August and at times thereafter. In addition, there was irregular and incomplete monitoring during the period. The outbreak originated near Jizan and then subsequently extended to Qunfidah and Lith areas. Breeding continued during December and first-generation adults were forming groups and laying eggs in some areas near Qunfidah while solitary adults were seen laying eggs near Lith. Ground teams treated 10 ha.

In January, second-generation hoppers of all instars began formed groups and bands from the second week onwards near Lith, Qunfidah and Jizan. By the last week, adults had started forming immature groups. Aerial control operations were mounted and treated 2 700 ha while ground teams treated 4 242 ha in January.

**Control operations (reported to DLIS)**

	<b>ERI</b>	<b>ETH</b>	<b>SAU</b>	<b>SOM</b>	<b>SUD</b>	<b>YEM</b>	<b>TOTAL</b>
<b>Nov</b>	6 943	0	0	0	82 977	0	<b>89 920</b>
<b>Dec</b>	4 070	0	1 823	0	11 951	0	<b>17 844</b>
<b>2014 TOTAL</b>	<b>11 013</b>	<b>0</b>	<b>1 823</b>	<b>0</b>	<b>94,928</b>	<b>0</b>	<b>107 764</b>
<b>Jan</b>	10 247	0	8 693	0	25 848	0	<b>44 788</b>
<b>Feb</b>	3 870	0	2,570	0	41,018	0	<b>47,458</b>
<b>Mar</b>	1 354	0	160	0	12,626	0	<b>14,140</b>
<b>Apr</b>	0	0	0	0	0	0	<b>0</b>
<b>May</b>	0	0	0	0	0	0	<b>0</b>
<b>Jun</b>	0	0	0	0	0	0	<b>0</b>
<b>Jul</b>	0	0	0	0	0	0	<b>0</b>
<b>Aug</b>	0	0	0	0	0	0	<b>0</b>
<b>Sep</b>	0	0	0	0	0	0	<b>0</b>
<b>Oct</b>	0	0	0	0	0	0	<b>0</b>
<b>Nov</b>	0	0	0	0	0	0	<b>0</b>
<b>Dec</b>	0	0	0	0	0	0	<b>0</b>
<b>2015 TOTAL</b>	<b>15 471</b>	<b>0</b>	<b>11 423</b>	<b>0</b>	<b>79 492</b>	<b>0</b>	<b>106 386</b>
<b>Jan</b>	0	0	0	0	0	0	<b>0</b>
<b>Feb</b>	0	0	0	0	0	0	<b>0</b>
<b>Mar</b>	0	0	0	0	0	0	<b>0</b>
<b>Apr</b>	0	0	0	0	0	0	<b>0</b>
<b>May</b>	0	0	0	0	0	159	<b>159</b>
<b>Jun</b>	0	0	0	0	0	365	<b>365</b>
<b>Jul</b>	0	0	0	0	0	0	<b>0</b>
<b>Aug</b>	0	0	0	0	0	0	<b>0</b>
<b>Sep</b>	0	1	3 000	53	0	50	<b>3 104</b>
<b>Oct</b>	0	30	3 420	0	4 525	0	<b>7 975</b>
<b>Nov</b>	2 390	0	0	0	800	40	<b>3 230</b>
<b>Dec</b>	7 818	0	10	0	115	120	<b>8 063</b>
<b>2016 TOTAL</b>	<b>10 208</b>	<b>31</b>	<b>6 430</b>	<b>53</b>	<b>5 440</b>	<b>734</b>	<b>22 896</b>
<b>Jan</b>	106	0	6 942	0	0	0	<b>7 048</b>
<b>2017 TOTAL</b>	<b>106</b>	<b>0</b>	<b>6 942</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7 048</b>
<b>TOTAL</b>	<b>36 798</b>	<b>31</b>	<b>26 618</b>	<b>53</b>	<b>179 860</b>	<b>734</b>	<b>244 094</b>

## Outlook until summer 2017

Seasonal predictions suggest an unusually wet February in the Arabian Peninsula and the Horn of Africa. Wet conditions are expected to persist over the Red Sea and Saudi Arabia in March and April. The probability of wet conditions is higher over the central and northern Red Sea than over the southern Red Sea and northwest Somalia.

**Arabian Peninsula:** If the predictions hold true, then another generation of breeding can be expected on the Red Sea coast in Saudi Arabia by any current infestations that escape detection and are not controlled. This could give rise to third-generation swarms in March and April that would most likely move to spring breeding areas in the interior of Saudi Arabia where one generation of breeding could take place before summer. More breeding could also occur on the Red Sea and Gulf of Aden coasts in Yemen until about April. Thereafter, adults and perhaps a few small groups are likely to move into the interior and breeding if rainfall occurs.

**Horn of Africa:** If rains fall in February or March, another generation of breeding may occur in northwest Somalia that could extend to adjacent areas of eastern Ethiopia, causing locust numbers to increase and the formation of groups and perhaps a very few small bands or swarms.

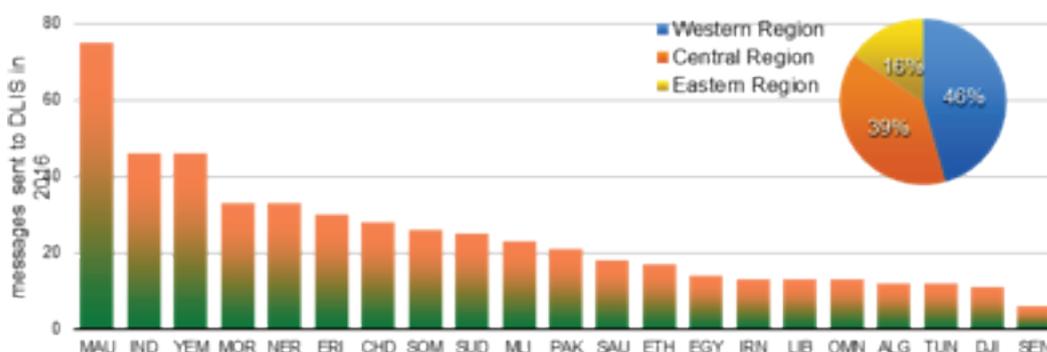
**Northeast Africa:** Limited breeding will continue on the Red Sea coast in northern Eritrea that could give rise to a few adult groups by March. Thereafter, winter breeding will come to an end and adults are likely to move from the coast towards the summer breeding areas in the interior of Sudan, first appearing in the Nile Valley to supplement existing infestations.

## Reporting and monitoring in the Central Region

### Reporting

An evaluation of locust reporting in 2016 indicates that most countries are reporting well but improvements are required. Some countries do not appear to be using Rv4.1 to help write their national locust bulletins. At times, the bulletins and summaries did not match the Rv4.1 data. Many bulletins include rainfall and greenness maps but without a caption giving a brief explanation of the image. More training and support are required for Desert Locust Information Officers (DLIOs). But as more training is provided, it is expected that bulletins will present more of an analysis of the situation rather than simply a general summary, and forecasts should become more complete and precise.

In 2016, 515 messages were received in DLIS from countries. Of this, 235 (46 percent) were from the Western Region, 200 (39 percent) from the Central Region and 80 (16 percent) from the Eastern Region. The messages were bulletins, reports and Rv4.1 data. Each message was evaluated and scored for quality and timeliness<sup>1</sup>.



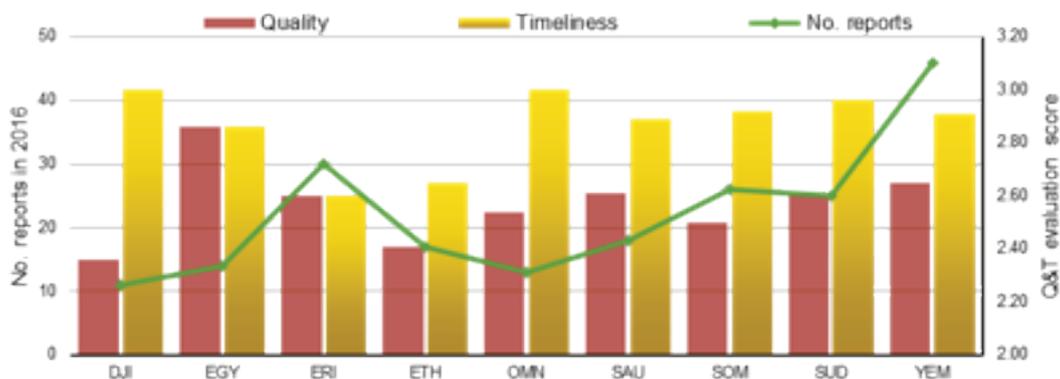
Reports received from the Central Region (CRC countries) varied in quality from 2.36 (Djibouti) to 2.86 (Egypt) and in timeliness from 2.60 (Eritrea) to 3.00 (Djibouti, Oman). Substantial improvements are required in Eritrea and Ethiopia while refinements are suggested in reporting quality for other countries.

#### <sup>1</sup> Quality:

3/3 – bulletins with complete, accurate text and maps; Rv4.1 data sent with summary  
 2/3 – bulletins with incomplete or inaccurate text or maps; Rv4.1 data without summary  
 1/3 – very few or no details

#### Timeliness:

3/3 – message received within 5 days of last date of survey or control operation  
 2/3 – message received 6–14 days after last date of survey or control operation  
 1/3 – message received more than two weeks after last date of survey or control operation



**Djibouti** (quality=2.36, timeliness=3.00, number of reports=11)

In the monthly bulletins, the Desert Locust situation should be clearly mentioned in the country. If surveys were not carried out then this should be indicated. All unconfirmed reports should be mentioned as well. During the winter period, the latest rainfall and greenness maps should be included. A monthly bulletin should be prepared and distributed every month.

**Egypt** (quality=2.86, timeliness=2.86, number of reports=14)

In the bulletins, a caption should be included for each map that indicates the correct dates and a brief interpretation. During the winter period, the latest rainfall and greenness maps should be included.

**Eritrea** (quality=2.60, timeliness=2.60, number of reports=30)

Information reported in the bulletins and summaries should always match the Rv4.1 data. This data should be sent every month and twice per week during outbreaks and control operations and include a brief summary. The correct format of the bulletin and data should be attached to the email message (not “.” resource files). The bulletins should contain the latest rainfall and greenness maps prepared in Rv4.1. Bulletins and Rv4.1 data should be sent on time without delay as nearly half the reports received in 2016 were more than five days late. It was noted that reporting often ceases during periods of increased locust activity due to an absence of staff at the NLCC in Asmara. This and a lack of internet connectivity in the country are a major hinderance to good reporting.

**Ethiopia** (quality=2.41, timeliness=2.65, number of reports=17)

eLocust3 should be used by all survey and control teams, and Rv4.1 should be used to analyze the data in a timely manner, especially during field operations. Rv4.1 data should be sent regularly on time to DLIS. The bulletins should contain the latest rainfall, greenness and locust maps prepared in Rv4.1 and have a caption that indicates the correct period with a brief interpretation. Control totals and information reported in the bulletins and summaries should match the Rv4.1 data. The date of information from the field should always be reported. Similar to Eritrea, reporting often ceases during periods of increased locust activity due to an absence of staff at the NLCC in Addis Ababa. This and unreliable internet connectivity in the country are a major hinderance to good reporting.

**Oman** (quality=2.54, timeliness=3.00, number of reports=13)

Control totals and information reported in the bulletins and summaries should match the Rv4.1 data. When there is rainfall, the bulletins should contain the latest rainfall and greenness maps prepared in Rv4.1 and have a caption that indicates the correct period with a brief interpretation.

**Saudi Arabia** (quality=2.61, timeliness=2.89, number of reports=18)

Control totals and information reported in the bulletins and summaries should match the Rv4.1 data. All survey and control teams should be using eLocust3 and the corresponding Rv4.1 data should be included when reporting to DLIS. When there is rainfall, the bulletins should contain the latest rainfall and greenness maps prepared in Rv4.1 and have a caption that indicates the correct period with a brief interpretation. Care should be taken not to stretch and distort map graphics.

**Somalia** (quality=2.50, timeliness=2.90, number of reports=26)

Information in the reports and data summaries should match the eLocust3 data and completed survey forms. When using both eLocust3 and survey forms, care should be taken to enter the same data. Unconfirmed reports should contain as many details as possible, including date and location with coordinates. NLCC/MoA should issue regular monthly bulletins.

**Sudan** (quality=2.60, timeliness=2.97, number of reports=25)

When surveys are not carried out, this should be clearly mentioned. The maps in the bulletins should have a caption that indicates the correct period with a brief interpretation. Information reported in the bulletins and summaries should always match the Rv4.1 data.

**Yemen** (quality=2.65, timeliness=2.91, number of reports=46)

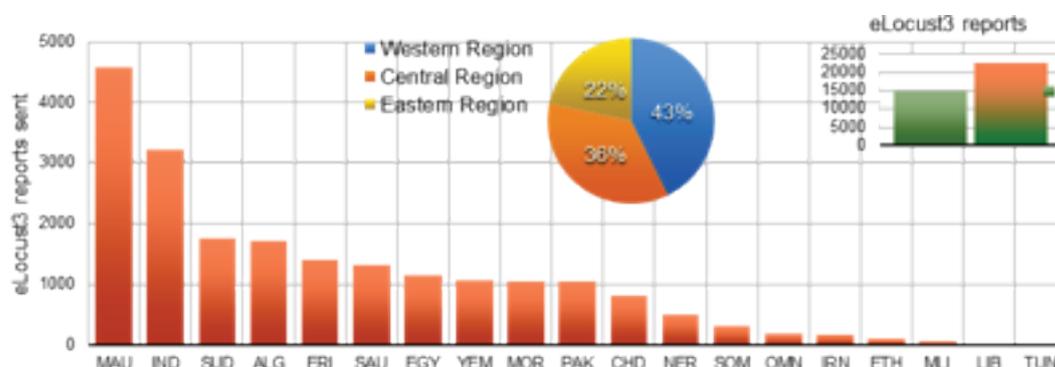
A brief summary should be provided when sending completed forms and Rv4.1 data. Information reported in the bulletins and summaries should match the Rv4.1 data. The bulletins should contain the latest rainfall, greenness and locust maps prepared in Rv4.1 and have a caption that indicates the correct period with a brief interpretation. Do not send duplicate Rv4.1 data to DLIS.

In 2016, DLIS maintain constant contact with countries, including 256 messages to countries that consisted of feedback on bulletins (34 percent), provision of general information (17 percent), requests for data and bulletins that were missing or late (17 percent), Rv4.1 updates and eLocust3 issues (13 percent), requests further clarification or details (11 percent), corrections to errors including area treated totals (5 percent), and issue specific warnings (2 percent).

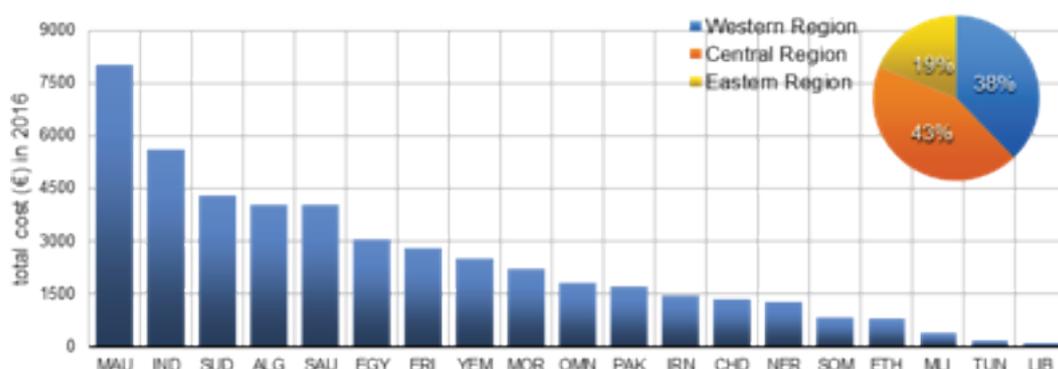
With few exceptions, there is a disturbing trend of declining report quality in countries during the past year or two. This may be partially explained by an increase in expectations after substantive inputs by FAO in training, feedback and support. It is important for DLIS and the commissions to address this issue further. It is proposed that at least one DLIO regional workshop be conducted in each region on a regular basis every year, and a second workshop could be considered. For example, the recent SWAC session agreed to support a DLIO workshop every six months – one as the CRC/SWAC DLIO interregional workshop and one as a workshop only for DLIOs in SWAC frontline countries. In the Western and Central Regions, a monthly Zoom conference call among DLIOs was established in 2016. Greater attention is required in ensuring the existence of a strong linkage between DLIOs and their Locust Head while the former should be conscientious and diligent.

### eLocust3

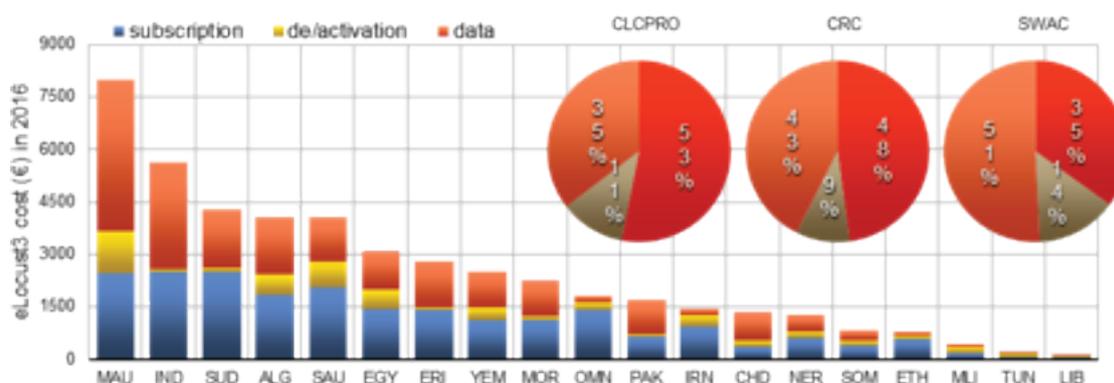
**Reports:** A total of **20 597** reports were sent by eLocust3 in 2016, which was a 54 percent increase from the previous year. In 2016, 43 percent (8 796) of the reports were from the Western Region (CLCPRO), 36 percent (7 353) from the Central Region (CRC) and 22 percent (4 448) from the Eastern Region (SWAC). The greatest number of reports was sent by Mauritania (4 583) followed by India (3 220). Eight other countries sent more than 1,000 reports in 2016: Sudan (1 756), Algeria (1 729), Eritrea (1 399), Saudi Arabia (1 333), Egypt (1 155), Yemen (1 079), Morocco (1 052) and Pakistan (1 045). The number of reports sent is generally a function of the locust situation. For example, there are increased survey and control operations during outbreaks; hence, more data is recorded and transmitted by eLocust3. The only exception to this is in India where a large number of surveys are undertaken every month throughout the year as part of the preventive control strategy employed by the Locust Warning Organization.



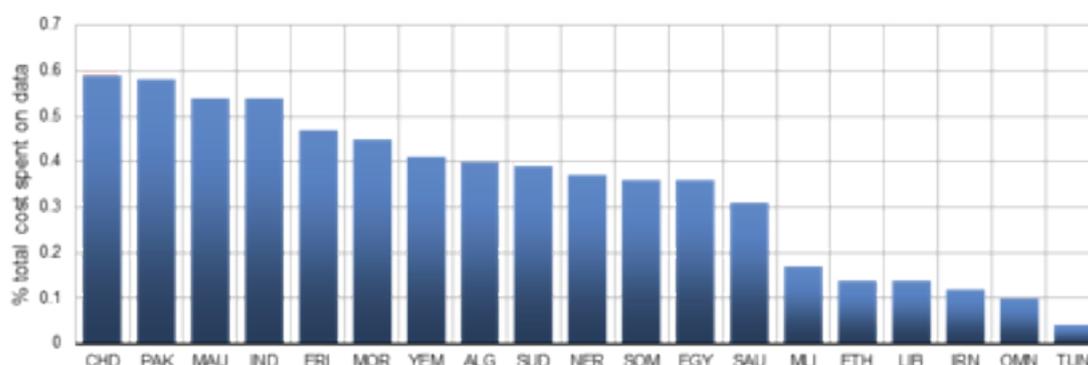
**Cost:** A total of **€ 46 681 60** was spent on eLocust3 usage in 2016. Of this, 47 percent (€ 21 848 50) was spent on monthly subscription costs for activated units, 11 percent (€ 5,265.00) for activation and deactivation of eLocust3 units, and 42 percent (€ 19 568 10) for data transmission. The Central Region spent the most € 20 236 80 (43%) compared to the Western Region (€ 17 643 70 or 38%) and Eastern Region (€ 8 801 10 or 19%). The greatest cost was associated with Mauritania (€ 8 014 35) followed by India (€ 5 635), Sudan (€ 4 300 70), Algeria (€ 4 066 05) and Saudi Arabia (€ 4 058 35).



**Efficiency:** The efficient use of eLocust3 is achieved by balancing subscription and de/activation fees with data transmission charges<sup>2</sup>. Ideally, data transmission costs should be higher than the subscription and de/activation fees. In 2016, this was realised in the Eastern Region (SWAC). It requires timely activation and deactivation of individual eLocust3 units. The general rule is to deactivate those units that will not be used for the next six months or so. A few countries had difficulties in using eLocust3 efficiently. Iran and Oman sent very little data while maintaining relatively high subscription and de/activation costs. Ethiopia, Libya and Mali did not activate eLocust3 very often and when the units were activated, they were not used very much. Egypt and Saudi Arabia used eLocust3 a lot but also had very high subscription and de/activation costs.



Four countries (Chad, Pakistan, Mauritania, India) used eLocust3 very efficiently in that more than half the total annual cost was spent on data in 2016, but for different reasons. Chad and Pakistan only transmitted an average amount of data while they spent very little on subscriptions and de/activations. Mauritania spent the most on eLocust3 total costs and de/activation fees, and was the third highest for subscription fees but also transmitted the most data. Similar to Mauritania, India spent nearly the most on eLocust3 total costs, subscription fees and data transmission costs but saved money by spending very little on de/activations.



For the effective monitoring and control of Desert Locust, FAO recommends that countries establish separate survey, survey/control (search and destroy) and control teams in the field. Each team should be equipped with eLocust and use it for recording and transmitting their field observations. A survey team should try to make as many stops as possible in order to cover a large area and have a complete picture of the situation. Ideally, one survey team should make at least 6–10 stops per day, depending on the difficulty of the terrain, ecological and weather conditions, and other factors. About 20 minutes should be sufficient to collect the required survey data at each stop. Mixed survey/control and control teams will make substantially less, perhaps only one or two, stops in a day. It is clear that relying only on mixed survey/control teams will result in an incomplete and poor overview of the situation and prolong the duration of a control campaign. Therefore, it is critical to maintain separate survey teams during control operations.

## RAMSESv4

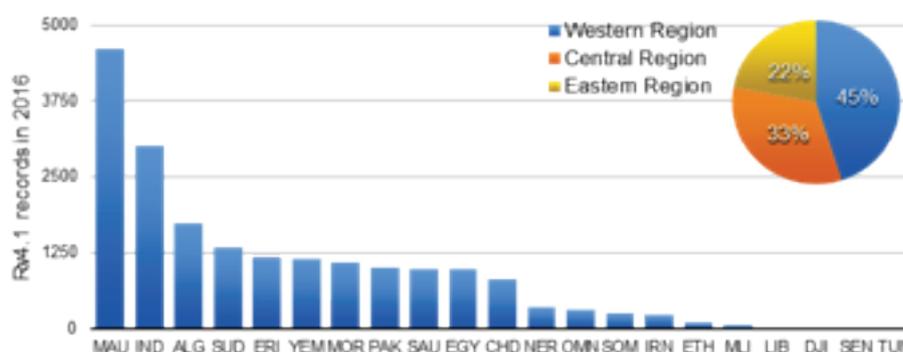
RAMSES is the custom GIS used in locust-affected countries by national DLIOs to manage and analyze the eLocust3 data collected by their own survey and control teams. Since 2000, it has been an important component in the Desert Locust global early warning system. A new platform-independent multi-lingual (English, French, Arabic) version, RAMSESv4, became operational on 1 January 2015 utilising open-source software and containing a single unified database. RAMSESv4 has been updated 31 times, including a major upgrade, RAMSESv4.1 (Rv4.1), released in

<sup>2</sup> Under the FAO/Novacom contract for 1/10/15–30/9/20, eLocust3 fees are:  
 Subscription (activated units only): 18.50€/month/eLocust3 unit  
 Activation: 45€/eLocust3 unit (only upon activation)  
 Deactivation: 15€/eLocust3 unit (only upon deactivation)  
 Data transmission: 1€/location

May 2016 that was subsequently updated five times in the past six months. Rv4.1 consists of improved functionality for entering, importing, editing, querying, displaying and exporting data. Rv4.1 automatically installs new updates as well as backing up the database to the user's PC and to the cloud as an additional precautionary measure to ensure that valuable databases are not lost. The application is no longer restricted to specific versions of third-party software.

Rv4.1 is used in 17 frontline countries where survey and control operations are carried out in which data are collected that need to be managed and analysed. In addition, the Desert Locust Control Organization for Eastern Africa (DLCO-EA) also uses Rv4.1. The application may eventually be established in other countries such as Djibouti, Senegal, Somalia and Tunisia, depending on needs.

**Records:** In 2016, frontline countries sent 19 303 records of Rv4.1 data to DLIS. Of this, the Western Region sent the highest number (8,688) compared to the Central (6 362) and Eastern (4 253) regions. This may have been due to increased locust activity and an outbreak in Mauritania that accounted for more than half the number of records (4 597) sent from the Region and nearly 24 percent of the total from all regions. India (3 023) was the second highest country, indicating the sizeable effort that is undertaken in early warning despite the absence of an outbreak in 2016. Algeria (1 745) and Sudan (1 354) were third and fourth highest users of Rv4.1 respectively.



**Usage:** Contrary to conventional wisdom that would suggest Rv4.1 usage may be higher during periods of control, the number of records and control data in Rv4.1 suggest the contrary. For example, Mauritania (4,597 records) treated 21,598 ha while Morocco (1,086 records) treated 15,797 ha, Sudan (1,354 records) treated 5,400 ha and Algeria (1,745 records) treated 1,417 ha. This anomaly could be explained if not all the control teams use eLocust3 in the field.



**Support:** Several methods are used to provide the necessary training, support, troubleshooting and problem-solving to Rv4.1 users in order to ensure smooth trouble-free and effective use of the application. Since 2007, the Desert Locust Information Service (DLIS) in collaboration with the three regional FAO Desert Locust commissions (CLCPRO, CRC, and SWAC) has provided training in the use of Rv4.1 by organizing regional workshops for national DLIOs in the respective regions. In 2016, a joint CRC/SWAC workshop was conducted but there was not a workshop organized by CLCPRO in the Western Region. In 2017, workshops will take place every six months for DLIOs in SWAC frontline countries, one as the annual CRC/SWAC interregional workshop and one as a workshop for SWAC countries only. It is hoped that the CLCPRO workshop will resume in the Western Region on an annual basis. In 2016, DLIS established a technical network that uses the Slack application to facilitate communications, collaboration and sharing experiences among DLIOs. In addition, CLCPRO began regular monthly conference calls, using the Zoom application, with DLIOs in its region. This was followed by a similar initiative in the Central Region in collaboration with DLIS, and will be established in SWAC countries in 2017. One-on-one sessions are conducted via TeamViewer by DLIS, Hichem Dridi (CLCPRO), Mehdi Ghaemian (Rv4.1 developer) and Osama Rabie (DLIO, Egypt) to remotely access the PCs of DLIOs when they face difficulties.

DLIS provides longer-term training in its 11-month locust assistant program in which one DLIO comes to FAO headquarters for substantive training in locusts, GIS, spatial analysis, weather, geography, IT and other disciplines. In 2016, the Pakistani DLIO (Shahbaz) was trained until November, followed by the Saudi DLIO (Marzouq Al Barakati).

It is becoming increasingly difficult for DLIS and the commissions to support a variety of Microsoft-based PC configurations (32 and 64 bit) and operating systems (Windows 7, 8 and 10) that are in common use by DLIOs. This is further compounded by the vulnerability of such systems to viruses and malware. In view of this, it was decided to test the possible use of Mac computers to be used for Rv4.1 and Desert Locust reporting in Eritrea, Pakistan and at CLCPRO. In addition, DLIOs in Mauritania and Saudi Arabia have personal Macs. The 30th SWAC session agreed to provide the DLIOs in India and Iran with a Mac laptop, which will mean that an entire region will be using Macs for Desert Locust reporting and early warning. Compared to Microsoft-based PCs, the high security, reliability, durability and ease of use of Macs means fewer problems occur, less support is required and Mac laptops lasts longer. Lastly, Rv4.1 is optimized to operate on a Mac since that is the platform on which it is being developed.

In 2017, Rv4.1 will continue to improve and new updates will provide increased analytical functionality. This will coincide with advanced training to be provided for DLIOs on analysis and forecasting in future DLIO workshops. Efforts will continue to align RAMSES and SWARMS (used by DLIS) and amalgamate the two applications into a single GIS that contains one common database for all users and takes advantage of cloud-based technologies for delivery and archiving of data and updates. It is likely that a first version of the new system, eSWARMS, will debut by the end of 2017.

## Appendix 5a: Training, research and publication:

Training is one of the ongoing activities in the Commission's work plan, which keeps pace with technological developments in different aspects of Desert Locust management, aiming to raise the capacities of the locust staff and replacing staff that have either been transferred to other departments or retired.

In this respect and according to the recommendations of the Commission's Sessions, the Secretariat conducted/organized/supported several Desert Locust training courses and workshops for member countries or in coordination with other Desert Locust Commissions, to ensure effective and efficient Desert Locust management in terms of survey and control operations, and these can be summarized as follows:

### **Short-term Training:**

This includes national, regional or sub-regional training courses that cover subjects directly or indirectly related to biology, survey and control of Desert Locust, and the implementation of environmental and health standards (EHS) in Desert Locust control operations, and can be summarized as follows:

### **National Training**

#### **Egypt**

- The Commission provided financial support to the General Department for Locust and Agro-Aviation Affairs, in Egypt, to conduct two "National Training Courses on Desert Locust Survey & Control Operations" held in Qena, from 5-11 April, 2015 and from 17-27 April, 2016, for 16 Locust Officers in each training course. In these courses, new topics were introduced e.g. environmental health and safety standards in the control operations.
- The Commission financially supported a "National Training Course on Environmental Health Standards in Desert Locust Control Operations", held in Ismailia, from 17-20 August, 2015, for 16 locust officers from the General Department for Locust and Agro-Aviation Affairs, in Egypt, on the implementation of EHS standards.

#### **Eritrea**

- The Commission provided technical & financial support to the Agriculture Extension Department, Migratory Pest Unit, Eritrea, to conduct a ToT "National Train-of-Trainers Course on Desert Locust Survey & Control Operations", held in Asmara, during 27 July to 1st August, 2015. Fourteen locust officers were trained by one national master trainer, the CRC Technical Assistant and FAO Consultant Munir Butrous.
- The Commission provided technical & financial support to the Agriculture Extension Department, Migratory Pest Unit, Eritrea, to conduct "National Training Course on Environmental Health Standards in Desert Locust Control Operations", held in Asmara, from 11-14 April, 2016. Fourteen locust officers were trained by the CRC Technical Assistant Essam Khalifah.

#### **Ethiopia**

- The Commission provided technical and financial support to the Plant Health Regulatory Directorate /Locust Control Unit, to conduct the "National Training Course on Environmental Health Standards in Desert Locust Control Operations", held in Debre Zeyit, from 12-15 July, 2016. Fourteen locust officers were trained by the CRC Technical Assistant Essam Khalifah.
- The Commission provided financial support to the Plant Health Regulatory Directorate /Locust Control Unit, to conduct the "workshop on the Operation & Maintenance of Desert Locust Sprayers held in Debre Zeyit, from 18-21 July 2016. Twelve technicians were trained by ULV sprayer expert Khaled Al-Harrasi from Oman.

#### **Jordan**

- The Commission provided technical and financial support to the Crop Protection Directorate, to conduct a "National Training Course on Desert Locust Survey & Control Operations", held in Amman, from 29th May to 6th July 2016, for 21 participants trained by Tamer AbdelHamed and Emad Kamel - Master Trainers from Egypt.

## **Oman**

- The Commission provided technical and financial support to the Locust Control Unit, Oman to conduct a “National Training Course on Environmental Health Standards in Desert Locust Control Operations”, held in Muscat, from 3-7 July, 2015. Fourteen locust officers were trained by the CRC Technical Assistant Essam Khalifah.

## **Saudi Arabia**

- The Commission and the National Center for Locust Control and Migratory pests in Jeddah coordinated a “National Training Course on Environmental Health Standards in Desert Locust Control Operations” in Jeddah, from 20-23 March 2016 for fourteen locust officers, trained by National Master Trainers.

## **Sudan**

- The Commission provided technical and financial support to the Locust Control Center, Sudan, to conduct the “National Training Course on Environmental Health Standards in Desert Locust Control Operations” in Port Sudan, from 13 to 17 December, 2015. Fifteen locust officers were trained by the CRC Technical Assistant Essam Khalifah.
- The Commission provided technical and financial support to the Locust Control Center in Sudan to conduct a “workshop on the operation and maintenance of Desert Locust Sprayers” in Port Sudan, from 12 -15 December 2016. Fourteen technicians were trained by ULV sprayer expert Khaled Al-Harrasi from Oman.

## **United Arab Emirates**

- The Secretariat of the Commission, in cooperation with the Health and Agricultural Development Department of the Ministry of Environment and Climate Change, UAE, organized a “National Training Course on Desert Locust Survey & Control Operations” in Al-Sharjah, from 9-13 October 2016 for nineteen trainees. A master trainer from Saudi Arabia, Issa Alrabghi and the CRC Technical Assistant delivered the training course.

## **Yemen**

- In view of current situation in Yemen and as an alternative option to train the locust officers as requested by Yemen government, the Commission, in collaboration with the General Department for Locust and Agro-Aviation Affairs, in Egypt, provided the financial and technical support to conduct a “Training Course on Desert Locust Survey & Control Operations” for five locust officers from Yemen in Hurghada, Egypt from 24-28 December 2016.

## **Djibouti**

- The Commission provided the financial and technical support to the Plant Protection Department (Locust Control Unit) in Djibouti, to conduct a “National Training Course on Desert Locust Survey & Control Operations” held from 15-19 January, 2016 for 12 plant protection officers. The training course was conducted, in cooperation with DLCO-EA, by Felege Elias and Nassor Alharthy from Oman.
- During the same period, a training on the maintenance of ULV sprayers was conducted at the locust control unit by the sprayer’s expert from Egypt, Rami Abdel Halim.

## **Regional workshop and Training:**

### **Regional workshop:**

#### **Egypt**

1. Based on the Commission’s recommendations in the twenty-ninth session, the Secretariat of the Commission conducted a workshop on contingency plans and the use of Desert Locust Contingency Planning Assistant (DeLCoPA), held in Hurghada, Egypt from 15-19 February 2015. The participants were from CRC frontline countries (Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen), Executive Secretaries of CLCPRO and SWAC, SWAC countries: Afghanistan, India, Iran and Pakistan, and DLCO-EA. FAO consultants, Christian Pantenius and Munir Butrous conducted the workshop.

2. In coordination with FAO Desert Locust Information Service (DLIS, FAO HQ) and in corporation with the Western Region Commission (CLCPRO), the Secretariat of the Commission conducted the “9th Desert Locust Information Officers workshop” on RAMSES, eLocust3 and Remote Sensing tools, in Hurghada, Egypt, from 22-25 April 2015. The attendees were Desert Locust Officers from CRC frontline countries (Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen), from SWAC (India, Iran and Pakistan) and from DLCO-EA.
3. The “10th Desert Locust Information Officers workshop” was conducted in Cairo, Egypt, from 22-25 May 2016, at the Regional office for the Near East and North Africa for participants from the countries mentioned in point 2 in addition to one participant from Djibouti.
4. On 26th of May, 2016, the Commission organized a one day workshop to introduce the new Data base developed by CLCPRO “Monitoring System of National Locust Control Preparedness - SVDN”. The attendees were Desert Locust Officers from CRC frontline countries: Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan and Yemen. The data base was introduced to discuss the possibility of applying this tool in the CRC countries.
5. The Secretariat of the Commission organized the “3rd workshop on the Implementation of Health and Environmental Standards in Desert Locust Control Operations in the Central Region EHS” in Hurghada, from 25-29 September 2016. Participants were from Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan, and Yemen, and an invitation was extended to DLCO-EA. Harold van der Valk, FAO consultant, was recruited to evaluate the progresses made in the implementation of EHS programme in the central region countries, since its introduction in 2012.

### **Saudi Arabia**

6. Upon the recommendation of the 29th Session, the Commission in close cooperation with the Western Region Commission (CLCPRO), and the National Center for Controlling Desert Locust and Migratory Pests in Saudi Arabia, conducted the “1st Regional workshop on Pesticides Stock Management System (PSMS)”, held in Jeddah, from 18-21 October, 2015. The participating countries were: Ethiopia, Oman, Saudi Arabia and Sudan, while Egypt, Eritrea and Yemen could not due different reasons. Amado Diallo, FAO consultant and Hichem Dridi from CLCPRO delivered the training course.

### **Sub-Regional training courses**

#### **Oman**

- The Secretariat of the Commission, in cooperation with the Locust Control Center, Ministry of Agriculture and Fisheries, Oman, conducted the 9th Sub-Regional Training Course on Desert Locust “campaign management” in Salalah, from 13-20 September 2015. Twenty trainees from invasion countries; Bahrain, Kuwait, Iraq, Jordan, Qatar, Lebanon, Syria, UAE and Oman. Two Master Trainers from Egypt and one from Oman, jointly, conducted the training.

#### **Results**

In conclusion, the training courses and workshops produced the following statistics:

1. In invasion countries, 20 agricultural technicians were trained from (Bahrain, Kuwait, Iraq, Jordan, Qatar, Lebanon, Syria and UAE ) in addition to 19 participants from UAE;
2. In frontline countries, 100 desert locust officers were trained on Health and Environmental Standards (EHS);
3. 120 desert locust officers were trained on Desert Locust survey & control operations and campaign management;
4. 30 technicians were trained on ULV sprayers maintenance in Ethiopia and Sudan.

### **Mid-term Training**

- 1- Tarik Hamood Almandhari, from Oman, achieved his M.Sc. Degree, in 2016, from the University of Nottingham, UK. The postgraduate student started his scholarship in September 2015, titled:

**“The impact of behavioural thermoregulation by the Desert Locust, *Schistocerca gregaria*, on development and longevity”.**

- 2- Marzouq Albarakati from Saudi Arabia, has been supported in his training in DLIS (Rome) for 6 months to be trained on collecting, restoring, retrieving and analyzing Desert Locust data from all countries. This program is an annual activity sponsored by FAO DLCC, to train Desert Locust Information Officers from the three Desert Locust Commissions.

**Suggested training course:**

- The 5th regional Aerial application training course for pilots and technicians, in coordination with DLCO-EA, to be held in 2017.
- A Sub-regional training course on survey and control operations for non-frontline countries.
- Contingency planning workshop for non-frontline countries.
- Regional workshop on sprayer testing and evaluation in control operations.

## Appendix 5b: Contingency Planning, Environmental and Health Standards (EHS) and pesticides stock management system (PSMS)

### **I. Contingency Planning:**

#### **Recommendations to CRC:**

- 1- Taking into account the possible impact of climate change on the locust behaviour and considering the weakest link in the regional prevention chain in an increasingly volatile environment, and the consequences inaccessible and restricted as well as of ecological sensitive areas may have for the overall DL risk management framework, CRC should develop and implement a regional CP;
- 2- The regional CP should take care of facilitating cross-border operations in cooperation with other regional bodies such as DLCO-EA and should consider the development and validation of standing partnership agreements between countries;
- 3- Noting the importance of sound emergency response coordination mechanisms, CRC should establish a regional Incidence Command Framework, to be activated in the onset of locust emergencies and aligned to the DLIS threat levels, with clearly defined mandate and structure;
- 4- CRC should provide due support to front-line countries in developing national CPs and the establishment of national Incident Command Systems or inter-ministerial Steering Committees by taking advantage of the example in the Western Region;
- 5- CRC should examine the introduction of the online capacity monitoring system Monitoring System of National Locust Control Preparedness (SVDN) established in the Western Region as replacement for the currently used MS Excel based data record sheets;
- 6- In order to improve and to maintain the vital regional communication systems, CRC should assist NLCUs in the front-line countries with poor Internet facilities or access;
- 7- Acknowledging the difficulties to carry out control operations with chemical pesticides in ecological sensitive or restricted areas, CRC should support the establishment of sizable strategic reserve stocks with bio-pesticides during recession periods;
- 8- Confirming the importance of regular emergency exercises, CRC is being requested to assure support to at least one simulation per year in one of the front-line countries;
- 9- With respect to web-based resources eLERT and DeLCoPA, CRC is being requested to stimulate and follow-up the use of both applications and to support regular regional/ national trainings;
- 10- CRC in collaboration with AGPMM should ensure regular up-dating of the eLERT database and should ensure translation of the Manual for Environment Impact Monitoring also in English and Arabic languages;
- 11- In relation to DeLCoPA, CRC is being requested to support the development of a new stand-alone interface including a CP component and a GIS version for global viewing.

#### **Recommendations to NLCUs:**

- 1- Noticing the relevance of contingency planning as critical preparedness and risk management tool and as a basic requirement to facilitate access to international emergency assistance, NLCUs are urged to undertake all efforts in preparing national CPs in consultation with other critical national stakeholders, approved and supported by the national governments and CRC;
- 2- The CPs of the front-line countries should include a Prevention and Emergency Plan, taking care of operational obstacles such as insecure and environmentally sensitive areas including alternative response options; the CPs should be reviewed and updated on a yearly basis;
- 3- Affected countries should establish Locust Incidence Command Frameworks (inter-ministerial Steering Committees) with clear mandates and functions;
- 4- Understanding the benefits of good resources management, the NLCUs commit themselves to ensure proper maintenance of equipment and store keeping as part of the Prevention Plan during recession periods and will take care of regular staff training on standard survey and control and other subjects with at least one national training course for NLCU and PPD staff per year.
- 5- NLCUs should conduct on a yearly basis emergency exercises/simulations during calm periods;
- 6- With regard to web-based resources eLERT and DeLCoPA, NLCUs are requested to make regular use of both tools and to contribute to their up-dating and improvement;
- 7- NLCUs should exercise DeLCoPA within the team at least twice per year to check the preparedness level and assess the gaps. The identified gaps should be addressed in the up-dated Prevention Plan;
- 8- NLCUs assure that DeLCoPA outputs are regularly being sent to the CRC Secretariat.

## **II. Environmental & Health Standards on Desert Locust Control Operations**

The following steps were proposed for the elaboration of a national works plan for implementation of the EHS:

1. The NLCU again analyses the actual national implementation of the EHS, using the CRC-EHS Evaluation Tool;
2. The NLCU reports to the CRC Secretariat on implementation and identify gaps;
3. The NLCU, at the same time, provides feedback on the practical use of the Tool and suggest improvements;
4. The NLCU, where needed in concertation with other stakeholders, identifies a limited number (proposed are three) of main requirements that have not yet been implemented, entirely or partially. These requirements will be selected on the basis of:
  - a. National priorities (e.g., policy, legal, agronomic, environmental, human health);
  - b. Ease of implementation (financially and organizationally);
5. The NLCU, where needed in concertation with other stakeholders, prepares a succinct national implementation plan for these priority requirements, covering at least the following elements:
  - a. Initial situation ("baseline" for the requirement);
  - b. Activities to be conducted;
  - c. Actors involved;
  - d. Target dates;
  - e. Resources required (staff, equipment, capacity building, budget (internal, external));
6. The NLCU sends the plan to the CRC Secretariat, who reviews it and provides technical advice on implementation, if required;
7. The CRC Secretariat identifies commonalities among the implementation plans, as a basis to provide (partial) technical support to countries;
8. The CRC Secretariat sensitizes national decision makers about the work plan and requests them to support its implementation;
9. The NLCU includes activities needed for implementation and monitoring of the EHS in the yearly work plan;
10. CRC frontline member countries will start implementation.

### **Recommendations:**

#### **Workshop participants**

1. Inform higher management at the relevant ministries responsible for locust control about the outcomes of the workshop.

#### **CRC Member Countries**

1. Step up the implementation of the Environmental and Health Standards (EHS) for Desert Locust control operations in the Central Region, as was recommended by the 28th Session of the CRC in 2012, and therefore include activities needed for implementation and monitoring of the EHS in the yearly work plans of the NLCU;
2. Establish an EHS monitoring team that can operate independently with regard to personnel, logistics and equipment;
3. Establish a documentation system for verification of the implementation of the EHS, which includes the collection and analysis of relevant data;
4. Prepare a national work plan for implementation of the EHS, along the lines described in this report;
5. Conduct annual national training courses on implementation of the EHS, involving drivers, store keepers, laborers and other relevant staff, and resulting in certification of this staff;
6. Envision the registration of *Metarhizum acridum* for locust control, if this biopesticide has not yet been registered, taking into account efficacy data that have been compiled throughout the Desert Locust area;
7. Give emphasis to using more environmentally friendly locust control methods and products, such as biopesticides and barrier treatments with insect growth regulators;
8. Establish active collaboration between the NLCU and the ministry responsible for public health with the aim to ensure that the health of locust control staff is properly monitored and that medical support in case of incidents can be provided effectively;
9. Encourage further collaboration between the NLCU and other key stakeholders for the implementation of the EHS, such as (but not limited to) ministries responsible for public health, labour and the environment;
10. Strive to fulfil the EHS requirement that spray aircraft are equipped with DGPS;
11. Start using the EHS Evaluation Tool for assessing the degree of national implementation of the EHS as well as gaps and constraints for implementation, and provide feedback to the CRC Secretariat.

## **The CRC**

1. Conducts a regional training course on the use of *Metarhizium acridum* leading to the establishment of specialized national control teams that can apply this biopesticide effectively;
2. Provides member countries with the necessary equipment to conduct monitoring of the EHS, such as for residue sampling, biological monitoring, cholinesterase assessments and pesticide application quality assurance;
3. Supports – technically and financially – the organization of further national training courses on implementation of the EHS;
4. Engages with DLCO-EA to continue to ensure the proper longer-term storage of *Metarhizium acridum*, when this biopesticide is used on a larger scale in the region;
5. Develops materials that can be used to raise awareness of national policy and decision makers on the importance of environmental and health protection in locust control.
6. Commissions the elaboration of a guidance document on recognition and treatment of insecticide poisoning intended for medical personnel in locust-affected areas.
7. Organizes a regional workshop to evaluate progress of implementation of the EHS in two years' time.

## Appendix 5c: New tools and technologies:

### I. Stakeholder Workshop on the Procurement and Supply of Pesticides for Locust Control, Rome, 2-3 September 2015

#### Recommendations:

#### **1. The meeting discussed technical requirements for procurement by FAO of insecticides for locust control.**

- The draft updated technical requirements as presented to the meeting were generally considered appropriate and feasible.
- It was recommended, however, to clearly distinguish between the need for the one-time establishment of a pesticide specification of the product concerned and the requirement for quality control of individual shipments.
- The meeting noted that co-formulants are presently not included in FAO/WHO Specifications for pesticides, and recommends that JMPS discusses their future inclusion.

#### **2. The meeting discussed insecticide supply chain mechanisms for locust control.**

- It was emphasized that the supply mechanism should allow the right insecticide of the right quality to be delivered to a locust-affected country in the right quantity at the right time, while avoiding the build-up of obsolete stocks.
- It was further stressed that the supply mechanism should ensure that empty containers resulting from locust control are collected and recycled/disposed of in compliance with FAO guidelines either by the supplier or through established local container management schemes, in collaboration with national governments.
- The establishment of framework contracts (sometimes referred to as a pesticide bank system) was considered a viable option in contributing to achieving the above objectives. It was recommended that FAO considers the services required and pursues dialogue with suppliers to define the contractual terms of such framework contracts.
- The meeting acknowledged that governments should take responsibility to avoid over-stocking of insecticides intended for locust control, e.g. through appropriate contingency planning.
- A purchase with return option, where unused insecticides would be taken back by the supplier, was not considered a feasible supply mechanism, for legal, operational and fiscal reasons.
- The establishment of a trust fund for the disposal of any obsolete stocks that are left-over from locust control operations was not considered appropriate as it would not be an incentive to reduce over-supply of insecticides.
- Alternatively, the establishment of a trust fund could be useful to permit the rapid activation of any framework contract, as well as covering externality costs such as insecticide quality control, the management of empty containers or the disposal of small unavoidable quantities of obsolete stocks.
- It was further suggested that a buffer stock of the biopesticide *Metarhizium* could be established in one or more strategic locations with appropriate storage facilities to be used for control operations during recession and early outbreak periods. Should such a stock become obsolete, the disposal would not incur large costs.
- It was recommended that insecticide procurement through tenders should be streamlined in order to reduce procurement times through a pre-selection of suppliers that meet technical requirements such as the availability of insecticide specifications and appropriate registration in recipient countries. This activity would be applicable in addition to the establishment of framework contracts.

#### **3. The meeting reviewed recent problems encountered with the compatibility of UL formulations and application equipment.**

- It was recommended that pesticide suppliers should ensure formulation compatibility with ULV spray equipment.
- In this respect, any pesticide tender should specify that the product be compatible with commonly used ULV aerial and ground application equipment, such as (but not limited to) glass reinforced polyester (GRP) aircraft spray tanks; high-density polyethylene (HDPE) portable or vehicle mounted sprayer tanks; PVC, nylon or stainless steel tubing; viton or teflon seals and O-rings.
- The meeting noted the need for chemical/biological insecticide and sprayer manufacturers to work together to find solutions regarding the compatibility of formulations with commonly used application equipment.

#### **4. The meeting discussed insecticides presently used for locust control.**

- The meeting noted with concern that no new insecticides had been sufficiently tested in the last 20 years to confirm effective dose rates against locusts.
- The meeting also took note of the constraints with respect to lack of data protection expressed by pesticide manufacturers to test new chemical and biological insecticides.

- It was recognized that it is difficult to make a purely financial business case for the development of new products solely for locust control. However social aspects, such as alleviation of poverty and preserving food security in developing countries, could also be considered.
- It was recognized that current efforts by FAO to promote regional pesticide registration schemes could also facilitate the registration of insecticides for locust control.
- There may be scope to screen and field test existing or new insecticides for use in locust control, possibly under an external funding mechanism. As an interim option, mixtures of insecticides may prove to be effective against locusts, subject to additional field testing.
- The meeting noted that progress has been made in increasing the production capacity of *Metarhizium acridum*, which should facilitate its wider use in locust control. While the initial cost of *Metarhizium* is still relatively high, it was noted that its use does not contribute to the generation of hazardous waste and is environmentally acceptable.

## **II. Monitoring System of National Locust Control Preparedness – SVDN - FAO regional Office in Cairo, 26 May 2016**

The preventive control strategy against the Desert Locust requires permanent monitoring system to follow-up all requirements of control operations, in terms of operational capabilities and its utilization, at the national and regional levels.

Therefore, as part of its duties, the Commission for Controlling the Desert Locust in the Western Region (CLCPRO), has introduced the “Monitoring System of National Locust Control Preparedness - SVDN». The system will enable National Desert Locust Control Units (NLCUs) to enter all the requirements and the resources of locust control to the system, and in return, each NLCU (separately) will get an adequate set of technical reports that demonstrate the suitability of resources of control to face any possible developments in the desert locust situation.

This system is not intended to assess the capabilities of control so much as an early warning system, which is thus in line with the logical vision of the Regional Preventive Control strategy against desert locust.

Accordingly, the inputs of NLCUs in the region, will not only allow the secretariat of the regional Commission to follow-up the preparedness of NLCUs to timely intervene at national level, but will allow the Secretariat to coordinate among countries to provide the mutual support to deal with the locusts’ crises.

In addition, it will provide a future vision about the preparedness of all countries, and how far those arrangements are appropriate to deal with the developments of the locust situation, thereby providing technical and financial assistance prior of the development of the crisis. This will lead to achieve the optimal goal of the regional Commissions that it is, to promote all actions aimed to implement the preventive control strategy against the desert locust, at national, regional, and international levels.

In the framework of the joint and ongoing cooperation among the regional Commissions, it has been agreed that the Commission for Controlling the Desert Locust in the Central Region (CRC) is to provide the “Monitoring System of National Locust Control Preparedness - SVDN” to its Member States, through a regional workshop held in the FAO regional Office in Cairo, on 26 May 2016. With the help of one of the western region experts to present the contents and the system and the way of using, for the members countries in the central region. The workshop was attended by Desert Locust Information Officers from the locust breeding countries (seven) in the central region, in addition to a representative of the Desert Locust Control for Eastern Africa Organization (DELCEA).

## **III. The potential use of drones in locust early warning and preventive control, Algeria, 27 April 2016**

Vast areas of remote desert within approximately 16 million sq. km. that stretch from West Africa to India and include some of the world’s poorest countries are regularly monitored for Desert Locust by National ground teams. Monitoring constitutes the primary activity in any locust early warning and preventive control system. Although satellite-based estimates of rainfall and green vegetation are utilised to reduce and prioritize these large and potentially suitable areas, imagery suffer from omission errors and are often not available in time. Aerial surveys are usually not possible due to high costs and unavailable aircraft. Consequently, there is a need to supplement these tools with additional technologies to guide ground teams to green vegetation and locust infestations. In this sense the start of incorporation to the idea of using drones, in order to improve the quality of surveys and early control of the Desert Locust.

The use of fixed and rotary wing unmanned aerial vehicles (UAV), commonly called drones, could be a potential means of improving Desert Locust monitoring, early warning and rapid control, and reducing the costs of survey and control operations. This was confirmed by a study conducted by Wageningen University, Netherlands in 2015.

The operational use of the proposed solution in a country could consist of a four-step approach.

Step	Task	Scale
<b>Preliminary assessment by satellite &amp; GIS data</b>	Satellite imagery identifies regions of recent rains and where ecological conditions may be favourable, filtered by RAMSES GIS data to reduce the large and vast areas that need to be checked by ground teams.	National or sub-national
<b>Drone extensive assessment</b>	Confirm green vegetation presence within larger areas of homogeneous or heterogeneous habitats.	Up to 100-50 km from survey team in the field
<b>Drone intensive search</b>	Detect hopper groups, bands, adult groups and swarms and extent of natural vegetation and crops.	Site-specific, up to 5 km
<b>Drone control</b>	Precision spraying of individual infestations using bio and chemical pesticides.	Site-specific, up to 5 km

## Appendix 6: Accounts for 2015 and 2016

### Summary of Expenditures of CRC MTF/INT/007/MUL for the year 2015 in US\$

Account	Description	Expenses
<b>5012</b>	<b>Salaries General Service</b>	<b>76 221</b>
	<b>Subtotal</b>	<b>76 221</b>
<b>5013</b>	<b>Consultants</b>	
	Morcy, Khaled	195
	Soliman, Hamada Ismail Ibrahim	940
	El-Gmayah, Ashraf	945
	Ghaemian, Mehdi	2 488
	Pantenius, Christian Ulrich	13 500
	Butrous, Munir Gabra	13 500
	Khalifah, Essam Ibrahim	12 561
	<b>Subtotal</b>	<b>44 129</b>
<b>5014</b>	<b>Contracts</b>	
	Novacom (Jan -2015 Dec 2015)	19 726
	Heron Group (DeLCoPA)	19 000
	<b>Subtotal</b>	<b>38 726</b>
<b>5020</b>	<b>Locally contracted labour</b>	8 160
	<b>Subtotal</b>	<b>8 160</b>
<b>5028 /5021</b>	<b>Training/workshop (travel and operation cost)</b>	
	National Training course, Egypt	8 630
	Desert Locust Information Officers training, Egypt.	23 500
	Desert Locust Contingency Planning workshop, Egypt.	50 828
	Train of Trainers "ToT" Training course, Eritrea.	11 656
	National training courses on survey & control, Saudia Arabia	5 000
	Regional workshop on applied research on Desert Locust, Tunis	2 615
	9th Sub-regional training course, Oman.	65 073
	PhD, Mohammed Ismail Tajassir	14 500
	MSc Almandhari Tarik Hamood Mohammed	53 330
	Environmental Health Standards workshop, Oman	4 351
	<b>Subtotal</b>	<b>239 483</b>
<b>5021</b>	<b>Travel</b>	
	One day meeting for frontline countries, Egypt	5 080
	Exchange visit to CLCPRO Desert Locust Centre in Agadir	2 038
	Stakeholder Workshop on the Procurement and Supply of Pesticides for Locust Control	5 945
	Chairman travel to FAO HQ to submit 29th Session report	2 296
	Support the Desert Locust Centre in Saudi Arabia – Nassor Al Harthy	3 179
	Travel by consultants in preparation of the book	7 500
	<b>Subtotal</b>	<b>26 038</b>
<b>5024</b>	<b>Expendable Equipment</b>	1 900
	<b>Subtotal</b>	<b>1 900</b>

<b>5028</b>	<b>General Operating Expenses</b>	1 304
	<b>Subtotal</b>	<b>1 304</b>
<b>5040</b>	<b>General Overhead Expenses</b>	129
	FAO Pouch and courier services	
	<b>Subtotal</b>	<b>129</b>
<b>5029</b>	<b>Support Costs</b>	
	5% on accounts 5024 and 5025; 13% on all other accounts	53 055
	<b>Subtotal</b>	<b>53 055</b>
	<b>Total expenditures in 2015</b>	<b>489 145 00</b>

**Summary of Expenditures of CRC MTF/INT/007/MUL for the year 2016 in US\$**

<b>Account</b>	<b>Description</b>	<b>Expenses</b>
<b>5012</b>	<b>Salaries General Service</b>	70 182
	<b>Subtotal</b>	<b>70 182</b>
<b>5013</b>	<b>Consultants</b>	
	Elliott, Clive	6 300
	Moustafa, Osama Rabie	2 715
	Hassan, Emad El Din	1 056
	Morgan, Mohamed Abdelrahim	3 000
	Pantenius, Christian Ulrich	13 500
	Butrous, Munir Gabra	13 500
	Khalifah, Essam Ibrahim	12 561
	<b>Subtotal</b>	<b>52 632</b>
<b>5014</b>	<b>Contracts</b>	
	Novacom (Jan 2016- Dec 2016)	18 507
	<b>Subtotal</b>	<b>18 507</b>
<b>5020</b>	<b>Locally contracted labour</b>	7 055
	<b>Subtotal</b>	<b>7 055</b>
<b>5021/ 5028</b>	<b>Training/workshop (travel and operation cost)</b>	
	National training course - UAE	3 597
	National training course – Egypt	4 581
	Desert Locust Information Officers training, Egypt.	41 410
	Spray maintenance workshop, Ethiopia	5 848
	Spray maintenance workshop, Sudan	7 454
	National training courses on survey & control, Sudan	2 615
	Training course on DL survey and control for Yemeni staff from Aden	5 658
	Two day training for Tedros - Eritrea	709
	MSc Almandhari Tarik Hamood Mohammed	1 007
	Support to Desert Locust surveys in Yemen	5 282
	National training course- Jordan	8 063
	<b>Subtotal</b>	<b>86 224</b>
<b>5021</b>	<b>Travel</b>	
	Travel by consultants in preparation of the book	14 551
	<b>Subtotal</b>	<b>14 551</b>
<b>5024</b>	<b>Expendable Equipment</b>	
	IT software	200
	eLocust3 cables	3 611
	equipment	3 299
	<b>Subtotal</b>	<b>7 110</b>
<b>5025</b>	<b>Non Expendable Equipment</b>	
	CRC computers	4 665
	Laptop computer for Eritrea	1 930
	<b>Subtotal</b>	<b>6 595</b>
<b>5028</b>	<b>General Operating Expenses</b>	2 541
	<b>Subtotal</b>	<b>2 541</b>
<b>5040</b>	<b>General Overhead Expenses</b>	
	FAO Pouch and courier services	
	<b>Subtotal</b>	<b>272</b>

<b>5050</b>	<b>General operating expenses- internal</b>	606
	<b>Subtotal</b>	<b>606</b>
<b>5029</b>	<b>Support Costs</b>	
	5% on accounts 5024 and 5025; 13% on all other accounts	27 020
	<b>Subtotal</b>	<b>27 020</b>
	<b>Total expenditures in 2016</b>	<b>284 792</b>

## Appendix 7: Contributions and arrears of member countries

### TRUST FUND No. 9409.00 - MTF/INT/007/MUL Status of Contributions as at 31 December 2015 (Expressed in US\$)

Member Governments	Outstanding 12/31/2014	Contribution due for 2015	Received up to 12/31/2015	Outstanding 12/31/2015
BAHRAIN	34 499 34	17 500 00		51 999 34
DJIBUTI	14 300 00	2 200 00		16 500 00
EGYPT	32 540 00	65 080 00	97 620 00	0 00
ETHIOPIA	16 000 00	16 000 00		32 000 00
ERITREA	0 00	8 000 00		8 000 00
IRAQ	28 750 00	57 500 00	57 500 00	28 750 00
JORDAN	49 327 62	28 715 00	28 715 00	49 327 62
KUWAIT	0 00	50 000 00		50 000 00
LEBANON	11 212 50	22 245 00	11 212 50	22 245 00
OMAN	0 00	20 000 00	20 000 00	0 00
QATAR	0 00	25 000 00	12 460 96	12 539 04
SAUDI ARABIA, KINGDOM OF	0 00	88 070 00		88 070 00
SUDAN	290 906 82	37 335 00		328 241 82
SYRIAN ARAB RE- PUBLIC	83 289 63	33 375 00		116 664 63
UNITED ARAB EMIRATES	0 00	52 500 00		52 500 00
YEMEN	28 914 76	10 000 00		38 914 76
<b>Totals</b>	<b>589 740 67</b>	<b>533 520 00</b>	<b>227 508 46</b>	<b>895 752 21</b>

\* Fiscal Year begins in July

**TRUST FUND No. 9409.00 - MTF/INT/007/MUL Status of Contributions  
as at 31 December 2016 (Expressed in US\$)**

<b>Member Governments</b>	<b>Outstanding 12/31/2015</b>	<b>Contribution due for 2016</b>	<b>Received up to 12/31/2016</b>	<b>Outstanding 12/31/2016</b>
BAHRAIN	52 499 34	17 500 00		69 999 34
DJIBUTI	16 500 00	2 200 00		18 700 00
EGYPT	0 00	65 080 00		65 080 00
ETHIOPIA	32 000 00	16 000 00	8 000 00	40 000 00
ERITREA	8 000 00	8 000 00	16 000 00	0 00
IRAQ	28 750 00	57 500 00	28 750 00	57 500 00
JORDAN	49 327 62	28 715 00		78 042 62
KUWAIT	50 000 00	50 000 00		100 000 00
LEBANON	22 245 00	22 245 00	11 177 50	33 312 50
OMAN	0 00	20 000 00		20 000 00
QATAR	12 539 04	25 000 00	12 539 04	25 000 00
SAUDI ARABIA, KINGDOM OF	88 070 00	88 070 00	88 070 00	88 070 00
SUDAN	328 241 82	37 335 00		365 576 82
SYRIAN ARAB REPUBLIC	116 664 63	33 375 00		150 039 63
UNITED ARAB EMIRATES	52 500 00	52 500 00	52,450.00	52 550 00
YEMEN	38 914 76	10 000 00		48 914 76
<b>Total</b>	<b>896 252 21</b>	<b>533 520 00</b>	<b>216 986 54</b>	<b>1 212 785 67</b>

\* Fiscal Year begins in July

## Appendix 8: Work plan and proposed budget for the years 2017 and 2018

### TRUST FUND No. 9409.00 - MTF/INT/007/MUL Status of Contributions as at 31 December 2015 (Expressed in US\$)

Work plan and proposed budget for the years 2017 and 2018			
Account	Description	2017	2018
5012	<b>Salaries-General Service Staff</b>	70 000	70,000
	Commission Secretariat		
5013	<b>Consultants</b>	20 000	20,000
	Consultants		
	<b>Contracts</b>	129 500	112 500
	Research	40 000	40 000
	Publication	15 000	15 000
	Translation	5 000	5 000
	Copying	2 000	2 000
	Annual fees for eLocust 3 transmission	25 000	25 000
	Support new technologies	20 000	20 000
	DeLCoPA maintenance	2 500	2 500
	Cost of updating the CRC website	5 000	3 000
	Renovation of DL bases in Sudan	15 000	
5020	<b>Locally Contracted Labour - Over Time</b>	4 000	4 000
5021	<b>Travel</b>	38 000	70 000
	Chairman travel to Rome to present the 30th CRC Session report	3 000	
	Chairman travel various	5 000	5 000
	Exchange visits	15 000	15 000
	35th Executive Committee Meeting	15 000	
	31st CRC Session and 35th Executive Committee meeting		50 000
5023	<b>Training</b>	120 000	155 000
	National (6 courses)	50 000	50 000
	Sub- regional (one per year)	25 000	25 000
	Regional Aerial Training Course	25 000	
	Regional training on the use of bio-pesticides	20 000	
	Assessment of ULV sprayers		30 000
	Simulation of Desert Locust Control operation		50 000

<b>5024</b>	<b>Expendable Procurement</b>	<b>15 000</b>	<b>15 000</b>
	Spare parts /books/publications	5 000	5 000
	Support to member countries	10 000	10 000
<b>5025</b>	<b>Non Expendable Procurement</b>	<b>30 000</b>	<b>30 000</b>
	Equipment	25 000	25 000
	Unforeseen	5 000	5 000
<b>5027</b>	<b>Technical Support Services</b>	<b>2 000</b>	<b>2 000</b>
<b>5028</b>	<b>General Operating Expenses</b>	<b>20 000</b>	<b>20 000</b>
	Meeting, reception, equipment, Communication, Stationary, etc.		
<b>5040</b>	<b>General Operating Expenses - external common services</b>	<b>2 000</b>	<b>2 000</b>
	Pouch services and couriers		
	<b>TOTAL</b>	<b>470 500</b>	<b>500 500</b>



## A celebration of 50 years of Service

الإحتفال بمرور 50 سنة من الخدمة

2017 - 1967



The Commission for Controlling  
the Desert Locust in the  
Central Region

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