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Organization of the  
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# **REPORT**

## **FAO Desert Locust Control Committee**

Forty-second Session

**13 – 17 March 2023**  
**Nairobi, Kenya**

Food and Agriculture Organization of the United Nations  
Rome, 2023

**Report of the**

**FAO Desert Locust Control Committee**

**42<sup>nd</sup> Session**

**Nairobi, 13-17 March 2023**



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**LIST OF ACRONYMS**

AFD	Agence Française de Développement/ French Development Agency
CIRAD	French Agricultural Research Centre for International Development
CLCPRO	Commission for Controlling the Desert Locust in the Western Region/ <i>Commission de Lutte Contre le Criquet Pèlerin dans la Région Occidentale</i> (FAO)
CRC	Commission for Controlling the Desert Locust in the Central Region (FAO)
DL	Desert Locust
DLCC	Desert Locust Control Committee (FAO)
DLCO-EA	Desert Locust Control Organization for Eastern Africa DLIS Desert Locust Information Service (FAO)
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
IGR	Insect Growth Regulator
LPRG	Locust Pesticide Referee Group (FAO)
NSP	Plant Production and Protection Division (FAO)
NSPMD	Locusts and Transboundary Plant Pests Team (FAO)
RAMSES	Reconnaissance and Management System of the Environment of <i>Schistocerca</i>
REOWA	FAO's Sub-Regional Team for Resilience West Africa and the Sahel
RTE	Real Time Evaluation
SWAC	Commission for Controlling the Desert Locust in South-West Asia (FAO) TC Technical Cooperation Department (FAO)
USAID	United States Agency for International Development
USD	United States Dollars

## LIST OF RECOMMENDATIONS

1. **Recommendation 1:** Due to the uncertainty of the long-term seasonal weather predictions and the large recession area, national surveys should be carried out regularly in all potential breeding areas of the frontline countries, including difficult to access areas.
2. **Recommendation 2:** Considering the key role of the Desert Locust Information Service (DLIS) DLCC reiterates the need that all possibilities should be explored in order to ensure appropriate and smooth continuation of the DLIS activities in the future, including succession planning for the Senior Officer post.
3. **Recommendation 3:** DLCC requests an update from FAO and CRC at the next Session on the actions taken to address the recommendations of the RTE and AFD evaluations.
4. **Recommendation 4:** DLCO-EA is encouraged to improve its cooperation with partners to support and sustain its capacity.
5. **Recommendation 5:** DLCO-EA member countries are urged to support the Organization and to pay their arrears and annual contributions regularly in order to ensure the sustainability of its surveillance and control activities.
6. **Recommendation 6:** FAO is invited to support DLCO-EA in strengthening the capacity, particularly in the areas of new eLocust3 applications used for the collection and processing survey data.
7. **Recommendations 7:** The DLCC encouraged the regional DL commissions to establish qualified environmental, health and safety monitoring teams.
8. **Recommendation 8:** DLCC urges the regional DL commissions to continue promoting the use of biopesticides in DL management in their respective regions.
9. **Recommendation 9:** DLCC encourages the DL frontline countries to accelerate and harmonize registration of biocontrol products.
10. **Recommendation 10:** Regional DL commissions are encouraged to establish and maintain strategic stocks of biopesticides in their regions to ensure quick supply when required.
11. **Recommendation 11:** FAO should produce and share guidelines on the application of biopesticides for Desert Locust control.
12. **Recommendation 12:** Regional Commissions should encourage countries to harmonize the registration processes of chemical pesticides and other available alternatives (biopesticides and IGRs) for locust control at the regional level by recognition of field trials results and registered products in countries with similar ecological conditions within the region.

13. **Recommendation 13:** FAO should continue to encourage plant protection organizations, manufacturers, and any other institutions to submit efficacy data on new or existing products for review by the LPRG.
14. **Recommendation 14:** DLCC recommends FAO and Regional Commissions to further explore options of drones for locust survey and control operations.
15. **Recommendation 15:** FAO and regional Commissions are urged to assess the integration of EarthRanger platform for more effective DL management in the frontline countries where survey and preventive control operations are carried out regularly.
16. **Recommendation 16:** FAO and the regional DL commissions are urged to speed up the completion and implementation of the Locust Pesticide Management System (Locust-PMS) to produce SOPs, and train the national staff on the system.
17. **Recommendation 17:** CLCPRO is encouraged to integrate the locust pesticide management module developed by the FAO into SVDN v 3.
18. **Recommendation 18:** DLCC urges the regional DL Commissions to encourage and support their member states to participate more significantly in the DLCC Sessions.
19. **Recommendation 19:** DLCC agreed to revisit Recommendation No 1 made in the 41<sup>st</sup> Session regarding the establishment of a working group to review the DLCC mandate, during the next Session.
20. **Recommendation 20:** The Committee recommended to postpone the decision to allow a waiver of 50% for members with arrears more than USD 100,000, to be brought to the attention of next Session for decision.



## INTRODUCTION

1. The 42nd Session of the Desert Locust Control Committee (DLCC) was organized from 13-17 March in Nairobi, Kenya and attended by 58 participants (51 in person and 7 virtually). Thirteen out of 62-member countries were present in the Session physically and virtually. Other participants represented two observer countries and 14 observer organizations and development partners, in addition to FAO experts and staff. The List of Participants is presented in Annex I.
2. The official opening ceremony of the 42nd Session was preceded by the handover ceremony of one agricultural aircraft to the DLCO-EA at Wilson Airport, Nairobi, Kenya. The aircraft was procured by FAO in the context of the international response to the 2019-21 Desert Locust upsurge in East Africa, to strengthen response capacity of DLCO-EA to locust and other migratory pest crisis. The aircraft was procured with the financial support of resource partners and technical support of the International Civil Aviation Organization (ICAO).
3. The official opening of the 42nd Session was moderated by Mr. Shoki Al-Dobai, the FAO's Team Leader of Locust and Transboundary Plant Pests and Diseases (NSPMD) and Secretary of the Desert Locust Control Committee (DLCC).
4. The meeting was officially opened by the FAO's Director of Plant Production and Protection Division (NSP), Mr. Jingyuan Xia on behalf of the FAO Director General, and Hon. Mithika Linturu, Cabinet Secretary, Ministry of Agriculture and Livestock Development of Kenya on behalf of the host country, Kenya. The opening Session was attended also by the Minister of Agriculture and Irrigation of Somalia, Hon. Ahmed Mathobe Nunow, Hon. Kyakulaga Fred Bwino, the State Minister of Agriculture of Uganda, the FAO Subregional Coordinator for East Africa Region, Mr. David Phiri and the FAO Representative in Kenya, Ms. Carla Mucavi.
5. In her welcoming remarks, Ms. Mucavi welcomed the guests to the 42nd Session. She mentioned that Kenya could provide a suitable opportunity to share experiences and document the challenges the affected country witnessed during the 2019-2021 Desert Locust crisis. She emphasized that Desert Locust control operations succeed to protect the livelihood of farmers and pastoralist in Northern and North Eastern Kenya and averted losses of 11 338 ha of crops, worth USD 3.4 million.
6. Mr. Xia in his opening remarks recognized the ministers and participants present. He acknowledged that the 42nd DLCC Session was being held in the East Africa sub-region for the 2nd time in a row, a demonstration of the importance of Desert Locust control for the region. He thanked the Kenyan Government for hosting the session and the Cabinet Secretary, Hon. Mithika Linturi for accepting to officiate the opening of the session on behalf of the Government of Kenya.
7. Mr. Xia reminded the participants that the Committee was established in 1955 as a global body to advise the Director General of FAO on the Desert Locust situation and on the appropriate measures required to keep it under control. It therefore remains a primary forum that brings together locust-affected countries, donors and other agencies to discuss the Desert Locust management under the FAO umbrella. He referred to the successfully implemented FAO Global

Emergency Response to the 2019/2021 Desert Locust crisis and thanked the partners, who contributed about USD 243 Million to bring the upsurge to an end and succeeded to prevent major damage to crops and pastures, thus saving livelihoods.

8. The Session was invited to review the achievements of the FAO Global Emergency Response to the Desert Locust upsurge (2019-2021), the lessons learned, and the preparedness for future emergencies. Mr. Xia pointed out that coordination and regional cooperation were crucial. FAO benefitted from excellent support and cooperation with the regional partners and organizations, particularly in the East Africa region.
9. The Minister of Agriculture and Irrigation of Somalia, Hon. Ahmed Mathobe Nunow and State Minister of Agriculture of Uganda, Hon. Kyakulaga Fred Bwino honored the Committee by their guiding notes. In their addresses, the ministers thanked FAO for its good efforts to preserve food security in the region. The ministers also emphasized on the need of stronger intra-regional coordination in the sub-region through regular surveillance, early warning and early reaction that are key to keep major locust outbreaks under control before becoming a threat to people's livelihoods.
10. The meeting was officially opened by Hon. Mithika Linturi, Cabinet Secretary (CS) of the Ministry of Agriculture and Livestock Development of Kenya. The CS thanked the Secretariat for considering Kenya to host this important meeting. The CS admitted that Desert Locust is one of the most destructive migratory pests to crops and pastures that requires close monitoring and early intervention in the outbreak areas. The CS also reminded the participants of the 2019-2021 Desert Locust invasion that was reported as the worst in Kenya in more than 70 years. The CS thanked FAO and partners for their timely and effective support through which the country managed to protect livelihoods of farmers and pastoralists in the affected counties.
11. The CS noted the lack of a guiding strategy as a weak point during the control operations in Kenya and the Horn of Africa in general. Acknowledging that Desert Locust is a regional problem and to sustain preparedness and continue building capacities to effectively manage desert locusts in future, the CS made appeal to FAO to consider establishing another regional DL Commission that will take care of the countries in East Africa.
12. The CS concluded by thanking the FAO, donors and the organizing committee, and wished all the participants a productive and successful meeting.

## **OFFICERS OF THE SESSION**

13. The following persons were elected:
  - Chairperson: Mr. Collin Marangu, Director, Plant Protection and Food safety Directorate (PP&FSD) (Kenya).
  - Vice Chairperson: Mr. Stephen Byantwale, Commissioner Crop Protection, (Uganda).

14. The following persons were selected for the Drafting Committee:
  - Mr. Mahgoub Mousa Mohamed Boshara, Director, Locust Control Department (Sudan)
  - Mr. Sory Cisse, Director National Centre for the Desert Locust (Mali)
  - Mr. Eliud Baraka, Information Officer Plant Protection and Food Safety Directorate (Kenya)
15. The agenda, as adopted, is presented in Annex II.

## **SESSION 1: Desert Locust developments and Emergency Response to 2019-2021 upsurge**

### *Overview of the Desert Locust situation (December 2019-2023 and outlook until summer 2023)*

16. Mr. Keith Cressman, Senior Locust Forecasting Officer (FAO-NSP), made virtual presentation and gave an overview of Desert Locust developments from 2018 to 2023.

### *Situation*

17. Between 2019 to 2022, some two dozen countries in Africa and Asia faced the worst Desert Locust upsurge in some 25–70 years. In 2018, two cyclones occurred in the Empty Quarter of southeastern Arabia, one of the remotest places on earth. Consequently, up to three generations of undetected locust breeding caused numbers to increase 8 000-fold in nine months. Swarms began leaving this area in January 2019, migrating north to Saudi Arabia and Iran and south to Yemen.
18. As a result, extensive breeding occurred during spring in southern Iran and during summer along the Indo-Pakistan border in 2019 and 2020. Swarms reached northern India and Nepal in the early summer of 2020. Substantial efforts by Pakistan and India brought the upsurge under control in southwest Asia by the autumn of 2020. In all, there were eight generations of breeding in two years.
19. Unfortunately, breeding could not be stopped effectively in Yemen due to political insecurity and thus more swarms developed. In the summer of 2019, swarms could cross the Gulf of Aden and invaded the Horn of Africa, followed by autumn breeding that led to a new generation of swarms that invaded Kenya by the end of 2019. Consequently, further breeding of a new generation of locusts occurred in Kenya and Ethiopia during the spring of 2020 with swarms reaching South Sudan, Uganda, D.R. Congo, and Tanzania.
20. At the beginning of the summer, swarms moved north to reinvade Ethiopia and Somalia for summer and autumn breeding, followed by another invasion of Kenya at the end of the year with subsequent breeding that was brought under control by April 2021. Swarms arrived on the Red Sea coasts of Eritrea, Sudan, Yemen, and Saudi Arabia at the end of 2020. From March 2021, swarms moved to the interior of Saudi Arabia and migrated to Iraq, Jordan, Syria, Lebanon, Israel, and Sinai, bred there and eventually declined.

21. Intensive breeding continued in Ethiopia and Somalia while effective monitoring and control efforts were affected by local conflicts during the summer in the northeastern and northern parts of Ethiopia. Another breeding occurred in the autumn but eventually, the upsurge in Ethiopia and Somalia was brought under control at the beginning of 2022.
22. As for southwest Asia, there were four generations of successful locust breeding in 2019 and another four in 2020. In both cases, Iran managed them during the first half of the year while Pakistan and India managed the situation during the second half of 2019. In the Central Region, there were four generations of successful locust breeding taking place in each of 2019, 2020 and 2021.
23. From 2019 to 2022, there were two more cyclones hitting the territory. In 2019, “Hikka” in Oman during September where two generations of breeding occurred until March 2020, and “Pawan” in Somalia in December from where swarms migrated to Kenya. In 2020, there was cyclone “Nisarga” in Maharashtra and Gujarati in India during early June when swarms went to Rajasthan for breeding in July, and “Gati” in northern Somalia during November. There were no more cyclones after that. Furthermore, rainfall finally stopped in Eastern Africa after September 2021.
24. During the year 2022, the situation remained calm. Limited breeding took place during the summer in West Africa and Sudan, while small outbreaks occurred in northwest Mauritania and the southern parts of Western Sahara at the end of 2022. During the winter, small groups of locusts formed on the Red Sea coast of Sudan in early 2023.

### ***Control***

25. From 2019 to 2023, a total of 5 678 473 ha were treated by ground and aerial operations in 28 countries; 1 850 054 ha (2019), 2 824 299 (2020), 975 733 ha (2021), 14 840 ha (2022), 5 548 (2023). Details on treated areas by countries and years are presented in Annex III.
26. Globally, the survey and control teams used eight data reporting tools (eL3, eL3g, eL3m basic Android, eL3m basic iPhone, eL3m Pro Android, eL3w and Earth Ranger) between 2020 and 2022 and submitted a total of 374,157 data points (Annex IV).

### ***Forecast***

27. The forecast from April to September 2023 looks at the spring and summer seasonal breeding areas.
28. The spring season is usually from March to June in northwest Africa (south of the Atlas Mountains in Morocco, central Algeria, and southwest Libya), the interior of Saudi Arabia, Yemen, and Oman, and in southeast Iran and southwest Pakistan. Above-normal rain is likely to occur in the interior of Saudi Arabia and Yemen, Oman and southeast Iran, and southwest Pakistan. In northwest Africa, below-normal rainfall is expected. Some rain is expected to occur

in the three spring breeding areas in April, continuing into May in Morocco and Saudi Arabia, but becoming dry again in June.

29. The summer season starts in about June/July in the northern Sahel from Mauritania to western Eritrea of Africa, the interior of Yemen in the Near East, and in the Indo-Pakistan area of southwest Asia. In the Sahel, light rain is expected to start during June from Niger to Sudan and become normal or slightly above normal from July to September 2023. In the interior of Yemen and Indo-Pakistan, normal or slightly below normal rain is expected except for September in the Indo-Pakistan areas, where slightly above normal may occur.
30. At the end of the presentation, the Committee thanked the Senior Locust Forecasting Officer for the quality of the information provided. The following question was raised for discussion: *Are we anticipating any similar situation as in the onset of the upsurge in 2019/20 in the near future?*
31. The question did not result in careful discussions in the plenary. However, according to the information provided by DLIS, there will be no probability of another upsurge in the coming six months. DLCC stressed the importance of capitalizing on lessons learned from the past experience to get prepared for a possible next upsurge in future.
32. **Recommendation 1:** Due to the uncertainty of the long-term seasonal weather predictions and the large recession area, national surveys should be carried out regularly in all potential breeding areas of the frontline countries, including difficult to access areas.
33. **Recommendation 2:** Considering the key role of the Desert Locust Information Service (DLIS) DLCC reiterates the need that all possibilities should be explored in order to ensure appropriate and smooth continuation of the DLIS activities in the future, including succession planning for the Senior Officer post.

#### ***Desert Locust upsurge and FAO Emergency Response 2020-2022.***

##### ***FAO Global Emergency Response.***

34. Mr. Shoki Al-Dobai, Team Leader (FAO-NSPMD), reported on FAO Global Emergency response (reference paper: DLCC/2023/17).
35. In January 2020, FAO scaled up its activities and launched a crisis appeal to contain the upsurge and anticipated impacts on livelihoods in the Greater Horn of Africa and Yemen. In view of the massive scale of the crisis, FAO developed a Global Response Plan in May 2020 and outlined the needs in the Greater Horn of Africa and Yemen, increased operations and assistance for Southwest Asia, and prepared for the possibility that also West Africa and the Sahel could be affected.
36. FAO appealed for USD 311.64 million to treat estimated area of 3.2 million ha, and provide livelihood support to 313 200 households distributed among locust infested/threatened countries

in the Greater Horn of Africa and Yemen, West Africa and Southwest Asia. The situation was characterized by extraordinary operational gaps.

37. The appeal activities were organized along three components: (i) provide technical and operational assistance in support of surveillance and control activities, (ii) provide livelihood assistance for affected farmers and herders, and (iii) build and sustain the capacity of national and regional actors to be better prepared for similar scenarios in the future.

### ***Greater Horn of Africa and Yemen***

38. FAO launched Desert Locust crisis appeal for the Greater Horn of Africa and Yemen and raised a cumulative sum of USD 230.5 million.
39. The resources were used to curb the spread of the desert locust through the support of the ground and aerial survey and control operations and provision of various equipment and service contracts. 28 aircraft were hired for survey and control operations, more than 200 vehicles were procured, 264 vehicle-mounted Ultra-Low Volume (ULV) sprayers, 11 167 knapsacks and handheld sprayers, 1.8 million litres of pesticides, 60 000 litres of Insect Growth Regulators (IGRs) and 12 730 kg of biopesticide (*Metahrizium acridium*). Survey teams were provided with modern data loggers (eLocust3m, handheld In Reach Explorer®+ GPS device and eLocust3g) to increase the quality and quantity survey data.
40. Further, funds were used to recruit locust experts, and to support training of government officers and community scouts. Over 3 800 government personnel were trained.
41. Cumulatively, ground and aerial teams treated about 2.4 million ha across the ten countries.
42. Desert Locust campaign averted crop losses estimated to be 4.6 million tonnes, saved 900 million litres of milk production, and secured food for 41.5 million people. The commercial value of the cereal and milk losses averted through the response is estimated at USD 1.77 billion. Further, FAO worked with partners to assist more than 650 000 families with a total of USD 14 million to compensate for livelihood damages suffered.
43. In terms of institutional capacity building, two National Desert Locust Control Centres were built in Somalia, one Regional Locust Management Training Centre was established in Sudan, and five Locust Control Centres are planned to be constructed in Yemen. In addition, 14 pesticide stores and some aerial control bases were rehabilitated in several countries.

### ***West Africa region***

44. Forecasts anticipated the possibility of escaping swarms from East Africa invading the eastern part of the Sahel and continue westwards from Chad to Mauritania. FAO activated a rapid response appeal to prepare for survey and control operations and livelihoods assistance. About USD 8.1 million were mobilized
45. The CLCPRO Secretariat and the countries were alerted and activated their contingency plans to cope with the possible desert locust risk. Various training courses were conducted to strengthen

national surveillance capacities and to enhance the overall locust detection and reporting system. The survey and control teams were provided with additional vehicles, and materials mobilized by FAO and CLCPRO. In addition, one fixed-wing aircraft and one rotary helicopter were deployed to carry out surveys in September and November 2020.

46. Although no locust swarms invaded West Africa, the vulnerable households still required livelihood support to strengthen their resilience and to ensure their quick recovery.
47. The livelihoods safeguarding activities enhanced the productive capacities of about 5 900 households and 395 farming households and 338 pastoral households only in Chad and Niger benefitted from the cash transfer.

### *Southwest Asia*

48. The FAO appeal for Southwest Asia mobilize USD 1.9 million of rapid response funds in Islamic Republic of Iran and Pakistan.
49. Several initiatives were undertaken with the goal to conduct successful control and optimize the use of resources and spraying assets available in the countries. Approximately 1 500 government officers in Pakistan and 300 in the Islamic Republic of Iran were formally trained on surveillance methods. Furthermore, FAO qualified three master trainers in the Islamic Republic of Iran, who later trained approximately 320 officers on updated survey equipment.
50. The Plant Protection Organization of the Islamic Republic of Iran secured flying hours for seven aircraft, six drones and 20 vehicles to support survey and control activities. The Government of Pakistan deployed three fixed-wing aircraft and five helicopters to support surveillance activities. The Government of India deployed 15 vehicles to support surveillance.
51. Cumulatively, a total 75 million ha was surveyed in Islamic Republic of Iran and Pakistan. Though India was not considered under the appeal, a total of 1 415 499 ha was surveyed utilizing the Government resources.
52. The upsurge affected 95 districts in India, 93 districts in Pakistan and nine provinces in the Islamic Republic of Iran. Between January and December 2020, a total of 1 340 929 ha were treated in India, the Islamic Republic of Iran and Pakistan. The affected countries enhanced and strengthened their national anti-locust structures. This included the mobilization of seven operation bases in Pakistan while FAO assisted with 50 vehicle-mounted sprayers to support control. The Government of India deployed two helicopters, 15 drones and 104 control vehicles mounted with sprayers to control hoppers and swarms.
53. Thanks to the valuable support of the donors, partners and the tremendous efforts and resources made available by the affected countries; it was possible to bring the desert locust upsurge under control in Southwest Asia by late 2020; the invasion to West Africa region was prevented; and the Central Region and East Africa controlled the upsurge by end of 2021.

***FAO Real time evaluation report***

54. Findings on Real Time Evaluation (RTE) initiated by FAO (reference paper: DLCC/2023/04) were presented by Ms. Rosanne Marchesich, Global Programme Support Team Leader, FAO's Office of Emergencies and Resilience (OER).
55. Ms. Marchesich emphasized that the 2019-2021 Desert Locust upsurge that affected parts of the Middle East, the Greater Horn of Africa, and Southwest Asia, was one of the most devastating in decades.
56. The upsurge posed an unprecedented risk to food security in some of the most vulnerable countries in the world. In this context, the FAO Office of Evaluation (OED) decided to launch a real-time evaluation (RTE) of the international response in three phases. Each phase covered specific aspects.
57. Phase I focused on leadership, management and coordination of the response, while Phase II concentrated mainly on the management operations and effects at country level. These phases highlighted the significant contributions made across all aspects of preparation, operation and livelihood protection, forming eight focus areas of investigation for the final phase of investigation. These included procurement and pre-positioning of materials, staff training; national anti-locust capacities; regional coordination, pesticides used, locust data management, new technical developments and livelihoods protection.
58. Phase III analysed the findings of Phase I and II and drew the conclusions for future operations for better multi-sector preparedness and response to Desert Locust upsurges or plagues. As a result, the evaluation identified 27 priority areas for follow-up by the Desert Locust response community. The recommendations can be found in the Phase III report, available online at <https://www.fao.org/evaluation>.

***Agence Française de Développement (AFD) evaluation report***

59. The Agence Française de Développement (AFD) presented a feasibility study for strengthening regional coordination against the locust invasion in East Africa: Operational Analysis was undertaken during the Desert Locust upsurge (reference paper: DLCC/2023/18).
60. This study was undertaken to understand the operational functioning of CRC better and to identify different options for strengthening its capacity similar to what the CLCPRO has achieved in West Africa with the support of AFD.
61. The analysis showed that it is possible to implement a single preventive control system in the Central Region with the same effectiveness as in the Western Region if the following provisions are considered, (i) strengthen the CRC in terms of qualified human resources and financial means; (ii) integration of Somalia into the Commission; (iii) implement a sustainable preventive control system in the eight frontline countries, and (iv) assistance to DLCO-EA.
62. The study recommended setting up of major training programme to address shortage of qualified human resources (managers and technicians) in each of the countries. The study proposed further



research to adapt Desert Locust preventive control strategy to the changing environment and new technologies.

63. DLCC appreciated the reports of the FAO and AFD evaluations and took note of the recommendations.
64. The Committee noted that the necessary actions are to be taken by FAO, the CRC Commission, the member countries and partner organizations to address the recommendations of both evaluations.
65. **Recommendation 3:** DLCC requests an update from FAO and CRC at the next Session on the actions taken to address the recommendations of the RTE and AFD evaluations.

#### *Contribution of the Desert Locust Control Organization for East Africa*

66. The report was presented by Mr. Mwesigwa Moses Rwaheru, Director General of DLCO-EA (reference paper: DLCC/2023/05).
67. The DLCO-EA is comprised of nine-member countries, Djibouti, Eritrea, Ethiopia, Kenya, South Sudan, Sudan, Somalia, Tanzania and Uganda. The DLCO-EA supports member Countries in Desert Locust management through aerial control, forecasting and information sharing, applied research on pests, pesticide use and safety and capacity building of regional crop protection staff.
68. During the Desert Locust upsurge of 2019-2021, DLCO-EA provided regular updates through the situation reports to the member countries. Aerial control was done in Ethiopia (Afar, Amhara and Somali region) from June to 2019-January 2020, and later in Kenya, Uganda and Tanzania to contain the Desert Locust situation.
69. DLCO-EA conducted trainings in the region on all aspects of the Desert Locust management. A total of 398 plant protection staff from Kenya, South Sudan, Uganda and Ethiopia were trained.
70. DLCO-EA conducted efficacy trials of Novacrid and the environmental health impact assessment of the pesticides used during the upsurge in Ethiopia with support of FAO.
71. DLCO-EA was inadequately prepared to contain the upsurge due to capacity limitations, especially the few aircraft with limited endurance. There is a need therefore to strengthen DLCO-EA with modern surveillance and aerial control technology (aircraft, drones) to be better prepared for equal situations in future.
72. DLCO-EA announced acquisition of the new air tractor spray aircraft donated by FAO with support from donors within the framework of emergency response.
73. During the discussion, it was pointed out that although DLCO-EA can undertake cross border operations without any limitations and restrictions. However, the organization was not able to effectively and timely mobilize its aircraft to control the incoming swarms since it was not sufficiently equipped to provide the services as requested by its member states (shortage of aircraft, pilots, fuel, etc.).

74. DLCC appreciated the report of DLCO-EA and noted the obstacles the organization was facing due to the problem as mentioned to undertake its operations in the region.
75. **Recommendation 4:** DLCO-EA is encouraged to improve its cooperation with partners to support and sustain its capacity.
76. **Recommendation 5:** DLCO-EA member countries are urged to support the Organization and to pay their arrears and annual contributions regularly in order to ensure the sustainability of its surveillance and control activities.
77. **Recommendation 6:** FAO is invited to support DLCO-EA in strengthening the capacity, particularly in the areas of new eLocust3 applications used for the collection and processing survey data.

### *Pesticide risk reduction and alternative sustainable management*

#### *Pesticide risk management in Desert Locust control (environment, human health and safety aspects)*

78. The report on Pesticide risk management in Desert Locust control was presented by Ms. Thecla Mutia, Environment, Human Health and Safety Expert (reference paper: DLCC/2023/09).
79. During the 2019/2021 Desert Locust upsurge, chemical pesticides such of organophosphates (fenitrothion, malathion, chlorpyrifos) and pyrethroids (deltamethrin), in addition to biopesticide *Metarhizium acridum* and Insect Growth Regulators (IGRs) were used for locust control in East Africa.
80. FAO encouraged and supported the governments in the region to implement sound Environment and Human Health Standards (EHS) through trained and dedicated monitoring teams to minimize potential adverse effects of chemical pesticide use.
81. The key environment and human health impacts observed in Kenya during the campaign could be summarized as: minor cases of direct exposure of control staff to chemical pesticides, some cases of pesticide spillages, effects to non-target organisms and soil and cultivated areas, observed but only limited information was provided to the rural population regarding pre-harvest intervals and withholding periods.
82. Immediate mitigation actions were undertaken during the campaign which included: regular sensitization of the control teams on the appropriate use of provided Personal Protective Equipment (PPE), observing its use during operations and maintaining standard pesticide application practices, clean-up of contaminated sites (using detergent) and disposal of waste, bio-remediation of contaminated soils and respect of buffer zones, chemical residue analysis of contaminated water and advising the rural population, avoiding of treatment to sensitive habitats and use of bio-pesticides if and where possible and constant communication with the rural communities in the vicinity of treatment areas.
83. At the end of the campaign, empty steel drums were cleaned and crushed using drum crushers provided by FAO and the metal recycled. Plastic containers were triple rinsed and sent for

recycling. The remaining pesticide stocks were kept at the stores of the Plant Protection and Food Safety Directorate.

84. Ms. Mutia concluded that it was possible to minimize the impacts of chemical pesticides on the environment and human health while achieving effective control of the Desert Locust.
85. During the discussion, some questions were raised, in particular on the existence of maps of ecological sensitive areas, such game reserves and / or parks and whether specific incidents were observed. Ms Mutia asserted that sensitive areas are usually mapped and were completely omitted during operations. In terms of the negative impacts, Ms. Mutia noted that only a few cases of affected non-target organisms were reported.
86. DLCC emphasized on the importance on the availability of information on maximum Pesticide residue Level, pre-harvest intervals and withholding periods of the pesticides that are used in the control campaign. The information on the pre-harvest intervals and withholding periods should be more effectively and timely shared with the communities.
87. The Committee thanked Ms. Mutia for the information provided and underlined the importance of EHS studies to be carried during control campaigns using chemical pesticides in all countries. The Committee further emphasized on the availability of specialized experts at the national level to carry out EHS tasks.
88. **Recommendations 7:** The DLCC encouraged the regional DL commissions to establish qualified of environmental, health and safety monitoring teams.

#### *Promotion of biopesticide and less hazardous pesticide use*

##### *Biopesticide, trend and promotion of the registration and application*

89. A paper on the trends and promotion of biopesticides was presented by Mr. Heath McRae, Locust Management Expert (reference paper: DLCC/2023/19).
90. Mr. McRae reminded participants that conventional pesticide products have for a long time been used against locusts. Unfortunately, many of these products can negatively affect human health and the environment if no proper caution is taken during their use. They are therefore becoming increasingly less popular due to their negative impacts.
91. More locust specific and less toxic locust pesticides such biopesticides and Insect Growth Regulators (IGR) have shown great promise, especially during the large-scale operations in Somalia in 2020-2022 where only the biopesticide, *Metarhizium acridum*, and the IGR Teflubenzuron were used with good results to treat over 450 000 ha of Desert Locust affected area.
92. Despite all positive experience, the registration of environmentally less benign locust control products remains one of the challenges. Difficulties of registration of biopesticides need to be overcome. The CILSS combined country pesticide registration scheme agreed in West Africa in 1992 gives a good example for other regions to follow.

*Use of biopesticide and IGR (Case study of Somalia)*

93. A case study on the use of biopesticide and IGR in Somalia was presented by Mr. Heath McRae, Locust Management Expert (reference paper: DLCC/2023/20).
94. Mr. McRae reported that in the lead up to the 2019-2022 Desert Locust upsurge, FAO and the Somali Government agreed on a sole use of the biopesticide, *Metarhizium acridum*, and Insect Growth Regulator (IGR) in control operations.
95. During the 2021 efficacy assessments of the IGR Teflubenzuron 30g ai, about 90-98% mortality was achieved within 4-10 days when applied as 300 m and 500 m barrier treatments against hopper bands. This success greatly reduced the number and size of swarm formation.
96. Towards the end of 2021, 250 swarms covering 80 000 ha were successfully treated with *Metarhizium acridum* at 50g ai/litre, applied at a rate of one litre per ha, achieving 83% mortality after 14 days. It was noted that very few swarms migrated from Somalia to neighbouring countries by the end of 2021.
97. The successful operations carried out in Somalia showed that large scale control using a combination of *Metarhizium acridum* and a low toxic IGR can provide results equivalent to those of conventional pesticides but with the benefit of a much lower impact on the environment and risk to human and animal health.
98. DLCC noted the good progress made by the countries in the Western Region to register and promote the use of biopesticides. Though there are currently still obstacles in the registration, processes in some of the countries, the successful use of alternative product in Somalia should serve as example and encourage the governments in the locust affected areas to allow the use of environmentally less harmful locust control agents.
99. **Recommendation 8:** DLCC urges the regional DL commissions to continue promoting the use of biopesticides in DL management in their respective regions.
100. **Recommendation 9:** DLCC encourages the DL frontline countries to accelerate and harmonize registration of biocontrol products.
101. **Recommendation 10:** Regional DL commissions are encouraged to establish and maintain strategic stocks of biopesticides in their regions to ensure quick supply when required.
102. **Recommendation 11:** FAO should produce and share guidelines on the application of biopesticides for Desert Locust control.
103. **Recommendation 12:** Regional Commissions should encourage countries to harmonize the registration processes of chemical pesticides and other available alternatives (biopesticides and IGRs) for locust control at the regional level by recognition of field trials results and registered products in countries with similar ecological conditions within the region.

*How ready are we to face future emergencies?*

104. This critical question was addressed by Mr. Christian Pantenius, Locust Management Expert to the audience, countries, FAO and partners, with the aim to recall some of the basics of risk management and contingency planning and to come to a common understanding in order to be better prepared for a next desert locust crisis, which may produce probably earlier than later as a consequence of global warming and increasing political and social unrest in many of the locust affected areas.
105. The Committee agreed that the main principles of effective Desert Locust emergency prevention are based on the five pillars:
  - Early detection,
  - Early warning,
  - Rapid reaction,
  - Contingency Planning,
  - And harmonized intra- and interregional collaboration and standards.
106. The ultimate objective is to locate and control gregarizing locust populations at the earliest possible stage, thus preventing a major upsurge or even a plague that could severely affect the livelihoods of hundreds of thousands of people.
107. This issue was raised because not all gregarious locust infestations are inevitably representing a “crisis” but the case depends on ability of the affected country to manage the situation by its own resources.
108. The Committee agreed that an emergency occurs when the locust infestations go beyond the capacity of the country or organization to cope with the situation, which requires extraordinary measures in order to effectively deal with the threat to the society.
109. It was explained that the challenges often observed are that the national and regional capacities are deteriorating during long recession periods as governments are attaching less priority to the Desert Locust problem. Consequently, the structures and human capacities built during the previous locust crisis are no longer in existence and less attention is being given to keeping up the preparedness level and to maintain regular human capacity building programmes.
110. As a result, the response to alarmingly new locust developments often starts too late to be effective and is usually utterly uncoordinated at all levels.
111. These factors have negative consequences to the national economies, in addition to extra costs, to the environment due to the massive and inappropriate use of chemical pesticides.
112. It was recalled that FAO is usually the first organization to be contacted for assistance once the locust developments are exceeding the capacities of the countries.
113. DLCC was made aware that the whole process after receipt of the first requests for assistance can take several months before the emergency assistance becomes effective. This needs to be taken

seriously into consideration by all parties as it allows enough time for 1 to 2 generations of successful locust breeding.

114. Arriving to the question, what should be improved in similar situations as during the upsurge 2019-2021. The Committee was made aware that the characteristics of successful locust management are similar to those of military operations and require permanent readiness in “peace-time”, based on intelligence, early warning and functional supply chains. In order to be ready for “war-time”, it is critical that one-command systems are activated in the onset of an emergency and links established to the national Disaster Risk Management Committee in order to be in a position to mobilize additional resources first from locally available sources to rapidly scale up the defense capacities.
115. The Committee agreed on the necessity to plan ahead during recession periods and to permanently monitor the resources in terms of quality and quantity. Furthermore, the Committee emphasized on necessity of continuously monitoring breeding areas in frontline countries and also to observe the development in the neighboring countries.
116. The Committee concluded several aspects of preparedness that should be taken into consideration.
117. Recommended actions for the front-line countries:
  - Promote the establishment of autonomous Locust Control/Migratory Pest Management Units in each of the frontline countries.
  - Enhance regular monitoring of the potential locust breeding areas.
  - In the context of contingency planning, the frontline countries should undertake regular assessment of their available resources and their capabilities.
  - Establish mechanisms to mobilize additional resources from other government departments in case of increased locust activities.
  - Conduct regular trainings of personnel to compensate for the high staff turnover and to have enough qualified field officers at hand when needed,
  - Establish effective logistics and supplies management systems (safe storage facilities, workshops, pesticides, vehicles, sprayers etc.)
  - Contingency planning should take the possible effects of global warming and political unrest into consideration that potentially could have an effect on the operations.
118. For FAO:
  - Reactivate and make a better use of the “electronic Locust Emergency Response Toolkit” (eLERT) and to ensure regular updating of the platform. This platform should provide stakeholders with up-to-date pool of experts, important contacts in a crisis situation, ready to use terms of references sample contracts, technical specifications of equipment and other critical information that is needed in the onset of an emergency.
  - Review and update of the currently existing Desert Locust Training of Master-Trainers Manual by considering in particular the recent technical and operational developments.

119. For the regional DL commissions:
- For the purpose to help the national Locust Control Units in preparing their annual contingency plans and to identify potential constraints, gaps or operational weaknesses etc., encourage the front-line countries to make appropriate regular use of the electronic Desert Locust Contingency Planning Assistant (DeLCoPA) platform developed under EMPRES/CR.
  - Ensure and support regular regional and national staff training courses at all levels.
  - Maintain regular contacts with its member countries and take note of their difficulties, constraints and needs.
120. Finally, and based on the experience made in Kenya during the anti-locust operations in 2020, Mr Pantenius referred to the difficulties to predict aspects of global warming and the consequences this may have on the Desert Locust population and its migration patterns, and invited the Committee to consider the establishment of a fourth FAO DL Commission for East Africa
121. As part of the actions to increase the level of preparedness and to sustain the capacity acquired in the Central Region and East Africa, FAO presented a new four-year project “Desert Locust risk reduction in the Central Region and Horn of Africa” (GCP/INT/1032/USA) worth USD 3 million and supported by the USAID's Bureau for Humanitarian Assistance (BHA). The project has a global component with the objective to strengthen the locust monitoring and forecasting system, and a regional component with the aim to enforce preventive control and disaster risk reduction capacities. A third component is focusing on the introduction of environmental, health and safety standards. Beneficiaries are Djibouti, Egypt, Ethiopia, Jordan, Kenya, South Sudan, Sudan and Uganda.
122. Mr Al-Dobai, FAO's NSPMD Team Leader expressed the gratitude of FAO to the USAID/BHA for funding this new project as well as for their continuous support to strengthen the preventive control capacities in locust affected regions.

## **SESSION 2. Activities of the Regional Commissions**

### ***Commission for Controlling the Desert Locust in the Central Region (CRC)***

123. Mr Mohamed Lemine Hamouny, Executive Secretary of CLCPRO, reported on the CRC Commission activities on behalf of Mr. Mamoon Al Alawi, who was not able to attend the meeting (reference paper: DLCC/2023/22).
124. It was recalled that Commission for Controlling the Desert Locust in the Central Region (CRC) was established in February 1967 with 7-member states. Currently with 16 members, CRC is by far the largest FAO DL Commission with its activities mostly funded through Trust Fund.
125. Since the emergency period 2020-2022, the Commission has taken some efforts to support the prevention strategy in the member countries. In this regard, the CRC has focused on human and

institutional capacity building and preservation, specifically in the frontline countries, and the introduction of up-to-date locust monitoring and control technologies such as drones.

126. The Commission supports joint activities at regional and inter-regional levels to foster cooperation and exchange of field experience among national locust officers. As part of its normative work, the Commission ensures regular locust reporting and the production of reference material and guidelines. At the heart of the Commission's efforts lies the promotion of environmentally safer locust management tactics to minimize the risks of control operations on human health and non-target organisms.
127. The Commission organized its 32<sup>nd</sup> Session in Saudi Arabia from 5 to 9 June 2022. The Session discussed several important technical topics, including the Desert Locust upsurge (2019-2021), the lessons learned to improve the countries' response capabilities, climate change impact on locust outbreaks, and new technologies for improving Desert Locust survey and control operations. Around 2.6 million hectares were treated by CRC member countries during the upsurge.
128. The Committee discussed the response of CRC Members to the recent Desert Locust upsurge, the effectiveness of operations, the lessons learned and ways to improve the collaboration, monitoring and information sharing between the concerned parties.
129. CRC CLCPRO made effort to harmonize their activities and collaborated in various fields and shared interest including, interregional training and research workshops funded by the French Development Agency (AFD).
130. Finally, CRC mobilized USD 4.5 from Saudi Arabia, the United Arab Emirates and Kuwait in support of countries in the region affected by the recent Desert Locust Upsurge.

***Commission for Controlling the Desert Locust in South-West Asia (SWAC).***

131. Mr. Shoki Al-Dobai, Team leader NSPMD, presented on behalf of the Secretary of Southwest Asian Commission, Mr Keith Cressman, the report on the activities carried out from 2020 to 2022. Due to health issues, the Secretary of the SWAC, was not able to physically attend the session (reference paper: DLCC/2023/23).
132. The 32<sup>nd</sup> Session of SWAC was held virtually by Zoom in December 2020 for the first time in 56 years, due to the COVID-19 pandemic. During the Session, member countries discussed the challenges and lessons learnt during the Desert Locust upsurge. The participants had an opportunity to familiarize themselves with a number of new technologies that have been developed by FAO during the last biennium in response to the upsurge. The session agreed on 21 recommendations and the 2021–2022 work plan budget.
133. In 2020, the efforts of the Commission and member countries were concentrated on management of the Desert Locust upsurge. Efforts of countries with support of FAO and the Commission bore fruits and the upsurge was brought under control by the end of 2020. The Commission maintained effective coordination and cooperation between the member countries, through the SWAC Technical and Operational Coordination (TOC) group that met on a weekly basis.



134. After the COVID19 restrictions ended, member countries and the Commission concentrated on the implementation of the planned field activities. The Desert Locust Joint Survey in spring breeding areas of the I.R. Iran and Pakistan was carried out in April 2022 with support of the Commission. Several national training courses on locust management were carried out in 2021-2022 (8 in Iran, 2 in India and 3 in Pakistan) In addition, a joint border meeting between India and Pakistan was held in 2022.
135. The SWAC member countries made efforts to register and promote the use of the locust biopesticide, *Metarhizium acridum*. However, the process of the registration was hampered due to the absence of locusts to carry our field trials. In some other cases, procedural obstacles delayed the process. However, the efforts will be continued by India and Pakistan with support of FAO and the Commission to overcome these obstacles through support of cross border field trials to facilitate the registration process in 2023.
136. During the last three years, the SWAC member countries made good progress using new tools and technologies developed by the Desert Locust Information Service (DLIS). With the help of the new eLocust3m/g/w gears 144 000 data were collected in SWAC region as compared to 80 000 data from CRC and 1 500 from CLCPRO.

***Commission for Controlling the Desert Locust in the Western Region (CLCPRO)***

137. The activities of CLCPRO were reported by Mr. Mohamed Lemine Hamouny, Executive Secretary of the Commission in the Western Region (reference paper: DLCC/2023/10).
138. Mr. Hamouny emphasized that sustainable preventive control strategy is ensured in the Western Region, thanks to the commitment of CLCPRO member countries that established National Locust Control Units. Contributions to the trust fund reached 100% in 2023. The voluntary contributions from six of the ten-member countries to the Regional Locust Risk Management Fund (FRGRA) reached USD 2.7 million.
139. The structural capacity building components, such as monitoring environmental, health, introduction of technical innovations and applied research have closely been monitored. In 2020, the regional capacities for anticipation and mobilization of financial mechanisms and operations were put to test as result of the developments in the Horn of Africa.
140. The main achievements in the Western Region since 2020 related to institutional aspects. Three countries, Cape Verde, Cameroon and Gambia applied for membership of the Commission. The requests were accepted during the 10<sup>th</sup> Session of the CLCPRO, held in Algeria in 2022.
141. CLCPRO started an operational research project financed by the French Development Agency (AFD) for the period from 2021 to 2024 and has increased the resources equipment from two operational bases in Mauritania and Chad.
142. The Commission has tested drones as part of surveillance devices since 2021.
143. The Commission has made significant progress in implementation of the regional training plan IV (2019-2022) and the preparation of a new regional training programme No. V (2023-2026).

### *CLCPRO and CRC Collaboration*

144. The Executive Secretary CLCPRO highlighted the interaction between CLCPRO and CRC within the framework of interregional cooperation. The two Commissions have jointly undertaken several actions to advocate a common sense particularly in the areas of human capacity building, research and technical innovations.
145. Although the 2019 to 2021 Desert Locust upsurge did not affect the western region, the alert level and the activation of the PRGRA (Regional Locust Risk Management Plan) including the mobilization of the entities in charge of locust control highlighted the gaps of CLCPRO and the needs to face future DL risks.
146. The coordination with FAO and FAO's Subregional Team for Resilience West Africa and the Sahel (REOWA) has greatly contributed to carrying out the activities planned under CLCPRO's PRGRA, in particular the strengthening of the intervention capacities of member countries and FIRO (Western Region Intervention Force) with vehicles, drones, spraying equipment and large quantities of biopesticides.
147. DLCC noted the reports of regional Commissions and appreciated in particular the work of CLCPRO, which succeeded in establishing operational and financial mechanisms to ensure timely reaction, in case of emergencies, thanks to its special emergency fund FRGRA created as part of the regional solidarity framework.

### **SESSION 3: Locust Technical Groups**

#### *Eleventh meeting of the Locust Pesticide Referee Group (LPRG)*

148. A summary of the 11<sup>th</sup> LPRG held in November 2021 was presented by Mr. Said Ghaout, Senior Locust Management Expert / member of LPRG (reference paper: DLCC/2023/06).
149. In his presentation, Mr Ghaout memorized that the LPRG is an independent body of experts, that advises FAO on the efficacy as well as health and environmental risks of commercial insecticides used for locust control. Its tasks are mainly to review insecticide efficacy trial reports and establish recommended dose rates and to evaluate environmental impact studies and classify insecticides
150. The 11<sup>th</sup> LPRG meeting took place virtually in 2021 due to COVID pandemic. The main outcomes of the meeting were presented under the following topics:
151. *Human Health Risks:* All commercial insecticides with a verified dose rate against the Desert Locust were re-evaluated against the updated criteria according to WHO classification (WHO, 2020) and GHS.
152. *Environmental Evaluation:* A large fraction of environmental studies reviewed during the session did not meet the minimum quality criteria, so they were considered not relevant to be reported.
153. *Insecticide selection:* The following priority list of products is given by LPRG as guidance:
  - **Priority 1:** Mycoinsecticide based on *Metarhizium acridum*.

- **Priority 2:** Insect Growth Regulators- IGRs such as Diflubenzuron, Teflubenuron, Triflumuron.
  - **Priority 3:** Neurotoxic insecticides (last resort)
    - A: Phenyl pyrazoles (Fipronil),
    - B: Pyrethroids (Deltamethrin, Lambda-cyhalothrin)
    - C: Organophosphates (Malathion, Fenitrothion, Chlorpyrifos)
154. *Evaluation and monitoring:* Only few reports on operational monitoring of locust control are being submitted for evaluation.
155. The discussion that followed gave the following conclusions:
- The principle advantages of biopesticides based on *Metarhizium acridum* spores and Benzoylurea IGRs for the following reason:
    - Biopesticides have proved to be effective in numerous trials and also operational. The product proved very specific to locusts which gives it a considerable ecological advantage.
    - Benzoylurea IGRs are very effective against locust hopper bands and can be used as barrier treatment. They are less hazardous than neurotoxic insecticides.
  - The main reason for retaining wide-spectrum chemical insecticides, such as chlorpyrifos and pyrethroids, in the list of LPRG was because of the currently limited availability of biocontrol options and their limitations in case of major swarm control.
156. The DLCC took note of the report and thanked LPRG for the advice.
157. **Recommendation 13:** FAO should continue to encourage plant protection organizations, manufacturers, and any other institutions to submit efficacy data on new or existing products for review by the LPRG.

#### ***Locust Drone Technology Advisory Group (LDAG)***

158. The DLCC Secretariat introduced the Locust Drone Technology Advisory Group (LDAG) that is an independent voluntary group of experts. LDAG was established in 2022 to enhance FAO's efforts in introducing and boosting the use of the drone technology for locust survey and control operations (reference paper: DLCC/2023/03).
159. LDAG supports and advises NSPMD and the DL regional commissions on the developments and advantages of the drone technology for locust survey and control.
160. Four virtual meetings were held in 2022 to inform of the technical developments of drones for survey and locust control.
161. Offers received from various companies of potential drone prototypes are being reviewed and will be field tested from 2023 to 2024.

162. The DLCC noted the establishment of LDAG and appreciated the progress made. The Committee also highlighted that there is need to mediate and further target investigations on the potential use of drones in locust survey and control operations.
163. **Recommendation 14:** DLCC recommends FAO and Regional Commissions to further explore options of drones for locust survey and control operations.

#### **SESSION 4: Research and technical aspect of Desert Locust management**

##### *New locust information and management technologies*

##### *Desert Locust Information Service (DLIS) tools and models*

164. The FAO Senior Locust Forecasting officer, Mr Keith Cressman presented the progress with regards to innovative locust survey technologies that have been integrated into the DLIS system (reference paper: DLCC/2023/24).
165. Eight new advances were developed with partners to improve early warning and forecasting. In collaboration with NASA and Lobelia (EU), new products were integrated into the DLIS system that estimate soil moisture from Earth Observations satellites on daily basis. These products are of advantage to guide national survey teams to potential breeding areas.
166. The European Commission Joint Research Centre updated the ten days greenness maps using the Sentinel satellite. The World Climate Service provides DLIS with the world's most sophisticated climate predictions of precipitation and temperature anomalies for 1-6 weeks (sub-seasonal) and 1- 6 months (seasonal) in advance that are derived from six different models and updated biweekly (sub-seasonal) and monthly (seasonal). DLIS integrates these predictions into alerts and forecasts and countries use the sub-seasonal predictions for planning field operations.
167. DLIS worked with NOAA and the UK Meteorology Office to develop trajectory and dispersal models that estimate the direction of swarm migration backwards (1 week) and forwards (2 weeks) in time.
168. Three other new tools concern data collection and reporting. Real-time field data for survey and control teams are the foundation of FAO's global Desert Locust early warning system. They are also critical for countries to plan and implement field operations.
169. In 2020, FAO expanded the eLocust3 suite of digital tools to include a mobile phone version eLocust3m and a Garmin GPS version (eLocust3g). This helps to ensure that all teams are equipped with eLocust3 and can quickly learn how to use it.
170. DLCC appreciated the new technologies integrated into the DLIS system that improved the forecasting and monitoring of locusts and encouraged the countries to take advantage and maximize the use of these technologies.

***Introduction of EarthRanger system in locust management***

171. The use of EarthRanger (ER) and its potential in Desert Locust management was presented by Mr. Swabir Seif Abdulrehman, Head of Technology Solutions 51 Degrees (reference paper: DLCC/2023/07).
172. FAO, in partnership with the Paul Allen Institute for Artificial Intelligence (Ai2) and 51 Degrees Ltd (51D), used the ER management tool to organize and conduct better targeted locust control operations in Kenya, Somalia and Ethiopia in particular.
173. ER allowed real-time data from the ground and aerial survey and control teams, enabling transparency in reporting and visualization, and thus facilitated coordination among field and aerial teams, the national information offices and DLIS.
174. ER's integration of multiple data sources including satellite imagery, ground reports, and weather data significantly improved tracking of teams and logistics thus making survey and control activities more targeted and effective at much reduced cost.
175. ER's capabilities revolutionized the management of Desert Locust operations, ensuring food security and the protection of the environment and communities in affected regions.
176. The DLCC appreciated the advantages the ER technology offers for more effective management of desert locust infestations and swarms by ground and air.
177. **Recommendation 15:** FAO and regional Commissions are urged to assess the integration of EarthRanger platform for more effective DL management in the frontline countries where survey and preventive control operations are carried out regularly.

***Drone technologies (locust survey and control)***

178. A report on the progress regarding the use of drones in locust survey and control was delivered by Mr. Hamouny, the Executive Secretary of CLCPRO (reference paper: DLCC/2023/11).
179. The process of promoting the use of the drone technology in the Desert Locust management started in 2015.
180. FAO DLIS in collaboration with CLCPRO and CRC initiated the process for assessing operational use of the drone technology. On-site field-testing exercises and on-line meetings took place to agree on the technical, operational and administrative details for drones for survey. The process resulted in operational use of drones for survey in 2021 in some CRC and CLCPRO countries.
181. To improve the performance and explore new options of drones for locust survey, a recent field testing took place in Oman in February 2023, involving new companies. The testing of using drones for locust survey and control is supported by AFD project, CRC and CLCPRO trust funds.
182. Consultations are ongoing to permit the use of drones for locust control in the front-line countries.

*Locust Pesticide Management System (LPMS)*

183. The presentation was given virtually by Mr. Mohamed Ammati, FAO Consultant on Pesticide Management (reference paper: DLCC/2023/21).
184. During 2021-2022, the FAO Locusts and Transboundary Plant Pests and Diseases Team (NSPMD) in close collaboration with the Information and Technology Division (CSI), developed Locust Pesticide Management System (Locusts-PMS). This is an advanced version of the FAO's Pesticide Stock Management System (PSMS) implemented during 2007-2017. Locusts-PMS is a web-based application (<https://locust-pms.fao.org>) accessible by authorized persons to monitor and manage pesticide stocks and equipment used for locust control. The system is fully digital from field data collection up to data analysis and reporting.
185. The Locust-PMS was successfully field tested in Morocco and Yemen. Currently it is operational to undertake risk analysis inventories of useable and obsolete pesticide products, equipment and alert national teams on registration and shelf-life status of pesticide products, tracking pesticide movements and the usage inside and /or outside the country using QR code.
186. The proposed plan is to (i) continue improving the performance and elaborating of Locust PMS databases in Morocco and Yemen; (ii) expand the Locust-PMS to Djibouti, Ethiopia, Kenya, Eritrea, Saudi Arabia, Somalia, Sudan and Uganda; and (iii) integrating Environment, Health and Safety (EHS) standards in the system. This would allow reducing the risk coupled with pesticides to human health and the environment before, during and after locust campaigns.
187. The Committee appreciated the progress made on development of the new Locust-PMS.
188. **Recommendation 16:** FAO and the regional DL commissions are urged to speed up the completion and implementation of the Locust Pesticide Management System (Locust-PMS) to produce SOPs, and train the national staff on the system.

*National locust control capacity monitoring system (SVDN)*

189. Mr. Hamouny, the Executive Secretary of CLCPRO briefed the Committee on the progress with the National Locust Control Capacity Monitoring System (SVDN) (reference paper: DLCC/2023/12). The system is designed to help the CLCPRO and its member countries to provide, in real time information on their human, material and financial resources. This information should facilitate the planning of extraordinary- and anticipated needs in case of a locust emergency.
190. The SVDN makes it possible to alert all the partners involved in the preventive control network and seeks for realistic solutions at the national level and, if needed, at the regional one. It also allows to follow the evolution of the countries recurrent expenses and to check their taking in progressive load.
191. The SVDN consists of management sections commonly used by the national Locust Control Units such as funding, infrastructure, warehouses, airstrips, human resources, vehicles/aircraft, equipment and pesticides.

192. As part of the ongoing process of developing this tool, a new SVDN version 3 will be completed in 2023. Version 3 will have three new modules 1) training module, 2) monitoring and evaluation module and 3) pesticide stocks management also integrating PMS.
193. The SVDN v 3 is currently being hosted on AWS (Amazon Web Services) servers in Ireland with permissions from OCC (FAO Office of Communications) and CSI (FAO IT services)
194. The DLCC noted and appreciated the progress made by CLCPRO in developing the new version of National locust control capacity monitoring system (SVDN).
195. **Recommendation 17:** CLCPRO is encouraged to integrate the locust pesticide management module developed by the FAO into SVDN v 3.

*New operational mechanisms to face major desert locust outbreaks and invasions*

***CLCPRO Intervention Force (FIRO)***

196. The Executive Secretary of CLCPRO informed the Committee on the existence of the regional Intervention Force (FIRO) (reference paper: DLCC/2023/13). The establishment of FIRO was decided during the 8th Session of the CLCPRO held in July 2016 in Dakar, Senegal. The aim of FIRO is to assist the frontline countries in the Western Region (Mali, Mauritania, Niger and Chad) in survey and preventive control activities with objective to reduce the risk of major locust outbreaks developing that could affect the invasion countries in the North.
197. The current capacity of FIRO includes: two regional bases in Mauritania and Chad; 33 4wheel drive vehicles for 15 surveillance and control teams and one coordination team, 10 vehicle-mounted ULV sprayers and 16 fixed-wing drones.
198. In 2018 and after the approval by a second meeting of ministers held in 2016 in Algiers, CLCPRO established two mechanisms to deal with a locust emergency: 1) an operational instrument FIRO, and 2) a financial tool, the Locust Risk Management Fund (FRGRA). The Desert Locust upsurge in the Horn of Africa in 2020 was an opportunity to test these two mechanisms.
199. Under FIRO vehicles and equipment will be mobilized with prior agreement of the Chairperson and the Executive Secretary of CLCPRO based on well written request from the beneficiary country addressed to the Executive Secretary.
200. The capacities of FIRO will also be used during regional field training exercise.

***The Regional Emergency Funds (mobilization mechanisms)***

201. The second mechanism introduced by CLCPRO the Locust Risk Management Fund (FRGRA) (reference paper: DLCC/2023/13). FRGRA was approved and endorsed by the second meeting of ministers of CLCPRO member countries in 2016 in an extraordinary session of CLCPRO held in Bamako, Mali in 2017. The regional emergency fund amounts to USD 6 million and financed by the CLCPRO trust fund, voluntary contributions from the member countries and assistance from partners.

202. In the event of a locust crisis in one of the frontline countries, the FRGRA payout process takes only ten days, the time required to check for i) funding request, ii) assessment of the locust situation, iii) establishment of the action plan. The implementation will be carried out with the FIRO resources based in Mauritania and Chad.
203. In expectation of a possible locust threat in 2020, FRGRA was first used by the CLCPRO to bridge the effective application of the PNUAs (National Locust Contingency Plans) and the support of financial partners. As such, the FRGRA was used i) to cover the costs for mobilizing surveillance teams in the frontline countries and ii) the costs of organizing national trainings in June 2020. The latest upsurge has highlighted the importance of emergency funds such as SFERA-FAO and FRGRA-CLCPRO to react quickly to a threatening situation before the international aid materializes.
204. DLCC appreciated the achievements CLCPRO in setting up operational and financial mechanisms thanks to the regional solidarity.

***Progress made with the locust sustainable management and applied research***

***The research project of CLCPRO and the French Agricultural Research Centre for International Development (CIRAD)***

205. The Committee was informed of the ongoing project supported by the French Development Agency (AFD) “Strengthening the preventive control strategy and Desert Locust research operation activities in the Western Region” (reference paper: DLCC/2023/15). The project budget amounts to USD 3.5 million for a period from 2020 to 2024. The project has four components: technological innovations, the adaptation of prevention tools to climate change, the development of new control methods that respect the environment, and collaboration between CLCPRO and CRC.

***CLCPRO-CRC Interregional Research workshop***

206. In 2022, CLCPRO and CRC organized an interregional workshop to develop a joint research programme for the period 2022-2027, to combine the results of the AFD project (reference paper: DLCC/2023/14). Forty participants attended the workshop, including the directors of the National Locust Control Units of the two Regions, scientists from research institutions involved in locust control and FAO experts. The plan includes assessment of technological innovation and new methods with particular attention on Desert Locust and the promotion of alternative control methods. The plan also includes a new one on the socio-economic aspects of locust control.

***Environment, Health, and Safety Standards (EHS) implementation***

207. The Executive Secretary of the CLCPRO presented an overview of the EHS implemented in Western Region (reference paper: DLCC/2023/16). The environmental specifications and requirements have been accepted by eight of the ten CLCPRO member countries. This led to better management of pesticide stocks, mapping of sensitive areas and promotion of biopesticides.



208. A training workshop was organized for new officers in charge of health and environmental monitoring in Saly, Senegal, from 11<sup>th</sup> to 13<sup>th</sup> October 2022, and informed the participants of the new environmental specifications. This training will be followed by technical support missions to the frontline countries in March 2023, in order to review the implementation of the environmental specifications, and another training session by the end of 2023. Moreover, eight CLCPRO member countries have registered the biopesticide products based on the fungus *Metarhizium acridum*.
209. CLCPRO provided more than 1.5 tons of biopesticides to member countries. An area of 583 ha was treated with this product in Mauritania in 2020, and 10 ha in Algeria in 2021.
210. In addition, CLCPRO participated with FAO, NEPPO (Near East Plant Protection Organization) and CRC an interregional training on the use of biopesticides for locust control in Agadir, Morocco, from 16<sup>th</sup> to 20<sup>th</sup> May 2022.
211. The Committee noted and appreciated the progress made in locust sustainable management, applied research and welcomed the cooperative relationships developed between CLCPRO and CRC.

#### **SESSION 5: DLCC activities**

212. The Committee noted with regret the very low attendance of the session by member countries, particularly the absence of front-line countries. From the CRC Region only four countries out of 16 attended and the CLCPRO Region only two out of ten countries. Attendance has never been such low in the history of DLCC Sessions. Low attendance can be attributed to financial obstacles of some low- and middle-income countries, who should pay their travel cost.
213. It was recalled that DLCC is an important global forum to bring the Desert Locust affected and concerned countries together, as well as development partners to provide guidance on key strategic issues related to Desert Locust management. As a consequence of the serious desert locust upsurge 2019-2021, the DLCC Secretariat undertook all efforts to mark a paradigm change on how locusts should be managed in future by considering the challenges of global warming and new technical developments. Unfortunately, more observers and development partners were present during the Session than concerned countries.
214. The Committee advised that more efforts should be taken by the regional Desert Locust Commissions to encourage and support their member countries to participate in future DLCC Sessions.
215. **Recommendation 18:** DLCC urges the regional DL Commissions to encourage and support their member states to participate more significantly in the DLCC Sessions.

***Implementation of the 41<sup>st</sup> Session recommendations (reference paper: DLCC/2023/08)***

216. The 41<sup>st</sup> Session of DLCC made 25 recommendations for the attention of FAO, the regional DL Commissions and member states. The DLCC Secretariat reported on the accomplishment and noted that most of the recommendations were addressed, while some remaining pending due to policy reasons.
217. The Committee noted the progress made to revise and update of the DLCC mandate to be resumed in the next Session.
218. **Recommendation 19:** DLCC agreed to revisit Recommendation No 1 made in the 41<sup>st</sup> Session regarding the establishment of a working group to review the DLCC mandate, during the next session.
219. The Committee welcomed the attendance of South Sudan in the Session as an observer and encouraged the country join DLCC as a member.

***International Trust Fund 9161: contributions and expenditures from 2019 to 2023***

220. The DLCC Secretariat presented the paper (DLCC 2023/25) on International Trust Fund (TF) 9161: contributions and expenditures from 2019 to 2023. The total assessed contributions by member countries is USD 207,780 per year. Activities funded by DLCC must be global and of critical importance to Desert Locust management and of benefit for all member countries.
221. DLCC funds are mainly earmarked to maintain the DLIS services at FAO Headquarters to monitor the Desert Locust developments to provide forecasts and early warning, and to maintain the FAO Locust Watch website. Further, DLCC funds are used to allow the 11-month-on-the-job training of national Desert Locust Information Officers at DLIS, to ensure publication of monthly Desert Locust bulletins and other relevant technical materials.
222. The DLCC funds are also used to support the improvement of the GIS technologies (ESRI and Lobelia Earth), the development of new technologies, and the Locust Pesticide Referee Group (LPRG). The Committee was made aware that the DLCC Trust Fund is the only source to secure crucial DLCC and DLIS activities.
223. The Secretariat presented the activities carried out from 2020 to 2022 that are described in the paper (DLCC 2023/25). The Secretariat informed the Committee about the renovation of the DLIS Office at FAO HQ with support of the Swiss Government to be named “Swiss Centre for Locusts and Migratory Pests”.
224. The contributions reached USD 160 574 in 2019; USD 72 875 in 2020; USD 168 268 in 2021 and USD 88 253 in 2022 making a total of USD 479,329 from 2019 to 2022.
225. While thirteen-member states (Egypt, Eritrea, India, Jordan, Kenya, Kuwait, Libya, Mauritania, Morocco, Niger, Pakistan, UAE, Uganda) contributed regularly to the DLCC Trust Fund, 16-member states (Afghanistan, Bahrain, Burkina Faso, Cameroon, Chad, Djibouti, Ethiopia,

- Gambia, Ghana, Iran, Lebanon, Qatar, Saudi Arabia, Senegal, Somalia, Sudan) did not contribute to the Trust Fund between 2019 and 2022.
226. A 13% increase of arrears was noted since the last DLCC Session in 2019. As of December 2022, the accumulated arrears of the Trust Fund reached USD 2 610 331 while the arrears at the last DLCC session in December 2019 were USD 2 309 179.
227. The estimated annual budget approved by the DLCC 41<sup>st</sup> Session for the biennium 2020-2021 was USD 400 000. Expenditures from 2019 to December 2022 amounted to USD 385 636 equivalent to about USD 112 073 per year.
228. The breakdown is as follows: in 2019 the expenditures reached USD 49 417; in 2020, USD 145 636; in 2021, USD 21 443 and in 2022, USD 169 141. The reduction in the expenditures in some years was due to financial support received from the Desert Locust Emergency Response Fund and FAO Regular Programme. In addition, some savings were due to the COVID 19 restrictions with the results that the 11-months Desert Locust Information Officer trainings could not be carried out as originally planned.
229. The DLCC Trust Fund cash balance as of 31 December 2022 is USD 281,567. This is the maximum amount available to secure the 2023-2024 activities in the absence of any additional income from outstanding contributions and without accounting for the cost of the DLCC 42<sup>nd</sup> Session. Details of the received and outstanding contributions are listed in Annex V.
230. Some representatives from member states referred to the recommendation of the DLCC 41<sup>st</sup> Session allowing 50% of arrears waived for those members who have more than USD 100,000 outstanding under the condition to pay the balance. The Secretariat reported that this recommendation has not been implemented as the FAO Legal Office advised that the contributions are political commitments and member countries should respect their agreed annual contributions regardless their accumulated arrears or any proposal by the Committee to waive 50% of the arrears.
231. The Committee could not come to a consensus regarding this question due to the low attendance.
232. **Recommendation 20:** The Committee recommended to postpone the decision to allow a waiver of 50% for members with arrears more than USD 100,000, to be brought to the attention of next Session for decision.

#### *Preparation of the work plan for 2023-2024*

233. The DLCC Secretariat informed the Session of key activities planned for 2023-2024.
234. With regards to secure the future functioning and performance of DLIS:
- Recruitment of a new Locust Monitoring and Forecasting Officer (P-3) with support of the project USAID project (GCP/INT/1032/USA) to ensure the succession of the current Senior Locust Forecasting Officer;
  - Inauguration of the new DLIS Centre in mid-2023;

- Locust Watch website migration to the new FAO- website Content Management System (CMS).
235. The Secretariat noted that DLIOs training at FAO HQ will resume in 2023 with a new programme that will start in mid-2023 with up to four national DLIOs to be trained annually, in addition to the remote training.
236. The 12<sup>th</sup> meeting of the Locust Pesticide Referee Group (LPRG) scheduled for 2024, based on the availability of new data for review. In addition, a Locust Drone Advisory Group (LDAG) meeting is planned as required.
237. FAO will finalize the revision and the publication of the Desert Locust Guidelines Volume 6 (Safety and environmental precautions) in 2023 and develop SOPs on biopesticide application.
238. DLIS plans a RAMSES GIS upgrade to version 5 after the consultation with the Regional Commissions and DLIOs.
239. The contracts with service providers to support GIS and new technologies into the DLIS system will be maintained.

**Table 1:** Planned activities and estimated budget for 2023-2024

Planned activities and estimated budget for 2023-2024		
	Activities	Estimated budget (USD)
1	DLIS Support / Locust Watch	210,000
2	DLIOs training at FAO HQ	90,000
3	Support GIS and new technologies	80,000
4	LPRG	15,000
5	<sup>nd</sup> 42 DLCC session in 2023	40,000
	<b>Total</b>	<b>435,000</b>

240. The DLCC endorsed the workplan and budget of 2023-2024.

### CLOSING SESSION

241. This report with agreed amendments was adopted by the participants.
242. The next session of the DLCC was proposed to be held in May 2025 at a venue to be decided by the Secretariat.
243. On behalf the Chairperson, Mr Shoki Al-Dobai, Team leader NSPMD thanked all participants for their contributions to the discussion, as well as the staff of the Secretariat who had contributed to organize the Session, the interpreters, the drafting committee and the Government of Kenya for hosting this session. He declared the session closed.

## ANNEXES

## ANNEX I: LIST OF PARTICIPANTS

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**ANNEX II: ENDORSED AGENDA****Opening session**

1. Official Opening Ceremony of the Session
  - a) Welcoming remarks of the FAO Office in Kenya
  - b) Opening statement of FAO
  - c) Opening statement of Kenya Government
  - d) FAO video on the Desert Locust Emergency Response
2. Election of the Chairperson, Vice-Chairperson and the Drafting Commission
3. Adoption of the agenda

**Session 1: Desert Locust developments and Emergency Response to 2019-2021 upsurge**

4. Overview of the Desert Locust situation (December 2019-2023 and outlook until summer 2023)
5. Desert Locust upsurge and FAO Emergency Response 2020-2022
  - a) FAO Global Emergency Response
  - b) Lessons learned, evaluations and studies carried out by FAO and partners
    - i). FAO Real Time Evaluation (RTE)
    - ii). Study carried out by French Development Agency (AFD)
  - c) Contribution of the Desert Locust Control Organization for East Africa
  - d) Pesticide risk reduction and alternative sustainable management
    - i). Review of environmental and human health consequences and management issues due to chemical pesticides
    - ii). Promotion of biopesticide and less hazards pesticide use
      - Biopesticide, trend and promotion of the registration and application
      - Use of biopesticide and IGR (Case study of Somalia)
6. How ready are we to face the future emergencies?

**Session 2: Activities of the Regional Commissions**

7. Commission for Controlling the Desert Locust in the Central Region (CRC).
8. Commission for Controlling the Desert Locust in South-West Asia (SWAC).
9. Commission for Controlling the Desert Locust in the Western Region (CLCPRO).

**Session 3: Locust Technical Group**

10. Eleventh meeting of the Locust Pesticide Referee Group (LPRG).
11. Locust Drone Technology Advisory Group (LDAG).

**Session 4: Research and technical aspect of Desert Locust management**

12. New locust information and management technologies
  - a) Desert Locust Information Service (DLIS) tools and models
  - b) Introduction of EarthRanger system in locust management
  - c) Drone technologies (locust survey and control)
  - d) Locust Pesticide Management System (LPMS)

- e) New locust information and management technologies
- f) National locust control capacity monitoring system (SVDN)
- 13. New operational mechanisms to face major outbreaks and invasions.
  - a) CLCPRO Western Region Intervention Force (FIRO) experience.
  - b) Regional Emergency funds (mobilization mechanisms).
- 14. Progress made with the locust sustainable management and applied research.
  - a) The research project of CLCPRO and the French Agricultural Research Centre for International Development (CIRAD).
  - b) CLCPRO-CRC Interregional Research workshop.
  - c) Environment, Health, and Safety Standards (EHS) implementation.

**Session 5: DLCC activities**

- 15. Implementation of the 41<sup>st</sup> Session recommendations.
- 16. International Trust Fund 9161: contributions and expenditures from 2019 to 2023.
- 17. Preparation of the work plan for 2023-2024.
- 18. Any other matters.
  - a) Preparation of draft report (Drafting Committee)
  - b) Cultural visit for participants to Nairobi National Park

**Closing session**

- 19. Adoption of the draft report.
- 20. Next Session.

**Annex III:** Total area (ha) treated in different countries between 2019 and 2023)

Country	2019	2020	2021	2022	2023	TOTAL
<b>Afghanistan</b>	0	4,622	0	0	0	<b>4,622</b>
<b>Algeria</b>	842	296	405	0	0	<b>1,543</b>
<b>Bahrain</b>	0	3	0	0	0	<b>3</b>
<b>Djibouti</b>	0	0	65	0	0	<b>65</b>
<b>Egypt</b>	21,152	3,054	1,268	4,335	0	<b>29,809</b>
<b>Eritrea</b>	46,525	60,304	3,813	0	0	<b>110,642</b>
<b>Ethiopia</b>	29,721	958,291	316,602	430	0	<b>1,305,044</b>
<b>India</b>	330,740	352,514	0	0	0	<b>683,254</b>
<b>Iran</b>	722,852	313,388	16,349	0	0	<b>1,052,589</b>
<b>Iraq</b>	0	2,684	642	0	0	<b>3,326</b>
<b>Jordan</b>	2,900	0	1,800	0	0	<b>4,700</b>
<b>Kenya</b>	0	161,071	50,938	0	0	<b>212,009</b>
<b>Kuwait</b>	15,653	21	26	0	0	<b>15,700</b>
<b>Lebanon</b>	0	0	437	0	0	<b>437</b>
<b>Mauritania</b>	281	754	40	4,799	35	<b>5,909</b>
<b>Morocco</b>	0	0	30	0	1,073	<b>1,103</b>
<b>Niger</b>	29	3,868	0	0	0	<b>3,897</b>
<b>Oman</b>	1,863	12,042	0	0	0	<b>13,905</b>
<b>Pakistan</b>	230,683	336,067	0	0	0	<b>566,750</b>
<b>Saudi Arabia</b>	281,395	224,554	223,606	0	410	<b>729,965</b>
<b>Somalia</b>	255	155,495	293,691	2,741	0	<b>452,182</b>
<b>South Sudan</b>	0	250	0	0	0	<b>250</b>
<b>Sudan</b>	162,326	173,892	60,914	2,535	4,030	<b>403,697</b>
<b>Syria</b>	0	0	3,361	0	0	<b>3,361</b>
<b>Tanzania</b>	0	0	1,324	0	0	<b>1,324</b>
<b>Uganda</b>	0	7,154	0	0	0	<b>7,154</b>
<b>United Arab Emirates</b>	0	6,103	0	0	0	<b>6,103</b>
<b>Yemen</b>	10,837	47,872	422	0	0	<b>59,131</b>
<b>TOTAL</b>	<b>1,858,054</b>	<b>2,824,299</b>	<b>975,733</b>	<b>14,840</b>	<b>5,548</b>	<b>5,678,473</b>

**Annex IV:** Data points submitted between 2020 and 2022 using various reporting tools

Data tools	No. data points submitted / year			
	2020	2021	2022	Grand Total
eL3	34,995	18,187	11,333	<b>64,515</b>
eL3g	6,744	27,099	11,823	<b>45,666</b>
eL3m basic Android	68,179	92,496	13,533	<b>174,208</b>
eL3m basic iPhone	1,080	4,000	1,873	<b>6,953</b>
eL3m Pro Android	0	1,213	17,799	<b>19,012</b>
e3w	33,919	29	0	<b>33,948</b>
Earth Ranger	25	3,194	497	<b>3,716</b>
Manual Entry	14,840	7,090	1,148	<b>23,078</b>
N/A	2,643	418	0	<b>3,061</b>
<b>Grand Total</b>	<b>162,425</b>	<b>153,726</b>	<b>58,006</b>	<b>374,157</b>

## ANNEX V: DLCC TRUST FUND, RECEIVED AND OUTSTANDING CONTRIBUTIONS

Member countries	Annual Contribution	2020	2021	2022	Received from 2020- 2022	Last payment	Outstanding 31.12.2019	Outstanding 31.12.2022	Outstanding in years-worth of contributions
<b>AFGHANISTAN</b>	3,480				0	2014	25,800	36,240	10
<b>ALGERIA</b>	7,700				0	2013	61,634	84,700	11
<b>BAHRAIN</b>	920				0	2019	0	2,760	3
<b>BURKINA FASO</b>	3,000				0		33,000	42,000	14
<b>CAMEROON</b>	2,780				0	2014	25,865	34,204	12
<b>CHAD</b>	3,520				0	2013	118,848	129,408	37
<b>DJIBOUTI</b>	1,120				0		43,540	46,900	42
<b>EGYPT</b>	5,740	22,960	5,740	5,740	34,440	2022	17,220	0	0
<b>ERITREA</b>	3,000		6,000	3,000	9,000	2022	0	0	0
<b>ETHIOPIA</b>	4,320				0	2017	17,254	30,214	7
<b>GAMBIA</b>	2,420				0	2015	9,680	16,940	7
<b>GHANA</b>	3,280				0	2014	26,240	36,080	11
<b>INDIA</b>	20,000		60,000	20,000	80,000	2022	20,000	0	0
<b>Islamic Rep. of IRAN</b>	20,000				0	2005	621,495	681,495	34
<b>IRAQ</b>	7,440			66	66	2019	171,186	193,440	26
<b>JORDAN</b>	3,420	6,840	3,420	3,420	13,680	2022	3,420	0	0
<b>KENYA</b>	3,580	3,581	7,160	3,580	14,320	2022	3,580	0	0
<b>KUWAIT</b>	20,000				0	2022	120,000	180,000	9
<b>LEBANON</b>	3,060				0	2016	47,633	56,813	19
<b>LIBYA</b>	10,640	10,640	10,640	10,640	31,920	2022	0	0	0
<b>MALI</b>	3,600		7,200		7,200	2021	6,949	10,549	3

Member countries	Annual Contribution	2020	2021	2022	Received from 2020- 2022	Last payment	Outstanding 31.12.2019	Outstanding 31.12.2022	Outstanding in years-worth of contributions
<b>MAURITANIA</b>	2,900			10,789	10,789	2022	101,699	99,561	34
<b>MOROCCO</b>	5,360		21,440	5,360	26,800	2022	10,720	0	0
<b>NIGER</b>	3,760	24,254	3,760	3,557	31,572	2022	137,160	116,868	31
<b>NIGERIA /a</b>					0		67,370	67,370	
<b>PAKISTAN</b>	6,520		6,520	13,040	19,560	2022	13,040	13,040	2
<b>QATAR</b>	1,760				0	2017	6,158	11,438	6
<b>Kingdom of SAUDI ARABIA</b>	20,000				0	2017	60,000	120,000	6
<b>SENEGAL</b>	3,520				0	2013	31,234	41,794	12
<b>SOMALIA</b>	3,500				0	1999	128,745	139,275	40
<b>SUDAN</b>	3,980				0	2007	115,708	127,648	32
<b>SYRIA</b>	4,520				0	2019	5,520	19,080	4
<b>TUNISIA</b>	4,460		4,460	4,460	8,920	2022	124,896	129,356	29
<b>UGANDA</b>	3,380		27,328		27,328	2021	27,328	6,760	2
<b>UNITED ARAB EMIRATES</b>	4,600	4,600	4,600	4,600	13,800	2022	0	20,000	4
<b>YEMEN</b>	6,500				0	2019	106,258	125,758	19
<b>TOTAL</b>	<b>207,780</b>	<b>72,875</b>	<b>168,268</b>	<b>88,253</b>	<b>329,396</b>		<b>2,309,180</b>	<b>2,619,692</b>	