Food and Agriculture Organization of the United Nations

Commission for Controlling the Desert Locust in the Central Region

REPORT OF THE 32nd SESSION OF THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE CENTRAL REGION & ITS 36th EXECUTIVE COMMITTEE MEETING

Jeddah, Kingdom of Saudi Arabia,

5 - 9 June 2022

55 YEARS ANNIVERSARY

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

Thirty Second Session & Thirty Sixth Executive Committee Meeting

Jeddah, Kingdom of Saudi Arabia,
5-9 June 2022

Food and Agriculture Organization of the United Nations, 2022

Contents

Participants of the Thirty Second Session and the Thirty Sixth Meeting of the Executive Committee of the Commission for Controlling the Desert Locust in the Central Region, Jeddah, Kingdom of Saudi Arabia, 5-9 June 2022

Summary of Recommendations

All the participants of the Thirty Second Session agreed on the following recommendations:

1. **Recommendation 1: The Commission urged the member countries to preserve the national capabilities available in their countries, and the capabilities gained within the framework of the Rapid Response Project to the Desert Locust upsurge (2019-2021). This could be attained through regular maintenance and good storage of vehicles, sprayers and equipment, and their use in non-other than Desert Locust Control according to the recommendations of the Food and Agriculture Organization in this regard.**

2. **Recommendation 2: The member countries are encouraged to regularly prepare, activate and continuously update national Desert Locust action and emergency plans and to send a copy to the Commission Secretariat with the latest update.**

3. **Recommendation 3: The member countries, especially the breeding countries, should institutionalize all the units / centers / departments / directorates operating for the Desert Locust Control. They should be administratively and financially autonomous with a sufficient annual operational budget in order to conduct various Desert Locust Control operations.**

4. **Recommendation 4: The Commission strongly recommended that breeding countries should establish departments, centers or units specialized in managing locust survey and control activities with financial resources to ensure efficient operation and successful management in accordance with the provisions of the Establishment Agreement of the Commission.**

5. **Recommendation 5: The Commission recommended that member countries should retain qualified cadres working in the field of locust control, as well as increasing their numbers, and replacing the retirees or staff, who have been transferred to other jobs, with new staff.**

6. **Recommendation 6: The member countries recommended that the organization should pay more attention to the expansion of remote sensing applications so that member states could improve national capacities regarding climate change and its potential impact on the desert locust situation.**

7. **Recommendation 7: The member countries recommended that positive improvements should be applied to the eLocust3mPro operating system in line with the proposals of the countries so that all countries could fully utilize them. They emphasized that gathered information should be only used for early warning and it is not allowed to serve for any other purposes - including research and scientific publication - without referring to regional commissions. They also recommended that all the data should be stored on the secure servers of the organization.**

8. **Recommendation 8: The member countries requested that the organization should coordinate with the regional commissions in anything related to Information Development and Early Warning Systems. In addition, unilateral measures should not be taken without participating with regional commissions.**

9. **Recommendation 9: The Commission recommended that member countries should encourage national locust information officers to notify their relevant departments and then the Commission Secretariat, before cooperating with developers of tools and programs for locust information exchange (eL3, eL3m, eL3w, eL3g). Any technical decision should be taken in the light of prior coordination, which may entail some obligations on the Commission whether financial, operational or otherwise.**

10. **Recommendation 10: The member countries agreed that the Commission Secretariat would deactivate the eL3 devices in the countries directly if the device has not been used for two consecutive months, without returning to the country in question, in order to preserve the financial resources of the Commission.**

11. **Recommendation 11: The member countries strongly recommended the information service for the Commission Secretariat should be improved and benefit from the appropriate expertise and competencies to enhance and strengthen the role of the Commission in the field of information management and remote sensing to level up the efficiency of information exchange between the countries.**

12. **Recommendation 12: The Commission urged the Member countries to notify and update the Commission Secretariat with the modifications on the data of the National Liaison Officers. Accordingly, the data should be updated frequently on the website of the Commission and the eLERT website.**

13. **Recommendation 13: The Commission strongly recommended that all Member countries adhere to the technical conditions and specifications approved by the Food and Agriculture Organization of the aircraft and the support devices used in aerial control, to ensure the efficiency of control operations in terms of using the recommended doses, reducing pesticide losses and preserving human health and environmental safety.**

14. **Recommendation 14: The member countries recommended to the Commission the necessity of providing a regional stock of locust control equipment to support countries affected by locust outbreaks and upsurges if national resources are not sufficient to accommodate it.**

15. **Recommendation 15: The Commission recommended that member countries should take all necessary measures to register the bio-pesticide Metarhizium and IGR insecticides so that they can be used in locust control as reliable alternatives.**

16. **Recommendation 16: The Commission recommended that member countries should take the necessary measures to obtain approvals and permits related to the use of drones in survey operations within their countries before that the Commission supports the introduction of this system into the survey in those countries, and inform the Commission Secretariat of any developments in this matter.**

17. **Recommendation 17: The member countries took note of the current projects of the Commission in cooperation with three different projects: the Kuwait Fund for Economic Development "Promoting early measures and rapid response to mitigate the effects of the desert locust invasion on food security and livelihoods in the central region OSRO/GLO/1036/KUW", the French Development Agency Project (the fourth component of the project to consolidate the foundations of the preventive control strategy and develop applied research on desert locusts in the western region GCP/GLO/096/FRA, and the New French Development Agency Project (subject to procedures) "Strengthening the preventive control of the desert locust in the central region" / Horn of Africa GCP/GLO/1081/FRA". The member countries have also approved the work plans suggested by the Commission Secretariat to implement those projects.**

18. **Recommendation 18: The member countries agreed to transfer the seat of the Commission from the FAO Regional Office for the Near East and North Africa (host of the secretariat's headquarters) to one of the member countries. In this regard, the host country submits the request to the organization/commission accompanied by the approval to give diplomatic status to the mission and the signed agreement in accordance with the procedures followed by the Food and Agriculture organization. The secretariat of the Commission should follow up and implement these recommendations with the countries wishing to host immediately.**

19. **Recommendation 19: The member countries unanimously agreed to cancel all arrears owed to the Trust Fund of the Commission on all countries until the end of the fiscal year 2021/2022. In contrast, all member countries should be committed to regular payment of the annual contributions assessed to the Trust Fund of the commission, starting from the fiscal year 2022/2023.**

20. **Recommendation 20: The member countries of the Commission approved the annual final accounts for the period from 2019 to 2021.**

21. **Recommendation 21: The member countries approved the work plan for the period 2022-2024, which incorporates the outputs of the workshop for the development of the regional training plan during the period 2022-2026 to be held in Cairo from 27-30 June 2022. It also incorporates the research plan for the same period to be discussed in the joint regional workshop with the Desert Locust Control Commission in the Western Region, which is suggested to be held in Tunisia from 26-29 July 2022. The Kuwait Fund for Arab Economic Development and the French Development Agency projects, as well as the Commission Trust Fund would finance these plans jointly.**

22. **Recommendation 22: The member countries delegated the Commission Secretariat, in consultation with its Chairman, to cover the costs of activities of the Commission, which were not included in the approved budget for work plans for the coming period.**

23. **Recommendation 23: The member countries requested from the Commission Secretariat to send the 32nd Session report and its recommendations to the concerned authorities in the member countries to support the representatives in implementing the decisions and recommendations issued by this meeting.**

24. **Recommendation 24. The member countries agreed on the request submitted by the Republic of Somalia to join the Commission as a "Nominated member". They also requested from the Commission Secretariat to follow the administrative and legal procedures, according to the Establishment Agreement of the Commission and the regulations in force within the Food and Agriculture Organization in order to obtain full membership.**

The report of the thirty-second Session and the thirty-sixth Executive Committee Meeting of the Commission for Controlling the Desert Locust in the Central Region,

Jeddah, Kingdom of Saudi Arabia, 5-9 June 2022

Introduction

The Director-General of the Food and Agriculture Organization of the United Nations (FAO) has invited the Member countries of the Commission: Bahrain, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen, to attend the Thirty Second Session of the Commission for Controlling the Desert Locust in the Central Region in Jeddah, Saudi Arabia, 05-09 June 2022.

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

Opening Session

On the 5th of June 2022, under the auspices of H.E. Eng. Ahmed bin Saleh bin Ayada Al Khomshi, Undersecretary for Agriculture, in the Ministry of Environment, Water and Agriculture (MEWA), Kingdom of Saudi Arabia, and on his behalf, Dr. Sulaiman Al-Khateeb, Assistant Deputy Minister of the Ministry of Environment, Water and Agriculture for Agriculture (MEWA), has opened the 32nd Session, in the presence of Mr Aymen Omar, FAO Representative to the kingdom of Saudi Arabia, Dr. Mohammed Al-Ghamdi, Saudi Arabia representative to the FAO, IFAD and WFP. Dr. El Khateeb has welcomed all the participants on behalf of the Minister, pointing out the role of the Commission and the member countries in mitigating the effects of the 2019-2020 Desert Locust upsurge in the Central Region. His Excellency has also given a brief on the efforts of the Kingdom of Saudi Arabia to control the Desert Locust upsurge during the 2019-2021 crisis and highlighted the country's continuous efforts to control the spread inside the country and to neighboring countries through active control operations and donations to the regional emergency fund during the crisis.

Mr Aymen Omar has welcomed the participants in Saudi Arabia and wished them successful meeting, emphasizing the importance of early warning systems, monitoring, follow-up and preventive control strategy within the integrated national and regional preparedness plans. He also stressed the importance of coordination and cooperation among the countries of the region, as well as between neighboring regions, for the integrated control of this transboundary pest. In addition, Mr Omar has hilighted how modern technologies and innovations could strengthen the early warning systems, and the importance of strengthening the Desert Locust Commissions to perform their important role in providing accurate information, technical support, training and other services to the member countries saving and safeguarding its achievements and building on the lessons learned from the 2019-2021 upsurge.

The Executive Secretary of the Commission, Mr Mamoon AlAlawi, has given a summary of Desert Locust's Control efforts in the central region and the challenges faced during the upsurge, coinciding with the COVID-19 pandemic, and the operations undertaken, advising Member countries to monitor the Desert Locust development on a regular basis. He also gave a brief on the topics that would be discussed in the working papers during the sessions. Mr AlAlawi thanked the government of the Kingdom of Saudi Arabia for hosting this meeting and appreciated its contributions in supporting the Commission and its member countries over the years, particularly during the recent Desert Locust upsurge.

The 32nd Session of the Commission took place during the period 05-09 June 2022, with the presence of delegates of the member countries : Bahrain, Egypt, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen, except Djibouti, in addition to Team Leader of the Locusts and Transboundary Plant Pests and Diseases Group at FAO headquarters, Executive Secretary of the Commission for Controlling the Desert Locust in the Western Region (CLCPRO), Director of the Desert Locust Organization for Eastern Africa (DLCO-EA), a number of consultants and observer (Somalia). (Appendix 1).

Report of the Chairman of the Commission

The Chairman of the Commission in its Thirty First Session, Eng. Setan Al Serhan, thanked the Kingdom of Saudi Arabia for hosting the 32nd Session and presented a report on the activities implemented by the Secretariat of the Commission as well as the challenges faced during the 2019-2021 locust upsurge, especially during the COVID-19 pandemic. The pandemic has greatly affected the activities and delayed the donations reaching the affected countries. Despite that, the Commission continued to execute its role once it was possible.

He pointed out the great collaboration between the member countries, and the Desert Locust Commissions, particularly the cooperation with the Commission of the Western Region, FAO and the Secretariat of the Commission. Finally, Mr Al Serhan wished the participants a successful meeting. (Appendix 2).
Election of Chairman and Vice Chairman

The delegate of the Kingdom of Saudi Arabia, Mr Meraya Al Qahtani, was unanimously elected as the Chairman of the 32nd Session of the Commission, with Mr Khaled Abd Rabbo, the delegate of Egypt, as the Vice-Chairman.

Adoption of the Agenda

The session member s has endorsed the agenda as per the following:

- **Opening session**
  - Report of the Chairman of the Commission
  - Election of the Chairman and Vice-Chairman of the Commission
  - Adoption of the agenda
  - Election of the Drafting Committee
- **Technical topics**
  - Desert Locust upsurge (2019-2021)
  - Control operation improvement
  - Climate change
  - The new midterm work plan of the Commission (2022-2025)
  - New technologies
- **Financial topics**
  - Financial resources of the Commission; emergency fund
- **Administrative topics**
  - Thirty-first Session recommendations: review and achievement
- **Commission financials**
  - Accounts for 2019–2021
  - Work plan and budget for 2021–2023
  - Any other business
  - Date and place of the next session
- **Session Closing**
  - Adoption of the Report
  - Closing

Election of the Drafting Committee

The representatives of Bahrain, Ethiopia, Qatar and Syria were elected as member s of the Drafting Committee. The Commission has also carried out the secretarial of the session.

A moment of silence has been observed in the memory of Mr Heruy Asghedom, former Director General at the Ministry of Agriculture in Eritrea and a member of the Commission Executive Committee.

Member Countries Response to Desert Locust Upsurge (2019-2021)

The Delegates of member countries had presented their reports on the Desert Locust situation and the activities implemented during the previous period 2019-2021.

Bahrain

In May 2019, some locust swarms were recorded in urban areas, which were immediately controlled. In February 2021, swarms of locusts arrived from Saudi Arabia due to strong winds and were also controlled by direct communication with colleagues in Saudi Arabia. Following that, Bahrain has prepared survey and control teams that were distributed in the regions. The locust unit ensured the availability of pesticides and control equipment, activated a hotline to receive reports and continued to follow up with specialists in neighboring countries. From this experience, Bahrain has recognized the importance of making use of the media and social media to mobilize all stakeholders including farmers during locust upsurges and highlighted the need for direct coordination with the commission and its role in supporting efforts to control locust outbreak. Bahrain also recognized the importance of participating in the training programs introduced by the Commission and the importance of coordination with neighboring countries.

Egypt

In 2019, surveys were carried out in the southeast of Egypt on the coastal plains and the coastal plains of the Red Sea to the Sudanese border, passing through Abu Ramad and Halayeb, southwest of Egypt, Abu Simbel, Toshka and the Western Desert (Bahariya Oasis and the New Valley), a total of 63,830 ha surveyed area. Two swarms of mature locusts in Halayeb arriving from Sudan, groups of hoppers and locusts were controlled with a total control area of 21,152 ha. The environmental conditions were suitable for locust breeding due to the presence of dense vegetation in most areas.

In 2020, the coastal plains of southeast Egypt were surveyed, in addition to the coastal plains of the Red Sea to the Sudanese border, passing through Abu Ramad, Halayeb, southwest Egypt, Abu Simbel, Toshka, the Western Desert (Bahriya Oasis and the New Valley), Matrouh Siwa and Salloum. The total surveyed area was 74,592 ha. Two locust swarms were controlled, over a total control area of 3,054 ha. In 2021, 171,926 ha was surveyed, with a total control area of 1,263 ha where swarms were coming from Saudi Arabia.

All necessary measures have been taken to deal with any potential infestations by deploying survey teams for any locust developments. The Ministry of Agriculture took advantage of the available technology such as wind and rain maps, vegetation maps, and the application of satellite maps for surveying paths and maps. Egypt has benefited from the reports provided by the Commission and neighboring countries. Egypt's main challenges lie in the delay that occurring during the funding process within the government, in addition to the declining trained staff due to retirement.

Eritrea

In Eritrea, more than half of the country area, which is estimated to 7 million ha, is favorable for Locust breeding during good climate conditions. The winter breeding area is the largest area covering 4.7 million ha and lies along the 1200 km length along the Red Sea coast. It also has a long rainy season starting from September to April. The summer breeding area covers 2.3 million ha and is found in the Western lowland of the country, which usually has a short rainy season from June to September.

In 2019, the outbreak was composed of both local breed in the Red Sea coast and Desert Locust swarms arriving from neighboring countries. The infestations spread to three regions of the country: Northern Red Sea, Southern Red Sea and the Southern region. No significant crop damage was recorded. In 2020, the outbreak included both local breed and invasion. The first phase of invasion was in August 2020 containing mature swarms from Ethiopia. Ground control operations were conducted successfully; however, the remaining mature swarms reproduced and laid eggs throughout the country. The second phase of the locust invasion arrived in waves of immature swarms from northern Ethiopia starting in October 2020. The swarms arrived through the southern region and spread throughout the country. Successful ground control operations were conducted across the country. Control operations on the new emerged hopper bands were also carried out in four regions of the country, namely the GashBarka Anseba, Northern and Southern Red Sea Regions.

Eritrea has continuously prepared itself for any locust emergency. National high-level meetings were conducted to consolidate the national desert locust management task force up to the village level. In the meeting, Ministers of Agriculture, Local Government, regional governors, military commanders and senior officials of the MoA participated. Annual work plan for controlling Desert Locust was thoroughly discussed with all stakeholders and the consensus was reached, which included 1) guidelines for Desert Locust management teams; 2) raising awareness of community and military personnel on biology, survey, control and safety; 3) staff training on behavior, surveillance, control, maintenance and repair of various spraying equipment; 4) deployment of trained technicians in the control operation to immediately maintain the spraying equipment; 5) and conducting a weekly regular meeting of Desert Locust management authorities in headquarters chaired by the Minister of Agriculture.

Ethiopia

Desert locust infestation started in June 2019, with scattered mature locusts first seen in Tigray Region in the Adigrat area. During summer breeding in June 2019, mature swarms started migration from Yemen to northeast Ethiopia's Afar region. In the meantime, from the eastern direction, mature swarms crossed from Somaliland to the eastern Ethiopia Somali region. Climate change, caused by cyclones brought continuous rainfall to eastern and northeast Ethiopia. Due to inaccessible areas, around 30-40% of the hatched hoppers migrated to crop areas of east Amhara, south Tigray and eastern Oromia. Around 70 districts were infested in four regions (Amhara, Afar, Tigray and Oromia). Ethiopia conducted aerial and ground control operations, which were followed up by the Prime Minister.

In the period between 2019 and 2021, the surveyed area increased from 125,000 ha to 6.7 million ha, with areas infested rising from 54,000 ha to 372,000 ha. Control operations covered around 48,000 ha in 2019, which increased

to 958,000 ha in 2020 and 316,000 ha in 2021. The main challenges are associated with the shortage of budget, sprayers, particularly vehicle mounted and motorized, field survey vehicles and trained desert locust officers. From the lessons learned, Ethiopia is establishing a Desert Locust Control unit and regional bases closer to breeding sites through the World Bank Fund, in addition to procuring five aircrafts and 11 survey drones to increase survey and control operations.

Iraq

After receiving the reports on swarm's movement from Saudi Arabia and Kuwait in the Desert Locust Bulletin issued by the Food and Agriculture Organization (FAO), the first reporting of desert locust swarms in Iraq was in the Muthanna Governorate, southern Iraq, on the border with Saudi Arabia on 19/2/2020. Afterwards. There were reports of desert locust swarms in the governorates of Basra, Dhi Qar, Diwaniyah, Najaf, Anbar and Holy Karbala. The environmental conditions were not ideal for locust breeding due to the lack of rain and vegetation in most areas. In addition, the control operations were efficient and the movement of control teams was rapid for controlling the first generation after laying eggs; such as plowing the land to expose eggs to weather conditions and the use of chemical pesticides on hoppers.

In 2021, the first swarms arrived in Basra Governorate in March 2021, with other infestations appearing in the governorates of Anbar, Najaf, Karbala and Muthanna. Environmental conditions were not suitable for breeding and spread of Desert Locust significantly in the governorates due to lack of rainfall and vegetation cover since mostly are desert areas, in addition to the rapid response of technical teams and the high efficiency of control operations against the hopper bands.

Iraq benefited from the support of the Commission, with eight GPS and four AU8115MS sprayers for ground operations. Meanwhile, Iraq has taken measures for any locust emergency by continuously monitoring reports from the Commission, except that it has a shortage of trained staff for monitoring and control operations, and lacks the logistical and technical capabilities for satellite monitoring and analysis. There is a need to coordinate with the Commission in training on survey and control operations, environmental health and safety standards and pesticides management.

Jordan

Jordan has developed an emergency plan in preparation for the desert locust crisis by developing an emergency plan that included training staff, forming survey and control teams, procuring sprayers and pesticides provision, coordinating with relevant authorities at the local and regional levels, and continuing to monitor locust through the Commission (CRC) and neighboring countries. A simulated control operation was also carried out in the southern governorates under the supervision of His Excellency the Minister, with the participation of all supporting authorities of the Ministry, and a spray plane after installing the aerial spray device to ensure the effectiveness and the efficiency of the device in the control operation.

In 2019, swarms of immature desert locusts were reported in Ma'an Governorate / Al-Jafr District, Manawkh District and Tafileh Governorate (Al-Birra, Dana, Al-Ais). The swarms were controlled through the ground and aerial control, an area of 3 000 ha and 2 435 liters of Pesticides (ULV, EC), with no damage caused to crops and pastures.

In 2020, small groups of immature desert locusts were reported at Mafraq Governorate/ Al-Ruwaished, and control operations were not carried out due to the lack of it. In the following year (2021), sexually mature swarms have been reported with copulation and laying eggs, where the eggs hatched and reached the age of the hoppers (4 + 5) in most of the governorates of the Kingdom. The quantity of pesticides used was 30 000 liters of (ULV, EC) pesticides and no economic damage was recorded because of the infestation.

Kuwait

During the Desert Locust upsurge of 2019, the mild weather and rainfall provided a suitable environment for the desert locust swarms crossing over to Kuwait with small groups of hoppers sited in the south of agriculture areas, where it was immediately controlled over an area of 15 635 ha. Continuing into 2020, large numbers of immature locust swarms were reported north of Kuwait due to favorable climatic conditions. However, in 2021, due to a lack of rain and unfavorable climatic conditions, only small-scattered swarms were reported in some parts of southern Kuwait where 26 ha were controlled.

During the 2019-2021 upsurge, the Public Authority for Agriculture Affairs and Fish Resources took various measures to mitigate the effects of the desert locust invasion by forming an emergency team with three sub-teams: monitoring, survey, and follow-up teams. The area of operations was divided into two: north and south. All government mechanisms

and agencies in Kuwait were included in the response, including the Kuwaiti army, the Amiri Guard, the Civil Defense, and the General Fire Department. All human, financial and logistical resources were provided. The Public Authority for Agriculture Affairs and Fish Resources managed the operation, guiding all efforts with the provision of all equipment and pesticides during the upsurge.

Internally, the Public Authority for Agriculture Affairs and Fish Resources conducted awareness-raising campaigns and provided instructions on how to deal with desert locust swarms by citizens and farmers through social media channels of the Public Authority for Agriculture Affairs and Fish Resources. A hotline was set up to receive desert locust monitoring reports from citizens and farmers. Posters and awareness brochures have been also distributed to farmers. Externally, Kuwait continued its cooperation with neighboring countries and the Commission and benefited tremendously from the cooperation with Saudi Arabia, which assisted in early warning.

The main challenges during the upsurge included the low number of employees specialized in Desert Locust Control, and the readiness of monitoring and survey teams, control teams and follow-up teams with specialized equipment and mechanisms to monitor, control and follow up on desert locusts. Due to inadequate budget allocation – that includes the provision of specialized staff, mechanisms, equipment and special pesticides for Desert Locust Control –, the response could have been faster.

Lebanon

Lebanon did not report any locust infestations during 2019 and 2020, but in April 2021, swarms arrived from the Syrian border in the Aarsal area in Beqaa valley, due to strong winds and rising temperatures. Around 10 locations in the Baalbek area with mature locusts were controlled by the Ministry of Agriculture, supported by the Lebanese Army and local municipalities using deltamethrin 2.5% ULV, aerial spraying and X-Cyhalothrin for ground spraying. The Plant Protection Authority was constantly following up on the initial reports of the locust situation in the region issued by the organization and the Commission, and the possibility of desert locust swarms arriving in Lebanon. The Ministry informed the Commission Secretariat about the locust situation, the locations, and the daily control operations. As rapid support, the Commission and the organization provided insecticides and ground spraying equipment AU8115MS & AU8000. Lebanon expresses its gratitude to the Commission and requests additional training in preparing reports, emergency plans, ground and air control operations, and training on both operating and maintaining the sprayers.

Oman

In April 2019, locusts groups arrived from the Empty Quarter and Yemen and were controlled in an area of 12 ha. In September, Cyclone Hikka hit southern Oman, accompanied by heavy rains covering a large area of southern Oman and Yemen. Surveys were intensified and no locusts were recorded during that period in those areas. In October 2019, swarms of locusts arrived from the north and were able to lay eggs in some locations, and control operations continued in the governorates of Al Sharqiyah, Al Wusta and Al Batinah until December.

In 2020, control operations continued in the eastern and central governorates against hopper and adult groups, and in the governorate of Dhofar, control operations began in June and continued until the end of August. While the situation was calm in 2021 in various governorates, there were no control operations.

The warnings of the Commission contributed to the preparation of timely monitoring, survey and control. In total, a survey of an area of 215,782 ha was conducted during the three years, and an area of 15,569 ha was controlled using more than 18 tons of pesticides. The locust control department was strengthened with many control equipment. Full preparedness, restructuring of the locust department, increasing cadres, and preparing and updating the national emergency plan were the lessons learned.

Qatar

Qatar is considered among the invasion countries, and therefore there are no desert locust breeding areas in the country. The Department of Agricultural Affairs follows up the locust situation in the countries of the region and communicates regularly with the Commission Secretariat. Accordingly, necessary measures have been taken, including early preparedness of locust control, the development of action plans by forming survey and control teams and their distribution in probable infested areas providing them with the necessary equipment for survey and control operations if necessary.

From February 20-23, 2020, desert locust swarms were reported in the western and southwestern regions of the country with medium to low densities, and control operations were conducted immediately by the concerned authorities for an area of 50 ha using 80 liters of the pesticide deltamethrin 2.5 EC. Crop losses of about 170 tons

were recorded. There were no locust infestations during 2019 or 2021, but survey operations continued, with a total surveyed area of 1,100 ha.

Based on Qatar's request to the Commission asking to provide technical support to assess the situation and develop the necessary action plans for any similar developments. The Commission assigned the FAO expert, Munir Boutros, to carry out the task, who submitted a proposal to establish a national system for desert locust monitoring and control that included all concerned authorities in the country, to develop proactive plans for monitoring and control. Work is underway to implement the recommendations proposed by the expert in terms of strengthening the locust control department with the necessary equipment, in addition to training staff in various fields preparing and updating the national emergency plan.

Saudi Arabia

The Kingdom is one of the most important breeding countries in the central region with two breeding seasons. Winter breeding on the Red Sea coast and spring breeding in the interior and eastern regions of the Kingdom. In 2018, the desert locust situation was calm in most countries , but in May of that year two cyclones formed in the Arabian Sea (Sagar and Mekunu) resulting in heavy rainfall in Oman, Yemen and the Empty Quarter, and several generations of breeding occurred in the border triangle in the Empty Quarter area between Saudi Arabia, Oman and Yemen, which led to an increase in locust numbers. A third cyclone (cyclone Luban) hit the southern region of Oman in October 2018. Good rains also fell on the coasts of the Red Sea in the north, south, east and west until November and December 2018, so the environmental conditions for breeding improved, and the number of locusts increased in all breeding countries in the central region warning of an upsurge.

In January 2019, the swarms resulting from the border triangle moved towards the center and east of the Kingdom to reach Riyadh and the Eastern Province, then to Qassim and Hail, and some swarms has also moved to Iran, where widespread breeding occurred. In February, breeding continued along the Red Sea coast from Al-Lith to the south of Al Wajh, where groups of hoppers were formed, eggs were laid in the interior areas, swarms and groups of adults appeared, controlling 18,468 ha. In March, spring breeding continued in the interior regions, where some swarms and groups moved and laid eggs. While control operations continued on the Red Sea coast, where 45,705 ha were treated. Spring breeding continued in the interior and eastern regions in April, groups and hoppers groups were controlled, in an area of 27,812 ha. As a result of the good rains that fell in the spring breeding areas in May, the environmental conditions for breeding continued to improve. Intensive control operations continued as 74 237 ha was controlled in May, 3 9270 ha in June and 1 300 ha in July.

In August 2019, unusually good rains fell along both sides of the Red Sea in Yemen, Saudi Arabia and Eritrea, which allowed breeding to occur in the following month and groups of hoppers formed and groups were seen in the Asir mountains between Al Baha and the Yemeni border and near Najran and on the southern coast of the Red Sea near Jizan, where some groups maturing and copulation occurred before the end of the month. Ground teams treated 3 900 ha in August, 4 195 ha in September and 1 805 ha in October.

The situation worsened in December 2019, the worst desert locust upsurge in the Kingdom in nearly 25 years due to the spread of the infestation and its intensity, where mature whole insect groups formed along the coastal plains of the Red Sea from Jizan to the north of Al-Lith. Swarms were seen near Al Qunfudhah and south of Asir between Abha and Najran, reaching the neighboring coastal areas of Yemen. Eggs were laid, extensive hatching occurred starting in the middle of the month and many groups of hoppers formed. Swarms also appeared in the interior regions west of Qassim and south of Hail, and the pace of control operations increased, reaching 43 798 ha.

The locust situation in the Kingdom did not subside. In February 2020, first-generation locust groups continued to appear on the Red Sea coast near Al Qunfudhah, where a large number of hopper bands and immature groups were found. In the interior, immature groups and swarms appeared and moved north reaching Al-Ahsa on February 16 and Hafr Al-Batin on the 18th. Intensive control operations were carried out inland, where 64 522 ha was controlled. In March 10 390 ha was controlled in the spring breeding areas between Al-Ahsa and Al-Ulaya and in the north between Hail and Al-Jawf, while the situation calmed down along the Red Sea coast. In April 2020, breeding continued near the northern Arabian Gulf between Dammam and Al Ahsa and Al Olaya, and more hopper bands formed, as well as near the borders of the UAE, where 29 868 ha were controlled in April and 9015 ha in May. Then the breeding began to decline at the end of May. In June 2020, immature swarms were seen north between Al-Jawf and the Iraqi border, as well as whole insect groups north of Hail, and 5 360 ha of infestations were treated. In July 2020, control teams treated 440 ha of adults and adult swarms in the Asir Mountains.

Rain fell on a large part of the southwestern coast of the Kingdom at the end of July and the beginning of August, which improved environmental conditions and breeding in large parts along the coast between Al-Qunfudhah and Jizan. The arrival of mature swarms from Yemen to the southwest of the Kingdom from the mountains of Asir and the coast of Jizan was also recorded, and controlled in an area of 3 135 ha. Mature swarms laid eggs in some locations.

Group formation continued during October, November and December. In March 2021, locust swarms continued to decline due to control operations and lack of rain in the Horn of Africa with a temporary decline in the upsurge, but hatching and the formation of hopper groups continued in the Kingdom. In April 2021, young, mature groups moved north from Iraq, Jordan, Syria, Lebanon and Sinai (Egypt). In May 2021, hatching occurred and groups of hoppers and immature adult groups formed where they were controlled. Starting from July and August, the frequency of locust swarms in the Kingdom decreased significantly, as only scattered numbers and groups remained.

For two whole years, the Kingdom exerted great efforts to control the desert locust swarms and groups throughout the Kingdom in an unprecedented situation for more than 25 years. Therefore, the Kingdom harnessed all the necessary human and material resources to continue working day and night until it succeeded in controlling the desert locust outbreak. The most important lessons learned from this outbreak was the necessity of permanent early preparedness, providing all survey and control requirements, constantly monitoring the locust situation with the continuity of qualifying human cadres and setting action plans and emergency plans to activate them in times of crisis. In total, the Kingdom has controlled approximately 791 000 ha (281 000 in 2019, 286 000 in 2020 and 224 000 in 2021).

Sudan

In 2019, Sudan conducted extensive surveys of winter breeding areas along the Red Sea coast. Swarms at the southern coastal areas between Eritrea's borders to the Suakin area near Port Sudan were reported, and aerial and ground control operations were conducted on different stages of locusts, including 48 swarms. Summer surveys started in June 2019 with breeding in 7 states, but by the end of the summer season, a low density of groups of hoppers and adults were detected and controlled in some parts of the Nile, Northern and Kassala states. With the vegetation drying up by the end of the year, the adults gathered and formed dense groups and swarms in areas of green vegetation. Ground control operations were carried out in the Bayuda desert and some areas along the banks of the Atbara River and the West Bank of the Nile, west of Berber. By the end of November, the outbreak had ended and about 162 000 ha had been controlled in total.

In 2020, the desert locust situation worsened, especially in the winter breeding areas, where about 31 swarms of sexually mature locusts were controlled in the southern and northern coastal regions. After that, the situation calmed down in April, but regular surveys and close monitoring continued during the mentioned period, including in the areas of the Nile Valley and Atbara River. In September, the desert locust situation developed significantly as a result of infestation across the southern coastal borders of the Red Sea State with many mature locust swarms. During September and October, no less than 40 swarms spread in a vast area between the Atbara River and the Red Sea Hills. The rainfall in these areas greatly improved the environmental conditions and consequently copulation and hopper formation occurred on a large scale. As a result of the dryness of the vegetation cover in the summer breeding areas, immature swarms continued to arrive in the coastal areas during November and December, especially in the Tokar delta, the northern coastal areas and the areas adjacent to the Eritrean border (41 swarms). As a result, aerial and ground control operations escalated to contain the spread of locust groups and swarms wherever they were detected. In total, 174 000 ha were combated. Environmental conditions remained favorable for breeding along the Red Sea coast as a result of heavy rains during December 2020.

In 2021, control operations on groups of hoppers and adults continued in the southern coast and western Wadi Ad-Dib during the period from January to May 2021 as a result of the breeding that occurred at the end of 2020. Large infestations were controlled from February to mid-April (45 swarms) on the southern and central coast between Suakin and Tukar. During April and May, infestations concentrated in the central region where many groups of hoppers and newly winged locusts were controlled south of Suakin to the Toker Delta. The situation calmed down by the end of May to September, and no large gatherings were reported in the summer breeding areas. Between October and December, as vegetation dried up, adults gathered and dense groups formed in the lowlands and valleys where patches of green vegetation were present. The onset of an outbreak in the Bayouda desert, in areas located on both sides of the seasonal Atbara River and the western bank of the Nile, west of the Berbers. Where intensive ground and aerial control operations were carried out. Moreover, drones were used in inaccessible areas to detect any unexpected infestation. By the end of November 2021, the locust oubreak had ended. About 400,000 ha was controlled from 2019 to 2021.

Sudan mobilized all its resources under the supervision of the Steering Committee for Desert Locust Control, formed from various ministries and government agencies (Agriculture, Interior, Defense, Finance, Customs, etc.), as well as regional and international organizations (FAO, DLCO- EA and donors). About 23 aircraft were contracted, with 5 aircraft deployed and operated in the Red Sea, Kassala and River Nile states. All airstrips were rehabilitated and equipped for aerial control operations, where pesticides, control equipment, jet fuel (V-Gas) and other related materials for survey and control operations were distributed to all locust control stations, with the distribution of 10 teams in the Red Sea and Nile states, conducting periodic surveys and control operations.

Syria

Syria, an invasion country, with no reports of Desert Locust in 2019-20 despite favorable environmental conditions for locust and hoppers copulation. Usually, an annual reserve of approved pesticides used in the control of desert locusts, local locusts and local grasshoppers (Sunna - Eurygaster integriceps) is available, sufficient to treat 25 thousand ha. However, there is a great shortage of locust sprayers.

In 2021, Syria was exposed to unprecedented swarms of desert locusts in different regions of the Syrian governorates. Several groups were also discovered in the Deir Ezor region coming from Iraq, and some of these groups moved south and west to the Syrian Badia and the Maskanah area in Aleppo. Large groups were recorded at the governorates of Daraa, As-Suwayda, and Quneitra in southern Syria, in addition to other groups in the governorates of Damascus, Damascus countryside and Homs. Control operations started the following day from the first warning of locust reporting (16 April 2021). Survey and control teams were formed in all Syrian governorates, and the necessary pesticides and sprayers were distributed to the affected areas. Locusts were sexually mature and laid eggs in many sites that were monitored and controlled at the hopper stage. The total area surveyed was 50,000 ha and 3,879.5 ha was controlled until June 13th, with 1,438 liters ULV and 600 liters EC used. No significant economic damage was recorded as a result of the rapid response in all the sites.

Regular contact with the Commission Secretariat to provide urgent assistance from the Commission and the Organization, and 20 backpack-mounted sprayers AU8000, 11 AU8115MS car-mounted sprayers and 15 hand-held sprayers ULV+ were provided. A virtual training course for Desert Locust Control teams in Syria was implemented on the eL3m information transfer program on October 5, 2021.

The crisis that faced Syria caused many problems, especially in the field of agricultural pest control, including securing specialized spraying equipment and pesticides. The planes used in the control operations were out of service, and ground spraying equipment was vandalized and stolen in many governorates, with a percentage exceeding 90% of the total equipment that was present. To rehabilitate the locust management system in Syria, the situation requires rehabilitating the technical staff, especially in the field of survey, control and reports prepared according to modern programs eL3w, eL3m and others, drones, and environmental health and safety. In addition to providing spray equipment for agricultural aircraft, spare parts for sprayers, agricultural aircraft, GPS devices, aerial survey drones, samples of the biopesticide Metarhizium for registration, health and safety testing devices, and technical and financial assistance in the restructuring and the establishment of an autonomous locust control unit, and the development of a national contingency plan.

United Arab Emirates

In January 2019, some Desert Locust swarms were monitored in the western region of the country (Al Dhafra) near the Saudi border, where control operations were carried out and surveys were intensified, especially in areas where the infestation was expected. Desert Locust was reported in February 2020, and control operations were carried out. In March 2020, other groups of immature adults were detected in the Al Dhafra (Al Sila) area near the Saudi border, and the necessary control operations were carried out. In April 2020, Desert Locust hoppers were reported on the border strip adjacent to the Sultanate of Oman in the southern sector of Al Ain. Locust hoppers were also spotted in their early stages in April 2020 in the Ras Ghamis area in Sila, near the Saudi border. In May 2020, control operations of scattered swarms continued along the border with the Sultanate of Oman in the Al Qaa region in the southern sector of Al Ain city and up to the Al Shuaib region, and in the northern sector in the areas of Maliha and Madam in Sharjah, Masfout in Ajman and Hatta in Dubai. Locusts were also reported north of Dubai, and they were controlled. Monitoring and control of hoppers and mature locusts continued in the Ras Ghamis area near the Saudi border and south of Al Dhafra near Liwa until June 2020, with a total area of 6,100 ha controlled. In 2021, there was no Desert Locust reported.

The country has taken major actions to reduce risks in the period 2019-21, including taking precautionary measures to control locust swarms through continuous monitoring and survey operations within the country. Throughout the upsurge, UAE was in coordination with the Commission and continued to follow up by providing reports on the size, status and movement of desert locust swarms. UAE has actively participated in virtual training courses in the field of desert locust survey and control, in coordination with the Commission Secretariat.

Desert Locust Control has been adopted by the highest levels of government in the UAE. Ministerial Resolution No. 287 of 2021 was issued to form a national working group for desert locust survey and control, which set an action plan approved by the Ministry of Climate Change and Environment. The UAE has also worked to enhance public awareness of desert locusts and reporting through the Biosecurity Early Warning System, which is the electronic platform approved for reporting agricultural pests, including desert locusts, in a manner that ensures rapid response and enables easy handling of incoming reports.

Yemen

Yemen has been subjected to many tropical cyclones that started in mid-2018, as rain fell on most areas of the country, and valleys and reefs, favoring suitable environmental conditions for locust breeding in remote desert areas, especially the Empty Quarter, which led to breeding and invasion of locusts to many locations. Locusts were reported in northern and central mountains located in the governorates of Sana'a, Saada, Amran, Dhamar and Al Mahwit. Given the appropriate environmental conditions, this caused unprecedented additional breeding in many locations in those governorates, and new swarms were formed and moved internally towards the winter breeding areas on the coastal plains of the Red Sea.

During the last quarter of 2019 and the beginning of 2020, Yemen faced another outbreak and breeding of desert locusts in the western coastal areas located in the Tihama Plain, which exacerbated the problem and caused severe damage to crops and agriculture. The Ministry of Agriculture intervened to carry out control operations in various areas of the Tihama Plain, but due to the density of swarms, the issue got out of control and some swarms moved towards the winter breeding areas in Saudi Arabia and the Horn of Africa.

Conditions in Yemen were not suitable to deal with a major outbreak for various reasons, including 1) the lack of security and stability due to the ongoing conflict, 2) the weakness of the locust control center, which had no survey and control vehicles nor an operational budget, 3) the expansion of the affected area including inaccessible remote areas, 4) the presence of bee hives in some locust-infested areas and the refusal of beekeepers to conduct control operations. For these reasons, Yemen faced unprecedented breeding of desert locusts, resulting in swarm migration to neighboring countries.

Despite the efforts made by the Food and Agriculture Organization and the Commission to assist the Locust center alleviate the locust crisis, the center continued to face various challenges, including: 1) the lack of a budget to mobilize survey and field control teams, as the center relies on the assistance provided by the Food and Agriculture Organization (FAO), which does not come at the right time, 2) the lack of very essential control equipment, including four-wheel drive vehicles and sprayers due to locust breeding areas in vast and remote desert areas, 3) weak cooperation between concerned authorities and the center to facilitate the movement of the field teams and to overcome the difficulties that hindered their work, most importantly the presence of beehives in areas near locust infested areas, which is considered one of the main obstacles facing control operations, 4) Lack of media coverage to educate farmers and beekeepers on the dangers of desert locusts urging all segments of society to cooperate with field control teams, 5) Weak participation of agricultural offices in the targeted governorates due to lack of resources. The general situation improved from mid-2020 through the assistance provided by FAO and the Commission in terms of an operational budget and securing vehicles for survey and control teams, in addition to spraying equipment and pesticides needed for control. In general, locusts were controlled in an area of 59 thousand ha, approximately 10,000 ha in 2019 and 48,000 ha in 2020.

The center continues to follow up with the concerned authorities at the Ministry of Finance to provide an operating budget to assist the locust center to secure vehicles for monitoring and surveying locust-breeding areas. The center is also working with the Ministry of Local Administration to address the governors and directors of the districts to cooperate with the locust control teams to remove the beehives from the affected areas, which is the main obstacle in control operations. The center is also communicating with the Ministry of Information to for raising awareness of the danger of desert locusts and their effects on agricultural wealth and food security, as well as working with agricultural departments in the targeted governorates to adopt the advisory aspect, educate farmers about locusts, and to immediately report the start of any locust activity on time.

Through the extensive discussions that took place after the countries reviewed the reports they submitted; the following recommendations were agreed upon:

Recommendation 1: The Commission urged the member countries to preserve the national capabilities available in their countries, and the capabilities gained within the framework of the Rapid Response Project to the Desert Locust upsurge (2019-2021). This could be attained through regular maintenance and good storage of vehicles, sprayers and equipment, and their use in non-other than Desert Locust Control according to the recommendations of the Food and Agriculture Organization in this regard.

Recommendation 2: The member countries are encouraged to regularly prepare, activate and continuously update national Desert Locust action and emergency plans and to send a copy to the Commission Secretariat with the latest update.

Federal Republic of Somalia

Somalia is one of Desert Locust breeding countries in the Horn of Africa. However, in 2019, desert locust from Yemen invaded the north western and northeastern regions, with no control operations due to lack of needed resources, which later severely affected crops and pasture of the entire country. In late December 2019 Tropical Cyclone Pawan and in November 2020 Cyclone Gati in northern Somalia, creating perfect conditions for the upsurge to develop.

Due to the massive breeding, the Federal Government of Somalia declared a state of emergency in 2020 and a Desert Locust emergency response strategy was developed together with FAO. Since 2019, Somalia has treated around 450,000 ha by using both ground and aerial means. Somalia built on the capacity for desert locust teams, developed a country strategy, procured new vehicles and sprayers, pesticides distributed in the needed locations, contracting of aerial plans when needed, and established the National Desert Locust Task Force.

The task force has continued to procure adequate and replacement of old PPE in advance, procure drum crushers, train teams on pesticide safety and use of only IGR and bio-pesticides, and cleanup of airport spillage areas. The task force has gained several lessons learned from previous operations including the implementation of regular surveys and reporting required during breeding seasons (winter and spring), procurement of strategic stocks of chemical to allow for quick response to developing crisis. The task force still needs to increase close cooperation with neighboring countries on control, survey, equipment and chemical compounds sharing, continuous engagement on desert locust matters even during the recession period and to constantly update the technology used for desert locust work in the field.

Lessons Learned from the Desert Locust Campaign (2019-2021)

The Commission presented the challenges faced during the desert locust campaign of 2019-21, primarily the restrictions of COVID-19, delays in funding and lack of emergency funds despite Commission Secretariat's early warning of the coming crises (High level Emergency meeting for Deputy Ministers and concerned Ministries in the member countries in Cairo, July 2019). Hence, it is essential to rely on national resources and the provision of control equipment for at least 6 months.

Climatic changes had also contributed significantly to the beginning of the crisis and the aggravation of it, resulting in an expansion of locust outbreak among the countries of the region. The strong winds accompanying tropical cyclones and the heavy rainfall over large areas, reaching remote, uninhabited areas, led to increased opportunities for favorable conditions suitable for breeding for periods up to 6 months.

The Commission Secretariat also highlighted the insufficiency of information tools in some countries that were not within the locust control system, as well as the lack of trained cadres for monitoring and information exchange in some of the member countries. When the locust upsurge accelerated during 2019-21, the eLocust3 devices available in these countries were not sufficient to cover all infestation sites, resulting in unclear size, breeding sites and swarm patterns in those countries.

National locust control units in the breeding countries, pest control departments and plant protection departments in the invasion countries, have carried out control operations using chemical and biological pesticides through ground and aerial spraying. The Commission reiterated the need for continuous investment in obtaining and upgrading information exchange tools. In addition to accelerating the introduction of new technologies in surveying such as drones, the importance of recording and actual use of alternative pesticides (bio-pesticides and growth regulators) that are also safer for the environment and contribute to the application of early control (Appendix 3).

Effective and Sustainable Operation of the National Locust Control Units (UNLAs)

The Commission presented its observations on the effective operation of National Locust Control Unites, noting the institutional differences between breeding countries and invasion countries Desert Locust management. In the breeding countries, desert locust operations are managed through the so-called "national locust control units". These units have its own financial resources, specialized staff and resources that enable them carry out regular and emergency desert locust operations. In the invasion countries, Desert Locust infestations are managed through the Plant Protection departments, which direct some of its resources on need basis to locust control operations, which are often insufficient, as it is not among the regular work plan and so it is considered as an exceptional situation.

When evaluating the performance of the national locust control units during the locust upsurge in the region (2019-2021), it became clear that the Desert Locust Control units with financial and administrative autonomy (Saudi Arabia, Egypt and Oman) had sufficient national resources and capabilities to generally deal with the locust upsurge in a better way than other non-autonomous units. The administrative and financial autonomy of these units empowered

them to manage the crisis better than the units with limited administrative and financial capabilities, taking into account the length of the campaign, which lasted nearly two years. Despite the different capabilities of the Desert Locust Control units in Eritrea and Sudan, they still need more support and reinforcement, especially with regard to enhancing financial resources and enhancing administrative independence. Its efficient management of survey and control operations enabled them to overcome the crisis in an excellent manner, which was positively reflected in locust control in the end. The generous international aid was fortunately obtained to support the efforts of these countries in controlling locusts. However, this does not replace its need to enhance administrative and financial autonomy, because in normal situation, financial support is not obtained from international partners, and so depending mainly on what the state provides from its own resources allocated to the pest control sector, which includes desert locust. While the situation in Ethiopia was different, as the preventive control strategy had not been implemented yet, the locust swarms had invaded in large areas of the country. Despite the clarity of the picture and the development of the situation in northern Somalia and the spread of locusts between the border areas, the measures taken to avoid a major crisis were weak, primarily due to the lack of a specialized department for Desert Locust Control that has the basic capacities of survey and early locust control operations. Therefore, it is necessary to re-evaluate the situation and develop appropriate plans to establish locust control units in the locust breeding regions, especially adjacent to the northwestern borders of Somalia, to avoid the re-occurrence of the crisis in the future.

In Yemen, despite the existence of a locust control center, which enjoys partial independence and limited resources, the instability and the security situation severely affected locust management and control, as well as the performance of field operations. It was difficult to carry out the normal survey work of areas that received heavy rains because of the tropical cyclones that struck Oman and Yemen in 2018 and 2019. Thus, the favorable environmental conditions for desert locusts breeding was created and had a pivotal role in the beginning of locust breeding and its spread in Yemen and then the migration to the neighboring countries . This reflects the difficulty of working in locust breeding areas in the context of conflicts and wars. Therefore, a mechanism should be found to deal with locusts breeding in those areas, taking into account the unstable situation in a number of breeding countries.

As for the invasion countries, the preparedness and response mechanism differed from one country to another. In brief, it could be divided into two categories: 1) Countries that responded well as a result of early preparation (training and qualification of national cadres during recession periods, and equipping the control teams with the appropriate equipment available in the Plant Protection Department, before the beginning of the crisis. Then, the phase of following up on successive developments of the locust situation issued by the Food and Agriculture Organization and the Commission, in order to prepare the final response. 2) Countries with the least response - despite the presence of some trained cadres -, where the response mechanisms were weak, because the control teams were equipped with equipment after the locust invasion, provided that successive warnings were delivered of possible locust arrival in those countries without prior notice.

Accordingly, it is imperative for all member countries to prepare and strengthen strong governance structures and policies for locust response, including ensuring the presence of operational and independent units with appropriate national capacity for Desert Locust management, and maintaining awareness of the locust threat in all government structures and sustainability of the experience gained in the field of locust control (Appendix 4).

Recommendation 3: The member countries, especially the breeding countries, should institutionalize all the units / centers / departments / directorates operating for the Desert Locust Control. They should be administratively and financially autonomous with a sufficient annual operational budget in order to conduct various Desert Locust Control operations.

Recommendation 4: The Commission strongly recommended that breeding countries should establish departments, centers or units specialized in managing locust survey and control activities with financial resources to ensure efficient operation and successful management in accordance with the provisions of the Establishment Agreement of the Commission.

National Human Resources (Qualification and Adequacy)

One of the lessons learned from the 2019-21 Desert Locust crisis was the need for more qualified personnel in this area from the Plant Protection Departments to support locust control units during major infestations. The Commission Secretariat noted that the capacity of human resources was a constant constraint on survey and control operations in a number of countries in the region due to a number of factors, including the turn over, and the lack of sufficient attention to the training process in some countries. In other countries, the staff involved in locust management were unskilled at the beginning of the locust outbreak despite the presence of dozens of previously trained staff, which resulted in the poor ability of survey and control teams to control the outbreak especially with the huge scale of the locust upsurge in 2020-21.

The Commission Secretariat indicated the need to continue the development of national capabilities for locust management, survey and control operations, with a focus on expanding capabilities for all countries of the Commission in general and giving some priority to the breeding countries. The Commission will strive to ensure the provision of adequate financial resources and technical assistance to enhance capacities for sustainable training and qualification programs at all levels.

The Commission secretariat highlighted the failure of some countries to appoint new employees to locust control units, which negatively affects the efficiency and effectiveness of the current staff, who are often very old, which led to a severe shortage of qualified personnel. In addition, the Commission noted the low capacity in a number of invasion countries.

The member countries had also highlighted the need for regional support from the Commission to conduct regional training and supervision of survey and control operations as well as monitoring activities when needed.

Despite the presence of a plenty of qualified and trained regional locust experts who can provide support to other countries, especially English-speaking ones who are not under the umbrella of the Commission, the inability to speak English language reduced the opportunities to benefit from them. Therefore, this aspect should be taken into consideration when qualifying human cadres in the future (Appendix 5).

Recommendation 5: The Commission recommended that member countries should retain qualified cadres working in the field of locust control, as well as increasing their numbers, and replacing the retirees or staff, who have been transferred to other jobs, with new staff.

Reporting and Early Warning Systems and Tools: eLocust3 and Drones

The Commission secretariat presented the results and efforts of the national reports on breeding and invasion countries of the region during the 2019-2021 crisis. It was found that the availability of tools and devices for transmitting information in the breeding countries, in general, and their proper use greatly helped to send the correct information from the field and showed the readiness of countries for locust swarms. However, this was not the case in other countries such as Yemen, Ethiopia and Somalia, where the response was generally weak for reasons including the lack of information transmission devices and the lack of qualified staff, in addition to the transfer of employees to work on other tasks. While there was a great lack of access to information from invasion countries even after the introduction of eLocust3 suite due to the reservations of countries on these tools and not taking into account the observations they made.

The Commission shared with the member countries its reservations and concerns about the eLocust3m information transmission devices, as well as the need to save all data on secure servers and to restrict access by non-concerned parties to the eLocust3mPro information. The Member countries requested from the organization to make improvements to the operating system of eLocust3m devices in line with its proposals so that it can be fully utilized and used by all countries , and not to use the information of the countries without referring to the regional commissions, including research and scientific publication. The Commission was concerned to activate or disable the paid eLocust3 information transmission devices when they are not needed and to manage them properly so that the authority does not incur additional unjustified costs, noting that operating expenses of these devices amounted to approximately USD 60,000 during the upsurge, compared to $30,000 per year in the usual situation (Appendix 6).

Recommendation 6: The member countries recommended that the organization should pay more attention to the expansion of remote sensing applications so that member states could improve national capacities regarding climate change and its potential impact on the desert locust situation.

Recommendation 7: The member countries recommended that positive improvements should be applied to the eLocust3mPro operating system in line with the proposals of the countries so that all countries could fully utilize them. They emphasized that gathered information should be only used for early warning and it is not allowed to serve for any other purposes - including research and scientific publication - without referring to regional commissions. They also recommended that all the data should be stored on the secure servers of the organization.

Recommendation 8: The member countries requested that the organization should coordinate with the regional commissions in anything related to Information Development and Early Warning Systems. In addition, unilateral measures should not be taken without participating with regional commissions.

Recommendation 9: The Commission recommended that member countries should encourage national locust information officers to notify their relevant departments and then the Commission Secretariat, before cooperating with developers of tools and programs for locust information exchange (eL3, eL3m, eL3w, eL3g). Any technical decision should be taken in the light of prior coordination, which may entail some obligations on the Commission whether financial, operational or otherwise.

Recommendation 10: The member countries agreed that the Commission Secretariat would deactivate the eL3 devices in the countries directly if the device has not been used for two consecutive months, without returning to the country in question, in order to preserve the financial resources of the Commission.

Recommendation 11: The member countries strongly recommended the information service for the Commission Secretariat should be improved and benefit from the appropriate expertise and competencies to enhance and strengthen the role of the Commission in the field of information management and remote sensing to level up the efficiency of information exchange between the countries.

Improve the Emergency Preparedness to the Desert Locust Crises

Building on lessons learned from the 2019-21 locust upsurge, the Commission highlighted the key areas of improvement in desert locust emergency preparedness for future outbreaks. Since good preparedness for desert locust outbreak must include basic elements upon which the implementation of the preventive control strategy in all concerned countries is based, and this strategy requires a number of elements to be implemented, namely 1) the presence of independent national locust units, 2) the allocation of a reasonable operational budget, 3) The presence of qualified national cadres who are able to work and implement plans in the field, 4) the existence of a national emergency plan for rapid support during outbreaks, 5) The regional emergency plan and the emergency fund, which are used during crises and after the exacerbation of the situation, and where the regional emergency fund is used for rapid support until the international community plays its role and supports countries in the event of major outbreaks. In general, when applying the above, the national response will be sufficient to control the locust at the national level, which in turn will be reflected in controlling outbreaks in their early stages, thus preventing locusts from migrating to other countries and preventing their spread on the regional scale (Appendix 7).

Recommendation 12: The Commission urged the Member countries to notify and update the Commission Secretariat with the modifications on the data of the National Liaison Officers. Accordingly, the data should be updated frequently on the website of the Commission and the eLERT website.

Ground and Aerial Control Operations

The Commission Secretary presented three main areas of innovation and success implemented in the countries of the Horn of Africa 2019-21 during the locust upsurge and contributed to the success of the control operations, which included 1) the successful use of fixed-wing aircraft in the long-range aerial survey of desert locust swarms and hopper groups, 2) the success of control operations through effective use of modern equipment-based aircraft, new means such as DGPS and Track Guidance System have made control operations more flexible, lower operational costs and protecting the environment, as well as reduced failures or excessive applications of pesticides. 3) Use of software and GIS (EarthRanger) to link management and field teams to follow the movements of survey, ground and aerial control teams, as well as the management of instant reporting.

The successful use of survey and control aircraft had an effective impact on controlling the successive locust waves that spread in Somalia, Ethiopia and Kenya, where aerial spraying aircraft were used effectively and efficiently in surveying, identifying locust areas and their control. The planes used were equipped with all modern tools and specifications approved by the organization, which helped in giving positive results and legalizing the use of pesticides. Therefore, it is necessary that all aircraft used in aerial control meet the technical requirements and specifications, recommended by FAO and regional Commissions, before being used in locust control in the member countries.

Ground control equipment that uses ultra-volume spray techniques recommended by the organization have also proven their effectiveness in locust control when used by trained specialists and represented the cornerstone for control teams working on the ground, especially in countries that do not adopt spraying by aircraft. This led to controlling the rates of pesticide use and the recommended doses, thus reducing the costs of the control campaigns, as well as reducing the indirect damage that pesticides may cause to the environment (Appendix 8).

Recommendation 13: The Commission strongly recommended that all Member countries adhere to the technical conditions and specifications approved by the Food and Agriculture Organization of the aircraft and the support devices used in aerial control, to ensure the efficiency of control operations in terms of using the recommended doses, reducing pesticide losses and preserving human health and environmental safety.

Recommendation 14: The member countries recommended to the Commission the necessity of providing a regional stock of locust control equipment to support countries affected by locust outbreaks and upsurges if national resources are not sufficient to accommodate it.

Conventional Pesticides and Biological Control

Conventional pesticides are still the cornerstone of Desert Locust Control and have proven their efficiency in the control operations by using appropriate sprayers and the recommended doses during the upsurge period. However, the shrinking of the list of these pesticides, as traditional pesticides are limited and some of them are restricted in use, and the lack of new alternatives, it is important to diversify pesticide options, and the need to find new alternatives, especially during periods of sudden increase in demand when demand for the same product is constrained by supply and logistics, similar to what happened in 2019-21 when COVID-19 had a significant impact on the locust control supply chain.

Therefore, the Commission has highlighted the importance of using biological control in the future and at large. The success of using alternatives to pesticides in Desert Locust Control in Somalia was presented, as the Food and Agriculture Organization and the Somali government have committed since the beginning of the upsurge in 2020 to use the biological pesticide Metarhizium acridum (Novacrid) in control operations, as well as the use of the Insect Growth Regulator (IGR) Teflubenzuron later in 2020 to enhance the control of hopper spots. During 2020, with FAO's support, aerial and ground control teams operating in Somalia controlled 130,000 ha of Desert Locust hoppers with Metarhizium (Novacrid) biopesticide. In 2021, another approximately 190,000 ha affected by hopper spots were controlled with the insect growth regulator (IGR) Teflubenzuron at 30 g a.i./l, which gave a very positive result that significantly reduced the number and size of swarm's formation. Also, about 250 swarms covering 80,000 ha were successfully controlled with the bio-pesticide Metarhizium at a rate of 50 g a.i./l, and an application rate of 1 liter per hectare.

Efficacy evaluations during 2021 confirmed excellent results for both barrier treatments using IGRs on hopper spots and biopesticides on immature swarms. In both field and cage trials with the biocide Metarhizium, a mortality rate of 50% at 9 days and 83% at 14 days of control was observed. Efficacy evaluations for IGR when spraying with baffles at 300 m provided a mortality of 90-98% between 4 and 10 days and at 500 m barriers spaced at 98% within 11 days after control. Successful operations conducted in Somalia, especially during 2021, showed that large-scale control using a combination of the biocide Metarhizium and IGR Low toxicity can provide results equivalent to those of conventional pesticides but with the benefit of much less environmental impact and low risk to human and animal health. Therefore, the Commission encouraged member states to expedite the registration and use of biopesticides to diversify the sources, especially while reducing the list of traditional pesticides approved for Desert Locust Control (Appendix 9).

Recommendation 15: The Commission recommended that member countries should take all necessary measures to register the bio-pesticide *Metarhizium* and IGR insecticides so that they can be used in locust control as reliable alternatives.

Drones for Survey and Control Operations

The Secretary of the Commission highlighted the modern techniques introduced into the locust survey and control operations during the locust outbreak as part of the preventive control strategy and as a complementary tool to enhance sustainable locust management. Where previously, drones were used in the field of surveying in Sudan and Saudi Arabia at the first stage, they are currently being introduced in Ethiopia. The Commission recommends other breeding countries to obtain this technology as part of the early warning system.

In control operations and as part of a preventive control strategy and as a complementary tool for sustainable locust management, technical specifications for drones in locust control are currently being developed to work in this field. The organization is testing drones with specially designed and calibrated spray equipment to enable target mapping and control, as well as the formulation of Standard Operating Procedures (SOPs) and operating standards for its safe and effective use (Appendix 10).

Recommendation 16: The Commission recommended that member countries should take the necessary measures to obtain approvals and permits related to the use of drones in survey operations within their countries before that the Commission supports the introduction of this system into the survey in those countries, and inform the Commission Secretariat of any developments in this matter.

Climate Change and Locust Outbreak in the Central Region and Adapting Prevention Tools for Climate Change

The Secretary of the Commission presented the effects of climate change on desert locust outbreak in the Central Region, and the impact of cyclones between 2018-19 on major locust upsurge during 2019-21, stressing the importance of following up the effects caused by climatic changes on the infestation areas and its spread to non-breeding areas until recently. The analysis of events and references showed that the majority of desert locust upsurges develop due to unusual weather conditions such as those associated with hurricanes and other exceptional weather phenomena that lead to heavy rains, which in turn lead to environmental conditions becoming very favorable for locust breeding.

Climate change has become more visible in recent years and experts expect more severe weather, including droughts, floods and hurricanes. The 2019-21 Desert Locust upsurge in East Africa is likely to be the worst of its kind in more than 70 years, exacerbated by shifts in rainfall patterns and intensity and high cyclone activity in late 2019. The initial desert locust breeding and, most importantly, occurred after heavy rains associated with Tropical Cyclones Sagar (May 19), Mkunu (May 23) 2018 and Cyclone Luban (October 11, 2018), which resulted in two successive generations of locusts breeding, in hard-to-reach breeding areas in the southern Empty Quarter of the Arabian Peninsula. Changes in El Nino and La Nina phenomena due to climate change can affect breeding during winter in the Horn of Africa and during summer in the Sahel region of West Africa

Member countries requested the Commission Secretariat to develop a system that helps predict and monitor locust breeding in remote areas according to the environment in which they breed (for topographic or security reasons). In addition, countries, regional commissions and FAO should develop an appropriate strategy to deal with climate change and its direct impact on desert locust outbreak in terms of monitoring forecasts for favorable conditions for locust breeding and invasion, as well as its spread to areas that were not within the traditional locust breeding areas (Appendix 11).

Review of the Joint Activities (CRC-CLCPRO) Executed under Component 4 of the French Development Agency Project

Within the framework of the fruitful cooperation between the Desert Locust Control Commissions in the Western Region and the Central Region, the Secretariat of the two Commissions succeeded in obtaining financial support for the activities carried out by the two Commissions for the benefit of their Member Countries , through a project (GCP/GLO/096/FRA), “Consolidate the basis of the preventive control strategy and develop operational research on the Desert Locust in the Western Region”. The Desert Locust Control Commission in the Central Region benefited from this project through the fourth component of this project “Improving the Strategic Mechanisms of Preventive Control and Dealing with Locust Upsurges / Invasions in the CLCPRO & CRC Countries .”, which is currently being implemented in central region countries.

Collaboration between the two commissions in the project, amounting to approximately $1.2 million, is focused on building the institutional aspects (autonomous national locust control units in breeding countries), financial aspects (strengthening existing financial mechanisms at the NLCU level in breeding countries), and operational aspects (management, contingency planning, building human capacities and research). The Commission presented the beneficial mechanism to the member countries. The project will enable the commission to use technological innovations to monitor locust numbers in inaccessible areas (drones), as well as help Member countries adapt prevention tools to climate change (in cooperation with CIRAD), in addition to also promote the use of biopesticides (*Metarhizium acridum*) and consolidating regional cooperation between CRC and CLCPRO (Appendix 12).

The New Midterm Work Plan of the Commission (2022-2025)

The Secretary of the Commission had presented a suggested action plan for the period 2022-25 in addition to programs and activities to be implemented to improve locust management units and centers in the member countries and benefit from the lessons and results that emerged from the locust upsurge between 2019-21. This should happen by the exploitation of the excellent resources available to the Commission to serve this purpose, namely the fourth component of the project funded by the French Development Agency, jointly with CLCPRO, which amounts to 1.2 million dollars. Also, through the project funded by the Arab Economic Development Fund in Kuwait, which amounts to 1 million dollars, in addition to the new French project (in progress) to enhance Desert Locust preventive control management the central region / Horn of Africa, estimated at 4.8 million US dollars (Appendix 13).

1. French Development Agency project

(Enhancing the sustainability of the preventive control strategy and improving the mechanisms of dealing with desert locust outbreaks in central region countries - the fourth component). The fourth component will focus on strengthening

the administrative and financial independence of the national locust control units by supporting the national locust control units to: (1) deal with locusts that cause serious damage, unlike other economic pests, (2) quick decision-making, (3) obtain financial, specialized staff and equipment resources at immediate disposal, (4) Strengthening communication with relevant regional and international parties and benefiting from their experiences in this field. Institutional, Operational and Financial Status in the member countries of the Commission.

Under the CRC-CLCPRO cooperation project, the Commission will assess the institutional, operational and financial status of some NLCUs in member countries. Besides assessing the current institutional hierarchy, the Commission will also work on strengthening existing financial mechanisms at the NLCUs level in CRC countries. This will include assessing the financial capacities of each NLCU, supporting advocacy to finance the preventive control strategy at the national level, support the creation of a regional emergency fund, and support the institutionalization of South-South cooperation. The Commission will evaluate and assist Member countries update their emergency plans, build human capacity through trainings and exchanges, encouraging applied research between the two regions (CLCPRO and CRC) and supporting the operational system of surveillance and control in Member countries (Appendix 13.1).

2. The Kuwait Fund for Arab Economic Development

The project will contribute in supporting early and rapid reaction capacities in desert locust affected countries in the central region, focusing on the following:

- Organizing advanced training courses on the use of remote sensing techniques to take appropriate early decisions and conduct the necessary surveys,
- Rehabilitation and development of remote Desert Locust Control facilities and bases in the most needy breeding countries ,
- Supporting locust-affected countries with the necessary equipment for survey and control (specialized control equipment with ULV micro-spray technology - pesticide protection tools - Camping equipment - Health and safety equipment - aerial sprayers and accessories - Four-wheel drive vehicles, transport equipment and pesticides)
- Introducing modern technology in desert locust survey and control, such as the use of environmentally friendly (bio) pesticides in control operations, as well as other alternatives.
- Introducing drones in surveys and training on their use in breeding countries (Appendix 13.2).

3. French Development Agency project (Strengthening the preventive control of the Desert Locust in the Central Region / Horn of Africa)

This project is a product of the assessment carried out by the French Development Agency during the desert locust upsurge in the countries of the central region and the countries of the Horn of Africa, and concluded the importance of supporting the authority in the central region and the countries of the Horn of Africa affected by the upsurge of locusts. Support the implementation of the preventive control strategy and disaster risk reduction as the only ways to adequately and sustainably address the management of Desert Locust Control. The critical challenge is to ensure that this strategy is implemented through improved management based on regular surveys and monitoring, using modern monitoring techniques (eLocust3, drones, geographic information systems), the use of rational control techniques in relation to the environment, health and safety standards and assisting in the development of integrated management strategies for transboundary migratory pests.

In general, the envisaged activities aim to empower the beneficiary countries, including allowing them to continue these activities in the future. More specifically, it aims to create a new generation of experts by imparting knowledge and experience to young experts who are able to provide support at the national and global levels. Relying on the experiences gained and the positive achievements reached in the past two decades through:
- Strengthening the governance and capacity of the Central Region Desert Locust Control Commission (CRC) in order to implement the sustainable preventive control strategy, and strengthen the National Desert Locust Control Units (NLCUs).

- Develop capacity building and regional curricula in Desert Locust management, including support for the Master of Science program in Desert Locust management.
- Strengthen coordination between regional entities (CRC, DLCO-EA, IGAD), including the Commission support to countries in the Horn of Africa that are not member s of the Commission (Appendix 13.3).

Recommendation 17: The member countries took note of the current projects of the Commission in cooperation with three different projects: the Kuwait Fund for Economic Development "Promoting early measures and rapid response to mitigate the effects of the desert locust invasion on food security and livelihoods in the central region OSRO/GLO/1036/KUW", the French Development Agency Project (the fourth component of the project to consolidate the foundations of the preventive control strategy and develop applied research on desert locusts in the western region GCP/GLO/096/FRA, and the New French Development Agency Project (subject to procedures) "Strengthening the preventive control of the desert locust in the central region" / Horn of Africa GCP/GLO/1081/FRA". The member countries have also approved the work plans suggested by the Commission Secretariat to implement those projects.

Institutional and Organizational Aspects of the Commission

The Commission secretary presented the institutional and operational status of its operations, and provided an overview of the history of the establishment of the Commission since its seat was in Jeddah, Saudi Arabia until its current seat in the Regional Office for the Near East and North Africa in Cairo. He also highlighted the current situation of the Commission Secretariat position in the regional office and that it lacks basic elements, including the absence of hosting agreement for the current headquarters that allows the Commission to enjoy the diplomatic rights granted to it by the hosting agreement with one of the member states, and the lack of administrative and financial independence guaranteed to it according to the Establishment Agreement, and the limited office space it occupies in relation to its work plan and projects being implemented, and the weakness of support provided by the organization. The Commission Secretariat also highlighted the delays in completing its work resulting from administrative bureaucracy and consequently delays in providing support to the activities of member countries.

The representatives of the countries discussed extensively the institutional and operational status of the Commission and how to work to strengthen its authority and capacity in order to enhance its position and raise its administrative, financial and operational capabilities. Accordingly, it was suggested that the seat of the Commission Secretariat should be transferred from the Regional Office for the Near East and North Africa to one of the Member countries to enhance its diplomatic status guaranteed by its Establishment Agreement under Article Fourteen of the FAO Constitution, similar to its sister Commission in the Western Region hosted by Algeria. This would enhance the governance and capabilities of the Commission for the sustainability of the preventive control strategy, strengthening the National Desert Locust Control Units (NLCUs) by supporting the capacities of member countries to be fully prepared to address desert locust outbreaks.

After extensive and lengthy discussion by the representatives of the participating countries , the countries agreed to transfer the seat of the Commission from the Regional Office for the Near East and North Africa as soon as possible to one of the willing countries , so that the host country guarantees signing the hosting agreement with the Commission and granting diplomatic status to the Commission and its seat. The member countries had also urged the organization to grant the Commission for controlling the desert locust in the central region higher administrative and financial powers to manage their affairs, similar to other commissions that work under Article 14 of the FAO Constitution. Noting that the Commission had agreed in its recommendation to the organization to grant the Executive Secretary of the Commission the responsibility of the Budget holder of the Commission for the Trust Fund, which has not been achieved yet. (Appendix 14).

Recommendation 18: The member countries agreed to transfer the seat of the Commission from the FAO Regional Office for the Near East and North Africa (host of the secretariat's headquarters) to one of the member countries. In this regard, the host country submits the request to the organization/ commission accompanied by the approval to give diplomatic status to the mission and the signed agreement in accordance with the procedures followed by the Food and Agriculture organization. The secretariat of the Commission should follow up and implement these recommendations with the countries wishing to host immediately.

Thirty-first Session Recommendations: Review, Achievements and CRC Activities

During the previous period, the Commission implemented a number of activities and events that were recommended in its 31st Session, held in Jordan in February 2019. Despite, the pandemic of COVID-19, which witnessed a long closure worldwide, the Commission managed to carry out some major activities when it was permissible. The Commission also expanded its support to not only its member countries, but also other non-member countries that were affected by the large desert locust upsurge of 2019-21, especially countries of Greater Horn of Africa. The Commission secretariat focused also on good management and continuous coordination with Member countries

through holding periodic virtual meetings and continuous tracking of the desert locust situation in the countries of the region, in addition to a number of workshops and training courses held at the national and regional levels on DL survey and control operations and environmental health and safety programs (Appendix 15).

Managing financial accounts (contributions and arrears)

The Commission Secretary introduced a summary of the financial position of the Trust Fund of the Commission and its annual contributions for the period from 2019 to 2022. He thanked the member countries that regularly paid their annual contribution to the Trust Fund. He also presented the current arrears status and the member countries that do not pay their contributions on a regular basis, which should be followed up with their concerned authorities and then they should inform the Commission Secretariat (Annex).

The delegates of the member countries noted the non-commitment of some member countries to pay their annual contributions to the Trust Fund of the commission for a number of years, which resulted in the accumulation of these arrears, amounting to a total of 1.5 million US dollars. This prompted them to expand the discussion of this important and detailed topic to find a radical solution to this problem, which hampers and impedes the Commission implementation of its obligations and duties, and this was evident during the recent upsurge of locusts 2019-21. These extensive discussions took a turn to the inability of a number of member countries to pay their annual contributions for a number of years due to the difficult economic and humanitarian conditions that these countries have been going through for years, and the lack of a real possibility to implement those pledges, due to the difficult economic conditions of these countries, which makes it very difficult for these countries to pay their large amounts of arrears.

After extensive and honest discussions and in appreciation of the member ship of these countries and the importance of regional solidarity among the countries of the Commission and an understanding of these current circumstances that they are going through, and since the Commission was founded to support Member countries and help each other within the joint regional action plan in Desert Locust Control and to encourage the governments of the member countries to pay annual contributions regularly, it was unanimously agreed to cancel all arrears owed to the Trust Fund of the Commission, which amounted to 1.5 million US dollars in June 2022, in return for the commitment of all Member countries to regularly pay their annual contributions to the Trust Fund, provided that it is with immediate effect from the fiscal year 2022-23 (Appendix 16).

Recommendation 19: The member countries unanimously agreed to cancel all arrears owed to the Trust Fund of the Commission on all countries until the end of the fiscal year 2021/2022. In contrast, all member countries should be committed to regular payment of the annual contributions assessed to the Trust Fund of the commission, starting from the fiscal year 2022/2023.

Accounts for 2019-2021

The Secretary of the Commission gave a detailed presentation on the final annual accounts for the period from 2019 to 2021 (Appendix 17), and after extensive discussion and clarifications of some points for the meeting, the accounts were approved by the meeting.

Recommendation 20: The member countries of the Commission approved the annual final accounts for the period from 2019 to 2021.

Work Plan and Budget for 2022–2024

The Secretary of the Commission explained the work plan for the years 2022 – 2024, which was endorsed by the meeting after extensive discussion, (Appendix 18). It was also agreed that the work plan and budget would include the results of the regional training workshop to be held in Cairo from 27-30 June for the years 2022-2026, in addition to the results of the regional research workshop to be held in Tunisia from 26-29 July 2022 for the same period. Noting that the training and research plan will be funded by the projects 1) the Kuwait Fund for Arab Economic Development, 2) the project funded by the French Development Agency - the fourth component in partnership with the Desert Locust Control Commission in the Western Region - and 3) the new project whose procedures are being completed and funded by the Development Agency French in addition to the Commission Trust Fund.

Recommendation 21: The member countries approved the work plan for the period 2022-2024, which incorporates the outputs of the workshop for the development of the regional training plan during the period 2022-2026 to be held in Cairo from 27-30 June 2022. It also incorporates the research plan for the same period to be discussed in the joint regional workshop with the Desert Locust Control Commission in the Western Region, which is suggested to be held in Tunisia from 26-29 July 2022. The Kuwait Fund for Arab Economic Development and the French Development Agency projects, as well as the Commission Trust Fund would finance these plans jointly.

Recommendation 22: The member countries delegated the Commission Secretariat, in consultation with its Chairman, to cover the costs of activities of the Commission, which were not included in the approved budget for work plans for the coming period.

Recommendation 23: The member countries requested from the Commission Secretariat to send the 32nd Session report and its recommendations to the concerned authorities in the member countries to support the representatives in implementing the decisions and recommendations issued by this meeting.

Election of Executive Committee members

Bahrain, Egypt, Jordan, Kuwait, Lebanon, Sudan and Syria were elected as member s of the Executive Committee, representative of Syria as Chairman of the Executive Committee, and Jordanian delegate as Vice-Chair of the Executive Committee.

Other business

The delegate of the Republic of Somalia, who was invited to attend the meeting of the Commission as an observer, submitted a request for the accession of the Republic of Somalia to the member ship of the Commission, after clarifying the reasons for this request and the benefits that will be for Somalia from joining the member ship of the Commission, as well as the benefit that may accrue to the countries of the Commission from Somalia's accession to its member ship.

Since Somalia has been considered a locust breeding country, and many of the member countries of the Commission are affected by what occurs in Somalia and vice versa, confirmed by the recent locust upsurge 2019-21, noting that Somalia is among the countries in the central region defined in the agreement establishing the Commission. After extensive discussions, two proposals were put to the vote: 1) Voting on the status of Somalia as an observer for the next two years while reviewing its operational, administrative and financial obligations, provided that the vote is held in Vote in the next session after the Commission Secretariat submits a report to the meeting. 2) Direct voting to accept Somalia as a member of the Commission, provided that Somalia cooperates with the Commission Secretariat and submits the proposed action plan for the coming period with the Somali State's pledge to work on the sustainability of work in managing and controlling desert locust in Somalia, coordinating with the Commission Secretariat in all activities related to desert locusts, achieving common benefit from its member ship in the Commission.

After the vote, the member countries agreed to accept Somalia as a member of the Commission, provided that the Somali Ministry of Agriculture sends its request to join the Commission to the Director-General of the Food and Agriculture Organization, as required by the relevant procedures.

Recommendation 24. The member countries agreed on the request submitted by the Republic of Somalia to join the Commission as a "Nominated member". They also requested from the Commission Secretariat to follow the administrative and legal procedures, according to the Establishment Agreement of the Commission and the regulations in force within the Food and Agriculture Organization in order to obtain full membership.

Date and place of the next Session of the Commission and its Executive Committee

The Chairman of the Session requested nominations from member countries to host the 33rd Session of the Commission. The delegate of Kuwait offered to be the host, which is proposed to be held in November 2024. The Commission Secretariat will coordinate with the host country to determine the date of the session and take the relevant measures to hold the meeting at the time.

Adoption of the report of the 32nd Session of the Commission

The participants unanimously approved the report of the thirty-second Session and its thirty-sixth Executive Committee meeting of the Commission, held jointly in Jeddah, Kingdom of Saudi Arabia, from June 5 to 9, 2022, with the agreed amendments.

Closure of the Session

Finally, and after the adoption of the report of the thirty-second session by the member countries, the Chairman of the commission thanked all participants for their fruitful discussions and their hard work during the meeting, which resulted in many important recommendations that covered various activities of interest to member countries in managing and controlling desert locust. The Chairman commended member countries for their support to the Commission and expressed his appreciation to the Commission Secretariat for its excellent organization, preparation for the session, and its role in implementing the recommendations of previous meetings. He also thanked the government of the Saudi Arabia, represented by the Ministry of Environment, Water and Agriculture, and the Locust and Migratory Pest Control Center for their great efforts in hosting the meeting and for the warm reception and hospitality. The Chairman also thanked the Drafting Committee, the translation team and everyone who contributed to the success of the meeting, wishing the guests safe journey back to their homelands.

Acknowledgements

The participants expressed their thanks and gratitude to the government of Saudi Arabia represented by the Ministry of Environment, Water and Agriculture and the Locust and Migratory Pest Control Center for the warm reception, generous hospitality, excellent arrangements, hard work and dedication, which led to the success of the work of the thirty-second session of the Commission and the thirty-sixth of its Executive Committee. They also thanked the Chairman of the Commission for his good management of the intensive and serious sessions and discussions on various topics, which resulted in positive and targeted recommendations to support the objectives and plans of the Commission, which is beneficial to the member states in the various Desert Locust Control activities.

They also extended their thanks and appreciation to the Executive Secretary of the Commission, its General Secretariat and all its employees for their exceptional efforts for the work they carried out in favor of the member countries, especially during the challenging time of the COVID-19 pandemic. They also thanked everyone who contributed to the success of this meeting, including the drafting committee, interpretation team and the hotel management.

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Appendix 2. Report of the chairman

Excellencies / Honorable Directors General / Directors of Departments / Representatives of the Member States of the Commission for Controlling the Desert Locust in the Central Region,
Mr. Executive Secretary of the Commission for Controlling the Desert Locust in the Central Region
Mr. Senior Officer of the Desert Locust, Plant Diseases and Migratory Pests Team, FAO-Rome
Mr. Executive Secretary of the Commission for Controlling the Desert Locust in the in the Western Region
Mr. Director General of the Desert Locust Control Organization for East African Countries (DLCO-EA)

Esteemed audience, greetings.

Allow me at the outset, on my behalf and on behalf of the distinguished delegates of the member states and esteemed guests, to express my heartfelt thanks to the Ministry of Environment, Water and Agriculture in the Kingdom of Saudi Arabia for its kindness in hosting the activities of the thirty-second session of the Commission, and for their great hospitality. I wish also to highlight the great efforts exerted to hold the activities of this meeting at the desired and honorable level. With this, I wish this commission the success in its endeavors.

I am also pleased to extend my sincere thanks to the distinguished delegates of the member states present at this meeting and who underwent the trouble of traveling - especially in light of the precautionary measures related to COVID-19 - for participating in this meeting to discuss all the issues and topics of interest to the countries of the region in the field of desert locust management and control.

Esteemed audience, the Commission's secretariat has made several attempts to hold this meeting since June 2021, but circumstances beyond its control prevented the Commission from holding such a meeting. During this period, many events have unfolded, and the opportunity has not presented itself for the Commission's secretariat to discuss all aspects related to the recent desert locust upsurge (2019-2021), at an earlier date. However, our meeting today is of a special nature, given the topics included in the agenda that will discuss the developments of upsurge, which began in mid-2019, and posed a real threat, especially in Yemen and the countries of the Horn of Africa. This period was full of substantial events, which deserve extensive study and technical analysis, in order to identify the lessons learned, and develop future action plans to reduce the risks arising from such surges in desert locust, as well as overcoming the shortcomings and challenges that were faced during this period.

The beginning of this upsurge was exceptional, where climate changes played a pivotal role in providing suitable environmental conditions for the breeding of desert locusts for long periods, in environmental conditions that were hard-to-reach such as the Empty Quarter in Saudi Arabia, or remote areas in Yemen. In addition to this, climate change contributed to the spread of locust swarms, through of-season strong winds associated with tropical cyclones[1].

During 2019-2021, swarms of locusts and hopper bands invaded 28 countries , from Nepal in the east, to Egypt in the west, and from Iran in the north, to Tanzania in the south. In February 2020 only, locust infestations were widespread and control operations were underway in 16 countries at the same time, a scene that rarely happened. Locust infestations did not stop in Sudan for 40 months and in Yemen for 36 months, while control operations continued in Saudi Arabia for 30 months, and 29 months in Sudan.

Control operations were carried out in 24 countries[2], covering an area of more than 5.6 million hectares, of which traditional chemical pesticides carried out about 97.5%, and biological pesticides, using ground and aerial means of control, specifically in Somalia (about 142 thousand hectares), carried out about 2.5%. This is in addition to the use of drones to control locusts in India in August 2020. The control rates were the highest in 2020, as more than 2.8 million hectares were covered, while the highest monthly control rates were during June and December 2020, which covered more than 330 thousand hectares per month. The highest rates of control operations were recorded in Ethiopia (over 1.3 million hectares), and in Iran, where more than 1 million hectares were covered.

[1] Tropical cyclones in 2018: Sagar, Mukono (May), Luban (October), and affected the countries of Yemen, Saudi Arabia, Oman, Djibouti, Somalia, in 2019: Fayo (June), Heka (September), Kyar (November), Bawan (December) and affected the countries of Oman, Iran, Pakistan and India, and in 2020: Evan (May), Jati (November) and affected countries: Somalia, Djibouti, Yemen and India, and in 2021: the impact of Cyclone Shaheen (September-October) on the countries of India, Pakistan, Oman and Iran UAE, Saudi Arabia and Yemen.
[2] Bahrain, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE, Yemen, Palestine, Democratic Republic of Congo, Kenya, Somalia, South Sudan, Tanzania, Uganda, Afghanistan, India, Iran, Pakistan, Nepal. The countries in which no control operations were conducted are: Qatar, Palestine, the Democratic Republic of the Congo, and Nepal.

In fact, field operations did not take place as usual during desert locust outbreaks or upsurges. A number of obstacles emerged, which posed challenges to field operations, the most prominent of which was the outbreak of the Covid-19 epidemic (Corona) at the end of 2019, which had a direct impact on operations. The delay in sending in-kind and material aid to the affected countries in a timely manner, as well as the significant impact on the work of the field teams due to the need to adhere to the precautionary measures and the working conditions which limited most normal daily activities.

The unstable security conditions in some countries (Yemen, Ethiopia, and Somalia) and the unusual climatic conditions (the floods of Yemen, Sudan, and Iran in 2019 and Sudan in August 2020), had an impact on the level and efficiency of the conduct of field operations, but they did not totally discourage field teams from carrying out their duties.

On the other hand, locust swarms invaded countries that have not witnessed similar infestations for decades, such as Syria, the Democratic Republic of the Congo, Kenya, South Sudan, Tanzania, Uganda and Nepal. Thus, two main challenges emerged: first, how do these countries deal with locust infestations in light of the fact that they did not practice this work before, or the absence of relevant departments, trained teams, or even specialized control sprayers? Second, the method of exchanging locust information between the organization and countries, the spread of locust infestation, especially in light of the acceleration and development of the pace of locust spread, with the absence of specialized departments, officers or tools for locust information analysis in those countries. This prompted FAO to rapidly develop innovative tools for exchanging basic Desert Locust information, such as eLocust3m &w and eLocust3g.

The self-managed national locust control units have provided a realistic example that proves beyond any doubt the success of the independent national units, administratively and financially, in managing the control operations efficiently and effectively when given those powers, the importance of desert locust emergency planning has emerged, and the ability to work efficiently and effectively during long periods of continuous field operations. As for the countries where locust spread, the training activities and support for the control resources carried out, in cooperation with the local authorities during the past years, have helped government departments concerned with locust control to succeed in controlling the desert locust swarms and hopper bands that infected those countries, in a timely manner, with the help of qualified technical capabilities and national resources.

Esteemed audience, this was a brief overview of some of the events of the Desert Locust upsurge (2019-2021), which unequivocally illustrates the tireless efforts made by the countries concerned with locust control to contain the crisis, in order to protect agricultural production and secure livelihoods for the peoples of the region, and here, we extend our thanks and appreciation to all governments that participated in the control operations, governments and various international organizations and partners that contributed to providing urgent support in response to the locust upsurge.

In this context, we would like to commend the pivotal role played by the locust information officers, in preparing technical reports and periodic bulletins and sending them to all concerned departments and authorities, and to the survey and control operations officers who made strenuous efforts, continuing day and night, to control locust spreading everywhere, in addition to all staffs working within the locust control departments in the concerned countries. These are the real soldiers on the battlefield. They have all the greetings, appreciation and respect. Thanks are due to the technical, administrative and financial teams in the desert locust commissions and the Food and Agriculture Organization, who made strenuous efforts to provide and support countries with the necessary capabilities for control operations and to provide the supplies required to control the desert locust crisis in a timely manner.

In conclusion, I would like to thank the secretariat of this commission, headed by the executive secretary of the commission and the administrative and technical staff of the authority for the outstanding efforts and ability they made in the past period, which have supported me and facilitated the tasks of my work over the past three years. I would like to thank as well the head of the team of locusts and transboundary plant pests and diseases in Rome, Mr. Shoki AlDobai and his team, as well as for Mr. MohamedLemine Hamouny, Executive Secretary of the Commission for the Control of Desert Locusts in the Western Region for support and integration in coordinating the work of the two commissions in a manner that serves the interests of states, as well as the organizations to combat the desert locust and all member states for their cooperation in facilitating the commission's activities and overcoming all obstacles. Thank you again to all, wishing our commission continued success and progress.

Mr. Saitan Sarhan
Chairman of the 31st session of the Commission (June 2022)
The Hashemite Kingdom of Jordan

Appendix 3. Lessons Learned from the Desert Locust Campaign (2019-2021)

With the beginning of the Desert Locust upsurge (2019-2021), a set of challenges have occurred, which deserve study and analysis, for lessons learned and for future mitigation so that the Desert Locust control units are in a better position to confront the locust upsurges in a better operational and administrative way.

One of the most important significant challenges is the outbreak of the Covid-19 pandemic, which had the greatest impact, not only in restricting field teams in carrying out survey and control tasks, but also in restricting the supply of urgent aid directed to countries affected by locust infestations. Despite the success of FAOs attempts to deliver the necessary aid, it took longer than usual, which exacerbated the crisis and made the rapid intervention very slow. Therefore, it is always necessary to rely on national resources and provide control supplies for a period of not less than 6 months. Therefore, this situation raises an important question: “How to confront desert locust crises in light of pandemic outbreaks or global humanitarian crises”.

Climate change played a key role in the beginning and development of the crisis, as tropical cyclones were not only the cause of the beginning of the desert locust crisis, but also helped in the expansion and spread of locust among the countries of the region, due to the strong winds accompanying tropical cyclones or due to heavy rains falling over large areas, which reached remote, uninhabited areas, providing suitable conditions for reproduction for periods of up to 6 months.

The initial breeding of the desert locusts took place, most importantly, after the heavy rains associated with tropical cyclones Sagar (May 19) and Mukono (May 23) 2018 and Cyclone Luban (October 11, 2018), which resulted in two successive generations of locusts. Locusts took up hard-to-reach breeding sites, like in the south of the Empty Quarter in Saudi Arabia and Yemen. Breeding was registered, but it was difficult to reach and follow up or control. In February 2019, locust moved from the Empty Quarter and began their invasion of Saudi Arabia, the UAE, and then Iran. This coincided with the migration of swarms resulting from winter breeding on the coasts of the Red Sea from Sudan and Eritrea to Saudi Arabia and Egypt. To this end, it is extremely important to develop a system to monitor locust breeding in hard-to-reach areas (for topographic or security reasons), with the importance of developing strategies for locust control according to the environment in which they breed.

After the spread of locust, the swarms arrived in countries accustomed to such infestations, and other countries that have not witnessed similar infestations for 50-70 years. The breeding countries were well qualified and with a degree of readiness to deal with swarms, while this preparedness was not up to par in some spreading countries despite previous warnings. The question is, was the degree of preparedness compatible with the size and multiplicity of infestations? What are the ways to increase the levels of preparedness, especially in the countries of spread?

With the beginning of the clarity of vision of a major outbreak in the region, the secretariat of the Commission called for an emergency meeting, in the presence of the undersecretaries of the ministries of agriculture and relevant ministries from the countries of the central region, in addition to the relevant authorities of the Food and Agriculture Organization, with the aim of presenting the situation of the desert locust and the developments and expectations that confirm the seriousness of the situation and its transformation into an outburst that will sweep through many countries in the region, unless urgent action is taken from the beginning. The aim of the meeting was to intervene quickly and obtain emergency funding for $3 million, to support control operations in the affected countries (Ethiopia, Eritrea, Sudan, and Yemen). However, the response was generally sub-par, and the support that would enable the Commission and the countries to control the outburst at its inception was not obtained. With the expansion of locust infestations and their arrival in other countries, a new challenge emerged represented in the irregular flow of locust information received from: (1) in some breeding countries, there where was an insufficiency of information transfer tools in these countries, and the absence of cadres trained for this purpose; the spread was large and accelerating, and the eLocust3 devices available in these countries were not sufficient to cover all spread sites, which resulted in lack of clarity on the size and sites of reproduction and the spread patterns of swarms in those countries; 2) In some spreading countries that witnessed locust infestations in intervals, the flow of information was irregular due to the lack of tools to transfer information or specialized information officers; in general, the weak response by some of these countries by not sending data immediately meant that the data arrived after several days from the arrival of locusts and the start of control operations; (3) in other spreading countries (outside the organization’s system) that have not witnessed locust infestations for a long time, as the locust information exchange system is not used in these countries.

This prompted the Food and Agriculture Organization to expedite the development and provision of new tools for transmitting information, that information that can address this challenge. The new tools eLocust3m, eLocust3w

and eLocust3g have been developed. The eLocust3Suite toolkit needs more study and evaluation, in terms of the effectiveness and efficiency to meet all possible challenges in the future, and what updates are needed for its work systems? Alternatively, is there a need for a more comprehensive system?

In the area of control operations, the national locust control units in the breeding countries, and pest control departments and plant protection departments in the countries of spread controlled the desert locust swarms by using chemical and biological pesticides, by means of ground and aerial spraying machines as well as drones. Speeding up the introduction of such technologies into the national locust control systems and using them effectively, helps in early control that is also safer for humans and the environment.

Reports indicated that nearly 5.6 million hectares were controlled using about 6.9 million liters of pesticides. This means that application rates are used above the recommended rates, and thus about 23% of the pesticides are lost unnecessarily. This is due to non-compliance with the approved control techniques and the conditions for their use and application. Reports have indicated some bad practices in dealing with the use of pesticides, such as not properly calibrating ground and air spraying devices, and sometimes using pesticides not recommended for control (such as EC) in addition to other practices such as leaving empty pesticide containers in work sites, which indicates lack of appropriate application of health and environmental standards in locust control during the crisis.

It was clear that the administrative and financial dealings of independent national locust control units were efficient and flexible in most times of the crisis, in terms of continuity of control operations despite the long periods of infestation, in addition to the effectiveness of surveys and information exchange. The administratively and financially independent National Locust Control Units are a good example that should be followed by all Desert Locust-prone countries. As for the spreading countries, the situation of the response to the locust outbreak differed from one country to another. Despite all the appreciated efforts made in this regard, it is certain that the absence of clear national frameworks for desert locust management was a reason for the lack of effective response to locust outbreaks in some countries. Accordingly, there is a lot of work to be accomplished in the near future so that these units have a higher capacity and greater effectiveness in responding to the emergency.

Discussion points

1. What are the strategies Ways to confront desert locust crises in light of epidemic outbreaks or global humanitarian crises?
2. What are the Locust control strategies, according to breeding environments, especially in unsafe environments?
3. National contingency plans in the affected countries. Has it been activated by the concerned countries?
4. Supporting national locust control units to become more independent from operational, administrative and financial aspects?
5. The absence of clear national frameworks for the management of desert locusts in the spreading countries?
6. Reducing dependence on the use of traditional pesticides and replacing them with bio pesticides as part of the preventive control system?
7. Introducing the use of drones into the information, early warning and control system?
8. The importance of applying environmental health and safety standards during locust upsurges, especially in breeding countries.

Appendix 4. Effective and Sustainable Operation of the National Locust Control Units (UNLAs)

The Commission for Desert Locust Control in the Central Region has a membership of sixteen countries, seven of which harbor desert locust breeding areas, so they are called locust breeding countries (or front-line countries), namely Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Sudan, and Yemen. As for the rest of the other countries, they are countries that do not harbor desert locust breeding areas, but are invaded by locusts during the years of desert locust upsurges or plagues, which are: Bahrain, Djibouti, Iraq, Jordan, Kuwait, Lebanon, Qatar, Syria, the United Arab Emirates, which are called the spreading countries.

In times of locust dormancy or activity, the breeding countries conduct regular periodic surveys of the areas where locusts are expected to breed, with the aim of monitoring any desert locust gatherings, and then intervening early in control operations as soon as they identify targets. Desert locust survey and control operations involve the use of trained and qualified field teams, specialized information transmission tools, and special pesticides and spraying machines. While the spreading countries do not conduct regular periodic surveys, they may have a certain number of resources for human and material control operations, which are used when locust infestations appear. The efforts made by the breeding countries to combat the desert locust enable them to stave off the dangers of the desert locust pest on agricultural production and protect livelihoods not only within the breeding countries, but also within the borders of the spreading countries and at the regional level as well.

Accordingly, we find a fundamental institutional difference in the system of dealing with desert locusts between breeding countries and spreading countries. In the breeding countries, desert locust operations are managed through the so-called “national locust control units”. These units have special financial resources, specialized human and material resources that enable them to carry out periodic and emergency desert locust operations. In the spreading countries, desert locust infestations are dealt with through the plant protection departments, which direct some of their resources on need basis to locust control operations, which are often insufficient.

In breeding countries, there is a fundamental institutional difference in the system of dealing with desert locusts. There are three categories of national locust control units, which are: (1) units with complete administrative and financial independence (2) units that are partially administratively and financially independent, (3) units that are not administratively and financially independent. The importance of the national locust control units being independent financially and administratively self-managing units is that they: (1) deal with a pest with serious risks, not caused by other economic pests, (2) dealing with locust requires speed in decision-making, (3) locust control requires availability of financial and specialized human and material resources, at immediate disposal, (4) need for direct communication with relevant regional and international bodies.

By evaluating the performance of the national locust control units during the current crisis (2019-2021), it becomes clear that the desert locust control units in Egypt, Saudi Arabia and Oman have sufficient national capabilities in general to deal with the areas that have been combated, which reflects the administrative and financial independence of these units and their management during the crisis, taking into account the length of the campaign, which lasted nearly two years.

Although the capabilities of the Desert Locust control units in Eritrea and Sudan are different and need more support and reinforcement, especially with regard to financial resources and enhancing administrative independence, their good management of survey and control operations was satisfactory, which was positively reflected in the locust control at the end of the locust reproduction season. This was helped by the generous international aid that was obtained to support the efforts of these countries in controlling and controlling locusts.

While the situation in Ethiopia was a little different, as the preventive control strategy was not implemented, which led to the invasion of locust swarms in large areas of the country. This is primarily a result of the lack of a specialized department with financial and administrative independence to combat the desert locust. Although warnings were frequently sent about the development of the situation in Yemen and Somalia, the reaction was weak. Therefore, it is necessary to reevaluate the situation, develop appropriate plans, and implement them so the crisis would not be repeated in the future.

In Yemen, despite the existence of a locust control unit, with partial independence and limited resources, the state of security instability and the appropriate environmental conditions – after heavy rains as a result of the tropical cyclones that struck Oman and Yemen 2018 and 2019 created very suitable environmental conditions for the breeding of desert locusts – which played a pivotal role in the start of locust breeding and its spread in Yemen and then its transmission to neighboring countries. The instability and security situation has severely affected the management of

locust control, as well as the performance of field operations, despite the availability of financial support from donors, which always comes late. In general, it is necessary to upgrade the national locust control units in most breeding countries to the levels of financially and administratively independent management.

Regarding the invasion countries, all of which were exposed to the desert locust invasion, albeit in a different way, after a very long period of the last locust invasion in the central region, the preparedness and response mechanism differed between one country and another, and in general we summarize them as follows:

- Countries that responded well, which was a result of early preparation (training and qualifying national cadres during the period of calm, equipping the control teams with the appropriate mechanisms and equipment available in the Plant Protection Department, before the start of the crisis, and then following up on the successive developments of the locust situation that were issued by FAO and the commission, and preparing for a direct response.
- Countries with weak response, despite the presence of trained cadres, but the response mechanisms were somewhat weak, and the control teams were equipped with the mechanisms and equipment after the locusts arrived.

Discussion points

1. What are the ways to enhance desert locust management in breeding countries?
2. What are the ways to enhance desert locust management in the spreading countries?
3. In light of the security instability witnessed by some breeding countries, how can one deal with the development of locusts and the possibility of their spreading outside the borders of those country/countries?

Appendix 5. National Human Resources (Qualification and Adequacy)

In times of Locust recession or activity, the breeding countries conduct regular periodic surveys of areas where Locusts are expected to breed, with the aim of monitoring any Desert Locust groups, followed by early intervention and control operations conducted by trained and qualified field teams as soon as the locust swarms are formed. Desert Locust management is highly specialized, requiring good technical background of locusts in addition to good knowledge of preventive control strategy. Applying this strategy requires the presence of well-qualified human units in the areas of locust survey, information and forecasting, various control methods, campaign management, and others. Therefore, institutional and human capacities in all countries are extremely important in Desert Locust management.

Therefore, and since its establishment, the Commission for Controlling the Desert Locust in the Central Region -CRC, is concerned with building human capacities, as one of its most important priorities. The Commission provides an integrated package of training activities and programs for the benefit of the Commission's member states, and also helps in training human cadre for non-member countries in the region when needed. This is done through various training programs in terms of course or duration of training. There are basic training programs for locust survey and control operations, training programs for Desert Locust trainers, Desert Locust emergency plan, environmental health and safety standards, the use of biopesticides in control operations, aerial control techniques, and the use of survey drones, Desert Locust information and forecasts, as well as programs for the operation and maintenance of Desert Locust spraying equipment. These programs are provided at the national level (for the benefit of each individual country) or at the regional level (with the participation of a number of countries). These courses are offered through short-term courses (up to 10 days long). Medium to long-term training courses (for a year or more) are also offered, such as the Locust diploma program (in the past) and postgraduate program with both masters and doctoral studies, as well as the training program for Locust information officers at the FAO headquarters in Rome.

It should be noted that the Commission's Secretariat provides all the scientific materials related to these training activities, as well as financial support to cover the cost of these activities through the Commission's Trust Fund, so that all member states (16 countries) benefit from the training programs provided. During the past 25 years, the Commission's Secretariat succeeded in training about 400 Locust officers from breeding countries, about 1,300 agricultural specialists from invasion countries, more than 15 information officers on Desert Locust information, and qualifying more than 100 technicians on the operation and maintenance of spray equipment and 77 officers and technicians on aerial spraying techniques. This is in addition to offering 53 scholarships to obtain diploma or master degrees in one of the fields of Desert Locust.

With Locust outbreak in many countries of the region and infestation over large areas, there was a great need for a more qualified Desert Locust staff. Human resources has been a constant constraint on survey and control operations in the region, due to a number of factors, including staff turnover, loss of senior staff, lack of interest in training in some countries and the massive scale of the outbreak in 2020-2021. In other countries, human resources were very low at the beginning of the outbreak despite dozens of pre-trained staff, slowing the ability of survey and control teams to operate. Great efforts were made in training new teams and building human resources in many countries, especially in the Horn of Africa, which contributed to improving crisis management by the end of 2020.

Therefore, continuing to support the national capacities of all aspects of locust management, survey and control operations, has become extremely important, with a focus on expanding capacities in all the Commission member countries with some priorities to breeding countries. FAO and the Commission will strive to ensure the provision of adequate financial resources and technical assistance to enhance capacities to sustain training and qualification programs at all levels.

However, to achieve this, member countries must establish and consolidate strong structures and policies for locust response. This means opening dialogues with relevant governments regarding the Locust response structure within national authorities, as they have an increasing responsibility in locust control. In all cases, countries should ensure the existence of operational and autonomous units with national capacity in Desert Locust management, and to raise awareness of the threat of locusts in all government's units and the ensure sustainability of experience gained in the field of Locust control.

Discussion points

1. New staff are not appointed in Locust control units, which negatively affects the efficiency and effectiveness of the current staff, who are often of advanced ages, leading to severe shortage of qualified staff in the future.
2. The lack of clear administrative structures in some countries through which the experience gained in Locust management and control are preserved.
3. The lack of good staff capacities in the invasion countries.
4. Not many regional experts can speak the English language to benefit from their experience in support countries in need by the Commission and FAO to conduct regional training and to supervise survey and control operations as well as monitoring activities when needed.

Appendix 6. Reporting and Early Warning Systems and Tools: eLocust3

From 2018 to 2021, control operations against Desert Locust infestations were carried out in 30 countries[3], with more than 5.6 million hectares controlled, of which 47% were conducted in the central region countries, 40% in the countries of Southwest Asia, and 11% in the of Eastern Africa countries[4], while the area controlled in the western region countries did not exceed 0.2% of the total area. The highest rates of control were in Ethiopia (about 1.3 million hectares), followed by Iran (about 1 million hectares), Saudi Arabia (about 720 thousand hectares), India (about 680 thousand hectares), Pakistan (about 560 thousand hectares). Somalia (about 440 thousand hectares), Sudan (about 390 thousand hectares), Kenya (about 220 thousand hectares) and Eritrea (about 124 thousand hectares).

This above brief of Desert Locust operations, from 2018 to 2021, is the result of technical locust information reports gathered and distributed through a combined effort by wide array of stakeholders, from field teams to locust departments and the FAOs locust information service. These reports had a fundamental and pivotal role in tracking the development of Desert Locust situation, in addition to providing likely forecast for locust infestations, to take appropriate measures and activate the national, regional and international tools and contingency plans. Reports from member countries on the locust situation were a pivotal factor in the success of the early warning system during the Desert Locust upsurge 2019-2022, whether at the country level or the FAO level. Without the continuous surveys and reports, data availability, locust monitoring in countries would be weakened. Such surveys are vital to provide the data, on which the locust early warning service is based. However, the efforts of countries and regional commissions in this regard does not receive the requisite attention at the locust information service in FAO, which is often credited with the success of the early warning system.

eLocust3 suite

FAO introduced eLocust3 in 2015 as a data collection tool that enabled trained locust officers to collect high-quality monitoring data in the field (locust density, vegetation and condition, moisture and locust condition). This information is transmitted via satellite in real time to their National Locust Control Centers and the FAO Locust Information Service to help forecast Desert Locust situation at the national, regional and global levels. The benefits of these technologies came at a price, as the eLocust3 data transmission costs are covered by the Regional Desert Locust Commissions.

In early 2020 and during the current Desert Locust outbreak, FAO expanded elocust3 technology to offer new alternatives eLocust3g, eLocust3m and eLocust3w that help transmit data from affected countries to the Locust Information Service. All data collected by these new elocust3 technologies passes through selected cloud platforms for comparison and is sent to the respective country where the data is imported into RAMSES Geographic Information System (Rv4.1) for the respective country. The data is then validated and analyzed for planning purposes to keep stakeholders informed of the Desert Locust situation and take appropriate steps.

Despite the availability of these new and good tools to transfer information to the relevant authorities, which led to the improvement of data transmission in locust affected countries and their rapid access to the organization's locust information service. But when creating these new tools, the basic requirements of the concerned authorities at the regional level were not taken into account. (States and regional bodies).

The new tools, for example, are available to the general public for their use, and therefore there is no regulatory role for the concerned local authority responsible for the credibility and quality of the transmitted data, which led to some countries not agreeing to use these alternatives, especially invasion countries. There are also questions regarding the presence of country data on a private platform (PlantVillage) and not one belonging to FAO. The same applies for the eLocust3m and eLocust3w, as national supervisors can access the data from the Kobo platform.

Efficiency and effectiveness of using eLocust3 devices in the period from 2019-2021 for breeding countries, Djibouti and Somalia

This remains an important issue because up-to-date monitoring and control information is the basis for field operations planning and also essential for determining logistical input. This has led to improving the quality of planning for control operations and then improving the speed, effectiveness and efficiency of control planning and spraying operations. Since the information transmission service is covered in full by the Commission's Trust Fund for all breeding countries in addition to Djibouti and Somali. It is necessary to take advantage of this service, whose average annual cost is about 35,000 US dollars, while it reached almost 50,000 US dollars during the outbreak period 2019-2021 due to the

[3] Countries in which control operations were conducted in the period from 2018-2021 (Algeria, Libya, Mali, Mauritania, Morocco, Niger, Bahrain, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia, Sudan, Syria, UAE, Yemen, Kenya, Somalia, South Sudan, Tanzania, Uganda, Afghanistan, India, Iran, Pakistan).

[4] The East African countries referred to in this report are (Democratic Congo, Kenya, Somalia, South Sudan, Tanzania, Uganda)

high number of messages sent from countries. The Commission's member countries, in addition to Somalia, used 96 eLocust3 devices to send more than 57 thousand messages, of which: 12% were sent in 2018, 28% in 2019, 40% in 2020, and 23% until September 2021. Field teams in Saudi Arabia sent more than 18 thousand messages (33%), and in Sudan, more than 11 thousand messages (22%).

Despite these distinguished efforts, it is noted that when these devices are not used, locust units do not request to deactivate them which means that unused monthly financial payments and additional costs on the Commission's budget. Despite the continuous follow-up on this issue, the response of some countries is still weak, and this requires raising the efficiency and effectiveness[5] of operating the devices. In general, the efficiency and effectiveness of using eL3 devices are as follows:

- Substandard use: Djibouti (2 devices)
- Acceptable use: Egypt (10 devices) and Oman (9 devices),
- Good use: Eritrea (12 devices), Ethiopia (14 devices), Somalia (5 devices),
- Very good use: Saudi Arabia (21 devices), Sudan (15 devices), Yemen (8 devices).

Discussion points

1. The importance of the participation of regional commissions and countries in the development of information transfer tools and devices
2. The necessity of making improvements to the operating system of elocust3m devices according to the member countries proposals so that it can be fully utilized and used by all countries
3. Locust units should pay attention to activating or deactivating the information transmission devices and managing them properly
4. Failure to send reports, surveys and locust infestations, and control operations in some countries, whether breeding or invasion.

[5] Efficiency = number of messages sent / number of devices used
Efficiency = SMS sending fee / Monthly subscription fee

Appendix 7. Improve the Emergency Preparedness to the Desert Locust Crises

The Desert Locust crisis 2019-2021 was the excellent greatest opportunity to test the effectiveness of the preventive control strategy against desert locust crises, which is primarily concerned with reaching the breeding sites of the Desert Locust in their desert environments and monitoring those sites to intervene with control operations as soon as they form to protect production agriculture and livelihoods. This strategy is an integrated, proactive plan applied during calm periods of the desert locust to limit the development of sudden locust infestations and their transformation into outbreaks or epidemics.

The preventive control strategy against desert locust crises requires appropriate financial resources to cover the costs of continuous surveys and control, if the situation requires, in remote locust breeding areas, by trained field teams using advanced control tools and devices and particular pesticides. The preventive control strategy requires proper and prior planning and the provision of necessary national cash flows to procure the needed tools and materials and set the competent administration in a permanent state of readiness by constantly training the teams in charge of survey and control and providing all the requirements for early intervention.

Often, the required financial resources may be insufficient or sometimes unavailable in some countries due to limited financial resources. Those upsurges of desert locusts often consume the resources allocated for this purpose in a limited period, especially in countries with limited financial capabilities. The intervention of the international community and relevant regional organizations and partners to support the management of desert locust control operations in the affected countries is an urgent necessity, as it compensates for the lack of national resources required for control and mitigates the repercussions of the locust outbreak on local communities in locust-infested areas.

From this standpoint, we find that an excellent preparedness to confront desert locust outbreaks must go through the following stages:

1. Autonomous National Locust Units

The following benefits justify the existence of national locust control units: (1) the ability to deal with a pest that poses serious risks, which are not caused by other pests, (2) quick decisions making in emergencies, (3) the availability of financial and specialized human and material resources, ready for immediate action, (4) and the ability to have direct and continuous communication with relevant regional and international partners. The more financially and administratively independent these self-managing units are, the more effective and efficient they perform and accomplish their work.

2. Operational fund

It is agreed that dealing with all the development of desert locust infestations (reduction - outbreak - upsurge - epidemic) is a national responsibility and obligation that falls primarily on the concerned countries exposed to infestation. Those countries should allocate the human and financial resources required to cover the costs of locust control operations. Accordingly, national emergency plans must display the financial position of locust control units or departments to identify the levels of infestation that can be dealt with nationally and those infestations outside national control limits and needing support.

3. Capacity building

National staff are the executing force for all significant locust operations. Action or emergency plans can only be implemented through trained and qualified national cadres scientifically and practically. Continuous investment in training national staff is the only guarantee for the sustainability of the success of locust operations management and thus the success of the preventive control strategy.

4. National contingency plans

Desert locust crises are often associated with panic, which is a significant cause of confusion in decision-making, inability to set priorities and consequently, failure to take the right decisions at the right time. Therefore, the Desert Locust action/emergency plans are a guide that helps decision-makers to identify risks and develop mechanisms to avoid or deal with threats. National locust control units or the concerned departments periodically prepare Desert Locust action/emergency plans based on available national capabilities.

5. Simulation

It is not possible to rely only on national emergency plans once they are developed or approved by the country's concerned authorities without testing the developed plan's effectiveness and efficiency. By simulating the implementation of a mini-model of the anti-locust campaign and applying the plan to this campaign, and according

to the simulation results, the established emergency plan is modified or improved and then approved in preparation for its activation when needed.

6. Regional contingency plans

The objective of having national contingency plans is to effectively manage desert locust operations in affected countries at certain levels of infestation that are compatible with the available national capabilities, resources and budget. When the infestation exceeds those levels, the regional emergency plan is activated, and the assistance of the regional emergency fund is used to support national control operations. Regional contingency plans are the intermediate support stage between national capacities and international aid. The efficiency of regional contingency plans for early intervention depends on the availability of financial resources for their implementation.

7. Regional emergency fund

The regional emergency budget is a financial instrument that must be resorted to by the regional Commission to support desert locust control operations in affected countries when national budgets cannot withstand or bear the costs of control campaigns at certain levels of infestation defined in national and regional contingency plans. The regional emergency find must be fiscally sound and easy to spend to achieve positive results.

8. International support

The sources of international aid for the Desert Locust crises are the donor countries, the Central Emergency Response Fund (CERF) and the Special Fund for Emergencies and Rehabilitation Activities (SEFERA). These sources provide substantial financial and in-kind assistance to the affected countries that help control the crisis. However, despite its importance, it comes late after the beginning of the crisis, when the situation has gotten out of control, and locusts have spread in many countries and threatened the rural population's food security and pastoralists in the countries. Therefore, it is necessary to find an innovative mechanism that depends on pumping sufficient funds from the emergency mentioned above funds and from donor countries and organizations at an early stage, subject to the early warning system and the forecasts report issued by FAO and its regional Commission.

Based on the previous, and in light of the lessons learned from the Desert Locust upsurge (2019-2021), suggest that early preparedness and improved response priorities can be arranged in the countries of the central region as follows:

1. **The Commission:** Member states pay annual contributions on an annual basis without delay and pay the arrears.
2. Adopting the regional emergency fund from outside the annual budget, with an amount not less than 3 million dollars to be divided among the member states according to what is agreed upon in a meeting held for this purpose.
3. **Member States:** Should give more attention to and support the national locust control units with adequate human and financial resources without waiting for external support.
4. **Breeding countries:** Support the establishment of autonomous locust units, rehabilitate existing locust bases, allocate an annual, approved and sufficient national budget to cover locust management, survey and control operations, develop national contingency plans, build human capacity, implement national simulation, maintain the capabilities obtained during Locust outbreak 2019-2021 (sprayers and vehicles, camping tools and equipment, pesticide and pesticides disposal equipment).
5. **Invasion countries:** The need to allocate units (unit or division) to manage Desert Locust control operations, maintain available national capabilities and resources, develop contingency plans, build human capacities, and preserve the qualifications obtained during the locust outbreak 2019-2021.

Discussion points:

1. Was the response of the affected countries in the region consistent with the crisis in each country?
2. Was the Commission's response consistent with the crisis in the region's countries?
3. Was the organization's response consistent with the crisis in the region's countries?
4. To what extent was the international response consistent with the magnitude of the crisis in the region's countries?

Appendix 8. Improving Control Operations - Ground and Aerial control

In the period from 2018-2021, 37 (36 + Nepal) countries were invaded by different levels of Desert Locust infestations. Control operations were conducted in 30 countries, for areas more than 5.6 million hectares, in which about 6.9 million liters of pesticides were used, indicating that the rate of pesticide application was relatively high. This may be due to several reasons, including: (1) the use of water-based (EC) pesticides sometimes, which requires more quantities than those required by ultra-fine volume pesticides (ULV), (2) many invasion countries conduct control operations on areas of extensive and wide range, bearing in mind that the rate of use of pesticides recommended for locust control ranges between 0.5 – 1.0 liter per hectare, for ultra-micro-volume (ULV) pesticides and (3) non-compliance with the calibration procedure of the machines before the control operations.

Given that "correct application and use of pesticides" is vital to conserve resources as well as preserving human health and environmental safety, improving control operations remains critical, through the correct application of the recommended rates of pesticides, using approved spraying equipment and modern supportive equipment that provide guidance for ground or aerial control methods such as Track Guidance System. This in turn leads to adjusting the rates of pesticide use and recommended doses, thus reducing the cost of the control campaigns, as well as reducing other damages that pesticides may cause in the targeted areas.

Application methods

During the period 2018 to 2021, more than 16,000 Desert Locust control operations were conducted in the central region member countries alone. Of these, 65.5% used vehicle-borne equipment, 15.2% through aerial control, and 8% by hand held control equipment, in addition to 11.5% by unknown equipment (as mentioned in eL3 messages). These equipment have often been used by the invasion countries that do not have specialized Locust control equipment. It should be noted that air operations were largely carried out in Ethiopia, to a lesser extent in Saudi Arabia and Sudan, and to a very limited extent in Jordan.

Control equipment recommended by the Food and Agriculture Organization have proven their effectiveness in Desert Locust control when used by trained specialists and represented the cornerstone of effective control teams. Nevertheless, some countries still do not have sufficient quantities of these recommended control equipment to deal with large infested areas, which has increased their reliance on traditional spraying equipment that use water-based pesticides. Additionally, their use were often proper due to poor or no training, which lead to a large quantity becoming out of service early, despite their quality and ease of maintenance. When the 2019-20 outbreak occurred, the demand for the recommended control machines increased, both by countries and by FAO, which led to the formation of a waiting list at the manufacturer, as well as the delay in their arrival on time. Thus it is very important to have a good balance of control equipment in stock in the member countries and by FAO before the crisis occurs.

Aerial control

Aerial spraying is one of the most important means in controlling Desert Locust, especially when the infestation large and expanding, where it is difficult for ground control teams to contain the infestation, and especially when the infestation is located in remote desert areas or areas difficult to reach by cars. Therefore, aircraft equipped for this purpose are used to control the Desert Locust and prevent the migration to agricultural crops areas and neighboring countries, especially in cases of large upsurges such as the last one 2019-2021. Aerial spray control was used extensively in many countries in the region such as Ethiopia, Kenya and Somalia. The spray aircrafts had a pivotal and effective role in controlling many locust swarms, and therefore it is necessary that these aircrafts meet the technical requirements and specifications. Since aerial control uses large quantities of pesticides to cover large areas of land, it is therefore necessary to pay attention to the efficiency of operations and the quality of control, taking into account the environmental aspect.

Despite all the efforts that have been made in this aspect over the past years, some countries still rely on operating aircraft for air control that do not meet the quality and safety standards recommended by FAO, which reduces the efficiency and effectiveness of air control and doubles the economic costs of control, in addition to not observing the environmental requirements adopted in this framework.

Discussion Questions

1. Do aerial spraying aircraft used in the region's countries conform to the specifications set by FAO?
2. Why some countries do not follow the general approach in this context?
3. Do member countries support the use of drones as a complementary tool to control locust in the region?
4. Why are many countries late in adopting the recommendations of the regional commission for using modern technology for locust control?

Appendix 9. Improving Control Operations- Conventional Pesticides, Biological Control and IGRs

There have been numerous pesticides used for locust control around the world over the last seven decades, many of these we came to realize were harmful to human, animal and the environments health, with some having long lasting negative effects. Over the last decade more of these previously used chemical-based insecticides have been banned in many countries, while others still choose to use them due to limited availability of alternative solutions that work. Chemical companies no longer invest in the research of new insecticides against locusts due to limited financial returns on their research investment. It is now vital that we work together to not only ensure we use existing options effectively and safely but we develop and share knowledge on best practices and successes achieved with some of the more locust specific and less toxic pesticides such the IGRs and Biopesticides.

Somalia success story

In late 2019, FAO and the Somalia government committed to the sole use of the biopesticide Metarhizium (Novacrid) in Somalia and the addition of the Insect Growth Regulator (IGR) Teflubenzuron later in 2020 to enhance hopper band control. During 2020, with the assistance of FAO, the Somali government aerial and ground control teams treated 130,000 ha of Desert Locust hopper bands with the biopesticide Metarhizium (Novacrid). On November 22, Cyclone Gati produced 2 years of rain in just two days across the northern Somalia region, producing ideal breeding conditions and resulting in the Desert Locust upsurge continuing into 2021.

To overcome the upsurge in 2021, almost 190,000 ha of hopper band affected area were barrier treated with the Insect Growth Regulator (IGR) Teflubenzuron 30g a.i / liter, greatly reducing the number and size of swarms forming and assisting with follow up biopesticides operations. 250 swarms covering 80,000 ha were successfully treated with the biopesticide Metarhizium at 50g a.i / liter, applied at 1 liter per ha. Reports of very few swarms migrating from Somalia to neighboring countries by the end of 2021 highlighted the success of the 2021 operations. Efficacy assessments during 2021 provided excellent results for both the IGR barrier treatments on hopper bands and the biopesticides on immature swarms. In both cage and field trials with the biopesticide Metarhizium, 50% mortality was seen in 9 days and 83% within 14 days of treatment. Efficacy assessments of the IGR at 300m spacing provided 90-98% mortality between 4 and 10 days and at 500m barrier spacing 98% within 11 days after treatment.

The successful operations carried out in Somalia, especially during 2021 showed that large scale control using a combination of the biopesticide Metarhizium and a low toxicity 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.

Foreseeable future

A local understanding of how desert locusts behave in each country combined with the sharing of advances in survey and control conducted in other countries and regions as well as affordable operational enhancing software systems will assist each country with the development of their own Integrated Pest Management Plans for both successful and environmental and human health and safety conscience Desert Locust responses.

Being able to quickly choose a control operation needs in terms of; ground/aerial/both, large capacity fixed wing spray aircraft, lower capacity / higher cost yet greater flexibility survey/spray helicopters or longer-range survey aircraft, and combining these options with a selection of approved insecticides that meet the range of situations DL are found in.
Such as fast acting insecticides for protecting cropping areas or treating very mobile swarms, longer lasting but more selective insecticides that allow Barrier Treatments to be employed, such as with IGRs, to very large areas of hopper bands too difficult to treat with blanket treatments, to increased knowledge of and use of biopesticides such as Metarhizium, in sensitive areas as well as to reduce our impact on the environment, non-target species and beneficial insects.

Discussion points

1. What are the proposed strategies to improve locust control while maintaining EHS standards?
2. Are the current strategies appropriate?
3. What are the main country hindrances to improving control?
4. How can we overcome these hindrances?

Appendix 10. Drones for Survey and Control Operations

The use of Drones for early warnings with the Desert Locust

After years of extensive efforts, the Food and Agriculture Organization (FAO) along with the regional Commissions for Controlling the Desert Locust have approved the use of drones as part of the early warning system. The integration of the use of drones and the current survey activities, which are conducted by the national teams on the ground, would lead to decrease the frequency, the duration as well as the intensity of the destructive pandemics. This would also enhance the food security and the livelihoods. Each team would be allowed to survey larger terrains and to reach those that are difficult or impossible to access, such as the sand dunes and the unsafe terrains.

The use of drones to control Desert Locust

FAO and the Desert Locust control Commissions are working to introduce drones in locust control as part of the preventive control strategy and as a complementary tool for sustainable locust management. Since there is no established methodology for using drones to control locust yet, despite the existence of some prototypes, they do not match the standards required for locust control in terms of the technology used and technical specifications. Accordingly, procedures are currently underway to obtain and develop prototypes in line with locust control. This will include equipping the drones with specially designed and calibrated spray equipment to enable precise target mapping and spraying, as well as formulating Standard Operating Procedures (SOPs) and operating standards for the safe and effective use of technology including adaptation to the use of environmentally friendly biopesticides. Moreover, the use of drones for controlling locust would reduce the risks faced by the employees in this field and make the operations more efficient and safe to the environment. Consequently, it would reduce the use of pesticides.

Discussion questions

1. Do member countries support the use of drones as a complementary tool to control locust in the central region?
2. Why are many countries late in adopting the recommendations of the regional commission for using modern technology for locust control?

Appendix 11. Climate Change and Locust Outbreak

Desert Locust and Weather

Desert Locust has a very close relationship to different weather factors. This relationship has two-way directions: the first is weather effect on the Desert Locust biological developments and behaviour, and the second is weather effect on the locust breeding areas. In the first aspect, various weather factors play a critical role in developing the Desert Locust life cycle, starting from the egg stage and passing through the different stages of the hoppers until the adult stage. Weather also constitutes the limitations of the behavioural forms that the different stages of locusts go through. As for the second aspect, weather factors determine whether the Desert Locust situation will be calm or in a more active state, such as an outbreak, upsurge or plague.

During Desert Locust calm or recession periods, a small number of solitary locusts are present in dry and scorching desert environments. When sufficient amounts of rainfall, the vegetation areas become green, forming areas for locusts to gregerize for food and breeding. Female locusts lay eggs in sandy soil with suitable ground moisture to maintain the viability and development of eggs that require specific ground temperatures and humidity for successful hatching. The emerged hoppers move from one place to another according to the soil temperature, direction and wind speed, searching for green vegetation for food and shelter. With varying temperatures, the hoppers develop and go through several different stages. Eventually, adults are formed again, but in numbers exceeding the number of parents, to begin the first stages of development of the locust situation, the outbreak. With the succession of two or more seasons of heavy rain on locust breeding areas, the new locust populations search for areas with more abundant green vegetation for food, thus migrate from one place to another for long distances under particular conditions of temperature, wind and sunshine. This migration helps the maturity for adults, as they breed again rapidly to form gregarious Desert Locust swarms, which cause severe damage to agricultural production and threaten the livelihoods of many poor rural communities in several countries inside and outside the boundaries of the breeding area. Thus, the most virulent Desert Locust situations are formed, the upsurge or plagues. It should be noted that the declines of upsurges or plagues are often attributed to the combined effects of unfavourable environmental conditions and control operations.

The situation of upsurge or plague requires the availability of specific readings from several weather factors that help in the success of the development of the Desert Locust and, at the same time, suitable the environmental conditions for Desert Locust breeding. This may seem exceptional and may not be much frequent. However, the occurrence of 12 upsurges and 10 plagues during 162 years (1860-2022) may be evident that this is not true.

Climate change

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities (e.g. Energy, industry, transport, buildings, agriculture and land use) have been the main driver of climate change. Warmer temperatures over time are changing weather patterns and disrupting the usual balance of nature. The Earth is now about 1.1°C warmer than it was in the late 1800s. The last decade (2011-2020) was the warmest on record. Global warming is projected to reach around 3.2°C by the end of the century.

General Impacts of Climate Change

It is believed that climate change mainly means warmer temperatures. But temperature rise is only the beginning of the story. Because the Earth is a system, where everything is connected, changes in one area can influence changes in all others. As greenhouse gas concentrations rise, so does the global surface temperature. Higher temperatures increase heat-related illnesses and make working outdoors more difficult. Wildfires start more easily and spread more rapidly when conditions are hotter. Temperatures in the Arctic have warmed at least twice as fast as the global average. As temperatures rise, more moisture evaporates, which exacerbates extreme rainfall and flooding, causing more destructive storms. The frequency and extent of tropical storms is also affected by the warming ocean. Cyclones, hurricanes, and typhoons feed on warm waters at the ocean surface. Such storms often destroy homes and communities, causing deaths and huge economic losses. The consequences of climate change now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.

The impact of climate change

The majority of Desert Locust upsurges and plagues develop due to unusual meteorological conditions such as those associated with cyclones and other extreme weather events that lead to heavy rainfall, which, in turn, causes ecological conditions to become highly favourable for locust breeding. Climate change experts predict more extreme weather, including droughts, floods and cyclones.

Whereas locust numbers decrease during droughts, locust outbreaks often follow floods and cyclones. Local increases in rainfall can favour breeding conditions for locusts and determine the size of feeding areas, leading to changes in plague development. Climate change experts also predict that temperatures will continue to rise. Temperature governs the speed of locust development and swarm movement. Thus, increased temperatures associated with climate change can potentially shorten both the long maturation and incubation periods during the spring and allow an extra generation of breeding to occur in North-West Africa, the Arabian Peninsula and South-West Asia. This could increase the number of locust generations in these regions in a year and amplify the overall plague risk.

Changes in El Niño and La Niña events due to climate change could affect breeding during the winter in the Horn of Africa and during the summer in the West African Sahel. The effects of climate change on winds are less certain. Any changes in wind speed, direction and circulation flows are expected to affect Desert Locust migration. They could allow adults and swarms to reach new areas at different times of the year. Whether they will settle, survive and breed in these new areas will depend on ecological, habitat and weather conditions.

Desert Locust Upsurge 2019-2021

Desert locust upsurges generally occur when the environmental conditions suddenly become suitable for the locusts to come out of the recession phase and reproduce rapidly. Past plagues and outbreaks have been linked to cyclones, as cyclone events produce heavy rainfall needed for locust outbreak. Due to climate change, more extreme weather events such as cyclones and extreme rainfall events are expected to occur in the region.

The 2019-2021 Desert Locust plague in Eastern Africa, the worst of its kind in more than 70 years, was likely exacerbated by shifts in rainfall patterns and intensity and high cyclone activity in late 2019. The initial breeding of Desert Locusts, most importantly, occurred after heavy rains associated with tropical cyclones Sagar (May 19) and Mukono (May 23) 2018 and Cyclone Luban (October 11, 2018), which resulted in two successive generations of locusts breeding, in hard-to-reach breeding areas, south of the Empty Quarter, the Arabian Peninsula.

It was known that breeding was underway, but it was difficult to reach and follow up or control it, which led to its expansion and migration from that area. In January-February 2019, the swarms moved from the Empty Quarter and began to reach Yemen, Saudi Arabia, and then Iran. This coincided with the migration of swarms resulting from winter breeding on the coast of the Red Sea from Sudan and Eritrea to Saudi Arabia and Egypt.

Cyclone Pawan 2019 also created wind patterns that enabled it to invade East Africa. Therefore, part of the swarms formed in Yemen moved to northern Somalia and Ethiopia, where breeding took place and more swarms formed. By December 2019, locust swarms were present in Ethiopia, Eritrea, Somalia, Kenya, Saudi Arabia, Yemen, Egypt, Oman, Iran, India and Pakistan. At the beginning of February 2020, swarms arrived in northeastern Uganda and northern Tanzania. Swarms also appeared in Iraq, Kuwait, Bahrain, Qatar, Emirates and southern Iran. The upsurge continued until the end of 2021, affecting nearly 23 countries. After more than two years, the locust infestation decreased because the environmental conditions became dry due to the lack of rainfall in the Horn of Africa and on both sides of the coast of the Red Sea and the Gulf of Aden, in addition to the success of ground and air control operations.

As climate change continues, we know that temperatures will continue to rise, that more positive Indian Ocean Dipol[6]e events are likely to occur, and that this will bring increased convection and precipitation to Eastern Africa. Increased soil moisture increases vegetation in semi-arid and arid regions due to increased rainfall, and higher air temperatures create the perfect concoction for locust breeding and development. For this reason, it is essential to gain a deepened understanding of the complexities and nuances of weather and bioclimatic conditions that uniquely affect Desert Locusts at each stage of their lives.

Discussion points

1. Ways to confront desert locust crises in light of epidemic outbreaks or global humanitarian crises.
2. Locust control strategies, according to breeding environments, especially in unsafe environments.
3. National contingency plans in the affected countries. Has it been activated by the concerned countries?
4. Supporting national locust control units to become more operational, administrative and financially independent?
5. The absence of clear national frameworks for the management of desert locusts in the countries of spread
6. Increasing reliance on biopesticides as part of the preventive control strategy.
7. Introducing the use of drones into the information, early warning and control system.
8. The necessity of applying environmental health and safety standards during locust upsurges, especially in breeding countries.

[6] The Indian Ocean Dipole (IOD) is defined by the difference in sea surface temperature between two areas (or poles, hence a dipole) – a western pole in the Arabian Sea (western Indian Ocean) and an eastern pole in the eastern Indian Ocean south of Indonesia. The IOD affects the climate of Australia and other countries that surround the Indian Ocean Basin, and is a significant contributor to rainfall variability in this region.

Appendix 12. Review of the Joint Activities (CRC-CLCPRO) Executed under Component 4 of the French Development Agency Project

In the Western region grouping the countries of North-West Africa and West Africa, the FAO Commission for Controlling of the Desert Locust in the Western Region (CLCPRO) which regroups ten (10) countries (Algeria , Burkina Faso, Libya, Mali, Morocco, Mauritania, Niger, Senegal, Chad and Tunisia) is responsible for promoting at the national, regional and international level all activities, including research and training in order to ensure rational and sustainable preventive control and to cope with Desert Locust invasions in its habitat area.

In this context, a research project GCP/GLO/096/FRA, entitled "Consolidating the bases of the preventive control strategy and developing operational research on the Desert Locust in the western region" was signed between the FAO and the French Development Agency (AFD) to improve food security and the livelihoods of populations likely to be affected by the Desert Locust in West Africa and to develop operational research to adjust the implementation of the preventive control strategy against the Desert Locust to the inaccessibility of certain areas, the impact of climate change and health and environmental requirements.

The project, which runs from January 2021 to December 2024, concern all CLCPRO member countries with a budget of 3 521 127 USD, of which 653 261 USD for the Letter of Agreement (LoA) with the French agricultural research and cooperation organization (CIRAD) and 1 194 743 USD for collaboration with the Desert Locust Control Commission in the Central Region (CRC) under component 4.

The three components of the AFD project concern technological innovations, the adaptation of prevention tools to climate change and better preservation of the environment by developing more respectful control methods. The actual launch of the project took place during a workshop organized by the CLCPRO, by videoconference, on April 6 and 7, 2021, attended by the head of the "Locusts and transboundary plant pests and diseases" (NSPDM) group from FAO Headquarters, the representatives of the CLCPRO member states, the Executive Secretary of the CLCPRO, the Executive Secretary of the CRC, the representative of CIRAD, the representative of the AGRHYMET Regional Centre, the representatives of the SERVIR East Africa Program west as well as officials from the CLCPRO Secretariat.

At the end of this workshop, an operational plan of activities to be carried out in 2021, inspired by the project's Activity Planning Scheme (SPA), was validated and budgeted. The CLCPRO Secretariat, in consultation with the national locust control units, coordinates this project and CIRAD for the implementation of the activity-planning scheme as approved.

Component 4 of the project is dedicated to the collaboration between the two FAO commissions (CRC) and (CLCPRO) whose agreement was signed on May 25, 2021 and covers three areas having direct impacts on the improvement of strategic mechanisms for preventive control as well as to cope with locust upsurges/invasions, particularly in the so-called "front line" countries; these are the institutional, financial and operational aspects.

As part of the implementation of component 4 of the AFD project, the activities carried out to date have focused on:

1. The organization of a workshop in Cairo, Egypt, from 28 to 30 September 2021, for the development of a detailed and budgeted action plan for component 4 for the period 2021-2024. Attended by representatives of 10 member countries from the two regions, the Executive Secretary of CLCPRO, the Executive Secretariat of the CRC, representatives of AFD and FAO headquarters.
2. Participation of four (O4) CRC representatives in the joint survey using drones in Desert Locust monitoring, organized by CLCPRO, from 1 to 9 November 2021, in Mauritania;
3. Participation of the CRC Secretariat in the workshop to update national/regional locust emergency plans in the western region held from 14 to 18 March 2022, in Saly, Senegal;
4. Joint inter regional organized jointly with NEPPO on the use of biopesticides in locust control, organized from May 16 to 20, 2022, in Agadir, (Morocco) and funded by FAO and component 4 of the AFD project.
5. An evaluation mission is being organized to evaluate the current institutional status of the NLCUs, regarding the autonomous in CRC and CLCPRO.
6. Workshop to prepare CRC regional training plan (2022-2025) is scheduled, 27-30 June in Cairo, Egypt;
7. An Inter-regional (CRC-CLCPRO) workshop to plan research activities (2022-2026) is planned, 26-29 July, in Tunis, Tunisia.

Appendix 13. Commission's New Midterm Workplan (2022-2025)

Year	Month	Start Date	End Date	Host Country	City	Activity
2022	June	27 Jun	30 Jun	Egypt	Cairo	Regional workshop to set up training work plan
	July	17 Jul	22 Jul	Kenya		Visit with CLCPRO Secretary and Head of NLCU of Sudan to ICPE
	September	14 Sep	22 Sep	Mauritania	Nouakchott	Training on DRONES (joint survey using drones)
		26 Sep	30 Sep	UAE	Dubai	EHS National Training Course
		21 Sep	28 Sep	Egypt	Safaga	National training course on Operating and Maintenance of ULV Sprayers for Technicians
				Morocco		Biopesticides for YEMEN
	October	23 Oct	28 Oct	Morocco	Agadir	Aerial Spraying (Aerial Application Techniques for Locust Control)
				Egypt		Locust-PMS for Arab countries (^ participants) + Locust-PSM for Yemen (^ Participants)
				Ethiopia		Locust-PMS for Eng. Countries (Back-to-Back)
	November	1 Nov	4 Nov	Tunisia	Tunis	Regional workshop to assess the current status of research in CRC countries
		14 Nov	18 Nov	Mali		SVDN
		13 Nov	21 Nov	Egypt	Safaga	Sub-Regional CRC + Libya
		27 Nov	1 Dec	Algeria	Algiers	The 10th session of the CLCPRO
	December	2023	2023	Egypt, Oman		Regional Simulation
		12 Dec	16 Dec	France		Scientific visit to CIRAD institute
				Egypt		ULV Sprayers Evaluation (Date To be confirmed)
2023	January			Saudi Arabia		Evaluation Drones
				Tbc		Regional workshop to setup research plan for CRC
	February					Organize National Donor meetings
						Harmonize Training modules,
	March					National or Regional Simulation
						Organize a Joint ToT training
	April					Organize Regional Donor meeting
						Update plans based on inventory reports
	May					Provide the necessary resources to implement risk management plans
						Strengthen the applied research between the two commissions
	June					Provide technical & financial support to ensure the autonomy of NLCUs
				Syria		GPS + Drones + Green Muscle
	July					Exchange visits between the two commissions member countries
	August					Provide a legal support to establish/strengthen the autonomy of NLCUs
						Support advocacy to finance the preventive control strategy at the national level
	September					Support through technical guidance the advocacy strategy to finance regional funds
	October					The technical and financial justification of the regional fund is used to advocate its funding
						Support advocacy to institutionalize south-south collaboration
	November					Exchange visits between the two commissions member countries
				Lebanon		DL Control+Sprayers+Info
	December			Iraq		DL Survey+Control+Sprayers+Info
				Bahrain		DL Control+Sprayers+Info

Appendix 13.1. French Development Agency project

The project

A research project entitled: “Consolidate the bases of the preventive control strategy and develop operational research on the Desert Locust in the Western Region” (GCP / GLO / 096 / FRA) was financed by the French Development Agency (Agence Française de Développement - AFD) to improve the food security and livelihoods of populations likely to be affected by the Desert Locust in West Africa and develop operational research to adjust the implementation of the control strategy prevention against the Desert Locust due to the inaccessibility of specific areas, the impacts of climate change and health and environmental requirements.

The project, which starts from January 2021 to December 2024, will concern all the member countries of the CLCPRO with a budget of 3,521,127 USD including 653,261 USD for the Letter of Agreement (LoA) with the Center for International Cooperation in agronomics Research for development (Centre de cooperation international en recherche agronomique pour le développement - Cirad) and USD 1,194,743 to support the FAO Commissions for Controlling the Desert Locust in the Central Region (CRC).

See the final report of the Regional Workshop for the Implementation of the Plan of the Fourth Component of the project (GCP/GLO/096/FAR) financed by the French Development Agency

Appendix 13.2. The Kuwait Fund for Arab Economic Development (KFAED)

The project

Kuwait Fund for Arab Economic Development (KFAED) project contribute to, reducing the spread and outbreak frequency of the Desert Locust, preserving national food security and livelihoods.

The project is considered as contribution from Kuwaiti Government through the Kuwait Fund (KFAED) to complement the generous contribution of the regional and international partners to the FAO Desert Locust emergency response.

The contribution will serve for further strengthening the preparedness of the Central Region countries. The two-year project with a budget of USD 1 000 000, will contribute to reducing the spread and outbreak frequency of the Desert Locust, and preserving national food security and livelihoods, and the environment from the extensive use of pesticides. The immediate beneficiaries are the National Desert Locust Control Units (NDLCUs) and plant protection services responsible for locust management in the 16 concerned countries, namely; Bahrain, Djibouti, Egypt, Eritrea, Ethiopia, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, Emirates and Yemen, whose technical and human capacities will be strengthened to better anticipate, prevent or respond to locust crises.

With the overall goal of reducing risks of locust disasters in CRC, the project objectives are to improve locust management and more specifically enhance early warning and reaction to appropriate locust monitoring as well as better capacities to respond to locust infestations, with particular attention to human health and environment.

The project contains several components that contribute to achieving its objectives, the most important of which are the following:

- Rehabilitate, maintain and equip LCUs in the Member States.
- Procure vehicles and sprayers equipment for locust control operations.
- Procure high-tech tools for DL early warning technology.
- Support the use of drones for DL monitoring within DL early warning system.
- Building national capacity in Desert locust management.
- Provide consultancy services for training, follow-up and process reference documents.

Appendix 13.3. French Development Agency project

Strengthening the preventive control of the Desert Locust in the Central Region / Horn of Africa

The project

The project was formulated based on the recommendations made by the Real-time evaluation of FAO's response to Desert Locust upsurge 2020-2021 - Phases I and II (which were presented to all stakeholders, primarily concerned countries) and Phase III (under finalization). The project aims to address also the recommendations of other studies carried out by the French Agency of Development (AFD) and World Bank (WB), which were presented at the High-Level Conference on the Prevention and Monitoring of future Desert Locust outbreaks in the East Africa region (May 2021) and at the Ministerial Conference on the Sustainable Management of Desert Locust and Other Transboundary Pests of the Intergovernmental Authority on Development - IGAD (June 2021). During the project implementation, consultations will continue to take place among relevant stakeholders including authorities at all levels and partners, to ensure activities be implemented based on the principles of solidarity, demand-driven and sustainability. The HassanII University and Kenya ICPAC will be engaged to determine their capacity to provide suitable services for the master' Programme. The DLCO-EA as a long-term Locust management contributor in the GHoA will be closely engaged during the project.

MAIN OUTPUTS/ACTIVITIES

Main Expected Outputs	Main Project Activities
• Enhance the sustainability management mechanism of the Prevention Control Strategy; • Promote Desert Locust management of the National Locust Control units (NLCUs) and strengthen the Commission for Controlling the Desert Locust in the Central Region Central (CRC).	• Enhance the Governance of the CRC, • Build the preparedness and early reaction capacity to manage locust activities; • Promoting knowledge exchange and partnership among CRC and CLCPRO.
• Capacity building and development of a regional locust curriculum in DL management, including a Master of Science Programme in Desert Locust Management.	• Development of a Regional Locust Curriculum; • Improve the countries preparedness, early response, prevention and risk reduction capacity at the national and regional level; • Improve the Desert Locust monitoring, prediction and control capacity and technologies.
• Structuring regional coordination through support to the CRC in its discussions with non-member invasion countries and regional organisations (DLCO-EA, IGAD and EAC).	• Enhance coordination between the regional organisations (CLCPRO & DLCO-EA & IGAD and EAC); • Improve the CRC non-member invasion country's preparedness, early action, prevention and risk reduction capacity.

Appendix 14. Commission Governing Body

History background

The establishment of the Commission for Controlling the Desert Locust in the Near East (the Commission for Controlling the Desert Locust in the Central Region today) in 1965 and its entry into force in 1967 after the signing of the establishment agreement by Jordan, Kuwait, Lebanon and Sudan was a historic event. The choice of the commission's head office in Jeddah, Saudi Arabia, came naturally, given that it hosted the International Locust Control Center in the Food and Agriculture Organization (FAO), which was responsible for coordinating international efforts and responding to emergencies, particularly in the Arabian Peninsula and East Africa, which was the basic cornerstone for the establishment of the Commission.

For unclear reasons, the FAO decided to close the International Locust Control Center in Jeddah in 1987, while retaining the work of the regional locust official to manage the tasks of the Regional Commission for Desert Locust Control in the Near East. This came after the desert locust plague that swept through the countries of the central and western regions from 1987-to 1989. Probably, FAO's reason was to promote the Commission in taking charge of its regional mandate with bigger responsibilities and to stop the conflicting roles with the International Center for Locust Control.

However, the financial difficulties experienced by the Commission due to the accumulation of arrears and the suspension of many countries from paying their annual contributions in addition to the suspension of holding regular meetings of the Commission during the period of the locust plague between 1990-1997 undoubtedly contributed to the deterioration of the situation in light of a deep crisis in the operational and financial aspects of the Commission. The value of the arrears amounted to one million dollars, which failed to carry out the basic activities of the Commission. The situation became worse when the Executive Secretary of the Commission, Mr Ahmed Al-Khasawneh, retired in 1991 without appointing a replacement, with his position being abolished, without interference or objection from the member states to help the Commission address its organizational and financial challenges. FAO stepped in, with its Migratory Pest Control Officer, Mr Abdul Rahman Hafrawi, assuming the duties of the Executive Secretary of the Commission temporarily. Accordingly, the head office of the Commission was moved from Saudi Arabia to Rome. In 1993, the Commission's head office was moved to the Regional Office for the Near East in Cairo as a temporary head office. Mr Mahmoud Taher was temporarily assigned to manage the tasks of the Commission's secretariat in addition to his job as a Regional Plant Protection Officer. In the 19th Commission Session, which was held in Syria, the member states requested the director-general of FAO to restore the position of the executive secretary of the commission, whereby Mr Munir Boutros assumed the position of Executive Secretary of the Commission in April 2000.

The locust breeding areas in the countries covered by the Commission are the primary source of most Desert Locust outbreaks in the central region. Swarms erupt from the breeding areas overlooking the coasts of the Red Sea, the Gulf of Aden, the Arabian Peninsula and the Horn of Africa. Therefore, FAO recommended the implementation of the EMPRES (Emergency Prevention System for Transboundary Plant and Animal Diseases and Pests) - the Desert Locust component in nine countries around the Red Sea (Djibouti, Egypt, Eritrea, Ethiopia, Oman, Saudi Arabia, Somalia, Sudan and Yemen), to promote the capabilities of desert locust management in those countries and reduce the risk of desert locust spread. It has been designed as a collaborative program in affected countries that partners with regional organizations, donors and FAO in developing and improving preventive control strategies. The Commission actively participated in the implementation of the EMPRES program (1996-2006), which greatly contributed to reviving the commission's role.

This also resulted in changes to the agreement establishing the Commission in 1996 so that the countries of the Horn of Africa (Djibouti, Eritrea, Ethiopia and Somalia) could join the Commission, and the name of the Commission was changed from the Commission for Desert Locust Control in the Near East to become the Commission for Controlling the Desert Locust in the Central Region.

EMPRES in the Central Region has made satisfactory progress towards achieving its objectives to reduce the risk of Desert Locust spread emanating from known breeding areas through well-targeted and timely surveys, and environmentally sound interventions to address food security concerns in the Central Region and beyond. For sustainability and achieving the goals in the countries of the region, the Commission has completed what was started by EMPRES in various fields of enhancing the capabilities of the national, regional and international components of the Desert Locust management system and implementing effective and efficient preventive control strategies based on early warning and intervention in a timely, safe and environmental manner.

Therefore, during the past 20 years, the commission has made distinguished achievements that included various elements of the preventive control strategy, such as supporting and strengthening early detection capabilities and national and regional early intervention capabilities, capacity building, training and contingency planning to prevent the outbreak from developing into an epidemic, thus decreasing the risk of locust outbreaks during the last two decades. However, the recent locust outbreak 2019-2021 cast a shadow over what has been achieved in the past years and indicated clearly that there is still a strong need for vigorous follow-up and closer work with all countries, especially concerning promoting and introducing the use of new technology in early detection and control in a more effective way, taking into account environmental safety in the implementation of the preventive control strategy with all its components. Therefore, the Commission is required to make redoubled efforts and continuous preparedness to curb the spread of desert locusts, protect livelihoods and provide timely assistance to their countries.

The Institutional and Financial Aspect of the Commission Secretariat

Although the Commission's secretariat has been providing its various services for more than 55 years, to sixteen member states, representing 33% of the desert locust distribution area. However, it is noted that this work is done through a limited staff consisting of the Commission's Secretary, Administrative Assistant and Technical Assistant only, and specialized technical cadres are sought on a need-basis but through work contracts of limited duration (3-6 months). The commission's annual budget (532,000 US dollars) does not allow it to cover all periodic activities related to the commission's work plan, in addition to spending on the operational aspects of the commission's secretariat, as the annual spending rate is always higher than the annual contributions paid to the trust fund. This is in addition to the very limited capabilities of the Commission's regional emergency fund, which was established in 2014. This has negative implications on the speed of response to support the countries that were under attack by locust swarms at the beginning of the recent locust upsurge from 2019-to 2021, and the Commission was unable to obtain early support from the donor countries calling for a high-level emergency meeting six months before the locust outbreak began (Cairo, June 2019).

Commission's seat

It was believed that the hosting of the Commission's seat by the Regional Office for the Near East and North Africa (RNE) would be provisional until one of the member states hosted the Commission's seat. This has negatively affected the administrative and managerial status of the Commission. Therefore, the Commission's secretariat suffered from the lack of sufficient support from member states, which in turn was reflected in the lack of interest of the Regional Office in the Commission compared to its sister Commission, the Commission for Controlling Desert Locust in the Western Region (CLCPRO), which is Commission's seat in one of its founding countries – Algeria – which provides it with in-kind and financial support.

The secretariat of the Commission is also exposed to other pressures, especially in the operational aspects of carrying out the duties and responsibilities entrusted to it, and also suffers from bureaucracy to complete its work smoothly and easily. For example, it took 3 years to complete the procedures for providing a new vehicle for the Commission and to provide simple financial support to set up training courses or some activity in one of the member states for a long period of up to 3 months. Furthermore, the delegation of the work to the Executive Secretary of the Commission was not carried out with the required speed or effectiveness. It is important to note that we are dealing with a dangerous, migratory insect that reproduces rapidly, spreads rapidly, and migrates freely between countries, resulting in a slow completion of the commission's work. Due to this, preventative measures and well-prepared interventions are always required to prevent locust infestations and maintain food security for the population living in the exposed areas.

Accordingly, the Commission's secretariat believes that it is of paramount importance to study the possibility of moving the seat of the Commission from the Regional Office to one of the member states. This will allow the Commission to perform the tasks required professionally while maintaining the Commission offices in Cairo to provide support particularly in order to conduct activities in Egypt.

Discussion points

1. Relocating the Commission's secretariat seat from the Regional Office to one of the member states,
2. Similarly, to the other FAO Commissions under Article 14 of the organization's constitution, the regional commissions should have more administrative and financial authority.

Appendix 15. Thirty-first Session Recommendations: Review, Achievements and CRC Activities

The Commission Secretariat for controlling Desert Locust in the Central Region carried out many activities from February 2019 to June 2022, in order to support the Desert Locust control operations, not only for the benefit of the member states of the Commission, but also for the benefit of other non-member states that were affected by the Desert Locust upsurge during 2019-21. The Commission Secretariat was concerned with good management, continuous coordination with the Member States, continuous tracking of the desert locust situation, in addition to holding workshops and training courses at the national and regional levels in various fields of desert locust survey and control, as well as Environmental and Health standards program.

It is also worth noting the distinguished cooperation and constructive coordination among the member states of the CR Commission in terms of supporting control operations, exchanging information and reports, and finding solutions to some obstacles, especially with regard to the use of the RAMSES program and eLocust3 tools.

Here, it is necessary to commend the close cooperation between the Commission Secretariat and each of the Desert Locust control commissions in the Western region and in the Southwest Asia region, as well as the Desert Locust Control Organization for East Africa in the areas of information exchange, training and other activities. The following is a presentation of the activities carried out by the Commission secretariat from February 2019 to June 2022:

The activities of the Commission for controlling Desert Locust in the Central Region from February 2019 to June 2022)

I	Visits			
Visited Country	**Date of Visit**	**Vistors**	**Objectives**	**Results**
Yemen	17 - 22 July 2019	CRC Secretary	• Evaluation of the desert locust situation in the country • Examine ways to support control operations	• Support Desert locust surveys and control operations
Ethiopia	10 - 16 Nov 2019	CRC Secretary	• Evaluation of the desert locust situation in the country • Examine ways to support control operations	• The necessity to start an urgent technical support project TCP • Encouraging countries and donors to contribute • The necessity of establishing an independent national locust unit
Morocco, Rabat	25 - 29 Nov 2019	CRC Secretary	• The use of Metarhizium in the control of desert locusts	• Exchange of experiences between commissions
Ethiopia	9 - 24 Dec 2020	CRC Secretary accompanied by a delegation of experts	• Evaluation of the desert locust situation in the country • Examine ways to support control operations	• Field team training support • Encouraging field reporting • Use helicopters to survey • Operations budget financing
Eritrea	6 - 9 Dec 2021	CRC Secretary	• Participation in the 66th Regular Session of the Desert Locusts Control Organization for East Africa	• Expedite the establishment of a field locust control unit in the winter breeding areas on the Red Sea coast.

II	Meetings/ Joint cooperation with regional Commissioons/Offices			
A	THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE CENTRAL REGION			
Visited Country	**Date of Visit**	**Vistors**	**Objectives**	**Results**
Egypt, Cairo	11 July 2019	Controlling Desert Locust in the Middle East Area	• Examine ways to support survey and control operations in Ethiopia, Eritrea and Yemen. • Financing the regional emergency fund.	• Get appreciated support from Saudi Arabia
B	THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE WESTERN REGION			
Mauritania	1 – 17 Sep 2021	Controlling Desert Locust in the Middle East Area		
Egypt, Cairo	28 – 30 Sep 2021	AFD Project	• Introduce principles / Components / Objectives of the project to member countries	• Project approval
Alegria	24 – 28 Oct 2021	10th Session of CLCPRO	• Joint cooperation with regional Commissions	
C	THE FAO REGIONAL OFFICE FOR THE NEAR EAST AND NORTH AFRICA			
Virtual Meeting	14 Sep 2020	Virtual Meeting	• Continue to monitor the locust situation using innovative monitoring tools and reports to the concerned countries in a timely manner. • Providing technical support, advice and training of self-accredited national cadres in the Member States in the field of locust survey and control.	• Advise countries on appropriate locust response actions and mobilize resources for preparedness and response.

III	Training Courses and Workshops		
Host Country	**Date**	**Activity**	**Results**
Ethiopia	24 – 28 June 2019	DLIO training Course	• A training for 12 information officers on Ramses programme and remote sensing and forecasting
Kuwait	17 – 21 Nov 2019	National Training Course	• Train 19 crop protection experts on Desert Locust Survey and Control Operations. • Meet with officials of the Kuwait Fund for Arab Economic Development
Rwanda	6 – 16 Mar 2020	National Training Course	• Train 25 crop protection experts on Desert Locust Survey and Control Operations
Sudan	15 – 26 Nov 2020	(2) National Training Courses	• Train 30 technicians on operating and maintenance of ULV sprayers used in Desert locust control operations
Egypt	16 – 22 Mar 2021	National Training Course	• Train 16 Desert Locust Officers on Desert Locust Survey and Control Operations through DL Simulation
Yemen	29 Jan – 7 Feb 2021	National Training Course	• Train 20 Desert Locust Officers on Desert Locust Survey and Control Operations

Uganda	21 May – 14 July 21	Consultative Mission	• Train the national staff on Desert Locust Survey and Control Operations, Environmental and Health Standards and operating and maintenance of ULV sprayers used in Desert locust control operations
Somalia	10 February - 20 March	Consultation mission	• Training of 30 locust officers in desert locust exploration and control • 16 technicians were trained on using and maintaining ULV machines in locust control deserts.

Appendix 16. Managing financial accounts (contributions and arrears)

Contributions and arrears of member countries
TRUST FUND GCP/GLO/896/MUL
(TRUST FUND No. 9409.00)
Status of Contributions as at 31 December 2019 (Expressed in US$)

Member Governments	Outstanding 31/12/2018	Contribution due for 2019	Received up to 31/12/2019	Outstanding 31/12/2019
BAHRAIN	26 249.34	17 500.00	35 000.00	8 749.34
DJIBOUTI	23 100.00	2 200.00		25 300.00
EGYPT	65 080.00	65 080.00	130 160.00	0.00
ETHIOPIA	72 000.00	16 000.00	56 000.00	32 000.00
ERITREA	0.00	8 000.00	8 000.00	0.00
IRAQ	115 000.00	57 500.00	57 500.00	115 000.00
JORDAN	49 327.62	28 715.00	28 715.00	49 327.62
KUWAIT	200 000.00	50 000.00	25 000.00	225 000.00
LEBANON	44 490.00	22 245.00		66 735.00
OMAN	10 000.00	20 000.00	30 000.00	0.00
QATAR	75 000.00	25 000.00	100 000.00	0.00
SAUDI ARABIA	176 140.00	88 070.00	264 210.00	0.00
SUDAN	440 246.82	37 335.00		477 581.82
SYRIA	216 789.63	33 375.00	199 952.33	50 212.30
EMIRATES	105 050.00	52 500.00	26 250.00	131 300.00
YEMEN	68 914.76	10 000.00		78 914.76
TOTAL	**1 687 388.17**	**533 520.00**	**960 787.33**	**1 260 120.84**

* Fiscal Year begins in July

TRUST FUND GCP/GLO/896/MUL
(Previously TRUST FUND No. 9409.00 - MTF/INT/007/MUL)
Status of Contributions as at 31 December 2020 (Expressed in US$)

Member Governments	Outstanding 31/12/2019	Contribution due for 2020	Received up to 31/12/2020	Outstanding 31/12/2020
BAHRAIN	8 749.34	17 500.00	17 500.00	8 749.34
DJIBOUTI	25 300.00	2 200.00		27 500.00
EGYPT	0.00	65 080.00	65 080.00	0.00
ETHIOPIA	48 000.00	16 000.00	16 000.00	48 000.00
ERITREA	0.00	8 000.00	8 000.00	0.00
IRAQ	115 000.00	57 500.00		172 500.00
JORDAN	49 327.62	28 715.00	28 715.00	49 327.62
KUWAIT	225 000.00	50 000.00		275 000.00
LEBANON	66 735.00	22 245.00	66 735.00	22 245.00
OMAN	0.00	20 000.00	20 000.00	0.00
QATAR	0.00	25 000.00		25 000.00
SAUDI ARABIA	0.00	88 070.00		88 070.00
SUDAN	477 581.82	37 335.00		514 916.82
SYRIA	50 212.30	33 375.00		83 587.30
EMIRATES	131 300.00	52 500.00	26 250.00	183 800.00
YEMEN	78 914.76	10 000.00		88 914.76
TOTAL	**1 276 120.84**	**533 520.00**	**248 280.00**	**1 561 360.84**

* Fiscal Year begins in July
* Saudi Arabia have paid a grant of USD 1 500 00.00
* United Arab Emirates paid a voluntary contribution of USD 1 000 000 to support DL in Eritrea.

TRUST FUND GCP/GLO/896/MUL
(Previously TRUST FUND No. 9409.00 - MTF/INT/007/MUL)
Status of Contributions as at 31 December 2021 (Expressed in US$)

Member Governments	Outstanding 31/12/2020	Contribution due for 2021	Received up to 31/12/2021	Outstanding 31/12/2021
BAHRAIN	8 749.34	17 500.00		26 249.34
DJIBOUTI	27 500.00	2 200.00		29 700.00
EGYPT	0.00	65 080.00	65 080.00	0.00
ETHIOPIA	48 000.00	16 000.00		64 000.00
ERITREA	0.00	8 000.00	8 000.00	0.00
IRAQ	172 500.00	57 500.00	57 500.00	172 500.00
JORDAN	49 327.62	28 715.00	28 715.00	49 327.62
KUWAIT	275 000.00	50 000.00	50 000.00	275 000.00
LEBANON	22 245.00	22 245.00		44 490.00
OMAN	0.00	20 000.00	20 000.00	0.00
QATAR	25 000.00	25 000.00	50 000.00	0.00
SAUDI ARABIA	88 070.00	88 070.00	176 140.00	0.00
SUDAN	514 916.82	37 335.00		552 251.82
SYRIA	83 587.30	33 375.00	23 491.33	93 470.97
EMIRATES	183 800.00	52 500.00	26 250.00	183 800.00
YEMEN	88 914.76	10 000.00		98 9752.29
TOTAL	**1 561 360.84**	**533 520.00**	**505 338.80**	**1 589 542.04**

* Fiscal Year begins in July

TRUST FUND GCP/GLO/896/MUL
(Previously TRUST FUND No. 9409.00 - MTF/INT/007/MUL)
Status of Contributions as at 05 June 2022 (Expressed in US$)

Member Governments	Outstanding 31/12/2021	Contribution due for 2022	Received up to 31/12/2022	Outstanding 31/12/2022
BAHRAIN	26 249.34	17 500.00		43 749.34
DJIBOUTI	29 700.00	2 200.00		31 900.00
EGYPT	0.00	65 080.00		65 080.00
ETHIOPIA	64 000.00	16 000.00		80 000.00
ERITREA	0.00	8 000.00		8 000.00
IRAQ	172 500.00	57 500.00		230 000.00
JORDAN	49 327.62	28 715.00		78 042.62
KUWAIT	275 000.00	50 000.00		325 000.00
LEBANON	44 490.00	22 245.00		66 735.00
OMAN	0.00	20 000.00		20 000.00
QATAR	0.00	25 000.00		25 000.00
SAUDI ARABIA	0.00	88 070.00		88 070.00
SUDAN	552 251.82	37 335.00		589 586.82
SYRIA	93 470.97	33 375.00		126 845.97
EMIRATES	183 800.00	52 500.00		236 300.00
YEMEN	98 752.29	10 000.00		108 752.29
TOTAL	**1 589 542.04**	**533 520.00**		**2 123 062.04**

* Fiscal Year begins in July

Appendix 17. Accounts for 2019 - 2020 - 2021

Account	Description	2019	2020	2021
5012	**Salaries**	**82 535**	**107 497**	**105 036**
	Secretary Staff of the Commission	82 535	107 497	105 036
5013	**Salaries of experts and consultants**	**14 390**	**16 656**	**16 656**
	Essam Mahmoud Khalifa / Sara Sadek / Osama Rabei	14 390		
	Essam Mahmoud Khalifa / Sara Sadek		16 656	12 450
5014	**Contracts**	**34 967**	**63 111**	**31 784.90**
	Cost of placing and operating DeLCoPA	2 500	2 500	2 500
	Novacom for eL3 devices (January – December)	**32 467.00**	**60 610.97**	**29 284.90**
5020	**Additional Payment**	**3 898**	**3 419**	**00**
		3 898	3 419	00
5021/ 5023	**Training and Workshops/ trainees' travel/ trainers**	**85 616.14**	**32 102**	**27 282.31**
	Training of Trainers - Sudan	11 614		
	Participation in the Workshops RS and GIS	1 648		
	Workshop on the use of Drones - Amman	16 707.61		
	Cost of participation in drones testing and use training – Mauritania		28,020	
	Workshop for the use of drones in Mauritania		1 898.86	8 618.30
	Training course in maintaining and operating spraying machinery - Mauritania	1 822		
	Training course in maintaining and operating spraying machinery – Ismailia, Egypt		1 076	
	Training course in maintaining and operating spraying machinery for the maintenance officers in the Eastern Region (India – Pakistan – Iran and Afghanistan) – Oman		1 107	
	Cost of training on the use and maintenance of drones – Jeddah, Saudi Arabia			2 756
	Official mission to train the technicians of the Agriculture Ministry of Uganda on operating and maintaining Locust sprayers – Rami El Arabi	1 822		
	Regional workshop for the Locust Information Officers - Ethiopia	11 794		
	Training course on surveying and controlling locust for the locust officers in Yemen and Egypt	9 311		6 548
	National training course on surveying and controlling Locust – Egypt	6 290		
	Support for applied research programs (Masters and PHD) PHD of Mahgoub Mohamed, and Masters of Emad Abd El Sayed	**23 302**		
5021	**Official Travels**	**56 838.74**	**9 470**	**3 136**
	Emergency meeting of the deputies of the concerned ministries in the member countries to discuss the possible locust upsurge in the region – June, Cairo – Egypt	3 770.74		
	31st CRC meeting in Jordan	47 000		
	Training of locust officers from invasion in Saudi Arabia		4 254	
	Cost of participation in the 41st meeting for the committee and Desert Locust Control – Ethiopia	6 068		

	Visit of Mr Belayneh Desta – Head of Plant Protection in Ethiopia – to Egypt for expertise exchange in controlling and managing the desert locust.			3 136
	Chairman travel to Rome		355	
	Dr. Munir Boutros visit to Qatar to help prepare plans for controlling and managing Desert Locust		4 861	
5025	**Non Expandable Procurement**	**33 970**	**1 112 707**	**40 707**
	Sprayer ULVAMAST V4		77 760	
	Spare parts for sprayers	3 110		
	4 SUV Field vehicles for Ethiopia (Saudi Grant)		152 425	
	2 drones for Saudi Arabia as well as spare parts and training on the use of them		70 706.60	
	20 back machines to support the member countries, which were later distributed to (Kuwait and Syria)	30 860		
	10 car-mounted sprayers AU8115MS			
	During the locust outbreak to support the countries of the Commission (4 Egypt - 4 Iraq - 2 Lebanon)		116 855	
	Spraying machines for Eritrea (Backpacked - Emirates Grant)			10 350
	Sprayer spare parts		10 448.83	23 000
	4 4x4 field cars 6 cylinders for Sudan (Saudi Grant)		205 000	
	4 4x4 field cars 6 cylinders for Eritrea (Saudi Grant)		225 025	
	GPS devices		3 588	
	6-cylinder 4x4 field cars for Eritrea (Emirates Grant)		250 899	
	2 MacBook computers for Yemen and Eritrea -support from the Commission			4 343
	2 computers for the Commission Secretariat			3 014
5024	**Expandable Procurement**	**47 650**	**163 107**	**569 710**
	Test-Mate ChE Cholinesterase devices for health and safety program	44 513	7 038	
	80 devices from GPS Map 64 for the member countries		24 344	
	Camping equipment for Eritrea (Emirates Grant)		12 499	
	Consumable spare parts to support the member countries		28 111.83	
	10 AU8115M V4 Ulvamast 20 AU8000, 60 ULV+ 100 for emergencies			249,205
	ULVAMAST V4 spraying machines for Eritrea (Emirates Grant)		89 658	
	Expenses for clearing the shipment from airport customs	1 885.00		
	Computers (Egypt - Saudi Arabia - the Commission Secretariat)	1 252	1 456	3 955
	Pesticides for Eritrea (Emirates Grant)			316 000
	Expenses for Baltic Inspection and Monitoring Company			550.00
5028	**General Operating Expenses**	**41 260**	**111 572**	**95 646**
		41 260	111 572	95 646
5040	**Indirect overheads**			**731**
	Express Mail			731
5029	Organization support cost	49 241	213 105	106 950
	13% on all account	49 241	213 105	
	The grand total of disbursement	**415 399**	**1 832 746**	**997 639.7**

Appendix 18. Work Plan and Budget for 2022 - 2024

Detailed estimates of the work plan and the activity of the Commission for the years 2023 - 2024			
Account	**Description**	**2023**	**2024**
5012	**Salaries-General Service Staff**	110 000	115 000
	Total	**110 000**	**115 000**
5013	**Consultants and experts**	30 000	30 000
	Total	30 000	30 000
5014	**Contracts**		
	Research	40 000	40 000
	Publication	10 000	10 000
	Translation	5 000	5 000
	Novocom - Annual fees for eLocust٣	25 000	25 000
	Support new technologies	20 000	20 000
	Cost of operational support and maintenance of DelCoPA	3 000	3 000
	Cost of placing, and migrating the CRC website	5 000	5 000
	Total	**108 000**	**108 000**
5020	**Overtime**	4 000	4 000
	Total	**4 000**	**4 000**
5021	**Travels**		
	Chairman travel to Rome to present the 32nd CRC Session report	3 000	
	Chairman various travel and activities	5 000	5 000
		25 000	25 000
	33rd CRC Session and 37th Executive Committee Meeting		50,000
	Total	**33 000**	**80 000**
5023	**Training & Workshops**		
	Training and workshops (more details in (Regional training work plan 2023-2026 report	100 000	100 000
	Total	**100 000**	**100 000**
5024	**Expendable Procurement**		
	Spare parts, books and publication	5 000	5 000
	Support to member countries	10 000	10 000
	Total	**15 000**	**15 000**
5025	**Non Expendable Procurement**		
	Purchase of equipment and tools	25 000	25 000
	Unforeseen	5 000	5 000
	Total	**30 000**	**30 000**
5027	Technical Support Services	2 000	2 000
	Total	**2 000**	**2 000**
5028	**General Operating Expenses**		
	Meeting, reception, equipment, Communication, Stationary, etc.	20 000	20 000
	Total	**20 000**	**20 000**

5040	**General Operating Expenses - external common services**		
	Pouch services and couriers	2 000	2 000
	Total	**2 000**	**2 000**
	TOTAL EXPENDITURE	**445 000**	**502 000**

Commission
for Controlling the Desert Locust
in the Central Region

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