2016

CRC/SWAC
INTER-REGIONAL WORKSHOP FOR DESERT LOCUST INFORMATION OFFICERS

No. 8

22-25 May 2016

Cairo, Egypt

Commission for Controlling the Desert Locust in the Central Region (CRC)
Commission for Controlling the Desert Locust in South-West Asia (SWAC)
Desert Locust Information Service (DLIS)

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The Food and Agriculture Organization of the United Nations encourages the dissemination of material contained in this publication, provided that reference is made to the source.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Chief, Publishing Management Service, Information Division, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy or by e-mail to copyright@fao.org

© FAO 2016

CRC/SWAC Inter-regional Workshop

for Desert Locust Information Officers

22-25 May 2016 (Cairo, Egypt)

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2016

Table of Contents

CRC/SWAC Inter-regional Workshop for Desert Locust Information Officers

22-25 May 2016 (Cairo, Egypt)

1. Introduction

The FAO Commissions for Controlling the Desert Locust in the Central Region (CRC) and South-West Asia (SWAC) sponsors an annual inter-regional workshop for Desert Locust Information Officers in frontline countries of the Central Region and South-West Asia. The workshop is normally held in Egypt. CRC staff organize the workshop and the Department for Locust & Agro-aviation Affairs (Ministry of Agriculture, Egypt) provide logistics and support. The FAO Senior Locust Forecasting Officer, Keith Cressman, conducts the workshop, assisted by two resource persons, Hichem Dridi (FAO/CLCPRO) and Mehdi Ghaemian (RAMSESv4 developer).

The workshop is the primary mechanism for the provision of much needed training in the use of new tools developed by FAO, specifically new functionality of the latest version of RAMSES GIS used by DLIOs for data management and analysis. As the RAMSES developer is one of the resource persons at the workshop, he can see how DLIOs use RAMSES and discuss improvements and additional functionality with users. The workshop allows FAO's Desert Locust Information Service (DLIS) to provide feedback to DLIOs on the quality and timeliness of reporting to FAO and discuss strengths and weaknesses as a means of improving further reporting and early warning. It is also an opportunity to present new technologies and obtain feedback from the users concerning the potential usefulness of such tools. All of the activities carried out at the workshop cannot be done by other remote means such as Skype and it is less efficient to accomplish by individual technical backstopping missions.

This year's workshop was the eighth annual DLIO workshop since 2008. It was held at the FAO Regional Office for the Near East (RNE) in Cairo on 22-25 May. A total of 22 DLIOs from two countries in SWAC, eight countries in CRC, and the Desert Locust Control Organization for Eastern Africa (DLCO-EA) attended the workshop (Annex 1). Djibouti participated for the first time. The DLIO from Pakistan was not present since he was participating in the 11-month training at DLIS. The involvement of the resource persons was critical as they assisted in the training and provided much needed personalized technical assistance in solving individual computer problems as they arose during the workshop.

2. Programme

Similar to previous workshops, participants indicated what problems and difficulties they faced in their daily work as DLIOs and what they would like to gain from this year's workshop. This information was used to refine the workshop programme to meet the needs of the participants. The main emphasis of this year's workshop was a major update to RAMSESv4 (Rv4.1) and to provide the first in a series of training on using Rv4 for data summary and analysis. As this represented a significant shift from simply using Rv4 to add data to a database and plot it on a map, it is expected that the next several workshops will continue to provide more advanced training in GIS analysis. The programme consisted mainly of hands-on practical exercises and demonstrations, supplemented by participatory discussions and a few presentations (Annex 2).

2.1 Participant expectations and difficulties

All of the participants wished to learn more how to use all aspects of the latest version of Rv4, and how to analyse data and make locust forecasts. Numerous rather minor problems were identified with eLocust3, eLocust3D and in the previous version of Rv4 eLocust3D that needed to be resolved. Many users indicated that they continued to require further assistance in managing files on their PC, downloading remote sensing imagery and updating Java. A number of users had problems with their laptop PCs (Windows 7 and 8). In general, participants wished to use the new tools developed by DLIS and others more effectively and efficiently.

2.2 DLIS questionnaire for DLIOs

DLIS prepared and distributed an online Survey Monkey questionnaire in English and French to DLIOs in the three regions to obtain their opinion and feedback concerning the services provided by DLIS through ten questions that addressed the usefulness of DLIS, the monthly bulletin, early warning and forecasting, training, existing and new tools, Rv4 improvements, communication, and Locust Watch. The last survey was done in 2012.

The results of 32 DLIOs in all regions who completed the questionnaire indicated that they were satisfied with DLIS services, new tools and Locust Watch (Annex 3). In general, DLIOs want more from DLIS, which is a good indication of the usefulness of its services and products. DLIOs prefer to have more training and technical backstopping visits, and confirmed the need for at least one DLIO workshop every year. The most desired improvements to Rv4 are eLocust3 management and map-making, analytical, developmental timeline and summary functions. The DLIOs felt that the monthly FAO Desert Locust Bulletin could have more maps and a new look while Locust Watch remained informative, useful and easy to use. They continue to rely on email and Locust Watch as the primary means to receive information from DLIS.

2.3 DLIO reporting

An analysis of the quality and timeliness of reporting by DLIOs in 2015-2016 indicated that for the most part high quality reports were received on time by DLIS (Annex 4). There were slight shortcomings in quality due to Rv4 data sent without a brief summary, Rv4 data not checked, the text in national bulletins not matching or reflecting the Rv4 data, some bulletins with no maps, and missing or poor analysis.

2.4 File management

A standard filing structure was proposed to participants in last year's workshop but most DLIOs had not fully implemented the suggested mechanism (Annex 5). Consequently, files were disorganized, difficult to locate and often duplicated on many users' laptops. DLIOs were strongly encouraged to adopt the standard filing structure and to adhere to a strict file naming scheme and organizational structure in order to improve the organization and access of data on their computers. This should make it easier and faster to find files as well as facilitate regular backups. A well-organized standard filing system also aids FAO in providing better technical assistance remotely and facilitate dialogue during country-to-country support.

Although DLIS provided clear guidance to participants one month prior to the workshop and requested them to ensure that their laptop and Rv4 were functioning correctly, that standard applications were installed and the laptops were virus free, many participants faced numerous problems with their laptop. As a result, one entire day was spent on addressing and resolving these problems with the assistance of the two resource persons, supplemented by the IT Officer at RNE.

2.5 eLocust3

The number of problems and issues with eLocust3 have declined as DLIOs and field officers have more experience in its proper use. Consequently, only a few problems were noted, many of which were the same that were identified last year:

(1) Missing coordinates – users would press *Save&Sent* without confirming that the latitude/longitude coordinates are indicated at the top of Report Page;
(2) Area to be treated coordinates indicated when control is not required – users would indicate one or more coordinates (*Get coordinates*) of the Area to be treated when either locusts were absent or there was no requirement for control. Users may have thought that mistakenly the *Get coordinates* button is a means of obtaining the coordinates of the survey location;
(3) Missing reports – any reports that are not transmitted on the same day will not be received by email; however, they will appear on the GeoFlex platform. Therefore, users should ensure that all reports have been transmitted before the end of the day by checking that the Queue = 0 in the footer of eLocust3; otherwise, the data will not be entered into RAMSESv4;

All of the above problems can be resolved with proper and regular training of eLocust3 users in each country. Given that these are the same problems as from last year, DLIOs in their capacity as Master Trainers for eLocust3 should organize and conduct more training courses to refresh users in the field.

In the past year, a new problem emerged with the internal CMOS battery of the ToughPad tablet that maintains the correct date and time. If the tablets are stored for a long period of time with the main battery fully charged or without a charge, the internal battery can lose its own charge. In order to prevent this, tablets should be stored at about 50% charge. DLIOs should try to check stored tablet every month or so by turning on the device and recharging slightly if necessary to maintain about a 50% charge.

In order to fix those tablets with a discharged internal CMOS battery, the following steps should be implemented:

(1) switch on the tablet
(2) set the correct date and time
(3) plug the tablet into the main power supply for three days (72 hours) without interruption
(4) turn off the tablet and
(5) check that the date and time remain correct on the following day

If the problem persists, the tablet may need another 72-hour recharging. Thereafter, the DLIO should contact DLIS for further instructions.

2.6 eLocust3D

The workshop participants were shown how to use the eLocust3D Desktop App on the PC to prepare, manage and update regional packages that are smaller than full country packages (Annex 6). In this way, it takes less time to create such packages and it is faster to use on the tablet because each package is smaller. A package consists of selecting the Area of Interest in a specific region of about 4 square degrees where a team will be conducting a survey, and then selecting the relevant static data (Landsat, TPC, elevation, boundary) and the latest decadal rainfall and greenness maps. Once the eLocust3D Desktop App has prepared the package, the compressed file is copied onto the micro SDHC memory card and inserted into the tablet for use.

The DLIOs were encouraged to prepare the smaller packages by using the eLocust3D Desktop App and to train survey officers in using eLocust3D on the tablet.

2.7 RAMSESv4

A major update to Rv4 was released to participants during the workshop (Annex 7). It was envisaged to distribute the update via Google Drive but the extremely slow WiFi connection at RNE did not permit this so it was distributed by copying the files to the individual HDDs of the participants.

Mr. Ghaemian, the Rv4 developer, introduced the new version and its features. Substantial training was provided so that DLIOs could become familiar with these features and use them effectively.

The Senior Locust Forecasting Officer introduced the concept of data summary and analysis, explaining what types of data are analysed and why, and different methods of analysis (Annex 8). This aroused much interest by the participants who then practiced using the latest version of Rv4 to analyse case studies, commencing with simple basic analysis of rainfall estimates and survey results in India during the first half of April 2016. This was followed by a more complete analysis of the 2016 Joint Survey results in Iran that included the analysis of rainfall runoff and its effects on breeding. Lastly, DLIOs undertook a brief analysis of the current situation in Yemen, tracing it back to the November 2015 cyclone rainfall and subsequent breeding on the southern coast in March 2016.

This was the first attempt to train DLIOs on using Rv4 to analyse weather, ecological and locust data in order to assess the current locust situation, understand how it developed, and predict its future evolution. Although there is no single, specific procedure for analysing locust situations, any analytical method should be systematic and coherent. The DLIO will need to know development rates of locust eggs, hoppers and adults as well as the time it takes vegetation to respond to rainfall. The quality of the analysis is a function of the DLIO's knowledge of locusts, weather, the area involved, and experience in managing field data. Every analysis requires a high degree of imagination and the testing and refining different hypotheses. It was emphasized that locust situations are a continuum over time and that the results of an analysis should be presented much like a story that explains what has happened.

The participants were also shown different examples of possible maps that can be output from Rv4.1 and trained on how to prepare clear, useful maps for national bulletins.

2.8 New technologies

Several new tools and technologies that are currently under development by DLIS as well as two tools developed by the Egyptian DLIO, Osama Rabie Mahmoud Moustafa, were presented and explained.

2.8.1 Slack app

During the past six months, DLIS successfully pilot tested a new app called Slack (www.slack.com) that can be used on any platform (PC, Mac, Android, iOS) as an easy to use messaging system for text, file sharing and (soon) voice. Its strength is that messages can be organised in different public channels according to specific topics. Specific people can be invited to each public channel. There is also a section for direct messages for one-to-one communication. Slack automatically syncs between all platforms so that participants can use it on their laptop, desktop, mobile at home and in the office. A message can be started on one platform and completed on another. Users are notified when there are new messages.

DLIS has set up a Slack account called FAOlocust to facilitate the sharing of information, experiences, problems, solutions and ideas concerning a number of issues (channels) such as drones, elocust3, elocust3d, google-earth-engine, ramses-v4, remote-sensing, reporting, soil-moisture-maps, and video-game. More channels can be added as needed.

This is meant to be used mainly for on-going and continuous discussions - like chat - rather than for formal email messages. For example, it is easier to solve a problem with Rv4 through numerous short chat messages compared to doing the same thing by numerous email messages that are difficult to organize, follow and respond to in a timely manner.

It is expected that the Slack app will be the primary means for DLIS to provide DLIOs with technical support for Rv4 and other tools and to maintain a constant dialogue with them concerning new technologies.

2.8.2 Soil moisture map

A two-year project, Soil moisture for Desert Locust early survey (SMELLS), funded by the European Space Agency (ESA) is currently developing a new remote-sensed product that detects soil moisture to 15cm under the surface of the ground[1]. The soil moisture map is derived from existing satellite imagery including the latest Sentinel products at resolutions of 1 km and 100m. It will be made available through the IRI portal, similar to current rainfall estimates, MODIS and greenness maps, every ten days starting by summer 2017. The soil moisture map will help to identify areas where conditions are favourable for breeding and can be used to guide survey teams. It will be a valuable component in analysing locust situations and early warning.

2.8.3 Google Earth Engine

A recent Memorandum of Understanding between FAO and Google has led to the availability and further development of some unique and very powerful tools that can be utilized by DLIOs for locust early warning. One such tool, Google Earth Engine (GEE), has the potential to make remote sensing imagery available in a timelier manner to DLIOs. It allows users to take advantage of tens of thousands of computers in the cloud to process imagery

[1] smells.isardsat.com

such as greenness maps in a matter of minutes, even with a relatively poor Internet connection, rather than waiting days or weeks. GEE is also expected to replace DL Mapper on Locust Watch, which displays locust data on a map according to custom queries as a means to facilitate the easy and rapid exchange of locust information.

2.8.4 Drones

DLIS in collaboration with the three regional Desert Locust commissions is actively pursuing the potential use of drones to help detect areas of green vegetation up to 100 km away from the survey team, to determine the extent of green vegetation and locust infestations at specific locations and to control locust groups, bands and swarms through precision treatments. A consortium of experts, institutes and companies are working together to develop and test appropriate technologies that can be used in locust-affected countries on a sustainable basis to supplement and improve current field surveys and control operations. The first results are not expected until later in 2017.

2.8.5 Rv4 DLIS export file summary macro

A macro has been developed that can be applied the Excel export file for DLIS that summarizes that data in that file. This should help DLIOs to prepare a brief paragraph that summarizes that data, which should accompany the data when it is sent to DLIS. It should also ensure that the data and the national locust bulletin text match and reflect each other correctly. The macro is available on the FAOlocust team in Slack.

2.8.6 Locus Map app

Mr. Osama Moustafa presented a custom Android app, Locus Map[1], that can display custom maps on the eLocust3 tablet and be used to navigate in the field during survey and control operations (Annex 9). It differs from eLocust3D in that it offers more functionality but is not three-dimensional. DLIOs were encouraged to become more familiar with Locus Map and try it in their own countries with survey officers.

3. Lessons learned

Many users continue to have a less than adequate knowledge in the basic use of a PC, primarily concerning file management and navigation but also including use of the mouse and track pad. CRC and SWAC should explore ways to improve the competency of DLIOs, perhaps by providing basic computer training and insisting on good file management.

Several participants arrived at the workshop with laptops that were not working correctly due to missing drivers, outdated applications, incorrectly installed or non-licensed software, viruses, and poor maintenance. This was compounded further by a wide variety of laptop models and two different operating systems, Windows 7 and Windows 8. This problem has plagued each of the annual DLIO workshops and it appears that little progress has been made to resolve it. This year, the two resource persons spent one entire day fixing participant laptops. In some instances, the IT Officer at RNE had to intervene and, in at least one case, a laptop had to be left over night for repair. After a thorough discussion with the

[1] https://play.google.com/store/apps/details?id=menion.android.locus

DLIOs, resource persons and CRC and SWAC Executive Secretaries, it was decided to carry out a pilot test in one country of each region, Eritrea and Pakistan, by providing the DLIO with a MacBookPro laptop that has been configured by DLIS to be used for Rv4 and locust early warning data management. DLIS will also provide training on how to use the Mac. The Rv4 developer, who develops Rv4 on a MacBookPro, indicated that this should substantially reduce current PC problems and issues, and provide users with a better computing experience. It should also allow future workshops to concentrate more on Rv4 and other tools and spend less time repairing PCs. The results of the pilot test will be reviewed at the next DLIO workshop.

Similar to last year's workshop, a fast and reliable Internet connection for each participant is a basic requirement for the workshop. Unfortunately, the WiFi connection at RNE was too slow and could not be used due to current problems and shortcomings. As a result, workshop material, presentations, Rv4 updates, data and other files could only be distributed to participants via USB flash drivers. This not only took additional time but led to the distribution of a number of viruses that infected several laptops. It was not possible to train DLIOs in using Google Drive, GeoFlex and Google Earth Engine. It will be necessary to determine Internet connectivity and speed at the location of next year's workshop prior to confirming that venue.

It was requested that the 2017 workshop be organized in early May at a suitable location with fast and reliable Internet connection.

4. Conclusion

The DLIOs expressed the need to continue to develop and update Rv4 on a regular basis. While the latest Rv4.1 update represents major improvements in functionality and speed, more functions are needed in order to meet the requirements of DLIOs (Annex 10). It is hoped that most of this work can be achieved during the 12 months so that the DLIO workshop in 2017 can present these new tools and train participants in their use. It is important to understand that updating and improving the RAMSES GIS is a continual process much like any major software package.

The participants were pleased with the organization, contents and facilities of the workshop except for the poor Internet access. They reaffirmed the importance of and the need to continue to organize the CRC/SWAC inter-regional workshop for Desert Locust Information Officers at least once every year. Many participants would like to have the workshop two times per year. This demonstrates the interest and usefulness of the workshop for DLIOs. It offers the only opportunity for DLIOs from locust-affected countries in the two regions to get together to exchange experiences and share knowledge, and to receive important training and feedback from DLIS. The technical workshop is specific and meant only for nationally designated DLIOs from each front-line country who use Rv4 and the other custom tools. The workshop contributes directly to the strengthening of the Desert Locust early warning system, which is the basis for preventive control in order to reduce the frequency, duration and intensity of Desert Locust plagues.

Annexes

Annex 1. Workshop participants

Region - Country	Desert Locust Information Officers
CRC	
Djibouti	Haissama Ali
Egypt	Khaled Ibrahim Kelany
	Osama Rabie Mahmoud Moustafa
	Osama Taha
Eritrea	Tedros Siam
	Bereke Ogbamichael
Ethiopia	Zebdewos Salato Amba
	Solomon Mirete Assefa
Oman	Khalid Said Adi Al Harrasi
Saudi Arabia	Saeed Turkistani
	Marzouk Ali AlBarakati
Sudan	Hussien Osman Abaker
	Talal Ahmed Mohammed Ali
Yemen	Saeed Al-Maamari
	Ahmed El Eryani
DLCO-EA	Felege Elias
	Mehari Tesfayohannes
SWAC	
India	Pramod Gour
	Chandra Sharma
Iran	Mahmoud Chalaki
	Ali Babali Fashki

Organization	Resource Persons
FAO HQ	Keith Cressman
FAO/CLCPRO	Hichem Dridi
Iran PPO	Mehdi Ghaemian
Oman/CRC	Nassor Al Harthy

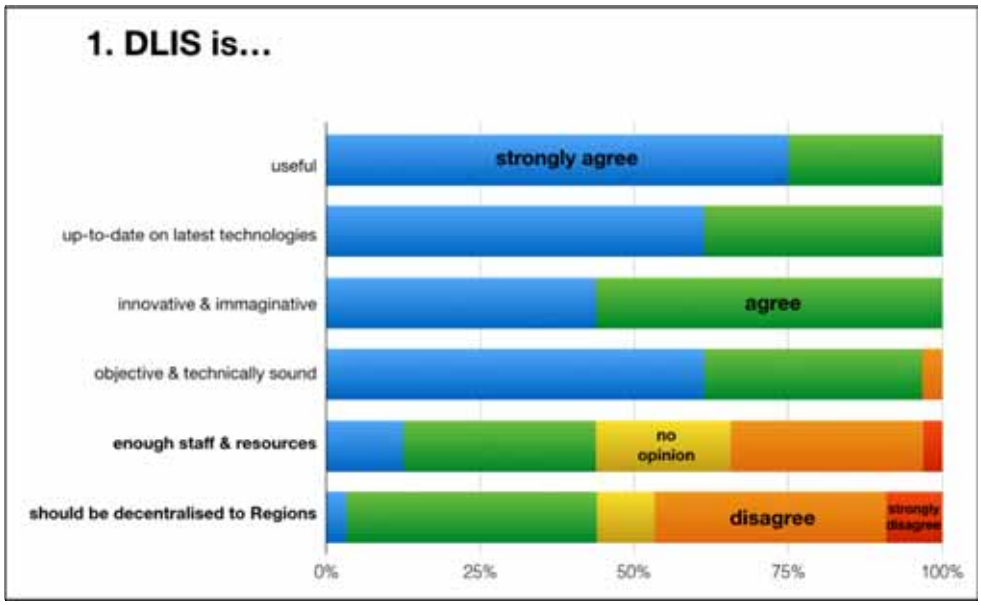
Organization	Coordination
FAO/CRC	Mamoon Alalawi
	Lidia AbdelShahid
	Essam Khalifah

Annex 2. Workshop programme

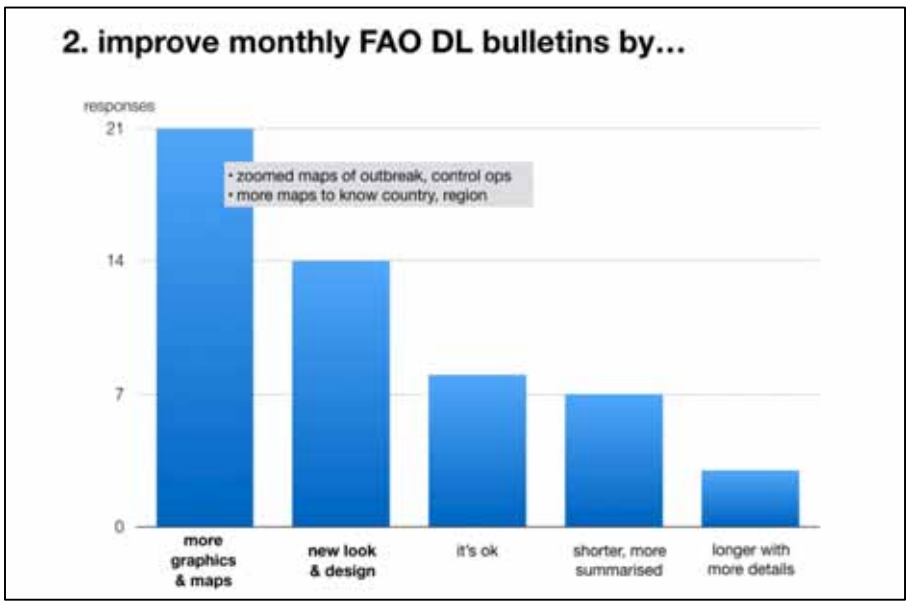
	Topic	Details
22 May (Sunday)		
0830 -1000, 1030-1200	**Opening** • Participant expectations & problems • Workshop objectives and programme	Al-Alawi, Cressman Card method
	DLIS, reporting • DLIS/DLIO questionnaire results • Managing DLIO work • Reporting review 2015-2016 • Understanding DLIS info & forecasts	Presentation, discussion, cards, practicals
1300-1430, 1500-1630	**eL3, eL3D** • eL3 problems & solutions • Using GeoFlex platform • eL3 activation & management	Presentation, discussion, practicals
	eL3D • regional package preparation	Presentation, discussion
23 May (Monday)		
0830 -1000, 1030-1200	**Rv4.1** • distribution & installation • new features	Presentation, discussion, practicals
1300-1430, 1500-1630	**Data analysis** • What is analysis? • Methods of analysis	Practicals
24 May (Tuesday)		
0830 -1000, 1030-1200	**Rv4 & data analysis** • Using Rv4 for analysis	Practicals (India, Iran)
1300-1430, 1500-1630	**Rv4 & data analysis (cont.)** • Using Rv4 for analysis	Practicals (Yemen)
25 May (Wednesday)		
0830 -1000, 1030-1200	**Rv4** • Analysis review • Map making	Discussion, practicals
1300-1430, 1500-1630	**New tools & technologies**	Presentation, discussion
	DLIO/LCU Head collaboration	Discussion
	Closing • Next steps & follow-up • 2017 workshop • Workshop evaluation	Discussion

Annex 3. Results of 2016 DLIO questionnaire about DLIS

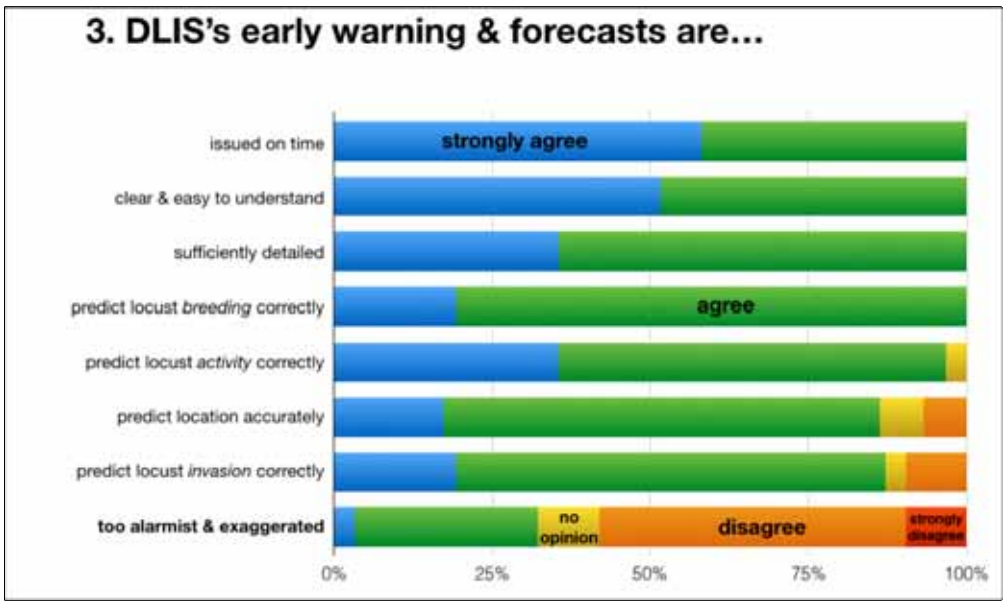
An online Survey Monkey (www.surveymonkey.com) questionnaire was prepared by DLIS to obtain feedback from DLIOs on the services provided by DLIS, including the bulletin, Locust Watch, technical support and new tools. A total of 32 responses were received, which represents all DLIOs. A similar questionnaire was done in 2012. The results of the ten questions are reviewed below. They will be used to improve DLIS services and products.



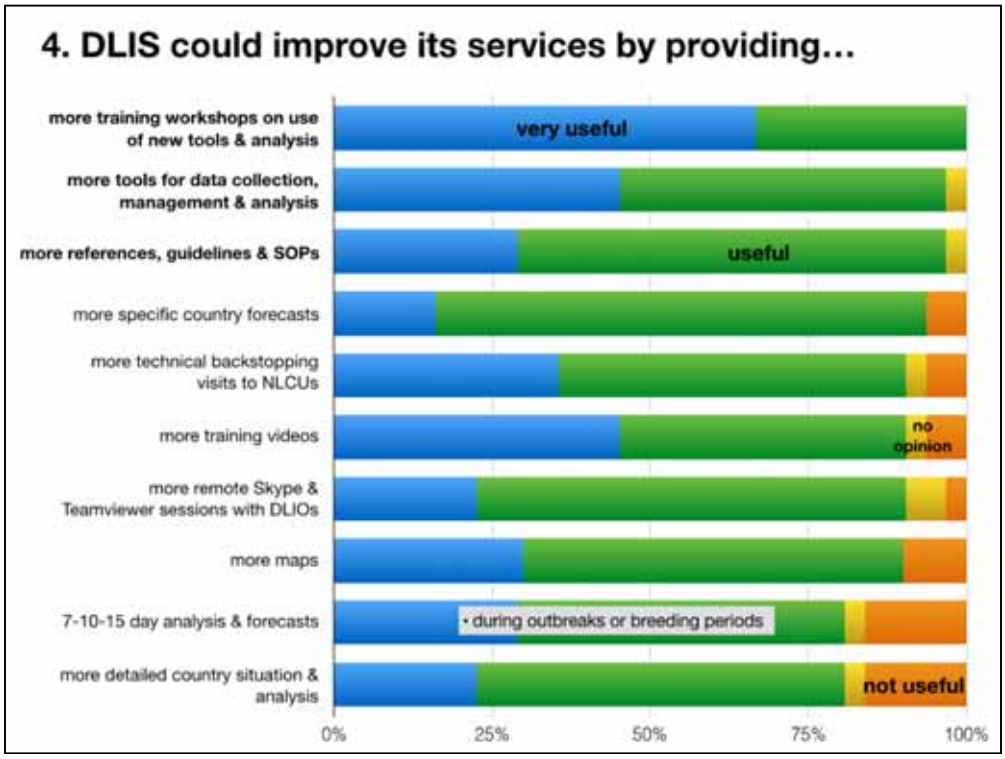
Question 1. DLIS is a useful service that is up to date on the latest technologies, innovative and imaginative as well as providing objective and technically sound information. There was some concern about the existing level of staff and resources in DLIS. Some DLIOs thought that DLIS should be decentralized however this would not be an efficient use of resources and the last time this was tried in the mid 1970s, a plague developed without warning.



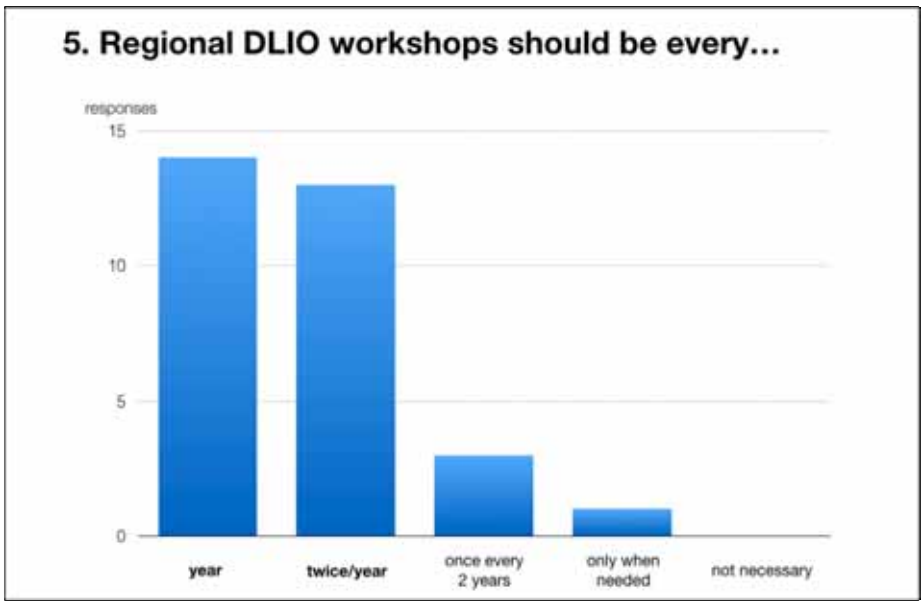
Question 2. More graphics and maps, and a new look and design were requested for the monthly Desert Locust Bulletin. The current length and detail appear to be acceptable.



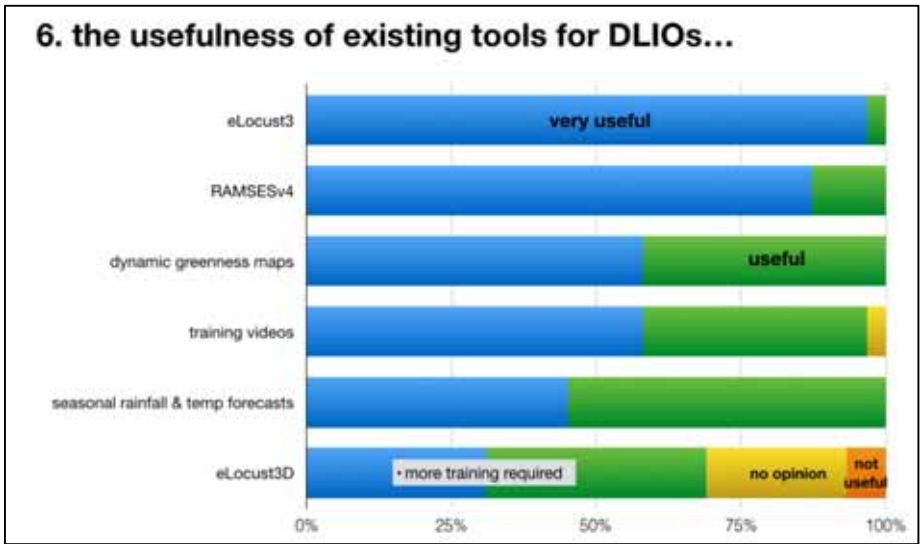
Question 3. DLIS early warning and forecasts are timely, clear and easy to understand, sufficiently detailed and predict locust breeding, activity, location and invasion correctly. They also strike the correct balance in that for the most part, they are not too alarmist.



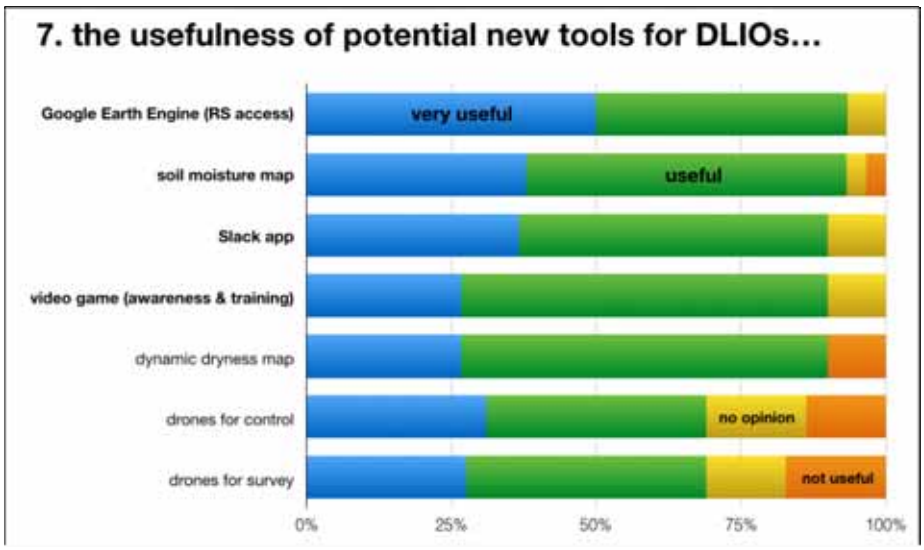
Question 4. DLIS could improve its services by providing more tools and organizing more training workshops on their use, preparing more references, guidelines, SOPs and training videos, undertaking more technical visits to NLCUs, providing more country specific forecasts and maps, and initiating more remote sessions (Skype, Teamviewer). There was less agreement on the usefulness of weekly, decadal and fortnightly as well as more detailed analysis and forecasts.



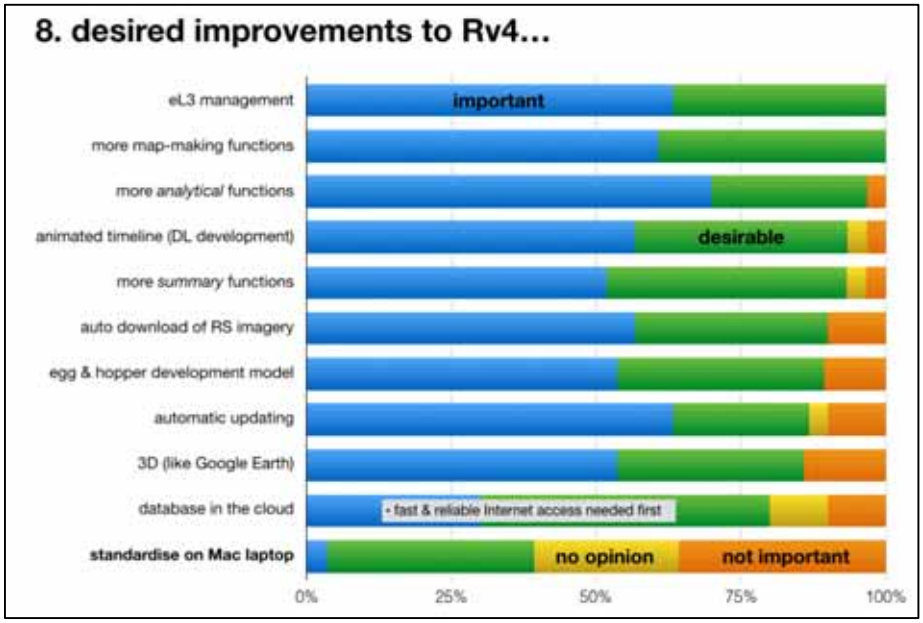
Question 5. Regional workshops should be organized for DLIOs at least once every year and perhaps even two times per year.



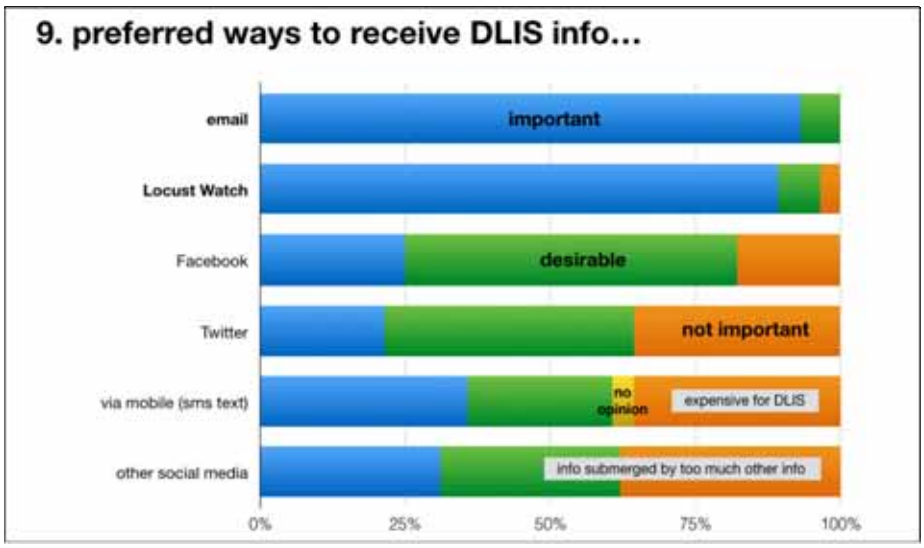
Question 6. eLocust3 and RAMSESv4 are by far the most useful tools, followed by the dynamic greenness maps, training videos and a new product, seasonal rainfall and temperature forecast, that was introduced in 2015. DLIOs had more mixed feelings about eLocust3D perhaps because it is still relatively new and not fully utilized yet. More training of users is required.



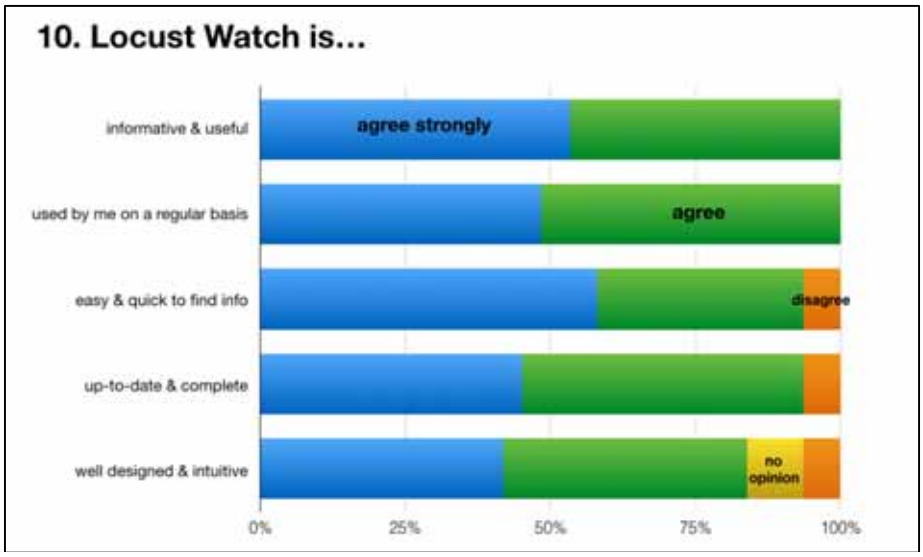
Question 7. DLIOs felt that Google Earth Engine, soil moisture maps, the Slack app, and a video game for awareness and training would be useful new tools. A dynamic dryness map could also be useful. Opinions on using drones for survey and control varied slightly as this is a new technology that is yet to be fully realized.



Question 8. Numerous improvements to Rv4 were desired by users with eLocust3 management the most important, followed by map-making, analytical, development timeline and summary functionalities. Other improvements concerning automatic downloading of remote sensing imagery, egg and hopper development model, automatic updating of Rv4, and 3D were also requested. Some DLIOs were concerned about their slow and unreliable Internet connection for a cloud-based database. There were mixed opinions about using a Mac laptop for Rv4 to overcome the numerous problems that plague Windows laptops.



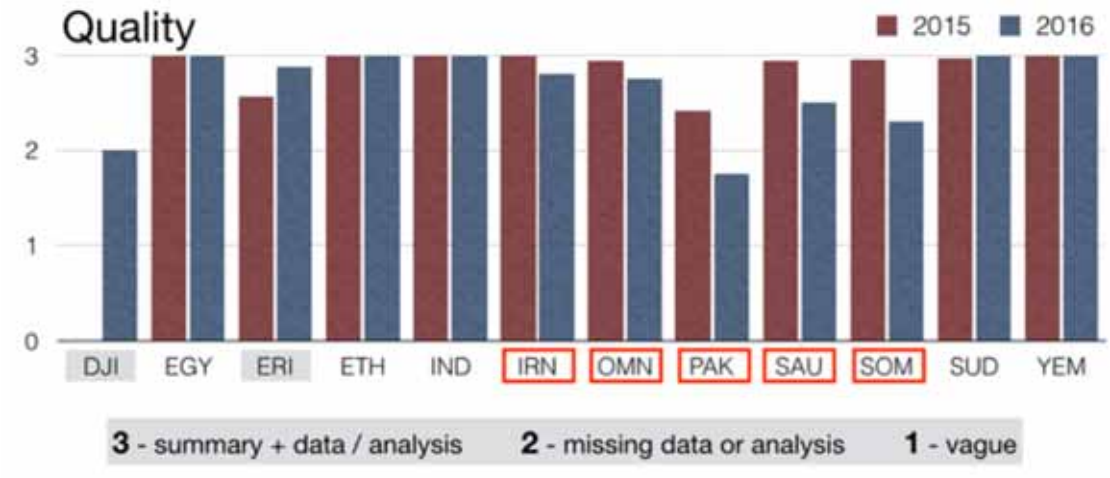
Question 9. DLIOs preferred the standard trusted methods of receiving information from DLIS, that is, by email and through Locust Watch while Facebook and Twitter were somewhat less popular. Concern was expressed that it would be too expensive for DLIS to distribute it information via mobile (SMS) text. Other social media mechanisms are less desirable since information tends to become submerged with too many other items.



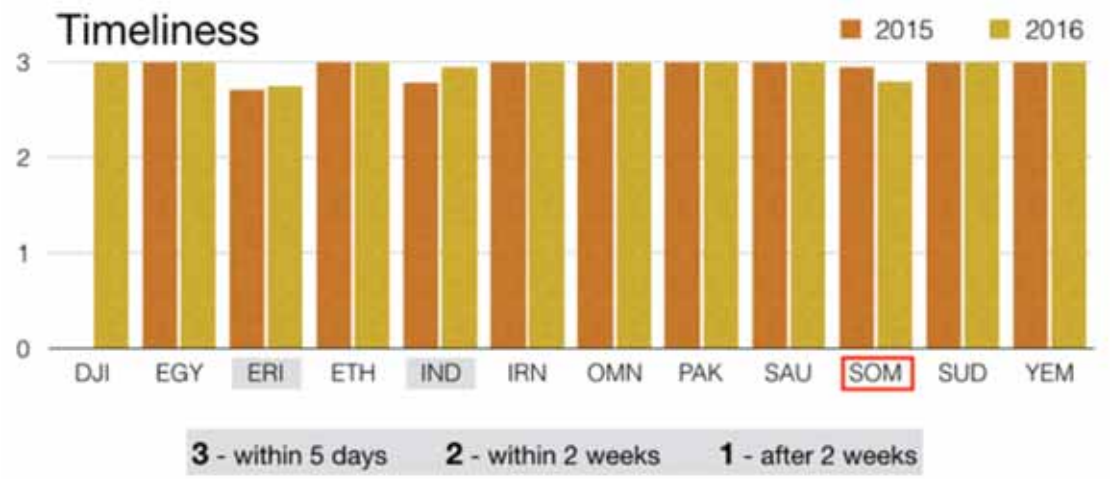
Question 10. Locust Watch continues to be information and useful, easy and quick to find information, up to date and complete, and well designed and intuitive. It is used regularly by the DLIOs.

Annex 4. The quality and timeliness of DLIO reporting in 2015-2016

DLIS assessed the quality and timeliness of each report received from locust-affected countries from 1 January 2015 to 30 April 2016 by indicating a grade of 1 to 3 where 3 was the highest score.



High quality reporting was maintained in most countries during 2015 and 2016 although there was a slight decline detected in 2016 in Pakistan, Somalia, Saudi Arabia and, to a lesser extent, in Iran and Oman. The decline in Pakistan is attributed to the 11-month DLIO training in DLIS in which the current trainee is from Pakistan and a substitute was not appointed during his absence. Personal and programme changes in Somalia affected reporting. Djibouti re-established its monthly national bulletin in 2016 after a gap of more than one year.



Reports were received from all countries on time except for a slight disruption in Somalia.

Annex 5. Standard file management

DLIOs are requested to adhere to a standard method of managing files on their PC in order not to lose important files or spend too much time trying to find them. This requires an organized approach and always naming files in the same manner. For improved access, the RAMSESv4 (data files associated with Rv4.1) and RAMSESv4.1 (the Rv4.1 app) folders should be dragged to the Favourites sidebar.

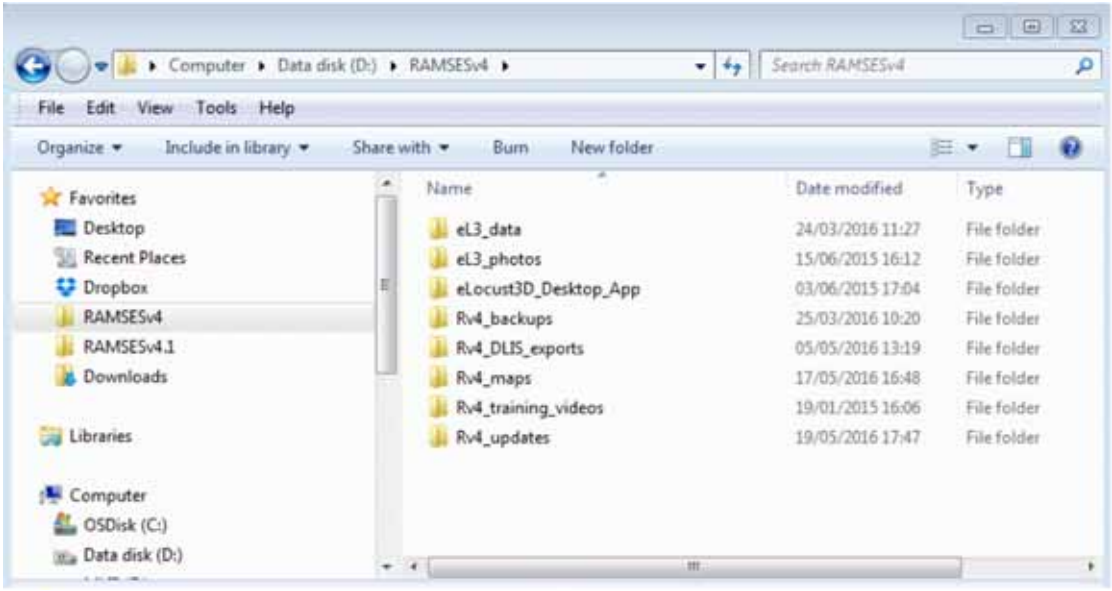


Figure 1. Standard file management organization for D:\RAMSESv4 folder.

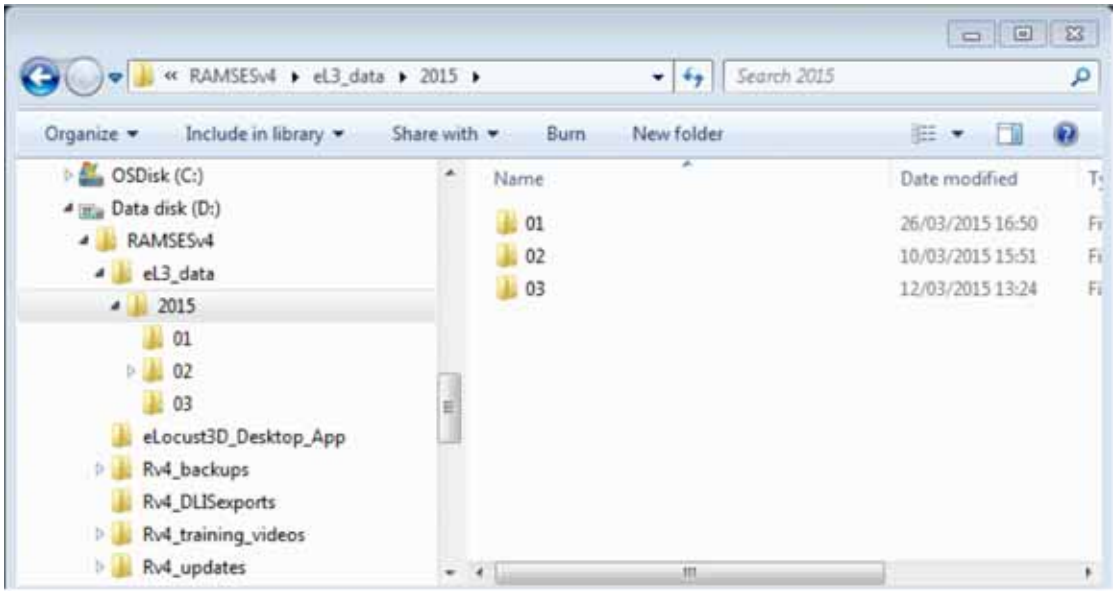
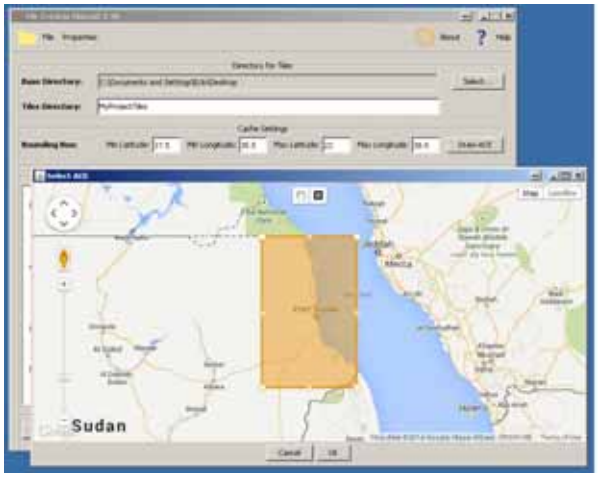


Figure 2. Standard file management organization for annual and monthly eLocust3 data in D:\RAMSESv4\eL3_data folder.

NB. File and folder names should be written exactly as indicated in the above figures.

Annex 6. Preparing regional packages in eLocust3D Desktop App



Step 1. Base directory

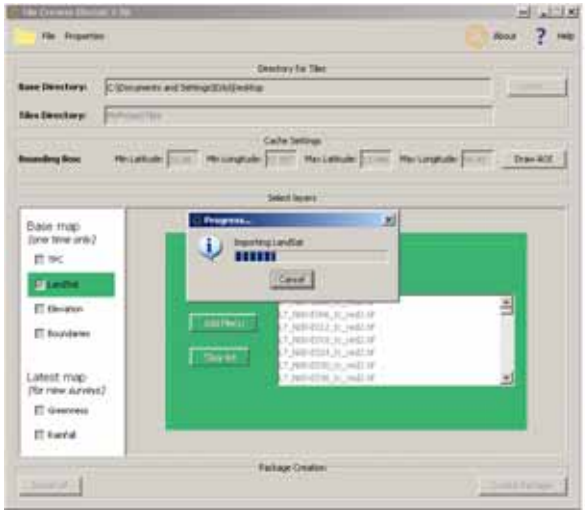
(a) Set the base directory on your PC where you want to save the tiles to D:\RAMSESv4\eLocust3D_DesktopApp\REGION

(b) change REGION to the name of the specific region

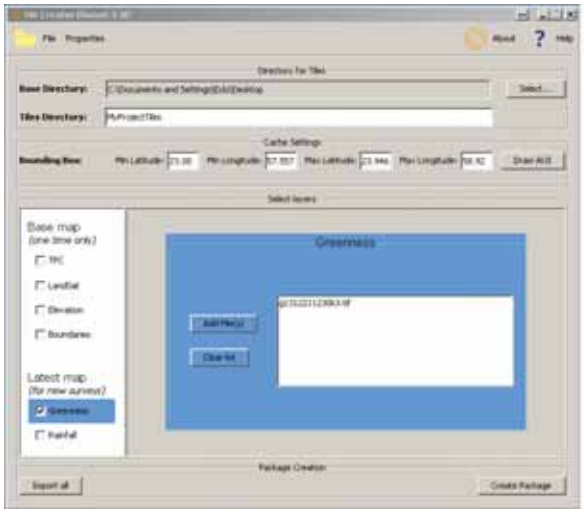
Step 2. Area of Interest

(a) Use the map (with Internet connection) to select a region up to about 2 x 2 sq. degrees;

(b) Note the coordinates of the region



Step 2 (do this only once!) Add the relevant base maps (TPC, Landsat, Elevation, Boundaries) one by one



Step 3. Add the latest greenness and rainfall maps

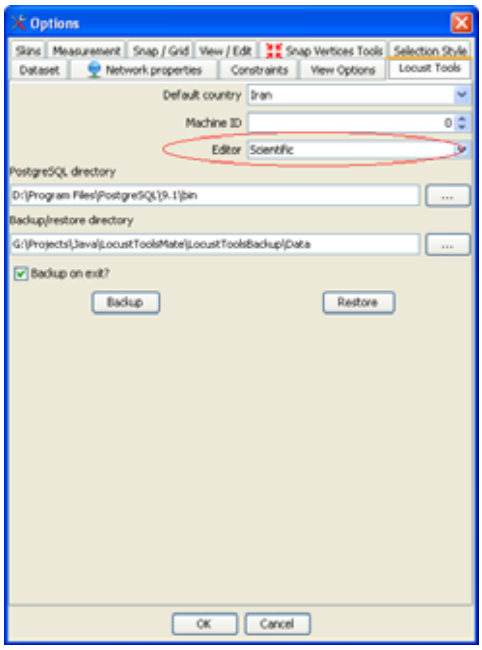
Step 4. Create Package

<u>Note</u>: to update again, indicate the correct region Base Directory, enter the coordinates for Area of Interest, then repeat steps 3 and 4 above.

Annex 7. Rv4.1 update

A major update, Rv4.1, was provided to participants at the workshop that addresses numerous shortcomings as well as new functionality that had been identified by users. Rv4.1 is a standalone version that should be saved in D:\RAMSESv4.1.

- Based on OpenJUMP 1.8
- Compatible with Java version 7 and above, and independent to Java version
- Independent to PostgreSQL version
- Independent to PostGIS (works with both PostGIS 1.5 and PostGIS 2.x)
- Importer for static vector data (boundaries, roads, wadis, towns, etc.) at both country and global levels
- New method and user interface for drawing vector data on maps
- Spatial queries are enabled
- Faster queries
- Data editor is in a different module that allows the possibility to have different editors as separate plugins. Currently Scientific editor is available. Soon eLocust3 editor will be available.



- A temporary table is now created for imported data so users can leave imported data in this table and come back to it in the next session
- Temporary data (data are which loaded from an eL3 file or entered manually but not imported into Rv4 database) can be displayed on the map using the correct symbols rather than green dots
- A number of new queries were added
- A number of new plugins were developed

Annex 8. Data analysis

In general, analysis of weather, ecological and locust data should be done systematically in a chronological order.

Summary	Analysis
Rainfall	Impact on Desert Locust? Timing? Location?
Vegetation – greening, green, drying	Previous rainfall timing and location? Runoff effects (topography)?
Locust presence	Numbers and location Trends (increasing, decreasing, same) Breeding? Movement?
Hoppers, copulating/laying adults	Timing of laying, hatching, fledging (work backwords)
Groups	Locust numbers & location Environmental conditions Breeding? Movement?

The following tips should be applied when analysing data:

- rainfall -> vegetation -> locusts
- vegetation becomes green 3+ weeks after rainfall
- analyze backwards and forwards from the current situation
- break into different geographic breeding areas and analyze separately
- analyze locust types systematically:
- adult presence/absence
- breeding (cop/lay adults, hoppers)
- lay-hatch=2wks, hatch-fledge=6wks, fledge-lay=4wks
- grouping
- always analyze chronological (by time)
- turn GIS layers on/off
- zoom in/out of GIS layers
- use your imagination – test different hypotheses
- develop a convincing story!

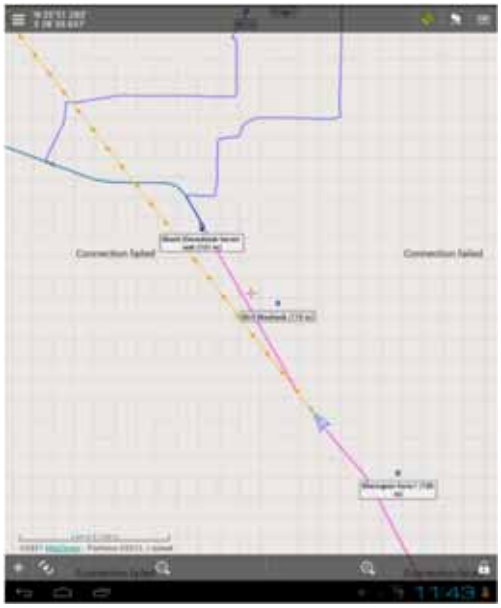
Annex 9. Locus Map app

A. Overview and use

The DLIO from Egypt, Osama Moustafa, has found a method that can help field officers to navigate better during survey and control operations by using a free Android app, Locus Map[1], on the eLocust3 tablet. There are several advantages, compared to eLocust3D, for users: (1) roads, wadis, tracks, wells (and other points of interest), and previous survey stops can be viewed on satellite and aerial maps, (2) marking a position, (3) add a new point with different coordinates and use the GOTO function to navigate to it, (4) record a track and save it for future use, giving it a unique colour and thickness, (5) measure the distance between two points, and (6) easy to use.

After downloading and installing the app on the tablet, press the Menu button (upper left corner), select Settings and change the Locus app directory to the external SD card.

Main screen showing user position with no background map



Recorded tracks and points with labels (each track can be coloured differently). The latitude and longitude on the top left are the coordinates of the screen centre

Different imagery, such as Bing and Google, can be easily downloaded (from a website, not by the app) and used as background maps in the Locus Map app. Vector layers such as roads, wadis, tracks, wells and towns as well as administrative boundaries can be created in a GIS. This items help users to better navigate in the desert.

[1] https://play.google.com/store/apps/details?id=menion.android.locus

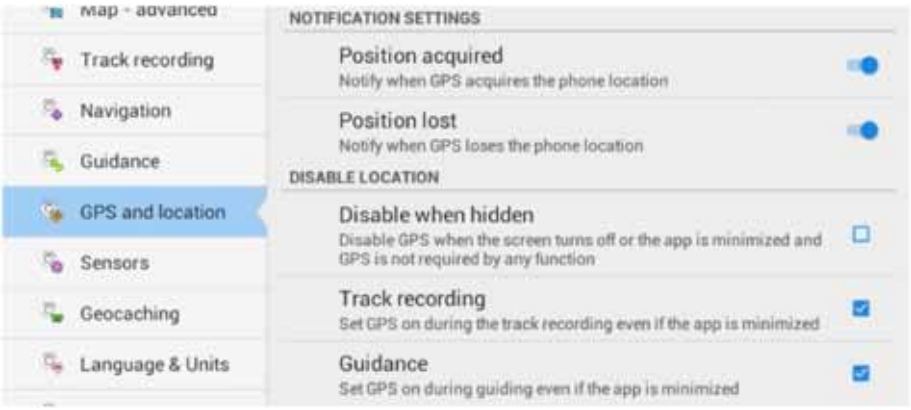
An offline map showing topography and main wadis (light blue) displayed during navigation in the desert. The track (red) is being recorded by the app during the survey. The current position of the vehicle is the blue arrow.

Wadis, roads, previous survey stops (green dots, some labelled) overlaid on a background satellite image and a MODIS EVI map showing green vegetation.

Adjusting Locus Map app settings before use

Before using the app in the field, users should adjust some settings to avoid technical problems when navigating.

1. **Main menu** button – select **Settings** to open the settings page
2. Select **GPS and location** from the left panel



3. Change the **Notification settings** so that the **Position acquired** and **Position lost** are both activated
4. Under the **Disable Location** option – un-tick **Disable when hidden** and tick both **Track recording** and **Guidance**

Creating line (tracks) and point layers by recording using Locus Map app

1. Start the locus app and make sure that the GPS signal is good (colored in green), and make sure that the GPS is enabled in the dashboard
2. Locus main page – **Data manager** button – select **Tracks** menu – press **(+)** button
3. A small window will appear – select **Track recording** – press the **Record** button
4. Start moving to record the line until you finish (keep the app working during recording process). You will see a red line showing your track
5. When reach the end of your track or road, click **Stop recording**, and name the track (the line color will become blue by default)
6. To record a point – press the **Data manager** button – select the **Point** menu – press the **(+)** button – click **Add new point** – give it a name.

TIP! You can group your points or tracks in separate folders and you can change the track colour and thickness.

B. Procedure to prepare maps

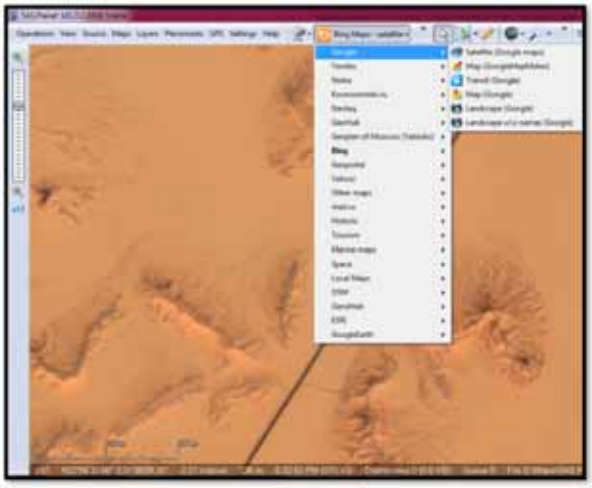
(i) vector layers from available shapefiles

In order to display vector layers such as wadis, roads and desert tracks or administrative boundaries in Locus Map app, you need to convert them to KML format. Until this functionality is available in Rv4.1, another GIS app such as QGIS must be used. Contact Osama for more details.

(ii) satellite imagery

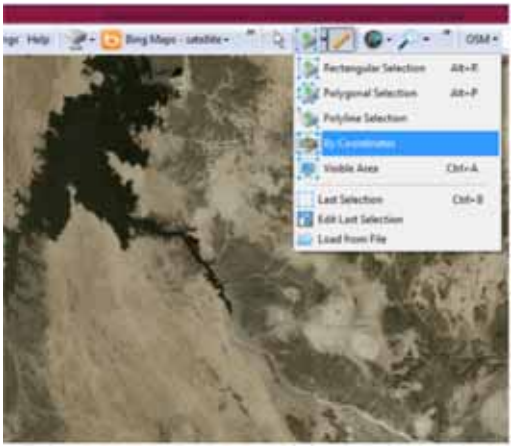
Use the **.sqlitedb** format for background maps in Locus Map app for other files to overlay on. The best software for this is **SAS.planet**[1]. Use this on your PC. Many map sources can be selected in this software package such as Google satellite, Google maps, Yandex, Nokia maps, Google Earth, ESRI imagery, Bing imagery and others.

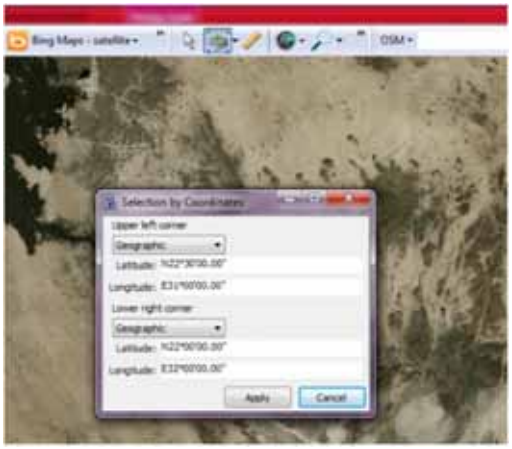
1. Start **SAS.planet** (make sure you are connected to the Internet) – select the desired map source



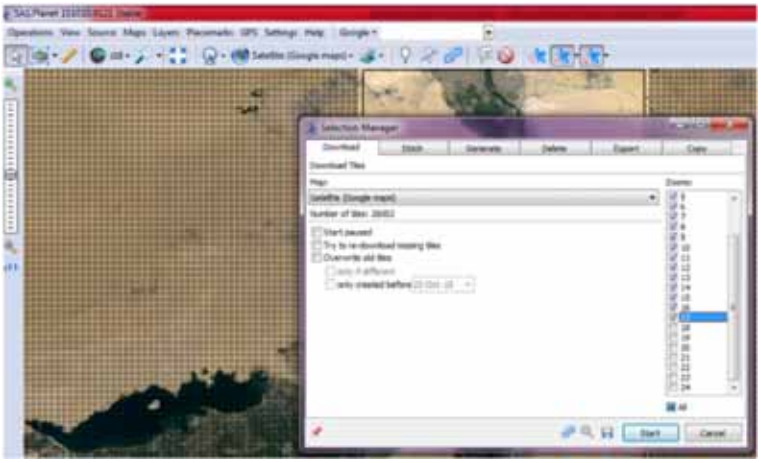
[1] https://bitbucket.org/sas_team/sas.planet.bin/downloads ; save to D:\Locus folder

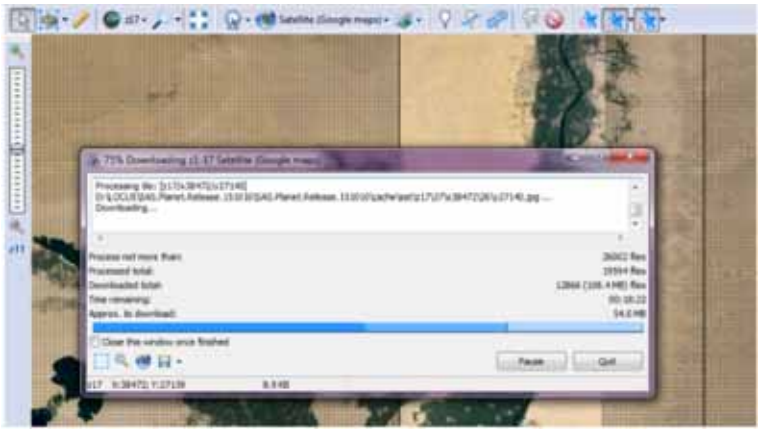
2. Click **Selection manager** icon – select your area of interest. The best way to select the area is by entering its coordinates, as this will help you to easily select the exact area and neighboring areas that will be selected later on. Enter the NW and SE coordinates – **Apply**





3. The **Selection manager** window will appear and you will see a frame line appears around your AOI – select the **Zoom levels** (1-18) from the **Download** menu – click **Start** to download the tiles of all selected zoom levels into a folder under the software package folder. The download window will appear and the downloading progress will be displayed. The tiles will be saved in the package directory to be exported as map file types in the future without the need to access the internet (keep the software package safe, otherwise saved tiles will be lost)





4. When downloading is finished for your selected area at all zoom levels, press **Quit** – open the **Selection manager** again (do not change the coordinates) – **Export** menu – select the desired file type "**RMaps(sqlite)"** – name it to save in the desired destination – select the **Zoom levels** (1-18, the same levels that you selected before) – **Start**.

5. When downloading is finished, copy the file into the **Locus** directory in the SD card (locus/maps) and insert the SD card again into the tablet or the smartphone.
6. To display your map file, click the **Map Manager** button on the Locus main page – select the **Offline menu** – press the **Add** button at the bottom of the page (a window will appear) – select **Add external maps** option – select your map and close the window (the map will be imported and added to the list of offline maps) – then select it to display

Resolution scales

You will notice that various zoom levels can be selected in **SAS.planet** when downloading tiles and exporting the map file. You can select zoom levels **1 to 18** for downloading and use zoom levels **11 to 18** for exporting (where 11 equals scale of 1:6400m and 18 equals scale 1:50m).

Annex 10. Rv4 improvements – 2016-2017 workplan

Based on the results of the DLIO questionnaire and discussion during the workshop, the following improvements to Rv4.1 can be expected in the next 10-12 months:

- PC/Mac installer app – to facilitate installation and updating
- Manual data entry using eLocust3 simulator – to facilitate rapid and easy data entry
- Automatic downloading of remote sensing imagery (rainfall estimates, MODIS, greenness maps; dryness and soil moisture maps, once available) – to facilitate and encourage the use of remote sensing imagery in analysis
- Summary and analysis functions – to improve national bulletins and early warning
- Data export formats (e.g. KML, CSV, etc.) – to facilitate data sharing and display
- Control query that indicates control method – to assist in data analysis
- Desert Locust Egg & Hopper Development model – to assist in data analysis
- Animated timeline showing changes in ecological conditions and locust populations over time – to assist in data analysis and presentation