

# 2015



## CLCPRO REGIONAL WORKSHOP FOR DESERT LOCUST INFORMATION OFFICERS IN THE WESTERN REGION

No. 6

8-12 June 2015

Nouakchott, Mauritania

Commission for Controlling the Desert Locust in the Western Region (CLCPRO)  
Desert Locust Information Service (DLIS)



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**CLCPRO Regional workshop for  
Desert Locust Information Officers in the Western Region**

**8-12 June 2015 (Nouakchott, Mauritania)**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

**Rome, 2015**

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# **CLCPRO Regional Workshop for Desert Locust Information Officers in the Western Region**

**8-12 June 2015 (Nouakchott, Mauritania)**

## **1. Introduction**

The FAO Commission for Controlling the Desert Locust in the Western Region (CLCPRO) sponsored a regional workshop for Desert Locust Information Officers in frontline countries of the Western Region. The CLCPRO staff organized the workshop and the National Locust Control Centre (CNLA) provided logistics and support. The FAO Senior Locust Forecasting Officer, Keith Cressman, and Hichem Dridi (FAO/CLCPRO) conducted the workshop, assisted by Mehdi Ghaemian (RAMSESV4 developer). The workshop was held at the Monotel Hotel in Nouakchott, Mauritania.

This year's workshop was the seventh annual DLIO workshop since 2008. A total of seven DLIOs from seven frontline countries in the Western Region attended the workshop as well as five additional staff from CNLA (Annex 1). The involvement of the RAMSESV4 developer was critical as he provided useful information, clarification and much needed technical assistance in solving RAMSESV4 problems as they arose during the workshop.

## **2. Programme**

The Secretary Generals of the three main ministries responsible for food security and capacity building (Ministry of Agriculture, Ministry of Livestock and Ministry of Employment, Capacity Building, Information Technology and Communication), the FAO Representative, the CLCPRO Executive Secretary, the FAO Senior Locust Forecasting Officer, and the CNLA Director-General officially opened the workshop.

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 using the card method. This information was used to refine the workshop programme and make sure it met the needs of the participants. The main emphasis of this year's workshop was RAMSESV4 and eLocust3D. The programme consisted mainly of hands-on practical exercises and demonstrations in the classroom, supplemented by participatory discussions and a few presentations (Annex 2). It had been sent to participants prior to the workshop and was posted on the CLCPRO website. The hours of the four-day workshop were from 8:00 to 5:00 PM with coffee breaks in the morning and afternoon, and a 1.5 hour break at midday for lunch and prayers.

Participants were presented with a Certificate of Attendance at the end of the workshop.

### **2.1 Participant expectations and difficulties**

The participants indicated that they wished to learn more about using all aspects of the latest version of RAMSESV4, how to use eLocust3D Desktop App and how to solve every day problems that eLocust3 users face when in the field. Some users indicated that they required further assistance in managing files on their PC, downloading remote sensing imagery and updating Java. In general, participants wished to use the new tools developed

by DLIS and others more effectively and efficiently. Participant expectations and difficulties were similar to those expressed in the CRC/SWAC DLIO workshop (Egypt, February 2015).

## 2.2 File management

A standard filing structure was proposed to participants as a means of improving the organization and access of data on their computers (Annex 3). This should make it easier and faster to find files and facilitate regular backups. The participants were encouraged to adopt the proposal and to adhere to a strict file naming scheme and organizational structure. A well-organized standard filing system will also aid FAO in providing better technical assistance remotely, training and facilitate dialogue during country-to-country support.

## 2.3 RAMSESV4

The workshop participants were trained in all aspects of using the latest version of RAMSESV4. A logical, sequential approach was presented, starting with the software itself:

- (a) downloading and installing the latest software update
- (b) configuring the options for country, machine ID
- (c) backup/restore directory

This was followed by the management of eLocust3 data:

- (a) downloading and saving the 24-hour CSV data file received from Novacom in the national eLocust Gmail account
- (b) decompressing the file, opening it in RAMSESV4
- (c) checking and correcting the data and importing it into the database
- (d) manual data entry
- (e) locust and soil data query (retrieval) and editing
- (f) plotting data on a map
- (g) preparing maps for national bulletins
- (h) exporting the data to DLIS and checking the file

DLIOs practiced entering four pages of manual data from the *FAO Desert Locust Standard Survey/Control Form* (12 locations) that was prepared in advance by DLIS. Some of the data were deliberately incomplete or wrong. DLIOs were also shown how to enter vague report (“a swarm seen yesterday near Sodiri”). The data was representative of what they might receive from field officers who use the *FAO Desert Locust Standard Survey/Control Form* and from travellers or locals.

A number of individual problems concerning RAMSESV4 were resolved on the spot by the resource persons (Annex 4).

Participants were also shown how to download current remote sensing imagery (MODIS, NDVI, EVI, greenness maps, IRI rainfall), rename each file according to a strict standard protocol, and then re-index the external HDD so that the RAMSESV4 application can find the image and display it (Annex 5). The annual workshops are an opportunity to update each of the country’s external HDDs with a complete set of the previous year’s imagery. These files are too large to send by email and often take a long time to download due to poor Internet connections in some countries. This year, X HDDs were updated with the 2014-2015 (to May) dynamic data as well as other new files (Annex 6). Each HDD took approximately two hours to be updated.

## 2.4 eLocust3D

eLocust3D is a new application within eLocust3 that can help ground teams locate green vegetation and potential locust infestations more easily. In this way, surveys can be more targeted and prioritized, which should lead to improvements in survey efficiency and reduce costs. While using eLocust3D, the survey officer can see his current position in the field in relation to the location of recent rainfall or green vegetation displayed on a Landsat or TPC map in 3D. As the officer moves in the field, the position is updated. Field officers use their fingers to zoom in/out, rotate and tilt the maps. eLocust3D does not require an Internet connection. The application has received several awards and international recognition for its innovative and practical approach<sup>1</sup>.

The workshop participants were introduced to eLocust3D and shown how to use the eLocust3D Desktop App on the PC to prepare packages that can be used on the tablet in the field. An initial package is created that contains static background maps (Landsat, TPC, elevation, boundaries) covering the entire country (Annex 7). This takes several hours or more but only has to be done once. Updated packages are then created that contain the latest rainfall and greenness maps for a specific Area of Interest, normally about 6-9 square degrees, where a team will be conducting a survey. 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 practiced preparing packages by using the eLocust3D Desktop App, managing the micro SDHC memory cards and using eLocust3D on the tablet. It was suggested to prepare a vegetation and rainfall package at the beginning of the breeding season and then perhaps update it midway through the season. Careful consideration will need to be given regarding the logistics of providing updated package(s) to teams in the field during the breeding season.

## 2.5 eLocust3

On 1 January 2015, eLocust3 began use on an operational basis in all countries. Morocco and Algeria used it during surveys carried out in the spring breeding season while Sahelian countries will start to use it next month for summer surveys.

As with the introduction of any new technology, there is an initial period of minor problems and difficulties that often occur due to inexperience or poor training. The main problems associated with eLocust3 during the first six weeks of 2015 were:

- (1) Missing coordinates – users would press *Save&Sent* without confirming that the latitude/longitude coordinates are indicated at the top of Report Page;

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<sup>1</sup> Nominations, special awards and international recognition from:

NASA World Wind Europa Challenge (<http://eurochallenge.como.polimi.it/projects2014>)

Geospatial World 2015 (<http://www.geospatialworldforum.org/award.htm>)

World Summit on the Information Society / WSIS Project Prizes

(<http://groups.itu.int/stocktaking/WSISProjectPrizes.aspx#nominated-projects> - page 13)

ESA Big Data from Space (<http://congrexprojects.com/2014-events/BigDatafromSpace>)

Panasonic Australia (<https://blogs.panasonic.com.au/business/2015/01/28/panasonic-toughpad-rugged-android-power-the-u-n-s-locust-watch-project/>)

RAI Italian TV (<http://www.rai.tv/dl/RaiTV/programmi/media/ContentItem-c8d21158-cd54-4781-9f02-f0cbc3ff8178.html#p=0>)

- (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;
- (4) Data quality – although there are many data integrity checks built into eLocust3, users must be careful and make a diligent effort to enter sensible data in order to avoid the “garbage in, garbage out” syndrome;
- (5) Report ID – users should never change the User in the Settings Page on eLocust3 because this has been pre-set to correspond to the tablet name and antenna ID.

All of the above problems can be resolved with proper and regular training of eLocust3 users in each country (Annex 8). Refresher courses are suggested in Sahelian countries prior to the summer season.

During the workshop, participants were shown how to take photos with eLocust3, transfer photos from the tablet’s micro SDHC memory card to the PC, and upload photos to the GeoFlex platform. Photos can only be updated if the associated Report has already been transmitted by eLocust3. The use of GeoFlex for monitoring teams and displaying survey and control results was also reviewed.

The DLIOs from Algeria and Morocco indicated that they as well as the users in their countries are extremely satisfied with eLocust3 and its new functionality, specifically the extra data that can be recorded, the reduction in cables, ability to take photos, the maps, references, videos, tri-lingual software, ruggedness of the hardware and general ease of use. eLocust3 represents a substantial improvement over its predecessor and it is a very important tool to be used by every survey and control team.

### **3. Drones**

A presentation was made consisting of several videos showing the potential use of drones in agriculture, industrial inspection and field monitoring. From this, a discussion ensued amongst participants about the potential use of drones in Desert Locust early warning and preventive control (Annex 9). For example, fixed-wing drones could be used to identify areas of green vegetation some 50 km or more from a survey team so that they can have an overview of the conditions in a much larger area. This can help direct teams to green vegetation in order to make surveys more efficient. A rotary drone could be used at the site of green vegetation to determine its spatial extent and also to identify gregarizing or gregarious hopper and adult populations. Another rotary drone could be used for spot treatments as a means to make control operations more precise and safer. It was suggested that drones could also be used to gather information from nomads. The Director-General of CNLA agreed that Mauritania could be used a pilot country for this new technology.

Presently, DLIS is in contact with several groups who are working on drones and is seeking funding for pilot testing and proof of concept. The current challenges for adopting drones to locust early warning and preventive control are endurance, power, communication, sensors,



image processing, maintenance and national legal and sensitivity issues. However, these challenges should not preclude investigation into this potentially useful technology.

#### **4. Lessons learned**

This year's workshop was mainly a training course on using RAMSEsv4 and eLocust3D Desktop App. Each participant brought his own laptop PC. This was essential so that each person could practice the new concepts, so-called "learning by doing". This was far more effective than passively watching PowerPoint presentations. However, this approach requires more than one trainer so that personal attention can be provided when necessary to address the large variety of wide-ranging individual hardware and software problems that occur during the workshop. Ideally, there should be a resource person or trainer for every 3-4 participants if sufficient attention is to be given to participants so that they learn all of the material adequately. Furthermore, the more advanced and experienced participants can help their colleagues. This strengthens so-called horizontal technical support, that is country-to-country, rather than relying solely on vertical support, e.g. FAO-to-country. It is hoped that the continuation of annual workshops will strengthen the horizontal support component.

The workshop timetable was designed to break up the intensive training sessions with rest periods of a half hour in the morning and again in the afternoon, supplemented by a 1.5 hour-long break at midday. Buffet snacks and drinks were provided during each break period. All efforts were made to finish the day at 1700h so that participants had sufficient time to rest in the evening and practice what they learned. This schedule also assisted the trainers and resource persons in maintaining the intensive pace throughout the workshop. This arrangement worked very well and should be applied to future workshops.

A fast, reliable Internet connection for every participant during each day of the workshop is absolutely essential. The Internet speed was not reliable or stable during this year's workshop and, as result, it constrained some of the teaching and participants could not take full advantage of the training.

During the 2014 workshop, specific eLocust Gmail accounts were established for each country to receive eLocust3 data. The benefits of this decision have become more apparent this year when countries started using eLocust3. It has allowed users to manage eLocust3 data easier and more reliably while facilitating testing, troubleshooting and problem solving by FAO DLIS.

Participants must come to the workshop prepared and ready to raise problems and difficulties they face in using new tools and technologies in their daily work as DLIOs. The trainers sent the workshop programme and associated exercises one month in advance so that participants had sufficient time to practice before arriving at the workshop. Participants were also requested to ensure that their laptops had sufficient RAM memory and was working correctly, that the latest version of RAMSEsv4 was installed and functioning properly, and that the latest virus definitions were installed and each computer scanned and cleaned of any existing virus. Unfortunately, not all participants followed these instructions. For example, three participants had not completed the exercises, one laptop had a virus, and one RAMSEsv4 was last updated on 10 January (e.g. seven updates had not been installed since then). As a result, precious time was lost during the workshop for resolving these problems.

Apart from the Internet difficulties, the venue of this year's workshop, the Monotel Hotel, was very good because the meeting room was comfortable, and well equipped and break and lunch services were excellent. Reasonable accommodation was less than ten minutes away. The timing of the workshop as well was good because it is less than four weeks before summer surveys start in the Sahel. Hence, the material from the workshop will still be fresh within the minds of the participants.

## **5. Conclusion**

The DLIOs expressed the need to continue to update RAMSESV4. The latest version contains basic functionality for data management and display but lacks sufficient tools for data summary and analysis (Annex 10). It is hoped that this work can be achieved during the next 12 months so that the DLIO workshop in 2016 can concentrate on presenting these new tools and training participants in their use.

Based on the results of a 20-question pre- and post-evaluation, nearly all participants improved their knowledge and skills in the use of RAMSESV3, eLocust3 and eLocust3D (Annex 11).

The participants were generally pleased with the organization, contents and facilities of the workshop (Annex 12). They reaffirmed the importance of and the need to continue to organize the CLCPRO/EMPRES-WR regional workshop for Desert Locust Information Officers on an annual basis. The workshop offers the only opportunity for DLIOs from locust-affected countries within the region to get together to exchange experiences and share knowledge, and to receive important training and feedback from DLIS. Therefore, it is critical that all front-line countries allow their nationally designated DLIO to take part in this activity, and that CLCPRO continues to organize this activity every year with DLIS participation. 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

Country	Desert Locust Information Officers
Algeria	Hamid Bensaad
Chad	Neldjibaye Rassei
Libya	Khaled El Gadgoud
Mali	Hamidou Sanogo
Mauritania	Ahmed Salem Benahi
	Habi Dia
Morocco	Jamal Chihrane
Niger	Idrissa Yacouba

Organization	Trainers and Resource Persons
FAO HQ	Keith Cressman
FAO/CLCPRO	Hichem Dridi
Iran	Mehdi Ghaemian

Organization	Observers
FAO/CLCPRO	Mohamed Lemine Hamouny
Mauritania	Mohamed Abdallahi Ebbi
	Mohamed Sidi
	Jan Hanbali
	Mohameden Ould Med Mahmoud
	Mohamed Moctar Lam
	Ousmane Ibrahima Sall

## Annex 2. Workshop programme

	Topic	Details
<b>8 June (Monday)</b>		
<b>0930 - 1230</b>	<b>Opening</b> <ul style="list-style-type: none"> <li>Opening ceremony</li> <li>Pre-evaluation</li> <li>Participant introduction and expectations</li> <li>Workshop objectives and programme</li> <li>eL3, Rv4, PC problems and difficulties</li> </ul>	GoM, FAOR, Hamouny, Cressman Test Card method
	<b>File management on the PC</b> <ul style="list-style-type: none"> <li>Standard file and directory structure</li> </ul>	Presentation, discussion
<b>1400-1530, 1600-1700</b>	<b>Rv4</b> <ul style="list-style-type: none"> <li>Updates since January 2015</li> <li>Using Google Site for updating</li> <li>Personalization and options</li> <li>Downloading eL3 data</li> </ul>	Practicals
<b>9 June (Tuesday)</b>		
<b>0800 -1000, 1030-1230</b>	<b>Rv4 (cont.)</b> <ul style="list-style-type: none"> <li>Inserting, correcting, importing eL3 data</li> <li>Manual data entry</li> </ul>	Practicals
<b>1400-1500, 1530-1700</b>	<b>Rv4 (cont.)</b> <ul style="list-style-type: none"> <li>Manual data entry</li> <li>Query, plotting and editing data</li> </ul>	Practicals
<b>10 June (Wednesday)</b>		
<b>0800 -1000, 1030-1230</b>	<b>Rv4 (cont.)</b> <ul style="list-style-type: none"> <li>Query, plotting and editing data (cont.)</li> <li>Renaming remote sensing files</li> <li>Raster and vector maps and layers</li> <li>Preparing maps for bulletins</li> <li>Re-indexing HDD</li> </ul>	Practicals
<b>1400-1500, 1530-1700</b>	<b>Rv4 (cont.)</b> <ul style="list-style-type: none"> <li>DLIS export and checking Excel file</li> <li>Troubleshooting and problem solving</li> <li>2015-16 roadmap</li> </ul> <b>eLocust3D</b> <ul style="list-style-type: none"> <li>Introduction to basics</li> </ul>	Practicals  Presentation, discussion
<b>11 June (Thursday)</b>		
<b>0800 -1000, 1030-1230</b>	<b>eLocust3D (cont.)</b> <ul style="list-style-type: none"> <li>Desktop app</li> <li>Preparing a package</li> <li>Usage on the tablet</li> </ul>	Practicals
<b>1400-1500, 1530-1700</b>	<b>eLocust3D</b> <ul style="list-style-type: none"> <li>Desktop app</li> <li>Preparing a package</li> <li>Using eLocust3D</li> </ul> <b>eLocust3</b> <ul style="list-style-type: none"> <li>Photo upload to GeoFlex</li> </ul>	Practicals  Practicals

	<ul style="list-style-type: none"> <li>• Review of usage</li> <li>• Tips and troubleshooting</li> </ul>	
<b>12 June (Friday)</b>		
<b>0800 -1000</b>	<b>CNLA visit</b>	Field visit
<b>1030-1300</b>	<b>eLocust3D</b> <ul style="list-style-type: none"> <li>• Transfer package from PC to tablet</li> </ul> <b>eLocust3</b> <ul style="list-style-type: none"> <li>• Asset management</li> </ul> <b>Evaluation</b> <ul style="list-style-type: none"> <li>• Post-evaluation</li> <li>• Workshop evaluation</li> </ul>	Demonstration  Discussion  Test Questionnaire
<b>1500-1700</b>	<b>Evaluation (cont.)</b> <ul style="list-style-type: none"> <li>• Pre- and Post-evaluation results</li> </ul> <b>Drones</b>	Presentation Video presentation, discussion
	<b>Closing</b> <ul style="list-style-type: none"> <li>• Certificates</li> </ul>	Hamouny, Ebbe, trainers

### Annex 3. Proposed standard file management

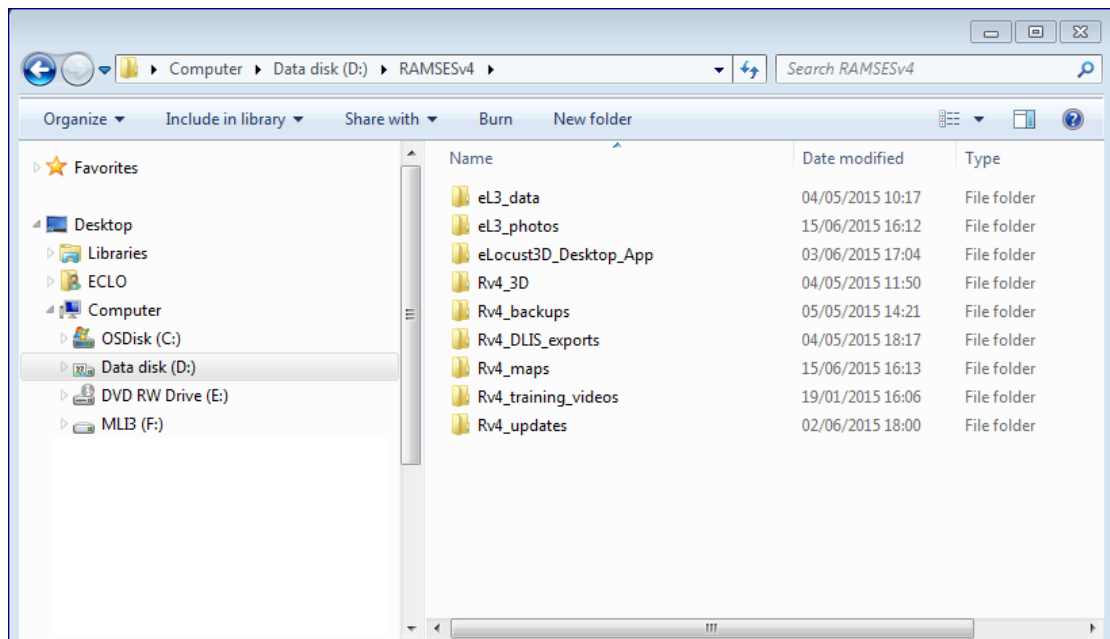


Figure 1. Proposed general file management organization for d:\RAMSESV4 folder.

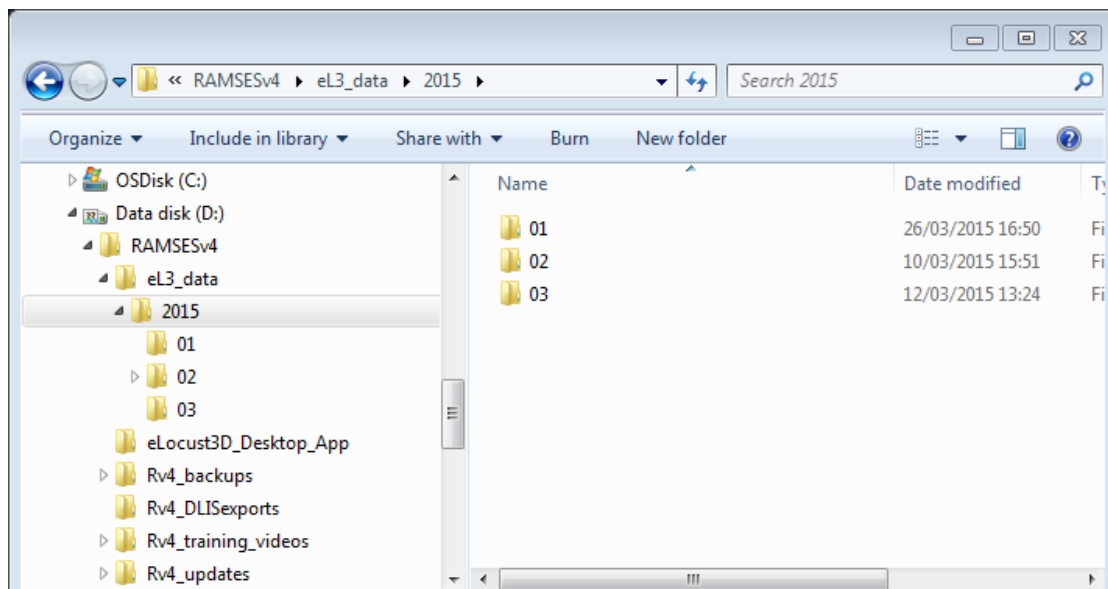


Figure 2. Proposed file management organization for annual and monthly eLocust3 data in d:\RAMSESV4\eL3\_data folder.

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

#### Annex 4. RAMSESV4 problems, solutions and tips

Problem	Solutions & Tips
Installation is not successful	<ul style="list-style-type: none"> <li>• Turn-off anti-virus temporarily</li> <li>• Follow Uninstall instructions (see doc on HDD)</li> <li>• Manually uninstall if necessary</li> <li>• Confirm that Java Advanced Imaging and Java have been completely removed (reinstall and then uninstall if necessary)</li> </ul>
Rv4 does not start – <i>“Could not create the Java Virtual Machine”</i>	<ul style="list-style-type: none"> <li>• Go to Control Panel – System – Advanced – Environmental Variables – Add (Name: JAVAOPTIONS, Value: -Xmx512M) and restart PC</li> </ul>
Rv4 does not start – Cannot find Java	<ul style="list-style-type: none"> <li>• Correct the Java paths (see SetJavaPath instructions on HDD)</li> </ul>
Remote sensing imagery does not display	<ul style="list-style-type: none"> <li>• Make sure the external HDD is connected to your PC</li> <li>• Re-index the external HDD (must always be done after adding a new file)</li> <li>• Make sure to follow the exact naming scheme (see Annex 5)</li> <li>• Make sure the files are saved in the correctly name folder and hierarchy on the external HDD</li> </ul>
Cannot connect to database	<ul style="list-style-type: none"> <li>• Make sure all Rv4 updates have been installed and you are using the latest version</li> <li>• Go to Plugins Menu – RAMSESV4 maintenance – Auto Maintenance, and review messages in Output Window (this will automatically confirm that PostgreSQL and Postgis library are installed)</li> <li>• Control Panel - Administrative tools: stop and restart PostgreSQL services</li> </ul>
Cannot open eL3 data	<ul style="list-style-type: none"> <li>• Decompress the CSV file before trying to open</li> </ul>
Symbols do not appear on the map	<ul style="list-style-type: none"> <li>• Make sure all Rv4 updates have been installed and you are using the latest version</li> </ul>



## Annex 5. Standard file names for remote sensing imagery

If you want to view new remote sensing imagery in Rv4:

1. download the desired GeoTiff file(s) from:  
[http://iridl.ldeo.columbia.edu/maproom/Food\\_Security/Locusts/](http://iridl.ldeo.columbia.edu/maproom/Food_Security/Locusts/)
2. save the file(s) in the correct folder(s) on the HDD attached to your PC
3. change the name(s) to the correct format – this must be very precise; no mistakes!
4. reindex the HDD in Rv4 (Layer – Raster Data – Global import – import)

HDD data\raster\_data\dynamic\

File name	Description
<b>iri</b>	
pYYMMDDdt.tif	daily rainfall estimate
pYYMMDDk1.tif	decade 1 rainfall estimate
pYYMMDDk2.tif	decade 2 rainfall estimate
pYYMMDDk3.tif	decade 3 rainfall estimate
pYYMMDDma.tif	monthly aggregate rainfall estimate
<b>modis\composite</b>	
mYYMMDDMMDDc1.tif	reflectance West Africa
mYYMMDDMMDDc2.tif	reflectance East Africa
mYYMMDDMMDDc3.tif	reflectance Southwest Asia
<b>modis\evi</b>	
eYYMMDDMMDDc1.tif	EVI West Africa
eYYMMDDMMDDc2.tif	EVI East Africa
eYYMMDDMMDDc3.tif	EVI Southwest Asia
<b>modis\greening</b>	
gYYMMDDMMDDk1.tif	decade 1 greenness
gYYMMDDMMDDk2.tif	decade 2 greenness
gYYMMDDMMDDk3.tif	decade 3 greenness
<b>modis\ndvi</b>	
nYYMMDDMMDDc1.tif	NDVI West Africa
nYYMMDDMMDDc2.tif	NDVI East Africa
nYYMMDDMMDDc3.tif	NDVI Southwest Asia
YY= year DD=month DD=day	

### Notes

1. Only change YY, MM and DD values; do not change the other characters
2. When there are two sets of MM and second DD, this is the From / To dates
3. Always include .tif in the name

## Annex 6. External portable hard disk drives (HDD)

The original 2TB HDDs that contain the RAMSESV4 installation and data files were updated and additional updated HDDs were distributed to participating countries at the workshop.

Each CLCPRO frontline country has two HDDs for a total of 14 HDDs as follows:

Country	Number	HDDs
Algeria	2	ALG2, ALG3
Chad	2	CHD, CHD2
Libya	2	LIB**, LIB2**
Mali	2	MLI***, MLI2**
Mauritania	2	MAU, MAU2
Morocco	2	MOR, MOR2
Niger	2	NER**, NER3

\* *to be provided by DLIS (was infected in 2013 workshop)*

\*\* *was not brought to the workshop so it could not be updated*

\*\*\* *directory had been changed*

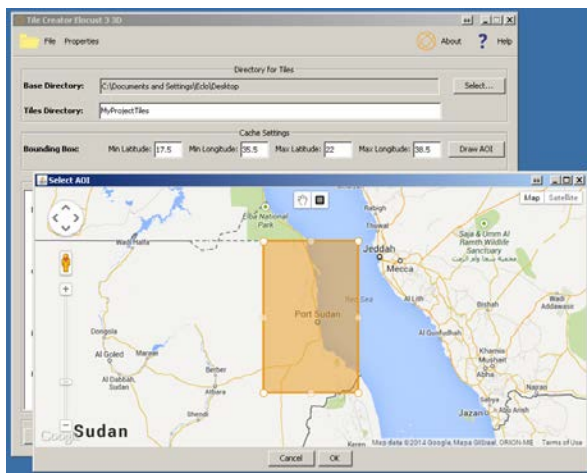
Workshop participants were requested to bring all of their HDDs with them so they could be updated during the workshop. Libya brought a personal HDD. Not all of the HDDs from Libya, Mali and Niger could be updated since they were not brought to the workshop. Each HDD was updated with the complete 2014 and 2015 (January-May) remote sensing imagery data (IRI, MODIS, NDVI, EVI, greenness), and Landsat geotif, eLocust3, eLocust3D and video files. An update took approximately two hours to complete.

After the update, each HDD now contains:

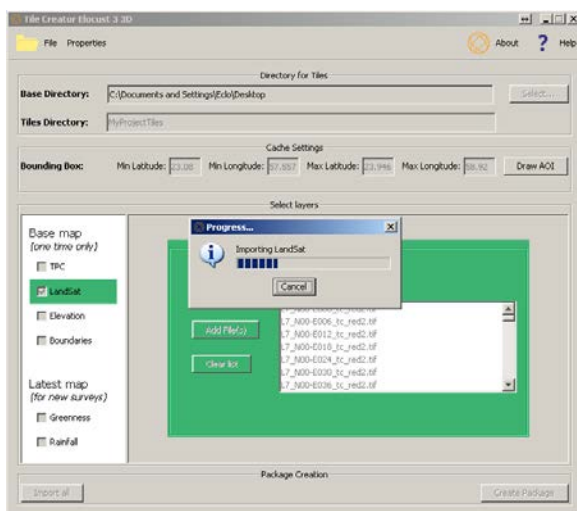
- data – static and dynamic raster data
- docs – installation, uninstallation and training guides for XP and Windows 7
- eLocust3 – apps, references, screenshots (Arabic, English, French), videos (15)
- eLocust3D\_Desktop\_App
- installation\_sequence – installation files including country specific files
- updates – eLocust2Importer
- videos – Rv4 instruction videos (7)
- WD SES Device Driver – driver for the HDD

Approximately 1TB of free space remains on each HDD. This is expected to last nearly one decade at the current rate of usage.

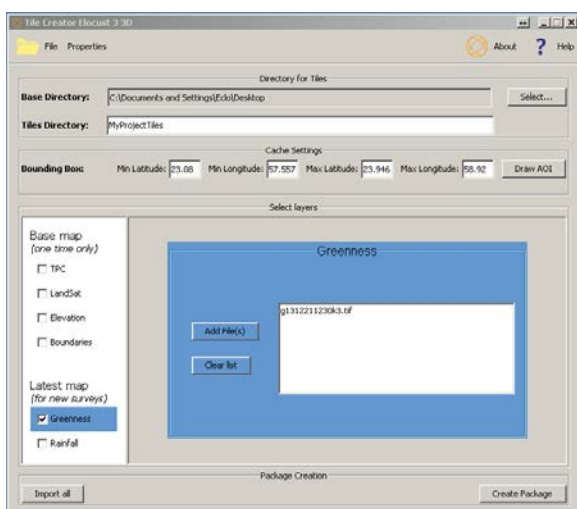
## Annex 7. eLocust3D Desktop App



**Step 1.** Use the map (you must have an Internet connection) to indicate the Area of Interest for making the package to be used on the tablet



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



**Step 3.** Add the latest greenness and rainfall maps

**Step 4.** Create Package

## Annex 8. eLocust3 problems, solutions and tips

Problem	Solutions & Tips
Missing coordinates	<ul style="list-style-type: none"> <li>• Wait for GPS coordinates to appear on Report Page before pressing <i>Save&amp;Send</i></li> <li>• Go to Dashboard and turn off/on GPS</li> <li>• Use Android GPS Test App to confirm the tablet's GPS is working ok</li> <li>• Keep the tablet on all day</li> </ul>
Area to be treated – coordinates	<ul style="list-style-type: none"> <li>• Only press <i>Get Coordinates</i> if there is an Area to be treated</li> <li>• If there is no Area to be treated, do <b>not</b> press <i>Get Coordinates</i></li> </ul>
Cannot delete Area to be treated coordinates	<ul style="list-style-type: none"> <li>• Cancel the report and start a New Report</li> </ul>
Cannot send report	<ul style="list-style-type: none"> <li>• Make sure all mandatory fields have been completed then press <i>Save&amp;Send</i></li> </ul>
Cannot transmit report by satellite	<ul style="list-style-type: none"> <li>• Check cable/cigarette lighter connection</li> <li>• Check antenna/cable connection</li> <li>• Sit inside the vehicle</li> <li>• Change position of antenna</li> <li>• Change position of vehicle</li> <li>• Use a different cable</li> <li>• Go to Dashboard and turn off/on Bluetooth</li> <li>• Press <i>Synchronize</i> button to retransmit immediately</li> </ul>
Data is not sensible	<ul style="list-style-type: none"> <li>• Users should take care and enter correct observations and complete data</li> </ul>
Not all transmitted reports are received by DLIO	<ul style="list-style-type: none"> <li>• Make sure to send all reports <b>before</b> the end of every day</li> <li>• Check that Queue = 0</li> </ul>
Tablet and antenna IDs do not match	<ul style="list-style-type: none"> <li>• Users should <b>not</b> change the User name in the Settings Page</li> </ul>
The time indicated in the eLocust3 footer and the tablet footer are different	<ul style="list-style-type: none"> <li>• Field users should inform their DLIO</li> <li>• DLIOs should check and correct this before distributing tablets to the field</li> </ul>

## Annex 9. Drones in Desert Locust early warning and preventive control

In response to increasing interest in the potential for using drones (unmanned aerial vehicles) in Desert Locust early warning and preventive control, the participants were introduced to this new technology and its possible incorporation into survey and control operations. The technology is developing rapidly and locust-affected countries and FAO have an opportunity to direct this development since it is an emerging technology in its infancy.

A number of challenges such as endurance, power, sensors, communication, maintenance, operational and legal aspects, must be addressed and resolved before this technology can be incorporated into national locust programmes. Field validation will be required in several countries. Mauritania indicated that it would be willing to participate in testing.

In general, participants were positive and enthusiastic about the potential use of drones in survey and control operations. Several suggestions were made such as increasing the distance for locating green areas to at least a 100 km radius from the survey team, and the possible inclusion of nomad communications.

This was the first time that drone technology was introduced to the Region.



### 1 Fixed-wing

identify green areas  
( 50km radius )



### 2 Rotary

determine extent of green area  
identify locust groups  
( 1-2km radius )

### 3 Rotary spot control ?

# DRONES FOR LOCUST MANAGEMENT

## Annex 10. RAMSESV4 improvements

### A. Summary and analysis functions

#### 1. One click by State:

- table: area surveyed, infested (Desert Locust, adults, hoppers, swarms, bands, laying, hatching, solitary/gregarious, rains, vegetation), treated
- map: color-coded state fills
- compare month by month, year by year (ex. summer 2012 surveys vs. summer 2011 surveys by state)

#### 2. Desert Locust

- graph: evolution of situation - changes in numbers (reports/day)
- table: area surveyed, infested, area treated, number of bands, swarms by entire sub-region over time 1
- table: do above for time 2, subtract from time 1 to show increase, decrease, no change
- table: area surveyed, infested, treated by region by day/month/year by region over time 1 and time 2
- table: area treated hoppers vs. adults
- map: frequency of Desert Locust presence/0.25 sq.deg and /region by month, year
- table: proportion that is solitary, transiens, gregarious
- table: proportion that is different maturation stages (hoppers, adults)
- map: DL presence and altitude
- graph: locust maturity, locust density, survey, area infested, area treated, by entire country or sub-region over time 1 and time 2
- map: show breeding adults in places greening up in last week returns a map with colored pixels

#### 3. Ecology

- summarize red pixels of greenness map in user-selected area to determine total area favorable
- plot: 1-5 stages as colors, summarize %/region
- plot: plant species vs. Desert Locust to see which species has most Desert Locust
- estimate % drying by region
- graph: vegetation density by entire country or sub-region over time 1 and time 2
- map: Desert Locust presence and soil type

#### 4. Control

- table: summary area treated, litres used by control type for country
- table: summary area treated, litres used by control type sub-region
- map: mortality after X hours
- plot: phytotoxicity and zootoxicity
- plot: treatment blocks
- graph: control, area treated, pesticide used, by entire country or sub-region over time 1 and time 2

#### 5. Field operations (depends on all teams having eLocust3)

- table: active days/team/month
- table: number of teams/region/period of time

#### 6. Data comparison in 4 windows

- compare time periods of same data (ex. Desert Locust in June-Sep) and different data (ex. Desert Locust, veg, rain, control) in 4 map windows.

#### **B. Plug-ins**

1. Desert Locust Egg and Hopper Development model – run model on selected data set (by mouse) and display results on a map and table
2. Western Region Stocks System – import geo-referenced export file to query/display data
3. Manual data entry – via eLocust3 simulator
4. DL trajectory model (depends on meteo data availability)

#### **C. Other improvements**

1. Country specific international, sub1 and sub2 boundaries (in addition to contours, roads, wadis) in Locust Menu (with asterisk)
2. The map of country should be displayed without the other countries, or have the possibility to choose which map will be displayed (with or without neighboring countries)
3. Add Haliab triangle (Egypt/Sudan) static vector maps
4. Ability to synchronize more than one database used in the same country
5. Clarify the need to update the index file after new raster imagery are added
6. Select language
7. eL3 management module
8. photo management and display
9. automated updates
10. 4D !!!

## Annex 11. Participant evaluation

Participants completed 20 questions at the beginning of the workshop and the same questions at the end in order to measure progress. The results indicate that participants improved their knowledge during the workshop by 5-20%. The scores of the post-evaluation ranged from 50-80% compared to 45-65% in the pre-evaluation.

Questions answered correctly		Pre	Post
1	Dans la dernière mise à jour de Rv4, il est possible de faire des requêtes sur le criquet, la végétation et le sol <i>In the latest Rv4 update, it is possible to make queries for locusts, vegetation and soil</i>	2	5
2	L'espèce du Criquet, la date de début, et le nom du pays sont les paramètres essentiels pour faire une requête sur le comportement du Criquet <i>Locust species, start date, and country name are the critical parameters for making a locust behavior query</i>	0	0
3	Est-il possible de supprimer une couche d'un résultat d'une requête en décochant le bouton du tracé <i>It is possible to remove a query layer by unselecting the plot button</i>	6	7
4	La requête Tous affiche tous ce qu'il y a dans la base de données <i>The All Query shows everything in your database</i>	3	4
5	L'ID du PC principal (le PC utilisé pour l'insertion des données) dans Rv4 est "1" <i>The ID of the primary PC (the PC used for data entry) for Rv4 is "1"</i>	6	7
6	Rv4 vous permet d'insérer des données à partir de différents PCs <i>Rv4 allows you to enter data from different PCs</i>	1	2
7	Est-il possible de sauvegarder et restaurer la base de données <i>It is possible to backup and restore the database</i>	5	5
8	Rv4 vous demande d'effectuer la sauvegarde de la base de données chaque fois que vous quittez l'application <i>Rv4 always asks you to backup the data when you quit the application</i>	3	5
9	La base de données est toujours sauvegardée quand vous quittez l'application, même si vous n'avez pas effectué des changements <i>The database is always backed up when you quit the application even if no changes have been made</i>	1	3
10	Les nouvelles mises à jour sont actuellement distribuées à travers Google site <i>New updates are only distributed from the Google site</i>	7	7
11	Les photos prises pas eL3 sont transmises avec les données par satellite <i>Photos taken with eL3 are transmitted with the data by satellite</i>	7	7
12	Est-il possible d'envoyer les données à partir de la tablette avant la fin de chaque journée <i>It is necessary to send the data from the tablet before the end of each day</i>	5	6
13	Il est préférable de télécharger les données eL3 directement à partir de Geoflex que d'attendre qu'ils arrivent par email <i>It is better to download eL3 data directly from Geoflex than to wait for it to arrive by email</i>	6	6
14	Les données eL3 sont envoyées au compte gmail personnel <i>eL3 data is sent to personal gmail accounts</i>	5	5
15	Est-il nécessaire de connecter le DDE au PC quand vous préparez les package eL3D <i>It is necessary to connect the HDD to the PC when you prepare an eL3D package</i>	5	5
16	Vous ne pouvez sélectionner qu'un seul fichier des estimations pluviométrique quand vous préparez le package eL3D <i>You can only select one rainfall estimate file when preparing an eL3D package</i>	4	4
17	Le format correct pour nommer les images satellites est AAMMJJ.tiff <i>The correct format of naming a remote sensing image is YYMMDD.tiff</i>	2	3
18	Il n'est pas possible de mettre à jour le système d'exploitation de la tablette eLocust3 <i>It is not possible to update the Operating System of the eL3 tablet</i>	1	4
19	L'antenne d'eLocust3 ne peut pas être utilisée à l'intérieur du véhicule <i>The eL3 antenna cannot be used inside the vehicle</i>	6	7
20	Il n'est pas possible d'insérer les données manuellement dans Rv4 <i>It is not possible to enter data manually into Rv4</i>	6	7



## Annex 12. Workshop evaluation

Participants from Algeria, Chad, Mali, Mauritania, Morocco and Niger as well as the Mauritanian observers completed an evaluation of the workshop. They were satisfied with the organization, transport and food arrangements, trainers, presentations, material, technical content, and workshop facilities and length. Opinions varied concerning interpretation. There was also a suggestion to demonstrate eLocust3D outdoors and to present training material in a logical order starting with the field (eLocust3) and finishing with the national locust centre (RAMSESV4). While this is may be sensible, the focus on this year's workshop was RAMSESV4.

1 = very unsatisfied    2= unsatisfied    3 = no opinion    4 = satisfied    5 = very satisfied

Workshop Evaluation	1	2	3	4	5
Opening ceremony	2		2	2	5
Workshop organization		1		4	6
Workshop transport				5	6
Lunches - quality				3	8
Lunches - length				3	8
Coffee break - quality			2	3	5
Coffee break - length			1	2	7
Meeting room	1		3	2	5
Workshop projection			2	4	6
Workshop material (paper, pens, etc.)		1	1	3	5
Workshop programme content			1	4	5
Workshop length (number of days)			1	3	6
Working hours				6	4
Official dinner - quality		1	1	2	6
Official dinner - length	1			3	6
Trainers - quality	1			2	7
Trainers - helpfulness			1	3	6
Trainers - number			1	2	7
Rv4/eL3 tools provided to participants				5	5
Workshop discussion and conclusion			2	3	5
Workshop interpretation		1	3	3	3
Workshop pre- and post-evaluation			1	5	4

### Key

unsatisfied				
no opinion				
satisfied				
responses	1-2	3-4	5-6	7-8