FAO ADVANCED TOOLS AND TECHNOLOGIES
FOR LOCUST MONITORING AND EARLY WARNING

© FAO

MONITORING, providing **EARLY WARNING**, and acting promptly to control outbreaks of locust and other migratory pests are crucial to ensure that timely and appropriate action can be taken when an emergency arises.

The Desert Locust Information Service (DLIS) at FAO Headquarters continuously monitors global weather, ecological conditions and the locust situation.

Geo-referenced data in the field are collected and analysed on a daily basis. This analysis, carried out by the national control locust centres and by FAO DLIS, relies on a range of computer-based software tools which were developed by FAO and several partners for early warning purposes.

The handheld device called eLocust is a striking example of these tools. These components constitute the oldest migratory pest monitoring and early warning system in the world.

Some other new important tools are briefly described in the following sections.

FAO DLIS *features*

RECORDING AND TRANSMITTING DATA IN REAL TIME VIA SATELLITE FROM THE FIELD TO THE NATIONAL LOCUST CONTROL CENTRES THROUGH ELOCUST3

MANAGING AND ANALYSING FIELD DATA THROUGH RAMSESV4 TO ASSESS THE CURRENT LOCUST SITUATION AND PLAN OPERATIONS

TOOLS TO MONITOR
DESERT LOCUST

In 2014, FAO DLIS released the updated **eLocust3** system that allows national survey and control officers in locust-affected countries to record and transmit data from the field to their national locust centres in real time via satellite. This data is the basis of the preventive control strategy adopted by FAO and locust-affected countries. The data are used to assess the current situation, forecast its developments and warn locust-affected countries and the international donor community of locust invasions and plagues.
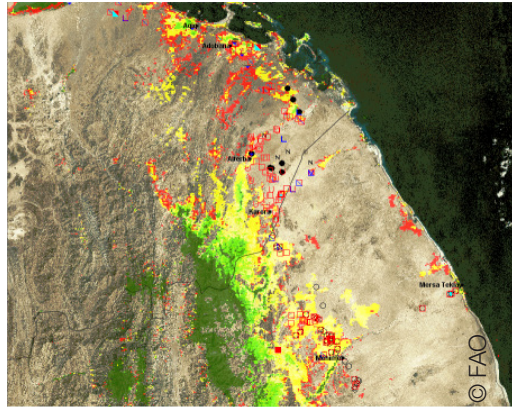
The eLocust3 system operates on Panasonic Toughpads, rugged Android tablets designed specifically for field use. The eLocust3 system is linked to two separate applications, Adobe Reader and eLocust3 3D. The first application is used for accessing a digital reference library in three languages. The second one is

© FAO

a remote sensing mapping application that guides users to specific areas where vegetation may be green. This innovative application has been internationally recognized and has won awards because it runs in the field without the need for an Internet connection. To date, FAO DLIS configured nearly 400 eLocust3 kits and dispatched them to nearly two-dozen Desert Locust frontline countries.

FAO has also provided extensive training through a series of workshops to designated Master Trainers who are responsible for training field officers in their own country.

FAO ADVANCED TOOLS AND TECHNOLOGIES FOR LOCUST MONITORING AND EARLY WARNING

› FAO DLIS *features*

PRODUCING A 10-DAY GREENNESS MAP THAT PROVIDES THE LOCATION OF GREEN VEGETATION AREAS AT 250M RESOLUTION

PROVIDING FORECASTS AND WARNING LOCUST-AFFECTED COUNTRIES AND THE INTERNATIONAL DONOR COMMUNITY

TRAINING NATIONAL LOCUST INFORMATION OFFICERS IN AFFECTED COUNTRIES IN THE USE OF NEW TOOLS

FAO DLIS

✉ eclo@fao.org
Food-Chain-Crisis@fao.org
Web site:
www.fao.org/ag/locusts
www.fao.org/food-chain-crisis
Twitter: @FAOLocust

Another notable tool is **RAMSESv4** (Reconnaissance and Management System of the Environment of *Schistocerca*). This is an open-source, platform-independent, license-free, geographic information system (GIS) and spatial database software developed for national Desert Locust information officers in locust-affected countries.

This custom software application is used in all frontline countries on a daily basis to manage and analyse remote sensing imagery and ecological, weather and locust data, including survey and control results, in order to assess the current locust situation and determine the need for survey and control operations. The first operational version of RAMSESv4 was released in January 2015 in English, French and Arabic. This was a basic version and further data management and analytical functionalities are being distributed in the form of regular updates according to user needs.

An additional tool in the existing arsenal used to identify potential areas where locusts may be present, increasing in number and perhaps require control is the greenness map. The **greenness map** is a dynamic product that provides the location of green vegetation areas at 250m resolution on a 10-day basis. This information is used to guide survey teams and make operational decisions. It is also incorporated into decadal and monthly locust bulletins prepared by national locust centres and FAO DLIS. FAO has made significant efforts in training national locust information officers in affected countries in the use and interpretation of the new greenness maps.

Finally, FAO DLIS uses **seasonal forecasts** from the World Climate Service (WCS) that predicts rainfall and

temperature six months in advance in all Desert Locust areas. The predictions are incorporated into the locust forecasts that appear in the monthly FAO Desert Locust Bulletin, updates and other advice provided by FAO DLIS to locust-affected countries and the international community.

WORKS IN PROGRESS

New tools for Desert Locust monitoring, forecasting and early warning are constantly being developed by FAO DLIS in collaboration with a variety of universities and other partner institutes.

For example, FAO DLIS is currently investigating how to adopt **drones** for locust early warning and preventive control to make surveys more efficient and control more safe. FAO DLIS is developing a 10-day **dynamic dryness map** that shows how long each area has been dry to help countries determine the best time to withdraw survey teams from the field at the end of a rainy season when locusts have finished breeding.

FAO DLIS is also developing a **soil moisture map** to assist field teams in identifying areas that are potentially favourable for locust breeding. These maps will be used in combination with existing rainfall estimate and greenness maps.

I5344E/1/01.16.