Food and Agriculture Organization of the United Nations

FCC-EMPRES INFORMATION SHEETS

a collection of FAO achievements

2015

FCC-EMPRES INFORMATION SHEETS

a collection of FAO achievements

2015

Food-Chain-Crisis@fao.org
Website: www.fao.org/food-chain-crisis

FCC-EMPRES INFORMATION SHEETS
a collection of FAO achievements
2015

PREVENTING, PREPARING and RESPONDING to transboundary, high impact animal and plant pests and diseases and food safety threats

INTRODUCTION

Animal diseases and **plant pests** are spreading across borders faster and further than ever. The globalization of food supply and the increased complexity of the food chain is increasing the risk of **unsafe food** reaching consumers in distant markets.

Recent severe outbreaks of **animal** and **aquatic diseases** and **plant and forestry pests** as well as **food safety and radiological emergencies** have affected human health, livelihoods, national economies and global markets. Innovative, multidisciplinary and holistic approaches are required to address these threats that emphasize prevention.

The **Food Chain Crisis - Emergency Prevention System (FCC-EMPRES)** is FAO's global tool to assist its Member States to face these challenges.

This booklet showcases a selection of **successful FCC-EMPRES programmes, tools,** and **services** illustrating prevention and early warning of food chain emergencies as well as preparedness and response, which have all led to **remarkable results** on the ground. The booklet is composed of a collection of monthly information sheets issued in **2015** that describe specific achievements.

These achievements show how FCC-EMPRES is assisting countries to **monitor transboundary threats** through effective information systems, how to track and report events, how to improve **early detection** of threats and **early warning**, and how to **better respond** to food chain emergencies.

The booklet also illustrates **laboratory techniques** leading to the reduction of these threats and the establishment of **technical epidemiological** and **laboratory networks** which enhance national capabilities. It highlights **environmentally sound pest control technologies** and describes the development of **risk modelling tools** of devastating diseases.

These FCC-EMPRES achievements are made possible through **partnerships** with national authorities, international and regional organizations, and research institutions. FCC-EMPRES aims to **protect people's livelihoods, health** and **food security** by enhancing their **resilience** through **better management of animal** and **plant diseases** and **pests** and **food safety threats**, that will ultimately reduce hunger, malnutrition and poverty.

Food-Chain-Crisis@fao.org
Website: www.fao.org/food-chain-crisis

FCC-EMPRES INFORMATION SHEETS

a collection of FAO achievements

2015

TABLE OF CONTENTS

FOOD CHAIN CRISIS MANAGEMENT FRAMEWORK: FAO'S APPROACH TO ADDRESS TRANSBOUNDARY THREATS AFFECTING FOOD SAFETY, ANIMAL AND PLANT HEALTH 6

FAO DESERT LOCUST INFORMATION SERVICE (DLIS) HELPS COUNTRIES TO CONTROL DESERT LOCUST 8

EMPRES-i: A POWERFUL GLOBAL TOOL FOR CONTROLLING MAJOR ANIMAL DISEASES 10

STRENGTHENING MADAGASCAR'S CAPACITIES FOR BETTER LOCUST MANAGEMENT 12

ENHANCING **FOOD SAFETY WARNING EARLY SYSTEMS** IN EAST AFRICA 14

CONTROLLING FRUIT FLY PEST BY RELEASING STERILE MALE INSECTS 16

Food-Chain-Crisis@fao.org

Website: www.fao.org/food-chain-crisis

FCC-EMPRES INFORMATION SHEETS

a collection of FAO achievements

2015

TABLE OF CONTENTS

BUILDING VETERINARY LABORATORY DIAGNOSTIC CAPACITY IN AFRICA:THE **VETLAB NETWORK** 18

IMPROVING NATIONAL AND REGIONAL **LOCUST MANAGEMENT** IN CAUCASUS AND CENTRAL ASIA 20

EMA-i: A MOBILE APP FOR TIMELY ANIMAL DISEASE FIELD REPORTING TO ENHANCE SURVEILLANCE 22

BASELINE ENVIRONMENTAL REQUIREMENTS HELP REDUCE PESTICIDE USE IN WEST AND NORTH-WEST AFRICA 24

STRENGTHENING REGIONAL **VETERINARY LABORATORY NETWORKS** IN AFRICA AND ASIA 26

FAO HELPS COUNTRIES PREVENT AND CONTROL **RIFT VALLEY FEVER** 28

Food-Chain-Crisis@fao.org

Website: www.fao.org/food-chain-crisis

FOOD CHAIN CRISIS MANAGEMENT FRAMEWORK:
FAO'S APPROACH TO ADDRESS TRANSBOUNDARY THREATS AFFECTING FOOD SAFETY, ANIMAL AND PLANT HEALTH

© FAO/FCC

OUTBREAKS OF TRANSBOUNDARY animal and plant pests and diseases, including forest pests and aquatic diseases, food safety and radiation events has been increasing over the past years, impacting people's access to quality food, and putting their livelihoods and health at risk.

To address this challenge, FAO established the **Food Chain Crisis Management Framework (FCC)**, an approach combining prevention, preparedness, and response to emergencies affecting the food chain and caused by transboundary animal and plant pests and diseases (including aquatic and forests pests and diseases), food safety and radiological threats.

FCC enables the utilization of the relevant technical and operational capacities and expertise of FAO under one governance to face transboundary, high impact threats to production, health and environment, and to support countries in the fight against these threats. This approach also contributes to one of FAO's key priorities "increasing the resilience of people's livelihoods to threats and crises".

FCC *functions*

ADDRESSES THREATS TO THE FOOD CHAIN OF TRANSBOUNDARY ANIMAL AND PLANT PEST AND DISEASES ORIGIN (INCLUDING AQUATIC AND FORESTS), AND FOOD SAFETY AND RADIOLOGICAL THREATS

INTEGRATES PREVENTION, EARLY WARNING, PREPAREDNESS AND RESPONSE TO AN EMERGENCY AT ALL STAGES OF THE FOOD CHAIN

FCC AT A GLANCE

The FCC is FAO's primary tool for action in support of countries in the global governance of threats to the human food chain at all stages from production to consumption. Two Committees in FAO, the Policy Advisory Committee and Oversight Committee, have the role of governance of these threats and crises. FCC strengthens the capacities of countries to prevent food chain crises. This includes support to adequate surveillance of threats, early warning, preventive and risk mitigating practices, better preparedness and response, and the adoption of adequate policies.

FCC comprises three areas of action dealing comprehensively with the whole cycle of a food chain crisis: coordination and intelligence, prevention and early warning, and response.

Coordination and intelligence supports FCC governance, multi-threat forecasting, information sharing, communication, and advocacy.

Emergency prevention and early warning functions are provided by the three specialized units of EMPRES for animal diseases (including aquatic diseases), plant pests (including forest pests), and food safety threats. They all promote approaches for prevention, early warning, rapid detection and timely response.

EMPRES Animal Health focuses on transboundary animal diseases (TADs), including zoonoses such as African swine fever, Avian influenza, Ebola, Foot-and-mouth disease, Middle East Respiratory Syndrome-coronavirus, *Peste des Petit Ruminants*, Rift Valley fever, and others.

FOOD CHAIN CRISIS MANAGEMENT FRAMEWORK:

FAO'S APPROACH TO ADDRESS TRANSBOUNDARY THREATS AFFECTING FOOD SAFETY, ANIMAL AND PLANT HEALTH

PREVENTION
SAVES **LIVES**
SAVES **LIVELIHOODS**
SAVES **MONEY**

FCC *functions*

GOVERNS THREATS OF TRANSBOUNDARY NATURE THROUGH THE FCC POLICY ADVISORY COMMITTEE AND FCC OVERSIGHT COMMITTEE IN FAO

IMPROVES SURVEILLANCE, RISK ANALYSIS, EARLY DETECTION, EARLY WARNING, AND COMMUNICATION

SUPPORTS THREATS FORECASTING THROUGH THE MULTI-THREAT QUARTERLY EARLY WARNING BULLETIN

SHOWCASES FCC-EMPRES SUCCESSFUL ACTIVITIES THROUGH MONTHLY FCC INFORMATION SHEETS AND SUPPORTS INFORMATION SHARING THROUGH FCC WEBSITE

FAO FCC

Food-Chain-Crisis@fao.org
Website:
www.fao.org/food-chain-crisis

EMPRES Plant Protection focuses on Desert Locust, and other locusts in the Caucasus and Central Asia and Africa, other transboundary insects such as armyworms and fruit flies, and crop diseases such as rust diseases of wheat and coffee, wilt diseases of banana and cassava, and maize diseases.

EMPRES Food Safety focuses on foodborne pathogens (e.g. salmonella and *Enterohaemorrhagic Escherichia coli*) and chemical contamination (e.g. mycotoxins, marine biotoxins).

Response is supported by a specialized global FCC response unit supporting a timely and adequate country and regional response using EMPRES technical capacities.

FCC-EMPRES ACHIEVEMENTS

FCC-EMPRES enhanced capacities of governments and stakeholders in prevention of food chain crises in many countries. A selection of achievements is shown here-below.

Threat monitoring systems at national, regional and global levels have been supported through successful information systems such as:

- the Desert Locust Information Service operating a global early warning system and providing forecasts and analysis for 50 countries
- the FAO Global Early Warning System (GLEWS) regularly monitoring the animal disease situation

Other monitoring activities:

- Forecasting of threats to animal and plant health and food safety through the quarterly multi- threat early warning bulletin, and other Early Warning Bulletins (Desert Locust Bulletin; Global Animal Disease Intelligence Report, and others).
- Rapid event reporting in a number of countries through development and implementation of mobile devices and touchpad applications for field threat reporting (EMA-*i*; e-Locust).
- Risk modelling tools to monitor animal diseases and zoonoses such as Rift Valley fever.

Capacity Development at regional and national levels has been enhanced through the development of manuals, guidelines, tools and regular delivery of trainings such as:

- Regional training on locust monitoring and information management for Caucasian countries and Desert Locust affected countries
- Regional and national trainings to improve veterinary epidemiology capacity, animal diseases surveillance and risk analysis of TADs
- A new training package and handbook on early warning capacity building for food safety being rolled-out for regions and countries
- A training on risk of introduction or transfer of live aquatic animals.

Knowledge, skills and information sharing has been supported for the enhancement of preparedness, early warning, response and monitoring capacities of countries by setting up and reinforcing regional networks and platforms such as the three Commissions for Desert Locust, the epidemiology and veterinary laboratories networks in Asia and Africa, and many other networks.

Special Programmes are being implemented such as the Avian Influenza multi-year programme which is supporting countries since 2004 in designing and implementing emergency national control strategies. Also, the locust control campaign in Madagascar has successfully halted the plague through the "Three-year emergency programme".

FAO DESERT LOCUST INFORMATION SERVICE (DLIS) HELPS COUNTRIES TO CONTROL DESERT LOCUST


© Field Sudan

THE DESERT LOCUST *(Schistocerca gregaria)* is considered the most dangerous of all migratory pest species in the world. It threatens people's livelihoods, food security, the environment and economic development. It can easily affect more than 65 of the world's poorest countries. It can reproduce rapidly, migrate long distances and devastate crops and pasture. The Desert Locust has the ability to change its behaviour and appearance, under particular environmental conditions (unusually heavy rains), and transform itself from a harmless individual to part of a collective mass of insects that form a swarm, which can cross continents and seas, and quickly destroy a farmer's field and his entire livelihood in a single morning.

A Desert Locust adult can consume roughly its own weight in fresh food per day that is about two grams every day. A 1 km² size swarm contains about 40 million locusts, which eat the same amount of food in one day as about 35,000 people, 20 camels or 6 elephants.

During quiet periods (known as recessions), solitarious locusts are found in low numbers scattered throughout the deserts of North Africa, the Middle East and Southwest Asia. This arid area is some 16 million km² in size, and includes about 30 countries. It is called the recession area. During a plague, swarms can also invade other countries and a greater amount of land equivalent to about 20% of Earth's land can be affected (invasion area).

DLIS*features*

ACTING AS A FOCAL POINT AND COORDINATOR OF A GLOBAL LOCUST INFORMATION NETWORK

MONITORING WEATHER, ECOLOGICAL CONDITIONS AND LOCUST INFESTATIONS IN AFRICA, NEAR EAST AND ASIA ON 24/7 BASIS

USING GIS TO ANALYSE THE CURRENT LOCUST CONDITION IN EACH COUNTRY

DLIS: FROM MAP READING TO GPS

The first records of Desert Locust plagues date from Pharonic Egypt and have been documented throughout history. During the first 60 years in the 20th century, there were five major plagues, lasting up to 14 years. Since 1963, there has been a dramatic decline in the frequency and duration of plagues, and now plagues occur perhaps only once every 10 to 15 years and rarely last more than three years.

Today, locust-affected countries' ability to detect, respond to and contain Desert Locust outbreaks has improved as a result of advances in technologies related to geo-positioning, spatial analysis, remote sensing and early warning.


© FAO

The reduction in the frequency, severity and duration of Desert Locust plagues and their associated food losses has been possible thanks to the adoption of a preventive control strategy relying on early warning and early reaction by locust-affected countries and FAO.

FAO DESERT LOCUST INFORMATION SERVICE (DLIS) HELPS COUNTRIES TO CONTROL DESERT LOCUST

DLIS *features*

PRODUCING INFORMATION ON A DAILY BASIS FOR ABOUT 30 COUNTRIES IN THE AFFECTED REGION

WORKING WITH NATIONAL LOCUST INFORMATION OFFICERS

PRODUCING MONTHLY SITUATION BULLETINS AND SIX-WEEK FORECASTS FOR EACH COUNTRY

SENDING WARNINGS AND ALERTS ABOUT POTENTIAL INVASIONS

FAO/DLIS

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

FAO DESERT LOCUST INFORMATION SERVICE

FAO Desert Locust Information Service (FAO DLIS) is the key monitoring and early warning tool in preventing Desert Locust plagues from devastating farmers' fields in Africa and Asia.

Since 1978, FAO DLIS operates an early warning system that monitors weather, ecological conditions, and locust infestations in the potentially affected area on a daily basis.
After 75 years of systematic Desert Locust monitoring and collaboration between locust-affected countries and DLIS, today's FAO DLIS has revolutionized the process.

In the past three decades, the system has shifted from camels to four-wheel drive vehicles, from telex to email, from map reading to GPS, from narratives to handheld data loggers, from manual plotting to GIS, and from weather station reports to satellite-based rainfall estimates and greenness maps.

GPS, RAMSES (Reconnaissance and Management System of the Environment of Schistocerca) and SWARMS (Schistocerca Warning and Management System) GIS, the Internet and eLocust3 (Android-based tablet) have replaced the traditional tools of paper, coloured pencils, maps and telephone.

PEOPLE AT THE CENTRE OF DLIS

DLIS manages an internet-based group of some 25 national locust information officers, a simple mechanism to keep national officers in contact with each other and share information every day. The primary and most important source of information are survey and control


© FAO

reports from affected countries. Each key country has a Locust Information Officer who is responsible for collating, analysing and transmitting this data to DLIS by email. DLIS, in turn, analyses the data and keeps countries informed of the current situation and expected developments.

DLIS issues a monthly bulletin in three languages (English, French and Arabic) to locust-affected countries, the international donor community, researchers, institutes, and other interested parties that summarizes the current situation and provides a six-week forecast on a per-country basis. During periods of increased locust activity, the bulletins are supplemented by updates, warnings and alerts.

DLIS spends considerable efforts to strengthen the capacities of nationally-designated locust information officers. New tools are developed to facilitate the collection, transmission, management and analysis of data. Annual workshops are held for English and French speaking information officers as a forum for informal discussions on the use, problem-solving and improvement of various tools (eLocust3, eLocust2Mapper, RAMSES, remote sensing, social media) used by the officers.

This global early warning system, based on new advances in technologies, can be a model for other migratory pest early warning systems throughout the world.

EMPRES-*i*: A POWERFUL GLOBAL TOOL FOR CONTROLLING MAJOR ANIMAL DISEASES


© FAO/ /Giuseppe Bizzarri

THE INCREASE IN EMERGENCE of new pathogens and spread of transboundary animal diseases (TADs) in countries around the world poses a serious and continuing menace to livestock production, food security and the entire food chain.

TADs can have significant negative impact on the economy, trade, food security and food safety of countries. They cause high rates of death and disease in animals, and have in many cases public health consequences, knowing that approximately 70 percent of diseases affecting humans have animal origins. Prevention and control of TADs require timely and reliable disease information.

Timely and reliable disease information enhances early warning and response to TADs and emergent zoonoses (animal diseases that can be transmitted to humans). It supports prevention, improved management and progressive approach to control.

To address the challenge, FAO's Emergency Prevention System (EMPRES) designed and developed a web-based secure information system to support country level veterinary services by facilitating regional and global disease information: EMPRES Global Animal Disease Information System (EMPRES-*i*).

This application contributes to the joint FAO/OIE/WHO Global Early Warning and Response System (GLEWS) for major transboundary animal diseases, including zoonoses.

EMPRES-*i* *features*

DISEASE EVENT DATABASE ENABLING USERS TO EASILY ACCESS AND RETRIEVE INFORMATION ON WILD OR DOMESTIC ANIMAL DISEASE OUTBREAKS/ CASES WORLDWIDE

DISEASE MAPPING/ GRAPHING TOOLS ENABLING USERS TO SELECT OUTBREAKS/ CASES FROM THE DATABASE AND REPRESENT THEM GRAPHICALLY AS CHARTS OR ON A MAP

LIBRARY PROVIDING ACCESS TO FAO TECHNICAL PUBLICATIONS

EMPRES-*i*: A RESPONSE TO A GLOBAL CONCERN

EMPRES-*i* was first released in 2004 with the worldwide flare-up of H5N1 highly pathogenic avian influenza (HPAI) and made publicly available in 2009. It was created in response to the growing demand from users for global animal health information systems, using a system approach to disease information gathering and sharing.

The platform consolidates disease events worldwide using information that EMPRES receives from a wide range of sources. Partners and FAO networks share and feed EMPRES-*i* with disease information on a regular basis.
For validation and verification, EMPRES uses not only official, but also unofficial sources of information. The verification process of disease events and unconfirmed reports is done also in coordination with OIE and WHO, under the GLEWS.

EMPRES-*i* collects information on outbreaks, vaccination and surveillance efforts and supports two main global strategies for control and eradication of two major diseases: Foot-and-Mouth Disease and Peste des Petits Ruminants (PPR).

EMPRES-*i* hosts data originated from active surveillance implemented through several projects executed by FAO. This data complements countries' efforts to know exactly the situation of animal disease pathogens and its distribution in livestock production systems or along the food chain.

EMPRES-*i*: A POWERFUL GLOBAL TOOL FOR CONTROLLING MAJOR ANIMAL DISEASES

Source: http://empres-i.fao.org

EMPRES-*i* features

MY EMPRES-*i* ENABLING USERS TO LOG IN AND ACCESS A PERSONALIZED PAGE DISPLAYING DISEASE EVENTS OF INTEREST AND SELECTING FROM THE DIRECTORY OR LABORATORY SECTIONS

DIRECTORY PROVIDING CONTACT DETAILS OF THE CHIEF VETERINARY OFFICERS (CVOS) FOR EACH COUNTRY

LABORATORIES PROVIDING CONTACT INFORMATION OF FAO/OIE REFERENCE LABORATORIES AND REGIONAL LABORATORY NETWORKS

FAO EMPRES-*i*

Food-Chain-Crisis@fao.org
empres-i@fao.org
Web sites:
www.fao.org/food-chain-crisis
http://empres-i.fao.org

WHAT DOES EMPRES-*i* DO?

EMPRES-*i* speeds up national, regional and global disease information sharing; supports the risk assessment process for existing and emergent animal diseases; facilitates epidemiological analysis on specific disease events at regional and global levels and planning surveillance.
EMPRES-*i* generates and disseminates early warning messages on global animal disease distribution, disease risks and current threats at the national, regional and global level for priority animal diseases.
Data sharing and interoperability is crucial to integrate data and information for analysis. EMPRES-*i* provides access to data integrated from other information systems in FAO and external databases:

- livestock population/density (GLiPHA/FAO)
- environmental (Geonetwork/FAO)
- genetic information (Openflu database)

Through specific official agreements with key partners, FAO is further linking and integrating other systems, including the FMD BioPortal, the World Reference Laboratory for Foot-and-Mouth Disease, the Swiss Institute of Bioinformatics (SIB) and FAO Reference Centres, into EMPRES-*i*.
EMPRES-*i* also supplies analytical and automated tools to better inform risk analysis processes and early warning activities including descriptive analysis (graphics and advanced mapping component).

KEY FIGURES AND ADVANCES

EMPRES-*i* is today a global reference database for animal diseases including zoonosis. EMPRES-*i* stores over 60 000 outbreak records of which more than 20 000 records of animal influenza from 2004 to 2014. It hosts information on disease monitoring and tracking for early warning activities. To date, over 4 000 events have been tracked.
The system has a historical database on almost 950 records on rinderpest outbreak information (1827-2003). The global eradication of rinderpest was officially declared in June 2011; still EMPRES-*i* monitors and verifies suspected syndromic cases compatible with rinderpest cases.
EMPRES-*i* hosts and maintains a database on Rift Valley fever outbreaks, including animal and human cases, developed in collaboration with Oxford University.
The system is under continuous development and new features may be added in the future.
In 2012, EMPRES-*i* developed a genetic module to link epidemiological and genetic influenza information and enable combined analysis. This tool links Avian Influenza events and outbreaks for the following subtypes: H5N1, H5N8, H5N6, H1N1, H9N2, H7N9, H7N2, H10N8. This module will be further developed to host genetic information on disease pathogens such as Foot and Mouth disease, Rift Valley fever and African Swine fever.
In 2013, a new Android mobile application - Event Mobile Application (EMA-i) - was developed and implemented in 10 Ugandan districts in collaboration with the National Veterinary Services and the Ministry of Agriculture. EMA-i allows veterinarians to enter key epidemiological data into a global database directly from the field using their smartphones.
EMPRES-*i* is undoubtedly proving useful in facing the big challenge of the emergence of new diseases and enhancing rapid disease reporting and early warning activities of countries and regions.

STRENGTHENING MADAGASCAR'S CAPACITIES
FOR BETTER LOCUST MANAGEMENT


© FAO / A. Monard

AN ONGOING LOCUST PLAGUE is threatening the livelihoods and food security of 13 million people in Madagascar.

The current Malagasy Migratory Locust plague started in April 2012, following a two-year upsurge that was not successfully addressed because of insufficient financial resources.

The locust emergency began in a context where food insecurity and malnutrition rates were high. In fact, more than three-quarters of Malagasy families rely on agriculture for their living, but frequent natural disasters – drought, floods, cyclones, locust crises – push families into poverty and hunger.

Rice and other cereal crops are at risk of considerable damage due to the locust plague, which can have a wider impact on domestic supply and cereal prices.

To address this major issue, the Ministry of Agriculture of Madagascar and FAO developed a "Three-year emergency Programme in response to the locust plague" comprising three successive locust campaigns (2013–2016).

The Programme aims at safeguarding the food security of the most vulnerable rural populations by halting the plague and allowing a return to recession.

KEY FACTS
major locust emergency

LOCUST PLAGUE SINCE APRIL 2012

LOCUST INVASION AREA: ALMOST THE WHOLE ISLAND

LIVELIHOODS AND FOOD AND NUTRITION SECURITY OF 13 MILLION PEOPLE THREATENED

STRATEGY TO CONTROL
THE MALAGASY MIGRATORY LOCUST PLAGUE

FAO coordinates and implements the locust campaigns, which sought to identify hotspots of locust populations; permanently monitors the dynamics of the locust populations to produce the most accurate forecasts; and carries out targeted control measures in accordance with good agricultural practices and respecting of human health and the environment.

The strategy adopted includes large-scale aerial survey and control operations and the use of conventional chemical pesticides for full cover treatments against adults and late instar hopper bands, insect growth regulators for barrier treatments to rapidly protect large areas infested by hopper bands and biopesticides in locations near or within environmentally sensitive areas. Those pesticides are mostly sprayed by air due to the huge infested areas and their remote locations.


© FAO / A. Monard

STRENGTHENING MADAGASCAR'S CAPACITIES FOR BETTER LOCUST MANAGEMENT

KEY FACTS
major locust emergency

THREE CONSECUTIVE LOCUST CONTROL CAMPAIGNS ARE NEEDED TO REACH A LOCUST RECESSION SITUATION

MORE THAN 1.4 MILLION HECTARES TREATED FROM OCTOBER 2013 TO FEBRUARY 2015

HUMAN HEALTH AND ENVIRONMENTAL PLAN IMPLEMENTED

LOCUST WATCH UNIT IN MADAGASCAR ESTABLISHED IN FEBRUARY 2013 AND TECHNICALLY SUPPORTED

US$10 MILLION STILL REQUIRED FOR THE SECOND AND THIRD CAMPAIGNS IN ORDER TO RETURN TO A LOCUST RECESSION

MADAGASCAR LOCUST CRISIS

Food-Chain-Crisis@fao.org
Websites:
www.fao.org/food-chain-crisis
www.fao.org/emergencies/crisis/madagascar-locust/en/
Twitter @FAOLocust

FIRST CAMPAIGN'S RESULTS

The first locust campaign (September 2013-August 2014) was successfully implemented: the locust plague was halted while crops and pastures were protected, thus preventing the country from a serious food crisis. The locust populations were controlled on an area exceeding 1.2 million hectares, without any incident affecting human health or the environment and without significant damage to the major rice baskets.
These results were obtained thanks to the implementation of large-scale aerial survey and control operations, which were executed from three aerial bases, redeployed as needed in accordance with the evolving locust situation.
Without these treatments, crops would have been destroyed by locusts.
In addition, the 2013/14 campaign significantly contributed to the building up of national capacities.

PREVENTING A LOCUST EMERGENCY IS MUCH BETTER THAN CONTROLLING A PLAGUE

The current fight against the locust plague in Madagascar shows again how managing a major locust emergency is expensive at all levels and very complex.
Implementing a locust preventive control strategy is more economical and potentially less damaging to public health and the environment as compared to large-scale control operations.
In order to prevent future emergencies, a locust preventive control strategy will have to be implemented in Madagascar upon return to a recession situation.
Such an approach is the only way to adequately and sustainably address locust issues. The locust preventive control strategy consists of appropriate monitoring of locust populations in their traditional habitats to allow early warning and early reaction with well-targeted control operations, using updated techniques, while reducing risks for human health and the environment.
In view of future implementation of the


© FAO / A. Monard

preventive strategy, an institutional and technical study on locust management in Madagascar was prepared. The study identified the main constraints encountered by the National Anti-Locust Center for effective prevention and formulated recommendations to that end.
Moreover, a number of actions have been taken during the implementation of the Three-year Programme to strengthen national capacities in the medium/long-term.
First, the Progamme has strengthened human capacities in data collection and analysis and information management, by setting up the Locust Watch Unit in Madagascar composed of young Malagasy professionals. The Locust Watch Unit is currently able to document the weather and ecological conditions, the locust developments and the survey and control operations; monitor the use of the main inputs such as pesticides and flying hours; provide forecasts on locust development and produce thematic maps using a customized Geographical Information System and related updated databases.
Second, a number of training sessions on survey, control operations, and field base management have been delivered. On-the-job training was also provided during field operations.
Finally, the Human Health and Environmental Management Plan was developed, to be implemented during the emergency programme and beyond.
Prevention and early action are key to properly managing locusts in Madagascar.

ENHANCING **FOOD SAFETY EARLY WARNING SYSTEMS** IN EAST AFRICA

KEY*facts*

FOOD CONTAMINATED WITH HARMFUL BACTERIA, VIRUSES, PARASITES, CHEMICALS OR POISONOUS METALS, CAN CAUSE AROUND 200 DIFFERENT DISEASES

FOODBORNE PATHOGENS (E.G. *SALMONELLA*, *CAMPYLOBACTER*, AND *ENTEROHAEMORRHAGIC ESCHERICHIA COLI*) CAN CAUSE SEVERE DIARRHOEA

CHEMICAL CONTAMINATION (E.G. MYCOTOXINS, MARINE BIOTOXINS, AND TOXINS) CAN CAUSE SEVERE POISONING AND LONG-TERM DISEASES, SUCH AS CANCER

UNSAFE FOOD causes considerable morbidity and mortality. More than 200 diseases are spread through food contaminated with bacteria, viruses, parasites, natural toxins, pesticides, and chemical or radioactive substances. Exposure to these contaminants can lead to infectious diseases, acute toxicities, cancers and developmental defects.

Millions of people fall ill every year and many die as a result of eating unsafe food or drinking contaminated water. For example, diarrheal diseases alone kill an estimated 1.5 million children annually (WHO, 2015. 10 facts on food safety).

FAO has estimated that at least 25 percent of the world's food crops are contaminated with mycotoxins, which are fungal toxins in crops (FAO, 2002). There is strong evidence of a link between exposure to aflatoxins - a foodborne mycotoxin - and liver cancer (WHO, 2003).

Food safety hazards can also spread through distribution of unsafely produced, processed or handled food and result in food chain incidents. Such events can easily occur in two or more countries and sometimes result in regional or global food safety emergencies.

Food safety incidents, beyond direct public health consequences, can have significant food security and economic impacts both in developed and developing countries. This is due to agri-food trade disruptions, losses of food and incomes, and health care and productivity costs.

It is crucial to detect and prevent spread of food safety hazards early. This is why FAO is supporting East African countries to strengthen their food safety early warning systems.

©FAO/ANDRIJANA RAJIC, © GARY VROEGINDEWEY

EARLY WARNING SYSTEMS (EW) ARE ESSENTIAL ELEMENTS OF FOOD CONTROL SYSTEM(S)

A NEW TRAINING PACKAGE ON EARLY WARNING CAPACITY BUILDING FOR FOOD SAFETY

An early warning system is an integral element of a food control system, working together with other elements such as food inspection, laboratory networks, surveillance programmes and risk assessment capacities.

ENHANCING **FOOD SAFETY EARLY WARNING SYSTEMS** IN EAST AFRICA

EMPRES FOOD SAFETY *features*

APPLYING A NEW INTELLIGENCE TOOL "TO MAP OUT" COUNTRIES' AND REGIONS' GAPS AND NEEDS IN THEIR EARLY WARNING SYSTEMS FOR FOOD SAFETY

PROMOTING USE OF HORIZON-SCANNING TOOLS THAT GATHER DATA FROM DIVERSE SOURCES IN COUNTRIES AND REGIONS TO SUPPORT THEIR MEDIUM- TO LONG-TERM THINKING ABOUT FOOD SAFETY ISSUES

A SIMPLE CHECKLIST FOR ASSESSING AND DESIGNING EFFECTIVE AND EFFICIENT EARLY WARNING SYSTEMS FOR FOOD SAFETY

FAO EMPRES Food Safety

Food-Chain-Crisis@fao.org
Website:
www.fao.org/food-chain-crisis

To strengthen food safety early warning systems, FAO EMPRES Food Safety is:

- developing surveillance and intelligence tools for prevention of food safety incidents;
- guiding and facilitating development of early warning systems in food safety, including rapid alert and communication networks;
- supporting food safety emergency prevention, preparedness and response capacity building;
- promoting inter-sectorial and trans-disciplinary partnerships and collaborations among key food safety stakeholders at all levels of the food chain, using the principles of a One Health approach.

A new training package is being developed through which the above objectives can be accomplished. The training package includes a new, comprehensive handbook, which explains how to identify, assess and prevent future threats to the food chain before they become emergencies and cause adverse events and illness.

The handbook illustrates key early warning concepts using:

- a new tool for identifying gaps and needs in existing early warning systems for food safety;
- foresight techniques that can help identify food safety knowledge and research gaps and opportunities, to inform future surveillance and monitoring practices, or to assess the vulnerability of a food system;
- a horizon-scanning tool, which uses a structured approach of gathering data from diverse sources to provide organizations, countries or regions with intelligence to support medium- to long-term thinking (5-10-20 years ahead) about food safety issues.

The handbook includes a checklist that guides countries and regions through an evaluation of their needs, where to find support, planning an early warning system as part of overall food control system, and ensuring sustainability.

©FAO/ JOSHUA KIMUTAI

East African Workshop in Action: Participants developed six action-plan proposals for improving early warning capacity in food safety at the country (Ethiopia, Kenya, Rawanda, Tanzania and Uganda) and regional (East Africa) levels.

The training package can be tailored to the specific needs and contexts of different countries and regions worldwide.

FAO'S WORK IN AFRICA

Two recent workshops, in Kigali (2012) and Addis Ababa (2013), identified many food safety challenges in Africa. Two initiatives were planned: 1) the creation of an African Union (AU) Food Safety Authority and 2) the development of an AU-Rapid Alert System for Feed and Food Safety.

Through a regional collaboration with the African Union-Inter-African Bureau for Animal Resources (AU-IBAR), FAO EMPRES Food Safety held a Regional Workshop on Enhancing East African's Early Warning Systems for Food Safety (Nairobi, 2014) to help East Africa develop proposals for building or improving existing food safety early warning systems.

All actions on early warning systems are done in partnership with regional bodies such as the AU-IBAR in Africa, and international partners and collaborators, and globally through WHO/FAO INFOSAN network.

CONTROLLING FRUIT FLY PEST
BY RELEASING STERILE MALE INSECTS


© IAEA

The larvae of **FRUIT FLY PESTS** damage plant tissues before their harvest. Fruit flies belong to the Tephritidae family.

Several species of Tephritidae have a greater impact on global agricultural horticulture trade than almost any other pest; their introduction poses a major risk to horticulture in affected countries.

Socioeconomic consequences are so severe that countries free of key fruit fly pests (such as Chile, Japan, New Zealand and USA) prohibit the import of fresh produce from countries where these pests are endemic or have been introduced.

Unfortunately, the spread of fruit flies does not stop at country borders. Globalization of trade favours the dispersal of these pests to countries and regions free of the pest. Furthermore, introduced pests are increasingly surviving in previously inhospitable areas due to a warming climate.

The Joint FAO/IAEA[2] Division of Nuclear Techniques in Food and Agriculture helps Member States control invasive pest fruit flies by providing technical and scientific support and transferring nuclear and related technologies to reduce losses in fruit and vegetable production, minimize insecticide use, preserve biological diversity. This results in facilitation of international trade, increase farmers' income and enhance food security.

KEY*facts: Fruit Fly Pest*

FRUIT FLIES HAVE A GREATER IMPACT ON GLOBAL AGRICULTURAL FRUIT TRADE THAN ALMOST ANY OTHER PEST

ABOUT 70 SPECIES OF TEPHRITID FRUIT FLIES ARE KEY PESTS OF FRUITS AND VEGETABLES, CAUSING HIGH LOSSES EVERY YEAR[1]

THE MEDITERRANEAN FRUIT FLY (*CERATITIS CAPITATA*) ATTACKS OVER 250 SPECIES OF FRUITS AND VEGETABLES

BIRTH CONTROL FOR INSECTS: THE STERILE INSECT TECHNIQUE

Fruit flies attack many important fruit crops, including citrus, mango, apples, peaches, apricots as well as some vegetables (especially cucurbits), seed crops and also many wild plants.

The economic implications are not only reduced production and increased control costs, but also loss of export markets and/or the cost of establishing and maintaining phytosanitary measures.

One efficient and cost-effective pest control technology is the Sterile Insect Technique (SIT). The SIT is a biologically-based pest control method in use since the late 1950's that, unlike chemical control tactics, is friendly to the environment and does not pose any health concerns.


© IAEA

1 J. Appl. Entomol. 137 (Suppl. 1) (2013), © 2013 Blackwell Verlag GmbH

2 International Atomic Energy Agency

CONTROLLING FRUIT FLY **PEST** BY RELEASING STERILE MALE INSECTS

› STERILE INSECT TECHNIQUE *features*

STERILE INSECT TECHINIQUE INVOLVES THE MASS-REARING AND SUBSEQUENT STERILIZATION OF LARGE NUMBERS OF MALE INSECTS OF THE TARGET PEST

STERILE INSECTS ARE NOT SELF-REPLICATING AND THEREFORE CANNOT BECOME ESTABLISHED IN THE ENVIRONMENT

STERILE INSECT TECHNIQUE HAS BEEN APPLIED TO ERADICATE FRUIT FLY PEST POPULATIONS FROM WHOLE AREAS OR COUNTRIES

FAO/IAEA Programme

Food-Chain-Crisis@fao.org
NAFA.Contact-Point@iaea.org
Websites:
www.fao.org/food-chain-crisis
http://www-naweb.iaea.org/nafa/index.html

The SIT involves the mass-rearing and subsequent sterilization of large numbers of male insects of the target pest. The sterilized male insects are then released repeatedly over the infested areas, where they mate with the fertile wild females that consequently produce no offspring. The wild pest population can be effectively suppressed if the sterile males outnumber the wild males.
In special situations of isolation, and if the pest population is treated systematically on an area-wide basis with sterile males, complete eradication can be achieved as sterile males will invariably seek out and mate with any remaining females of the target pest population, a feat that is difficult to achieve using insecticides.

Thus, the SIT is also suited to help eliminate outbreaks of invasive, newly introduced pest populations before they spread and become fully established.

In addition, the SIT is species-specific. As such, it has no negative impact on natural enemies and pollinators, meeting the increasing public demand for safe and environmentally friendly pest control.

CONTROL STRATEGIES AND SIT APPLICATIONS

The SIT is effectively used as part of an integrated approach and in emergency situations is also effective to eliminate outbreaks of invasive pests.

With assistance of the Joint FAO/IAEA Programme the SIT has been used successfully to suppress (Argentina, Israel, South Africa, Spain), contain (Australia, Guatemala), prevent establishment (California and Florida, USA), or even eradicate (Argentina, Chile, Peru, Mexico) the Mediterranean fruit fly

from entire areas or countries.
In addition, it has been applied to prevent incursions of the Mexican fruit fly (*Anastrepha ludens*) into Texas, USA, and to eradicate the Mexican fruit fly and the West Indian fruit fly (*A. obliqua*) from northern Mexico. The SIT is also utilized against the South American fruit fly (*A. fraterculus*) in South America.

Thanks to the application of the SIT component in area-wide integrated pest management programmes, the melon fly (*Bactrocera cucurbitae*) was eradicated from the Okinawa archipelago in Japan. In Thailand, the Oriental fruit fly (*B. dorsalis*) and the Guava fruit fly (*B. correcta*), and in the Philippines the Oriental fruit fly, are being suppressed in pilot areas to reduce losses in mango. In the Mediterranean region, the interest in the use of SIT against olive fruit fly (*B. oleae*) is growing. The recent introductions and spread of several *Bactrocera* species into Africa and other regions serve as a warning about the invasiveness of these exotic species.
At present, the Insect Pest Control Subprogramme of the Joint FAO/IAEA Programme is supporting regional (Africa, Asia and Europe) and national field projects for controlling fruit flies. Research and development, training, and expert services and equipment are provided.
The SIT is proving to be one of the most successful and environment-friendly insect pest control methods ever developed.

BUILDING VETERINARY LABORATORY DIAGNOSTIC CAPACITY IN AFRICA: **THE VETLAB NETWORK**

TRANSBOUNDARY ANIMAL DISEASES and those animal diseases that affect human health have a strong impact on public health, community livelihoods, and trade.

They also pose a major challenge to the value chain of food of animal origin, causing serious production losses and food safety problems.

Additionally, the globalization of trade with increased movement of people facilitates the rapid spread of infectious diseases across countries and between continents.

The early and rapid diagnosis and progressive control and eventually eradication of these diseases require concerted interdisciplinary actions at national and international levels.

In this context, the veterinary diagnostic laboratory network (VETLAB Network) offers a unique opportunity for countries facing similar challenges to work together and better coordinate activities, including training, information dissemination, expertise and experience exchange, and the design of common disease control strategies.

The VETLAB network carries out research and development, training and activities in support of member countries.

VETLAB NETWORK *features*

32 AFRICAN AND 17 ASIAN NATIONAL ANIMAL DISEASE DIAGNOSTIC LABORATORIES SHARING EXPERIENCES AND INFORMATION

SUPPORTING HARMONIZATION OF REGIONAL APPROACHES FOR EARLY, RAPID AND CONFIRMATORY DETECTION OF TRANSBOUNDARY ANIMAL AND ZOONOTIC DISEASES

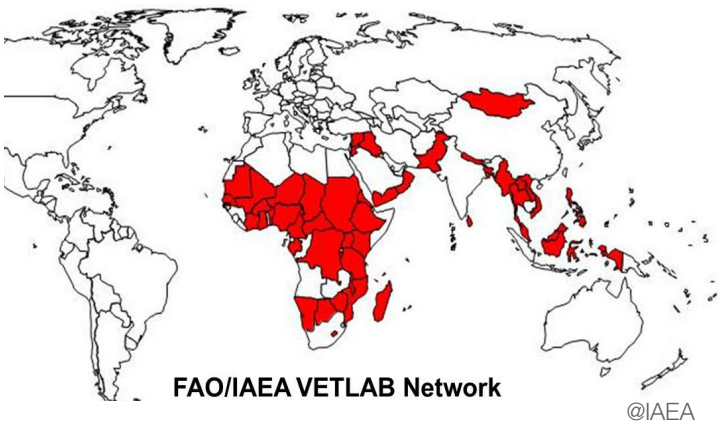
WHAT VETLAB NETWORK DOES

The VETLAB network was initially developed and supported by the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture in close cooperation with FAO's Animal Production and Health Division to support the global rinderpest eradication campaign through the development, evaluation, validation, and transfer of selected diagnostic technologies.
Rinderpest has been a dreaded cattle disease for millennia, causing massive losses to livestock and wildlife on three continents.

The formation of the laboratory network in Africa was essential to rinderpest eradication and outbreak management campaigns and this network continues today for the prevention, control and eradication of transboundary animal and zoonotic diseases.

The VETLAB network is also a forum to introduce and apply Quality Assurance systems to ensure international acceptance of test results.
In addition, the VETLAB Network improves regional and national laboratory diagnostic capacity; supports coordination and harmonization of regional approaches for early and efficient detection and readiness to disease alerts during disease surveillance; enhances regional capacity and cross boundary collaborations to enable more effective responses to transboundary animal and zoonotic diseases; builds trust through enhanced transparency

BUILDING VETERINARY LABORATORY DIAGNOSTIC CAPACITY IN AFRICA: **THE VETLAB NETWORK**



VETLAB NETWORK *features*

IMPROVING REGIONAL AND NATIONAL LABORATORY DIAGNOSTIC CAPACITY

PROVIDING TECHNICAL ADVICE, TRAINING ON SEROLOGICAL AND MOLECULAR TECHNIQUES FOR DISEASE DIAGNOSIS AND A QUALITY ASSURANCE PROGRAMME ON THE DIAGNOSIS OF MAJOR DISEASES

PROMOTING CONSISTENCY AND RIGOR IN METHODOLOGY

LABORATORY ACCREDITATION; COUNTRY-TO-COUNTRY TECHNICAL SUPPORT; PROFICIENCY TESTING EXERCISES

FAO/IAEA Programme

Food-Chain-Crisis@fao.org
NAFA.Contact-Point@iaea.org
Websites:
www.fao.org/food-chain-crisis
http://www-naweb.iaea.org/nafa/index.html

and mutual confidence in support of EMPRES-i disease information; facilitates a dynamic approach for interaction between countries and enhances information sharing between national veterinary laboratories in the region.

SUPPORTING VETERINARY DISEASE DIAGNOSTICS IN AFRICA

The sub-Saharan African branch of the VETLAB Network is composed of 32 African countries with four leading institutes providing regional support. The leading institutes are in Cote d'Ivoire (West Africa), Cameroon (Central Africa), Ethiopia (East Africa) and Botswana (Southern Africa).

Through FAO and IAEA support, several laboratories in Africa have strengthened their diagnostic capacity, upgraded their facilities, become more technically sound and improved test reliability.

A striking example of this is the National Veterinary Institute in Ethiopia, which received ISO 17025 accreditation in 2014, an international standard certifying that the laboratory is technically competent and able to produce accurate tests.
This is also shown by the National Animal Health Diagnostic and Investigation Centre in Ethiopia, which has increased the number of accredited assays during the last two years.

Furthermore, the Botswana National Veterinary Laboratory and the Cameroun Laboratoire National Vétérinaire have proven their capacity to contribute as centres of excellence. In fact, they have organized and hosted training courses on disease diagnosis funded by both FAO and IAEA.

In Botswana, the laboratory is currently providing external quality assessment for contagious bovine pleuropneumonia to Southern African Development Community (SADC) countries while the laboratory in Cameroon is providing diagnostic services for African swine fever to Chad. Both are excellent examples of country-to-country support.

As a result of the improved capacity attained through the help of the Joint FAO/IAEA Division and collaboration with national and international laboratories, the laboratory in Botswana was granted the status of a World Organisation for Animal Health (OIE) reference laboratory for contagious bovine pleuropneumonia in May 2012.

The joint FAO/IAEA Animal Production and Health Laboratory runs annual proficiency tests with laboratories affiliated to the VETLAB Network on foot and mouth disease (FMD) and *peste des petit ruminants* (PPR) and will add further relevant diseases to these exercises in the near future. Participation in these proficiency testing exercises gives confidence to the successful laboratories – and alerts and highlights shortcomings to the less successful ones.

The VETLAB Network will continue supporting collaboration and harmonization between the veterinary laboratories in Africa, aiming to increase the overall laboratory proficiency, performance and preparedness to respond to animal and zoonotic disease challenges.

IMPROVING NATIONAL AND REGIONAL LOCUST MANAGEMENT IN CAUCASUS AND CENTRAL ASIA


© FAO / A. Monard

LOCUSTS AND GRASSHOPPERS pose a serious threat to agriculture in Caucasus and Central Asia.

During outbreaks, the three main locust pests (Italian, Moroccan and Migratory Locusts) attack all types of crops and plants.

More than 25 million hectares of cultivated areas can be affected and locusts can jeopardize food security and livelihoods of more than 20 million people, including the most vulnerable communities living in rural areas.

As locusts are a migratory and transboundary pest that can fly up to 100 km per day and since political boundaries in Caucasus and Central Asia often fall within traditional locust habitats, locust infestations and movements can be a source of tensions between countries.

Locusts are becoming even more dangerous with exceptional weather events associated to climate change, due to their capacity to take advantage of new situations.

In October 2011, FAO initiated the "Programme to improve national and regional locust management in Caucasus and Central Asia (CCA)" to safeguard food security and the livelihood of rural populations through reduction of locust outbreaks and upsurges.

The Programme supports the locust preventive control strategy, which relies on appropriate monitoring, early warning and early reaction. If properly implemented, crises could be avoided, with no, or limited damage on crops and rangelands, less impact on human health and the environment, and low financial costs.

To that end, FAO contributes to develop regional cooperation and strengthen national capacities.

CCA PROGRAMME *features*

TEN COUNTRIES INVOLVED: AFGHANISTAN, ARMENIA, AZERBAIJAN, GEORGIA, KAZAKHSTAN, KYRGYZSTAN, RUSSIAN FEDERATION, TAJIKISTAN, TURKMENISTAN, UZBEKISTAN

EFFECTIVE REGIONAL COOPERATION, INCLUDING CROSS-BORDER SURVEYS, FOR TRANSBOUNDARY LOCUST PEST MANAGEMENT

ENHANCED LOCUST MONITORING, EARLY WARNING & EARLY REACTION

DEVELOPING REGIONAL COOPERATION

Encouraging cooperation among countries is one of the most important aspects of the Programme and a number of joint activities and trainings are organized such as annual joint and cross-border surveys.

For example, three cross-border surveys were carried out between Kyrgyzstan-Tajikistan, Kyrgyzstan-Uzbekistan, and Tajikistan-Uzbekistan in May 2015.

A joint survey was also conducted in Kakheti, Georgia, involving Armenia, Azerbaijan, Georgia and Russia.

A total of 42 locust experts from seven countries participated. While these surveys allow locust experts to jointly collect data and evaluate the locust situation in border areas, one of their major breakthroughs is a significant reduction in tension between countries regarding the sources of locust invasions.

Those benefits have been fully recognized by countries.

IMPROVING NATIONAL AND REGIONAL LOCUST MANAGEMENT IN CAUCASUS AND CENTRAL ASIA


© F. Hakimov


© B. Rekhviashvili

CCA PROGRAMME *features*

DEVELOPMENT OF A LOCUST GEOGRAPHIC INFORMATION SYSTEM (GIS) FOR CAUCASUS AND CENTRAL ASIA

IMPROVED RESPONSE TO LOCUST OUTBREAKS

RISK REDUCTION OF CONTROL OPERATIONS ON HUMAN HEALTH AND THE ENVIRONMENT

CCA Programme

Food-Chain-Crisis@fao.org
Annie.Monard@fao.org
Websites:
http://www.fao.org/ag/locusts-CCA/en/
www.fao.org/foodchain
Twitter @FAOLocust

SUPPORTING EARLY WARNING IN CCA

Information collection and exchange is the cornerstone of any preventive approach. Nine out of the ten CCA countries, i.e. a total of almost 100 locust experts, have benefitted from training on improved locust monitoring and data management since the start of the Programme.
Every year, national bulletins on locust situations and their actual management are prepared and issued as monthly regional bulletins that are shared amongst all countries during the locust campaign in CCA.

A Geographic Information System (GIS) is under development for locusts in CCA that will be used both at the national and regional levels. It will allow storing, sharing and analysis of the standardized, geo-referenced locust data, which are collected during field surveys by the observers and scouts from the national plant protection services.

A complementary tool was developed in 2013, the Automated System for Data Collection (ASDC), which will be linked to the GIS. Two pilot countries, Georgia and Uzbekistan, whose experts were trained, were designated to test the system from 2014; Russia has also decided to join as a pilot country from 2015. The ASDC will be improved on this basis and then shared with all countries, together with the GIS.

MITIGATING AND MONITORING THE IMPACT OF LOCUST CONTROL ON HUMAN HEALTH AND THE ENVIRONMENT

A critical aspect in locust control is the adverse effects that pesticides may have; therefore, major efforts are done to mitigate and monitor them.
National capacities are being enhanced to improve spraying techniques, including promotion of the Ultra-Low Volume technology, recognized throughout the world as the most efficient means of locust control. A total of 65 locust experts (from seven countries so far) have also been trained to better monitor and mitigate the impact of locust control operations on human health and the environment.
A pilot activity was conducted in 2014 in Tajikistan to develop an integral system for monitoring locust control operations. As a result, for the first time ever in CCA, a Human Health and Environmental Monitoring Team was set up during the 2015 locust control campaign. A similar system is being developed in Kyrgyzstan in 2015.

Since its launch, highly positive results have been obtained by the Programme in terms of strengthening national and regional locust management in CCA. This is an ongoing process and more is envisaged, such as training-of-trainers so that each country will be able to train a large number of national experts.

EMA-*i*: A MOBILE APP FOR TIMELY ANIMAL DISEASE FIELD REPORTING TO ENHANCE SURVEILLANCE


@ FAO/Animal Health

SURVEILLANCE AND EARLY WARNING of animal disease outbreaks, including zoonotic diseases, with potential public health impact enables national authorities to advise at-risk populations.

However, early detection and timely reporting of animal diseases from the field are a challenge in developing countries, where weak infrastructure, human resources, capacities and lack of adequate incentives have an impact to effectively implement adequate disease surveillance and reporting.

Good-quality disease information and reporting is needed in order to understand the disease situation, support decision-making, prevent potential disease incursion and respond quickly.

Thus, it is crucial to apply a system at national level to enhance veterinary services capacities in disease reporting from the field to decision makers and information-sharing among stakeholders.

For this reason, FAO has developed EMA-*i* (Event Mobile Application) for data collection and to facilitate real-time disease reporting to support veterinary services capacities in disease surveillance implemented in the field.

The rationale for the app is that in some developing countries access to the Internet can be difficult, especially away from urban centres, while telephone networks have good signal coverage over wider areas with rapid connection form the field.

EMA-*i* features

FACILITATING THE EXCHANGE OF INFORMATION ON ANIMAL DISEASE REPORTING BETWEEN ALL ACTORS, FROM FARMERS TO CHIEF VETERINARY OFFICERS

COLLECTING DATA AND REAL-TIME REPORTING FROM THE FIELD

HOW EMA-*i* WORKS

Using Smartphones, animal disease information is collected with EMA-*i* app from the field. These data, which are geo-referenced, are entered into the app. The app generates a report that is sent in real-time to the Global Animal Disease Information System (EMPRES-*i*) database where the information is safely stored. The data are verified and validated, and the submitter of the information can be contacted if necessary.

All reports are also accessible through a mapping component of EMA-*i* which permits to visualize the location and epidemiological details of a disease event from the field ("near me"). In addition, EMPRES-*i* platform developed by FAO can serve as a tool for data analysis through charts, tables and maps. An early warning e-mail notification system is also in place for informing decision makers on a disease event.


@ FAO/Animal Health

Crucially, the application allows for confidentiality of sensitive information. Only registered participants have access to their national data.

EMA-*i*: A MOBILE APP FOR TIMELY ANIMAL DISEASE FIELD REPORTING TO ENHANCE SURVEILLANCE

› EMA-*i* *features*

DELIVERING DISEASE INFORMATION DIRECTLY TO THE EMPRES-*i* DATABASE

ALLOWING DIRECT ACCESS TO THE DATABASE THROUGH A "NEAR ME" MAPPING FUNCTION, WHICH PROVIDES A MAP ON OUTBREAKS REPORTED IN THE NEARBY

EMPRES-*i* ACTING AS A DATA REPOSITORY FOR SPECIFIC ANALYSIS WHERE ALL SENSITIVE INFORMATION AND DATA REPORTED IS SAFELY STORED

FAO/EMPRES-*i* EMA

Food-Chain-Crisis@fao.org
empres-i@fao.org
Websites:
www.fao.org/food-chain-crisis
http://empres-i.fao.org

Another important advantage of this approach is that EMPRES-*i* can provide a stable and reliable platform for data storage, analysis and management, which is often not available for less developed countries with scarce financial and infrastructure resources.

EMA-*i* IN THE FIELD

EMA-*i* was first tested in Uganda in 2013 under a One Health Project supported by the Government of Ireland. A pilot activity included the testing and use of EMA-*i* in 10 out of 112 districts in Uganda. For this purpose, EMA-*i* was customized for the use of the national authorities and FAO delivered internet-enabled smartphones to the Chief Veterinary Officer, epidemiologists of the National Animal Disease Diagnostics and Epidemiology Center (NADDEC) and District Veterinary Officers. Computers and power back-up were also distributed to the NADDEC offices.

A workflow of report communication was also established according to the existing reporting procedure from the field to the decision makers.

The use of EMA-*i* app in Uganda has demonstrated major improvements in disease reporting and communication between districts and central level (i.e. from monthly to real-time) and increased the number of animal disease reports received from targeted districts. For instance from July to December 2013, 126 livestock disease reports were submitted in real-time to NADDEC. This compares to 45 and 56 monthly reports NADDEC received through the regular reporting system in 2012 and 2011, respectively. In addition, a wider range of diseases is reported using EMA-*i*.

Interaction and communication between the field and decision-makers was also significantly improved. For this reason, the Ministry of Agriculture, Animal Industry and Fisheries has expressed a strong interest in expanding EMA-*i* to all districts.

In early 2015, a new project was launched in Mali. Working in collaboration with FAO Mali and the Emergency Centre for Transboundary Animal Diseases (ECTAD) in Bamako, FAO implemented the first phase of the project by interviewing the veterinary services in Mali to carry out an assessment of needs and gaps in disease information and reporting and with purchasing some of the equipment.

Furthermore, a "*training of trainers*" session was held at FAO headquarters in Rome, Italy, in December 2014 for FAO officers, one officer from FAO Mali and another from FAO Bamako. The training session was an opportunity to learn about the EMA-*i* app and EMPRES-*i*, and to become actively involved in the implementation of the application in Mali.

Two pilots program are also planned in Latin America for 2016.

Through EMA-*i* app, a rapid, real time, efficient and highly confidential communication channel is guaranteed, allowing for an effective and more immediate action during the occurrence of a disease outbreak from detection, reporting and response. This is why FAO is planning to extend the use of this tool to other regions and countries to enhance global capacities in disease reporting, surveillance and early warning.

BASELINE ENVIRONMENTAL REQUIREMENTS HELP REDUCE PESTICIDE USE IN WEST AND NORTH-WEST AFRICA


©FAO/Carl de Souza

Many of the pesticides used in **DESERT LOCUST CONTROL** pose a risk to the environment and to human health, even if they are used judiciously.

To minimize the impact of pesticides use on human health and the environment, member countries of the FAO Commission for Controlling the Desert Locust in the Western Region (CLCPRO) established baseline environmental requirements that locust campaigns should comply with.

The endorsement of the Human and Environment Standards by eight countries of the CLCPRO has allowed a better management of pesticide stocks, the mapping of sensitive areas and the use of biopesticides in the region covered by the Commission.

Mali and Mauritania were among the first countries to meet the two most important requirements: developing their Pesticide Stock Management System (PSMS) and mapping of ecologically sensitive areas.

CLCPRO *key facts*

COMPOSED OF TEN MEMBER COUNTRIES: ALGERIA, BURKINA FASO, CHAD, LIBYA, MALI, MAURITANIA, MOROCCO, NIGER, SENEGAL AND TUNISIA

WORKING FOR FARMERS IN WEST AND NORTH-WEST AFRICA INVOLVED IN INTERVENTIONS AGAINST LOCUSTS

WORKING WITH COUNTRIES AT RISK FROM DESERT LOCUST INFESTATIONS

PEST CONTROL SYSTEM HELPS DATA COLLECTION AND SHARING

Obsolete pesticides contaminating the environment pose a risk on the health of local people.

In order to facilitate the collection and sharing of information on pesticide stocks movements and registration status of products in stocks, FAO developed the Pesticide Stock Management System (PSMS).

The Pesticide Stock Management System is a country-level inventory of usable and unusable pesticides to be adopted by countries, particularly those affected by locusts.

In this respect, Mauritania is one of the first countries to have successfully implemented the web-based application which ensures the sound management and disposal


©FAO/CLCPRO

of stocks and reduces over-supply of pesticides.
Pesticide Stock Management System provides information on the quantity of pesticide stocks available in the country (by region, product type, production batch, active ingredients, quantity, quality, manufacturers, etc.), pesticides use (amount sprayed, target, location (geographical coordinates) of treatment,

BASELINE ENVIRONMENTAL **REQUIREMENTS** HELP REDUCE PESTICIDE USE IN WEST AND NORTH-WEST AFRICA

CLCPRO *key facts*

WORKING TO MINIMIZE HUMAN HEALTH AND ENVIRONMENTAL EFFECTS OF INSECTICIDE USE IN LOCUST CONTROL OPERATIONS

IMPLEMENTING THE PESTICIDE STOCK MANAGEMENT SYSTEM (PSMS), A COUNTRY-LEVEL INVENTORY OF USABLE AND UNUSABLE PESTICIDES

MAPPING OF ECOLOGICALLY SENSITIVE AREAS PARTICULARLY SENSITIVE TO PESTICIDE CONTAMINATION

CLCPRO

Food-Chain-Crisis@fao.org
clcpro@fao.org
Websites:
www.fao.org/food-chain-crisis
http://clcpro-empres.org

rates of application, processing equipment used, etc.) and empty pesticide containers. It incorporates a simplified and automated management based on barcode labels placed on packages.

The Pesticide Stock Management System facilitates the prioritization of pesticide stocks movement from countries having an excess of pesticides to countries that have an immediate need for them. Examples include transfers from Mauritania to Yemen and from Mali to Malawi and Mozambique. It also prioritizes pesticide usage by classifying the products into three categories (good, expiring, expired).
The database displays the certificates of conformity issued by laboratories which can transfer stocks to other countries and continents (triangulation or bilateral donation). It also warns about the expiration date six months in advance to let countries arrange for a compliance check.

By using the system, countries have been able to: (i) ensure traceability of their stock from purchase to the return and disposal of empty pesticide containers, (ii) be informed on the availability of pesticide stocks, their locations and compliance with FAO/WHO standards, and (iii) recover almost all empty containers at the end of locust campaigns.

MAPPING OF **ECOLOGICALLY SENSITIVE AREAS** IN MALI

Pesticide treatments used in desert locust control operations can pollute the environment and harm large numbers of vulnerable animal or plant species. The identification and mapping of areas particularly sensitive to pesticide contamination is important to ensure minimal environmental damage and impact on human health of such control operations.

To this end, the National Locust Unit of Mali has successfully achieved the mapping of ecologically sensitive areas - human settlements, wetlands, oases, protected areas, areas with a concentration of migratory birds and areas with a high or unique biodiversity - in 2012.

Mali developed a tool for the mapping of ecologically sensitive areas and included it in the national environmental action plan. This plan restricts the use of pesticides in areas identified as sensitive to pesticide contamination.

The validation of this mapping tool in Mali was used as an example for other CLCPRO member countries to build their mapping systems.

The mapping tool was also recently integrated into the *Reconnaissance and Management System of the Environment of Schistocerca* (RAMSES), a geographical information system used by national locust information officers to manage and analyze ecological, weather and locust data. This will allow locust units to avoid the treatment of sensitive areas during locust control operations and implement risk reduction measures.

This is the first time that such an important environmental and ecological aspect is taken into consideration by Locust Units.

STRENGTHENING **REGIONAL VETERINARY LABORATORY NETWORKS** IN AFRICA AND ASIA

TRANSBOUNDARY ANIMAL DISEASES (TADs) including some high impact zoonoses are highly contagious diseases that can spread rapidly, irrespective of national borders and can negatively impact public health, livelihoods and safe trade.

Controlling infectious diseases of animals, and minimizing their impact on countries' economies and livelihoods of people is crucial for food security.

Veterinary laboratories play a critical role in the early detection and characterization of known, new, or re-emerging epidemic diseases, as well as in the control of endemic diseases. They also contribute to addressing complex issues at the human-animal-environment interface.

A strategic imperative for efficiently managing TADs and zoonotic diseases is building national technical capacities of laboratories in competency and a critical mass of laboratory specialists belonging to global, regional, and national networks.

REGIONAL VETERINARY LABORATORY NETWORKS *key facts*

PROVIDING SUPPORT TO PREVENT AND CONTROL TRANSBOUNDARY ANIMAL DISEASES, AND FACILITATE REGULAR, TRANSPARENT, AND RAPID EXCHANGE OF INFORMATION

SERVING AS PLATFORMS ALLOWING THE DEVELOPMENT OF REGIONAL PROGRAMS ON COMMON ISSUES, SUCH AS THE REGIONAL QUALITY ASSURANCE PROGRAM

REGIONAL VETERINARY LABORATORY NETWORKS TO COMBAT TRANSBOUNDARY ANIMAL DISEASES

FAO's experience in networking has shown that regional networks are an effective framework for combating TADs. The FAO EMPRES-Emergency Centre for Transboundary Animal Diseases, enhanced by the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, has been working for many years with national laboratory focal points and international partners to provide coordination, capacity development, and support to regional laboratory networks in Africa, Middle East and Asia.

FAO supported the establishment and development of several regional laboratory networks. In 23 West and Central African countries, two major active networks, the Regional Laboratory Network (RESOLAB) and the Regional Epidemiosurveillance Network (RESEPI), initiated and assisted by FAO, cover diagnostic and epidemiological surveillance activities for Avian Influenza and other TADs. Two similar regional networks, the Eastern Africa Region Epidemiology Network (EAREN) and the Eastern Africa Region Laboratory Network (EARLN), provide support to these activities in 11 countries in East Africa. In West Eurasia, two networks, the West Eurasia Laboratory Network (WELNET) and the Epidemiology Network (EPINET), have been established in support of Foot-and-mouth disease progressive control pathway. In the Mediterranean region, six countries are covered by the Mediterranean Network for Animal Health (REMESA). In Asia, the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) networks allow laboratory networking to ten South East Asian countries and eight South Asian countries, respectively.

Resource laboratories, known as "support" or "leading diagnostic" laboratories have been selected in sub-Saharan Africa and Southeast Asia, to provide services in disease confirmation, production of standardized reagents, validation of protocols, and capacity building.

STRENGTHENING **REGIONAL VETERINARY LABORATORY NETWORKS** IN AFRICA AND ASIA

REGIONAL VETERINARY LABORATORY NETWORK *key facts*

ENABLING THE APPLICATION OF STANDARDIZED PROTOCOLS AND TOOLS, SHARING OF EXPERTISE, EXPERIENCES AND TRAINING OPPORTUNITIES

ENABLING THE USE OF STANDARDIZED DIAGNOSTIC REAGENTS, THE ORGANIZATION OF REGIONAL PROFICIENCY TESTS, AND BUILDING TRUST ACROSS BORDERS AND PROFESSIONALS

REGIONAL SPECIALIZED NETWORKS FOR DIAGNOSTIC AND EPIDEMIOLOGICAL SURVEILLANCE: WEST AND CENTRAL AFRICA - RESOLAB AND RESEPI; EASTERN AFRICA - EARLN AND EAREN; SOUTH EAST ASIA – ASEAN; SOUTH ASIA - SAARC; MEDITERRANEAN REGION – REMESA; WEST EURASIA – WELNET AND EPINET

FAO EMPRES Laboratory Unit

Food-Chain-Crisis@fao.org
EMPRES-Lab-Unit@fao.org
Websites:
www.fao.org/food-chain-crisis
www.fao.org/ag/againfo/home/en/index.htm

FAO provides support to ensure and guide their regional responsibilities. Regional networks enable the coordination of a multiplicity of actions including the application of standardized protocols and tools, sharing of expertise, experiences and training opportunities, the use of standardized diagnostic reagents, breaking the isolation of national teams in developing countries, organization of regional proficiency tests and more transparent disease reporting, as well as building trust across borders and professionals. They are also useful platforms allowing the development of regional programs on common issues, such as the Regional Quality Assurance Program developed by FAO, or the Regional Biosafety Program for national veterinary laboratories in South and Southeast Asia.

FAO assists also in linking countries and regional laboratory networks with global networks such as the joint World Organization for Animal Health (OIE)-FAO OFFLU network for influenza and those of international partners such as the World Health Organization (WHO) and OIE, Reference Centres for independent technical and scientific advice.

SOME **FAO GLOBAL INITIATIVES AND TOOLS** IN SUPPORT TO VETERINARY LABORATORIES

Adequate veterinary laboratory policy and legislation are key to maintain accessible, efficient and cost effective veterinary laboratory services. In 2013, FAO initiated the development of an approach to strengthen veterinary laboratory policy. This novel approach is currently piloted in Kenya.

Understanding national and regional needs and resources by using standardized tools to assess and monitor laboratories' capacities and functionality is essential to identify diagnostic laboratory's gaps. FAO developed the Laboratory Mapping

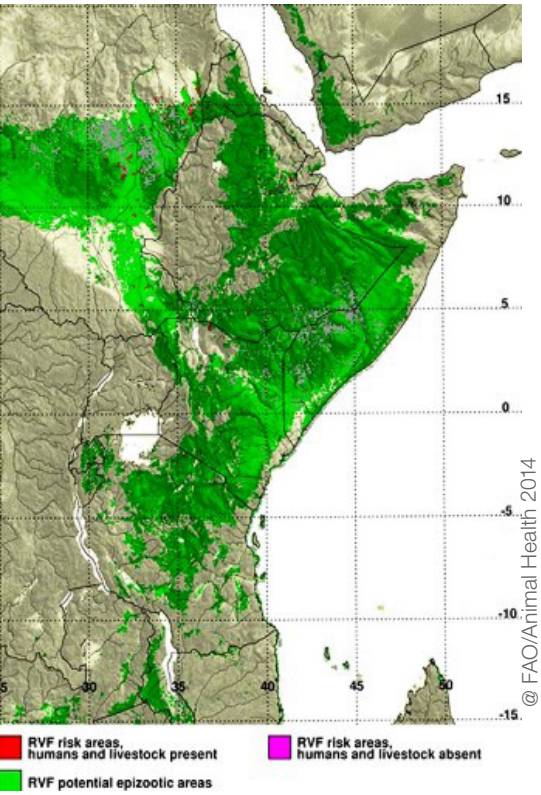
Tool in order to standardize data collection on the competencies and gap identification in laboratory functionality, including the required personnel profiles. This tool has been applied in various countries and the outputs can be used to generate a "map" of a laboratory's strengths and weaknesses to better understand national and regional expertise, and to target areas for support. The FAO Laboratory Mapping Tool will be soon expanded through specific modules, including that of antimicrobial resistance, and will be available on smartphones and tablets.

FAO provides guiding tools and supports the implementation of Laboratory Information Management System (LIMS) in national laboratories for standardization of laboratory diagnostic processes and better sample tracking. Inter-operability between the LIMS and the national Livestock Identification and Traceability System is also established in some countries. FAO supported Indonesia in building a national database for real-time information sharing of laboratory results within the country.

FAO developed the influenza genetic module which is a component of EMPRES-*i* database (the FAO Global Animal Disease Information System). The influenza genetic module is a tool to integrate pathogen-related data into EMPRES-*i*.

FAO will continue supporting member countries in preventing, detecting, and responding to threats of animal origin by strengthening capacities of national and regional epidemiology and laboratory systems through continuous staff training, provision of tools and standardized methodology.

FAO HELPS COUNTRIES **PREVENT** AND **CONTROL RIFT VALLEY FEVER**



RIFT VALLEY FEVER (RVF) is a zoonotic, viral, vector-borne disease representing a threat to human health, animal health and livestock production in Sub-Saharan Africa, the Near East and potentially Europe and the rest of the world.

The virus can be transmitted from infectious ruminants to humans through several mosquito species and by contact with infectious animal material. Most human cases develop a mild influenza-like illness while some patients develop much more severe symptoms. In ruminants, it may be associated with high mortality in neonates and young animals as well as high levels of abortion. The impact of the disease on people's livelihoods (socio-economic) and on trade (restrictions) can be high.

Climatic factors are important drivers of RVF viral activity as they drive vector abundance and population dynamics, thus influencing the risk of disease emergence, transmission and spread. A climate-affecting phenomenon such as El Niño can have high impact on RVF.

FAO KEY ACTIVITIES *against RVF*

MONITORING CLIMATE AND VEGETATION PATTERNS AND ANOMALIES IN AFRICA, PARTICULARLY IN EAST AFRICA, AND THE MIDDLE EAST

CALIBRATING AND MODELLING RVF RISK MODEL IN WEST AFRICA (SENEGAL AND MAURITANIA)

CLIMATE-BASED **FORECASTING MODELS** AND **EARLY WARNING SYSTEMS**

Risk modelling tools, based on near-real-time satellite climate data, monitor the first signals of a possible increase in vector abundance and RVF risk and provide information for prevention and risk mitigation.

The National Aeronautics and Space Administration (NASA), FAO and the World Health Organization (WHO) have been monitoring climatic conditions to predict the risk of RVF vector amplification in East Africa for the past several years using a modelling approach developed by the NASA Goddard Space Flight Center team. In 2006-2007, this climate-based model predicted the risk of RVF occurrence in the Horn of Africa several weeks before the first signs of the disease were recorded in livestock and humans.

In this approach, climate data are used to identify and map areas with persistent, heavy, above-average

rains and vegetation anomalies over the last three consecutive months. Results are then interpreted and assessed in relation to El Niño and Sea Surface Temperature indicators as well as precipitation forecasts and compared with historical data.

Every month, the risk of RVF epizootic is assessed by FAO through the monitoring of the three climatic parameters: precipitation, El Niño Southern Oscillation (ENSO), and cumulative Normalized Difference Vegetation Index (NDVI) anomalies. For East African region, FAO produced 190 RVF risk maps covering the period 1998-2014.

FAO HELPS COUNTRIES **PREVENT** AND **CONTROL RIFT VALLEY FEVER**


@ FAO/Animal Health

FAO KEY ACTIVITIES *against RVF*

GENERATING RVF RISK MAPS AND CONDUCTING RISK ASSESSMENT OF RVF

PROVIDING TRAINING AND CAPACITY BUILDING TO FILL ANY GAPS ON PREVENTION AND CONTROL OF RVF

INCREASING THE USE AND UNDERSTANDING OF MOLECULAR EPIDEMIOLOGY BY DEVELOPING THE RVF GENETIC MODULE

DISSEMINATING RVF DATA, RISK ASSESSMENTS, UPDATES, AND EARLY WARNING MESSAGES

FAO EMPRES Animal Health

Food-Chain-Crisis@fao.org
RVF@fao.org
Websites:
www.fao.org/food-chain-crisis
http://www.fao.org/ag/againfo/programmes/en/Vmerge.html

Following on the work conducted in East Africa, FAO is leading activities on disease modelling and risk mapping to improve early warning and surveillance strategies for northern Africa and Senegal. In particular, FAO is working to calibrate risk modelling tools in West Africa, specifically in Senegal and Mauritania.

Innovative methods are being explored to optimize the RVF prediction in northern and western Africa based on environmental and climatic variables in order to produce risk maps regularly.

These activities are carried out in the framework of the Vmerge project on "Emerging, Viral Vector-Borne Diseases", a research consortium funded by the European Commission.

CAPACITY BUILDING AND DATA DISSEMINATION

Building countries' capacities and providing training to fill any technical gaps is a crucial part of FAO's work in Africa. For this, a training programme on RVF preparedness (surveillance for early detection and contingency plans) took place in Tunisia in October 2015. It brought together 16 focal points of the Mediterranean Animal Health Network, one representative from the veterinary services of Senegal, and three representatives from the World Organisation for Animal Health (OIE).

A FAO manual on RVF surveillance is under development, which will complement this training in addressing the need for awareness and capacity building on RVF preparedness in the region.

Another important component of FAO's activities is assisting countries in formulating RVF preparedness and response plans in East Africa. Two RVF task forces, one in Tanzania and another in Kenya, have been established to provide countries with the best possible advice on the implementation of strategic RVF


@ FAO/Animal Health

work plan for containing expected RVF outbreaks at source. FAO also supported awareness creation in Kenya by using local FM radios in high risk areas, especially in the northeast.

FAO continues also its effort to increase the use and understanding of molecular epidemiology by developing the RVF genetic module. The module being developed together with the Swiss Institute of Bioinformatics aims to enhance the linking of genomic sequence information - in centralized sequence database - with outbreak information available at FAO's Global Animal Disease Information System epidemiological database (EMPRES-*i*). This tool will enable understanding the distribution of viral strains, whether a virus has been recently introduced or was already present, the possible origins of an outbreak, the spread routes, etc.

In addition, FAO produced manuals on RVF prevention, control and elimination and guidelines to prepare national RVF contingency plan.

On a wider scale, FAO disseminates regular RVF updates, and produces RVF early warning messages (EMPRES Watch) in collaboration with OIE and WHO.

Food Chain Crisis-Emergency Prevention System

FCC-EMPRES

2015

FOR FURTHER INFORMATION

Food-Chain-Crisis@fao.org
Website: www.fao.org/food-chain-crisis

I5279E/1/12.15