



**REPORT**

**BRAINSTORMING MEETING ON THE RAPID ALERT AND  
RESPONSE SYSTEM FOR PLANT PESTS AND DISEASES  
IN EASTERN AFRICA**



**Nairobi, Kenya, 11- 13 November 2013**

## **Executive Summary**

In recent past, several devastating pests and diseases entered Africa unnoticed and their spread is now causing serious damage to crops, contributing to nutritional insecurity, causing economic loss to African agriculture and huge amounts of money is spent in managing the menace. To address the growing threat from plant pests and diseases, including invasive plants, Inter-Africa Phytosanitary Council of African Union (AU-IAPSC) identified the need for an Early Detection and Rapid Response System for plant pests and diseases in Africa. Thus in response to this need, the Food and Agriculture Organization of the United Nations (FAO) Sub Regional Office for Eastern Africa (SFE), in collaboration with AU-IAPSC, convened a brainstorming workshop on the Rapid Alert and Response System for plant pests and diseases in Africa. The workshop was financed by FAO and focused on the following objectives:

- To bring together the various actors in the plant health and protection field as well as experts involved in early warning, detection and control of emergencies in animal health to engage in collective reflection on the current status and future prospects of the plant health systems in African member states prior to developing a draft document on an Early Detection and Reporting System (EDRR) and proposing its functioning action plan.
- To discuss the implementation of various initiatives regarding plant pests and diseases in particular the TCP 'Regional response for management and control of Maize Lethal Necrotic Disease (MLND) in Eastern Africa and the way forward. Countries and partner institutions were also able to share their experiences so far and their proposed way forward.

A total of 24 experts consisting of representatives from the East African countries, AU-IAPSC Director accompanied by two senior officers, representatives of Kenya (MALF, KEPHIS, KARI), Uganda (MAAIF) Southern Sudan (Ministry of Agriculture, Forestry, Tourism, Animal Resources, Fisheries, Cooperatives & Rural Development), ICIPE, CIMMYT, ICRISAT; the Head of EMPRES Animal Health from FAO Rome, representatives from FAO Kenya, FAO Uganda, FAO South Sudan, REOA as well as staff from ECTAD Nairobi office attended the three day meeting held in Jacaranda Hotel in Nairobi, Kenya.

In order to get a clear understanding of the current situation on existing rapid alert systems, participating organizations made presentations on their experience. Experts involved in early warning, detection and control of emergencies in animal health shared experiences in operating an efficient global early warning and response system. After presentations by the different experts, it emerged that the ongoing activities on early detection and rapid response systems on plant pest and disease are mainly at national level and although commendable, none of the countries represented has a sustainable and efficient system in place. Upon appreciating that the systems in

place have gaps, the participants designed a model rapid alert and response system for plant pests and diseases at national and regional level. The modalities to establish a surveillance network for Eastern Africa, including roles of the network and institutional arrangement were discussed. In addition, a road map for development of a continental system was defined. Also discussed were the ongoing initiatives on plant pests and diseases in the region and these were: Cassava Brown Streak and Cassava Mosaic Diseases, Banana *Xanthomonas* wilt and Maize Lethal Necrotic Disease. Details of the workshop deliberations and key recommendations are provided in this report.

## **Introduction and Workshop Objectives**

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In the recent past, several devastating pests and diseases entered Africa unnoticed and their spread is now causing serious damage to many countries in the East and Central African region while neighbouring countries are threatened by the possible spread of the pests and diseases. This has been the case for the fruit fly (*Bactrocera invadens*), the leafminer (*Tuta absoluta*), the papaya mealy bug (*Paracoccus marginata*), the Maize Lethal Necrotic Disease (MLND), Cassava Brown Streak Disease (CBSD) and Banana *Xanthomonas* Wilt (BXW) among others. The Inter-Africa Phytosanitary Council of African Union (AU-IAPSC) estimates that introduced plant pests and diseases result in considerable crops damage, contributes to nutritional insecurity, cause economic loss to African agriculture and it costs taxpayers more money in control expenditures for member states.

To address the growing threat from plant and plant products, pests and diseases, including invasive plants, the AU-IAPSC formally identified the need for an Early Detection and Rapid Response (EDRR) System for pests and diseases in Africa during its previous General Assemblies and Steering Committee meetings. That system includes mechanisms for early detection and reporting of suspected new pests and diseases; and for rapid response to address these threats and outbreaks. In partnership with the Food and Agriculture Organization of the United Nations (FAO), AU-IAPSC convened a brainstorming workshop with a focus on discussing the various elements of such a system in Africa including, the structure of the system, the resources needed for its establishment, taking stock of the resources already in place, experience from existing programs, and strategy for mobilization of funds for new programs, and the coordination at various levels (national, regional and continental). The Food and Agriculture Organization of the United Nations funded this brainstorming meeting which was held in Nairobi Kenya from 11-13<sup>th</sup> November 2013.

### **The objectives of the workshop were:**

1. To bring together the various actors in the plant health and protection field as well as experts involved in early warning, detection and control of emergencies in animal health to engage in collective reflection on the current status and future prospects of the plant health systems in African member states prior to developing a draft document on an Early Detection and Rapid Response System and proposing its functioning action plan.

2. To discuss the implementation of various initiatives regarding plant pests and diseases in particular the TCP 'Regional response for management and control of Maize Lethal Necrotic Disease (MLND) in Eastern Africa' and the way forward. Participating Countries and partner institutions were also able to share their experiences so far and their proposed way forward.

## **OPENING REMARKS**

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### **Bouna Diop, Regional Manager, Emergency Centre for Transboundary Animal Diseases for Eastern and Central Africa (ECTAD)**

The Regional Manager of ECTAD Eastern Africa welcomed the participants to the meeting and thanked them for being in attendance. He stated that the meeting was jointly convened by FAO SFE and AU-IAPSC. He further pointed out that the need for an early detection and rapid response system for plant pests and diseases was home grown, having been identified by AU-IAPSC. He also stated that the experts from the animal health were in attendance in view of sharing their experiences, challenges and lessons learned in running an early detection and rapid response system for animal diseases.

### **Theresia Wambui Karanja, State Department of Agriculture Kenya**

Mrs. Theresia Wambui Karanja of State Department of Agriculture thanked all participants for being in attendance and also welcomed them to Nairobi, Kenya. She emphasised that food and nutritional insecurity remained a challenge in Kenya and many other African countries and pests and diseases were among the key contributing factors. She went on to say that in most cases pests and diseases went undetected for considerable duration and this offered an opportunity for the disease causing agents to multiply in number, spread to affect larger geographical areas and have devastating impact on livelihoods and the environment as a whole. She pointed out that the meeting was very timely and implementation of recommendations from the forum would have a positive impact on crop production and livelihoods in the region. She also pointed out that FAO had a wealth of expertise in early detection and rapid response from creating a system for Animal Health and commended FAO for being in attendance to share this experience with the plant specialists in the East African Region. She added that the meeting was a starting point for reflection and discussions which will lead to the development of a road map in developing an early detection and rapid response system for plant pests and diseases in Eastern Africa and will eventually be reproduced in the rest of Africa. In concluding, she wished the participants fruitful deliberations and a good stay in Nairobi.

### **Jean Gerard MEZUI M'ELLA, Director Inter-Africa Phytosanitary Council of African Union**

The Director of Inter-Africa Phytosanitary Council of African Union (AU-IAPSC) expressed his gratitude to the participants for taking time to discuss an issue which is very important to all countries in the African Continent. He stated that the need for an early detection and rapid response system for plant pests and diseases in Africa was identified by African Union and together with FAO, they found it extremely important to convene the meeting to develop a road map for an early detection and rapid response system for plant pests and diseases in Africa. He emphasised that pests and diseases do not respect national boundaries and it was necessary to develop and implement the system at national, regional and eventually at continental level. In addition he mentioned that the lack of capacity to rapidly detect plant pests and diseases was a threat to food security in Africa. It was also stated that initially, the system would be developed for the Eastern Africa region and then be scaled out to the entire continent of Africa. He was optimistic that building on the lessons of the FAO early detection and rapid response for animal pests and diseases animal, the participants would come up with a road map for a similar system for plant pests and diseases. He expressed gratitude to FAO for accepting to fund and facilitate the meeting.

### **Mr Luca ALINOVI, FAO Representative in Kenya**

In his opening remarks, Mr. Luca Alinovi, incoming FAO Representative in Kenya, said that FAO was very happy to collaborate with the African Union Commission (AUC). He thanked all participants for being in attendance. In addition, he emphasized the need for having an early detection and rapid response system for plant pests and diseases in the region. He also pointed out that the improved mobility within the region was contributing to spread of pests and diseases. In addition, changes in land use and landscape in general are also contributing to the spread and development of pests and diseases. It was emphasized that if the African countries are to realize the first Millennium Development Goal (Eradicating hunger and poverty) then it is paramount to develop a sustainable early detection and rapid response system for plant pests and diseases. "We should not necessarily strive for a perfect system, we should strive to make it work", said Mr. Alinovi. He mentioned that there was no magic solution for everything but addressing the problem partially would be a big win for Africa. Thus, in closing, he expressed confidence that the participants would come up with a road map for developing a sustainable early detection and rapid response system for plant pests and diseases in the region.

## **SUMMARY OF THE DIFFERENT SESSIONS**

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### **Session 1: Analysis of current situation: Experience sharing on rapid alert systems**

**Sam Okuthe, epidemiologist, FAO ECTAD Eastern Africa** presented the experience on Rapid Alert and Response System (RARS) for Animal Diseases

The Food Chain Crisis Management Framework (FCC) was created in July 2010 as FAO's instrument for action in support of Member Countries in the global governance of threats to the human food chain at all stages from production to consumption.

The Animal Health Strategy, developed within the FCC, serves to establish robust, global animal health systems that effectively manage major health risks that arise from and affect animals, paying particular attention to the human-animal-ecosystem interface using the One Health approach, and placing disease dynamics into the broader context of sustainable agriculture, socio-economic development, environment protection and sustainability. There are three main structures in place:

- i) Global framework for the progressive control of TADs (GF-TADs)
- ii) Global Early Warning Systems (GLEWS)
- iii) Emergency PREVENTION System (EMPRES)

There are Tools & Instruments used for Early Warning / Rapid Alert and Response to AH outbreaks:

- FAO-OIE Crisis Management Centre - Animal Health (CMC-AH)
- Emergency Centre for Transboundary Animal Diseases (ECTAD)
- Regional Animal Health Networks (RAHCs)

ICT tools such Digital Pen Technology (DPT), EMPRES-i Event Mobile Applications (EMA), Epi-collect among others could greatly support RARS as they facilitate fast and easy exchange of disease information and data among stakeholders.

EDRR system must be able to integrate data from multiple sources; be flexible and adaptable to integrate these various data sources and the technologies that drive them. They must have a functional response capability to distinguish real from false alarms; need protocols for how to respond to signals.

### **Esther Kimani, Kenya Plant Health Inspection Services, Rapid alert system in Kenya**

In 2007, Kenya Plant Health Inspection Services (KEPHIS) received information on the presence of a pest on exported roses. The pest in question is known to occur/present in Kenya but had previously not been reported on roses. Early detection of the pest on roses was not reported and the potential negative implication of the pest on the export of this cut flower contributed to the birth of the strategy for early detection of pests and disease which was launched in 2011. The specific activities in the strategy include pest reporting, inspection of consignment at points of entry, risk analysis, improving awareness and accurate forecasting. Though commendable, the preparedness which was in place during the outbreak of Maize Lethal Necrotic Disease (MLND) was not sufficient in handling this new disease which is devastating maize production in Kenya and the East African Region as a whole. Key challenges included: diagnosis of the disease causing agent was being carried out by multiple organizations which were using different tools, coordination was not very efficient, a team of experts was constituted when the problem was ongoing and not prior to the disease outbreak, no finances were specifically allocated to early detection and rapid response to

plant diseases and there were concerns as to who would pay for the diagnosis of diseased plants. KEPHIS stated that early detection and rapid response to plant diseases must be anchored on policy. Generally, there is a system in place to report presence of plant diseases in Kenya as reported by the State Department for Agriculture. When farmers notice symptoms of a strange disease, they are required to report it to the agriculture officers at village level, who then notifies officers at sub-county level and county levels. In the case of MLND, when the farmers realized they could not diagnose the problem, samples were taken to the sub county and extension officers then took the materials to the crop protection laboratories for diagnosis and also to the nearest KEPHIS and KARI regional centres. The challenge is that the farmer is required to pay for analysis. A recommendation was to come up with a structure where the government can cater for the fee. It was also stated that there is need for better coordination to make the reporting more efficient. Lessons from the MLND has resulted in enhancing linkages example, KARI has developed links with local and international universities at various levels. Another response has been to create awareness about the diseases and brochures were produced and plans are underway to a mobile plant doctor system to enhance pest and diseases detection. In response, FAO-AH recommended emulating the coordination used in APHIS<sup>1</sup> (US).

**Stephen Byantwale Tibeijuka, Ministry of Agriculture, Animal Industry & Fisheries (MAAIF), Uganda**, shared highlights of the ten year investment and development plan by the government of Uganda. With reference to crops, the plan focus is to:

- Increase crop production and productivity
- Enhance information sharing
- Promote marketing and value chain
- Institutional strengthening.

With reference to crop protection the plan identifies the core diseases as MLND, Banana bacterial wilt, Cassava mosaic virus diseases and Coffee wilt. Core pests include fruitfly, large grain borer and quelea birds while key weed challenges are *Lantana camara*, *Striga hermonthica* and water hayacinth among others. In addition it was stated that the MAAIF, has structures in place for effective pests and diseases control and several organizations are involved, including the National Plant Protection Organizations (NPPOs) and the local government. Also, in place is a stake holder platform where information is shared. Surveillance is in place and mobile plant clinics tools are in use. Diagnostic laboratories for plant pests and diseases are also in place. It was noted that there are some challenges with regard to information sharing and creating a centralized database. Other key challenges include: limited budget allocation, inadequate skilled human resource and quarantine facilities as well as some gaps in reporting and monitoring.

**George Mahuku, International Maize and Wheat Improvement Centre (CIMMYT)**

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<sup>1</sup> The Animal and Plant Health Inspection Service (APHIS) is a multi-faceted Agency with a broad mission area that includes protecting and promoting U.S. agricultural health, regulating genetically engineered organisms, administering the Animal Welfare Act and carrying out wildlife damage management activities. These efforts support the overall mission of USDA, which is to protect and promote food, agriculture, natural resources and related issues.

The CIMMYT, in partnership with other stakeholders, including KARI has been on the forefront of combating the MLND. It was reported that there was a delay between the occurrence of MLND in the farmers' fields and the reporting of the disease to the authorities. This was occasioned by the lack of an efficiently functioning early detection and rapid response system for plant pest and diseases within individual countries in Eastern Africa. The disease was first reported in Bomet in Kenya and interventions were taken. A taskforce consisting of key maize stakeholders was constituted to see how best to address the MLND problem. The team visited affected areas in Kenya and Tanzania to make a rapid assessment of the situation and also collect plant samples for analysis. Because the appropriate reagents and antibodies to undertake virus analysis were not available locally, samples were analysed in United States of America and agents causing the disease were identified as co-infection with *Maize Chlorotic Mottle Virus* (MCMV) and any one of the following potyvirus namely: *Maize Dwarf Mosaic Virus*, *Sugarcane Mosaic Virus*, *Wheat Streak Mosaic Virus*. Other characteristics of the MCMV are: it is spread by thrips and also use of infected seeds, transmitted through sap and can infect about 73 different grass species as alternate hosts. To-date response to the MLND include the following: Creating awareness about the diseases through multiple avenues, establishment of a well equipped regional laboratory at KARI Naivasha research station to undertake detailed studies on MLND and screening of maize germplasm for resistance to MLND is ongoing. There is need to further characterize the disease causal agent.

#### **Sevgan Subramanian, International Centre of Insect Physiology and Ecology (ICIPE)**

The ICIPE is involved in pest management programs focusing on five invasive pests. However, in most cases, except that of fruit flies, the interventions were curative to manage invasive pests that had established well and were catastrophic. This is mainly due to the lack of an organized rapid alert and response system for plant pests and diseases in Africa. ICIPE has continued to build the capacity and knowledge for monitoring and detection of pests. This has entailed developing field guides for fruit fly detection and management, and other user-friendly tools for pest detection e.g. LUCID key for identification of thrips. In addition, a Google application for identification of thrips in East Africa is available on the web and at no charge. Another intervention has been the NARS staff training on monitoring and detection of pests. Monitoring of fruitfly is on-going in several African countries. Control measures recommended include an integrated package with emphasis on bio-control through use of baits, parasitoids and bio-pesticides. There is need for funds to establish a regional and continental early detection and rapid response system, enhance quarantine surveillance and reporting at regional and continental level and strengthen capacity for monitoring and detection.

#### **Nana Sani Flaubert, African Union-Inter-Africa Phytosanitary Council (AU-IAPSC)**

The mission of AU-IAPSC with regard to Early Detection and Rapid Response is to improve the effectiveness of invasive species control by sharing information, innovations and technologies across borders of African countries. With regard to the current situation on pest alert response, there is emphasis on pest identification, pest life history, invasion history/control costs, development of ID photos so as to support/guide Early Detection and Rapid Response. The AU-

IAPSC's representative also stated that the NPPOs' members have a history of working together in multidisciplinary teams (consisting of agronomists, plant biologists, entomologists, weeds scientists, plant pathologists and farmers working groups among others), sharing experience, information and resources to control invasive species. AU-IAPSC undertakes multiple activities which can be summarized to include: project management, risk assessment, surveillance, provide guidance in developing national disease preparedness plans, laboratory support, provision of disease control equipment and supplies, public awareness and technical information, capacity building especially with regard to upgrading of NPPOs services and research. On a regular basis, AU-IAPSC liaises with NPPOs officials for and is well versed with National Comprehensive Plan of Actions on Preventing and Control of plant and plant products pests. The council works in collaboration with partners who include: NPPOs, IPPC, FAO, IITA, Non-governmental Organizations, Agro-industries, farmers' organizations and Universities. The AU-IAPSC undertakes several roles, including the following:

- Coordinate and manage the international pest and disease response, at the continental and national level.
- Provide support to infected countries in their efforts to control and eradicate the pest.
- Assist unaffected countries in their efforts to be prepared to face an incursion of the pest.
- Lobbying for resources to enable support for a rapid response, should new countries become infected
- In the area of system coordination and oversight AU-IAPSC continuously encourage the establishment of a national early warning coordination capability for Invasive species. The council generally coordinates actions and activities of member states NPPOs.

In conclusion, it was emphasized that AU-IAPSC would be more successful if the following are in place:

- An Early Detection and Rapid Response data reporting system was developed
- Standards of Operating Procedures for NPPOs are implement
- Increase use of professional for uniform exotics control data reporting;
- Advise on expanding NPPO agency/grant funding of EDRR and ongoing control efforts;
- Continue to encourage the commitment of different stakeholders involved in Plant protection and quarantines services.

## **Session 2: Structure of a plant pests and diseases Early Detection and Rapid Response system: elements that need to be considered; needs and challenges**

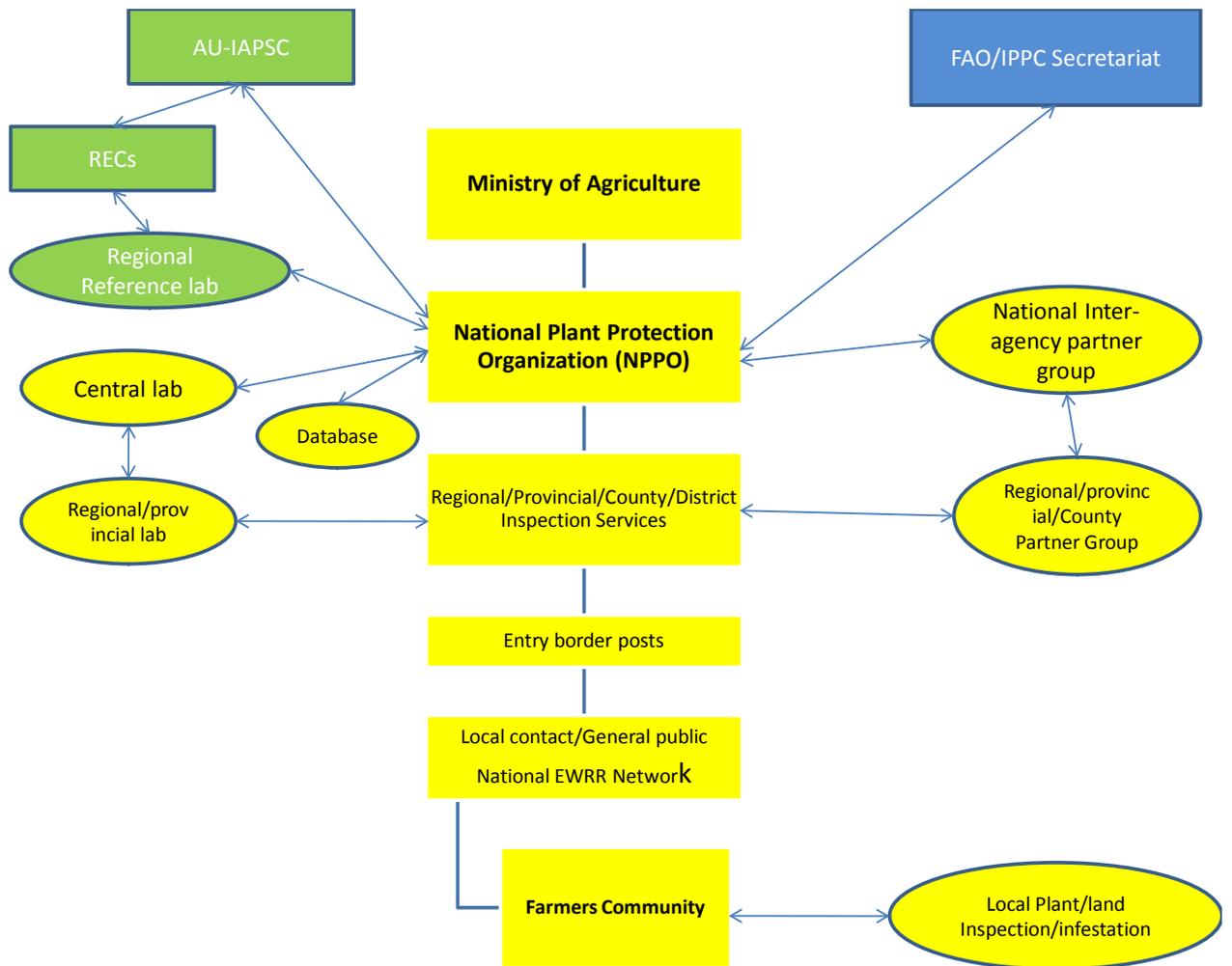
Following presentations by various speakers, a plenary session was held and participants identified the elements of a functional Early Detection Rapid Response System so that the nations are prepared for emergencies. The elements include the following:

- An awareness creation mechanism that targets stakeholders in the commodity value chain
- A team of experts with a clear command structure
- Well developed current risk surveillance activities
- Developed and implementable procedures for preparedness and contingency planning to predict, monitor and control the spread of pest and diseases.
- Standardized operating procedures and appropriate laboratory infrastructure
- Database and other relevant information system that is updated regularly
- Sufficient emergency fund that can be tapped into when need arise
- A well-developed risk warning approach
- Availability of a risk assessment framework and rapid alert systems
- Appropriate policy framework.

The participants appreciated that a functional and sustainable EDRR has to overcome key challenges which were identified as: inefficient coordination, limited budgetary allocation, limited skilled human resources and infrastructure, lack of adequate quarantine surveillance and reporting, lack of comprehensive data base and limited flow of information especially with regard to pests and diseases. Lack of policies focusing specifically on EDRR for plant pests and diseases was also identified as a challenge.

The participants proposed a EDRR structure at country level as shown in Figure 1.

**Figure 1: Proposed EDRR structure for plant pests and diseases**



## **Identification of Modalities to establish a plant pest and diseases EDRR Network for Eastern Africa**

The establishment of a Regional EDRR Network requires the following:

- Each member country has to identify a focal institution as well as entities handling plant pest and disease issues (such as the KEPHIS in Kenya) and her equivalent in other countries. Other interventions would be to establish modalities of both vertical and horizontal linkages.
- For effective communication, each member country has to nominate an official contact person to serve as focal technical person nominated by the responsible institution. Contact persons responsibility will be to share information through the surveillance portal. The contact person would coordinate communication within the national network. Procedures on notification need to be established and also guidelines on the information that require the governments to verify (formal communication)
- Identify Secretariat of the Network
- The existing Pest Risk Analysis Network for Eastern Africa Region could be modified to suit the needs of a regional EDRR system for plant pests and diseases.
- Network to be hosted by AU
- Surveillance including monitoring and expertise sharing.

Key Roles and Responsibilities of the regional Network:

- Access, compile and disseminate information
- Conduct training needs assessment to feed into capacity building activities
- Formulation of regional strategy for disease control
- Database management at national/regional levels
- Meetings regularly to share information – procedures, protocols etc.

Institutional arrangement of the network

- National level- responsible institution to nominate a focal person
- Coordination at regional- members will be the national representatives from each country
- Regional focal point to be nominated later
- AU to coordinate at continent level (AU and FAO will write to countries to nominate coordinator)
- Roles and responsibilities of coordinator spelt out.

Potential stakeholders of the network

Regional & international membership:

- AU-IAPSC
- ASARECA, IARCs, RECs, FAO

National level

- Training institutions
- Ministry of Agriculture
- Non-governmental and United Nation Organizations
- Farmer organizations
- Agro input dealers.

### **Session 3: Roadmap for development of a regional Plant Pest and Diseases EDRR Network for Eastern Africa**

The participants were divided into two groups and tasked to develop a regional Plant Pest and Diseases Surveillance Network for Eastern Africa. For the network to be operational, the participants pointed at the following pre-requisites:

- System must be participatory and involve key stakeholders, including the grass root communities.
- Need to create awareness about the need for the system to be in place
- Enhance the capacity of those involved in detection and surveillance
- Identify the most important pests and diseases requiring emergency preparedness
- Have a clear command structure in place
- Need for standard operating Procedures for the various actors of rapid alert system
- A dedicated service in-charge of rapid diagnostics need to be present in NPPO
- Policy that defines the guidelines for each actors of the EDRR
- Adequate funding and Regular Participatory surveillance
- Need for a functional system at national, regional and continental level.

An example of the structure used in Pest Risk analysis from the International Plant Protection Convention (IPPC) was suggested. The IPPC is an [international agreement](#) on plant health to which 180 signatories currently adhere. It aims to protect cultivated and wild plants by preventing the introduction and spread of pests. The secretariat of the IPPC is provided by FAO.

Another example given was that of FERA (UK). FERA's Plant Health and Seeds Inspectorate (PHSI) is responsible for implementing the plant health Regulations in England and Wales, on behalf of Defra and the Welsh Government. The Scottish Government is responsible for implementation in Scotland. Separate but similar arrangements apply in Northern Ireland.

FERA's PHSI, together with the devolved administrations and the Forestry Commission (FC), forms the UK Plant Health Service and works with other EC Member States and the European Commission

to agree appropriate plant health rules for Europe and co-ordinate their implementation. A range of services are available to help growers, traders and the general public meet their obligations under these plant health rules.

The meeting's participants suggested that countries would need to contribute in order to sustain the network. They agreed that it would be paramount to have immediate, medium and long term goals. The key would be to have something that is simple and get it working then it would be made more formal in the future. Worth noting is that getting funding from government continues to be a challenge. There was an urgent need to develop proposals to be presented to different partners including **FAO** and **AU**.

The participants identified the immediate, mid-term and also long term priorities as shown in Table 1. The two groups came up with models which were simplified for ease of making it operational and this is illustrated in Figure 2

**Table 1: Priorities in establishing a regional Plant Pest & Diseases EDRR Network for Eastern Africa**

Key Priorities	Immediate (1 -2 years)	Mid-term (up to 5 years)	Long term (long term beyond 5 years)
1) Development of preparedness plans	X		
2) Validation of preparedness plans	X		
3) Establish a database for existing and potential constraints effective surveillance and detection	X	X	X
4) Capacity building (human and infrastructural capacity)	X	X	X
5) Preparing the communities for food diversification		X	X

**Session 4: Stocktaking of the ongoing initiatives related to plant pest and diseases in the region, the current Maize Lethal necrotic disease in Eastern Africa**

**Paul Omanga, crops specialist at FAO Kenya presented the topic related to FAO Supported Disease Intervention Initiatives in the Eastern Africa region**

Three diseases intervention initiatives which are supported by FAO were presented: the Cassava Brown streak and Cassava Mosaic Diseases, banana bacterial wilt and MLND as below.

**The cassava Brown streak and Cassava Mosaic Disease initiative**

The cassava Brown streak (CBSD) and cassava mosaic diseases (CMD) initiative covered Eastern and Central Africa region and the objective was to restore cassava yields by reinforcing the capacity of the most food insecure subsistence farmers to prevent, mitigate, prepare for, and respond to cassava related diseases in the region. The focus was to create capacity in participating countries to detect CMD & CBSD; avail clean planting materials of disease resistant varieties; conduct surveillance & monitor the spread of CMD & CBSD; and put in place regulations to control movements of cassava cuttings to limit spread and also to complement other on-going initiatives. The initiative made great strides in terms of achievements. The following were achieved:

- Improved knowledge and disease diagnostics for sustainable management of cassava viruses and virus vectors
- Access to disease free planting materials improved
- Advanced training of research and Ministry of Agriculture staff on disease and pest surveillance through digital pen technology
- Comprehensive cassava-related disease surveys
- Disease and vector spread monitored and forecasted
- Mapping exercise and creation of maps data-warehouse.

#### **Banana *Xanthomonas* Wilt in Eastern & Central Africa initiative**

The rationale of this initiative was to build preventive and mitigation capacities of the communities whose livelihoods depend on banana and are at risk from Banana *Xanthomonas* Wilt disease on a regional and coordinated basis. The objective was to strengthen and improve coordination and planning; mobilize and sensitize communities while applying community based phytosanitary practices and facilitating effective early warning. The key achievements of this initiative were:

- Capacity building of researchers, extension and development partners on BXW
- BXW Disease surveillance and mapping
- Mobile phone technology for mapping and surveys
- Creation of maps
- Establishment of coordination platforms.

#### **Maize Lethal Necrotic Disease Initiative**

The MLND was first reported in Bomet County in Kenya in September 2010 and by June 2011 it had spread to Narok, Nakuru, Embu, Uasin Gichu, Meru and Trans Nzoia. By June 2012 the disease had been reported in 22 districts of Kenya and to over 16,000 hectares of maize was affected, with estimated loss of affected crops ranging from 60-90%. In 2012 and 2013 the disease was reported in Tanzania, Uganda, Rwanda and South Sudan. All maize commercial varieties are affected at all stages of growth. The disease is caused by concurrent or double infection with two viruses. FAO responded to the MLND problem by funding a project under its Technical Cooperation Programme (TCP). The activities will be undertaken in Kenya, Uganda, Tanzania and South Sudan and this will be joint venture with partners, namely: Ministry of Agriculture, National, Regional and International Research Institutions and Universities, National Crops Protection Departments, Public and private

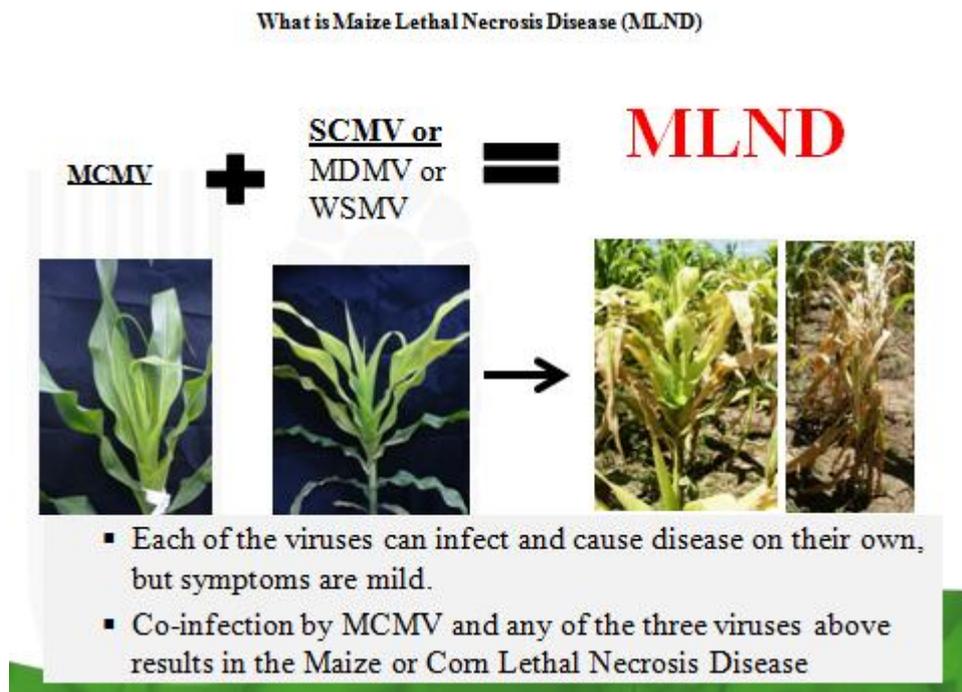
seed companies. Funding for this initiative have not been released to the implementing countries but ones implemented, the anticipated outcome of this intervention is reduced speed of spread of MLND resulting in better food security in maize dependent communities and supported strategies for future mitigation.

**George Mahuku (CIMMYT)** indicated that his centre, in collaboration with partners, has been brainstorming as to why MLND is having a devastating effect in Eastern Africa. It is believed that this is because MCMV is new to the region, there is also the possibility that there are new strains of SCMV/MDMV or the widespread cultivation of susceptible germplasm that has never been screened for MCMV. Characterization of viral populations will help to identify the strains in the region and the ongoing research will provide information on management package. Cause of the disease is shown in Figure 3 below. Interventions undertaken to date can be summarized as follows:

- Increased public awareness on MLND and management options targeting extension staff, farmers and other key stakeholders along the maize value chain. This had been achieved through use of electronic and mass media, technical publications, public forums and holding field days.
- Developed diagnostics protocols for the detection of Maize chlorotic mottle viruses (MCMV) and Sugarcane Mosaic Virus (SCMV)
- Pure cultures of SCMV & MCMV have been obtained/isolated and further epidemiological studies are ongoing. Screening trials of maize germplasm for tolerance/ resistance to MLND is on-going at Naivasha and Bomet in Kenya
- A centralised MLND facility for the region has been established on 20 Hectare land in KARI - Naivasha for MLND screening in laboratories, greenhouses and also in the field.

**Figure 3: Cause of Maize Lethal Necrotic Disease\***

\*Maize Chlorotic Mottle virus (MCMV), Sugarcane Mosaic Virus (SCMV), Maize Dwarf Mosaic Virus (MDMV), Wheat Streak Mosaic Virus (WSMV)



### **Sevgan Subramanian, ICIPE**

In response to the MLND outbreak, ICIPE has initiated research activities focusing on the virus vector. This specifically targeted characterization of insect vectors and their competencies, development of management strategies for the vectors, assess the impacts of maize - cropping patterns, habitat management and landscapes on the dynamics of the disease and the vectors, developing novel and ecologically sustainable seed treatment technologies for vector management and Explore the possibility of RNAi mediated resistance for multiple virus infections. The Maize chlorotic mottle virus is spread by several vectors and these are Corn thrips, Leaf beetles and Rootworms while Sugarcane mosaic virus is spread by Aphids.

To-date, ICIPE has accomplished the following in response to the MLND outbreak:

- Assisted KARI, NARL in diagnostics for the thrips species observed on MLND infested plants
- Conducted training of KEPHIS plant quarantine officers on identification of thrips
- Developing MLND management strategies with a focus on the use of insect vector attractants, biopesticides, intercropping and seed treatment.

The meeting's participants discussed and adopted the annexed Final Communiqué. They thanked the Government of Kenya for hosting the meeting and FAO for its funding.

## ANNEX 1: FINAL COMMUNIQUE

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The Brainstorming meeting on the Rapid Alert and Response System for plant Pest and Diseases in Eastern Africa organized by FAO in collaboration with the Inter-African Phytosanitary Council of African Union (AU-IAPSC) was held in Nairobi from 11 to 13rd November, 2013. Representatives from Kenya (MALF, KEPHIS, KARI), South Sudan, Uganda, ICIPE, CIMMYT, ICRISAT, AU-IAPSC, FAO (Kenya, South Sudan, Uganda, EMPRES AH, REOA, ECTAD) attended the meeting (Annex 2: list of participants). It was facilitated by Dr Rose Njeru.

The meeting was officially opened by Mr. Luca Alinovi, incoming FAO Representative in Kenya following remarks from the hosting country delivered by Theresia Wambui Karanja from the State Department of Agriculture Kenya, and the Director of AU-IAPSC, Mr. Jean Gerard MEZUI M'ELLA.

The objectives of the meeting were to:

- Share knowledge and experience on early warning-rapid alert, detection and control of plant and animal emergencies
- Engage collective reflection on the current status and future prospects of the plant health systems in Eastern Africa prior to developing a draft document on an Early Detection and Reporting System and proposing its functioning action plan
- Discuss the implementation of various initiatives regarding plant pests and diseases in particular the TCP 'Regional response for management and control of Maize Lethal Necrosis Disease (MLND) in Eastern Africa and the way forward
- Create opportunities for collaboration.

The proceedings of the meeting that were conducted over a period of three days enabled the participants to address the various topics highlighted in the agenda:

- Analysis of current situation: Experience sharing on rapid alert and response systems
- Structure of a Rapid alert and Response systems: elements that need to be considered; needs and challenges
- Roadmap for development of a regional Plant Pest & Diseases EDRR Network for Eastern Africa
- Stock taking of the ongoing initiatives related to plant pest and diseases in the region.

## BACKGROUND

Globalization has enormously enhanced the movement of plants and plant products across borders and some of the plants introduced have taken invasive proportions in Africa, such as striga, water hyacinth, Lantana, etc. Several introduced pests and diseases have become invasive. Examples of invasive alien species (IAS) are the larger grain borer *Prostephannus truncatus*, fruit fly *Bactrocera invadens*, the leaf miner *Tuta absoluta*, the papaya mealy bug *Paracoccus marginata*, Maize Lethal Necrotic Disease (MLND), Cassava Brown Streak Disease (CBSD), and Banana Xanthomonas Wilt (BXW). These introduced pests often spread rapidly across country borders resulting in serious

economic and environmental impacts, threatening ecosystems, indigenous biodiversity and affecting livelihoods, for food security and well-being of the communities. Introductions are more frequent and uncontrolled in countries/regions with poorly established regulatory frameworks. This affects their ability to fore warn on such introductions, detect them early and prevent their rapid spread and impact through rapid response. To assess in a harmonized way the risks associated with existing and emerging pests, a Pest Risk Analysis (PRA) scheme would be of paramount importance. It is also important to provide early warning on emerging pests and diseases to Plant Protection Services so that they can improve on import inspections and surveillance programmes. Better late than never is not a good approach for managing plant disease or pest outbreaks. A proactive approach rather than reactive is needed where networks are put in place for early warning, surveillance, detection, and rapid response to mitigate the potential outbreaks at minimal costs. The overall purpose of the Plant Pests Early Detection and Rapid Response System (EDRR) will be to provide a coordinated framework of public and private partners at the local, national, regional, continental and global levels. It will also strengthen the human and infrastructural capacities of the National Plant Protection Organizations authorities (NPPOs) of African Member States to more effectively address pest and disease threats through: early detection and reporting of plant pests and diseases to appropriate institutions; and rapid response to prevent build up and spread of emerging infestations/infections that are expected to be economically important.

A fully operational / functional EDRR system requires the following elements, so that the nations are prepared for emergencies:

- A well-developed risk warning approach
- Functional and up to date databases and data management systems
- Availability of a risk assessment framework and rapid alert systems
- Well developed and strengthen current risk surveillance activities
- Enhance surveillance, detection mechanisms and maintain laboratory readiness for rapid and accurate diagnosis.
- Availability of emergency funding that can be tapped into depending on need
- An awareness creation mechanism that targets stakeholders in the commodity value chain
- Developed and implementable procedures for preparedness and contingency planning to predict, monitor and control the spread of pest and diseases.
- Reviewed, simplified and strengthened governance and legislation
- Key skills shortages addressed.

Once fully implemented across the continent, the proposed early warning and rapid response system will provide important defense tools against invasive pests and diseases that will work in concert with national efforts to prevent unwanted introductions at the ports of entry. With both systems in place, the continent will be in a better position to defend against future economic and environmental losses.

KARI, FAO, CIMMYT and ICIPE provide an update on ongoing initiatives related to plant pest and diseases in the region.

Following fruitful discussions, the meeting adopts the following recommendations.

## **RECOMMENDATIONS**

- 1) Considering that (i) plant pests and diseases are a threat to crop production and productivity, trade, environment, food security, human health and livelihoods; (ii) a well established early warning and rapid response system at national level critical to address plant pests and disease; (iii) the ongoing efforts in the various countries to establish sustainable, rapid and alert response system, **the meeting recommends** that Member States NPPOs take necessary action to establish / strengthen a functional early warning and rapid response system involving the key stakeholders at national level with the support of relevant regional and international organizations.
- 2) Considering that a number of plant pests and diseases are transboundary, the meeting recommends that countries develop adequate and appropriate policies, legal framework and strategies, that need to be harmonized/ standardized at regional level
- 3) Considering that a well functioning early warning system requires effective surveillance and monitoring the meeting recommends that Member States commit adequate funding and other resources to improve existing activities related to surveillance, response, monitoring and reporting.
- 4) Considering the need to harmonize the early warning and response mechanism at country level the meeting recommends Member States to ensure that their mechanism take into consideration the chart presented in Figure 1.
- 5) Considering that any delay in providing appropriate response to plant pests and disease outbreak can lead to devastating consequences to food security and livelihoods the meeting recommends by that Member States comply with ISPM6<sup>2</sup> in particular by linking a rapid response mechanism to early warning.
- 6) Considering the ongoing efforts to better control plant pest and diseases at country level and the need to better coordinate and harmonize these efforts at regional level the meeting recommends to establish a regional surveillance network in Eastern Africa starting initially with the following countries: **Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Tanzania and Uganda**. The meeting also recommends to AU-IAPSC and FAO to explore the possibility to extend this initiative to other regions in order to establish a comprehensive continental network.

In establishing this regional network, the meeting agrees to consider the following steps:

1. FAO and AU-IAPSC to share the meeting report with the Member States NPPOs by 15<sup>th</sup> December 2013

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<sup>2</sup> International Standards for Phytosanitary measures number 6

2. FAO and AU-IAPSC to facilitate the mapping of the key stakeholders involved in plant pests and diseases surveillance, monitoring, detection and response
  3. Uganda and Kenya to draft TOR and Modus Operandi of the regional network to be shared with other countries and relevant regional and international partners by end of December 2013
  4. Member States NPPOs to nominate a country focal point for early warning rapid response by February 2014.
- 7) Considering that different database or information systems are in place (INFONET-BIOVISION, PLANTWISE KNOWLEDGE BANK, EAPIC<sup>3</sup>, IPP<sup>4</sup>, CABI<sup>5</sup>, FAO COUNTRY STAT) the meeting recommends to conduct a rapid assessment on the relevance of information provided and establish a more comprehensive database on plant pests and diseases adapted to regional needs.
- 8) Considering that early warning system requires functional regional laboratory (ies) in providing accurate diagnosis, the meeting recommends the following:
1. CIMMYT/ ICIPE to establish the profile of existing national and regional laboratories and identify the list of laboratories that can provide adequate plant pests and disease diagnosis for the Eastern Africa countries
  2. Member States consider to establish a reference laboratory within the region with the support of relevant regional and international organizations.
9. With regard to the current MLND the meeting appreciates ongoing effort from FAO, CIMMYT, KEPHIS, KARI, NARO, ICIPE, NPPOs and others to address the disease and recommends that FAO expedite the immediate implementation of the regional TCP on MLND at country level
10. Considering that a modern MLND screening facility has been established at KARI Naivasha to serve African countries, the meeting encourages member countries to submit maize germ-plasm for evaluation. CIMMYT and KARI will communicate the details to interested parties. Member states also encouraged to visit the facility to learn about the MLND
11. Considering that there are gaps in terms of MLND epidemiology in particular transmission mechanism (seeds, mechanical and vectors), host plant resistance, the meeting recommends that research needs to be focused on understanding this and its implication in the MLND management

### **Acknowledgement**

The participants thank the FAO for the support extended during the preparation and the conduct of the meeting and the hosting country, Kenya.

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<sup>3</sup> East Africa Phytosanitary Information Committee

<sup>4</sup> International Phytosanitary Portal

<sup>5</sup> Commonwealth Agricultural Bureau International.



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