

## Short Research Activity (SRA):

Developing and emergency response and long term management strategy for Cassava Mosaic Virus in Cambodia and Vietnam



January 15, 2018

Vientiane



# About SLCMD and its arrival in SE Asia

Wang et al., 2015.  
Plant Disease



plant disease

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Posted online on March 4, 2016.  
<http://dx.doi.org/10.1094/PDIS-10-15-1228-PDN>

DISEASE NOTES

## First Report of *Sri Lankan cassava mosaic virus* Infecting Cassava in Cambodia

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Citation

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**ABSTRACT**

Cassava (*Manihot esculenta* Crantz) production can be severely affected by cassava mosaic disease (CMD) caused by viruses in the genus *Begomovirus* of the family *Geminiviridae*. Eight begomoviruses associated with CMD have been recorded on the African continent and two on the Indian subcontinent (Brown et al. 2015). Duraisamy et al. (2013) reported that two cassava geminiviruses on the Indian subcontinent—*Indian cassava mosaic virus* and *Sri Lankan cassava mosaic virus* (SLCMV)—were transmitted by the whitefly *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae), but the genetic group(s) or cryptic species of the whitefly responsible for the transmission were not determined, as *B. tabaci* is now known as a complex consisting of >35 morphologically indistinguishable species (Liu et al. 2012). Cassava cultivation in Southeast Asia started in early 1900s, and today it has become one of the major crops in many countries in this region including Cambodia (FAOSTAT). However, cassava in Southeast Asia has not previously been identified to be infected by CMD. In May 2015, a virus disease outbreak of cassava with infected plants showing typical symptoms of CMD was observed in the field in Ratanakiri, KaunMoum,

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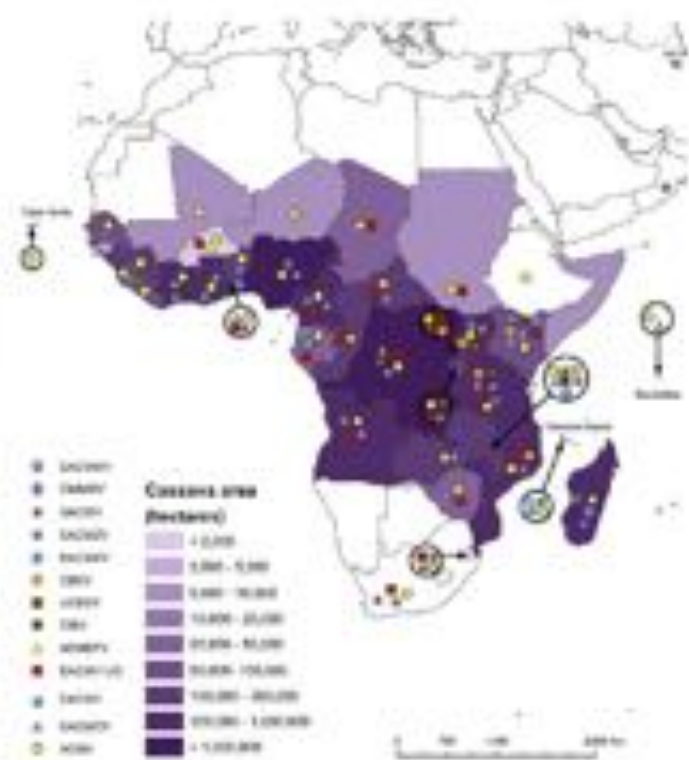
Focus Issue

Noncoding RNA Regulation of Plant-Microbe Interactions

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# Global distribution viruses – late 2015

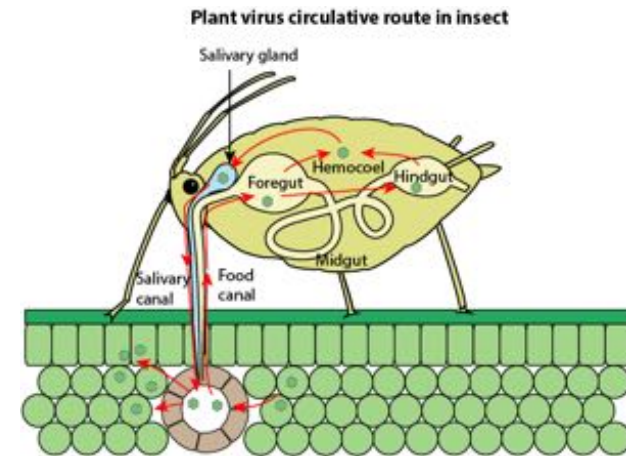


# Vectoring: two main mechanisms



## Human-mediated movement

Long-distance disease spread  
Between-field movement  
Most important driver of spread



## Insect-mediated movement

Short-distance disease spread  
Within-field movement  
Presumably of lesser importance

# Laboratory-based confirmation SLCMV presence

Report shared with Cambodian authorities & FAO on March 8, 2016

Planning Workshop SRA, 2016



Sharing of Findings Workshop, 2016



# Overview SRA

## **OVERALL OBJECTIVE:**

- Gain an in-depth appreciation of the current level of geographical spread, incidence and severity of the SLCMD in Vietnam and Cambodia, and to develop an overarching framework to guide further applied research and action towards SLCMD containment and management

## **SPECIFIC OBJECTIVES:**

- Generate an accurate, baseline diagnosis (including map) of the current geographical distribution of SLCMD in Cambodia and Vietnam (including measures of field-level incidence and severity) and baseline information on the insect / anthropogenic vectors involved in SLCMD spread
- Generate broad-level awareness of the risks posed by SLCMD and to build critical capacity among multiple stakeholders, including researchers, plant protection officers and extension agents, to deal with disease.

# Activities – SO 1

1. Organize a multi-stakeholder workshop to share current knowledge and plan implementation of the SRA
2. Develop a survey and sampling protocol following a customized sampling design
3. Train a survey team in the implementation of the baseline diagnostics surveys
4. Implement the baseline diagnostics surveys and conduct extensive plant sampling and vector information
5. Conduct centralized data entry and data cleaning of the completed diagnostics and vectoring surveys
6. Conduct centralized disease diagnosis on cassava leaf and insect samples
7. Conduct statistical analysis, generate maps and draft a working paper on the baseline situation of the SLCMD geographical incidence, severity / incidence, and direction of spread, as well as disease vectoring

# Activities – SO 2

1. Develop information-extension materials on SLCMD, its symptoms and management for public or private sector actors
2. Organize a technical training on sampling protocols, laboratory-based diagnostics and recommended post-baseline-diagnostics surveillance
3. Elaborate a focused strategy document for sector-wide sensitizing with actions, research needs or targeted biosecurity measures, based on the baseline diagnostics to devise SLCMD management / mitigation plans
4. Organize a multi-stakeholder (closing) workshop to share the project's finding and present / discuss a strategy for the short, mid- and long-term





# What makes this SRA unique?

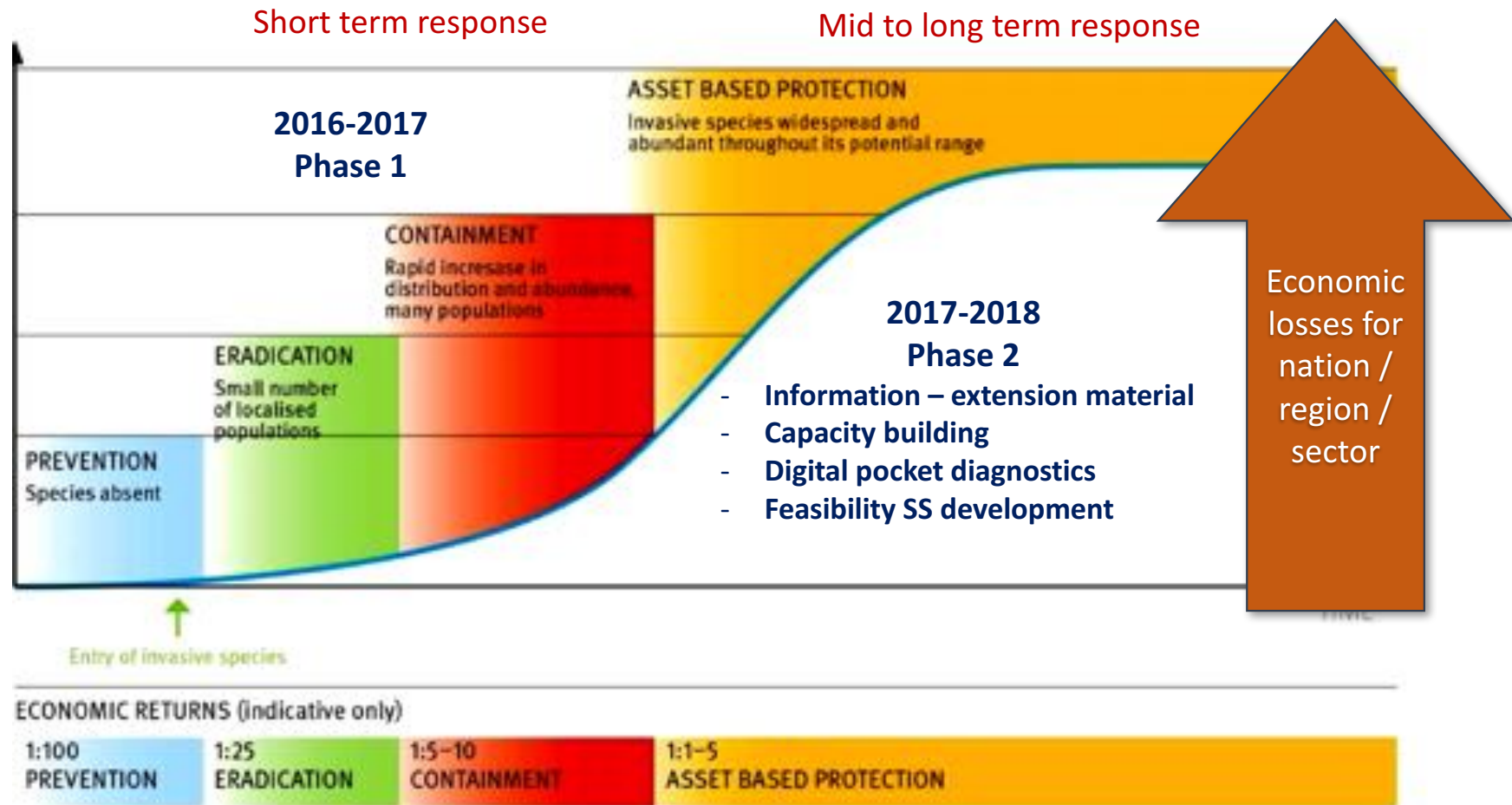
- Short duration and 'to the point' activities
- Wide range of stakeholders consulted and involved
- Involved multidisciplinary team (young researchers taking a lead)
- Involved two countries (and attracted a third)
- First robustly designed and geographical representative survey
- Use of published primers and uniform protocol / lab facility
- Tight link between disease surveillance and seed systems studies
- Picture database of each sampled plant and georeferencing

# CIAT's Role

- Provide science-based evidence and solutions
- Support regional intelligence (i.e. spatial / temporal monitoring, south-south learning)
- Participate in and contribute to national and regional / platforms that deal with / strategize about the problem / solution
- Backstop collective action to deal with the complex problem of emerging diseases
- Enhance national capacity and extension where demanded



# From short to mid / long term responses






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