



# **Characterizing economic and health impacts of Aflatoxin contamination**

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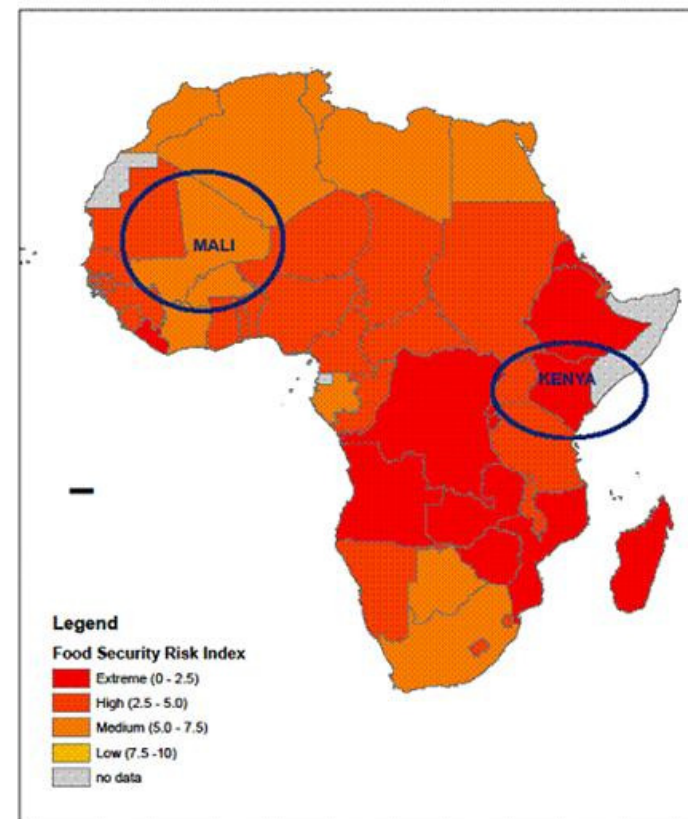
# **AFLACONTROL: Exploring the Scope of Cost-Effective Aflatoxin Risk Reduction Strategies in Maize and Groundnut Value Chains to Improve Market Access and Health of the Poor in Africa**

- ✿ International Food Policy Research Institute
- ✿ International Center for the Improvement of Maize and Wheat
- ✿ International Crops Research Institute for the Semi-Arid Tropics
- ✿ University of Pittsburgh
- ✿ Uniformed Services University of the Health Sciences
- ✿ ACDI/VOCA/Kenya Maize Development Program
- ✿ Kenya Agricultural Research Institute
- ✿ Institut d'Economie Rurale
- ✿ The Eastern Africa Grain Council

## **Project GOAL:**

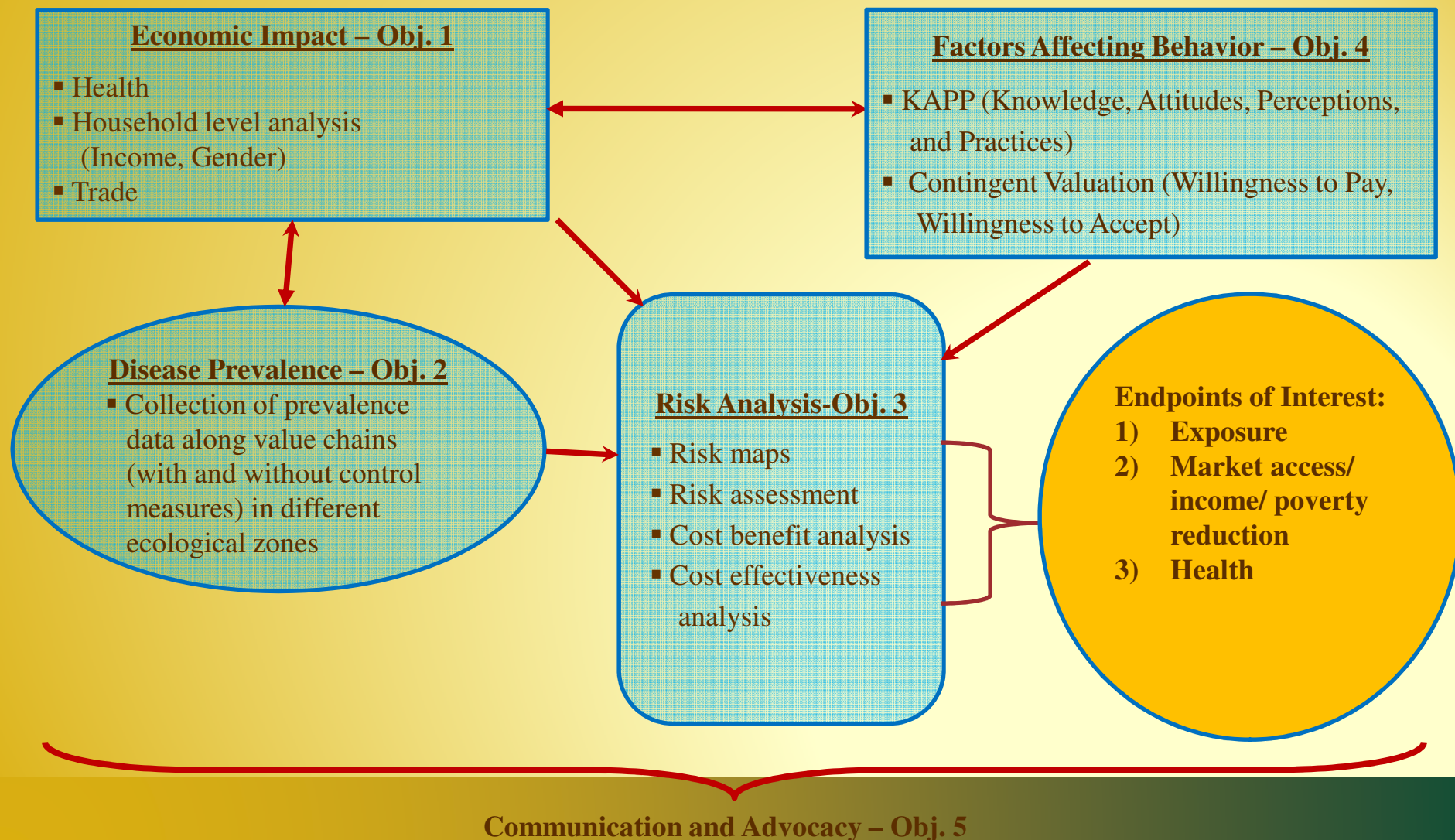
To identify pro-poor cost-effective aflatoxin risk-reduction strategies and to suggest interventions that ensure high rates of adoptability along value chains.

AFRICA - MAP OF FOOD SECURITY\*



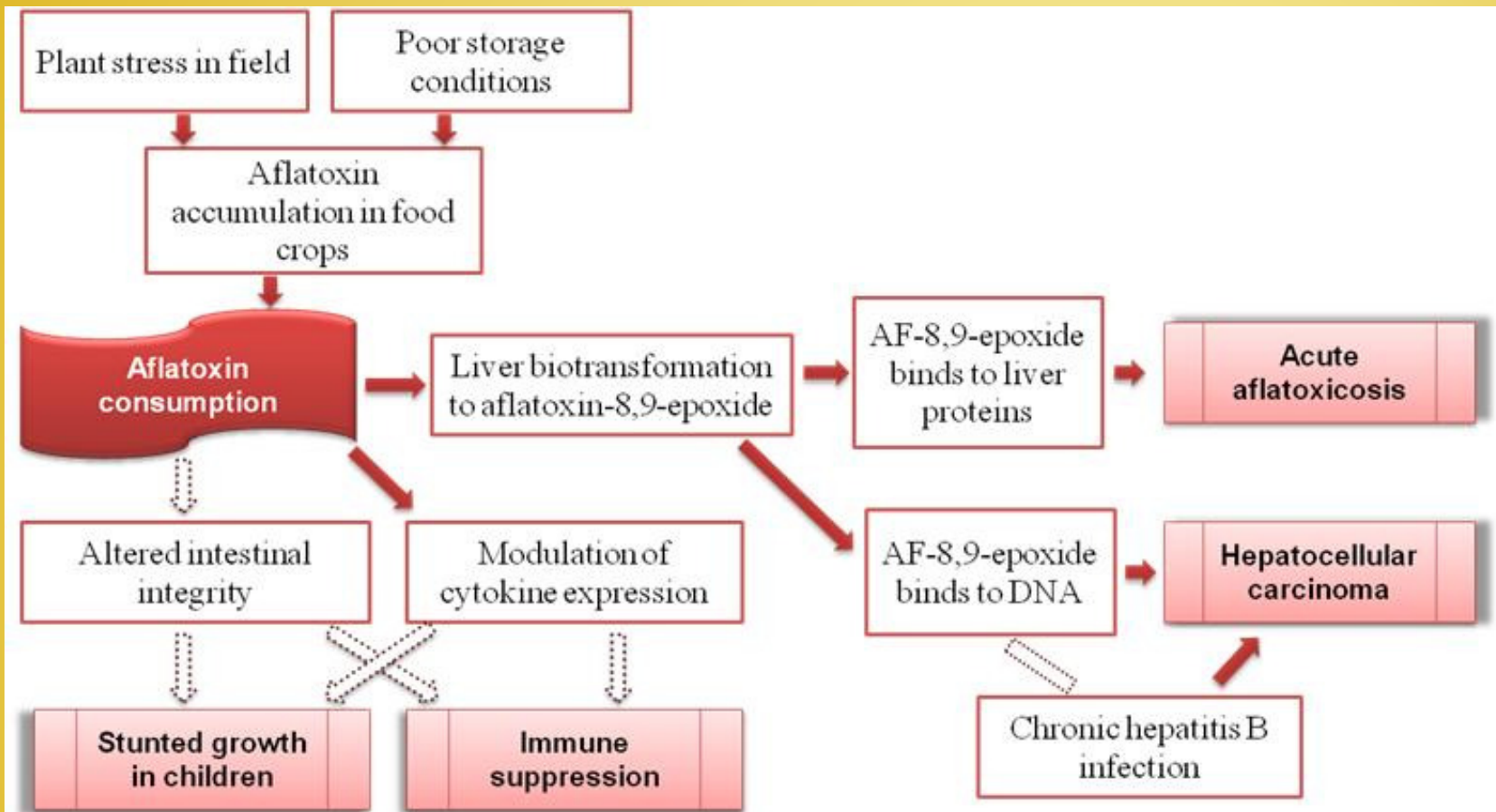
\*Adapted from Global Risks, Maplecroft (2009)

# Project Objectives





# Health Impacts



The darker arrows identify linkages that have been well-established in agricultural and toxicological research; the white arrows denote linkages that have been relatively less well-established (Wu 2010)

**Center for Disease Control has estimated that more than 4.5 billion people in developing countries are chronically exposed to aflatoxins in their diets.**

**Liver cancer incidence per 100,000 in Kenya and Mali, IARC  
GLOBOCAN 2008)**

<b>Nation</b>	<b>Male</b>	<b>Female</b>
<i>Kenya</i>	8.5	4.9
<i>Mali</i>	19.4	8.8
<i>North America</i>	6.8	2.2
<i>Europe</i>	6.5	2.2

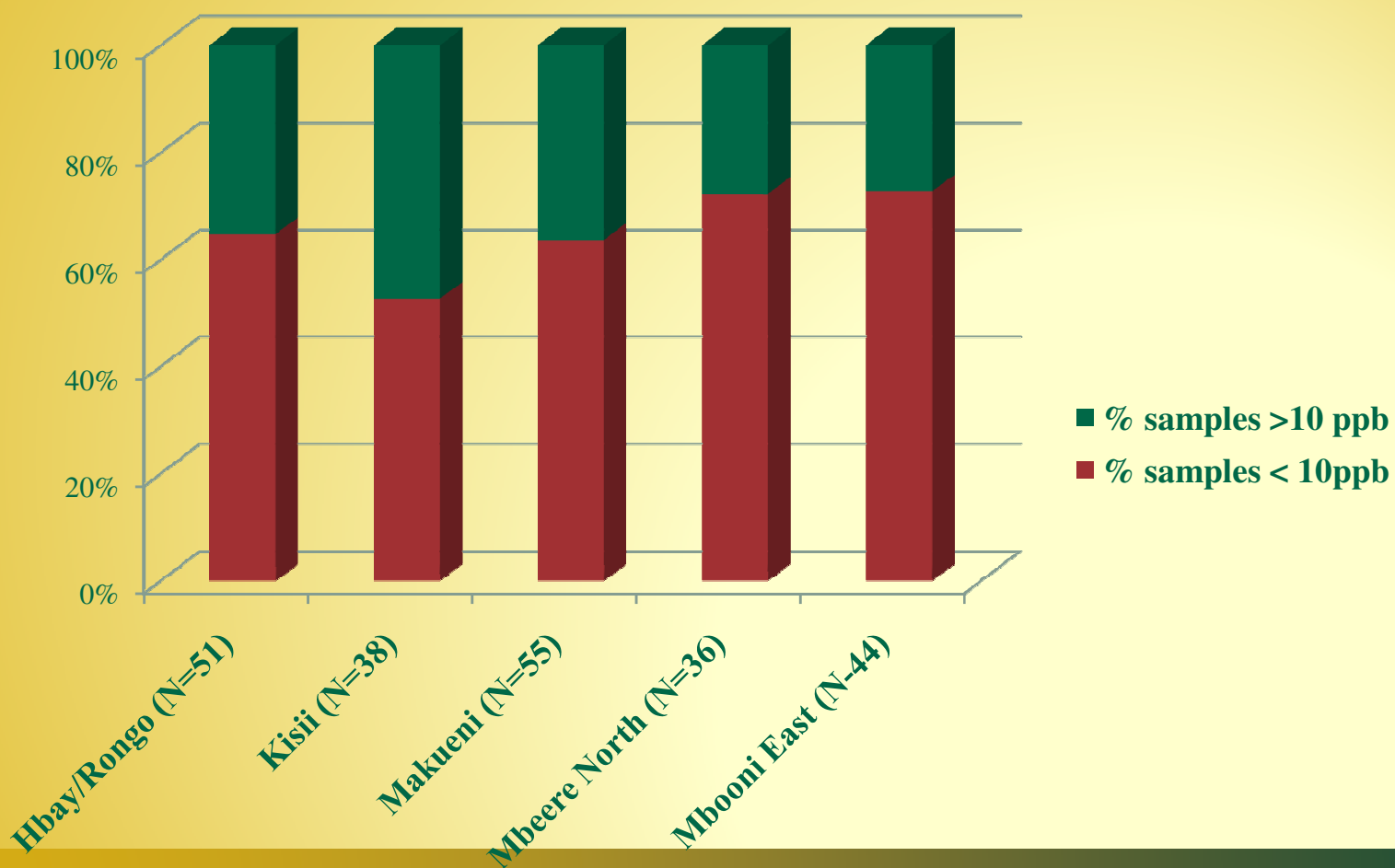
**Global number of DALYs associated with aflatoxin-induced liver cancer cases worldwide ranges from 328,000 TO 2 MILLION PER YEAR.**

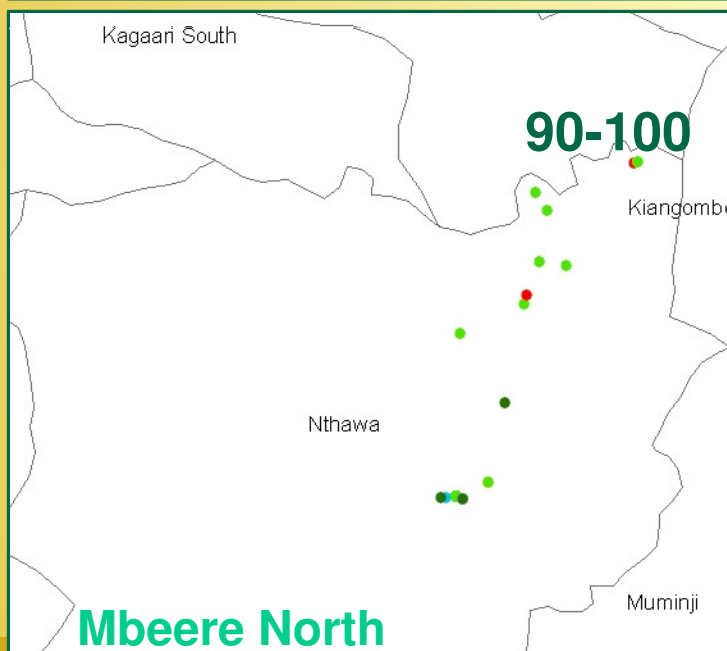
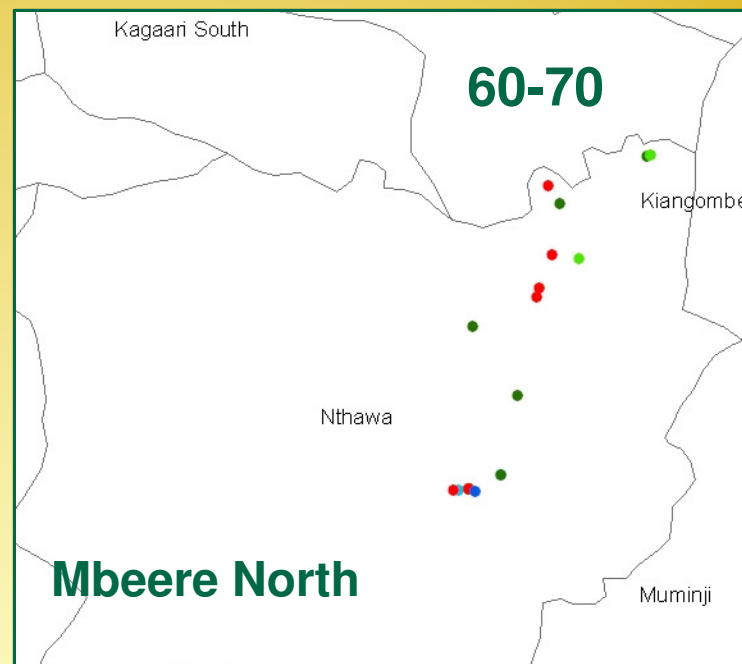
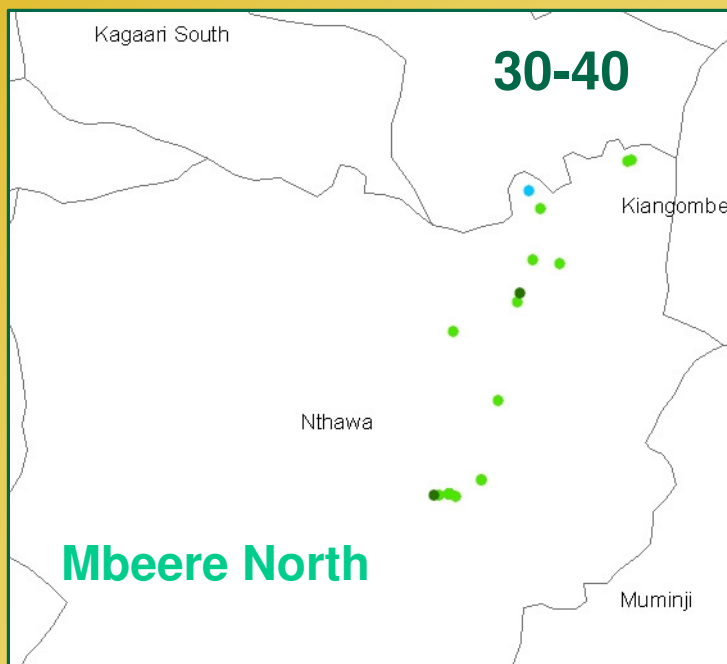
**In Africa alone, the estimated burden associated with aflatoxin-induced liver cancer ranges from 130,000 TO 500,000 DALYS PER YEAR.**

**Wu et al., in press.**



# ***Percent of maize samples from farmer fields with aflatoxin levels above and below 10ppb, (Jan – Feb 2010)***

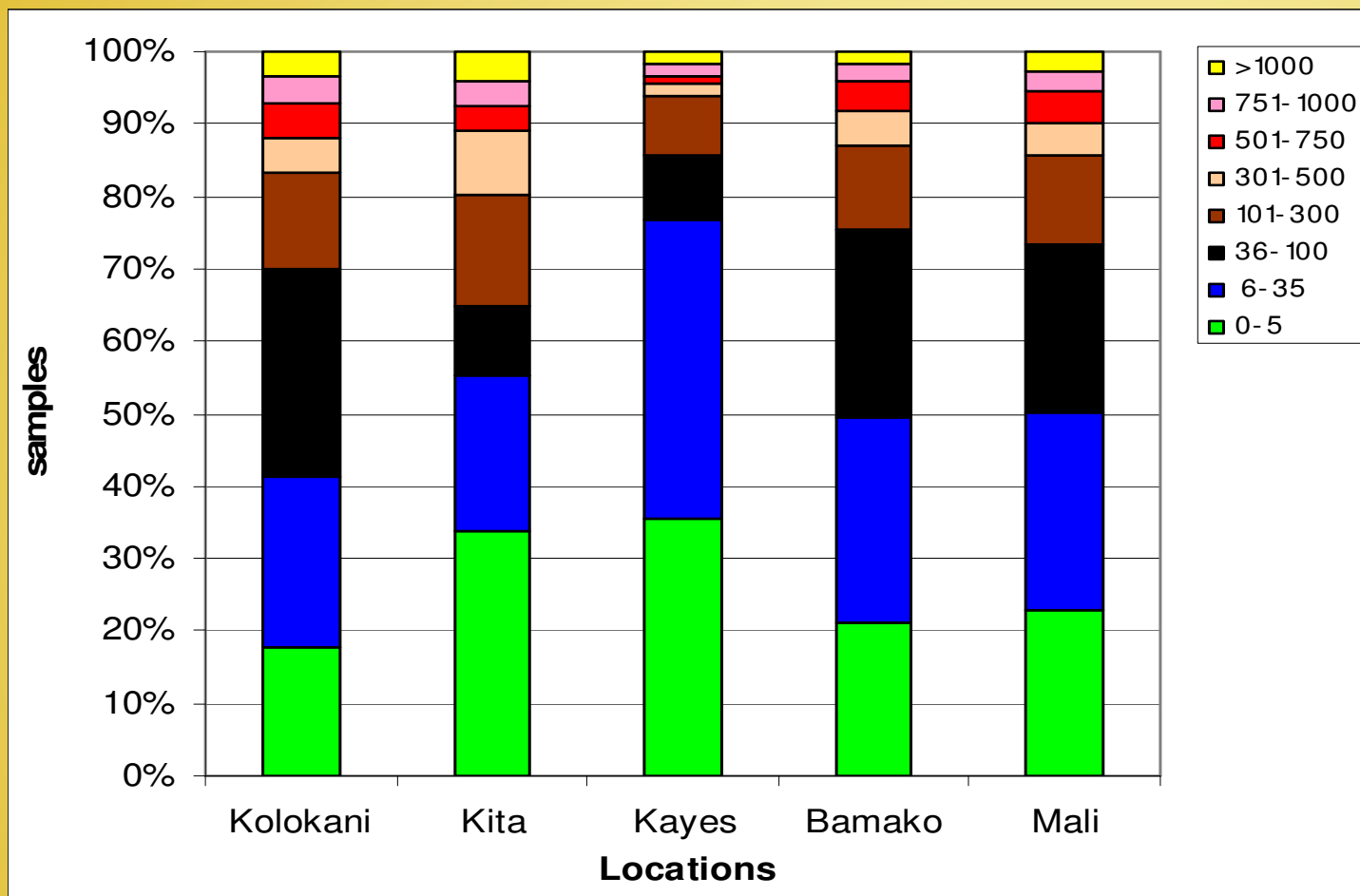




**Most maize not from original stock, but sourced from market**

- 0 - 10
- 10 - 100
- 100 - 200
- 200 - 300
- > 300

## Distribution of aflatoxin content ( $\mu\text{g/kg}$ ) range in groundnut and its products value chain across locations and country



Source: Waliyar et al., 2010

# Market impacts

- International
  - Lost markets
  - Alternative markets – feed markets
  - Real issue “at home”
- National
  - Market failures – no testing, no premium, home consumption
  - Potential premium markets associated with local sourcing by WFP etc.
  - Lack of alternatives in food insecure areas
  - How to evaluate these losses?

# Willingness to pay

**The contingent valuation method is used to capture farmers' and other value chain actors' WTP for "hypothetical" aflatoxin control technologies**

- Improved seed that reduces the risk of aflatoxin
- Drying maize off the ground (tarpaulin)
- Plastic silos
- Metal silos
- Bio controls

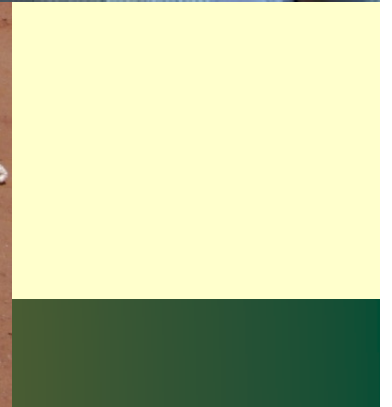


**BDM Auction among farmers is used to assess the willingness of farmers as consumers to pay a premium for maize that has been certified as aflatoxin-free**

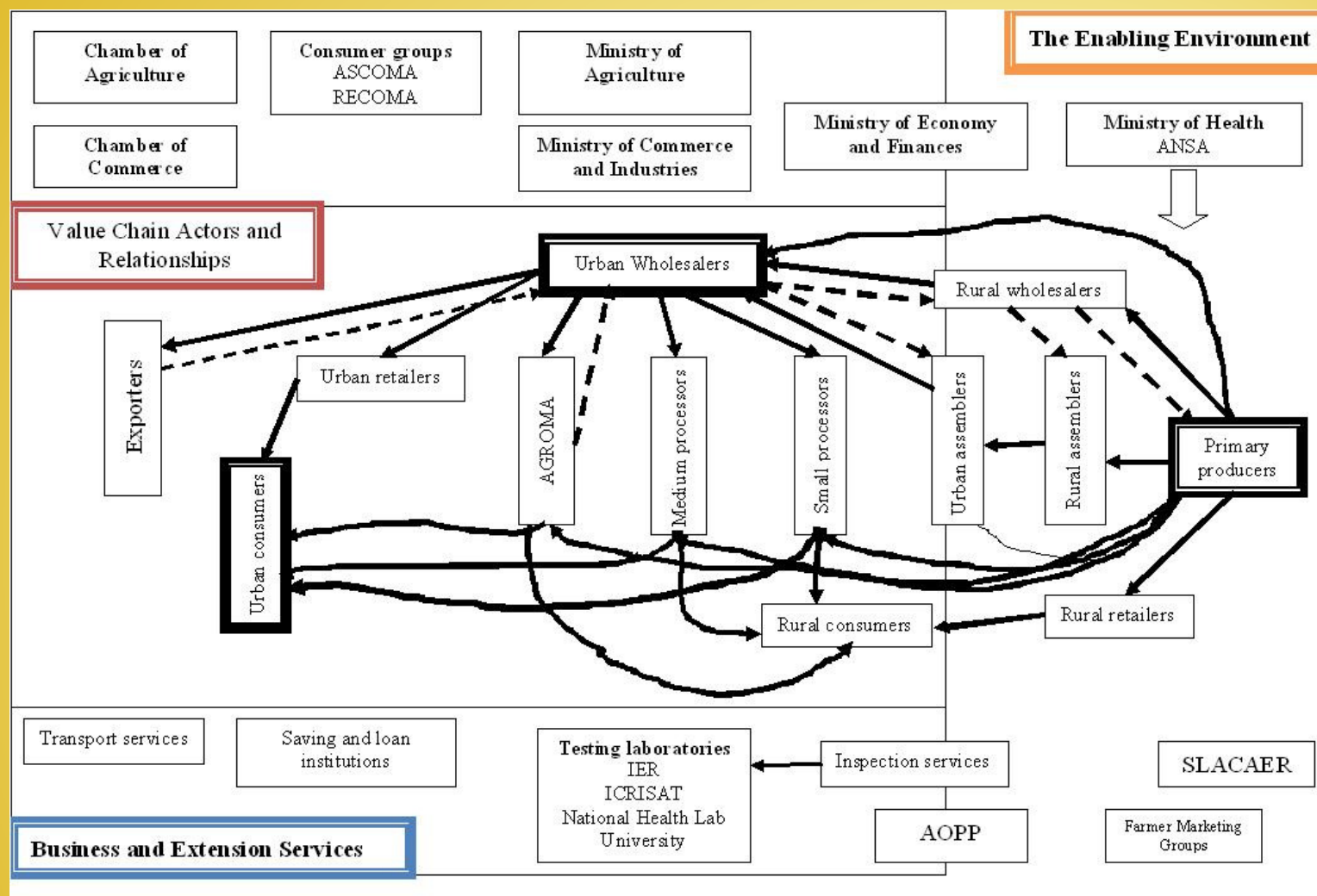
**Evaluation of risk mitigation strategies: Cost-benefits and cost-effectiveness analysis of different technologies to reduce aflatoxin contamination**



# KAP influence decisions to take actions to reduce risks



# Institutional complexity of the market and value chain actors - Mali





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## FOOD SECURITY



Finance minister Uhuru Kenyatta (right) Internal Security minister George Saitoti (second left), permanent secretary Francis Kimemia (left) and Prof Nick Wanjohi (second right) chat after addressing the media at Harambee House yesterday on the existence of 25 million bags of contaminated maize. Photo/HEZRON NJORGE

## National alert over poison maize

By LUCAS BARASA

A major alert has been issued over the presence of 2.3 million bags of poisonous maize in the country.

And the Government yesterday banned the transportation of the contaminated maize within and

outside 29 affected districts.

President Kibaki chaired a high-powered ministerial team on food security at his Harambee House office before Agriculture Minister Sally Kosgey sent out the health alert.

"The government wishes to announce that we are facing a health

threat as a result of there being high levels of aflatoxin contaminated maize in Eastern Province and parts of Coast Province," Dr Kosgey announced.

Aflatoxin is a fungus that affects

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# MARKET/HEALTH IMPACT

- **Market loss** occurs when:

- Food IS monitored for aflatoxin: Buyers pay lower prices for or reject contaminated food (developed nations, local or international trade)
- Animals become sick from aflatoxin consumption



- **Health loss** occurs when:

- Food IS NOT monitored for aflatoxin: Dangerous levels enter food supply

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“Food security exists when all people at all times, have physical and economic access to sufficient, **safe** and nutritious food to meet dietary needs and food preferences for an active and healthy life.”

(FAO, 1996 – Rome Declaration of the World Food Summit)



2011

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