



Report on the Inception Workshop

Nairobi, Kenya, March 27-28, 2009

STRUCTURE

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Exploring the Scope of Cost-Effective Aflatoxin Risk Reduction Strategies in Maize and Groundnut Value Chains so as to Improve Market Access of the Poor in Africa

In 2008 the International Food Policy Research Institute (IFPRI) in partnership with International Maize and Wheat Improvement Center (CIMMYT), International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Catholic Relief Service, ACDI-VOCA, University of Pittsburgh, and US Uniformed Health Service, have developed a framework to investigate present challenges and opportunities for preventing Aflatoxin in maize and groundnut in African countries for the benefit of poor farmers. Bill and Melinda Gates Foundation had kindly agreed to provide funding for Research Project “Exploring the Scope of Cost-Effective Aflatoxin Risk Reduction Strategies in Maize and Groundnut Value Chains so as to Improve Market Access of the Poor in Africa”.

The **aim** of this project is to increase knowledge of available methods and technologies to reduce Aflatoxin contamination, their effectiveness, costs, benefits and to identify constraints to their adoption and appropriate incentives needed to ensure their use along the maize and groundnut value chains so as to improve market access of the poor. Project will contribute to an economic benefit of smallholders’ trade in local markets and it will also add to health benefits of smallholders and their families who consume most of their own maize and groundnut.

A multi-disciplinary research team is working to accomplish five goals:

- 1) Estimate the economic impact of aflatoxin contamination on market access and livelihoods, trade, and health;
- 2) Produce a consistent and technically sound database on aflatoxin prevalence in selected sites in study countries and the effectiveness of control strategies;
- 3) Use a risk analysis framework to
 - a) develop risk maps based on predictive models that identify high risk areas within study countries for aflatoxin given climatic conditions;
 - b) conduct a risk assessment of baseline risk and how control measures alter that risk;
 - c) conduct a cost-effectiveness analysis of risk management methods for reducing aflatoxin prevalence so as to provide insight into the decision-making process;
- 4) Conduct primary surveys of maize and groundnut value chain actors to investigate
 - a) awareness, attitudes, perceptions and knowledge regarding aflatoxin, and
 - b) willingness to pay for various testing and effective control technologies to reduce aflatoxin prevalence
- 5) Make information available so as to inform the decision-making process.

Objectives of the workshop

This stakeholder/inception workshop was organized by the International Food Policy Research Institute (IFPRI). The purposes of this workshop were to:

- introduce and discuss the project to the key stakeholders
- present and discuss the proposed research approach
- discuss stakeholders' view on the project and other ongoing work related to the topic, and
- map the value chain of groundnut sector in Mali and maize sector in Kenya

Participants

The stakeholder/inception workshop was very well attended by a wide array of stakeholders from the maize industry, Kenya and Mali NARS, international research organizations, and NGO's. A detailed list of participants and their contact details is presented in Appendix A.

Summary of the workshop

Workshop was held for two days in Nairobi Safari Club, Nairobi, Kenya. 40 participants attended the workshop. First day of the workshop stakeholders made presentations of their works, projects, and studies. Second day of the workshop project team presented the project activities to stakeholders, which were followed by discussions. In the afternoon of the second day the net-mapping exercise of groundnut and maize sectors was taken in separate groups.

The first day of the workshop started with welcome notes from project leader, Clare Narrod and self-introduction of participants. Felicia Wu, University of Pittsburgh, made presentation about economic and health impacts of aflatoxin. Specifically she talked about different existing approaches for controlling aflatoxin contamination (bottom-up and top-down); links between liver cancer and aflatoxin, Hepatitis B and aflatoxin, effect of aflatoxin in immune system disorders and stunted growth in children; ways for testing for aflatoxin exposure; current levels of aflatoxin regulations in various countries and in particular stringent EU regulation and its impact on trade and health in developing countries; and possible interventions to control for aflatoxin contamination (agricultural, dietary, and clinical). Presentations were followed by lively debate and active discussion. Among the issues raised were the EU stringent regulations, EU strategy in assisting developing countries to meet these regulations and the rationale behind it; awareness of consumers and farmers in the developing countries of aflatoxin problem; full utilization of maize (which may be aflatoxin-contaminated) in households in developing countries.

Next, representatives of grain traders made their presentations. Bridget Okumu, EAGC, made presentation about newly established grain trading system that operates in the East African countries, Uganda, Tanzania, Zambia, South Africa, and Kenya, and explained what types of services EAGC provide. Kevin Manyara, Lesiolo Grain Handlers Limited, talked about his company, grain quality standards at the warehouse and services the company offers to farmers, and about problems company faces when

dealing with farmers – high cost for testing that limits small-scale producers to use Lesiolo services, massive lack of awareness/information among farmers on aflatoxin and the ways it can be mitigated (harvest time and post-harvest technologies). These presentations raised vivid discussion among other participants of the workshop on issues related to cost of testing, grain drying technologies and its storage.

Zippy Mbatia, World Food Program – Kenya, made brief presentation about WFP activities in Kenya, such as school feeding, providing food in refugee camps, and emergency distribution. Aflatoxin became an issue for the WFP since they started purchasing grain from local producers. Another concern for the WFP is supporting small-scale producers. WFP is launching several projects aimed at more active engagement of small-scale farmers.

Clare Narrod, project leader, presented project overview and project activities to stakeholders followed by presentation from donor representative, Diana Grusczyński, who talked about Gates foundation, its vision and agenda. The two presentations were followed by vigorous discussion among the stakeholders. Many comments were targeted at specific project activities, such as use of data from existing databases and methods of testing for aflatoxin.

In the second half of the day representatives from ACDI/VOCA, Kenya Agricultural Research Institute, Food Science Australia, CDC, AVISC, IITA, Peanut CRSP, AATF, and Mali NARS made presentations on their experiences related to aflatoxin research and management.

Steve Collins, ACDI/VOCA, talked about Kenya Maize Development Program, its activities, achievements, problems they faced and future activities. Sila Nzioki, KARI, reported several studies that KARI had done on issues such as factors triggering aflatoxin contamination, grain storage practices, and post-harvest techniques. John Pitt, Food Science Australia, talked about biocontrol approach in controlling the aflatoxin contamination in the soil. Yanique Redwood, CDC, presented a case-study of the effect of having rapid screening tool to prevent the outbreaks in greater scale. Gerald Mumma, AVISC, reported results of study that looked at the cost-effectiveness of home testing for aflatoxin. Ranajit Bandyopadhyay, IITA, made an extensive presentation of organization and numerous projects focusing on aflatoxin issues that IITA was involved in the past. Jonathan Williams, Peanut CRSP, talked about diminishing attention international organizations and governments put on aflatoxin issues and briefly presented results of his studies that looked at the links between aflatoxin and HIV, underweight in children and malaria correlation. Rebecca Nelson, Cornell University, and Vivian Hoffmann, University of Maryland, made presentation of the expected pilot project on aflatoxin contamination in maize in Kenya. Francis Nang'ayo, AATF, talked about efforts that AATF is making to bring-in and distribute aflatoxin biocontrol technologies among farmers in Africa. Ondie Kodio and Bamory Diarra, Mali NARS, briefed the audience about the aflatoxin contamination levels and exposure in peanuts in Mali.

On the second day of the workshop project team presented expected research activities. In the afternoon the net-mapping exercise of peanut sector in Mali and maize sector in Kenya was conducted with active engagement of stakeholders. Next section presents discussions followed from research activities' presentations. Section VI presents summary of net-mapping exercises.

Discussion on project objectives

Below is the summary of presentations made by project team on research activities.

a. Economic consequences of aflatoxin

Activity 1.1: Economic Impacts.

- Conduct a value chain analysis and network mapping to identify key stakeholders in the value chain network; understand their roles with respect to management of risk; assess losses in the value (price) of maize and groundnut; identify bottlenecks, inefficiencies, and constraints or high risk areas along the value chain and assess control mechanisms
- Conduct qualitative and quantitative data analysis. Qualitative work will lay groundwork for the quantitative work.
- Data needs: household asset inventory; livestock assets, demographic characteristics; household human capital data; household food consumption patterns; KAPP of risk

Activity 1.2: Economic costs and formal trade losses

- Study the rigid standards and the barriers on trade (imposed by developed countries)
- Generate table of expected economic losses due to the impact of Aflatoxin on international trade
- Economic impact on human health (Felecia and Clare) – construct a health economic model and model the probability of health outcomes, looking at HCV HBV, liver cancer, stunting, and immunosuppression
- Estimate cost for human health and mortality from Aflatoxin consumption and run sensitivity analyses to see what is driving.

Participants raised few concerns regarding the activities. These are:

- Estimation of DALYs in study countries can show the impact of aflatoxin on health in Kenya and Maize
- There is a need for stronger rationale for the use of Gravity model in trade study
- Data collection procedure needs to be explained in greater detail

b. Disease risk and effectiveness of control strategies

Activity 2: Production of a consistent database on Aflatoxin prevalence in selected sites in the study area and effectiveness of control strategies along maize and groundnut value chains.

- Project is not developing new technologies.
- Aim is to fill the gaps in current knowledge.

- Evaluate the efficacy of intervention strategies. Identify which technologies are suitable for individual farmers.
- Collect prevalence data along the value chain. Data will be merged with data from other colleagues.
- Data to be collected: From farmer's field at harvest (once a year for groundnuts, twice for maize), drying method (once a year), storage methods (15-30 day interval), Market (every month – assemblers, wholesalers, retailers, consumers)
- Methodology: random draws of 1kg from containers, bags, etc will be done. Measurements on the level of Aflatoxin will be performed using ELISA test kits. Both ICRISTAT and CIMMYT will use the same techniques.
- Demonstration of pre-and post-harvest technologies to farmers (application of gypsum, application of manure, cereal crop residues for groundnuts; conservation agriculture for Maize)
- Sampling method for bags, post harvest, sample from three places on top, middle, and bottom. Work plan details will be worked out with NARS.
- Collect data on where or not the crop is a woman's crop – often have less access to irrigation.

Participants raised few issues regarding the activity. These are:

- Need to involve the National Grain Board in Kenya (National Cereals and Produce Board).
- Need to look at the local brews – that's where the poor quality grain goes.
- Tom Whitaker – has written papers on sampling methodology of Aflatoxin. We will grind 1 kg and sample 100 grams.
- The best technologies are known – what is important is to determine the cost effectiveness of the technologies.
- Need appropriate sample size to determine statistical significance of the different technology options.
- Families in Kenya put their maize into a community bank (larger farmer) and withdraw from his or another store. Farmer has no control over his exposures nor the storage methods. Most small farmers sell immediately what they grow and slowly buy it back from a larger farmer. Need to fully understand what the farmer's practices are in order to understand the options for controlling the problem.

c. Risk analysis to identify cost-effective control strategies for reducing aflatoxin risk

Activity 3.1 Predictive modeling of high risk areas for aflatoxin

- Generation of digital maps of areas that may have problems with aflatoxin
- Using field data acquired at harvest, three and six months after harvest models and risk maps will be developed

Activity 3.2 Risk analysis of the value chain

- A predictive model based on a risk assessment of how the prevalence of aflatoxin varies as the product goes through the value chain
- Cost-benefit model of risk management options

- Cost-effective models to determine the risk trade-offs of control methods with costs of both risk management options as well as health outcomes

Participants made few comments on these activities. These are:

- Need to use national weather data for creating digital maps

d. Perceptions of stakeholders regarding adoption of control strategies along supply chains

Activity 4: Investigate value chain Actors' KAPP and estimate their willingness to adopt and their willingness to pay to implement preventive methods

- Identify gaps that may result in increased risk
- Identify the main factors that impact the risk; identify the most efficient and effective means/media to inform actors along the value chain
- Planned outputs: detailed maps of the groundnut and maize value chains showing the critical (high risk) actors; informing stakeholders including Ministries of Agriculture and Health, private sector, AGRA, etc.

Participants raised the following comments regarding this activity:

- There is concern about how little farmers currently know and expect them to make the leap of understanding their individual risk and willingness to pay for prevention.
- **Farmers don't have the where with all to be able to pay for interventions not clear.** Instead government interventions will be needed.
- There are public health interventions such as grinding clay into maize flour that can be implemented.
- Farmer's willingness to pay for Aflatoxin resistant maize/drought resistant maize – if they are educated about the risks- would be worth investigating.
- Communication of the risk is challenging. Important to identify WHO is at risk – risk to the farmers/producers, risk to the consumers, etc.
- Only 10% of farmers are not involved in both the consumption and production of the maize.
- There is concern over exploring the impact of aflatoxin contaminated food on urban consumers.
- Need to involve regulators as well. A study done in late 1990s found important information.

e. Advocacy and communication

Activity 5: Communication and Advocacy

- Quarterly roundtable discussions/meetings in countries.
- Hold national workshops, one per country; dissemination of messages
- Tailoring website info and research findings into media messages (local newspapers)
- Dissemination of research findings on a limited scale. Tailoring the message at each level will be very important.
- AGRA and others will take up the advocacy piece/ awareness campaigns.

- This is a basic research project to fill in the gaps. Findings will be distributed in fact sheets as soon as possible.

Participants raised the following concerns and comments regarding this activity:

- In Mali, awareness is much less than in Kenya, since people aren't dying of acute aflatoxicosis in Mali.
- There is concern for keeping the website updated
- Website should have
 - Discussion board where people can post comments and links to other research – portal
 - Blog for engagement was suggested.
- Suggestion to present this project at the Aflatoxin conference in Australia in order to generate more discussion and dialogue
- Link project website to the website of other research organizations that are involved in aflatoxin research (database of literature)