

Final

Report of the Partnership for Aflatoxin Control in Africa (PACA) Workshop



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Executive Summary

Background

Aspergillus flavus, a fungus commonly found in soils and on grain and legume crops, produces “aflatoxin”, a highly carcinogenic toxin. According to the United Nations Food and Agriculture Organization (FAO), 25% of world food crops are affected and countries situated between the 40°N and 40°S are most at risk. Aflatoxin contamination is often not appropriately controlled or regulated within the African continent unless the product is exported into global markets. As a result, millions of people living throughout the continent are chronically consuming high, unsafe levels of aflatoxin through their diets. Beyond affecting crops, aflatoxin also has negative impacts on the production of healthy livestock through contaminated feed, causing a decrease in milk and egg yields, toxic residues in dairy, meat and poultry products, and serious illness to animals. Due to improper post-harvest handling and inadequate storage conditions coupled with high levels of on-farm consumption of grains and legumes, the smallest producers, their families and their livestock are at the greatest risk.

Chronic aflatoxin ingestion has been shown to cause liver disease and, in high concentrations, death in both humans and domestic animals. Aflatoxin is strongly linked to immune-system suppression, increased susceptibility to diseases, and growth retardation, notably stunting. According to the US Center for Disease Control and Prevention (CDC) about 5 billion people in the developing world are chronically exposed to dangerous levels of aflatoxins through their diet. This is especially relevant for the populations of Africa due to their maize-based diet and high consumption of groundnuts and other legumes. In summary, aflatoxin contamination is a public health and food safety issue as well as a concern for animal health.

In March 2011 at the 7th CAADP Partnership Platform meeting in Yaoundé, Cameroon, African leadership requested that the African Union Commission (AUC) explore a Partnership for Aflatoxin Control in Africa (PACA) and link it to the Comprehensive Africa Agriculture Development Program (CAADP) process. Following this, at the tenth annual Africa Growth and Opportunity Act (AGOA) Forum in Lusaka, Zambia the USG announced that \$12 million of FY11 USG funds from Feed the Future and the United States Department of Agriculture (USDA) had been designated to support aflatoxin programs across Africa to strengthen the PACA priorities. It is anticipated that this funding will be complemented by other public and private funders.

The Partnership for Aflatoxin Control in Africa (PACA) aims to be an innovative, Africa-owned and led consortium to coordinate aflatoxin mitigation across the health, agriculture and trade sectors of Africa, serving as a holistic model for a multisectoral solution. It will be embedded within existing African institutions and is aligned with the CAADP process to leverage existing continent wide harmonization efforts.

The PACA convened its first organizational planning meeting under the auspices of the AUC in Nairobi, Kenya on October 3-4, 2011 sponsored by USAID. Forty-one participants representing AUC member countries, regional economic communities (REC), trade organizations, donors, NGOs, farmers’ organizations, the private sector, and technical experts attended. The workshop

was divided into five sessions: Welcome, Introduction and Background; The CAADP Framework; Aflatoxin Contamination; Critical Pathways for Aflatoxin Control; and Operational Structures for the Partnership. The agenda provided for comprehensive discussions covering a range of relevant technical and administrative topics required to further the timely establishment of a fully functional PACA and set the stage for continuing stakeholder coordination. The momentum achieved to date marks significant progress towards addressing this formidable public and animal health, agriculture and trade issue.

Plenary Session Proceedings

Welcome, Introduction and Background

After providing a brief technical backdrop for the workshop, the CAADP technical advisor noted that due to high proportions of maize and groundnuts in the diet, Africans were at significant risk, as were grain-fed livestock. The complexity of aflatoxin control and abatement systems was noted due to the cycle of drought, poverty and food insecurity coupled with low technology on-farm storage and postharvest handling (PHH) methods. These conditions increase the risks of both acute and chronic aflatoxin consumption among small producer households, which comprise a majority of consumers in Africa. The multisectoral nature of successful aflatoxin abatement, requiring interventions across public health, agriculture and trade was noted. The economic consequences both in terms of the human cost, as well as losses in the agricultural trade sector were highlighted.

Aflatoxin in the CAADP Framework

The CAADP COMESA sanitary and phytosanitary (SPS) advisor reiterated the four CAADP pillars and described the linkages between the Pillars and regional and national subcommittees:

- Pillar I. Extending the area under sustainable land management and reliable water control systems;
- Pillar II. Improving rural infrastructure and trade-related capacities for improved market access;
- Pillar III. Increasing food supply and reducing hunger; and
- Pillar IV. Agricultural research, technology dissemination and adoption.

It was noted that Pillars II, III and IV provided the best conduits for aflatoxin control and abatement activities. While Pillar II currently has SPS mechanisms in place for the integration of aflatoxin, and Pillar IV is ideally positioned to envelop biocontrol and post-harvest handling (PHH) protocols, significant capacity building within Pillar III was needed to adequately address the impacts of aflatoxin on food security, health and nutrition. The CAADP framework supports the mandate of the PACA to build upon existing structures while simultaneously offering significant breadth and depth to develop, disseminate and adopt regionally harmonized SPS for aflatoxin in foods and feeds across the continent.

Aflatoxin Contamination

The AUC SPS Food Safety specialist discussed characteristics of the food production, processing and supply chain which would continue to pose challenges to aflatoxin control. Cereal-based diets (corn, millet and sorghum) are the norm across the African continent. Coupled with high levels of consumption of groundnut and beans health risks were exacerbated. As 80% of the grains and legumes produced and consumed remained at the household level or were traded within informal markets, creative strategies outside of the formal CAADP Framework to ameliorate the aflatoxin problem for a majority of producers and consumers will be required. The economic necessity for small producers to sell their best quality grains and legumes and consume those of inferior quality was an additional risk factor for aflatoxin consumption in Africa. Lastly, the frequent reintroduction of contaminated food into the supply chain was noted as a significant public health risk for humans and for animal health. The need for increased investments and improvements in food quality assurance was noted.

The following were highlighted as major institutional and knowledge constraints to aflatoxin control:

- Inadequate pre and postharvest technologies to reduce mold growth conditions in Africa, leading to a very conducive environment for aflatoxin.
- An absence of robust epidemiological systems across the continent to adequately document and describe the impacts of both acute and chronic aflatoxin consumption on morbidity and mortality, including liver disease for humans and low productivity and mortality for animals.
- Throughout Africa, food safety policies and consumer awareness programs are weak.
- Quality control practices along the value chain were weakest for lower income consumers.

Critical Pathways for Aflatoxin Control

The presenter proposed that regional and country specific road maps for action be drafted to address aflatoxin issues. The presenter mentioned that the Tripartite Agreement of EAC, COMESA and the Southern Africa Development Community (SADC) to merge their trade regulations, harmonize standards, develop common policies, and cooperate on enforcement and compliance, and build mutual capacity would provide numerous windows of opportunity for aflatoxin control activities. Within these structures actions could be prioritized and resources mobilized. This configuration would encourage both horizontal and vertical communications and coordination among member States and allow the PACA to take a strong leadership role. It was noted that participation of the Economic Community of West African States (ECOWAS) was also a critical element to achieve a successful and inclusive PACA.

Operational Structures for the Partnership

The structure of the Partnership for Livestock Development, Poverty Alleviation and Sustainable Growth in Africa (ALive) was described as a possible model for the PACA structure. This included three categories of members: international, African continental and institutional, including executive members, observers, experts and invitees from each of these. In addition to permanent members there were four caucuses: African organizations, donors and international organizations, research, technical and trading organizations and civil society. The platform and governance structure is supported by a Secretariat and decisions are made by consensus or a simple majority. Eight areas for further discussion on how to best structure the PACA were subsequently put forward by the attendees:

1. Identify the leadership structure, configuration of a Board, a steering committee and the necessary technical support teams.
2. Indicate how these structures would intersect, be integrated and be coordinated.
3. Suggest the stakeholder representatives, e.g. private sector, farmer organizations, civil society.
4. Discuss the coordination of countries, regions, and RECs to achieve a comprehensive continental approach.
5. Establish the parameters for an interim body to formalize the PACA.
6. Consider the possible need for sub-groups to assess proposals for funding in the future.
7. Determine the appropriate advisory entities and how they would be integrated into the formal PACA structure.
8. Propose the working relationship between the PACA and established policy and regulatory groups.

Coordination, Roles and Responsibilities

The PACA Structure

The PACA will support the mainstreaming of aflatoxin issues into the CAADP process and SPS activities at regional and bi-lateral levels. The PACA may have opportunities to inform resource allocation and conduct monitoring and evaluation activities.

Continental Responsibilities

At the continental level, there was consensus that there would be a Steering committee and a Secretariat.

The Steering Committee will provide policy direction and strategic guidance; promote dialogue among partners to ensure synergy; address overlapping roles and gaps of RECs; mobilize resources and conduct fundraising; and make decisions on Africa-wide initiatives and projects. One or more expert committees will provide technical guidance at the continental level, and technical advice on Africa-wide proposals and projects, to inform Steering Committee decisions.

The Secretariat, to be housed in the AUC, will support the Steering Committee; promote communication linkages between the different PACA structures; and develop an Africa-wide website.

In order to further develop the continental structure and establish a permanent Steering Committee, it was decided to immediately form an interim Steering Committee. The following persons were nominated to serve on this interim Steering Committee:

- AUC: Boaz Blackie Keizire
- RECs: ECOWAS & COMESA (then two on a rotational basis as needed)
- Farmers Organizations: East Africa Farmers Federal & Africa Farmers Federation Representatives
- Private Sector: Alex Ariho, ExcelHort, Uganda LTD
- Civil Society: Rene Alphonse, ROPA
- African Research & Academia: Abigael Abdura, CDC; Another Rep TBD
- Implementing Partners: Nancy Muchiri, African Agriculture Technology Foundation
- Development Partners: USAID's CAADP DP TT Chair Jeff Hill or designee Jennifer Maurer

Regional Responsibilities

At the regional level, aflatoxin programs will be supported by the RECs and the CAADP coordinating units. The regional entities will have the unique role to serve as the coordinator between the PACA and country programs. They will take a leadership role in the harmonization of regulations, standards and compliance across all sectors affected by the aflatoxin problem.

National Responsibilities

National priorities will be developed by appropriate stakeholders and government representatives but be closely aligned with the PACA and regional priorities. PACA activities should be linked to CAADP implementation at country level. PACA activities should strengthen existing CAADP Coordinating Units and complement existing resources.

Technical Discussions & Recommendations

Health & Nutrition

Participants suggested a three track approach to address health and nutrition issues:

1. On the ground programs and projects with quick start up time.

2. Operational research which blends the collection of data with interventions.
3. Pure research to answer important questions on the impacts of chronic consumption and gather epidemiological evidence over the medium to long term.

In the health sector, the initial focus of the PACA should be on farm household consumption, consumers supplied by the informal sector, and low income households who are at the highest risk of both acute and chronic aflatoxin consumption.

Participants identified a number of possible actions, including:

- Establish an expert technical panel on adoption of Hepatitis A & B vaccinations to ameliorate the impact of aflatoxin on liver disease related morbidity and mortality.
- Develop and disseminate a model integrated training curriculum for community health and agricultural extension workers, health professionals, social scientists and the private sector.
- Develop regionally harmonized standards for foods.
- Integrate aflatoxin control and awareness activities into World Food Programme (WFP) school gardens and other school based health and nutrition interventions.
- Consider the development of nutritionally sound dietary diversity strategies to reduce the proportion of high risk cereals and legumes in the African diet.
- Identify health and nutrition best practices to minimize aflatoxin exposure and analyze their application to the African setting.

Agriculture & Trade

CAADP Pillar III can play an important role in accommodating aflatoxin and the cross-sectoral linkages between food security, nutrition and agriculture.

Similar to the need to focus on small producers (see above), the PACA should focus on quality control among small millers, who process up to 80% of total cereals consumed through the informal trading systems across the continent.

Participants identified a number of possible actions, including:

- Commission a series of policy and technical briefs to inform key decision makers at the continental, regional and country levels.
- Consider alternative uses for commodities unfit for human or animal consumption.
- Strengthen SPS systems through the CAADP process, RECs and national regulatory agencies.
- Develop harmonized standards for food and feed to promote inter-regional trade and improved food security.
- Encourage the identification of eco-zones for the development of biocontrol of aflatoxins at the farm level.
- Strengthen laboratory testing capacity and develop standardized sampling and testing protocols, and affordable user-friendly testing technologies.

- Develop education and awareness programs for key actors in the value chain, from “farm to fork.”
- Develop models to predict aflatoxin outbreaks based on weather patterns, crop cycles and other variables.
- Develop low cost post harvest handling, drying and storage techniques to minimize aflatoxin contamination.
- Pursue crop research to explore aflatoxin resistant species.

Next Steps

Participants agreed on the following next steps:

- Present recommendations of October 3-4, “The Nairobi Consensus”, at three key November 2011 meetings:
 - AUC planning meeting in Dar-es-Salam
 - The CAADP Planning Platform meeting in Dar-es-Salam
 - The Interministerial meetings on infrastructure and market access in Kigali.
- Develop procedures to disseminate The Nairobi Protocol to West Africa, including translation to French.
- Convene the interim Steering Committee as soon as possible, preferably in Southern or West Africa to promote equitable participation among regions between now and February 2012.
- Take steps to establish the PACA-AUC Secretariat and permanent Steering Committee by April 2012.
- Commission a paper to inform the Steering Committee on the key issues in human and animal health, agriculture and trade related to aflatoxin in the African context.
- As a priority, launch the development of a comprehensive PACA strategy which coordinates pan-African, regional and country level actions as designated by the permanent Steering Committee.

Conclusion

The Nairobi Consensus represents a significant step forward toward the formation of the PACA Secretariat and the permanent Steering Committee. Based on this successful meeting, we anticipate the formal launch of the PACA in early 2012. While fully recognizing the enormous challenges ahead, participants remain committed and enthusiastic about continuing to pursue the next steps, and to transform the knowledge and recommendations from this initial planning session into tangible actions, policies and programs for aflatoxin control throughout the African continent.

Report of the Partnership for Aflatoxin Control in Africa (PACA) Workshop

1. Introduction

The Partnership for Aflatoxin Control in Africa (PACA) workshop was organized by USDA, USAID, AU-DREA and AU-IBAR with the aim of facilitating the establishment of a PACA coordination body for Africa. The workshop was divided into five sessions. The workshop took place at AU-IBAR, Nairobi, Kenya on the 3rd-4th October 2011.

Forty one (41) participants attended the workshop (see Annex 1), drawn from the African Union (AU), Regional Economic Communities (RECs), Member States (MS), private sector, development partners, civil society organizations, farmers' organizations, technical experts and research institutions.

The purpose of the workshop was to bring together key aflatoxin (AFL) stakeholders to contribute to the development and design of a comprehensive, Africa-owned and led partnership for the holistic management of AFL across Africa. This report presents a summary of the deliberations of the PACA Workshop, and focuses on the definition of the interim operational structure for organizing and coordinating support for AFL control programmes and recommendations for the consideration of the decision making authorities.

2. SESSION I: Welcome, introductions and background to the workshop

2.1 Welcome and introductions

The workshop facilitator, Dr. Simplicie Nouala, the AU-IBAR, Chief Animal Production Officer, appreciated the participants and called upon them to introduce themselves. To break the ice, participants were asked to sit next to someone they did not know and get to know then then each participant introduced their neighbor. He further asked them to note their expectations of the workshop (see Annex 2).

On behalf of the Chairperson of the African Union Commission, His Excellency, Dr. Jean Ping, and that of the Commissioner for Rural Economy and Agriculture, Her Excellency, Madam Rhoda Peace Tumusiime, the Director of AU-IBAR – Prof. Ahmed Elsayalhy – welcomed the participants to the first meeting of stakeholders on the Partnership for Aflatoxin Control in Africa. He acknowledged the presence of key stakeholders among them the representatives of African Union Member States (MS), representatives of the Regional Economic Communities (RECs), colleagues of the African Union Commission (AUC), representatives of development partners (USAID and Bill and Melinda Gates Foundation), private sector, civil society organizations, technical experts and research institutions

In his speech, the Director outlined the purpose of the workshop as to: develop a PACA framework and strategic guidance, discuss and establish an interim Steering Committee, and to establish a process for streamlining important decisions with regard to the control of AFL in Africa.

He further emphasized the important role played by the Seventh Comprehensive Africa Agriculture Development Programme's Partnership Platform (CAADP-PP), which underscored the need to address the threat of AFL to consumers and economies in Africa in an integrated and holistic manner. CAADP PP had urged the AUC and the NEPAD agency to oversee the establishment of a continental SPS working group to mainstream SPS matters in the CAADP framework, and establish an African-led and African-owned partnership for AFL control. He underscored the importance of the workshop in developing and designing a coordination mechanism that reduces the impact of AFL in the world's agricultural and livestock production, enhances the health of consumers, promotes trade, augments smallholder income and enhances food security.

The Director officially opened the meeting and wished the participants fruitful deliberations.

2.2 PACA Origination

Mr. Boaz Blackie Keizire, CAADP Technical Advisor, African Union Commission set the scene by thanking the AU-IBAR Director, the Planning Committee and the attendees for making the meeting a reality.

He pointed out that AFLs are highly poisonous cancer-causing toxins produced by a fungus, which affects 25% of the world's agricultural production. An estimated 4.5 billion people in the developing world are chronically exposed to dangerous levels of AFL through diet, undermining public health and food security. The fungus, which infects crops before harvest in the field, spreads as a result of poor drying and storage, particularly in maize and groundnuts. AFLs also affect sorghum, cassava, yam chips, cotton seeds, cocoa, copra, livestock feed and oils and prevents them from meeting international agricultural trade and food safety standards.

The CAADP Technical Advisor further pointed out that in sub-Saharan Africa, where maize and groundnuts are essential staple foods, AFL poses a major public health risk leading to chronic health problems and malnutrition, the largest burden being linked to liver cancer, with 40% of the cases. He emphasized that AFL is a cross-cutting issue that has significant adverse effects not only on human health and food security, but also on animal health, income generation and trade.

He further said that since 2009, there had been various meetings and workshops designed to highlight the AFL problems and consider solutions. These include meetings at the International Institute for Tropical Agriculture (IITA), United States Department of Agriculture (USDA), World Bank, European Union, the Gates foundation, and the CAADP PP. In all the meetings, the core challenges have been identified and in particular the complexity of the problem and the lack of coordination. This made it increasingly clear that an African-led coordination body was required to coordinate the various efforts to addressing the problem. This is particularly important because AFL contamination is a multisectoral problem, there are many African countries, each has its own regulations and farmers are often compelled to consume the contaminated food due to the prevailing

droughts and food security problems on the continent. Mr. Keizire appealed to participants to “think partnership”, come to the table without any pre-conceived ideas, and discuss issues from a free mind in an open and transparent manner.

2.3 Workshop Objectives and Outcomes

At the CAADP PP in March, 2011, African stakeholders requested the AUC to explore an African-owned and led partnership for AFL control in Africa. Considering the lack of coordination in Africa, and the low magnitude of working with AUC organs, there was need to form PACA and link it to CAADP. The objectives of the PACA workshop were to bring to fruition the development of an interim Africa-owned and led operational structure for organizing and coordinating the activities on AFL control in a holistic manner, and to make recommendations for an operational structure and the way forward for PACA.

The Workshop Outcomes sought included:

- Clearly delineate the relationship between AFL → food safety → SPS → CAADP and where a PACA would support those relationships;
- Provide recommendations of an operational structure for the PACA that:
 - coordinates AFL mitigation activities and progress;
 - describes the delegation of responsibilities over the next 12 months
- Establish an interim PACA steering committee to lead important decision making processes;
- Complete a survey of AFL activities across Africa to enable partners to coordinate activities, define priorities and develop roadmaps.

2.4 Workshop Process and Programme

Meeting methodology and process

The workshop was facilitated and included a range of activities to foster maximum contribution from all stakeholders. As indicated in the programme (Appendix 2), the methodology incorporated plenary sessions, group discussions and question-and-answer sessions. The bringing together of African leadership and technical development partners contributed to the development of a dynamic African framework, linked to the CAADP, that will coordinate AFL issues in health, agriculture and trade to promote food security in Africa.

3. SESSION II: CAADP Framework – mainstreaming SPS issues within CAADP – focusing on aflatoxin

AFL management in relation to the CAADP framework (mainstreaming SPS issues within CAADP-focusing on AFL)

The presentation by Ms. Martha Byanyima, CAADP Regional Process facilitator/SPS expert, COMESA Secretariat focused on how PACA and SPS issues could fit into the CAADP framework.

She outlined the four CAADP pillars (1. Extending the area under sustainable land management and reliable water control systems; 2. Improving rural infrastructure and trade-related capacities for improved market access; 3. Increasing food supply and reducing hunger; and 4. Agricultural research, technology dissemination and adoption), and the implementation structure and explained the developments that led to the decision to streamline SPS issues into CAADP in relation to AFL. Further, she emphasized the need for a partnership to address AFL control in Africa, using appropriate tools available and bearing in mind the countries and regional diversity.

Ms. Byanyima emphasized that the issue of AFL, and hence PACA fitted mainly in pillars 2, 3, and 4, needed to be coordinated at the AU level, with multi-sectoral regional and national SPS committees which take into consideration trade, agriculture and health issues. The national SPS committees link to regional SPS sub-committees. She emphasized regional priorities as harmonized regulatory frameworks for food safety and effective national food control systems to mitigate risks such as aflatoxins. The regional sub-committees meet annually to outline regional issues, while bearing in mind national priorities.

Food safety systems, institutional set-ups at regional levels, harmonization of AFL across the regions and alert systems have been set up and linked to regulatory, certification and laboratory systems, but this is not credible. Besides, data on AFL, that would include the level of human exposure and techniques that mitigate the AFL process has not been well documented by researchers.

The main challenges to control of AFL include addressing the AFL problem; implementing solutions; use of existing mechanisms available at country, RECs and the AUC to coordinate and harmonize policies; and the use of AUC system to coordinate continental mechanism. Other key challenges include: effective coordination at all levels (including regulatory aspects and policy and actions), prioritization and resource mobilization (funding and technical resource).

The presenter concluded that there was need for coordination of AFL issues and appropriate policy. There is a need to implement aflatoxin control programmes with RECs, who are the CAADP implementers and could ensure SPS priorities are well articulated in the National CAADP Investment Plans, for resource mobilization from key stakeholders, including the private sector.

4. SESSION III: Aflatoxin Contamination

4.1 The size of the problem

Complexity of AFL control and the need for a holistic approach

Dr. Sarah Olembo, Technical Expert, SPS-Food Safety –AUC/DREA outlined the size of the problem of AFL by pointing out that most diets in Africa were cereal-based and poor in nutrition, with maize being the major staple (consumption standing at 200-500g/person/day). Sorghum is present in various countries such as Botswana, Namibia and Zambia, while millet, groundnuts and beans are also consumed.

Health impacts

Statistics presented by Dr. Olembo indicate that approximately 4.5 billion people (about 1/2 of the world's population) are chronically exposed to AFL in varying degrees, most of them in developed countries. Citing a World Bank study, she stated that 98% of individuals in ten West African countries tested positive for dangerous levels of AFLs. About a 1/3 of all maize stores in sub-Saharan Africa contain concentrations of AFL that are higher than the allowable health safety limit for most countries (20 ppb). Further, a study carried out between IITA and Leeds University found that the height gain of children under 5 years infected in Benin and Togo was reduced by one quarter. In Kenya, between 2000 and 2008, AFL killed about 265 people, out of which 124 died in 2004. The effect on human health in Africa is compounded because AFL-free foods tend to be exported, while AFL-contaminated foods dominate the local food chains instead of being destroyed.

AFL Entry into the food chain

Dr. Olembo noted that most food produced by subsistence farmers never gets into food marketing chains, and much of what enters the local marketing chain is traded informally with little quality control measures. Good food is sold for cash, whereas contaminated food is consumed by the farmer / households or used to brew local beer. In some cases, crop failure leads to the consumption of contaminated foods.

Major constraints in AFL control and prevention

- Inadequate pre-and post-harvest technology to reduce mould growth conditions in Africa leads to conditions conducive to AFL.
- Inadequate documentation of cancer cases/registries and reporting mechanisms.
- Inadequate policies on food safety and consumer awareness programs.

Addressing the problem

AFL is a food safety and trade issue that requires an inter-disciplinary approach; national, regional and international collaboration; mainstreaming in policies and programmes; and resources and investments in projects to improve food quality and access to markets.

Mainstreaming in policies and programs

In a CAADP PP meeting held in Yaoundé in March 2011, whose objective was to deepen the understanding of the impact of AFL on food safety, health and nutrition, the AUC and NEPAD were requested to oversee to the establishment of a continental working group on SPS to mainstream SPS matters in the CAADP and to establish an African-led partnership on AFL control-PACA.

The presenter pointed out that policies mainly protected rich countries, and emphasized that contaminated food usually dominated the lower food value chains because it did not get destroyed, and that diversion of AFL contaminated food to the poor led to death. She stated that there was no quality control practiced at the lower levels of food value chains.

In relation to mainstreaming policies and programmes, she noted that at country levels, there was no ownership of the AFL issue, and even with regulations, countries needed to establish Maximum Tolerance Levels (MTLs). There was thus a need for putting in place country specific internal control mechanisms. Internal regulations supported by surveillance in good laboratories would lead to empowerment of external controls; hence a comprehensive approach to AFL control at all value chain levels was needed.

Potential scope of Comprehensive AFL control in Africa

Dr. Olembo noted that AFL control required a comprehensive value chain approach from the farm to fork. AFL, which contaminates crops in the field before harvest, could spread at all post-harvest stages until the food is consumed, undermining health and nutrition. A comprehensive approach also means coordination across key activities including policies and regulations-standard and testing; incentives and awareness-adoption of best practices; and technology-data and knowledge.

She pointed out that to effectively manage the levels of AFL in food and livestock products, the following activities may be necessary:

- Policy formulation, development of standards and regulations - a policy framework is needed to develop standards and regulations for human and animal consumption. Standards are also needed to create markets for crops deemed unsafe for human consumption for instance detoxification, blending and cattle feed.
- Awareness testing and training - a holistic approach to training of all stakeholders is necessary. All stakeholders along the value chain (including producers, traders, the health sector and stockists) need training. Farmers and the general public need to be informed of the dangers associated with AFL poisoning, both in food and feed. On-site training with key leaders identified at all levels and robust awareness and public education programmes that involve all stakeholders were necessary. Also necessary was the notification of AFL in affected countries to inform and warn consumers, increase capacity of non-state actors to understand, advocate and push for safe food and consumer health, and provide early detection of illness symptoms such as poisoning for immediate medical attention.
- Health impact analysis - There was a need to understand effective interventions to minimize health impacts, which included death due to acute poisoning, chronic illness and loss of productivity, reduced immunity to opportunistic disease, and stunted growth, mainly of children.
- Economic impact analysis and research - Economic impacts include loss to farmers and traders through contaminated produce. It also included decreased animal productivity, loss of trade opportunities, reduced availability of both quantity and quality food to the population. Generally, research and development should be instituted and scaled up.

- Use of appropriate bio-control technologies - Use of beneficial fungi has been successful in other parts of the world e.g. U.S.A. Trials are needed, as was already happening in Kenya. Offering solutions to AFL menace in Kenya and the rest of the world was required.
- Pre- and post- harvest handling Factors influencing fungal growth and toxin development include growth cracks, mechanical injury and damage by pests lead to infestation by fungi; toxins produced under high temperatures, drought, high insect activity prior to harvest; and wet conditions at harvest led to higher contamination and innovative breeding needed to be explored to produce cereals that were more resistant to fungal infection.

Value chain approach to pre-and post- handling that includes proper drying as soon as possible, proper storage where control of humidity, temperature and ventilation are considered was recommended. Other considerations were manual or mechanical sorting/segregation by risk; appropriate transport for food, including grains; grains suspected of contamination need to be impounded for analyses; confirmed contaminated grain needs to be destroyed or decontaminated to other uses; and routine surveillance.

- Promotion of alternative uses - research and development of appropriate alternative uses and education and training were needed. School feeding programmes would be very good entry points for education. Awareness could also be created at market places, taking advantage of specific market days in Africa. Also needed were sampling preparation, protocols and procedure methods; analysis using rapid feed-based test kits and reporting of results; quality assurance and laboratory capacity for elaborate confirmatory tests.

Research was needed to understand appropriate alternative uses, making sure contaminants did not enter the food chain.

- More effective testing is crucial in several parts of the value chain.

4.2 Discussion and comments

Following the two presentations on the CAADP Framework and AFL contamination, the facilitator opened the floor for questions and comments, and the discussions focused on the following:

1. It was noted that the transmission of AFLs to infants through breast milk demonstrated the magnitude of the problem.
2. It was observed that destruction of contaminated produce could be very expensive and there was need to re-examine the possibility of destroying contaminated food in view of Africa's food security situation. Detoxification could be an alternative, but it posed a dilemma since it worked better at big markets or stores as opposed to grains stored at household level.
3. There was a need to seek alternative uses of infected produce without exposure. However, it was observed that alternative uses that had been applied before had not been practical, and the best solution was to prevent contamination at production stage.

4. It was observed that subsistence farmers were the most vulnerable group and this issue was brought out consistently over the years. This raises more questions on health impacts such as how many communities / people were exposed to such acute poisoning / illnesses due to AFL? There as thus need to be more concerned with the small-scale producer level and with health rather than economic issues.
5. In relation to consumer protection, it was noted that this mainly targeted the market levels, and people at the grass roots were not targeted.
6. Questions about health impacts indicated very high exposure (up to 48ppb), without clinical disease. Besides, there was no clear distinction between acute viral hepatitis and clinical AFL, and exposure was very high among subsistence farmers who were most vulnerable.
7. An economic view by one of the private sector stakeholders indicated that:
 - It was difficult to control AFL because the MTL in Kenya was 10 ppb but most of what was received was above that level. Some areas in the country were more predisposed than others and most products had higher levels than the MAL. Production of maize or groundnuts could thus be avoided in areas prone to contamination.
 - The cost of reducing the MAL of AFL was very high and would ultimately be passed on to the consumer. Processors were thus at times compelled to seek alternative uses.
 - Alternative uses for contaminated cereals were important, but hard to implement. On the other hand, the cost of ignoring the problem was massive. It was thus important to build the capacities of all stakeholders at all levels of the value chain. To achieve this, there was need to identify the different value chain actors and involve them in awareness creation and sensitization programmes.

4.3 Where things stand now

Overview and status update of current aflatoxin activities and support

In relation to possible scope of comprehensive AFL control in Africa, Dr. Sarah Olembo pointed out that:

- In some countries, the Ministry of Agriculture only addressed AFL in crops, while in others the Ministry embraced animal, livestock, fisheries, the environment and trade. She considered the strong policy of CAADP to be an overarching umbrella;
- There was need to have a budget line for SPS in the CAADP in all countries, and that COMESA was working towards the development of a regional policy;
- There was need for promoting legal harmonization, which was not being done well and needed improvement. However, some relevant policies were in place or being developed;

- ISO 27025 needed to enhance testing. Most countries lacked appropriate testing facilities and relevant training. As a continent, Africa had skeleton testing facilities which were not adequate and lacked facilities and capacity for laboratory accreditation;
- Enforcement mechanisms were critical, but there were inadequate enforcement (legal) mechanisms at country level. Consistent enforcement is necessary for harmonization of policies at regional levels;
- People doing inspection at borders including police were involved during awareness creation at all levels;
- Awareness raising and education on beneficial fungi for AFL control is needed;

Awareness raising, sensitization and training on health and economic impacts of AFL were necessary across the entire value chain (traders, stockists, manufacturers, consumers etc.); There is a need for a comprehensive approach to AFL control, including: policies, standards and regulations; pre-harvest and post harvest (e.g. seed varieties, pest control and drying, storage and handling) measures; structured demand; alternative uses of AFL, especially the bulk of crops from subsistence farmers; testing (sampling, diagnosis); health impacts; economic and trade impacts; holistic strategy implementation in pilot countries; AFL programmes instituted and up-scaled to other institutions; field trials carried out for all beneficial institutions; beneficial fungi manufactured and utilized in key countries; post-harvest handling research and development addressed at all four pillars of CAADP; and research and development of new information to help implement PACA.

School feeding programme (funded by Bill and Melinda Gates Foundation) found out that grains purchased were unfit for human consumption. In Ghana, mothers were encouraged to grow food crops consumed by their children and sell to the schools to ensure the food consumed by their children was safe. Breast milk / infant milk / school milk also needed to be safe for children.

With regard to country specific activities in relation to AFL control, a list summarizing activities was circulated to the participants (Annex 3).

4.4 Kenyan experience – evidence of the aflatoxin problem

Mr. Joseph Ngetich presented a case study of Kenya highlighting the experience of Kenya with regard to the problem of AFL. His presentation touched on the two rainy seasons in Kenya (long and short rains), the major crops grown, the acreage of maize and the strategic grain reserves in the country. He pointed out that in 1980, 12 people died due to acute Aflatoxicosis, and 265 people between 2000 and 2008 (with 124 in 2004). He highlighted the post-harvest challenges in relation to losses, time of harvest, method of harvesting, drying methods, shelling and threshing, storage and transportation.

According to Mr. Ngetich:

- The Government of Kenya was putting in place measures to combat AFL and there were public/private partnership interventions to bring order because of cross border movement of produce, which had helped to transform business and improve food security;
- Kenya still faced challenges in surveillance for AFL; not all cereal containers were tested for AFL;
- The Ministry had adopted a strategy of training of extension staff, farmers and all stakeholders; routine surveillance – field and food stores; using simple moisture meters; salt and bottle method but needed help to create risk maps; stakeholder involvement and participation from both public and private sectors;
- There was need to promote / invest in commodity-based storage structures and facilitate the National Cereals and Produce Board to establish a warehouse receipt system.

The suggested way forward was to mainstream AFL into national policies and programmes; mobilization of resources and investment in projects with direct impact on food quality; and improving access to markets.

5. SESSION IV: Critical Thematic Pathways to Aflatoxin Control

5.1 Aflatoxin management in relation to the CAADP framework

Regional and/or country specific road-maps to action

Ms. Martha Byanyima made a brief presentation on AFL management in relation to AUC/CAADP SPS structures and the CAADP Pillars. This presentation provided regional and country-specific road maps to action. Linking the PACA to the CAADP pillars, Ms. Byanyima noted that the Partnership for AFL Control in Africa directly supported the CAADP Pillars II and IV, and indicated that the EAC, COMESA and SADC had an agreement to merge their trade areas, and would focus on regulatory aspects. The health objectives would include awareness, regulation and enforcement. Harmonization of trade regulatory strategies would influence all countries in the regions and surveillance systems would be harmonized. She argued that the value chain analysis approach would help to map out key actors – vertical and horizontal at country and regional levels, and there was a need to sensitize the respective member states to allow PACA to coordinate AFL activities.

Using the COMESA model to prioritize actions, she pointed out the roles of the SPS regional sub-committee and the national technical committee on agriculture. Implementation would take place through partnerships such as EAC, COMESA, and SADC. She underscored the role of the

Tripartite Joint SPS work programme in working towards common agreements, where focus would be on regulatory aspects, harmonization, policy, enforcement, capacity and compliance.

Highlighting the key challenges, Ms. Byanyima cited the need to encourage programming that links national and regional actions, the need for strengthening and broadening partnerships, prioritization and resource mobilization.

5.2 Discussion and comments

The comments and discussions session highlighted the following points:

1. There was consensus that Africa needed a comprehensive approach to AFL control at all value chain levels, as well as regional and country specific road maps for action in health and nutrition, research, trade and market access. Also, a strategy taking the issues to the highest level should be developed;
2. It was noted that a number of SPS tools had been developed along the value chain approach;
3. Information was available on SPS issues at different levels of the value chain, especially for regional and national frameworks;
4. Possible areas of intervention included during various stress conditions such as at harvesting of produce during the rainy season, which was becoming a big concern in different agro-ecological zones;
5. There was a need to think about strategy and find out why AFL was not viewed as important as, for example, Malaria. It was felt that the issue of AFL fell between cracks and needed to be situated under a strategic area to ensure it got the attention it deserved;
6. There was need to support regulation, enforcement and provide incentives. Further, groups needed to take a strategic position and agree on the strategy required to improve visibility;
7. Millers who did not have quality storage facilities faced major challenges, and due to the lack of a regulatory framework, they did not feel compelled to test for AFL;
8. Awareness without tools to dry cereals/crops may not be helpful. There was need for capacity development and empowerment with regard to technologies developed for farmers. For example, their capacities to dry crops needed to be strengthened.

6. SESSION V: Possible Operational Structures for Partnership

6.1 What is required to coordinate AFL in Africa

Mr. Boaz Blackie Keizire set the scene by suggesting some guiding principles and challenges that need to be considered for effective control AFL contamination. He pointed out that the way forward was to put in place appropriate structures. He underscored the importance of RECs as building

blocks for the AU and the role of AU institutions in providing leadership and driving the proposed coordination mechanism.

6.2 ALive: Example of a Coordination platform

Highlighting an example of a coordination platform, Dr. Germain Bobo made a presentation on the Partnership for Livestock Development, Poverty Alleviation and Sustainable Growth in Africa (ALive) Secretariat.

What is ALive?

ALive is a continental partnership, based on a multi-stakeholder platform, that aims to reposition the African livestock sector into the development agendas of the national, regional and international policy makers. The ALive platform brings together multiple international communities of stakeholders involved in African livestock, wildlife and environment, including governments, multilateral and bilateral donors, farmer associations, research and training institutions and NGOs.

Membership

ALive has three categories of membership, namely members (international, continental, regional and national institutions or organizations involved in livestock development or management in Africa), executive members (four caucuses) and observers (experts and invitees). The members comprise permanent members such as AU-IBAR, FAO and OIE. Other members include four caucuses – African caucus (RECs, MS), donors and international organizations caucus, the research, technical and training organizations caucus and the civil society caucus. The executive members include representatives from each of the four caucuses and a permanent member of the executive committee. The platform also has a Secretariat.

ALive governance bodies and their roles:

ALive has two governance bodies:

- The General Assembly (chaired by the AUC Commissioner) which is a political / consultative body that meets once a year. The Forum for Livestock Management and Development in Africa passes recommendations for implementation by the Executive Committee, assesses progress achieved and the potential impact of global trends on African countries, and identifies new paths to attain the set objectives.
- Executive Committee (19), which is a technical / decision making body has three permanent members, six executive members from the African caucus, four from the donor and international organizations caucus, four from research, technical and training organizations caucus, and two from the civil society caucus. The Executive Committee focuses on management, institutional arrangements and advocacy and the chair is elected every three years.

The Secretariat and staffing

The Secretariat supports the ALive Platform and its governance structure, with a programme manager (Director of AU-IBAR), who is supported by a coordinator. The latter is responsible for the development and coordination of action plans. Decisions are made by consensus or by simple majority.

6.3 Group discussions on operational structure for PACA

The facilitator then invited participants to share other successful platforms or coordination mechanisms along with the ALive example, and the experiences of participants guided the group discussions. Three groups were formed and their terms of reference (TOR) were to brainstorm on the question – What coordination structure do we want and how do you operationalize it? In other words, the groups were to suggest generic structures required for the coordination of AFL control at various levels, where they should be located and partnership coordination aim at: How do they link to CAADP, RECs, MS and AU. The specific TORs were to:

1. Suggest the leadership structure required, board, steering structure, and technical teams;
2. Suggest the stakeholder representatives – private sector, farmer organizations, civil society;
3. Indicate to what extent the structures needed to be broadened;
4. Discuss the coordination of small regions, country, REC and continental approach;
5. Discuss the need for an interim body to drive the process;
6. Discuss the need for sub-groups to assess proposals;
7. Discuss the advisory roles of MS or REC; and
8. Discuss the roles of policy and regulatory groups.

Group presentations on operational structure for PACA

The key issues that emerged from the group presentations were that:

- AFL is a public health issue. A lot is known about AFL, but it remained in small circles. There was a need to strengthen the process of information flow from REC to continental level.
- There was insufficient information on AFL and people did not fully understand certain issues.
- The agriculture, health and trade concerns about AFL have not been featured at the policy level, and there was a significant lack of coordination of its control. As a result, PACA requires a strategy for control of AFL.

- In order to implement coordination, a task force of some sort was required with possible representation from the AU, RECs, public and private sectors, civil society, development partners and MS. The task force will target health, research, agriculture and trade. PACA needed to be lean and strong.
- AFL contamination along the food value chain could possibly concentrate on practice, i.e. from household to community level. There may be a need for research on food practices at the domestic level and on traditional practices.
- On issues related to availability of indigenous knowledge on AFL, it was noted that some geographical areas were more prone to AFL than others. This could be an area of interest for research.
- Convenient structures could be used to explore possible biological control of AFL.
- Food gets contaminated through processing, handling and transportation among others. In addition, there was need for a strong regulatory framework to strengthen traditional mechanisms, effective inspection systems, quality control laboratories etc.
- Implementation included social issues, trade issues, agricultural and health issues. It was noted that the private sector needed to be brought on board.
- There is a need to obtain buy-in from policy makers, at the community level, and from NGOs.

Consensus of group presentations on the operational structure for PACA

After the three groups made their presentations on the operational structure for PACA, the plenary team arrived at the following consensus:

1. There was need for a continental steering committee to provide coordination, guidance, advice and make decisions. This would build on existing structures and ensure a channel of communication to the AUC system, so that issues of AFL could be addressed at the top level and down-stream.
2. At the regional level, existing structures would be used to bring together regional and national issues. The regional level structures would address and harmonize technical AFL issues on trade, agriculture and health, and inform the steering committee. Specialized Technical sub-committees or groups could be established based on need. Existing structures e.g. SPS technical committees or CAADP structures (whatever specific RECs decided to use) could be strengthened and expanded instead of setting up parallel structures.
3. Use existing structures at national level such as CAADP or SPS committees. The national partnerships would be broadened to incorporate all key stakeholders.
4. A secretariat to support the steering committee at continental level.

Roles and responsibilities of the various coordination levels and how they fit with the CAADP process at national and regional level

The participants broke into three working groups to discuss options for a long-term PACA structure within the CAADP framework, highlighting the purpose of the recommended structure, existing resources, relevant institutions and roles and responsibilities of the steering committee, secretariat, regional and national levels. The TORs for the groups were to discuss the:

- Purpose;
- Roles and responsibilities;
- Access to information and resource sharing);
- Decision- making mechanisms at all levels;
- Proposals on actions of the proposed structures; and
- Proposed composition of coordinating representation.

Group presentations on the roles and responsibilities of the various coordination levels

The key issues that emerged from the group presentations on roles and responsibilities were that:

- The General assembly and caucuses would meet once a year and back to back meetings would be held with those with caucuses.
- There is need for awareness creation at different fora and at different platforms, e.g. SPS technical meetings and reports on progress.
- There would be need for accountability at continental, regional, RECs and national levels.
- Monitoring and evaluation activities would be incorporated in activities at all levels.
- The steering group would address the challenges posed by overlapping membership of RECs.
- Coordination would touch on cost effectiveness and where mechanisms already existed to address issues, and these would be used and empowered, but new structures would be established where such mechanisms did not exist.
- The interim Steering Committee established would be disbanded as soon as the final Steering Committee was in place.
- The recommendations on the roles and responsibilities of the various coordination levels, along with the PACA structure would be reviewed later by the decision making authorities.

- The proposed next steps / timelines were to:
 - Conduct a stock-taking of projects and initiatives; identify gaps (Dec 2011); and establish an interim body (4.10.2011);
 - Produce workshop report;
 - Have a secretariat, process and membership to CAADP in place (Nov 2011);
 - Develop resource mobilization and support best practices (Jan 2012);
 - Have a follow-up meeting (Feb 2012);
 - Commission a policy paper on current state of AFL and options for addressing AFL (Feb 2012);
 - Have a standard process for and initiate country assessments (Mar 2012).

Recommendations on roles and responsibilities of the various coordination levels

i) Roles of the Continental coordination level

- To establish a steering committee and a strong and lean secretariat. The purpose of the steering committee would be to provide policy direction, strategic guidance, and promote dialogue among partners to ensure synergy. The steering committee would also address overlapping roles and gaps of RECs (tripartite instrument) and national level, and would build on existing structures;
- To facilitate Africa-wide coordination of AFL issues and harmonization of policy, resource mobilization and fundraising, and improve communication linkages;
- To mainstream AFL into the CAADP and SPS mechanism;
- To make decisions on Africa-wide initiatives and projects;
- The expert committee would provide continental technical guidance on standards and good practices;
- The purpose of the secretariat would be to support decision making by the steering committee
- To improve access to information and develop an Africa-wide website;
- Resource mobilization;
- Decision making mechanism.

ii) Regional level

- To strengthen existing structures at the regional level, CAADP coordinating unit, and utilize existing resources (technical and financial). The purpose of the regional steering level would be to coordinate regional priorities;
- To provide support to the national and continental levels;
- To facilitate information sharing and communication, and share best practices;
- To facilitate flow of information on decision made at continental to national (two-way)
- To support harmonization;

iii) National level

- The purpose of a coordination body is to guide national AFL strategy;
- To strengthen existing structures at national level – CAADP coordinating unit;
- To set national priorities – inclusive of all stakeholders, program implementation and ensure flexibility to decide on priorities at national level;
- To tap into existing resources (technical and financial);
- To enforce regulations;
- To work with RECs to develop AFL control programmes that fit within country specific plans;
- To establish thematic AFL groups through CAADP country teams;
- To improve access to national information on AFL;
- To develop country level communication strategy;
- To conduct periodic monitoring and report contamination;
- To implement programmes and projects;
- To conduct monitoring and evaluation at national level.

7. Way forward, next steps and closing remarks

7.1 Way forward

An interim coordinating Steering Committee-It was agreed that a small group will be formed to take forward the work of PACA and build on achievements already realized, until the steering committee

is formed. The composition of the interim SC will be based on the proposed composition of the final SC, and it will be as follows:

| Organization | Representative to the Interim SC |
|---------------------------------------|--|
| AUC | Boaz |
| RECs | Two on a rotational basis -COMESA and ECOWAS |
| FARMERS' ORGANIZATIONS | East African Farmers Federation and the African Farmers Federation to nominate representatives |
| PRIVATE SECTOR | Mr. Alex Ariho from ExcelHort (Uganda Ltd) |
| CIVIL SOCIETY | ROPA-Mr. Rene Alphonce |
| ACADEMIA/RESEARCH INSTITUTIONS | CDC-Dr. Lauren Lewis |
| DEVELOPMENT PARTNERS | USAID-Abigael Abdura |
| IMPLEMENTING PARTNERS | AATF-Nancy Muchiri |

7.2 Next steps

It was agreed that a draft report would be circulated to the planning committee by 6th October 2011 for comments. The report would then be circulated to participants for comments by 15th Oct 2011, and comments were to be sent back by 19th October. The final report would then be sent out by 24th October. The AUC would organize another meeting in January /February 2012 at a venue to be yet determined. A schedule of planned meetings where PACA could be publicized includes:

- AUC-NPCA-REC joint planning meeting 7-8 November 2011 in Dar-es-Salaam;
- CAADP PP business meeting 10-11 November 2011, Dar-es-Salaam;
- Africa ministerial meeting – infrastructure and market access 21-24 November 2011, Kigali;
- AU-January Summit Jan/Feb 2012;
- 8th CAADP PP hosted by AU-NEPAD Mar 2012 and the venue is yet to be determined;
- All documents would be translated to French.

7.3 Closing remarks

Mr. Boaz Blackie Keizire thanked the facilitator, Dr. Simplicie Nouala for his dynamism, mastery of the subject area and a job well done, the AU-IBAR Director for excellent facilities, the presenters and participants, translators, Ms. Grace Uwamwezi (AU-IBAR) and Ms. Susan Nyinawandoli (AU) for logistical support and Dr. Annie Kigezo and Dr. Hilda Munyua (AU-IBAR) for capturing the proceedings. He also thanked the organizing committee and sponsors of the workshop.

8. ANNEXES

Annex 1: List of Participants - Partnership for Aflatoxin Control in Africa (PACA)

| | ATTE NDIN G? | ORGANIZATION | NAME | TITLE | OFFICIAL ADDRESS | TELEPHONE | EMAIL | TRAVEL SPONSOR |
|---|--------------------|---------------------------------------|----------------------|--|---|---|---------------------------|-------------------|
| AU/RECs: 9-10 Representatives | | | | | | | | |
| 1. | Yes | AUC -DREA | Boaz Keizire | | Addis Ababa, Ethiopia | | KeizireB@africa-union.org | Self-sponsored |
| 2. | Yes | AUC-DREA | Sarah Olembo | | Addis Ababa, Ethiopia | | ahono_olemboh@gmail.com | Self-sponsored |
| 3. | Yes | AU-Inter Africa Phytosanitary Council | Jean Baptiste Bahama | Senior Scientific Officer; Phytopathology | AU-IAPSC Box 4170 Yaounde-Cameroon | | jbbahama2002@yahoo.fr | USAID via IBAR |
| 4. | Yes | AU-IBAR | Dr. Raphael Coly | PANSPSO Coordinator & SPS expert | Westlands Road, Kenindia Business Park P.O.Box 30786-00100 Nairobi, Kenya | +254 203674229 | raphael.coly@au-ibar.org | Local |
| 5. | Yes | COMESA | Martha Byanyima | CAADP Regional Process Facilitator/ SPS Expert | COMESA Secretariat Ben Bella Road, PO Box 30051 Lusaka, Zambia | +260-211- 229725/32 Ext. 7316 | mbyanyima@comesa.int | USAID via IBAR |
| 6. | Yes | ECSCA Health Community | Dorothy Namuchimba | Manager, Food Security & Nutrition Program | PO Box 1009 Arusha, Tanzania | +255 27-254- 9362/5/6 | dnamuchimba@ecsa.or.tz | USAID via IBAR |
| 7. | Yes | CAADP II | Mr. Nicholas SABWA | Trade & Market Access Expert | | | nsabwa@cmaoc.org | USAID via IBAR |
| Member States: 6-7 Representatives | | | | | | | | |
| 8. | Yes | Kenya Ministry | Dr. Kepha Ombacho | Head, Division of Food Safety Coordination Committee (NFSCC) | Ministry of Public Health and Sanitation PO Box 30016-00100 Nairobi, Kenya | +254 020 209-6839 +254 020 7226- 8878 | rmkilonzo@yahoo.co.uk | Local |

| | | | | | | | | |
|--|-----|--|---------------------------|--|--|---|--|----------------|
| 9. | Yes | Mozambique Ministry | Ms Lourena Arone | Head, Plant Protection Dept. OR | Mozambique Ministry of Agriculture Maputo, Mozambique OR Universidade Eduardo Mondlane Faculdade de Agronomia e Eng. Florestal Campus Universitario C.P. 257 Maputo, Mocambique | OR Tel. +258-21 492178 Cell: +25882399691 Fax +258-21 492176 | serafinamangana@gmail.com sanidadevegetal@map.gov.mz OR amondjana@uem.mz loureenaarone@gmail.com | USAID via IBAR |
| 10. | Yes | Zambia Ministry | Mweshi Mukanga | Senior Agricultural Research Officer | Zambia Ministry of Agriculture, ZARI Mount Makulu Research Station, Zambia Agriculture Research Institute, Private Bag 7, Chilanga, ZAMBIA | +260 968 674107 | mmweshi@gmail.com | USAID via IBAR |
| 11. | Yes | Nigeria Ministry | Mr. Emmanuel D. Eniaijeju | Deputy Director (Crops) | Ministry of Agriculture and Rural Development Federal Department of Agriculture, p.m.b 135 GARKI Abuja, NIGERIA | Mobile: +234 8055127197 Or +2348055127197 | deniaijeju@hotmail.com | USAID via IBAR |
| 12. | Yes | Ghana Ministry | Vesper Suglo | Director Plant Protection and Regulatory Services Directorate | Ministry of Food and Agriculture Pokuase PO Box M37 Accra, Ghana | +233244388275 | jackvesper@yahoo.com | USAID via IBAR |
| Private Sector: 4-5 Representatives | | | | | | | | |
| 13. | Yes | Farmers & Agricultural Producers Organization of West Africa - ROPPA (Réseau des organisations paysannes & de producteurs de l'Afrique de l'Ouest) | Mr Rene Alphonse Barbier | Vice Président Filière betail Viande au Mali | Mali- Representant de la coordination nationale des organisations paysannes du Mali | +223-66761126 | barbieren2001@yahoo.fr | USAID via IBAR |
| 14. | Yes | East Africa Farmers Federation | Kubai Robert Mwenda | | Nairobi | | kubairobha@yahoo.com | Local |
| 15. | Yes | Unga Holdings LTD | Billy Okongo | | Nairobi | | bokongo@unga.com | USAID via IBAR |

| | | | | | | | | |
|---|-----|---------------------------------|---------------------------------|--|---|--|--|----------------|
| 16. | Yes | Twin Trading | Andrew Emmott | | | | andrewemmott@twin.org.uk | USAID via IBAR |
| NGO/Civil Society: 3 Representatives | | | | | | | | |
| 17. | Yes | AGRA | Anne Mbaabu | Director, Market Access Program | Nairobi, Kenya | | ambaabu@agra-alliance.org | Local |
| 18. | Yes | AATF | Nancy Muchiri | Communication and partnership manager | African Agricultural Technology Foundation (AATF) P.O.Box 30709 Nairobi, Kenya | +254 735992206 | n.muchiri@aatf.africa.org | USAID via IBAR |
| 19. | Yes | Excel Hort Consult LTD(Uganda) | Ariho Alex | Chief Executive Officer | Plot 67, Buremba Road, Kakoba PO Box 664 Mbarara, Uganda | +256-772-467207 or +256-702-967074 | excelhortconsult@gmail.com or ariho_alex@yahoo.com | USAID via IBAR |
| Research: 3 participants | | | | | | | | |
| 20. | Yes | CORAF | Dr Ousmane Ndoye | Delegate of (Executive Director) | Dakar, Senegal | | Ousmane.ndoye@coraf.org secoraf@coraf.org paco.sereme@coraf.org. | USAID via IBAR |
| 21. | Yes | IITA | Paula Bramel | Deputy Director General, Research for Development | OYO Road, Ibadan, Nigeria | +234 2 751-7472 | p.bramel@cgiar.org | USAID via IBAR |
| 22. | Yes | ILRI | John McDermott (Segenet Kelemu) | Deputy Director General, Research (Director, BeCA Hub) | Nairobi, Kenya | +254 20 422-3207 / +254 20 422-3804 | j.mcdermott@cgiar.org (s.kelemu@cgiar.org) | Local |
| Development Partners: 5 participants | | | | | | | | |
| 23. | Yes | USAID/BFS | Jennifer Maurer | | USAID/BFS, 1300 Pennsylvania Ave. NW, Washington, DC | 202-712-5256 | jhill@usaid.gov / jmaurer@usaid.gov | Self-sponsored |
| 24. | Yes | Bill & Melinda Gates Foundation | Arlene Mitchell | | PO Box 23350 Seattle, WA 98102 | (206) 709-3100 | Arlene.Mitchell@gatesfoundation.org | Self-sponsored |
| 25. | Yes | GIZ | Stefanie Kirse | Project Officer, Sector Project Agricultural Trade | Division 45 – Agriculture, Fisheries and Food Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH | +49 6196-79-3296 | Stefanie.Kirse@giz.de | Self-sponsored |

| | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| | | | | | PO Box 5180 65726 Eschborn, Germany | | | |
|--|--|--|--|--|--|--|--|--|

Technical Resource/Organization Support Staff (not to exceed 8 total):

| Technical Resources: 9 participants | | | | | | | | |
|-------------------------------------|----------------|------------------------------------|------------------------|--|--|--------------------------------|---|-------------------|
| | Atten ding? | Organization | Name | Title | Official Address | Telephone | Email | Travel Sponsor |
| 1 | Yes | AU-IBAR | Dr. Simplicie Nouala | Facilitator Head of Animal Production Unit | Westlands Road, Kenindia Business Park P.O.Box 30786-00100 Nairobi, Kenya | +254 203674224 | nouala.simplice@au- ibar.org | |
| 2 | Yes | Center for Disease Control | Dr. Lauren Lewis | Chief, Health Studies Branch | 4TID Buford HWY,ms-f- 57,Chambloe,GA,30341.USA | | lwb6@cdc.gov | USAID via IBAR |
| 3 | Yes | USDA FAS | Merritt Chesley | Agricultural Counselor | American Embassy Entoto Road Addis Ababa, Ethiopia | +251 11-130-6349 | merritt.chesley@fas.usda. gov | Self-sponsored |
| 4 | Yes | USAID/East Africa | Francesca Nelson | | USAID East Africa P.O. Box 629 Village Market 00621 Nairobi, Kenya | 254-20-862 2000 | fnelson@usaid.gov | Local |
| 5 | Yes | USAID- USDA/Africa | Dermot Sean Cassidy | SPS Coordinator | Pretoria, South Africa | +27 12 8090-867 | dermot.cassidy@gmail.co m | USAID via IBAR |
| 6 | Yes | Bill & Melinda Gates Foundation | Rose Barbuto | | PO Box 6176 Ben Franklin Station Washington, D.C. 20044 | +1 202 662-8130 | Roselinda.Barbuto@gatesf oundation.org | Self-sponsored |
| 7 | Yes | Meridian Institute | Rex Raimond | Senior Mediator and Program Manager | PO Box 1829 105 Village Place Dillon, CO 80435 | +1 720.328.3380 | rraimond@merid.org | USAID via IBAR |
| 8 | Yes | Meridian Institute | Barbara Stinson | Senior Partner | PO Box 1829 105 Village Place Dillon, CO 80435 | =1 303-670-5161 | bstinson@merid.org | USAID via IBAR |
| 9 | Yes | USDA/ARS | Peter Cotty | Plant Pathologist | P.O. Box 210036 Forbes Building, Room 303 School of Plant Sciences University of Arizona Tucson, AZ 85721-0036 | +1 520 626-5049 | pjcotty@email.arizona.ed u | USAID via IBAR |
| 10 | Yes | ACDI-VOCA | Steve Collins | Country Director and Chief of Party | 209 Muthangari Drive Off Waiyaki Way, Westlands PO Box 1308-00606 | +254 (20) 4443254 722701021 | scollins@acdivoca- kenya.or.ke | Local |

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| | | | | | Sarit Centre Nairobi Kenya | | | |
| 11 | Yes | Crop Protection- Nairobi | Mr. Joseph Ngetich, | Deputy Director, | Crop Protection Agriculture Secretary, Kilimo House, Cathedral Road, P.O.Box 30028 -00100, Nairobi, Kenya | + 254 20 271 8870, 272 5723 | ngetichj@ymail.com / wsonga@africaonline .co.ke] | Local |
| 12 | Yes | AFRICAN AGRICULTUR AL TECHNOLOGY FOUNDATION | Francis Nang'ayo | REGULATO RY AFFAIRS MANAGER | P. O. BOX 30709, NAIROBI, 00100, KENYA | +254 20 4223700 | f.nangayo@aatf- africa.org | Local |
| 13 | Yes | KENYA | CDC-KENYA MOH | Abigael Obura | Aflatoxin Project coordinator KEMRI Headquaters of Mbagathi way PO Box 606-Village Market Nairobi | +254 2867000/ 0722710602752 | aobura@ke.cdc.gov | Local |
| 14 | Yes | AU-IBAR | Hilda Munyua | Knowledge Management Programme Officer | Nairobi , Kenya | | hilda.munyua@au- ibar.org | Local |
| 15 | Yes | AU-IBAR | Annie Kigezo | Projects Officer | Nairobi, Kenya | | Annie.kigezo@au- ibar.org | Local |

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| 16 | Yes | AU-IBAR | Edward ASU | Legal contract Execution officer | Nairobi, Kenya | +254203674000 | Edward.asu@au-ibar.org | Local |
|----|-----|---------|------------|----------------------------------|----------------|---------------|------------------------|-------|

The below participants didn't attend the Meeting

| | | | | | | | |
|---|---|-----------------------|--|--|--|--|--------------------------|
| 1 | ECOWAS | Ernest Aube | Principal Programme Officer, Agriculture | 101 Yakubu Gowon Crescent, Asokoro District Abuja, Nigeria | +234 80-628-3719 | aubee2008@yahoo.com | USAID via IBAR |
| 2 | WHO Kenya | Wilfred Ndegwa | Food Safety Officer | | +254 733-958434 | ndegwaw@ke.afro.who.int | USAID via IBAR |
| 3 | EAC Health Secretariat | Dr. Stanley Soniya | Head | Arusha, Tanzania | +254 273 32-460 | sonoiya@eachq.org | USAID via IBAR |
| 4 | Senegal Ministry | Mme. Mariétou Diawara | Director Direction de la Protection des Végétaux (DPV) | Ministere de l'Agriculture Km 15 Route de Rufisque, B.P. 20054 Thiaroye Dakar, SENEGAL | | dpvl@orange.sn | USAID via IBAR |
| 5 | National Cereals & Produce Board | Prof. Gideon Misoi | Managing Director | | | md@ncpd.co.ke | USAID via IBAR or Local? |
| 6 | EU (SPS, PH advisor to AU); EC / DFID / GTZ (?) | Moustapha Magumu | | | | | Self-sponsored |
| 7 | African Development Bank | Abdirahman Beileh | | Tunisia | Phone: +216 7110 2134 Fax: +216 7110 3744 | A.Beileh@afdb.org | Self-sponsored |
| 8 | McKnight Foundation | Dr. Charles Riches | Liaison Scientist, Southern Africa Community of Practice | United Kingdom | +441 934-8424 53 | charlie@riches27.freemove.co.uk | Self-sponsored |

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|----|------------------|---------------|-----------------|------------------------------|----------------|---------------|-----------|
| No | Southern African | Ishmail Sunga | Chief Executive | Unit 11, Central Office Park | +27 82-9444480 | ceo@sacau.org | USAID via |
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|----|--|--------------------------------------|---------------------------------|--|--|----------------------------|----------------------------------|-------------------|
| | | Confederation of Agricultural Unions | | Officer | 257 Jean Avenue Centurion 0157 South Africa | | | IBAR |
| No | | USAID-USDA/ West Africa | Connie Bacon | SPS Advisor | BP 49 Dakar, Senegal | +221 33 869 6100 x 3705 | cbacon@usaid.gov | Self-sponsored |
| No | | Trade Mark Southern Africa | Jennifer Rathebe | SPS Advisor | Pretoria 0020 – South Africa | +27 12-349-7500 | jrathebe@trademarksa.com | USAID via IBAR |
| No | | World Bank | Mr. Andrew Mwihia Karanja | | | | akaranja@worldbank.org | Self-sponsored |
| No | | Bill & Melinda Gates Foundation | Prem Warrior | | PO Box 23350 Seattle, WA 98102 | (206) 709-3100 | Prem.warrior@gatesfoundation.org | Self-sponsored |
| No | | Tanzania Ministry | Dr. Claude J.S. Moshia | Head, Agriculture and Food Section | Tanzania Bureau of Standards PO Box 9524 Dar Es Salaam, Tanzania | | cjmoshar@yahoo.co.uk | USAID via IBAR |

Annex 2: Expectations of the Participants

Information / knowledge on aflatoxin

The recognition of aflatoxin as a public health issue as well as an agriculture issue

- Aflatoxin control definition to include : elimination e.g. biological; control e.g. standards; removal from human food chain e.g. value chains
- Within the framework of CAADP, document PACA activities to raise the profile of “food safety” in relation to “food security”. Need to include Pillar 1 – land suitability; risk mapping; crop rotation
- Comprehensive consideration of issues of aflatoxin control in: agriculture, health, economic development and social development
- Good understanding of aflatoxin / mycotoxin issues in Africa
- Broaden network of interested parties – I want to meet and learn from partners I have not yet met (CDC, some AU partners, ILRI, AU-IBAR, twin trading etc)
- Share first hand experiences from other countries, and learn how aflatoxin in maize and groundnuts is controlled, and need for networking
- Sharing and exchanging information with fellow participants
- Exchange experiences that can be used to address the problem of aflatoxin
- Consensus on the need for aflatoxin mitigation
- Get more light on what is being done in Africa to control aflatoxin
- Adoption of alternative uses of aflatoxin contaminated produce
- Website where all partners will upload their progress in their studies on aflatoxin. Databases very important

Partnership / coordination

- A coordinated mechanism to feed into the aflatoxin work
- Africa-led proposed way forward for PACA
- Clarity from African partners regarding how they can cooperate under the PACA – how can decisions be made and adhered to? How can the PACA be structured to ensure effectiveness and comprehensive action?
- Aflatoxin management structure for Africa developed

- Clarity on the partnership structure including roles and responsibilities
- Better understand partnership issues from other views
- Definition of thematic actions needed for coordination and possible operational structure for PACA
- Establish an Africa-wide committee to work on resolving the technical problems of aflatoxin in all countries
- Establish a mechanism that will enable the AUC to bring aflatoxin problems in African countries to tolerable levels, to enable African producers access to international markets, trade and improve their incomes
- Recommendations on an African organizational structure to coordinate aflatoxin work on the continent
- Clearly set up PACA body without massive overheads and with the ability to impact on activities in the continent
- Full alignment of all stakeholders to form a partnership
- Open discussion on how best to organize and implement PACA and how it links with other initiatives

Strategy / Action plan

- Clear implementation strategy for PACA
- Strategies for aflatoxin control identified
- A clear way forward as to how the different stakeholders can address the aflatoxin issue over a five-year time frame
- Translation of proposed mitigation tools into workable solutions for small-scale farmers and other stakeholders
- Initiate a process that will come up with maximum aflatoxin levels that are uniform – food, feed, milk for improved trade
- Key possible actions by respective partners
- Timing of particular action / activities
- A plan of action to implement this organizational structure
- Development of practical mitigation plan of activities that will reduce the effects of aflatoxin contamination in Africa

- Actions to be taken to implement PACA
- Give broader considerations – a voice within institute partnerships and tasks
- Highlight priority areas for support by AU and partners

Resources

- Discuss and understand the rationale of goals of PACA and harmonizing them with goals and interest of the funders (donors)
- The commitment of resources to fill gaps in the knowledge related to health impacts of aflatoxin exposure
- Having well mapped next steps and source of funding

Others

- Change in legislation to allow higher levels of aflatoxin in certain feed types (especially in Kenya)
- Get our institutions involved in the PACA initiative

Annex 3: Summary of Existing and Planned Activities on Aflatoxin Control in Africa¹ as of 9/12/2011

Please carefully review this summary of aflatoxin control activities in Africa and do the following:

1. Ensure that the information contained in the table is accurate. Please insert corrections if needed.
2. Add information about relevant activities that are missing from the current list, using the pages at the end of the document.

| Country/Region | Activity | Amount | Partners | Funders |
|---------------------|---|---------------|---|--|
| Africa-wide | Development of low cost diagnostic tests for aflatoxin in maize to increase smallholder farmer's income | ~\$1 million | Diagnostics For All | Bill & Melinda Gates Foundation and DFID |
| Africa-wide | Supporting the creation of a Partnership for Aflatoxin Control in Africa | \$205,000 | Meridian Institute IITA, AATF, USDA | Bill & Melinda Gates Foundation |
| Africa-wide | Novel integrated strategies for worldwide mycotoxin reduction in the food and feed chains (MYCORED) | €5.77 million | National Research Council Institute of Sciences of Food Production, Italy (and many other member institutions) | European Commission |
| Africa-wide | Support to Pan-African Quality Infrastructure (continental, regional and national level) as basis for regional and national testing facilities and for pan-african standard alignment. | ??? | Physikalisch-Technische Bundesanstalt (PTB), Germany | Standards and Trade Development Facility (STDF) |
| Africa-wide | Desk analysis of total post-harvest grain losses in storage, and causes of losses | ??? | World Bank (WB)/NRI/FAO | WB |
| Africa-wide | Bio-pesticide registration workshop with specific focus on the use of native beneficials for aflatoxin control | \$75,000 | USDA/IITA/IR-4, AATF | US Department of Agriculture (USDA) |
| Burkina Faso | Biocontrol development | \$680,000 | IITA/USDA/INERA | Austrian Development Agency |
| Ghana | Laboratory Support to achieve international accreditation according to ISO 17025; in framework of project "Quality assurance of agricultural products through metrological and testing services." | ??? | Physikalisch-Technische Bundesanstalt (PTB), Germany; Ghana FRI (Food Research Institute) | Germany |

¹ This list contains current activities, unless otherwise noted. This is not an exhaustive list. Other activities are taking place or being planned that should be added.

| | | | | |
|-------------------------|---|----------------|---|--|
| Kenya | Varietal differences in susceptibility | \$30,000 | Cornell/BecA | ??? |
| Kenya | Biocontrol strain identification, development, testing | \$600,000 | USDA/IITA/KARI/AATF | USDA and African Agricultural Technology Foundation (AATF) |
| Kenya | Mycotoxin diagnostics platform and application to national program maize breeding (proposal under final consideration) | \$900,000 | BecA/Cornell/CSIRO/Kenya/Tanzania/QAAFI | AusAID |
| Kenya | Understanding aflatoxin accumulation in maize and evaluating strategies to reduce human exposure in East Africa | \$110,000 | Cornell/U Maryland/BecA | ??? |
| Kenya | Understanding aflatoxin accumulation in maize and evaluating strategies to reduce human exposure in East Africa | \$50,000 | Cornell/U Maryland/BecA | StART/Nelson Lab/ AusAID |
| Kenya | Prevalence and risk assessment of mycotoxins in dairy value chain, including cattle feed | ??? | ILRI | MTT Agrifood Research Finland (MTT) |
| Kenya | Explore alternative uses for contaminated crops | \$500,000 | AGRA | Bill & Melinda Gates Foundation |
| Kenya | Purchase contaminated commodities in 2010 | ~\$100 million | The Government of Kenya | The Government of Kenya |
| Kenya | Field activities related to local beneficial fungi biocontrol. | TBD | KARI | World Bank |
| Kenya | Training of farmers, government staff, and traders, purchase of mobile dryers, setting up communal storage facilities, and sampling and rapid testing at the trading outlets. | \$400,000 | Kenya Ministry of Health | FAO |
| Kenya/Uganda | Improving the health and livelihood of people of East Africa by addressing aflatoxin and gender related constraints in peanut production, processing and marketing | \$900,000 | ICRISAT/KARI/University of Makerere, Virginia Tech | Peanut CRSP (USAID) |
| Kenya Nigeria | Development and Commercialization of Biological Control of Aflatoxins in Nigeria and Kenya. | \$ 1,319,661 | IITA/AATF | Bill & Melinda Gates Foundation |
| Kenya Tanzania | Capacity and Action for Aflatoxin | \$1.5 million | Commonwealth Scientific and Industrial Research Organisation (CSIRO), Queensland Alliance for | AusAID/CSIRO |

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|-----------------------|---|---------------|---|---------------------------------|
| | Reduction in Eastern Africa Establishing a Regional Mycotoxin Analytical Platform and its Application in Reducing Aflatoxin Contamination of Kenyan and Tanzanian Maize | | Agriculture and Food Innovation (QAAFI), Cornell University, Kenya Agricultural Research Institute, and Agricultural Research Institute, Tanzania. | |
| Kenya Mali | Analyze the impact of aflatoxin contamination on the livelihoods and health of people in Kenya (maize) and Mali (groundnuts). Map areas at highest risk, identify cost-effective control measures to reduce exposure to aflatoxins, and disseminate findings to key stakeholders and policy makers. | \$2.7 million | IFPRI, CIMMYT, International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), University of Pittsburgh, Uniformed Services University of the Health Sciences, Kenya Agricultural Research Institute, Institut d'Economie Rurale (Mali), ACIDI/VOCA, and the East African Grains Council | Bill & Melinda Gates Foundation |
| Mali Senegal | New tools for groundnut aflatoxin control in Sahel Africa (2005-2007) | €819,941 | CIRAD, CERAAS-ISRA-ENSA (Sénégal), EPM-Université de Paris, IER-ICRISAT (Mali), DPP-EAN (Portugal) | European Commission |
| Malawi | Groundnut variety improvement for yield and adaptation, human health and nutrition: includes breeding for low aflatoxin and field management practices | \$699,000 | ICRISAT/NARS/NASFAM | McKnight Foundation/CCRP |
| Malawi | Post-harvest value-chain technology improvements in groundnuts in Malawi and Tanzania, includes local manufacture of tools for groundnut handling & processing | \$673,000 | ICRISAT/NASFAM | McKnight Foundation/CCRP |
| Malawi | Mapping of aflatoxin contamination of groundnuts and products in Malawi - national survey completed 2009/01 | \$74,000 | ICRISAT/NASFAM | McKnight Foundation/CCRP |
| Malawi | Groundnut variety improvement for yield and adaptation, human health and nutrition: includes monitoring blood aflatoxin loads | \$699,000 | ICRISAT/Lilongwe Central Hospital | McKnight Foundation/CCRP |
| Malawi | Analysis of groundnut markets in Malawi - includes impact of aflatoxin on trade. | ??? | NRI PhD studentship. | McKnight Foundation/CCRP |
| Malawi | Groundnut variety improvement for yield and adaptation, human health and nutrition: includes developing education materials and links to policy makers. | \$699,000 | ICRISAT/NASFAM/NARS | McKnight Foundation/CCRP |

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|--------------------------|---|-------------|--|--|
| Malawi Tanzania | Post-harvest value-chain technology improvements in groundnuts in Malawi and Tanzania, includes aflatoxin testing of ingredients for infant complimentary foods | \$673,000 | ICRISAT/NASFAM Sokoine University of Agriculture | McKnight Foundation/CCRP |
| Malawi Tanzania | Innovative communication media and methods for more effective aflatoxin mitigation, variety uptake and use interventions in groundnut in Malawi and Tanzania | \$75,000 | Danish Management / ICRISAT ARI Naliendeli | McKnight Foundation/CCRP |
| Mozambique | Development and Commercialization of Biological Control of Aflatoxins in Mozambique. Field activities related to local beneficial fungi biocontrol. Training of farmers, government staff, and traders. | \$1,600,000 | IITA, Ministry of Agriculture (GoM), University of Eduardo Mondlane, University of Lurio, University of Arizona. | USDA |
| Tanzania | Groundnut variety improvement for yield and adaptation, human health and nutrition: includes breeding for low aflatoxin and field management practices. | \$699,000 | ARI Naliendeli | McKnight Foundation/CCRP |
| Nigeria | Efficacy trials, registration, large-scale farmers' trials, lab-scale manufacturing, sensitization | \$100,000 | IITA/USDA/AATF | AATF |
| Nigeria | Large-scale farmers' trials, sensitization, farmer training | \$175,000 | IITA/AATF | MycoRed/AATF |
| Nigeria | Biocontrol commercialization | \$100,000 | IITA/Doreo Partners | Bill & Melinda Gates Foundation |
| Nigeria | Low-cost manufacturing method development | \$75,000 | USDA/IITA/AATF | USAID funds through IITA |
| Nigeria | Cultivar development | \$100,000 | IITA | Nestle |
| Senegal | Biocontrol R&D including demonstration trials | \$125,000 | IITA/DPV/University of Thies /USDA/ AATF | Fondation Agir pour l'Education et la Santé (FAES) |
| Senegal | Climate change and aflatoxin exposure | \$200,000 | Leeds University/IITA/ University of Thies | AHRP |
| Zambia | Development and Commercialization of Biological Control of Aflatoxins in Zambia. Field activities related to local beneficial fungi biocontrol. Training of farmers, government staff, and traders. | \$2,000,000 | IITA, ICRISAT, Ministry of Agriculture, Zambia Agriculture Research Institute (GoZ), University of Arizona | USAID |
