

# The PACA Africa Aflatoxin Information Management System (AfricaAIMS) and Knowledge Repository: Establishing a Strong Knowledge Base

# Background

The Partnership for Aflatoxin Control in Africa (PACA) is an innovative platform - established as a Flagship Program of the African Union, aimed at coordinating and supporting aflatoxin mitigation and management across the health, agriculture and trade sectors in Africa.PACA is currently on its second phase of implementation. The PACA phase I executed early wins on aflatoxin mitigation projects and established activities in six pilot countries. In the first four years, PACA has distinguished itself as a strategic leader in the fight against aflatoxins in Africa with major support from the Bill and Melinda Gates Foundation (BMGF). PACA is now considered a credible resource on aflatoxin with many country governments across the continent, undertaking early analyses to generate evidence and inform country and regional aflatoxin control action plans, and creating a number of assets for aflatoxin mitigation at the grassroots level.

The establishment of the Africa Aflatoxin Information Management System (AfricaAIMS) is one of the priority activities of PACA. The AfricaAIMS was launched by PACA as an evidence generation activity in 2014, providing pilot countries of Malawi, Uganda, Tanzania, The Gambia and Senegal with support for capacity building on the provision of baseline data on aflatoxin in the three sectors of agriculture, trade and health. In 2015, Nigeria was included in the number of pilot countries. Although not intended as a pilot country, in 2016, Kenya was also added to the countries to benefit from the Africa AIMS activities based on its history of high vulnerability to aflatoxin effects.

The AfricaAIMs has continued to facilitate data generation, sample analysis and data submission capacities in the six countries of Malawi, Uganda, Tanzania, The Gambia, Senegal and Kenya. All these countries received VICA equipment, accessories, and consumables and about 30-35 individuals were trained in each of the countries.

The data generation activity has so far produced comprehensive and reliable evidence-based information required to facilitate informed decisions on policies, regulations, standards, interventions and awareness creation by the country governments and stakeholders.

The types of data submitted by the countries on aflatoxin contamination in food and feed (from the agriculture sector); diseases associated with aflatoxin exposure, aflatoxin exposure in humans and animals, consumption of aflatoxin-prone foods and rates of child stunting (from the health sector); and aflatoxin standards in countries and volume of imports & exports of aflatoxin-prone foods including rejection (from the trade sector). The data generation activity has so far produced comprehensive and reliable evidence-based information from the agriculture sector data (contamination data) in the countries of The Gambia, Senegal, Uganda, Malawi and Tanzania. Although trade and health related data were also submitted by these countries the coverage is narrower than expected.

However, there are a number of challenges that call for the augmentation of the AfricaAIMS to effectively respond to the growing demand for evidence based information on aflatoxin in the continent. For instance, data on diseases associated to aflatoxin, data on aflatoxin exposure and food consumption are not available. Food import and export data are also not easily accessible as they can only be submitted by authorized government authorities.

The current Africa Aims is hosted on the AU-IBAR, ARIS II platform with limited flexibility in terms of management and administration, and over reliance on AU-IBAR expert support on the system but, PACA envisions an AfricaAIMS under PACA’s full management and administration to ensure ease of accessibility to updated and credible information and knowledge by a wide range of stakeholder and the PACA community at any time and place.

In view of these challenges, the AfricaAIMS need to be augmented, to effectively respond to the current and growing demand for evidence-based information on aflatoxin.

This concept note proposes an AfricaAIMS with a strong one-stop knowledge base, to facilitate the systematic collection and conversion of data to useful knowledge products, as well as for the analysis, storage, and dissemination for use by African countries for specific country aflatoxin mitigation strategies. The overall objective is to integrate comprehensive modules on Agriculture, Health and Trade, covering a wider range of aspects, to respond to the specific informational needs of various stakeholders and make the repository available to inform regional and Africa-wide strategies. In addition, the AfricaAIMS should be scalable; to accommodate a vast range of information analysis capabilities and appeals from all African countries.

# Justification/Rationale

PACA established the AfricaAIMS as online system to collect and share aflatoxin related information from pilot countries, non-pilot countries (Kenya Agricultural and Livestock Research Organization), and others (e.g. research and development organizations). Lessons learned have been drawn from the implementation of PACA Phase I, in line with the AfricaAIMS initiative, the Country-led Aflatoxin Situation Analysis and Action planning (C-SAAP) and efforts to control aflatoxins using promising technologies (such as Aflasafe, sorting, hermetic storage and novel drying interventions (e.g. AflaSTOP)).

Despite increasing buy-in at country level, adoption barriers to aflatoxin control tools and technologies, still exist due to lack of information and knowledge on the extent of the problem and on suitable options to control the problem. The lack of systems and knowledge of existing technologies to address highly or even moderately contaminated grain, and lack of understanding about the health impacts of aflatoxins, has further increased the risk and exposure to Aflatoxins. Weak incentives and the absence of standards and market differentiation between clean and contaminated grain in the domestic market are at the heart of low adoption of aflatoxin control technologies and other measures to reduce exposure.

Therefore, a robust AfricaAIMS platform and knowledge base will empower countries to participate in evidence generation; collection and analysis of prevalence data on the levels of contamination and the associated impact on trade and health risks; access to aflatoxin occurrence data in food and feed; patterns of consumption of food and feed; exposure in humans and animals; associated diseases; and rejections of food exports and imports.

This data when timely and professionally handled, will be useful to guide and monitor the effectiveness of interventions. Given the multitude of influencing factors and the variability of toxin contamination across seasons and regions, surveillance and monitoring of aflatoxin contamination should be continuous to ensure public health and safety.

However, experiences show that data from five or six countries is too limited to justify for Africa-wide interventions. Thus, it is prudent to expand coverage countries from 6 to 10, given the resource intense nature of the activities. The database/platform such as PACA’s AfricaAIMS will be vital to coordinate and provide support to countries that generally have weak food control systems. Data availability will facilitate dietary exposure assessments and inform dietary interventions. Data on the impact of postharvest practices on aflatoxin levels are also urgently needed. This enhancement should enable PACA to use AfricaAIMS to generate periodic data on aflatoxin contamination in key value chains across agro-ecological zones to enable: rapid interventions to avert outbreaks of acute aflatoxicosis; tracking of contamination levels over time; evaluation of control efforts; and development of climate-based models for better prediction of aflatoxin levels. PACA and the country governments will leverage the higher quality AfricaAIMS data in their coordination and advisory roles to stakeholders, including private sector and investors, on appropriate sourcing of high quality grains from specific regions in the countries. The data will be very instrumental in arguing for aflatoxins standards that protect food and feed consumption and achievable with the existing technologies. Countries can also use the database to review their regulatory (enforcement systems) with a view to ensuring adequate consumer protection and fair trade facilitation.

It is anticipated that when redesigned and implemented in the current pilot countries and in four more countries over a two year period, enough data to explain the aflatoxin situation in Africa will be generated. Likewise, food regulatory systems in the 10 countries will be improved and ready to sustain the data generation culture in their systems. This implies that after two years of PACA Phase II AfricaAIMS, the PACA secretariat will only retain the data processing and sharing responsibility. The data generation and submission costs will then be met by individual participating countries.

# Objectives of PACA Phase II AfricaAIMS Initiative

The objective is have a scalable and extendable AfricaAIMS and Knowledge repository that is able to support a large number of users and robust databases, capable of expanding as needed, secure, collaborative, offers powerful analysis, compliant with industrial standards, relevant and time-sensitive. We envisage an integrated AfricaAIMS and knowledge repository with modules of information and knowledge on Agriculture, Health and Trade that responds to the specific informational needs of various stakeholders to inform regional and Africa-wide strategies with the following four objectives:

1. To build national government capabilities to continuously monitor aflatoxin control activities and share data with the PACA- Secretariat;
2. To expand the AfricaAIMS with searchable databases, data analysis tools and data mining capabilities and knowledge sharing;
3. To Enhance the knowledge base with KM tools to proactively facilitate knowledge generation, analysis, storage, sharing, use and dissemination; and
4. To gather more reliable and continentally representative (increasing pilot countries from 6 to 10) evidence to inform policy decisions, facilitate interventions (e.g. educational/awareness and technological) and resource allocations, and contribute to addressing gaps in technology and regulations.

# Action Areas for AfricaAIMS and Knowledge Repository:

1. Actions to build national government capabilities to continuously monitor aflatoxins activities and share data with PACA- Secretariat (**objective 1; output 1**)
   1. Identify and build the capacity for coordination and submission of agriculture, health and trade data in to the AfricaAIMS. One institution in each of the four countries will be identified and its capacity strengthened. For sustainability the **coordinating and data** **submitting institution** should be the **one mandated** for food safety administration/coordination in the country;
   2. Appoint an employee of the data submitting institution to act as a PACA Focal Point and train the Focal Point on data submission; and
   3. Support meetings of the National Aflatoxins Working Group as an important body to approve data for submission in to the PACA AfricaAIMS.
2. Actions to expand the AfricaAIMS with searchable databases, data analysis tools, data mining capabilities and knowledge sharing (**objective 2; output 2**)
3. Transfer AfricaAIMS from ARIS2 to a PACA platform to enhance accessibility and visibility; and
4. Develop a multi-faceted and scalable system that will facilitate a user-friendly and time-sensitive mode of capturing aflatoxin data at country level, deployed on a client/server back-end with a web-based front-end.
5. Actions to enhance the knowledge base with KM tools to proactively facilitate knowledge generation, analysis, storage, sharing, use and dissemination (**objective 3; output 3**)
6. Support international fora (engagements/networks) through which PACA can access new knowledge; and
7. Subscribe to aflatoxin resource centres (journals).
8. Actions for generation of reliable and representative data (**objective 4: output 4**)
9. To support generation of food contamination data, sampled at harvest, 6 (six) months after harvest, market and points of importation and exportation;
10. Support harmonization of sampling protocols and analytical method performance criteria. Where possible, base the sampling protocol and method performance criteria on Codex standards; and
11. Support generation of data on diseases associated with aflatoxin exposure, aflatoxin levels in humans/biomarker data, extent of consumption of aflatoxin prone staples and rate of childhood stunting.

# Funding Needs

In 2017, PACA will continue to support data generation in the six pilot countries using the available resources. Resources are also set aside for some of the activities identified in this concept note, specifically the transfer of AfricaAIMS portal to AUC-Addis Ababa, from AU –IBAR in Nairobi.

The AUC proposes to integrate PACA in the AU structure in 2017. This provides more assurance for support of the PACA Secretariat activities. Thus, funds will be generated to implement activities indicated in the concept note for three years of the PACA Business Plan; Dec. 2016 – Nov. 2020, and an extra year, as shown in Table 1.

**Table 1: Estimated Budget (US$) for AfricaAIMS and Knowledge Repository**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SN** | **Activity** | **2018** | **2019** | **2020** | **2021** |
| **1.0** | **To build national government capabilities to continuously monitor aflatoxins activities and share data with PACA- Secretariat (Objective 1: Output 1)** | | | | |
| **1.1** | Identify and build capacity for coordination and submission of agriculture, health and trade data to the AfricaAIMS | **30, 000** |  |  |  |
| **1.2** | Train the Focal Point on data submission | **60,000** |  |  |  |
| **1.3** | Support meetings of the National Aflatoxins Working Group as an important body to approve data for submission to the PACA AfricaAIMS | **100,000** | **100,000** | **100,000** | **100,000** |
| **2.0** | To expand **the AfricaAIMs with searchable databases, data analysis tools and data mining capabilities and knowledge** sharing (Objective 2; Output 2) | | | | |
| **2.1** | Transfer AfricaAIMS from ARIS2 to a PACA platform to enhance accessibility and visibility; |  |  |  |  |
| **2.2** | To develop a multi-facet and scalable system that will facilitate a user-friendly and timely way of capturing Aflatoxin data at country level, deployed on a client/server back end with a web-based front |  | **23,000** | **23,000** | **23,000** |
| **3.0** | **To enhance the Knowledge base with KM tools to proactively facilitate knowledge generation, analysis, storage, sharing, use and dissemination (Objective 3; Output 3)** | | | | |
| **3.1** | Support international fora (engagements/networks) through which PACA can access new knowledge | 30,000 | 30,000 | 30,000 | 30,000 |
| **3.2** | Subscribe to Aflatoxin resource centres (journals) | 4,000 | 4,000 | 4,000 | 4,000 |
| **4.0** | **To gather more reliable and continental representative (increase pilot countries from 6 to 10) evidence to inform policy decisions, facilitate interventions (e.g. educational/awareness and technological) and resource allocations, and contribute to addressing gaps in technology and regulations** | | | | |
| **4.1** | 1. To support generation of food contamination data, sampled at harvest, 6 months after harvest, market and points of importation and exportation | **500,000** | **500,000** |  |  |
| **4.2** | Support harmonization of sampling protocols and analytical method performance criteria. Where possible, base the sampling protocol and method performance criteria on Codex standards | **100,000** | **100,000** |  |  |
| **4.3** | Support generation of data on diseases associated with aflatoxin exposure, aflatoxin levels in humans/biomarker data, extent of consumption of aflatoxin prone staples and rate of childhood stunting | **300,000** | **300,000** |  |  |
|  | **Total** | **1,194,000** | **1,057,000** | **157,000** | **157,000** |
|  | **Grand Total** | | | | **2,565,000** |

1. **Sustainability Plan**

It is anticipated that PACA will build the capacity of targeted country level institutions, so that they can provide data beyond the two year (2018 and 2019) funding window. Institution and focal persons will receive expertise training on AfricaAIMS and other technological tools to continue related activities with support from the participating African governments.

There is also need to renew commitments from governments to solicit their buy-in and support to Aflatoxin control initiatives.