

# The Pay-for-Results Challenge in Nigeria: Incentivizing New Technology Use for Sustainable Markets and Development Impact

## Background

In Nigeria, smallholder farmers (SHFs) produce over 70% of the maize crop, of which an estimated 60% is contaminated by high levels of aflatoxin varying throughout the country.<sup>1</sup> Aflatoxin contamination is produced by *Aspergillus* molds that are commonly found in grains such as maize. When ingested, aflatoxins may cause myriad health issues such as cancer and in extreme cases, death.

In order to combat this threat, the International Institute of Tropical Agriculture (IITA) developed a biocontrol product, Aflasafe™, which displaces aflatoxins by crowding out their growth. Despite the product's proven efficacy,<sup>2</sup> various market barriers including consumer awareness, access, affordability, and a lack of accepted contamination limits have prevented widespread adoption.

The AgResults Nigeria Aflasafe™ Challenge Project was the first Pay-for-Results (PfR) prize contest developed under AgResults, and its design focuses on incentivizing private sector actors to overcome Aflasafe's market limitations. However, since the Project's goals are to not only build a sustained market but also to deliver development impact to SHFs, the Project's design inhibited the growth of the grain traders and competitors it was hoping to incentivize through the pay-for-results mechanism. While the Project has achieved significant results, growth has been slower and the overall scaling of results has been less than initially anticipated in the original business plan.

## Project Design and Initial Selection of Competitors

The original Project design focused on three objectives

<sup>1</sup> International Institute of Tropical Agriculture, "Aflasafe Offers Win-Win Formula for Farmers, Investors" press release (June 23, 2010).

<sup>2</sup> Bandyopadhyay, Ranajit, Cotty, Peter, et al. "Between Aflatoxin and Aflasafe." Presentation to National Export Promotion Council of Nigeria, 28 July 2010.

## Key Lessons Learned and Recommendations

### Lessons Learned

- Conflicting development objectives could hinder a PfR project's ability to achieve intended scale.
- PfR projects may not achieve the full market penetration but can act as a "first mover" to spur future sustainability.
- PfR has the best chance for success when the technology works and can be implemented with minimal guidance.

### Recommendations

- Design teams should think carefully about the trade-offs between incenting the creation of a sustainable market and the need to measure direct economic benefits.
- Donors should work to understand when to use alternative finance like PfR prize contests to achieve development objectives.
- PfR programs to scale technological innovations should be done only with proven technology.

aligned to AgResults' overall goals:

1. Deliver development impact in terms of health and economic benefits to SHFs.
2. Help to build a sustained market for Aflasafe™.
3. Learn about pull mechanisms to determine their efficacy at incentivizing smallholder adoption of agriculture technologies.<sup>3</sup>

<sup>3</sup> AgResults Nigeria Aflasafe™ Pilot Business Plan, pp. 14-15.

To meet these objectives, the Project designers found that existing grain traders, input suppliers, large farmer cooperative societies, and maize processors in Nigeria would be best suited as competitors for the incentive. Measuring sales of the product as well as the proper use of the product was needed to verify the development benefits to SHFs. Therefore, AgResults designed the incentive based on the amount of maize bought, or aggregated, from SHFs that met a high-Aflasafe-prevalence threshold of over 70%. The premium prize per ton paid to qualifying competitors was set at an attractive rate (\$18.75/ metric ton) that would eventually be complemented, and then replaced, by a premium for aflatoxin-reduced maize once the market developed.

To make the use of Aflasafe™ economically viable for smallholders in the long-run, competitors had to be capable of supporting the enhancement of SHF productivity through access to yield-enhancing inputs and provision of technical assistance. Many actors along the maize value chain were considered during the design phase, from upstream agro-dealers to downstream maize processors, but few of these actors completely met the criteria. Commercial farms had strong market linkages and potentially powerful economic motives to produce aflatoxin reduced maize for a premium, but their participation would not have satisfied the need to achieve health and income benefits for SHFs. To offset this, AgResults chose competitors who already had or were capable of developing input sales and output purchasing relationships with farmers. As the program progressed, it was envisaged that other organizations would develop competitor relationships and join the Project.

To improve initial targeting and set ground rules for future participation, AgResults developed a set of criteria for selection of competitors:



Farmers in Nigeria learn about negative impacts of aflatoxins

## Nigeria Prize Overview

The Nigeria Aflasafe™ Challenge Project is a 5-year, US \$12 million PfR project that works to incentivize SHFs to adopt Aflasafe™. AgResults offers a per-unit payment premium to competitors for each metric ton of high Aflasafe™ maize (i.e., maize grains containing a high proportion of beneficial fungi). By motivating SHFs to use Aflasafe™ and providing technical assistance, competitors help SHFs to produce high-Aflasafe™ maize which has reduced the levels of aflatoxin. The Nigeria Project is managed by Adebowale Akande in coordination with IITA.

- Ability to facilitate SHF access to Aflasafe™ and yield-enhancing inputs
- Strong marketing capability to access premium downstream markets for maize
- Demonstrated ability to meet verification procedures, including delivery of high-Aflasafe™ maize to designated collection points and in the minimum quantities
- Involvement at least 500 contract farmers, primarily smallholders
- Evidence of high potential for rapid growth in number of contract farmers
- Willingness to maximize transparency, disclose records, and show transfer of a premium payment for high-Aflasafe™ maize to SHFs
- Positive reputation among SHFs in terms of technical support received and fair market price offered for their output<sup>4</sup>

## The Smallholder Verification Paradox

As explained above, AgResults needed to verify not just that competitors promoted Aflasafe™, but that SHFs applied Aflasafe™ appropriately to show the development impact. The verification system would ascertain the total amount of treated maize aggregated, as well as the levels of Aflasafe™ and aflatoxins in the maize. At agreed-upon aggregation points, maize was sampled and these samples were sent for testing in AgResults-approved facilities.

To be successful, competitors had to provide Aflasafe™ to farmers and train them on its proper use. In addition to Aflasafe™, competitors were expected to provide

<sup>4</sup> AgResults Nigeria Aflasafe™ Pilot Business Plan, p. 16.

smallholders with other inputs on credit and negotiate a better price for Aflasafe™-treated maize by marketing the benefits to big buyers. This would allow them to take advantage of the Project's verification of maize, and then act as a marketing bridge between the SHFs and buyers to create a sustainable, lucrative market benefiting both the SHF as well as the competitor.

In Nigeria, there was a lack of sufficient traders with the resources to grow within this scheme. From the start of the Project, many initially targeted competitors were actually just input suppliers who had no experience trading maize. Providing inputs as well as technical assistance combined with buying maize back from smallholders was a new business model for some competitors, and this precluded the participation of many companies in early years. For example, in the second year of the Project, AgResults approved four companies to join the Project that ultimately decided not to participate that year. In subsequent years, these companies all joined after they had time to understand and prepare for the Project's requirements. However, as we have seen in later years, some of these competitors were still not able to achieve the growth and scale anticipated due to difficulties in accessing the capital needed to function within the model.

As competitors joined in the first year, AgResults found that the Nigeria Project's business plan did not take into account the significant challenges that the access to capital requirement would have on the scalability of the Project. Buying back maize requires significant financial resources that competitors usually do not have. Accessing loans in Nigeria, especially in the agriculture sector, is difficult if not impossible for many businesses because risk-averse financial institutions charge high interest rates and require high collateral of small and medium enterprises. Some of the competitors did not have enough size and credit history to be eligible for loans with local banks and most banks in Nigeria would not provide agricultural loans without a loan guarantee. These financial constraints forced some of the competitors who joined the Project to drop out during the aggregation season or after just one year of participation. To date, we have seen 14 companies drop from the Project due to financial constraints.

## Attempts to Respond to the Challenges

In the Project's second year, AgResults attempted steps to address the challenges caused by access to finance. First, AgResults tried to work with financial institutions to motivate them to provide the competitors with short-

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term loans. The Project management team contacted banks with experience working alongside donor-funded agricultural projects, including First Bank, EcoBank Nigeria, Fidelity Bank, Wema Bank, Sterling Bank, Stanbic IBTC, and Diamond Bank, to gauge their interest in working with AgResults competitors. However, without a loan guarantee none of the financial institutions would provide loans. The Secretariat then approached the World Bank, which also functions as the AgResults Trustee, to explore the creation of a loan guarantee facility and letter of credit for AgResults. Ultimately, we found this idea untenable, due primarily to high costs associated with establishing and maintaining a new loan guarantee facility of this scale. Finally, the Secretariat met with the USAID Development Credit Authority to discuss a potential loan guarantee program with the Central Bank of Nigeria's agricultural loan program. This idea did not work because the USAID DCA loan guarantee program addressed only the collateral requirements, while participating banks were not willing to lower interest rates, which at the time ranged from 23 to 36 percent. It was eventually determined that solving the access to credit issue in agriculture was beyond the scope and resources of the Project.

Another design consideration that hindered competitor



A farmer applies Aflasafe™ to his field

involvement was the number of contract farmers required in the design, which originally stipulated that competitors would work with a minimum of 500 SHFs. In reality, most competitors' resources only allowed them to work with 100 to 200. AgResults revised the contest rules accordingly to reduce the number of farmers each participant was required to work with in order to join.

This allowed some previously excluded competitors to join the Project and to grow the number of farmers they serviced through reinvestments of incentive prizes. For example, after the rule adjustment Agbelere Integrated Farms joined the Project with 120 farmers and grew to 1,145 farmers by the fourth year.

While not a direct challenge, AgResults found that several of the larger competitors did not face financial constraints because they had access to other sources of funding and were able to grow quickly and even exceed growth expectations. Often, these other sources of funding come from donor initiatives, showing the potential for traditional funding to work alongside PfR programs like AgResults to amplify results.

## **Building on AgResults: Achievement of Outcomes and the “Second Mover” Advantage**

After four years of implementation, AgResults has seen that the private sector is motivated to serve SHFs not only because of the incentive per metric ton of aggregated Aflasafe™-treated maize, but also due to the market premium received from larger buyers that require higher-quality, aflatoxin-reduced maize. Despite the financial challenges faced by competitors, over the past two years some competitors have scaled their number of participating farmers significantly. This indicates that the AgResults prize has incentivized competitors to change business models to increase maize aggregation. This growth is in part due to significant price premiums of 17% to 50% that competitors have realized by selling the Aflasafe™-treated maize. The premiums are an indication that the Project has not only created a general awareness but also emerging into a sustainable market for the product. As the Project enters its final year, we are attempting to understand the price sensitivity and sustainability of the Aflasafe treated market by reducing the prize incentive by 50%. Given the increased demand for Aflasafe maize and if the market

premium is as high as we have found, then we should see no drop in aggregation.

Another piece of evidence that the Project was able to increase awareness of the negative effects of aflatoxins and raise awareness of the benefits of Aflasafe™ is through the implementation and growth of a new Aflasafe project. The USAID and the Gates Foundation-funded Aflasafe™ Technology Transfer Commercialization (ATTC) project launched in 2016 to identify companies and work with them to commercialize Aflasafe™ throughout Nigeria. In its first year, the company that is selling Aflasafe in Nigeria achieved huge growth in sales. The numbers point to an existing market awareness and demand for Aflasafe that was in large part created by AgResults.

An important consideration that underlines the ability of competitors to slowly scale up their results as well as the early success of ATTC is the relatively foolproof nature of the product. There is compelling early evidence from data collection done with participating SHFs to indicate that, while many participating smallholders may not apply Aflasafe™ according to IITA's specifications, the product still works extremely well in reducing aflatoxin prevalence to acceptable levels.



Women farmers learning about Aflasafe™

## Lessons Learned and Recommendations

- **Conflicting development objectives could hinder achievement of intended scale:** The Nigeria Project has shown that selecting the right private sector actors to address a market failure is not as straightforward as it seems. Requiring both sustainable market growth and SHF development outcomes led to stringent verification requirements, forcing competitors to aggregate maize instead of simply marketing a new input. The participating companies were unable to reach the scale originally projected in the Project’s business plan due to constraints in accessing needed capital to fund effective aggregation services. Despite these constraints, over four years of the Project we have seen competitors gain traction and begin to take Aflasafe™ to scale.
  - **Recommendation:** Design teams should think carefully about the trade-offs between incenting the creation of a sustainable market and the need to measure direct economic benefits for SHFs.
- **Pay-for-Results projects may not achieve the full market penetration but can act as a “first mover” to spur future sustainability:** The growth rate of the Project was initially disappointing. However, over the past two years we have seen a strong growth curve in aggregation totals as they reinvest earnings and find new ways to link SHFs to premium markets for Aflasafe-treated maize. The activity has increased market awareness and set the stage for other actors to find channels outside of AgResults to take Aflasafe™ to scale.
  - **Recommendation:** Donors must analyze market systems carefully to identify when to deploy PfR and when to use push mechanisms (or when to use both to complement each other) to achieve development outcomes.
- **The technology has to work:** Aflasafe is backed by extensive research that shows its efficacy in lab and field tests. However, AgResults was its biggest test to date. The results have been impressive: in the cases where the product has been correctly applied, the prevalence of aflatoxins in aggregated maize is extremely low.
  - **Recommendation:** PfR projects have the best chance of success when the technology works and can be implemented by SHFs with minimal guidance. Farmers are notoriously risk-averse, and a product that does not work reliably or easily will have little chance for scale – and reduce a private sector actor’s appetite to work to promote it.

## About AgResults

AgResults is a \$147 million collaborative initiative between the governments of Australia, Canada, the United Kingdom, the United States, and the Bill & Melinda Gates Foundation to incentivize the private sector to overcome market barriers and develop solutions to food security and agricultural challenges that disproportionately affect people living in poverty. The initiative designs and implements agriculture-focused prize competitions, also referred to as pay-for-results or pull mechanisms, which are innovative development finance programs that engage the private sector to work towards a defined goal to receive a monetary award.

## About AgResults Lessons Learned Series

One of the primary objectives of AgResults is to better understand how well pay-for-results prize competitions work to overcome market failures in agricultural development. The lessons learned series explores AgResults’ experience designing and implementing agriculture-focused pay-for-results prize competitions, with the goal of providing key lessons and recommendations that development practitioners should take into account when designing similar programs.



AgResults is a Partnership Between:



