AgResults
INNOVATION IN RESEARCH AND DELIVERY

The AgResults initiative is a partnership between:

Australian Government
Department of Foreign Affairs and Trade

BILL & MELINDA GATES foundation

Canada

UKaid
from the British people

USAID
FROM THE AMERICAN PEOPLE

THE WORLD BANK

AgResults Kenya On-farm Storage Presentation to the Crawford Conference

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AgResults Overview and Theory of Change

$118 million

Collaborative initiative between **DFID**, **DFAT Australia**, **Global Affairs Canada**, **USAID**, and the **Gates Foundation** to use pay-for-results mechanisms to incentivize and reward high impact agricultural innovations that promote:

Food Security | **Health** | **Nutrition**

Why?

"Pull" mechanisms incent the private sector to overcome market barriers by investing in innovation **and reward only those who are successful**.

They contrast with traditional "push" mechanisms where donors give **up front** grants or technical assistance to achieve an expected, but **not guaranteed**, impact. Oftentimes, this means that donor money is spent regardless of whether or not the desired results were achieved.

How?

The AgResults, analyzes **binding constraints** that inhibit solutions such as**:**

Access to finance/credit

Low consumer awareness

Lack of business capacity

Distortionary gov't policies

Once binding constraints are identified, AgResults determines **which of the constraints to solve**, and the **right amount** to provide as a prize.

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Prizes stimulate private sector investment by altering the expected return

Increases Market Attractiveness

- Prizes alter the expected value of entering a particular market
- Organizations build the technological, management or distribution capabilities to compete in the market after the conclusion of the competition

Provides Platform for Innovation

- Prizes are agnostic to the technology or approach used
- Competitions measure the results of each approach, enabling the most effective solution to rise to the surface

Crowds in Solvers

- Traditional development allows for one organization to attempt to solve the problem at hand, while prizes enable more organizations to participate
- Competition increases the need to innovate to meet consumer demand

The X-Prize, a US $10 Million Prize, resulted in over US $100 Million in private sector investment.

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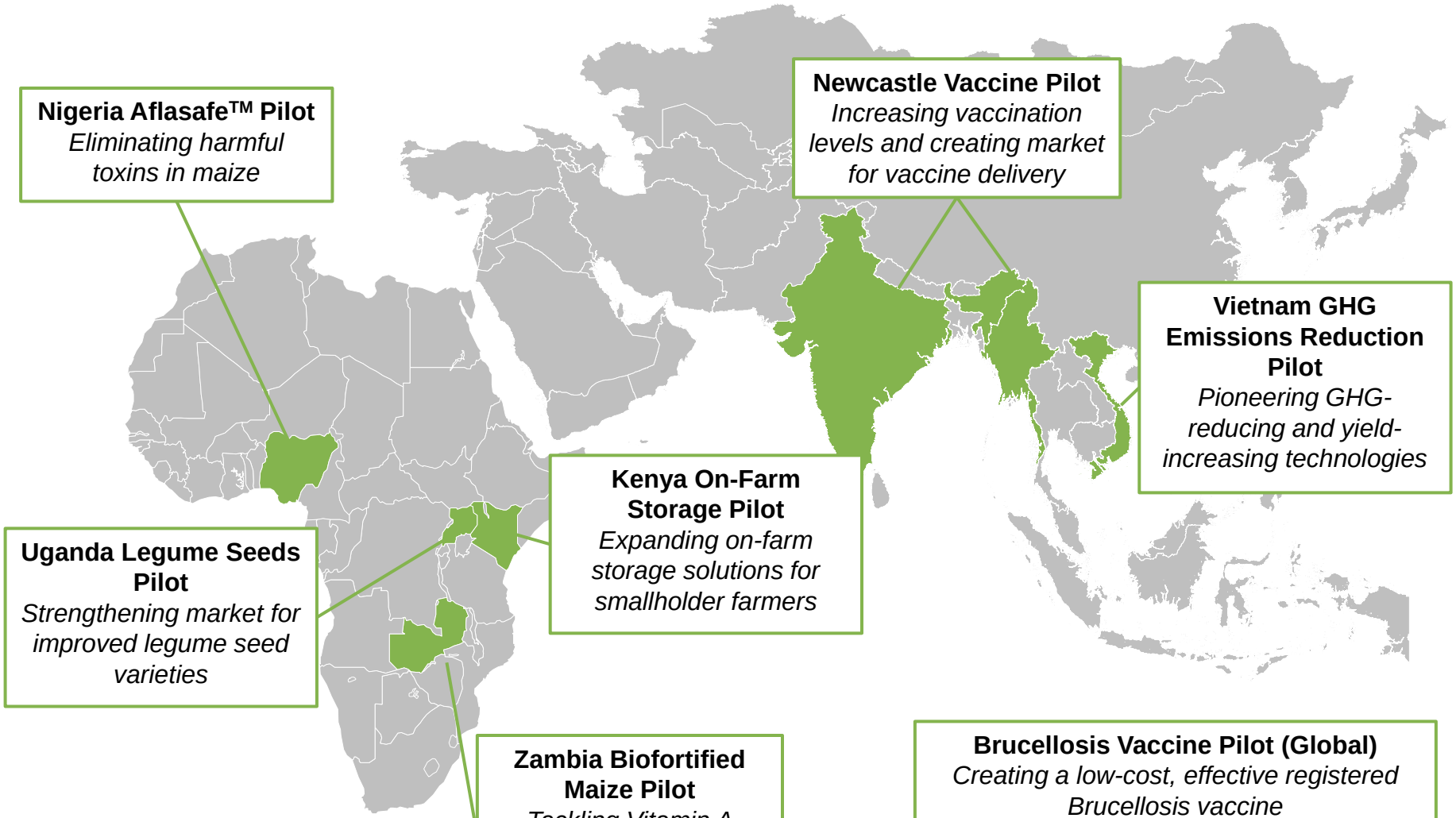
AgResults Pilots



Nigeria Aflasafe™ Pilot
Eliminating harmful toxins in maize

Newcastle Vaccine Pilot
Increasing vaccination levels and creating market for vaccine delivery

Vietnam GHG Emissions Reduction Pilot
Pioneering GHG-reducing and yield-increasing technologies

Kenya On-Farm Storage Pilot
Expanding on-farm storage solutions for smallholder farmers

Uganda Legume Seeds Pilot
Strengthening market for improved legume seed varieties

Zambia Biofortified Maize Pilot
Tackling Vitamin A deficiency with biofortified Provitamin A maize

Brucellosis Vaccine Pilot (Global)
Creating a low-cost, effective registered Brucellosis vaccine

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The Kenya On-Farm Storage Pilot uses a pull mechanism to address post harvest losses of maize and grain by creating a market for on-farm storage solutions for SHFs

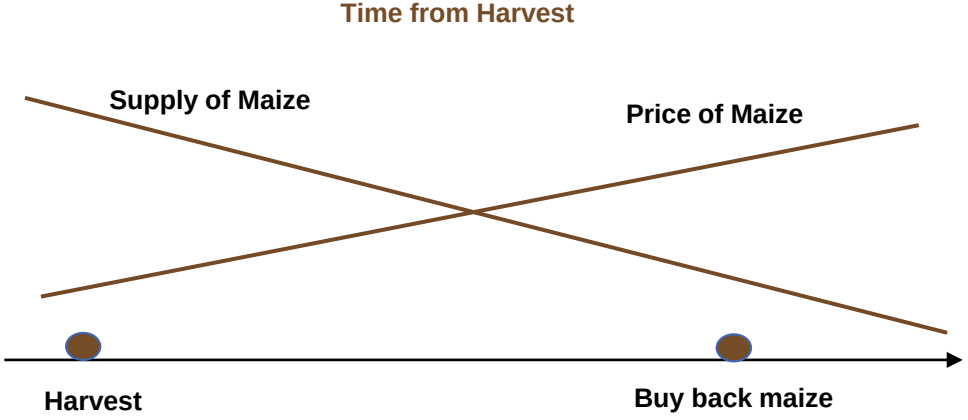
Magnitude of Post-Harvest Losses

- Post-harvest grain losses in Sub-Saharan Africa are estimated to be US$1.6 billion per year, which is 13.5% of the $11 billion grain market
- The Larger Grain Borer (LGB) and other pests cause substantial post-harvest losses that have a significant impact on small-holder farmer (SHF) food security. The Eastern Region of Kenya experiences particularly large losses from the LGB.
- Significant Post-harvest losses caused by spoilage and pests
- Farmers flood the markets with grain at harvest and are required to buy grains at a higher price later

Market Barriers for Storage Solutions

- Low supply of technologically effective on-farm storage solutions suitable for Kenya
- Lack of SHF awareness of effective storage practices and their benefits
- Limited access to affordable on-farm storage solutions for SHFs
- High marketing and promotion costs associated with access to the SHF market
- Market solutions exist and they have helped large and medium farmers but they are not reaching SHF

Negative Economic Impact on Smallholder Farmers without Post-Harvest Storage Devices



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The Kenya Pilot aims to reduce post-harvest losses of maize and grains by facilitating the development, marketing, and distribution of on-farm storage solutions to SHFs

Kenya Pilot Pull Mechanism Structure

The pilot is separated regionally to meet the specific need to prevent LGB damage in the Eastern Region

Rift Valley Sales to Smallholder Farmers

Pilot Mid-Point: The first five Implementers to reach the **21,000 MT** (Metric Ton) sales threshold of any single storage device type will receive a USD **$750,000** performance-based grant.

Pilot End-point: All Implementers that pass threshold will share **USD $1,000,000, proportionally** distributed based on sales

Eastern Region Sales to Smallholder Farmers

Pilot End-point: Implementers that reach the 21,000 MT sales threshold of any single storage device type that is LGB proof will share **USD $3,000,000, proportionally** distributed based on sales

By offering **$7.75M** in prize awards to solvers that meet pilot sales thresholds, the pilot aims to:

$7.75M

- Increase the economic welfare of SHFs through improved access to affordable storage devices that minimize crop losses and increase SHF income and food security
- Help catalyze a sustainable market for SHF storage devices in Kenya
- Test an innovative model of engaging the private sector to serve smallholder needs, with potential future applicability to the delivery of other goods and services to SHFs
- Incentivizing the creating of new technologies and adapting existing technologies in a technologically agnostic framework

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The Kenya Pilot Implementers are marketing and testing the use of plastic tanks, metal silos, and hermetically sealed bags as storage devices

Storage Standards

- Easy to use and affordable for smallholders farmers
- Solution eliminates pests within two to three weeks of the grain being placed in the container
- No external infestation of pests during reasonable 4 to 6 month storage life
- No adverse effects to grain quality during storage

Technologies Used

- **Metal Silos:** Large, sealable silos recently adapted for SHF use. Capable of storing up to 540KG of maize (20 years)
- **Plastic Tanks:** Durable, affordable airtight plastic containers capable of storing more than 100KG of maize (10 years)
- **Hermetically sealed bags:** Multi-layered, sealable bags that can store up to 100KG of maize (3 years)

Metal Silos

Plastic Tanks

Storage Bags

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AgResults in collaboration with the International Center of Insect Physiology and Ecology developed the Large Grain Borer penetration protocol for testing storage devices against insect damage

The penetration tests consisted of three stages:

- **Insect Damage Test** to assess the efficacy of storage devices in protecting the grain from insects that enter during the storing process
- **Penetration 1 Test** to determine if Large Grain Borer can breach storage device materials
- **Penetration 2** Test assessed whether insects released outside a full-size storage container could penetrate the device within a four-week period

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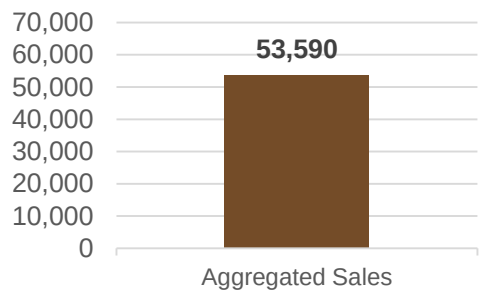
Increased market participation by various on-farm storage providers leading to increased sales to smallholder farmers (SHF)

Participating Regions in Kenya

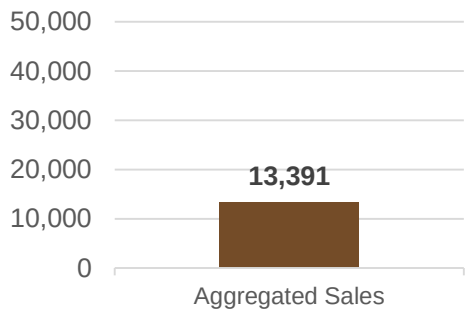
- **The Pilot has 6 local and international companies participating and 2 new companies joining from Uganda**
- **Participating companies have seen increased demand for storage devices by small holder farmers have improved their designs to respond to their needs**
- **In spite of the existing sales progress, new companies are joining**

- **To date companies have sold nearly 70,000 metric ton (MT) capacity to smallholder farmers**
- **Increasing their ability to store grain to fill their needs**
- **No longer selling in a glut market or having to buy grain when price is high**

Total Storage Capacity (MT) Sold to SHF in Eastern Region



Total Potential Storage Capacity (MT) Sold to SHF in Rift Valley



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What is the expected impact of the Kenya On-Farm Storage Pilot?

Expected Pilot Impact	• Reach approximately **480,000 smallholder farmers** and generate at least **172,000 MT of adjusted storage capacity** for grain in the Rift Valley and Eastern Region. • Generate **US$14M** in smallholder benefits from the storage of grain, the sale of crops in higher-priced market periods, and the reduced need to buy grain for household consumption. • Enable Implementers to test products and marketing strategies that can be used for distribution of storage solutions.

Smallholder Farmer Impact	• **Improved storage capacity will allow SHF farmers to retain maize and avoid selling immediately after harvest, when prices are lowest**
	  ○ Research shows that the difference in price of selling at farm-gate and buying back from the retail market as soon as a month later is often $150-$200 MT
	  ○ Improved storage capacity will lead to increased food security and reduce expenditure on maize during non-harvest periods
	• Safely stored, non-contaminated maize will demand a premium price in the market, growing farmer incomes
	• Access to on-farm storage not only reduces post-harvest losses, but incentivizes farmers to increase production
	• Effective storage methods eliminates the need to dust stored grain with pesticides reducing adverse effects on farmers' health

Aflatoxin Reduction	• On-farm storage technologies limit aflatoxin contamination of maize. Airtight storage technologies limit oxygen and prevents aflatoxin from building up by suppressing the development of *Aspergillus flavus.* • Reduced aflatoxin contamination will result in higher quality maize and improved health outcomes among SHFs

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By offering an incentive, the private sector has created a sustainable new market for devices that fit the needs of SHFs

Private Sector

- Redesign of larger storage deceives
- Product machinery in place
- Investment in marketing and promotion of smaller storage devices
- Product prices generate profit

Farmers

- Ability to save maize after harvest
- Higher income from selling grains when prices are high
- Higher demand for better storage devices after realizing their benefits

Agro-Dealers

- Established relationships with the private sector and farmers
- Realized profit from selling new storage devices
- Established distribution channels

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