

**AGRESULTS: INNOVATION IN RESEARCH AND DELIVERY
SUBMISSION TO THE PARLIAMENT OF AUSTRALIA
JOINT STANDING COMMITTEE ON FOREIGN AFFAIRS, DEFENSE AND TRADE
FOREIGN AFFAIRS AND AID SUB-COMMITTEE**

*The Australian Government's Contributions to Agricultural Innovation and Development
through the AgResults Initiative*

AgResults Overview

The Australian Government's Department of Foreign Affairs and Trade (DFAT), has been at the forefront of agricultural innovation through the AgResults initiative, a multilateral undertaking focused on developing high-impact innovations in agriculture that promote global food security, health, and nutrition and benefit smallholder farmers (SHFs). The initiative is pioneering new development financing models that move beyond traditional forms of aid.

AgResults originated at the 2010 G20 Summit in Toronto, where the Australian Government, along with other leaders of the G20, committed to exploring innovative, results-focused methods of harnessing private sector innovations in food security and improving productivity in developing countries. Following this summit, the governments of Australia, Canada, the United States, and the United Kingdom, along with the Bill and Melinda Gates Foundation, committed AUD \$162.5 million to formally establish AgResults. The Government of Australia pledged an AUD \$20.2 million contribution to the initiative.

AgResults consists of six pilot projects across the developing world focused on either the adoption of existing technologies or the development and adaptation of new research and technologies. The Initiative is currently in its preliminary stages, with pilots at different phases of development and implementation. The most mature pilot has been running for two years, while other pilots are still in their first year of implementation, or slated to launch in the near future.

AgResults' Objectives

The principal objectives of AgResults are to 1) overcome market failures impeding agricultural innovations by offering results-based economic incentives ("pull" mechanisms) to competing private actors for the uptake of new agricultural technologies; and to 2) test the effectiveness and efficiency of pull mechanisms in comparison with traditional approaches.

AgResults focuses primarily on SHFs as the beneficiaries of pull mechanism interventions. Through pulls, AgResults incentivizes a host of different actors to develop sustainable, market-based solutions that reduce poverty and support broad-based economic growth. Sustainability requires addressing the key market failures along the entire value chain of a product, and ensuring that these failures do not reemerge after the conclusion of an AgResults pilot.

The AgResults initiative is also committed to pursuing a learning agenda and imparting lessons onto project stakeholders and the general public. Although some of AgResults pilots are located largely outside of the Indo-Pacific region, the initiative's learnings and project models are of great value to the Australian Government, as well as other participating donors, who can take away valuable lessons from the innovative financing mechanisms implemented across AgResults' pilots. These approaches can be exported to the Indo-Pacific region and other geographies looking to strengthen food and nutrition security and promote innovation in not just agriculture, but in any sector or industry.

AgResults Focus Areas

The AgResults initiative has focused its pull financing efforts on three thematic issues: food security, nutrition, and health:

Food Security: To ensure sustained and equitable growth through increased yields and post-harvest loss reduction

Health: To promote improved health outcomes focus on livestock management in the developing world

Nutrition: To improve nutrition and promote economic growth and poverty reduction

Organizational Structure

The Australian Government's contributions to the AgResults initiative are pooled with the four other participating donor agencies in a Financial Intermediary Fund operated by the World Bank, which serves as the AgResults Trustee. The implementation of AgResults is overseen by a Steering Committee, currently chaired by a representative from DFAT. The Steering Committee, which is comprised

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of representatives from the five donor agencies and the Trustee, is responsible for strategic oversight of the initiative, including endorsement of key management decisions, approval of concepts, and the monitoring of pilots and the initiative as a whole.

AgResults is directly managed by a Secretariat, responsible for pilot implementation, oversight and monitoring, sourcing new research and development and adopting pilots, conducting peer review of new pilots, and outreach and communications.

Each pilot project runs with a competitively selected Pilot Manager, who coordinates the project on the ground, Implementers that compete to solve the issues at hand, and Verifiers who confirm Implementers have met the pull's requirements. Independent Evaluators are responsible for measuring AgResults' impacts and comparing them to traditional push mechanism development approaches.

Innovative Financing through Pull Mechanisms

In all of its pilot projects, AgResults employs pull mechanisms, ex-post provisions of economic incentives provided to business or organizations in areas where private sector investment is virtually absent due to market uncertainties. These mechanisms address specific, well-defined problems—without preference to market participants or technologies—by creating demand, while leaving production, marketing, and distribution strategies to the private sector.

There are several different types of pull mechanisms—which award “prizes” as incentives—that are applicable to different situations:

- **Standard / Grand Prize:** A winner takes all contest, where the first solver to achieve the objectives of the competition receives a lump sum payment
- **Milestone Prize:** A contest where payments are made at different stages for meeting competition objectives
- **Proportional Prize:** A contest that pays out competitors proportional to their measured achievements
- **Advance Market Commitment:** Subsidies provided by funders on a per-unit basis for a product or service for a specific duration of time. In return for this subsidy, participants agree to provide a product at a reasonable price
- **Patent Buyout:** Funders pay competitors for developing a new technology or product and broadly disseminate the knowledge for uptake and commercialization

Pull mechanisms differ from traditional development aid models, such as upfront research and development funding, in that they: pay only for results; can leverage investments from a range of different competitors that outweigh what is spent on operating the pull; do not need to prescribe which approach works best, only verify results against established criteria; and tend to attract significant public attention and interest.

Although pull mechanisms are not a new concept, the popularity of pulls has grown significantly in the last decade. Across the public, private, and social sectors, pull mechanisms are being recognized as dynamic tools in catalyzing innovation and problem solving for some of the most pressing modern challenges.

Amidst this new excitement around pulls, AgResults is serving as a pioneer in testing their effectiveness within the developing world and their efficacy in regions such as the Indo-Pacific in the future.

AgResults Pilots

Six AgResults pull pilots are already underway across the developing world:

1. **Vietnam Greenhouse Gas Emission Reduction Pilot:** Incentivizing the uptake of innovative practices to reduce greenhouse gas (GHG) emissions and simultaneously increase yields through milestone and grand prizes in paddy rice production
2. **Brucellosis Vaccine Pilot:** Promoting the introduction of a safe, low-cost, and efficacious registered vaccine for an endemic disease that affects production animals and humans, through milestone and grand prizes
3. **Nigeria Aflasafe™ Pilot:** Catalyzing the adoption of biocontrol technology to control Aflatoxin contamination and toxins in maize by offering economic incentives to maize aggregators on a per-unit basis
4. **Zambia Pro Vitamin A Biofortified Maize Pilot** Incentivizing the introduction of biofortified pro vitamin A (PVA) maize to poor consumers through per-unit payments to participating millers that reach sales thresholds

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5. **Kenya On-farm Storage Solutions Pilot:** Reducing post-harvest loss through proportional, performance-based grants to companies based on development and sales of affordable storage devices to small holder farmers
6. **Uganda Legume Seeds Pilot:** Incentivizing seed companies to find market solutions to challenges in the legumes seed value chain through volume guarantees and proportional prizes

Another pilot tackling Newcastle Disease in India is in the development stages and will begin in 12-18 months. This pilot focuses on incentivizing the creation of scalable and replicable vaccination business models to address village-level vaccination for this poultry disease.

1. The Vietnam Greenhouse Gas Emissions Reduction Pilot

The Problem: Weather variations caused by climate change – such as floods, draughts, rising sea levels and extreme storms – profoundly affect SHFs, who are highly vulnerable to external shocks that damage an otherwise steady source of income. Agricultural practices emit over 50% of global non-carbon dioxide GHG emissions, which contribute to the warming of the planet. About 7% of agricultural non-carbon dioxide GHG emissions are a result of rice farming and over 80% of GHG emissions from rice farming are produced in South and Southeast Asia.

The Pull Solution: Participating Implementers in the Vietnam Pilot compete over the course of four years to win proportional milestone prizes on their progress against a baseline of GHG emissions and yields. Participants in the pilot competition can include single entities or groups of organizations from the private and / or non-governmental sector. The Vietnam Pilot is currently in the initial launch stage. AgResults is in the process of selecting a Pilot Manager team to manage the project in-country and laying the groundwork for the prize competition, which will begin in 2016.

In the first pilot phase, spanning 1.5 years, the three pilot Implementers with the highest absolute GHG emissions reductions and yield increase receive first, second, and third place prizes for USD \$50,000, USD \$30,000, and USD \$20,000, respectively. During this period, Implementers are also eligible for a proportional interim prize of USD \$20,000 for GHG emissions reduction.

In the second pilot phase, Implementers will work to increase the number of SHFs adopting successful GHG reducing and yield increasing practices from the first phase. The three Implementers who are able to reach the highest number of SHFs, using tested solutions from Phase 1, will receive prizes of USD \$1 million, USD \$600,000, USD \$400,000, respectively. Implementers, who surpass baselines for GHG emissions and yields, receive an interim proportional prize of USD \$500,000.

Projected Outcomes: Over the course of the project, AgResults anticipates reaching up to 75,000 farm households in the Red River Delta in Vietnam. The pilot also has the potential to reduce around 375,000 tCO₂e and may result in cost savings of around 15% to SHFs as a result of lower input use. This reduction in emissions would be enough to offset around 78,000 passenger vehicles. If proven effective, the solutions tested and scaled in this pilot can be expanded to other areas of Vietnam, and the broader region.

By addressing contributing factors to climate change and simultaneously enhancing agricultural productivity, this pilot will help produce both an immediate economic impact through yield-enhancing technologies, but also contribute to longer-term environmental and health benefits from reduced pollution and environmental risk.

2. Brucellosis Vaccine Pilot

The Problem: Brucellosis is a contagious and costly disease of ruminants—such as cattle, sheep, and goats—that causes abortions, decreased milk production, weight loss, infertility, and lameness. Brucellosis is endemic in a number of developing countries and the most common zoonotic disease worldwide with approximately 500,000 new human cases annually. Wholesale vaccination of livestock can be a cost-effective way of controlling the disease and limiting its impact on both human and animal health. However, the existing Brucellosis vaccines are not safe, affordable, or efficacious enough to use in developing countries. Pharmaceutical companies are generally not interested in developing vaccines that meet these criteria since they have better opportunity cost options.

The Pull Solution: Through results-based milestone payments, the Brucellosis Vaccine Pilot aims to encourage the development of an improved, safe, low-cost, and efficacious registered vaccine for the most common bacterial strain of the disease. The pull mechanism for the Brucellosis Pilot will include three milestone payments for Implementers during the vaccine development process. Potential

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Implementers for this pilot include medium-sized companies with vaccination research and development experience or larger companies with Animal Health divisions. The Brucellosis Pilot has not formally begun, however, AgResults will be mobilizing a Pilot Manager team and launching the pilot in 2016.

The first pilot phase will last up to one year and requires the initial submission of an application to AgResults—and subsequent selection by an expert review panel. Up to 10 selected Implementers will receive USD \$100,000 for successful submissions. The second phase involves the completion of an Efficacy Study over five to seven years. To receive a USD \$1 million milestone prize, Implementers must test a scaled-up version of a Brucellosis vaccine and meet specific efficacy requirements. The third and final phase lasts two to three years and involves the successful submission of a vaccine for registration in an EU country that meets viability criteria laid out by AgResults. After officially registering their product, an Implementer will receive a USD \$20 million prize award. Within one year of this award, an Implementer can also receive a USD \$5 million prize for meeting additional Best-in-Class vaccine elements.

Projected Outcomes: The development of an improved vaccine through the Brucellosis Pilot will have a significant impact on populations affected by the disease—particularly SHFs—within the developing world. The livelihood of SHFs will be improved through the mitigation of costs associated with animal sickness, which have been estimated at US \$21 per sheep and US \$38 per goat. In addition to avoiding costs associated with animal sickness, an effective vaccine will help vulnerable populations avoid costly human infections, which can require hospitalization, drug treatments, and loss of work due to sickness. All of these outcomes will dramatically improve health outcomes in developing countries, where the disease is endemic.

3. Nigeria Aflasafe™ Pilot

The Problem: Aflatoxin contamination is a global problem affecting 4.5 billion people in developing countries. Among the most carcinogenic substances known, aflatoxins are produced by some species of *Aspergillus* fungi that are most commonly found in grains such as maize and groundnuts. Although technologies to reduce aflatoxin contamination have existed for decades, barriers in the market, among other reasons, have prevented widespread adoption in the developing world.

The Pull Solution: The Nigeria Aflasafe™ Pilot provides economic incentives to SHFs for the adoption of Aflasafe™, an aflatoxin biocontrol technology. The structure of the pull mechanism features per-unit payments for performance that are tied to the number of kilograms of maize treated with Aflasafe™ collected from maize aggregators. Maize aggregators function as the pilot Implementers, with each Implementer managing a network of SHFs, and providing them with technical assistance and support during production, as well as distribution channels, once Aflasafe™ maize is harvested. Each Implementer receives a premium payment equal to US \$18.75 (3,000 Naira) for every metric ton (MT) of high- Aflasafe™ maize that is delivered to designated collection points. The Nigeria Pilot spans five years, and expects to deliver premium payments to Implementers totaling approximately USD \$4.36 million over the course of the pilot.

Projected Outcomes: The Nigeria Aflasafe™ Pilot is estimated to incentivize a total production of approximately 480,000 MT of high-Aflasafe™ maize over the life of the project. By Year 4 of the pilot, nearly 35,000 participating farmers are expected to sell 200,000 tons of high-Aflasafe™ maize, roughly 3% of Nigeria's total maize production, and consume roughly 60,000 tons.

The pilot is expected to deliver improved health outcomes among 70,000 smallholder family farmers, who will directly consume the treated maize their families grow. Additionally, downstream maize consumers will enjoy nutritional benefits from their consumption of aflatoxin-free maize.

The SHFs that produce Aflasafe™ maize will enjoy higher incomes: the incremental net economic benefit to smallholders participating in the pilot is estimated to average US \$270 per hectare per year.

Results: The Nigeria Pilot is moving into Year 2, with impressive results thus far. The group of pilot Implementers has increased by 125% from Year 0 to Year 1. The number of farmers producing Aflasafe™ maize increased 222% from Year 0 to Year 1, with 3,271 farmers now participating. Finally, the amount of Aflasafe™ maize aggregated for sale grew 255% from 2,031 MT in Year 0 to 7,220 MT in Year 1.

In Year 1 of the pilot, 14% of the farmers AgResults worked with were women. AgResults' efforts with these farmers directly contributes to women's improved livelihoods, access to agricultural technologies, training, and increased market access.

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4. Zambia Biofortified Maize Pilot

The Problem: Vitamin A deficiency causes preventable blindness in children and increases the risk of disease and death from infections. This condition causes up to 250,000 child deaths annually in Africa. In Zambia, research indicates vitamin A deficiency rates as high as 31% in children and 21% in women. Vitamin A is critical for maternal and child health and for reducing mortality among these groups.

The Pull Solution: The Zambia Biofortified Maize Pilot supports the introduction of biofortified PVA maize into commercial rural and urban markets through incentive prizes for milling companies. At the onset of the pilot, milling companies, who function as the pilot Implementers, submit a marketing and sales plan, and select applicants receive grants to cover initial marketing costs. After conducting marketing, millers advanced to the next phase of the pilot, where they are eligible for PVA maize subsidies on a per-unit basis. In order to qualify for the subsidy of US \$50 per ton, millers need to pass the individual threshold of 1,000 MT of PVA maize sold. The pilot currently involves four participating millers competing for the PVA maize payouts.

Projected Outcomes: The Zambia Pilot is currently in Year 1, with millers undertaking marketing activities to stimulate demand and competing to reach the threshold to receive per-unit subsidies of USD \$50 per ton. The pilot expects to incentivize the production of over 60,000 MT of PVA maize meal by its fifth and final year. This increased output in biofortified maize will deliver improved long-term health outcomes as well as increased economic productivity per capita in Zambia. PVA maize produce consumers will receive an additional 124µg of vitamin A per day, 24% of the average requirement. The additional vitamin A intake is also expected to save 476 lost years of "healthy" life (DALYs) among Zambia consumers due to decreased disability, allowing greater contributions to GDP.

5. Kenya On-Farm Storage Pilot

The Problem: Post-harvest losses of grain in Kenya are extensive, leading to lower incomes among SHFs and farm-level food security issues. Insufficient on-farm storage solutions often lead farmers to sell after harvest and receive lower prices when the market is flooded. Improved smallholder access to storage solutions could therefore lead to meaningful economic benefits if more grain was stored for sale or for later consumption. By being able to store maize for their own family consumption as well as providing a grain banking opportunity the SHFs food security is dramatically improved.

The Pull Solution: The Kenya On-Farm Storage Pilot addresses post-harvest losses by facilitating the development, marketing and distribution of on-farm storage solutions to SHFs. The pull mechanism provides performance-based grants to storage device companies, who serve as pilot Implementers, based on verified sales of approved storage devices that meet a minimum 21,000 MT of Useful Life Adjusted Storage Threshold. The Kenya Pilot operates in two regions: The Rift Valley Region and the Eastern Region. In the Rift Valley, up to five Implementers, who reach the 21,000 MT threshold for any storage device, will be eligible for a US \$750,000 performance-based grant in mid-2017. At the end of 2018, Implementers in both the Rift Valley and the Eastern Region will be eligible for USD \$1 million and USD \$3 million proportional prize based on sales to SHFs.

Projected Outcomes: The Kenya Pilot is in Year 1, with sales of on-farm storage devices by three Implementers already underway. The pilot is projected to reach approximately 480,000 SHFs and create at least 172,000 MT of new storage capacity for grain in the Rift Valley and Eastern Regions. The pilot is also projected to generate US \$14 million in smallholder benefits from the storage of high quality grain, the ability to spread sales into higher-priced periods and a reduced need to buy grain for household consumption, especially during non-harvest months.

The pull mechanism is expected to enable participants to test marketing strategies that can be used for distribution of storage solutions and other products targeting smallholder consumers. If proven effective, these models can be expanded to other regions.

6. Uganda Legume Seeds Pilot

The Problem: Improved legumes provide high-impact benefits in terms of income, nutrition, and soil health. In Uganda, however, demand uncertainty, barriers to working capital, and challenges faced by seed breeders have constrained seed companies from producing improved legume seeds and ensuring they are accessible in the market.

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The Pull Solution: The pilot's pull mechanism centers on the use of an annual Volume Guarantee to incentivize Implementers, seed companies within Uganda, to address key market failures in the legume seed value chain. At the same time, an additional proportional End-Of-Pilot Prize encourages Implementers to dramatically increase sales.

Under the Volume Guarantee, AgResults agrees to purchase a certain quantity of unsold, certified legume seeds at a proportion of the wholesale market price from each participating Implementer. This guarantee will help the Implementers address demand certainty and will assist these companies in securing financing.

The End-of-Pilot Prize is designed to further accelerate the seed companies' desire to increase sales and to utilize the Volume Guarantee as little as possible. The End-of-Pilot Prize is a payment that will be calculated based on the selected Implementers' sales over the pilot period of five years that are above a minimum threshold.

Projected Outcomes: The Uganda Pilot launched in 2015. The pilot expects to enroll Implementers in 2016 and bring quality seeds to market in 2017. Over the course of the pilot, the anticipated cumulative projected benefit to seed companies and farmers may reach approximately USD \$2.5 million and USD \$30.4 million, respectively. Under a scenario of an anticipated 20% legume seed growth per year, the project would result in a cumulative 5,396 MT of additional legume seed being sold into the market. Switching to certified improved seed varieties may also increase legume yields up to 40% in Uganda.

Legumes are a reliable and low cost source of protein, providing the highest calories of any cereal or meat option. An important part of local SHFs' diets, legumes account for roughly 25% of per capita protein intake in Uganda. Thus, improving yields could greatly contribute to the country's food security.

Conclusion

This document has served as an overview of the Australian Government's efforts to take innovative approaches to agricultural development through the AgResults initiative. Australia's participation in this landmark multilateral initiative presents unique opportunities to replicate successful models in the Indo-Pacific region and continue our efforts to build food security and broad based economic growth in the region. AgResults partnerships established across the private, public, and social sectors can be leveraged in the future to help meet Australia's regional agricultural development objectives.