



**AgResults**  
INNOVATION IN RESEARCH  
AND DELIVERY



## EVALUATING PULL MECHANISMS – EVALUATION FRAMEWORK & INITIAL LESSONS

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Presentation at USAID, March 30, 2017

# Presentation outline



- Overview of AgResults pull mechanisms
- Evaluation framework for the external evaluation
- Initial lessons

# AgResults tests the use of pull mechanisms



- A new approach that provides prizes to private sector actors to engage with smallholders in a way that will overcome market failures impeding the development or uptake of new agricultural technologies
- AgResults through its multiple pilots:
  - Engages multiple private sector actors
  - Incentivizes competition/performance to deliver best results
  - Pays only if results are achieved
  - Tests the effectiveness and efficiency of pull mechanisms
- Learning agenda is high priority



# How AgResults pull mechanisms work: A few examples



## Pilot incentivizes ...

## and awards prizes for ...

**Nigeria**

Maize aggregators

Aggregating maize treated with an aflatoxin biocontrol agent – Aflasafe – from smallholders

**Kenya**

On-farm storage device suppliers

Selling improved on-farm storage devices to smallholders

**Uganda**

Seed companies

Selling improved and certified legume seeds

**Zambia**

a) Seed companies and  
b) maize millers

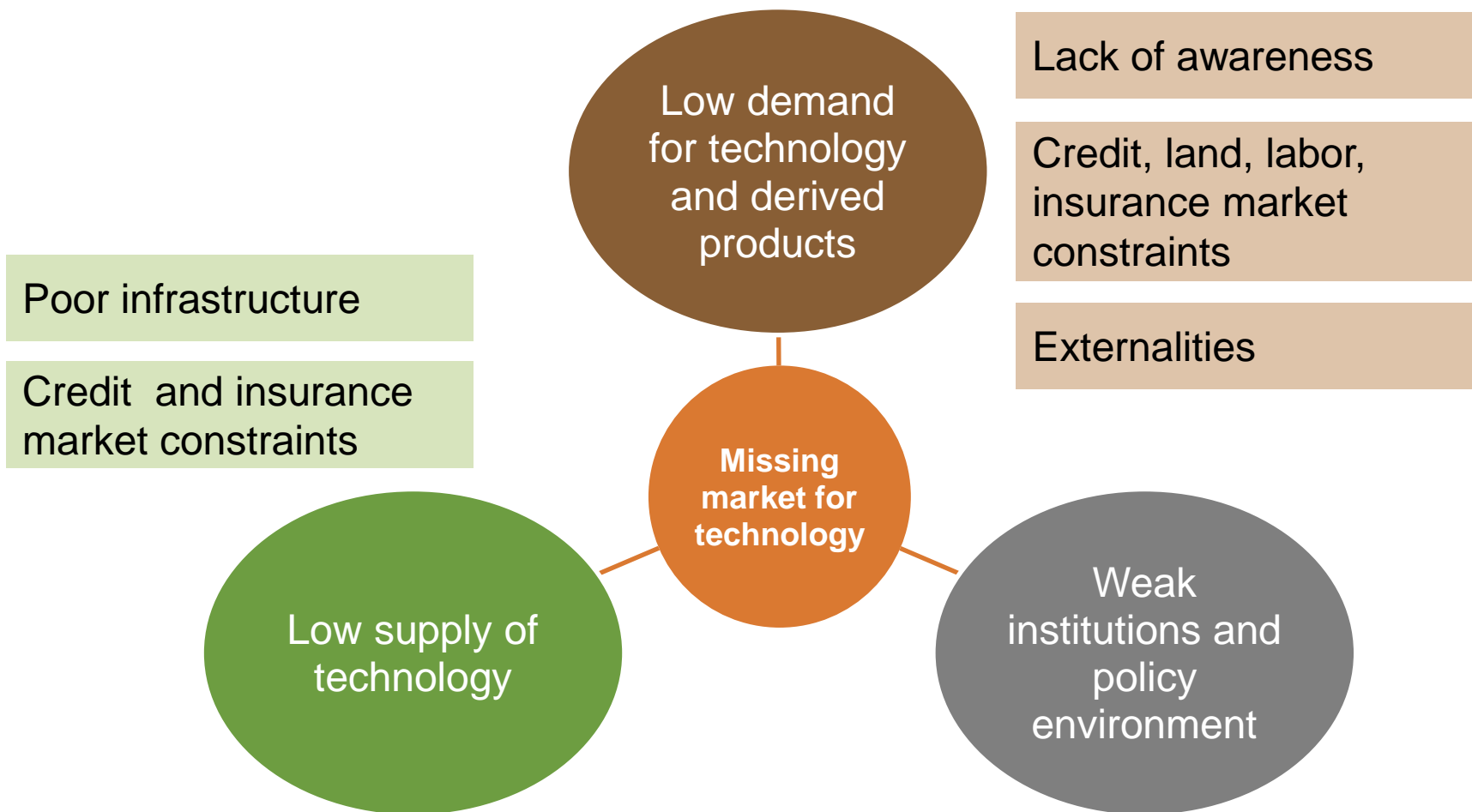
Selling a) Pro Vitamin-A maize seeds and  
b) Pro Vitamin A milled maize

# External evaluation supports learning, a key objective of AgResults

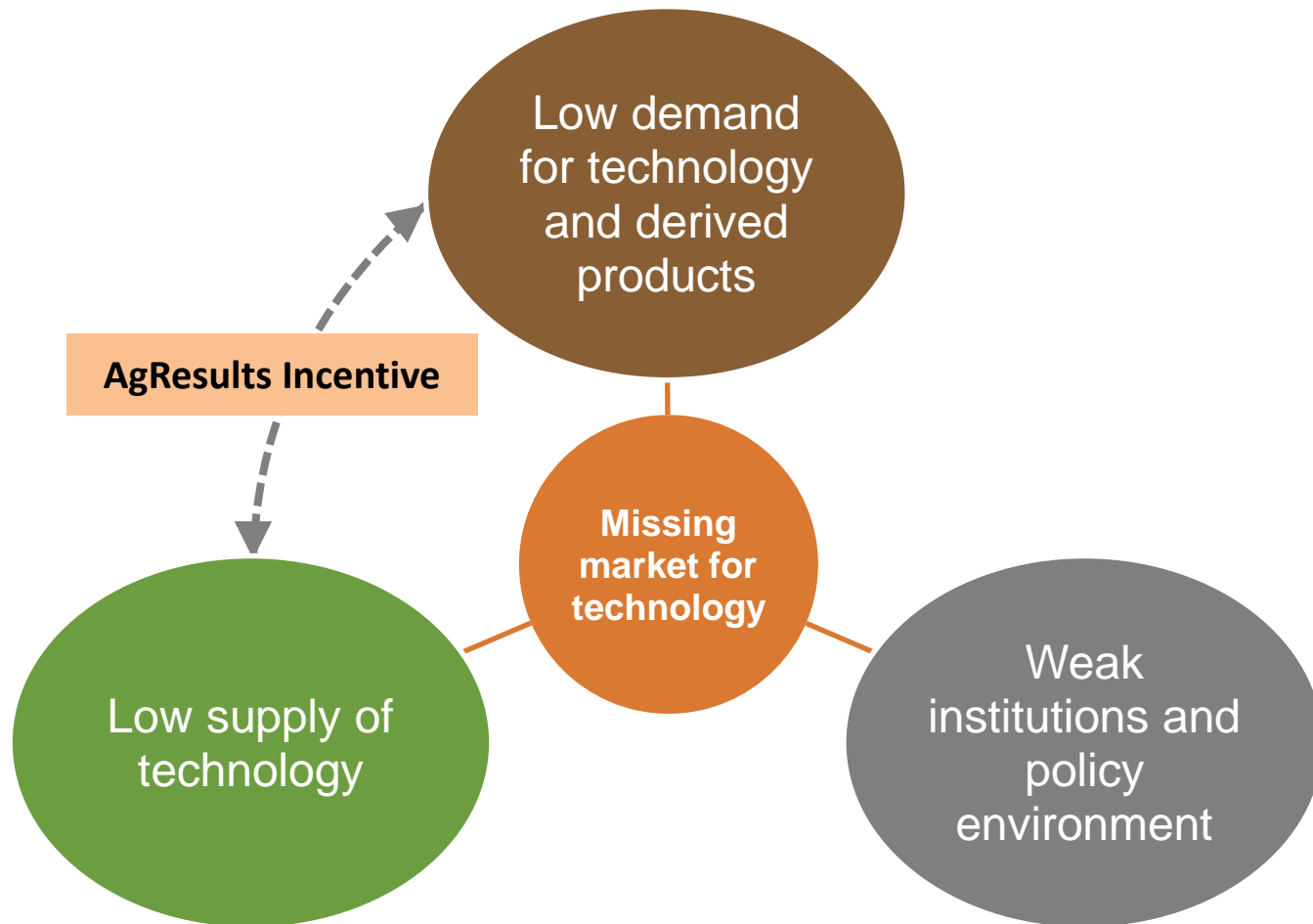


- Are the pull mechanisms in the various pilots achieving the intended development objectives? *How do they fare compared to a push?*
- Under what circumstances are pull mechanisms likely to succeed?
  - We answer these questions through rigorous evaluations of each pilot that measure net contribution to development.
  - We also contribute to continuous learning and adaptation of the interventions through our engagement with the Secretariat, Steering Committee, pilot managers, and private sector actors.

All AgResults pilots begin with recognition of a market failure in provision of agricultural technologies for poor farmers



# AgResults theory of change: Addressing market failure



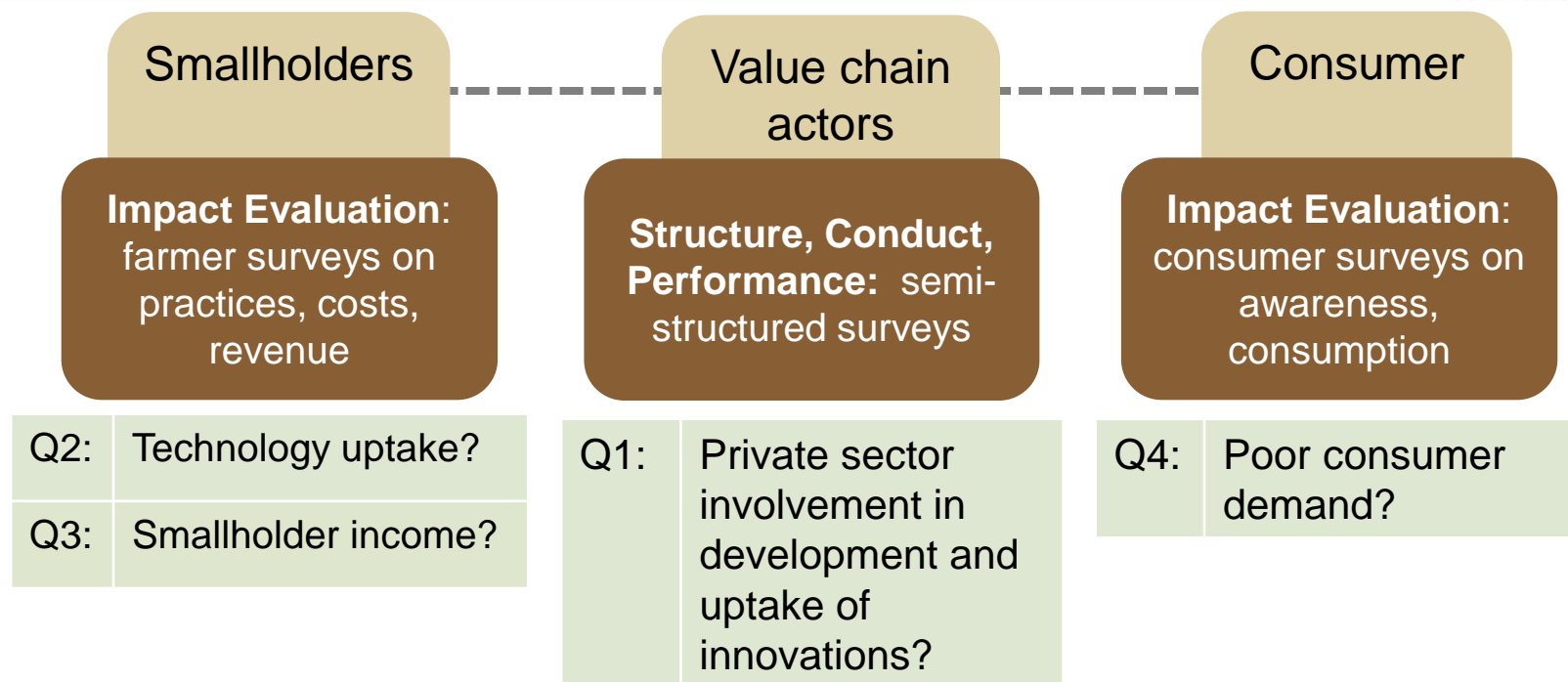
# Theory of change (cont'd): Expected impacts



- By “pulling in” the private sector, AgResults aims to:
  - Motivate private sector engagement to address market failures
  - Engage smallholders and poor households to demand beneficial technologies
  - Eventually create a sustainable, private-sector driven market for agricultural technologies, inclusive of smallholders and poor households, after the pilot ends



# Evaluation research questions: What is the pilot's impact on...



Cost-effectiveness analysis and synthesis of results across questions and pilots	Q5:	Are the improvements caused by AgResults sustainable?
	Q6:	What are scale and cost-effectiveness of AgResults' impact?
	Q7:	What lessons can be learned for design and implementation of pull mechanisms?

# Evaluation approach



- Common theory-based evaluation framework
  - Uses economic theory to project expected impacts and gathers data to measure whether they occur
  - Applies structure-conduct-performance paradigm to study development of markets for technology
  - Identifies and tracks areas of strategic behavior that might impede development impact
- Integrated and rigorous qualitative and quantitative analytic methods to test theory-derived hypotheses

# Continuous learning and adaptation



- From the beginning, we seek to understand:
  - Does the pull mechanism to be implemented address the key market failure?
  - Does the prize incentive have the potential to motivate the right solvers and induce competition?
  - Does the theory of change demonstrate a link to smallholders?
  - Will other programs or government policies interfere with the pull?
  - Are the policy and regulatory environment conducive to pilot success?

# Evaluation design for each pilot



**Impact evaluation questions that go beyond achieving outcomes that result in prize award**

**Evaluation method for measuring smallholder impact**

**Nigeria**

Did farmers consume more Aflasafe treated maize?

Quasi-experimental design

**Kenya**

Did smallholders face fewer grain shortages after OFS adoption?

Comparative interrupted time series

**Uganda**

Did smallholders buy and plant improved seeds, and were improved seeds of better quality?

Pre-post analysis

**Zambia**

Did households consume more PVA maize?

Qualitative case comparison; Pre-post analysis of urban consumption

# Status of our work



- All evaluations on-going.
- First answers to formal research questions will come with Nigeria report later this year.
- In the meantime, we can share early insights on pull mechanism design.
- We're also developing lessons on the challenges of rigorous impact evaluations for pull mechanisms.

# When are pull mechanisms a suitable development tool? Early insights



## Preconditions for development of a sustainable market

Pull mechanisms lend themselves to situations where:

- There is **potential demand** for beneficial technologies by smallholders and/or poor households
- There is **potential supply** of the technology by private sector actors
- There is a **key leverage point** (where a prize could incentivize change) rather than a multitude of constraints that have led to a missing market for the technology

## Preconditions for smallholder impact

- The technology must be **effective**

# How effective are pull mechanisms in developing a sustainable market? Early insights



## Challenges to developing a sustainable market through pull

### Solvers attracted by business interest

- Market actors may not see opportunity for sufficient return on investment
- Lack of response to pilot may be a reason for early-course correction

### Other challenges that may limit sustained private sector engagement

- Establishing forward linkages to final market may be difficult
- Access to credit may impede private sector engagement or smallholder uptake
- Slower progress towards “growing” demand for technology. Smallholders may not be ready for technology, or may simply be hard to reach.
- The enabling environment may need to be developed further, e.g., so that quality can be certified

# How effective are pull mechanisms in benefitting smallholders? Early Insights



## Challenges to achieving smallholder impact

### Smallholder impact vs. market impact

- It may be hard for the private sector to reach poorest beneficiaries given their competing interest in developing a sustainable market for new technologies
- Donor needs to recognize the trade-offs between development impact and market impact, at least in the short run
- Strategic behavior by the private sector may hamper development impact (e.g., aggregators may not encourage on-farm consumption of healthier maize)

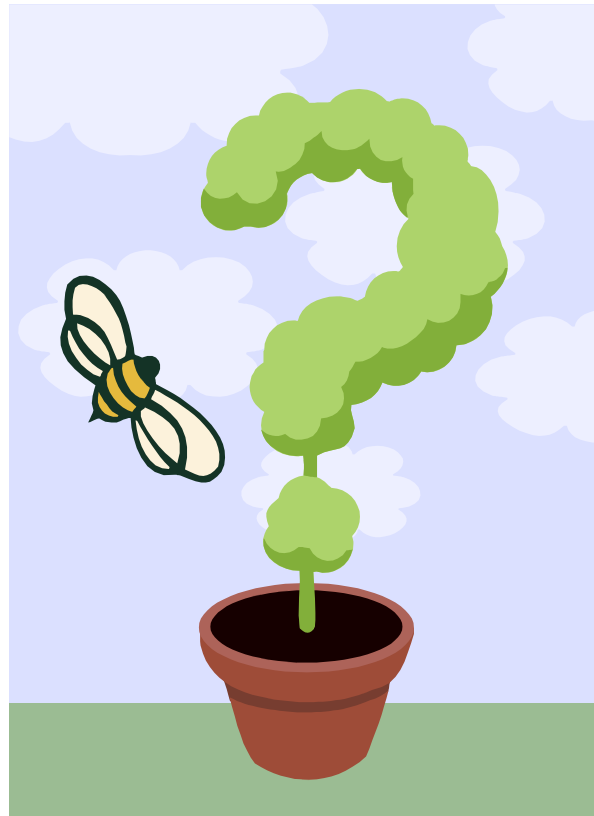


# In conclusion – AgResults is a collaborative learning experience



- Learning is a core objective of AgResults
- Everyone involved with AgResults actively participates in advancing the learning agenda
- As the external evaluator, we both:
  - Address the formal research questions about private sector engagement, smallholder impact, etc. and
  - Participate in discussions about ways to adapt intervention designs so that pilots adhere as closely as possible to AgResults objectives and what we are learning about pull mechanisms along the way.
- We look forward to continued sharing so that all donors can benefit from AgResults.

Time for questions and discussion!





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## EVALUATING PULL MECHANISMS, PART 2 – EVALUATION FRAMEWORK & INITIAL LESSONS

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# Outline: Comparative case studies of Kenya and Zambia pilots



- We apply lessons learned on pull mechanism suitability and design retrospectively to two AgResults pilots
  - Kenya, where pilot design appears to have catalyzed private sector innovation and investment, and initial development impact, as intended
  - Zambia, whose original design did not bring desired results leading to a revised design after Year 1 (we discuss both the original and revised pilot structures with reference to critical design elements)
- For each pilot we will address
  - Background on pilot
  - Pilot theory of change
  - Suitability of pull mechanism and critical design elements
  - Preliminary implementation results
- Lessons learned and conclusions

# Kenya On-Farm Storage (OFS) Pilot



# Background: Development problem and potential market-based solution



- Lack of appropriate on-farm storage (OFS) leads to high post-harvest losses
- Traditional “push” solutions have promoted OFS via demonstrations, training, and subsidized distribution but with little effect
  - <4% of smallholder farmers in the major production areas use any improved OFS solutions
  - <12% of smallholder farmers are aware of improved OFS
- Potential development impact of increasing smallholder uptake of OFS
  - Improve food security by reducing post-harvest loss of grain
  - Alleviate farmer concerns over health impacts (and cost and effectiveness) of chemical treatments of grain to reduce post-harvest loss



# Background: Underlying causes of “missing market”



- There is a “missing market” for smallholder-appropriate OFS that AgResults seeks to resolve
- Why hasn’t a private-sector driven market for improved OFS already emerged?
  - Low demand for OFS solutions among smallholders
    - Due to lack of information about improved OFS storage and its benefits
    - Implies a high cost to suppliers of creating awareness and demand
  - High risks and entry barriers to supplying OFS
    - Lack of access to finance
    - Poor distribution network

# Pull mechanism theory of change



- The AgResults incentive will temporarily mitigate the underlying causes of market failure...
  - motivating private-sector investment into the market for OFS
  - overcoming barriers to entry, and
  - creating the foundation for a sustainable and competitive market



# Suitability of Pull Mechanism to Problem: Does the potential for a market exist?



- Does potential demand exist?
  - Yes—Farmers are generally unaware of existing OFS solutions, but are interested and willing to buy once made aware of them
- Does potential supply exist?
  - Yes—A number of private firms either already work in the market (on a limited basis) or have expressed interest in and enthusiasm over the potential market
- Is the institutional (enabling) environment conducive?
  - Yes—Kenya has a dynamic private sector with a well-structured market for agricultural inputs and equipment
  - Regulatory environment (e.g. Kenya Standards Board) is not considered onerous

# Critical Pull Mechanism Design Elements: Can a pull mechanism be designed...



- ...that has a clearly defined and verifiable outcome on which prize will be based?
  - Sales of OFS to smallholders
- ...whose outcome can be clearly linked to the desired development impact?
  - Yes—increasing uptake of OFS by smallholders should reduce post-harvest losses and improve food security

# Critical Pull Mechanism Design Elements: Can prize parameters be set that guide private sector to desired outcome?



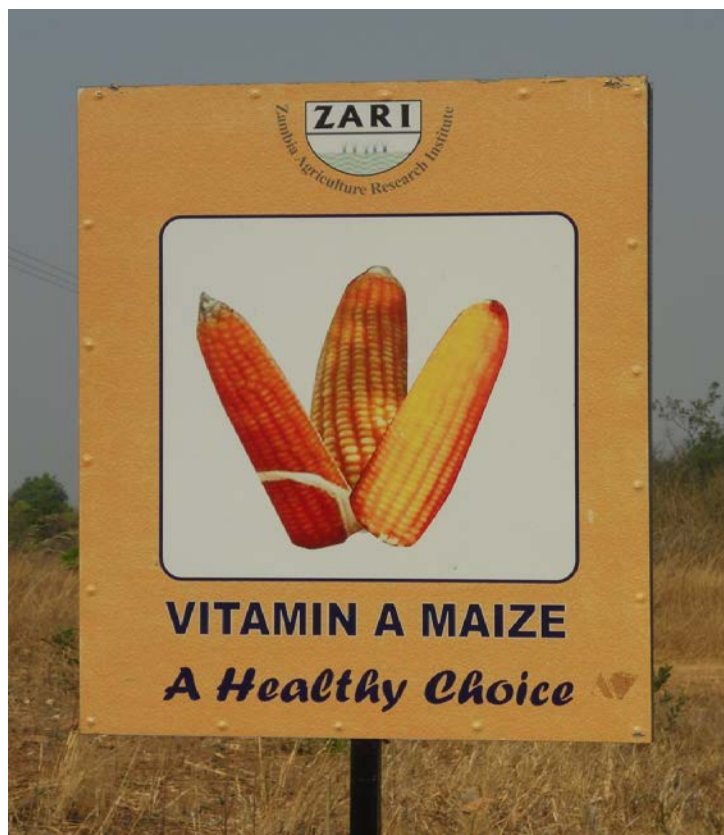
- Do prize parameters effectively promote targeted outcome?
  - OFS solution must be technically effective
  - *Note that the pull mechanism does not specify technical solution—only performance of solution*
- Are prize parameters tailored to targeted beneficiaries?
  - Prize only awarded for sales of OFS solutions suitable to smallholders for storage of grain
- Do prize parameters support development of a *sustainable* market?
  - Farmer must pay for solution (i.e. can't be purchased on his/her behalf by a charity or project)
  - Sales price must be equal to or greater than production cost (no dumping)

# Preliminary Implementation Results



- Are the right solvers motivated to participate?
  - Numerous and diverse companies participating with diverse business models
  - Implementers
    - Show interest, enthusiasm, and creative ideas for how to develop market
    - Say that pull mechanism made them move to “front burner” something that already interested them
  - Several firms approaching initial prize threshold
- Were factors underlying market failure adequately offset to catalyze private-sector innovation?
  - Diverse types of OFS solutions (most hermetic)
  - Diverse systems developed to raise awareness and distribute OFS

# Zambia Pro-Vitamin A (PVA) Maize Pilot



# Background: Development problem and potential market-based solution



- *Discussion focuses on original pilot design then introduces updates*
- Potential for Pro-Vitamin A (PVA) maize to reduce vitamin-A deficiency
- Traditional “push” solutions have tried to promote uptake via demonstrations, training, and subsidized seed distribution but with little effect
  - Well under 1% of farmers grow PVA maize nation-wide
  - Only 13% of urban consumers know of PVA maize, only 6.5% have eaten it
- Potential development impact of promoting production and consumption of PVA maize
  - Reduced Vitamin-A deficiency among nutritionally vulnerable consumers

# Background: Underlying causes of “missing market”



- There is a “missing market” for PVA maize that AgResults seeks to resolve
- Why hasn’t a private-sector driven market for PVA maize already emerged?
  - Low demand for PVA maize among consumers
    - Lack of information about VAD, VAM and its health benefits
    - Prejudice against non-white maize
    - Implies high cost of creating awareness and demand, particularly among millers who lack experience in developing and promoting new products
  - High risks and cost of entering market for PVA maize
    - Limited supply base of VAM
    - Logistical requirements for segregation as PVA maize moves along value chain
    - Uncertainty about production, processing, quality requirements

# Pull mechanism theory of change



- **Motivating industrial maize millers' investment into the PVA maize market will create a demand pull that will motivate smallholder production of PVA maize for sale and consumption, and ensure commercial availability of PVA maize to vulnerable consumers**



# Suitability of Pull Mechanism to Problem: Does the potential for a market exist?



- Does potential demand exist?
  - Consumers lack awareness of PVA maize and are initially prejudiced against it, but interest grows with education
- Does a potential supply exist?
  - Tepid interest among commercial millers
  - Smallholders interested for market or own use depending on exposure
- Is the institutional (enabling) environment conducive?
  - In flux due to Zambian government's maize policy
  - But overall non-constraining

# Critical Pull Mechanism Design Elements: Can a pull mechanism be designed...



- ...that has a clearly defined and verifiable outcome on which prize will be based?
  - Sales of PVA maize by industrial maize millers
- ...whose outcome can be clearly linked to the desired development impact?
  - Weak linkages between VAD-vulnerable consumers and industrially milled PVA maize market
  - i.e. few nutritionally vulnerable consumers (poor rural people) buy milled maize or sell to that market

# Critical Pull Mechanism Design Elements: Can prize parameters be set that guides private sector to desired outcome?



- Do prize parameters effectively promote targeted outcome?
  - Directly rewards sales (and consequently procurement) of PVA maize, thus creating a market
- Are prize parameters tailored to targeted beneficiaries?
  - Initial pilot design did not directly include smallholders as either suppliers or consumers of PVA maize—by design they were to be indirectly involved
  - VAD-vulnerable consumers not targeted as primary beneficiaries on either supply or demand side
- Do prize parameters support development of a *sustainable* market?
  - Pursuit of pilot prize should lead millers to invest in development of PVA maize market—particularly consumer demand for PVA maize
  - But millers were lukewarm in their enthusiasm – perceived lack of business interest

# Preliminary Implementation Results



- Were appropriate private-sector players motivated to participate?
  - Slow entry and investment by industrial millers due to lack of enthusiasm over market potential
- Were factors underlying market failure adequately offset to catalyze private-sector innovation?
  - Slow investment with heavy reliance on “push” complements to prize incentive
- Lack of early results and concerns around theory of change led to revisions to incentive after Year 1
  - Reduced prize thresholds for millers
  - Added incentive to seed companies (who more directly link to smallholder farmers) to reward sales of PVA maize seed

# Comparative summary: Critical Pull Mechanism Design Elements



	Kenya	Zambia (original design)	Zambia (revised design)
<b>Suitability of Pull Mechanisms</b>			
Technology has potential for development impact	Yes	Yes	Yes
Potential market exists	Strong	Weak	Moderate
<b>Pilot Design</b>			
Clearly identifiable and verifiable outcome	Yes	Yes	Yes
Outcome has clear linkage to desired development impact	Yes	No	Yes
Prize parameters effectively promote outcome	Yes	Yes	Yes
Tailored to targeted beneficiaries	Yes	No	Yes
Promote sustainable market?	Yes	Unclear	Yes
<b>Preliminary Implementation Results</b>			
	Strong	Weak	TBD but promising

# Lessons Learned and Conclusions



- Pull mechanisms
  - Have a unique potential to help develop competitive and sustainable markets for socially beneficial technologies
  - Are most likely to succeed in contexts where a single leverage point can be identified to induce market development
- In designing pull mechanisms
  - It is critical to understand the value chain to develop a viable theory of change
  - There must be a strong linkage between outcome on which prize is based and the desired development impact