

Encouraging the adoption of agroforestry: Summary of research results

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with support from IGC, CDKN, Musika

Policy context:

Long run agricultural investments

What are long run investments?

- Agricultural technologies with short-run costs and long-run benefits
 - To farmer and to the environment
 - Examples: tree crops, agroforestry, conservation farming, “climate-smart” agriculture

Agroforestry in Zambia

- Adoption rates are typically low
- Adoption may not be in farmer’s best interest

Policy context: REDD+ in Zambia

What is REDD+?

Reduced Emissions from Deforestation and Degradation...
Plus

REDD+ in Zambia

- 14 countries pilot the UN-REDD programme, including Zambia
- Anticipate benefits for livelihoods and biodiversity
- Agroforestry ranked first among land use practices for REDD+ (Kokwe 2012)

Challenges and Questions

Adoption of long run technologies

- What technologies generate the greatest benefits?
- What technical assistance and training should be incorporated into extension?
- What input and output markets need further development?
- How do farmers trade off current and future costs and benefits?

REDD +

- What activities and investments are eligible for REDD+ funding?
- How to monitor and verify actual changes in carbon?
- What legal and policy frameworks are needed?
- How can farmers and forest users be encouraged to adopt REDD-consistent behaviors?

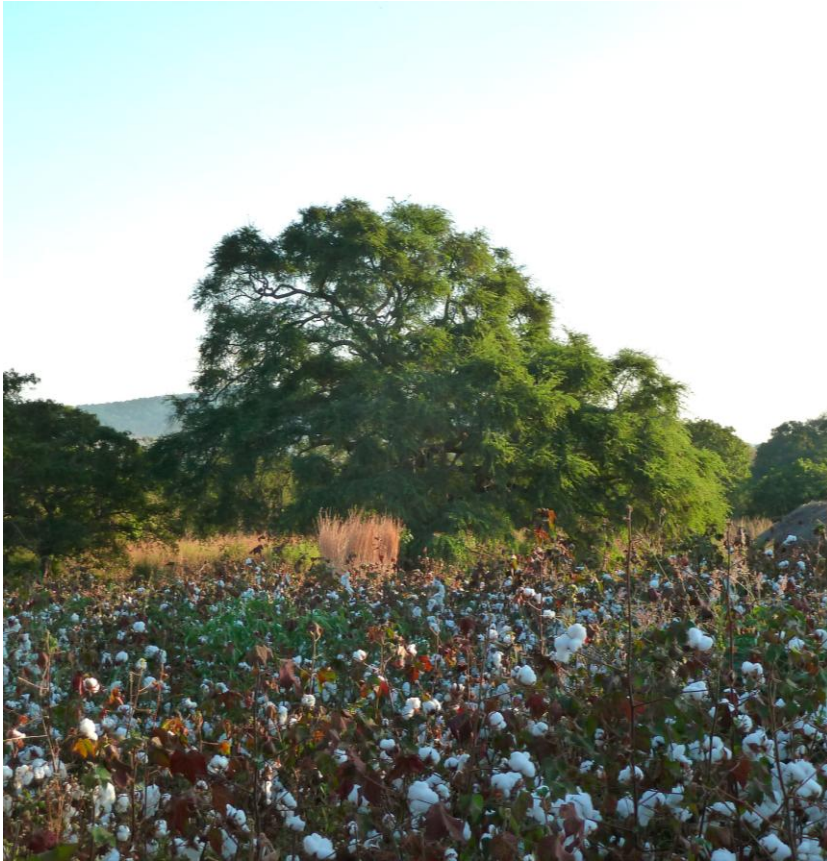
Project overview

Research collaboration with Trees on Farms Programme, implemented by:

- Dunavant Cotton, Ltd.
- Shared Value Africa Ltd.

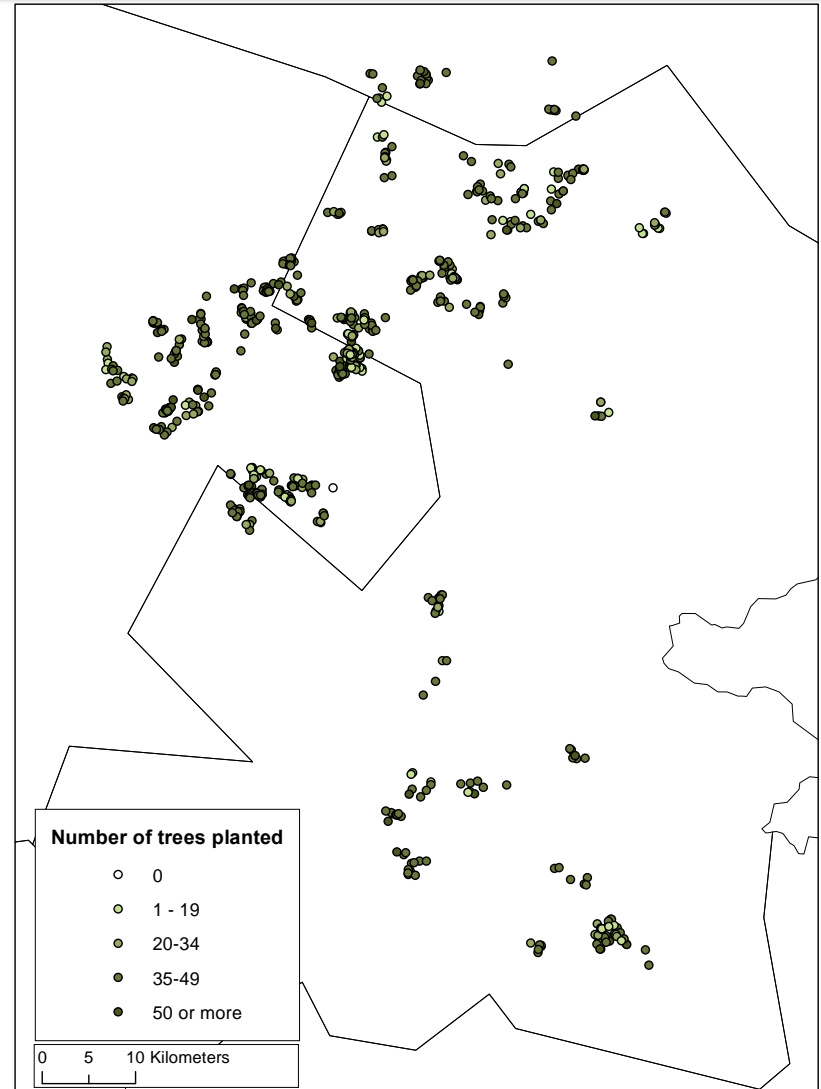
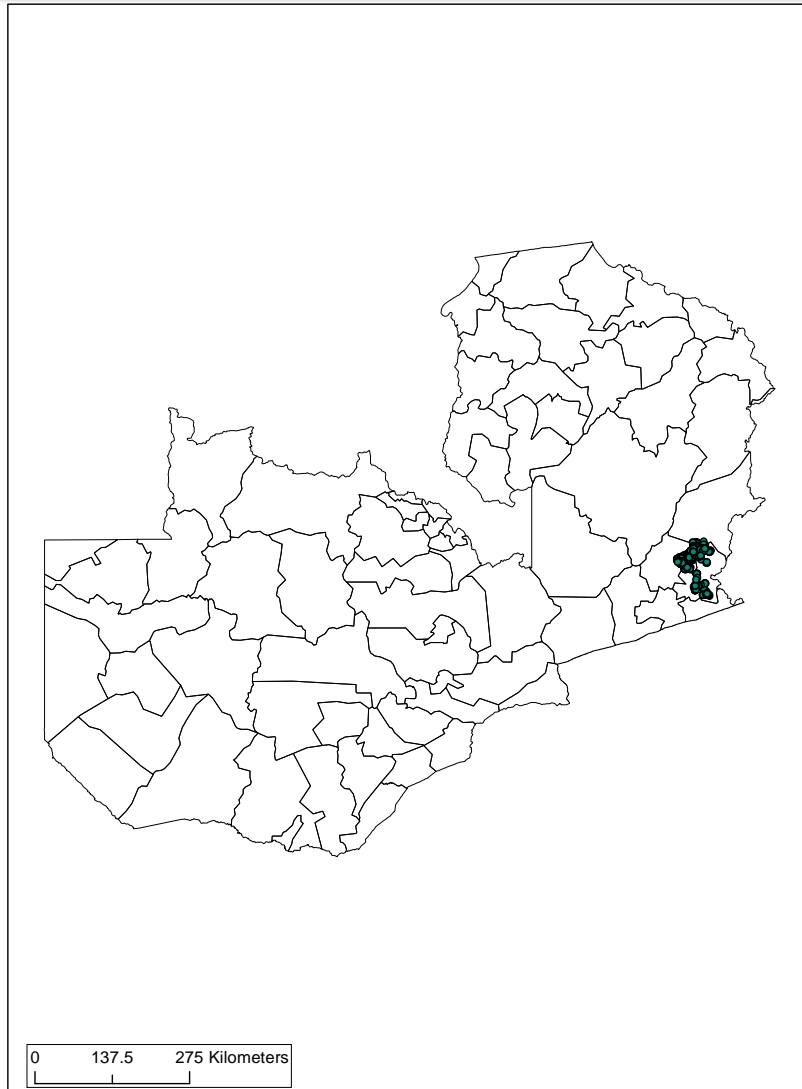
- Promote planting of musangu (*Faidherbia albida*) trees by Dunavant farmers
 - Provide training, inputs and incentives

Musangu (*Faidherbia albida*)



- Indigenous to Zambia
- Fixes nitrogen + sequesters carbon
- Loses leaves during rainy season
- Natural animal protection (thorns)
- Fertilizer benefits take 5-10 years

Study setting



Study population



- ~1300 Dunavant cotton outgrower farmers
- Mean landholding is 7 acres
- 97% of land is under cultivation
- 12% female headed households
- Report 1 month of food shortages
- No formal land title

Objectives

Programme objective: Increase the adoption of agroforestry by small-scale farmers in Eastern Province, Zambia

Research objectives:

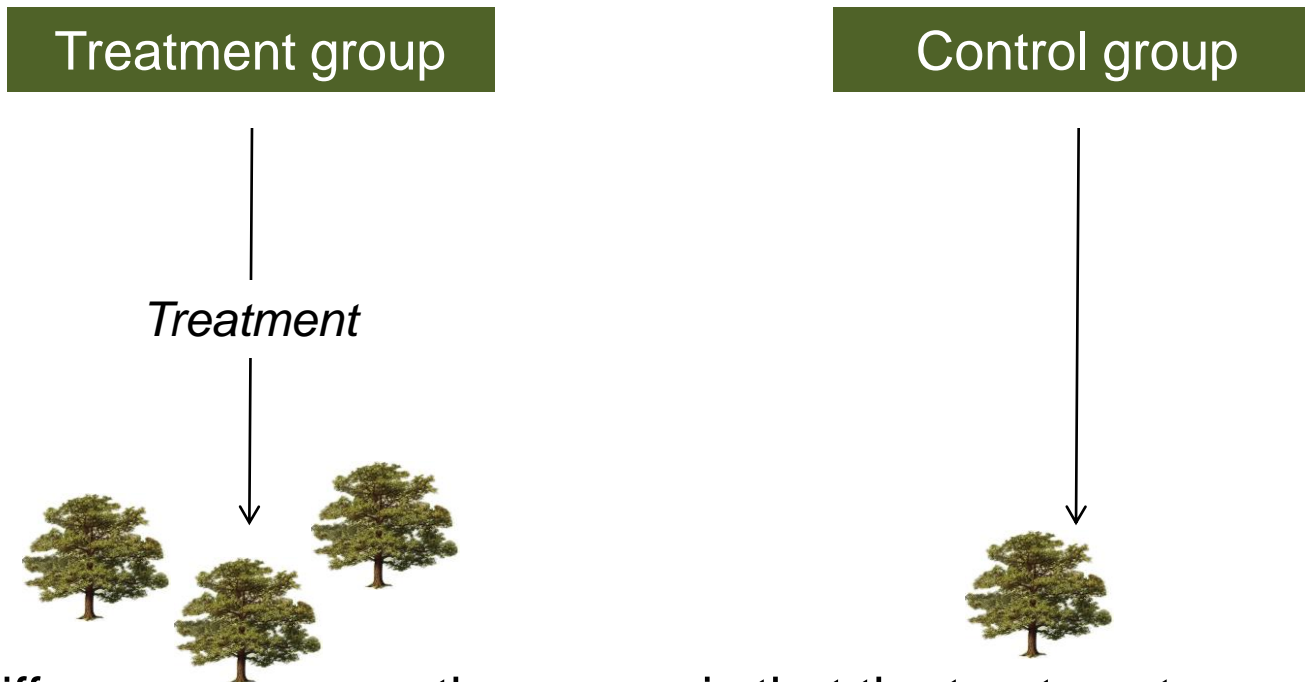
- Generate rigorous evidence on what determines adoption
- Measure both take up and tree survival
- Analyze which farmers benefit and cost effectiveness

Research questions

- How do short run costs and long run benefits influence adoption?
 - Better to subsidize inputs or shorten the delay of benefits (incentives)?
- Are there tradeoffs associated with subsidies and incentives?
 - Do subsidies increase access but decrease follow through?
 - Do incentives increase effort but attract risky types?
- What types of farmers are most interested and most successful?

The methodology: Randomized controlled trials in social science

Divide all eligible individuals into two similar groups ... randomly



Only difference between the groups is that the treatment group received the treatment

- Any difference in outcomes can be attributed to the treatment

The methodology: Our study

- During early stages of a programme, test alternative approaches
 - Use findings to inform scale up
- RCTs offer a flexible methodology that generates clear causal results
 - Adds short run costs but improves cost effectiveness later

Study design

- All participating farmers receive 50 seedlings
- Plant seedlings in maize or cotton fields
- Water, weed, protect from fire and pests
- One-year contract

Farmer groups randomly assigned to different input costs (A) in ZMR

A=0

A=4

A=8

A=12

Individual farmers randomly assigned to different incentives (0 – 150 ZMR)



Incentives paid after one year if 35 or more trees survive

Implementation

November 2011

- Training on musangu benefits and care
- Contract offer
- Baseline survey

April 2012

- Survey of planting outcomes

October 2012:

- Final monitoring
- Follow up survey
- Contract payments

October 2013

- Follow up survey, post-incentives

Results

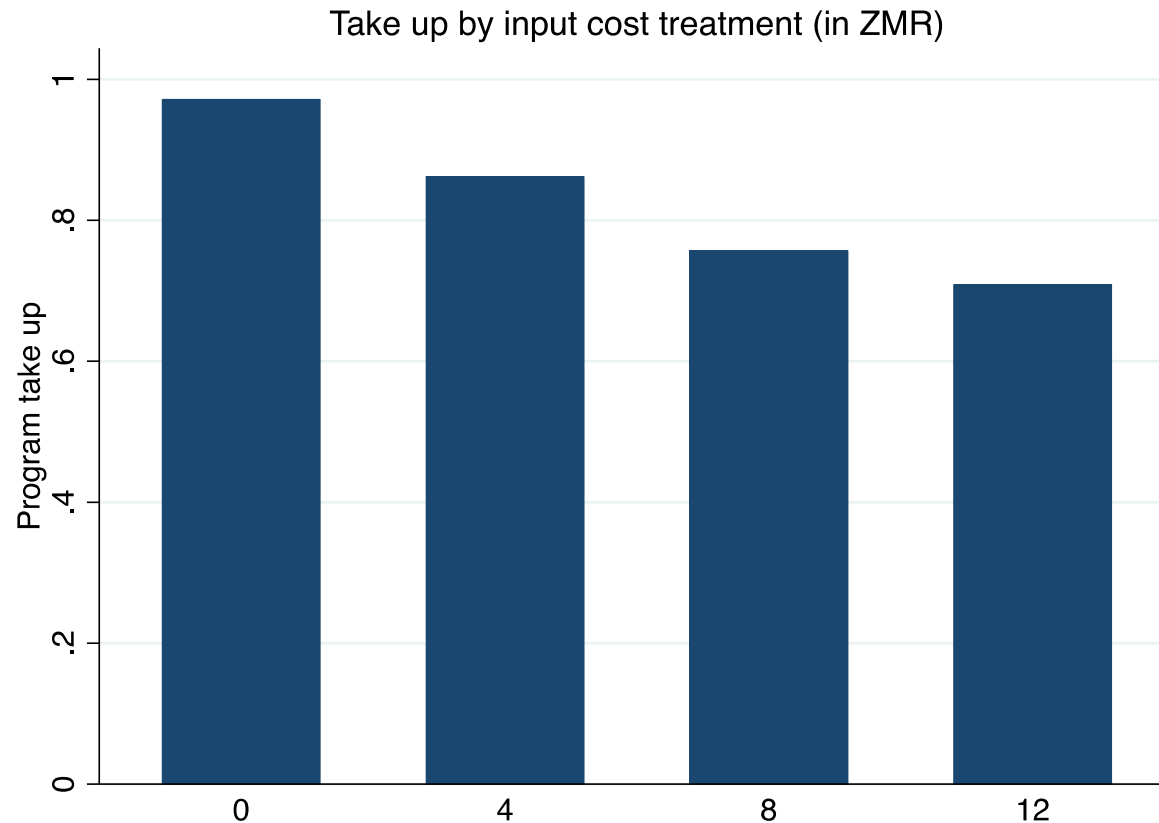
Outcome I: Take up

Outcome II: Tree survival

Outcome III: Results by farmer type

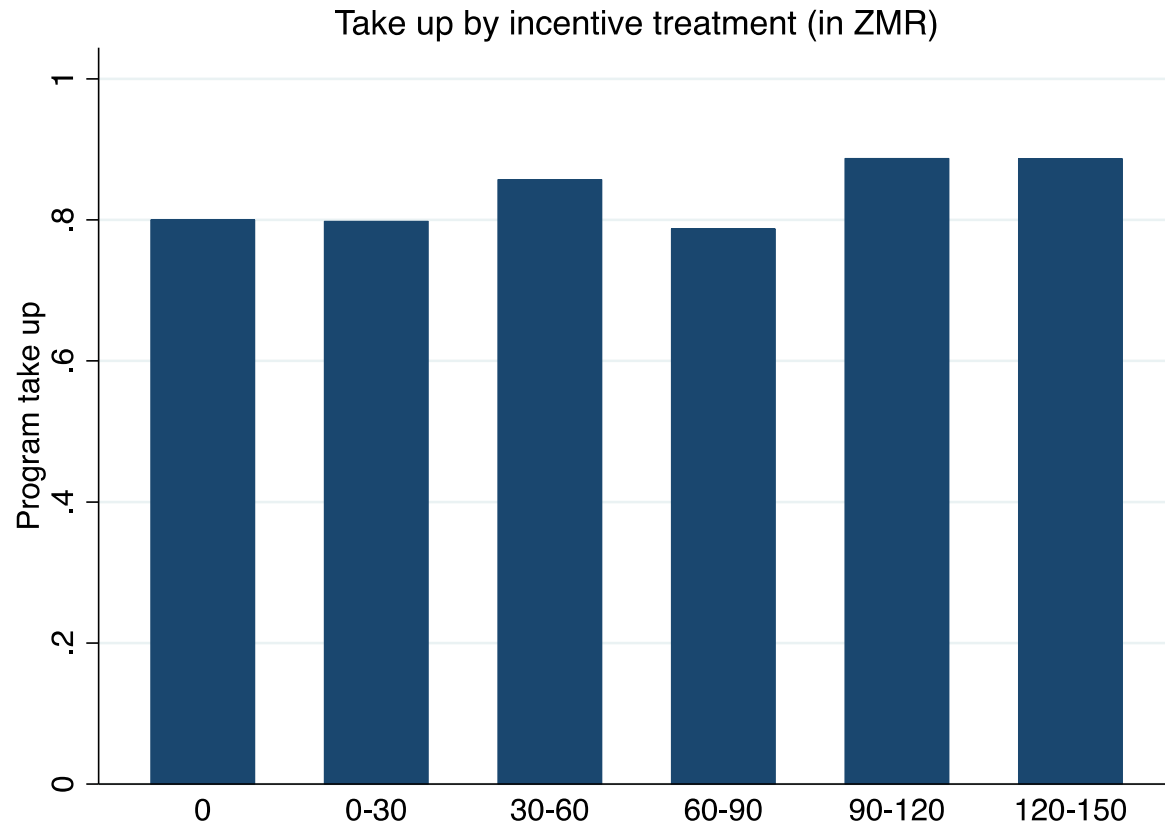
Outcome I: Take up

How do input cost subsidies affect take up?



Outcome I: Take up

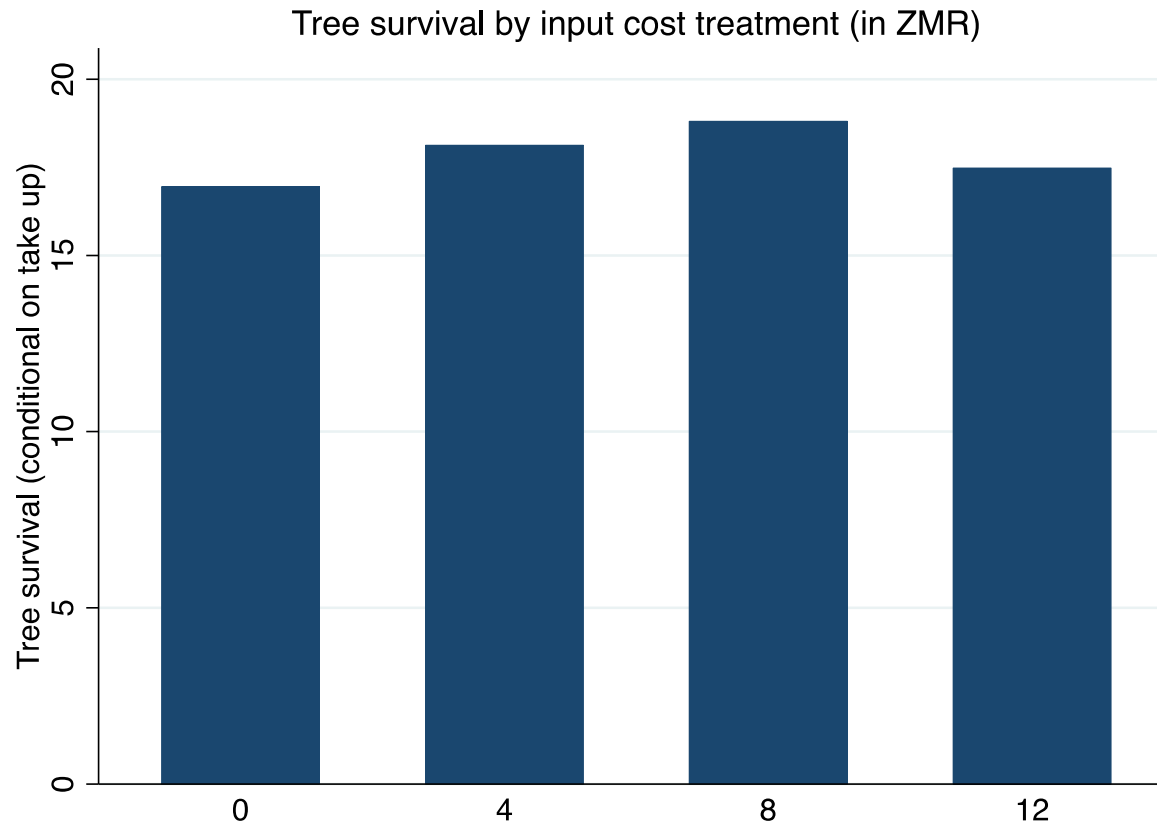
How do performance incentives affect take up?



Outcome II: Tree survival

- program participants

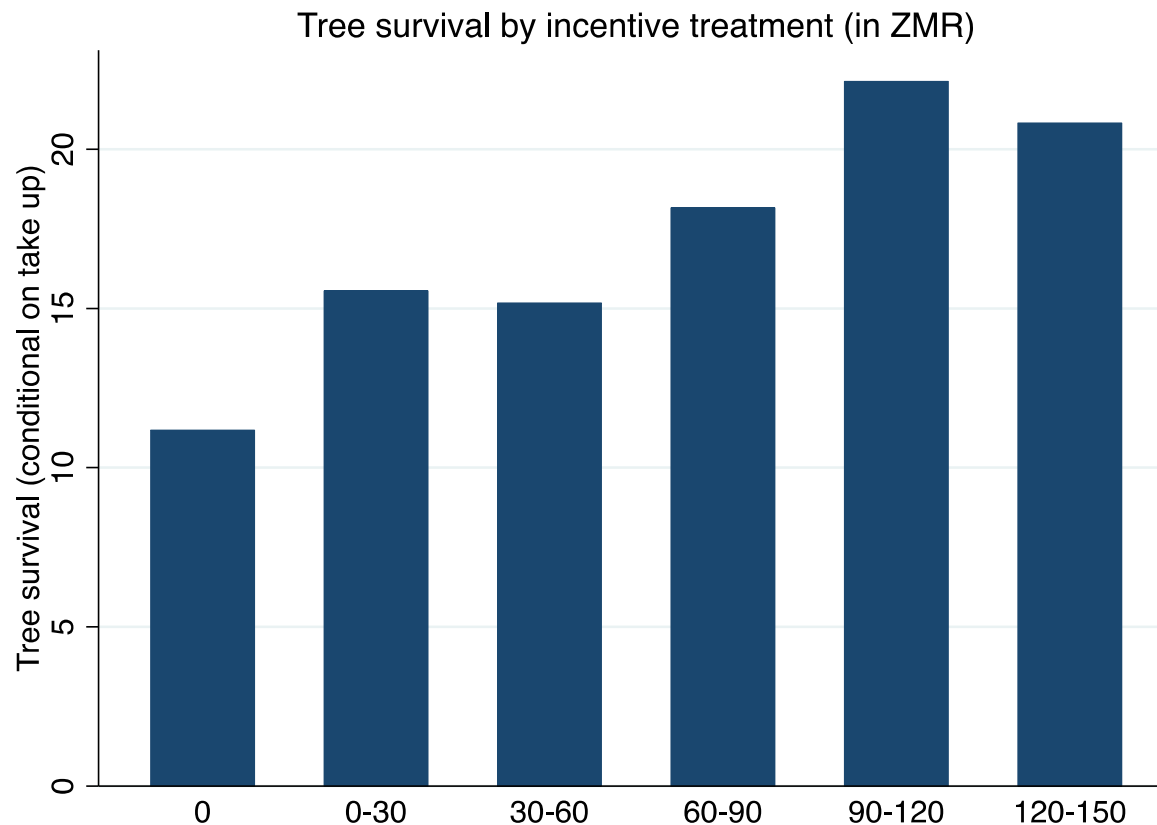
How do input subsidies affect tree survival?



Outcome II: Tree survival

– program participants

How do performance incentives affect tree survival?



Outcome IV: Results by farmer type

Characteristic	Participate	Earn rewards
Wealth (land, assets)	+	not significant
Female headed household	+*	not significant
Larger households	+	+
More educated hh head	+	+
Older hh head	+	+
Past musangu planting	not significant	+
Purchased fertiliser	not significant	+

*Controlling for other factors

Summary

1. Input subsidies increase take up
 2. Performance incentives increase tree survival
 - Optimal combination depends on fixed costs of contracting
- Little evidence of unintended negative effects
 - No evidence of subsidies or incentives worsening follow through
 - Less well-off farmers participate and do well
 - Suggestive evidence that regular monitoring improves tree survival outcomes

Next steps

Research next steps

- Return in October to measure what happens after incentives stop (we hope!)

Implementation scale up

- Partners (Dunavant and SVA) are scaling program up this year
- National Tree Planting Programme (DoF) launched recently

Policy and programme implications

- Long run agricultural technologies and REDD+ strategies depend on getting incentives right
 - Positive incentives (subsidies and performance incentives) help
- Cost effectiveness depends on fixed and variable program costs
- Economic theory and rigorous piloting can help inform program design

Thank you

- IGC Environment Programme
- Climate Development & Knowledge Network
- Musika Development Initiatives

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Agenda

- Welcome and meeting opening
- Presentation of results
- Discussion
- Lunch
- Breakout sessions
 - Practical lessons (group A)
 - In depth research findings (group B)
- Closing remarks