

# Storage, Credit and Market Access Timing: A Randomized Evaluation of Inventory Credit

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# Introduction

- ▶ **How does access to credit affect product marketing choices for agricultural producers (i.e. when to sell)?**
  - ▶ Is observed timing optimal given preferences or constraint-driven?
- ▶ Motivation:
  - ▶ Large Seasonal Price Fluctuations (Sahn, 1989): price going down at harvest time and then rising
  - ▶ “Selling Low” Puzzle (Barrett, 2006)
- ▶ Evaluations in Sierra Leone (palm oil):
  - T1 **Community Storage** (commitment+marketing support)
  - T2 **Inventory Credit** (T1 + credit using storage as collateral)
- ▶ No rigorous evidence on inventory credit/warehouse receipt schemes

# Research Questions

- ▶ Do the interventions change storage adoption and inter-temporal sales decisions?
  - ▶ Take-up
  - ▶ **Storage and Sales** at different times of the year
- ▶ By generating an exogenous increase in storage, do the interventions affect:
  1. Labor hiring
  2. Production Volumes
  3. Prices at individual and village level

# Background: Palm Oil in Sierra Leone

- ▶ One of the two most important crops in terms of sales
- ▶ Low storage losses (!)
- ▶ Three main seasons
  - ▶ March-June: Palm Oil Harvest Season (some off-peak production)
  - ▶ Jul-Sep: Hungry Season
  - ▶ Oct-Dec: Rice Harvest Season
- ▶ Stylized Facts
  1. Large Price Seasonality ( $> 50\%$  in 6 months)
  2. Average 50% sold by end harvest season, 81% by end hungry season
  3. Large producers better able to smooth sales

# Sierra Leone Inventory Credit

- ▶ Program implemented by MoA, three rural banks and IPA
- ▶ Business plan profitable (in expectation) for banks in the medium term
- ▶ Successful pilot in 2010
- ▶ 120 communities in 3 groups (village level randomization) :

## T1 Community Storage: storage commitment+marketing support

- ▶ Community to provide storage space, IPA/bank to do minimal rehabilitation

## T2 Inventory Credit (T1+credit)

- ▶ Storage as collateral for loan worth 75% of price at harvest season
- ▶ 3% /month interest rate

## C Control Group

# Data Collection Activities

- ▶ Intervention scheduled for March-June 2011
- ▶ Evaluation:
  - ▶ Nov-Dec 2010: Baseline Survey (ongoing):
  - ▶ July 2011: Midline Survey
  - ▶ December 2011: Endline Survey
  - ▶ March-December 2011: Sales Diaries
  - ▶ Qualitative data collection led by Sullay Kamara (CESPA-Sierra Leone)

# Primary Outcomes

1 Take-up

2 Storage and Timing of Sales

▶ Heterogeneity by:

▶ Village Level Characteristics:

- ▶ Distance from main towns
- ▶ Total volume of production

▶ Individual Level Characteristics

- ▶ Access to Credit
- ▶ Wealth
- ▶ Risk and time preferences

# Program Impact on Output and Labor Hiring

- ▶ Following better expected prices due to increased storage, do producers increase their:
  1. **Labor Hiring (household and hired labor)**
  2. **Harvesting of Wild Palm Trees**



# Program Impact on Prices

How do the interventions affect

## 1. Village level average prices?

- ▶ Change in supply in partially segmented markets
- ▶ Price in given season depends on:
  - ▶ Village Treatment
  - ▶ Neighboring Villages Treatment (Kremer and Miguel 2004)
- ▶ Counterfactuals from estimates

## 2. Prices received by different types of farmers?

- ▶ Change in outside option in bargaining with buyers
- ▶ Heterogenous treatment effect by initial outside option (e.g. baseline price received, production volume)?