

# myAgro Data Analytics Project



Team 2 Members:

Xinyi (Esme) Li, Paul Seiters, Tripti Sharma, Shu  
Wang (Alex), Robert Zhang





# Agenda

3	My Agro Value Proposition/Founders
4	Problems Facing African Farmers
5	Data Source Description
6	Key Variables & Visualizations
7	High-yield Village Distribution
8	Revenue Patterns and Insights
9	Limitations and Macroeconomic Factors
10	Conclusion & Recommendations



# myAgro aims to move farmers out of poverty through a focus on education and value proposition

## Mission

*“To move farmers out of poverty”*







Founder:  
**Anushka Ratnayake**

### Brief Description:

- Founded in 2011
- Active in **Mali, Senegal, Tanzania**
- Provides Farmers with a combination of seed- and self-financing model

## Tools and Business Model

✓ 	Village Entrepreneurs	myAgro employs village entrepreneurs that drive sales and advertise among communities
✓ 	Mobile Layaway	Allows farmers to purchase their seeds and fertilizer in small increments
✓ 	Delivery	After the farmers payed little-by-little for seeds and fertilizer, myAgro delivers the products
✓ 	Training	myAgro hosts multiple multi-stage training that aim at improving farming yields

# Data Source Description

## Basic Data Info

From myAgro's data warehouse

Each file contains  $\geq 2000$  rows & 20 columns

## Data Usage

Tracking progress and making a variety of business decisions.

## Types of data collection

✓ myAgro's Client information



✓ The Client payments information



✓ myAgro packages information

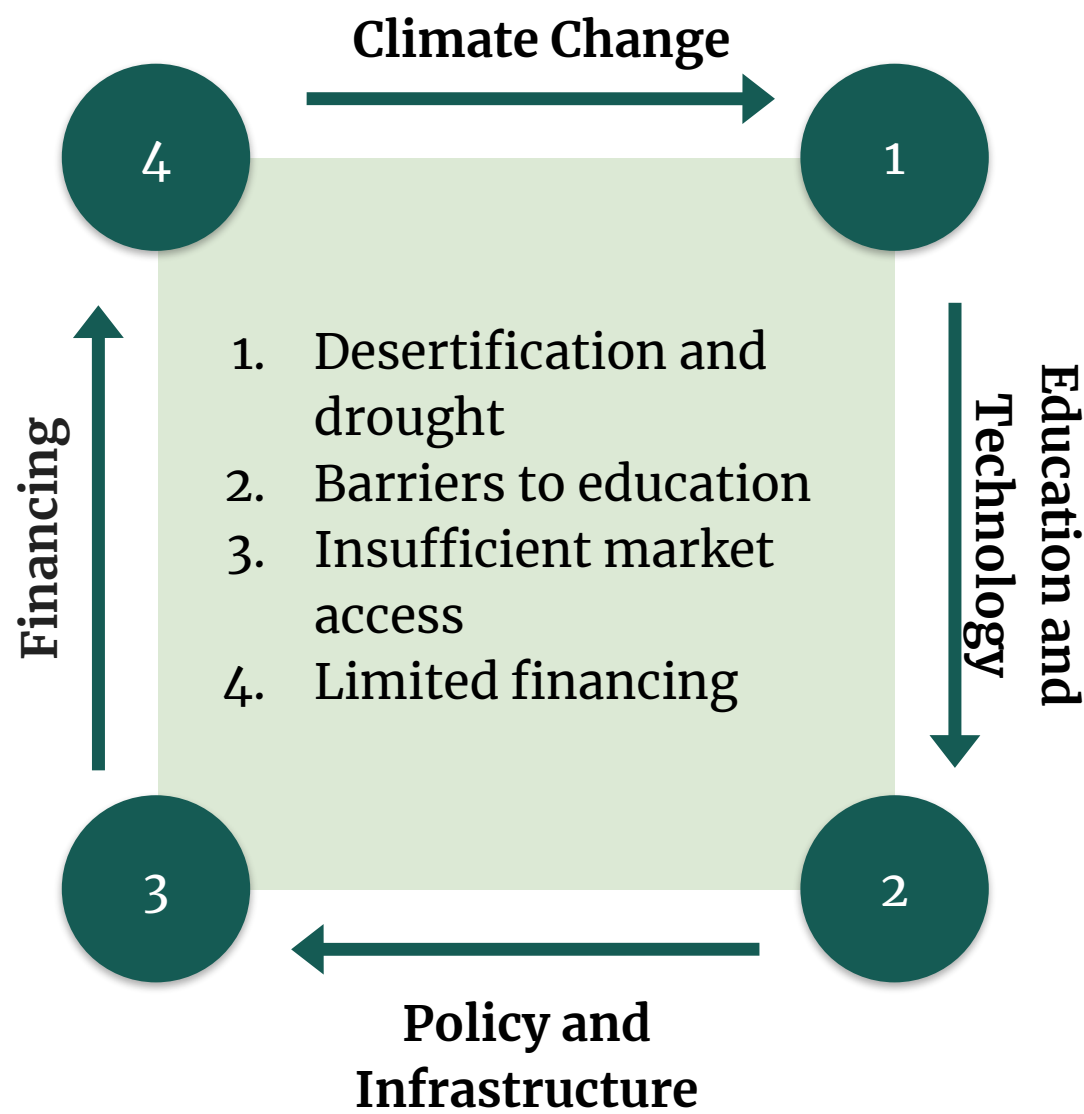


✓ Crop yield information



# Numerous Obstacles Limiting Success of Small-scale Farming in Africa

## Major Problems



## Project Goal

*Analyze Yield Patterns and Client Behavior to Improve myAgro's Sales and Farming Yields*

### 1. Crop Types

Compare how crop yields differ across season, country, etc.



### 2. Villages

Find high-yield villages and determine common features



### 3. myAgro

Provide recommendations to improve farmers' future payoff



*myAgro helps smallholder farmers overcome **poverty** and **food insecurity** through saving options on high-quality seeds, while empowering **female farmers** in the process!*

Source: "4 factors holding back Africa's small-scale farmers", World Economic Forum, May 10, 2016.

<https://www.weforum.org/agenda/2016/05/4-factors-holding-back-african-farmers/#:~:text=In%20fact%2C%20there%20are%20major,the%20poorest%20in%20the%20world>

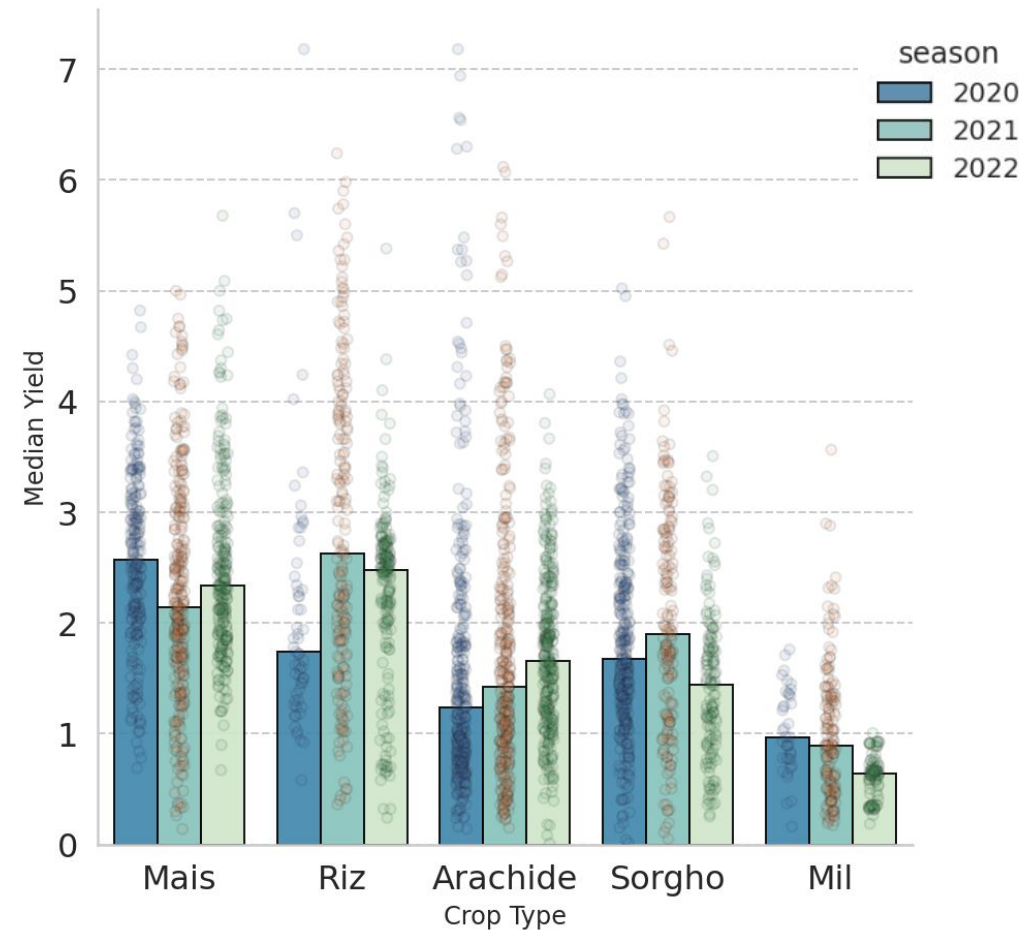


# Key Factors Impacting Yields and Land Ownership

3

## Yield & Season

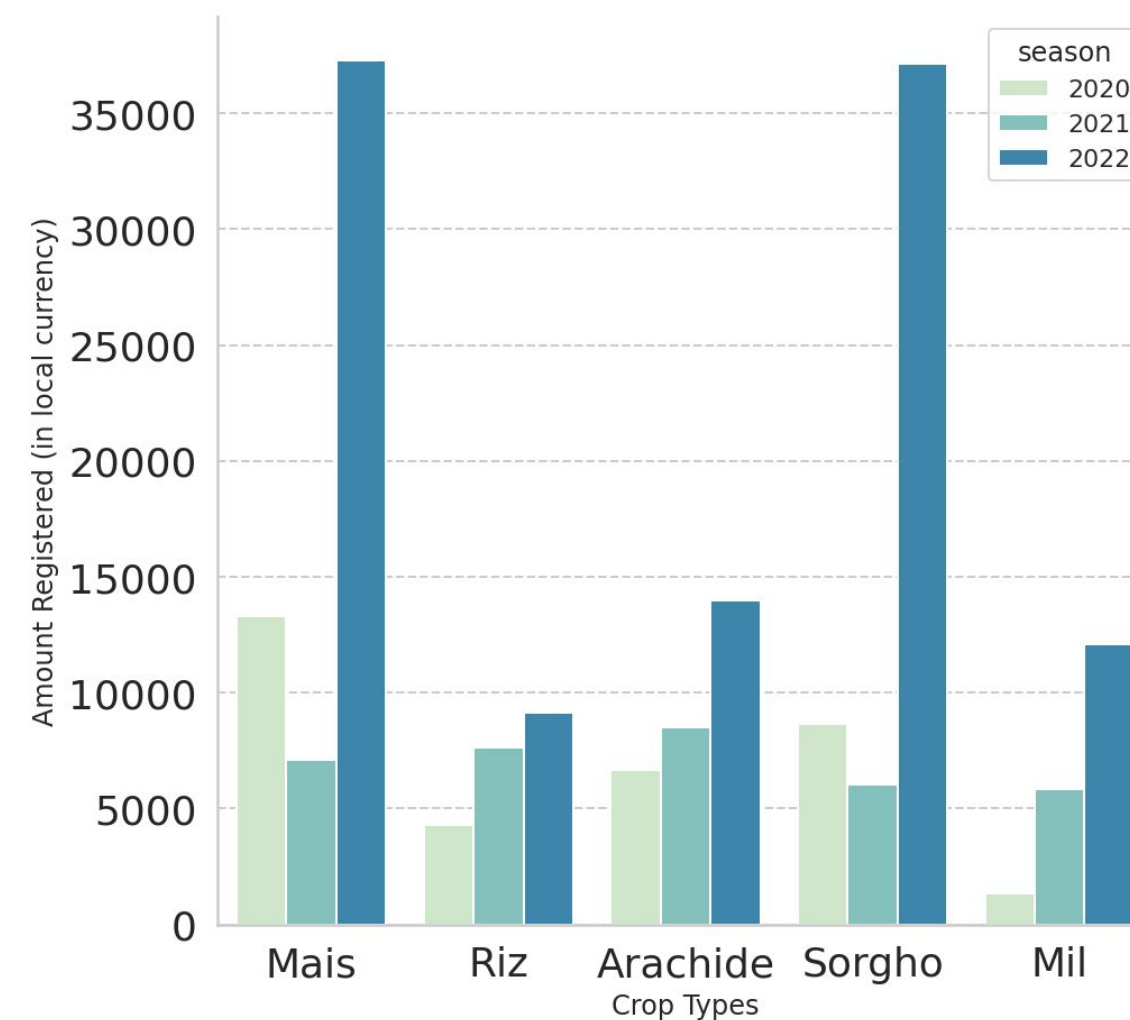
Figure 2: Median Yield Based on Crops and Season (Descending)



1. **Mais** and **riz** outperform other crops
2. **Mais** is consumed by more than 50% of the population in Africa
3. **Crop diversification** provides backup

## Package Sales

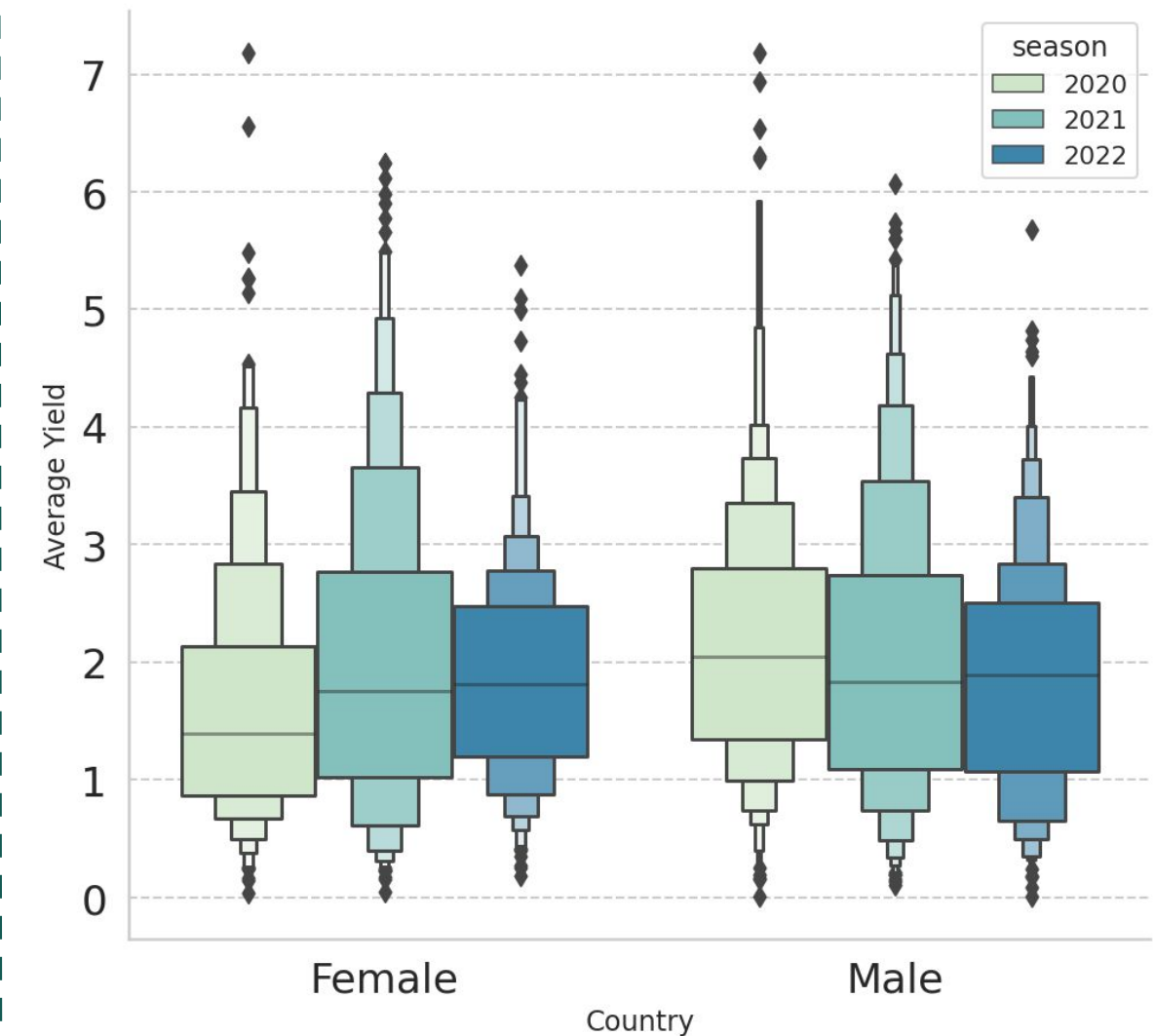
Figure 4: Yields and Amount Registered From 2020-2022



1. **ALL** crops experienced higher sales in 2022 due to eased COVID restrictions
2. **Sorgho** is viewed as an alternative due to wheat's soaring price

## Yield & Gender

Figure 5b: Yield Difference by Gender and Season



1. **Women farmers** experienced increasing yields from 2020-2022
2. Room for improvement: 71% women farmers in Mali and 26% in Senegal

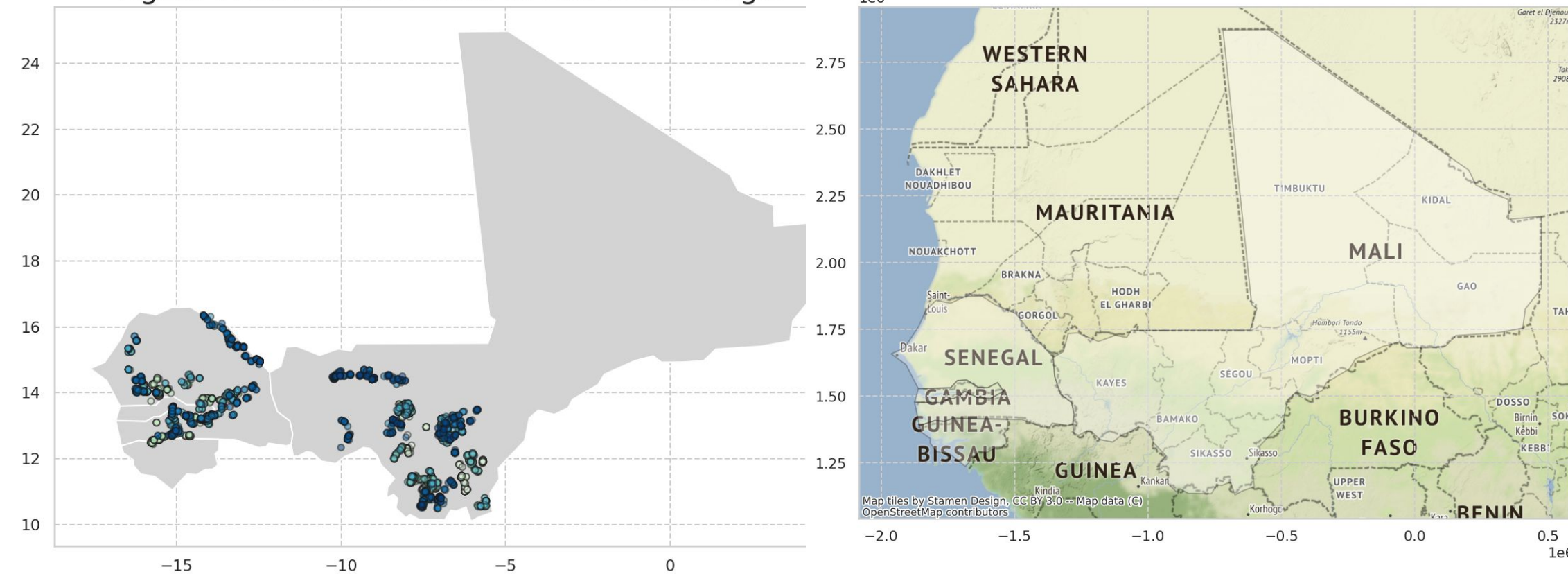


# High-yield Village Distribution and Sales

## Definitions

- **Groups**: Group all clients by their crop type and zone code.
- **High yield client**: A client with yield  $>$  75% quantile in their group in a particular season.
- **High yield village**: A village with at least one high yield client.
- **Sales**: Total amount paid by clients in a particular season, excluding some rollover/internal transfer as required.

Figure 7: Farm Distribution in Mali and Senegal

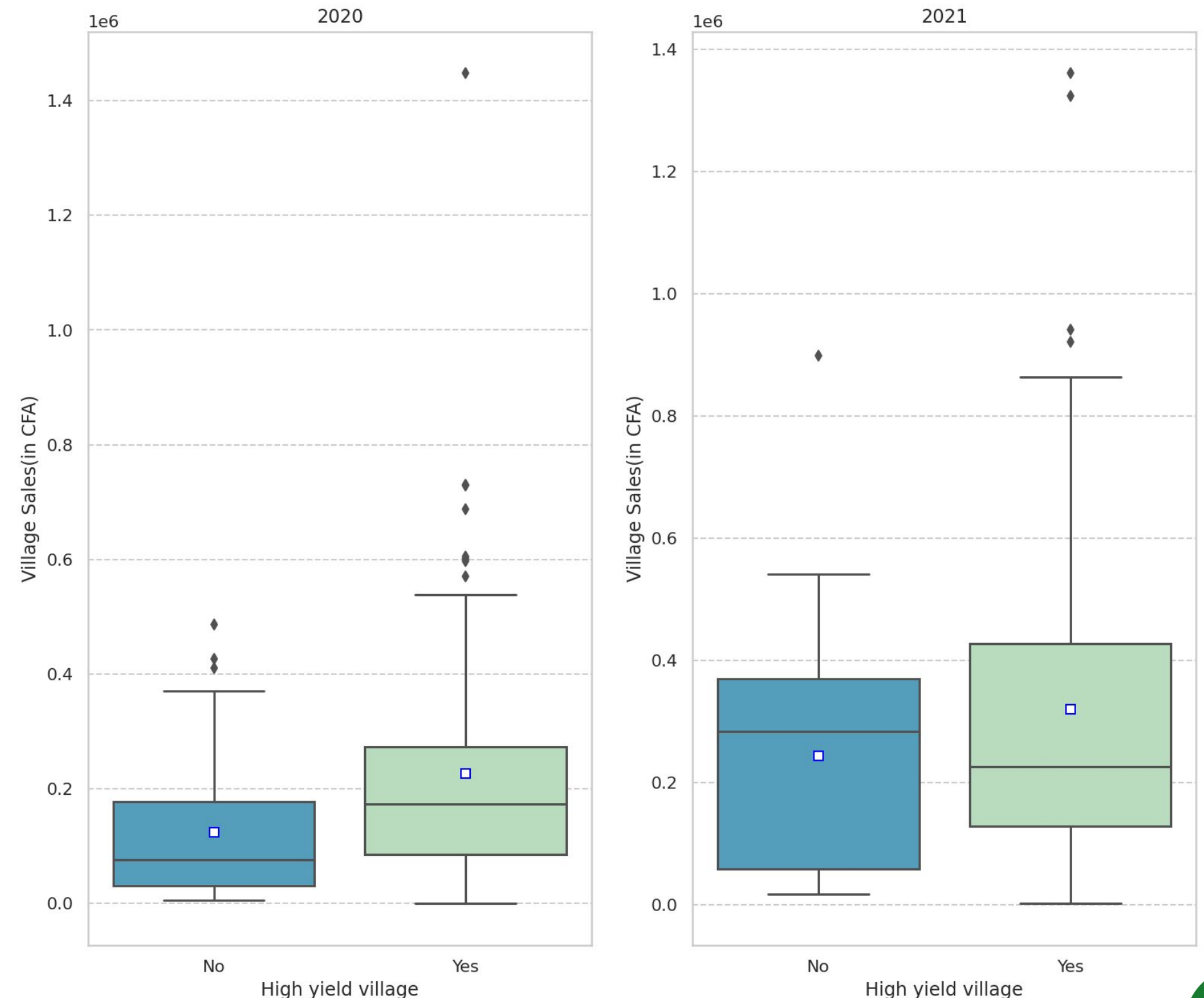


# High-yield Villages and Sales Patterns

Figure 9: Total Sales of High/Low Yield Villages in 2020 & 2021

## Observations

1. **High yield villages have a higher average sales** compared to low yield villages in both 2020 and 2021. They did increase sales in the following season but low yield villages also sees large increase in sales.
2. **Low yield villages have a higher median sales in 2021.** The outliers in high yield villages are some high yield clients in previous season, indicating that they highly pull up the average sales.
3. **The effect of these high yield clients remains unclear.** To optimize sales strategy, we suggest myAgro to publicize these high yield clients and attract more farmers to purchase their packages.





# High-yield Villages and Sales Patterns(by country)

6

Figure 10: Total Sales of High/Low Yield Villages in 2020 & 2021(Mali)

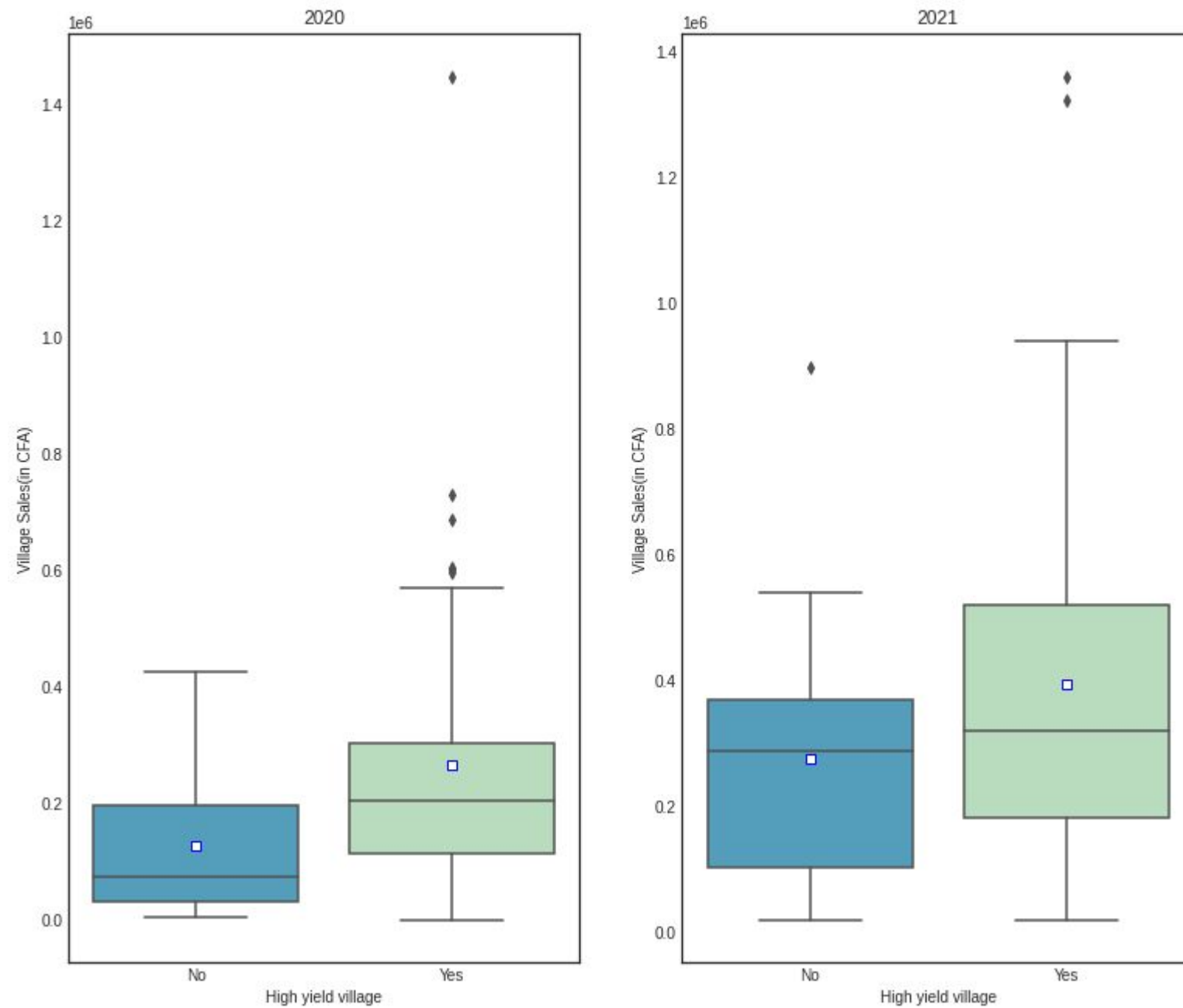
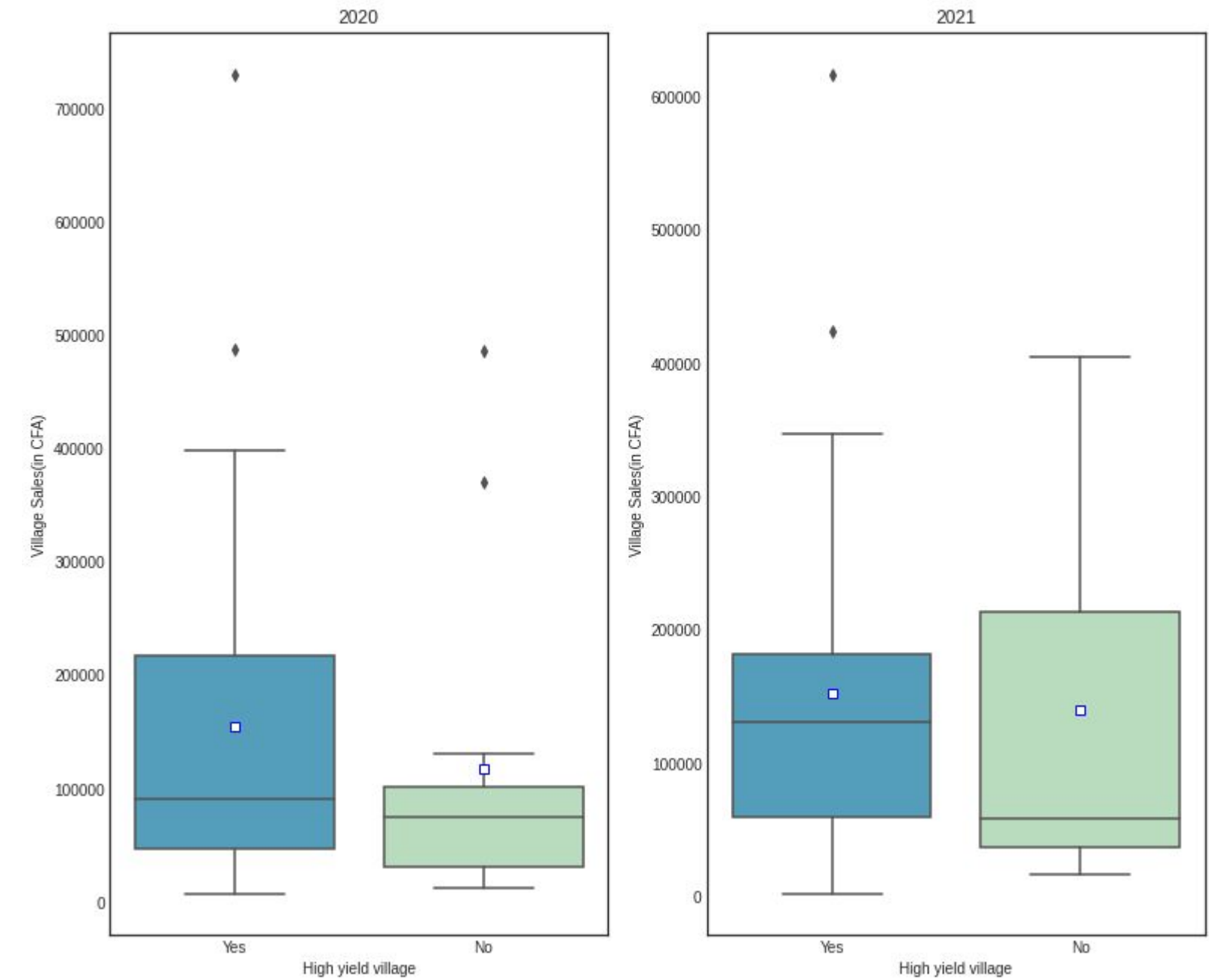


Figure 11: Total Sales of High/Low Yield Villages in 2020 & 2021(Senegal)



# Limited Data and Macroeconomic Headwinds

## Limited Scope and Drawbacks



### Duplicated Customer ID's within Dataset

- Problem: farmers sign up with new ID every season



### Limited Harvest Data Available because of data collection process:

- Data collection is done manually by farmers and is often unreliable
- Some data has to be collected by myAgro employees in a costly and time-consuming process of visiting client vicinities

## Macroeconomic Factors



### Ongoing Drought Conditions in Middle Africa

- 2022 season had one of the lowest recorded precipitation records in history, which calls for resilient and high quality crops



### International Fertilizer Shortage impacts farmers




- Global fertilizer production is curtailed by limited energy resources and surging costs
- Farmers revert to compost usage as an alternative








# Takeaways and Recommendations

## Key Takeaways

Country:		For 3 out of 5 crops, median yields are higher in Mali compared to yields in Senegal.
Fertilizer:		Compost plays a vital role in the improvement of yields for 4 out of 5 crop types.
Revenue:		Both “high yield” and “non-high yield” villages see an increase in revenue in 2021.

## Recommendations

Incentive Program:		Provide an incentive referral program to farmers and offering women heavy discounts.
Intercropping Technique:		We suggest that myAgro look into different farming techniques, like intercropping, especially between millet and peanuts.
Data Collection:		Data collection and accurately keeping consistent data entry for specific customer IDs year after year. Adopte tablet survey technology to ensure data quality.





1. "A Transparent, Easy Way For Smallholder Farmers To Save", myAgro, Forbes, June 28, 2022.  
<https://www.myagro.org/media-post/a-transparent-easy-way-for-smallholder-farmers-to-save/>
2. "Polishing Peanuts: The Senegalese Groundnut Story by Gro Intelligence,  
<https://gro-intelligence.com/insights/polishing-peanuts-the-senegalese-groundnut-story>
3. "Integrating poverty reduction policies into development strategies", Jean-Luc Dubois, January 1998.  
[https://horizon.documentation.ird.fr/exl-doc/pleins\\_textes/divers17-06/010012893.pdf](https://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers17-06/010012893.pdf)
4. "Analysis: Africa's unreported extreme weather in 2022 and climate change", CarbonBrief, October 26, 2022.  
<https://www.carbonbrief.org/analysis-africas-unreported-extreme-weather-in-2022-and-climate-change/>
5. "What You Think You Know About Smallholder Farmers Is Probably Wrong", myAgro, July 27, 2022.  
<https://www.myagro.org/media-post/what-you-think-you-know-about-smallholder-farmers-is-probably-wrong/>
6. "Instability in Mali", Center for Preventive Action, May 12, 2022.  
<https://www.cfr.org/global-conflict-tracker/conflict/destabilization-mali>
7. "Evaluation of the effect of compost as a substitution for inorganic fertilizers on yield of rice" (Bg 94-1) in Ampara District.  
[https://www.researchgate.net/publication/312171708\\_Evaluation\\_of\\_the\\_effect\\_of\\_compost\\_as\\_a\\_substitution\\_for\\_inorganic\\_fertilizers\\_on\\_yield\\_of\\_rice\\_Bg\\_94-1\\_in\\_Ampara\\_District](https://www.researchgate.net/publication/312171708_Evaluation_of_the_effect_of_compost_as_a_substitution_for_inorganic_fertilizers_on_yield_of_rice_Bg_94-1_in_Ampara_District)

