Climate Event Consequences on Food Insecurity and Child Stunting Among Smallholder Farmers in Uganda: A Cross-Sectional Study

Stephanie Ly, MPH, PhDc
UCLA Fielding School of Public Health
BRAC International

CUGH 2018 New York City, NY
March 16, 2018

Disclosures

Japan Social Development Fund (BRAC)

Conrad N. Hilton Foundation (Fellowship)

Eunice Kennedy Shriver National Institutes of Child Health & Human Development (Fellowship)

Contents

BRAC

- International NGO founded in Bangladesh
- Began in Uganda in 2007
- Reached 4.4 million Ugandans

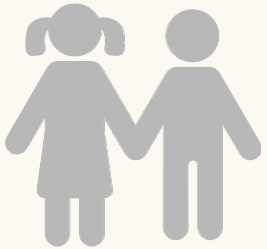
Education

Microloans

Health

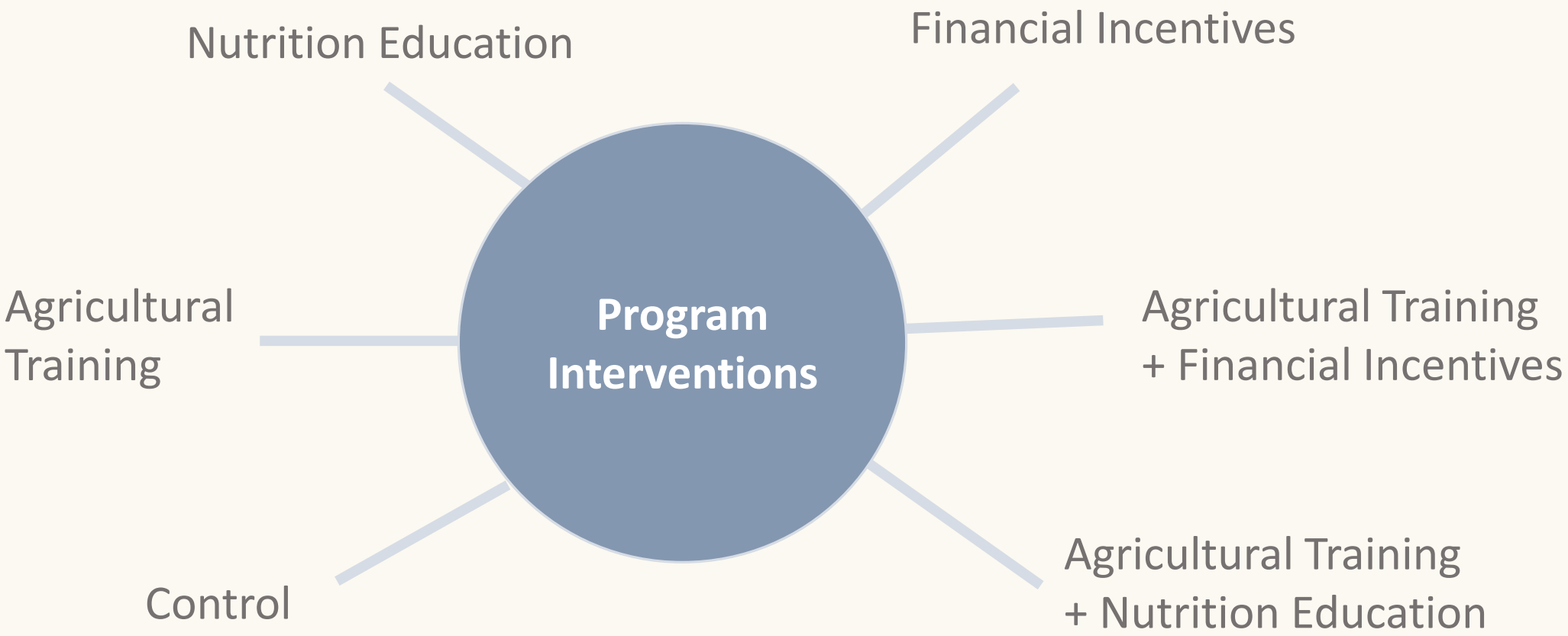
Women's Empowerment

Agriculture

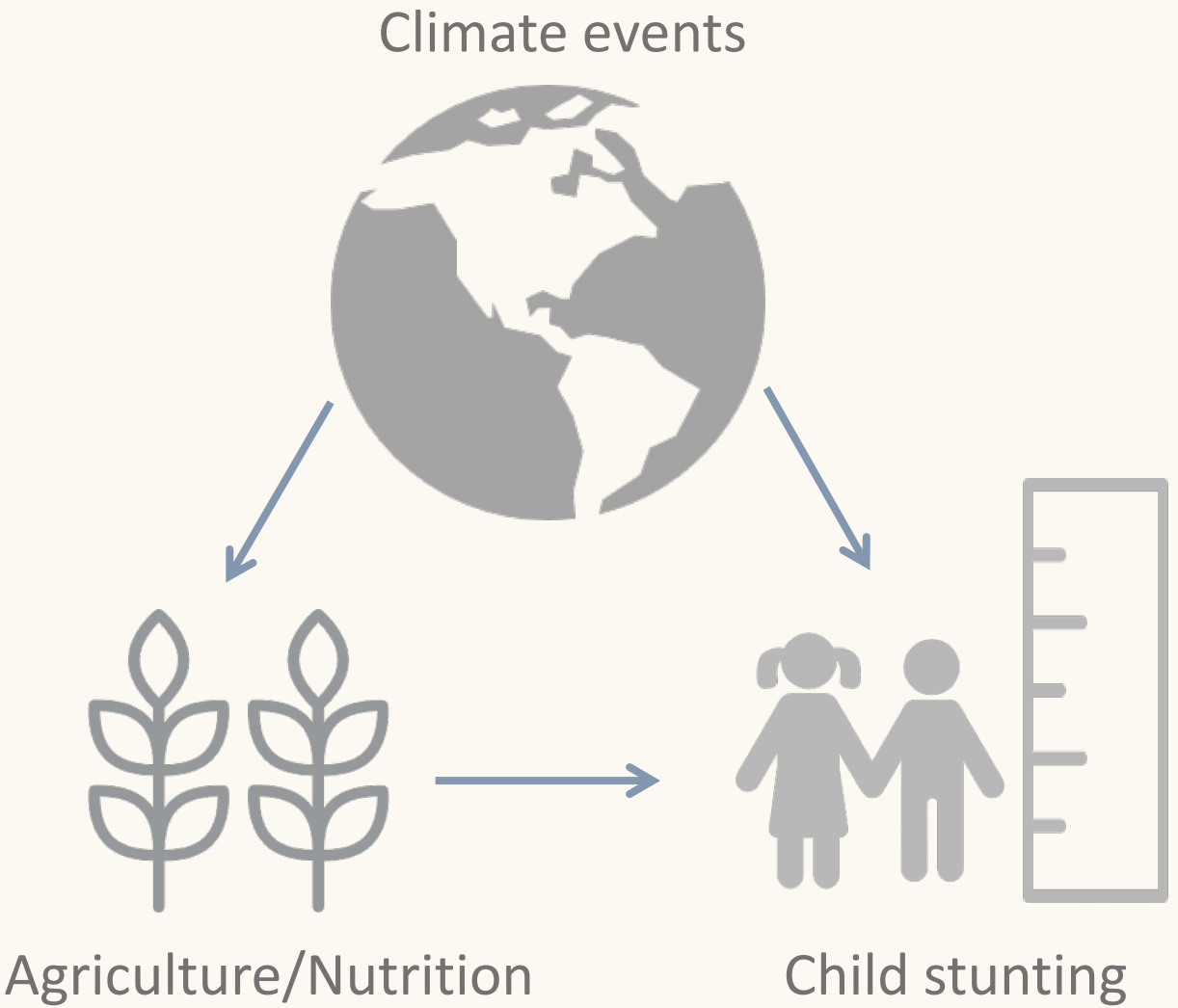


Children

Smallholder farmer intervention

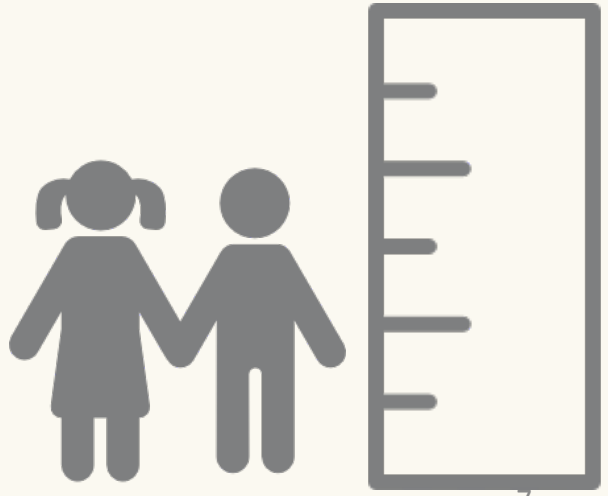


Factors of interest

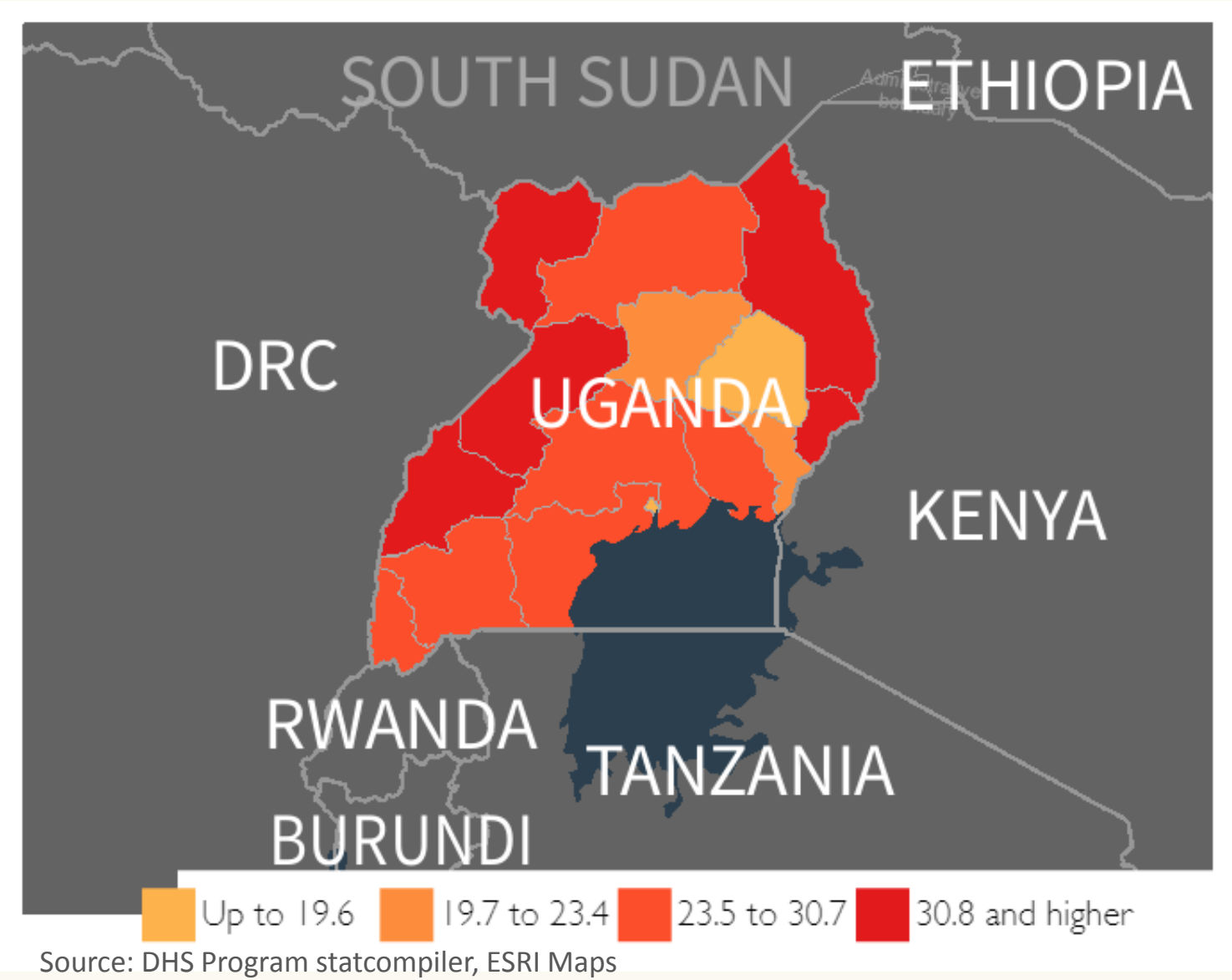


Stunting

- 23% of children globally are stunted
- Lifelong consequences
  - Cognitive impairment & low educational attainment
  - Chronic diseases
  - Lower lifetime earnings
- Stunting can be prevented and reversed
- A form of malnutrition mixed with other factors



Rates of Stunted Children in Uganda



Source: DHS Program statcompiler, ESRI Maps

Food insecurity

- Whether household had enough food to meet needs
- Month by month assessment
- Detailed assessment for the past month
  - Unable to eat preferred foods
  - Smaller or fewer meals
  - Sleeping hungry

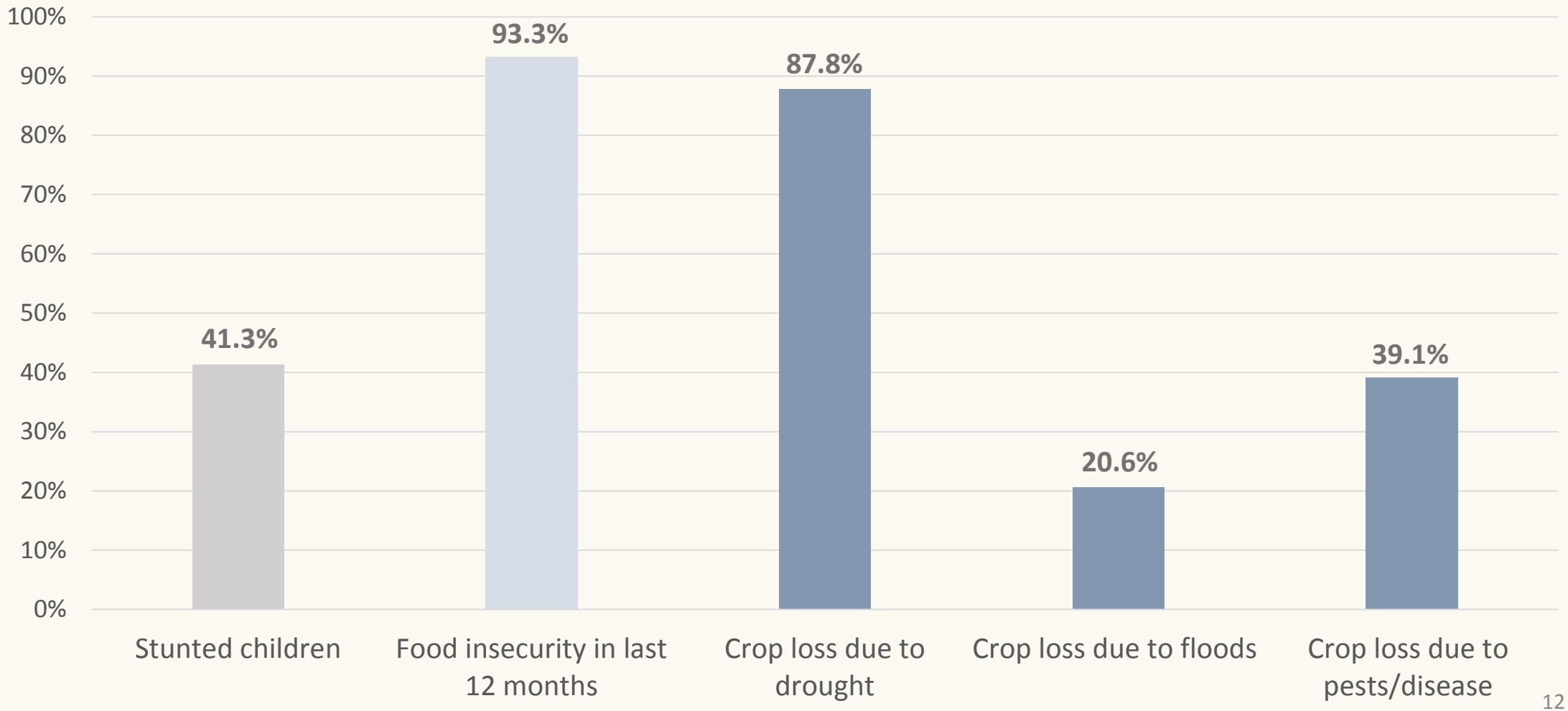
Climate Events

- Inconsistent global weather patterns
- Ugandan subsistence farming
- Crop loss
  - Droughts
  - Floods
  - Pests/diseases
- Strategies to cope with loss

Study Design

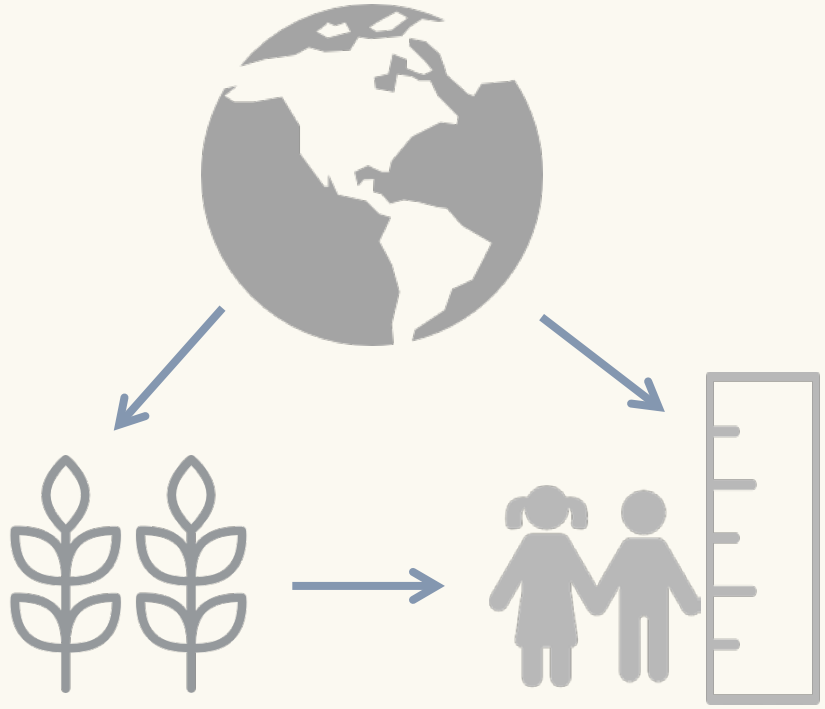
- Cross-sectional baseline data
  - Smallholder female farmers
  - Interviewer-led, self-reported responses
  - Random sampling of 210 villages in 4 districts
- 7,787 households
- 2,177 children under 2 years of age
  - Complete anthropometric data

Findings


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
41.3%
93.3%
87.8%
20.6%
39.1%
Stunted children
Food insecurity in last 12 months
Crop loss due to drought
Crop loss due to floods
Crop loss due to pests/disease

Statistical models

- Binary logistic regression
  - Stunted vs. non-stunted outcome
  - Crop loss due to climate events
- Multivariate linear regression
  - Number of food insecure months outcome
  - Explored the same crop loss predictors



Logistic regression on stunting outcome

Predictors	Odds Ratio	95% Confidence Intervals	P-value
Crop loss due to drought			
No (reference)	1.00		
Yes	**1.38**	**(1.01-1.89)**	**0.039***
Crop loss due to floods			
No (reference)	1.00		
Yes	0.959	(0.77-1.20)	0.716
Crop loss due to pests/disease			
No (reference)	1.00		
Yes	0.685	(0.89-1.27)	0.478
Food insecurity			
No (reference)	1.00		
Yes	1.047	(0.68-1.61)	0.832

Linear regression on food insecurity outcome

Predictors	Coefficients	95% Confidence Intervals	P-value
Crop loss due to drought			
No (reference)	-		
Yes	**1.08**	**(0.72-1.45)**	**<0.001**
Crop loss due to floods			
No (reference)	-		
Yes	-0.11	(-0.27-0.47)	0.169
Crop loss due to pests/disease			
No (reference)	-		
Yes	**0.70**	**(0.47-0.93)**	**<0.001**

Linear regression on food insecurity outcome

Predictors	Coefficients	95% Confidence Intervals	P-value
Crop loss due to drought			
No (reference)	-		
Yes	**1.13**	**(0.40-1.85)**	**0.002**
Crop loss due to floods			
No (reference)	-		
Yes	-0.11	(-0.27-0.47)	0.169
Crop loss due to pests/disease			
No (reference)	-		
Yes	2.98	(0.47-0.93)	0.300
Coping with pest crop loss			
Did nothing (reference)	-		
Reduced consumption	**0.85**	**(0.36-1.34)**	**0.001**
Used savings	**-0.75**	**(-1.26-(-0.24))**	**0.004**
Sold assets	0.85	(-0.96-2.67)	0.357
Used pesticides or sprays	-3.85	(-9.50-1.79)	0.180

Summary

- High rates of child stunting, food insecurity, and crop loss due to climate-related events
- Crop loss due to droughts associated with stunting
- Droughts significantly linked to food insecurity
  - Pests and food insecurity may be confounded
  - Coping with pest loss changes effects
- Limitations exist with cross-sectional data
  - Overall study contributes understanding of emerging factors in a unique sub-population

Future work

- Expanding on climate-related questions
- Using rainfall pattern data
- Analyzing program data to see intervention effects
- Targeting child stunting in BRAC programs

Acknowledgements

- BRAC participants
- Co-Authors
  - Patrick Olobo Okello
  - Robert Mpiira
  - Dr. Zulfiqar Ali
- Organizations
  - World Bank Group Gender Innovation Lab
  - Uganda Ministry of Health & Ministry of Agriculture
  - Uganda Food & Nutrition Council
- Other contributors
  - Dr. Wameq Raza
  - Dr. Munshi Salaiman
  - Francis Fuller Bbosa
  - Bhuiyan Imran Muhammad

THANK YOU