



Development Research



Better Data for Better Agricultural Policies: the LSMS-ISA experience

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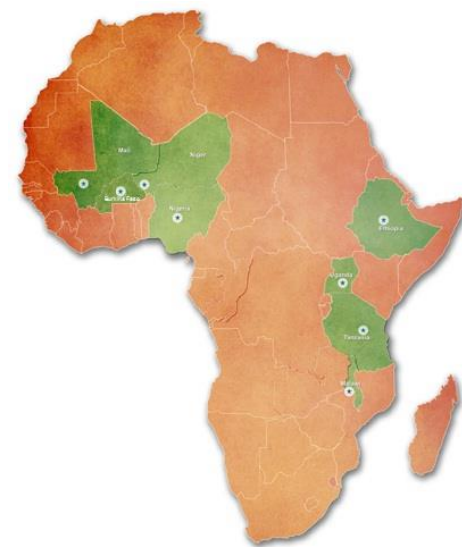
Development Research Group

The World Bank

LSMS-ISA: Working on 3 Fronts



- **Collecting & disseminating** multi-topic panel household survey data with a focus on agriculture in 8 African countries



- Improving methods in agricultural statistics based on rigorous experimentation
- Conducting and promoting policy research

Survey Features

- Implemented by **National Statistical Offices**
- **Multi-topic, disaggregated/gender**
- Nationally/regionally-**representative** samples
- **Panel** of households & individuals
- **Field-based** data entry (CAPI)
- Linked with **ecosystem** data
- **Open access** unit-record & geo-spatial data

Survey Schedule

Country	Baseline	Follow Up	
Tanzania	2008/09	2010/11	2012/13 <i>(Jul 2014)</i>
Uganda	2009/10	2010/11	2011/12
			2013/14 <i>(Dec 2014)</i>
Malawi	2010	2013 <i>(Jul 2014)</i>	
Nigeria	2010/11	2012/13	
Ethiopia	2011/12	2013/14 <i>(Dec 2014)</i>	
Niger	2011	2014	
Mali	2014	2016	
Burkina Faso	2014/15	2015/16	

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Methodological Research

- “Minding the (Data) Gap” research program
- Collaborative effort (FAO/GS, CGIAR, PSE, NSOs, ...)
- Focus on improving **productivity measurement**
- Components
 - Land area measurement
 - Soil fertility
 - Continuous and root crop production
 - Seed variety identification
 - Agricultural labor
 - Livestock
 - Skills

Why focus on methodological research?

Exhibit # 1: Your Avg. Yield Series

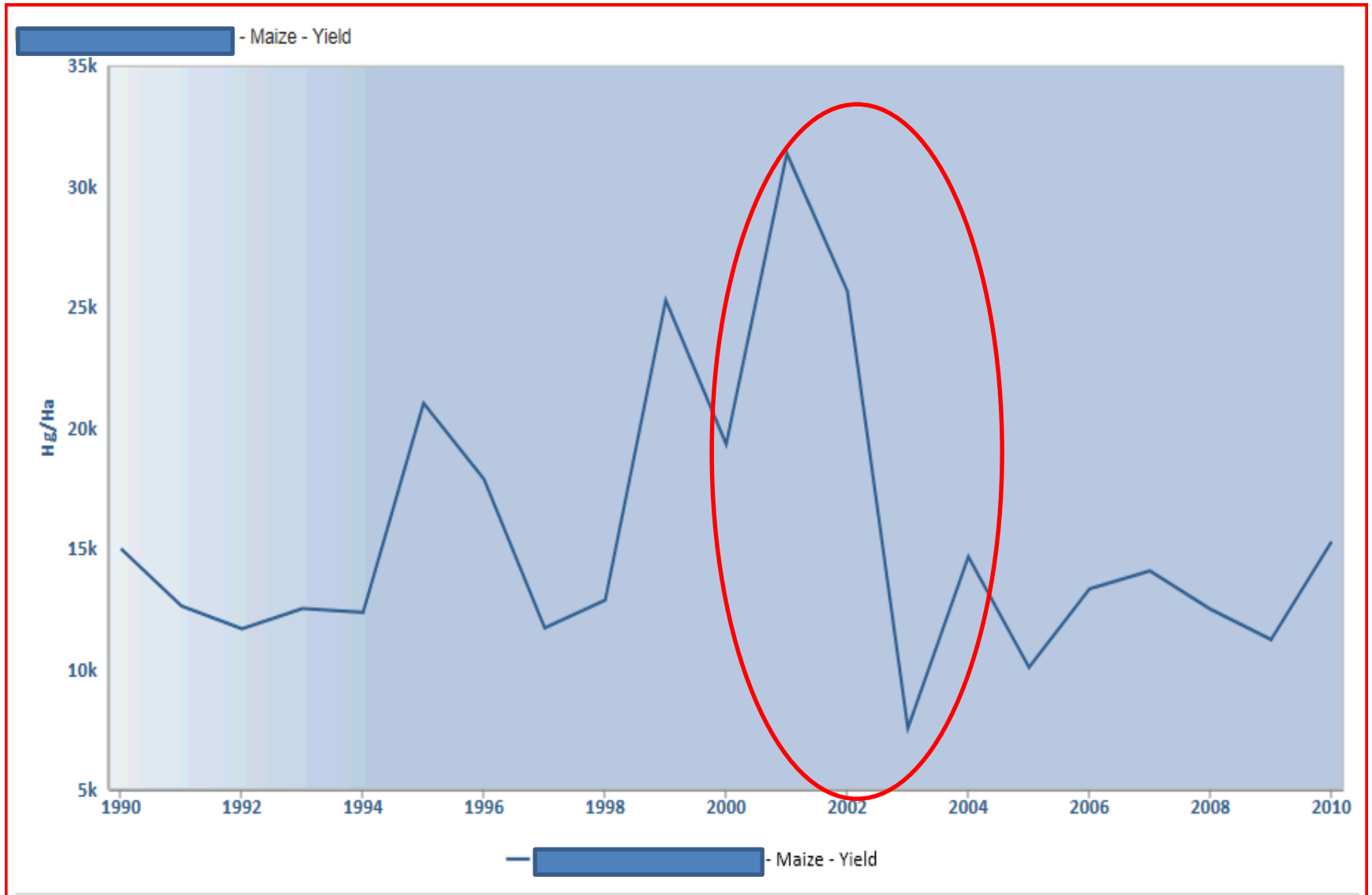
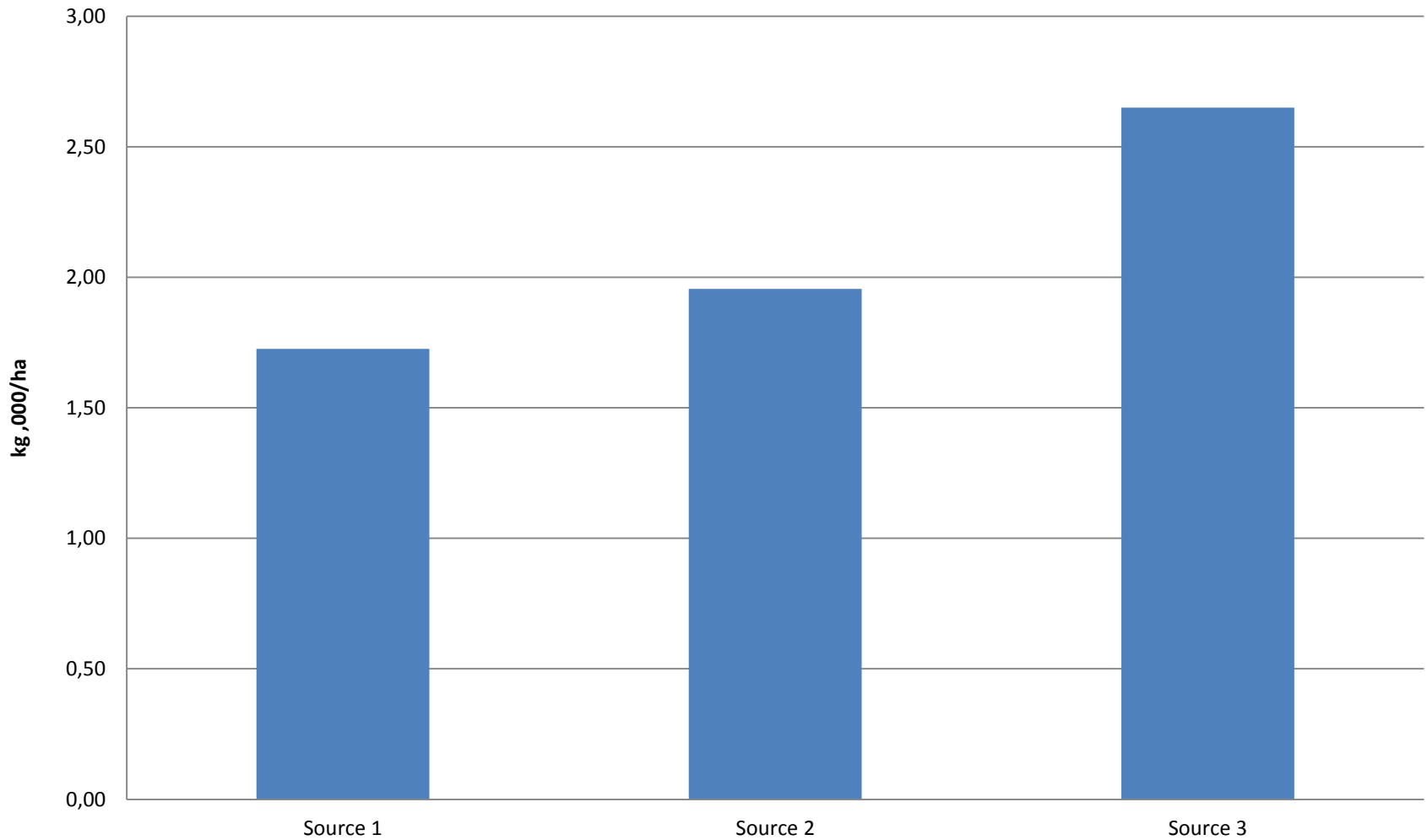


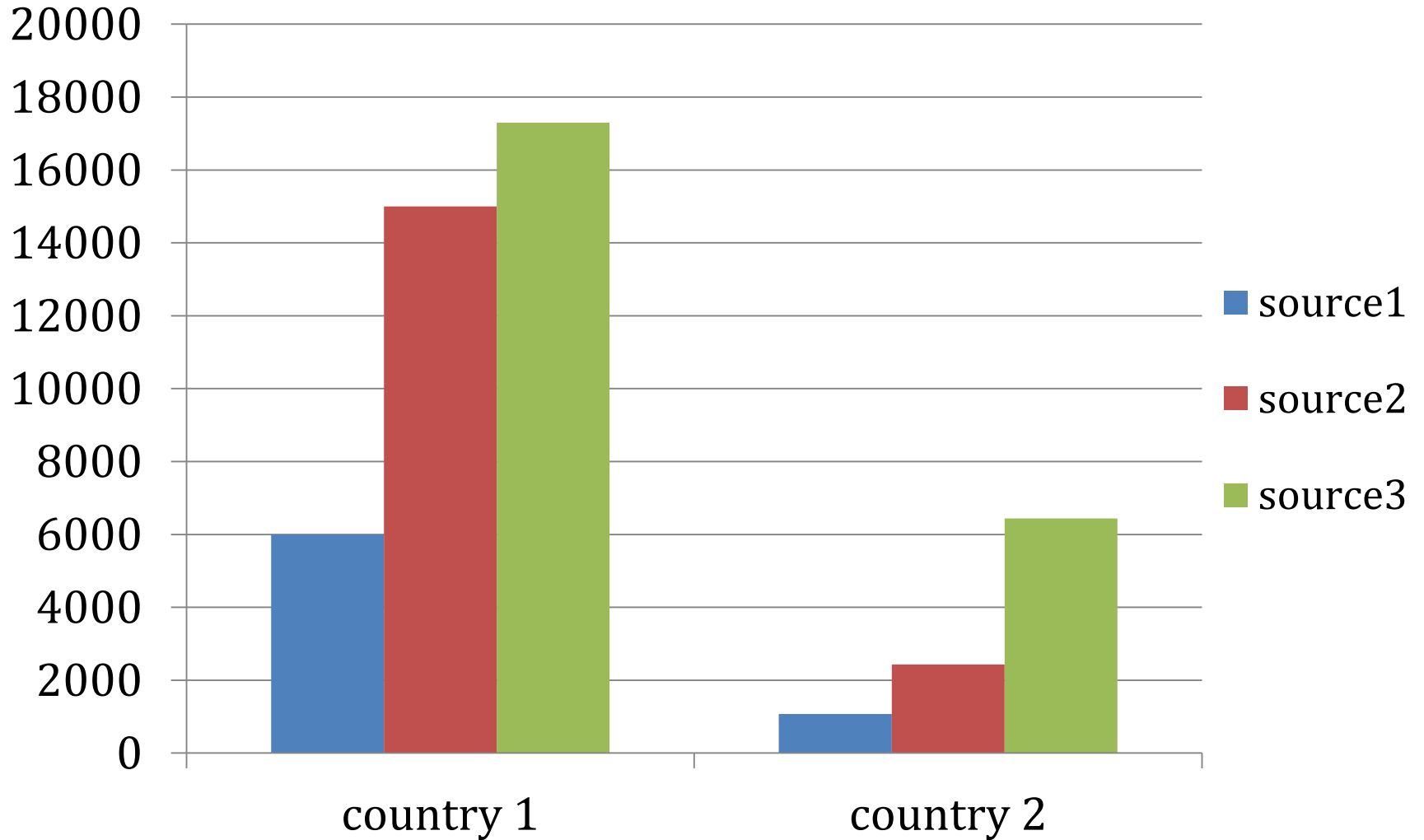
EXHIBIT # 2: Maize Yield Estimates in Country X



Year: 2006/07

EXHIBIT # 3:

Your Avg. Cassava Yields in your Avg. Country



Measuring Farm Productivity

- Many different measures, similar issues!
- Partial measures of productivity: Labour, Land
- Focus here is on **land** productivity (yield) and how method used affects its measurement

$$Yield = \frac{Output}{Land}$$

Measuring Output

- Smallholders don't keep records
- Recall widely used, but does not always work
- Continuous crops harvested in small quantities over several months (e.g. cassava, banana, ...)
- Measured in non-standard units of varying size
- Different units along the value chain; different states
- Prices/Unit values (own consumption)

The problem in pictures ...



Focus on denominator (Land) ...

What are the different methods?

- Satellite imagery
 - Lots of potential but ...
- “Eye estimate”
 - Surprisingly widespread but ...
- Traversing (compass and rope)
 - Gold standard but ...
- Farmer’s self-reporting
 - Widely used but ...
- GPS
 - Increasingly used but ...



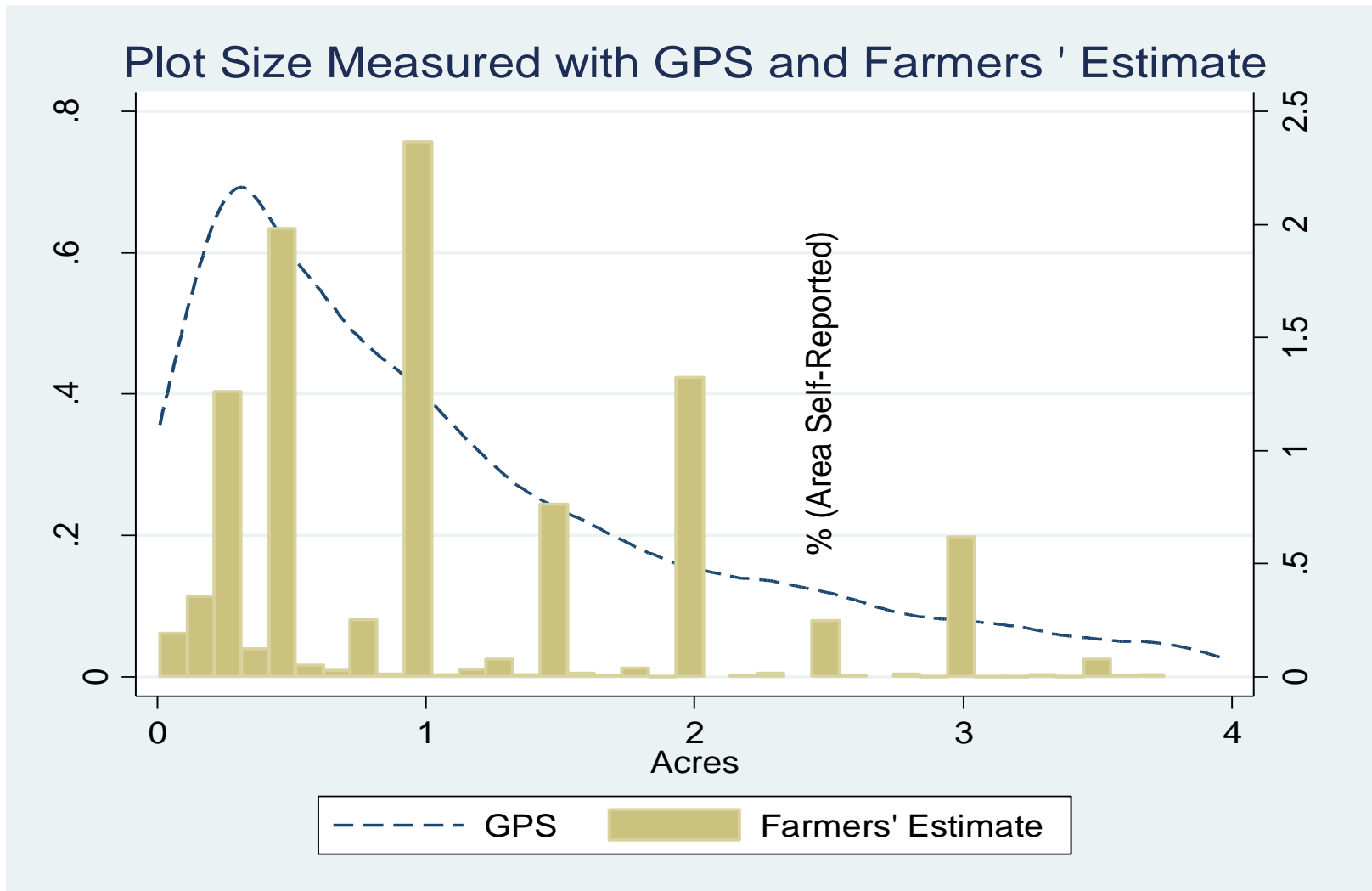
DOES USING GPS TO MEASURE PLOT AREA MAKE A DIFFERENCE?

Systematic bias in reporting ...



Source: Carletto, Savastano, Zezza (2013). "Facts or Artefacts: the Impact of Measurement Errors on the Farm size - Productivity Relationship", *Journal of Development Economics*.

... plus heaping!



Source: 2005/06 UNHS

COMPARING GPS AND FARMERS' SR LAND AREA MEASURES

**Farm Size
(terciles)**

**Yields difference
(GPS-SR)/GPS**

Smaller

28%

Medium

7%

Larger

-30%

Source: 2005/06 UNHS

BUT, IS UNHS A SPECIAL CASE?

Yields differences: (GPS-SR)/GPS

FARM SIZE (terciles)	Pooled	Malawi	Uganda	Tanzania	Niger
Smaller	19.4%	18.0%	17.4%	32.2%	19.1%
Medium	-4.3%	-5.7%	-4.1%	-0.1%	-3.3%
Larger	-19.1%	-13.9%	-34.0%	-28.5%	-89.6%

Carletto, C. S. Gourlay and P. Winters. (2013) "From Guesstimate to GPSstimates: Land Area Measurement and Implications for Agricultural Analysis" Policy Research Working Paper, World Bank

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- **Conducting and promoting policy research**

- **Telling Facts from Myths in African Agriculture**
 - 15 F&M
 - Partners: AfDB, Africa Chief Economist Office, Yale U, Cornell U, Maastricht U & others
- **Nutrition & Agriculture**
 - Partners: BMGF, IFPRI
- **Livelihood, Vulnerability & Resilience in Drylands**
- **Gender & Agriculture**
 - Partners: IFAD, Gender Innovation Lab, IFPRI, FAO, ONE

Gender & Agriculture

- LSMS **traditional** focus: individual disaggregated data on demographics, education, health & labor
- LSMS-ISA: **Expanded** individual disaggregation on
 - Intra-household control of resources
 - Agriculture (& livestock): Ownership (rights), management, control, labor, control, extension
- **Opportunity** to revisit the extent & drivers of gender gap in agricultural productivity in Africa



LEVELLING THE FIELD

IMPROVING OPPORTUNITIES FOR
WOMEN FARMERS IN AFRICA



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ONE

Why should we care about women farmers?

- Women farmers produce less per hectare than men
- Focus on women farmers could have big payoffs (FAO)
 - Women with equal access to inputs would increase their output by 20-30%
 - Aggregate increases could lift 100-150 million out of hunger
- This is inefficient! This is money on the table. Why aren't we doing something?

Not gender & agriculture again...

This time it's different!

1. New Data

- Before: national data = little on gender
detailed data = 6 villages in Burkina Faso
- Now: nationally representative LSMS-ISA data
 - 6 countries: Ethiopia, Malawi, Niger, Nigeria, Tanzania, Uganda
 - That's 40% of SSA population
 - Detailed production, (gender) management data, and input data

This time, it's different

2. New, consistently applied methods (in this area)

- Decomposition analysis. Look at contribution of levels of factors of production, but also *returns* to these factors

Kg of fertilizer (levels)

Yield from 1kg of fertilizer (returns)

Male farmer



after harvesting



Female farmer



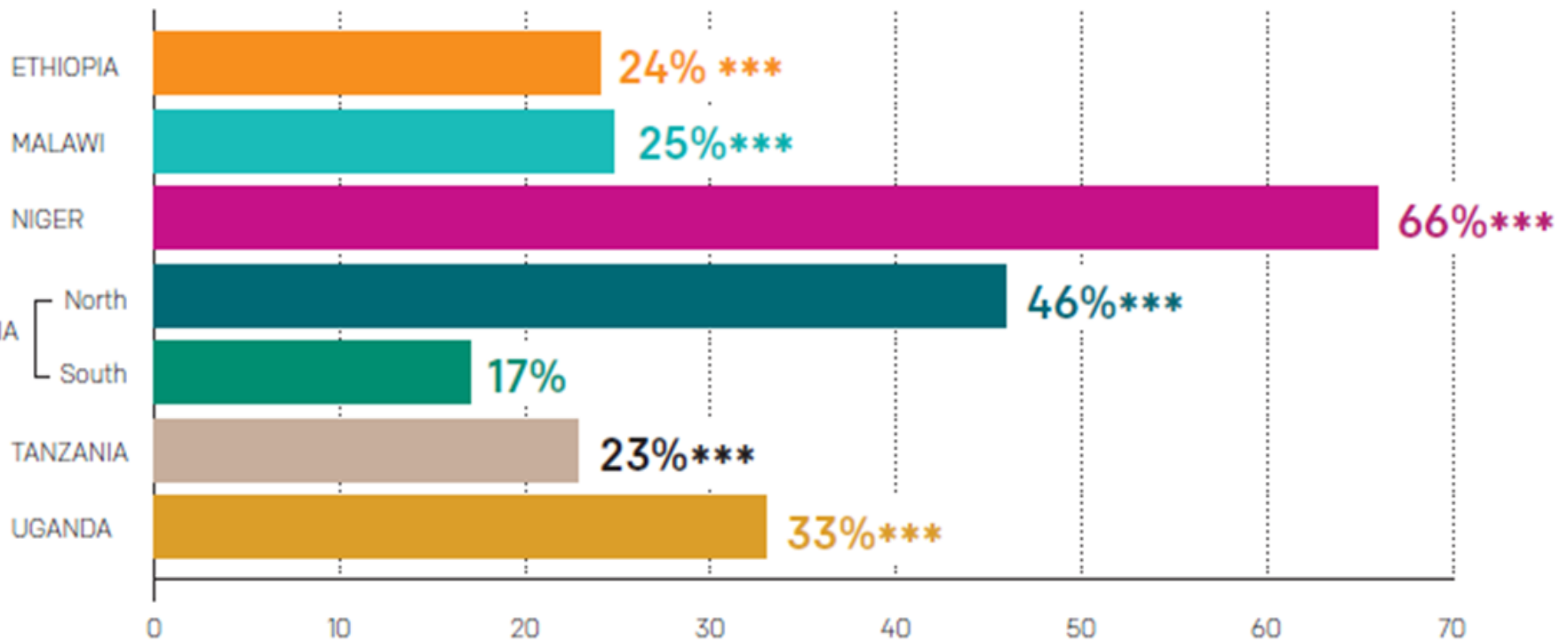
after harvesting



What are the facts?

How much less do they produce?

DIFFERENCE AFTER ACCOUNTING FOR PLOT SIZE AND REGIONS



What's driving the gap?

- Example of Malawi
- 80% of the gap comes from differences in the **levels** of factors of production
 - Household adult male labor input
 - High-value export crop cultivation
 - Access to agricultural implements
 - Inorganic fertilizer
- And 20% of the gap comes from **returns** to those factors
 - Lower returns to adult male labor & inorganic fertilizer on female-managed plots
 - Domestic duties (children in particular) lower women's agricultural productivity

How do we level the field?

From evidence to action

- Report has 10 key policy priorities
 - Within these, 18 concrete policy options
 - We looked for rigorous, tested interventions
 - There is still a significant knowledge gap about what works
 - But we have some promising (i.e. those with rigorous impact evaluation evidence), some emerging

Key Driver	Policy Priority	STATE OF EVIDENCE	
LAND		1. Strengthen women's land rights.	PROMISING
		2. Improve women's access to hired labor.	EMERGING
LABOR		3. Enhance women's use of tools & equipment that reduce the amount of labor they require on the farm.	EMERGING
		4. Provide community-based child-care centers.	EMERGING
NON-LABOR INPUTS		5. Encourage women farmers to use more, & higher-quality, fertilizer.	PROMISING
		6. Increase women's use of improved seeds.	EMERGING

Key Driver	Policy Priority	STATE OF EVIDENCE
INFOR- MATION	 <p>7. Tailor extension services to women's needs, and leverage social networks to spread agricultural knowledge.</p>	PROMISING
ACCESS TO MARKETS	 <p>8. Promote women's cultivation of high-value/cash crops.</p>  <p>9. Facilitate women's access to & effective participation in markets.</p>	EMERGING
HUMAN CAPITAL	 <p>10. Raise education levels of adult female farmers.</p>	PROMISING

Some final thoughts ...

- On methodology
 - “Quick wins”
 - Use of GPS for land area measurement
 - Sourcebook
 - Non-standard units
 - CAPI; conversion tables
 - Information on crop state
 - Protocols on data integration (satellite imagery, ...)
 - Tougher “nuts to crack”
 - Intercropping
 - Post-harvest losses
 - Continuous and root crops
 - Labor inputs
 - Prices
- Need more methodological validation!

Some final thoughts (cont'd) ...

- On policy research
 - “Quick wins”
 - Improve access and documentation
 - Tool for dissemination/increase usability
 - Marginal repurposing of existing/planned surveys
 - Enhanced integration and use of data sources
 - Multi-purpose
 - Survey-to-survey
 - Tougher “nuts to crack”
 - Individual-level data
 - Nutrition, Gender
 - Institutional coordination (for scaling up)
 - Global Strategy
 - Capacity Building