



The United Republic of Tanzania  
Agriculture Sector Lead Ministries

# 4<sup>TH</sup> ANNUAL AGRICULTURAL POLICY CONFERENCE [AAPC]

**Integrating Food and Nutrition  
Security into Economic Transformation  
and Industrialization Agenda:**  
How can agriculture be the driver rather  
than follower of economic transformation in  
Tanzania?



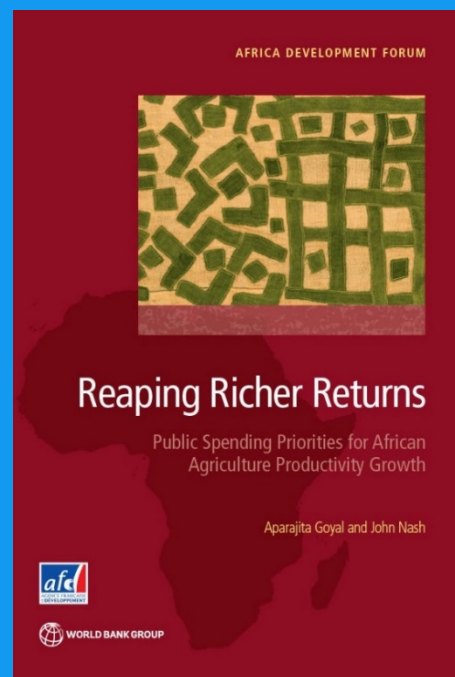
**New Dodoma Hotel, Dodoma**

**14<sup>th</sup> - 16<sup>th</sup> February, 2018**



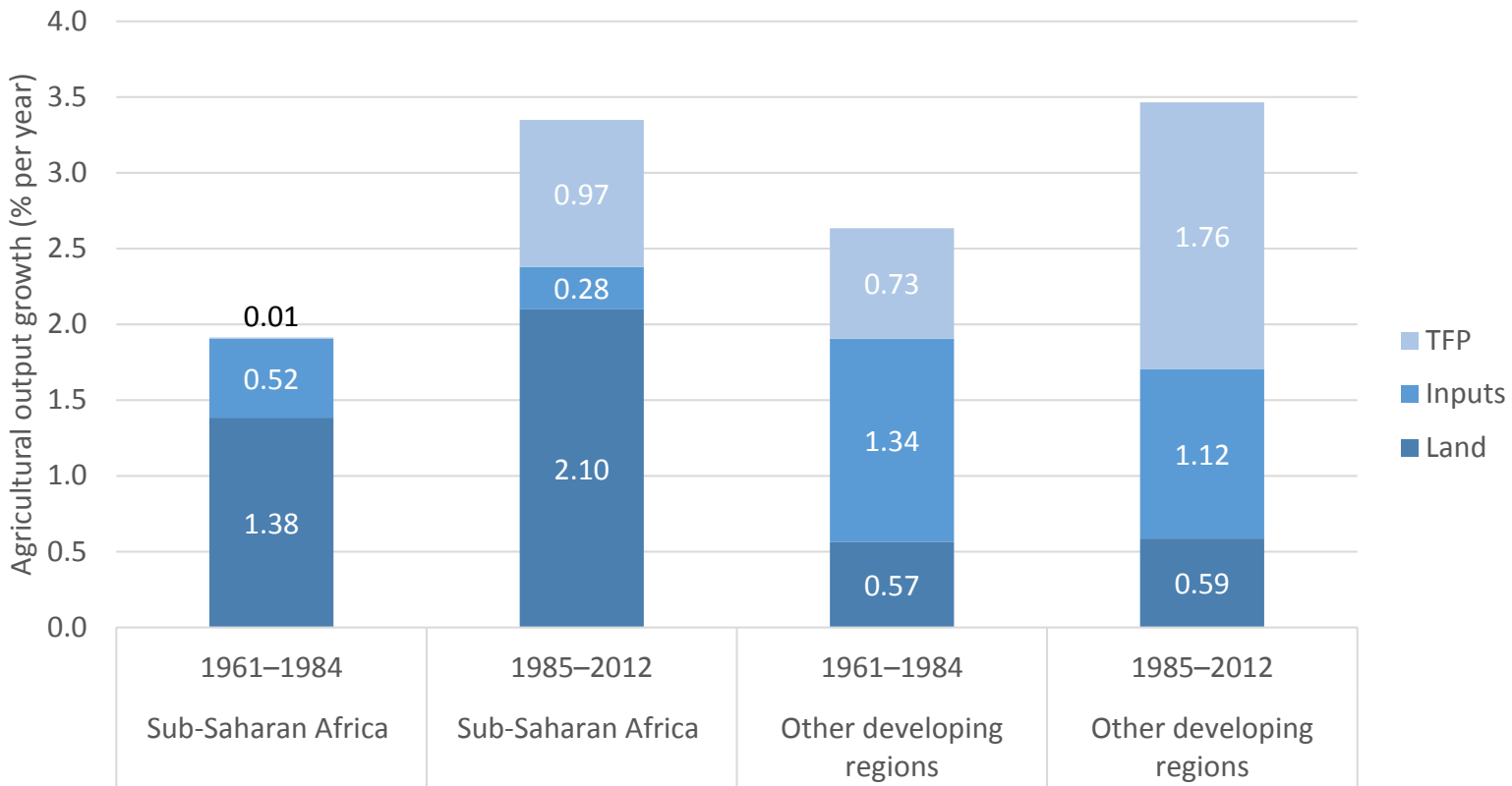
# REAPING RICHER RETURNS

Public Spending Priorities for African  
Agriculture Productivity Growth



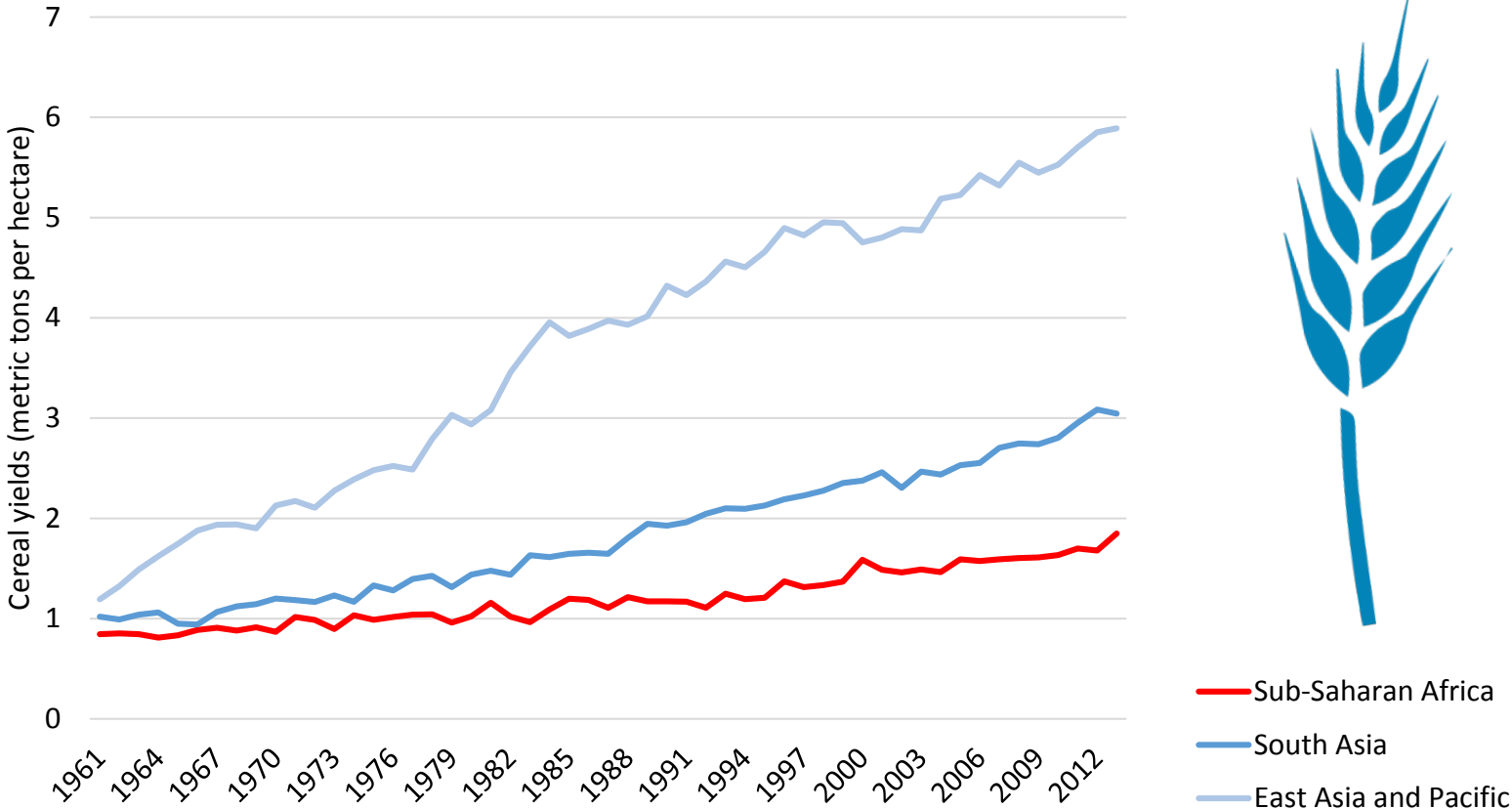
# Africa's Increased Production Has Been Driven Mostly by Increases in Area

## Agricultural Output Growth



# Cereal Yields in Africa Have Barely Increased in Four Decades

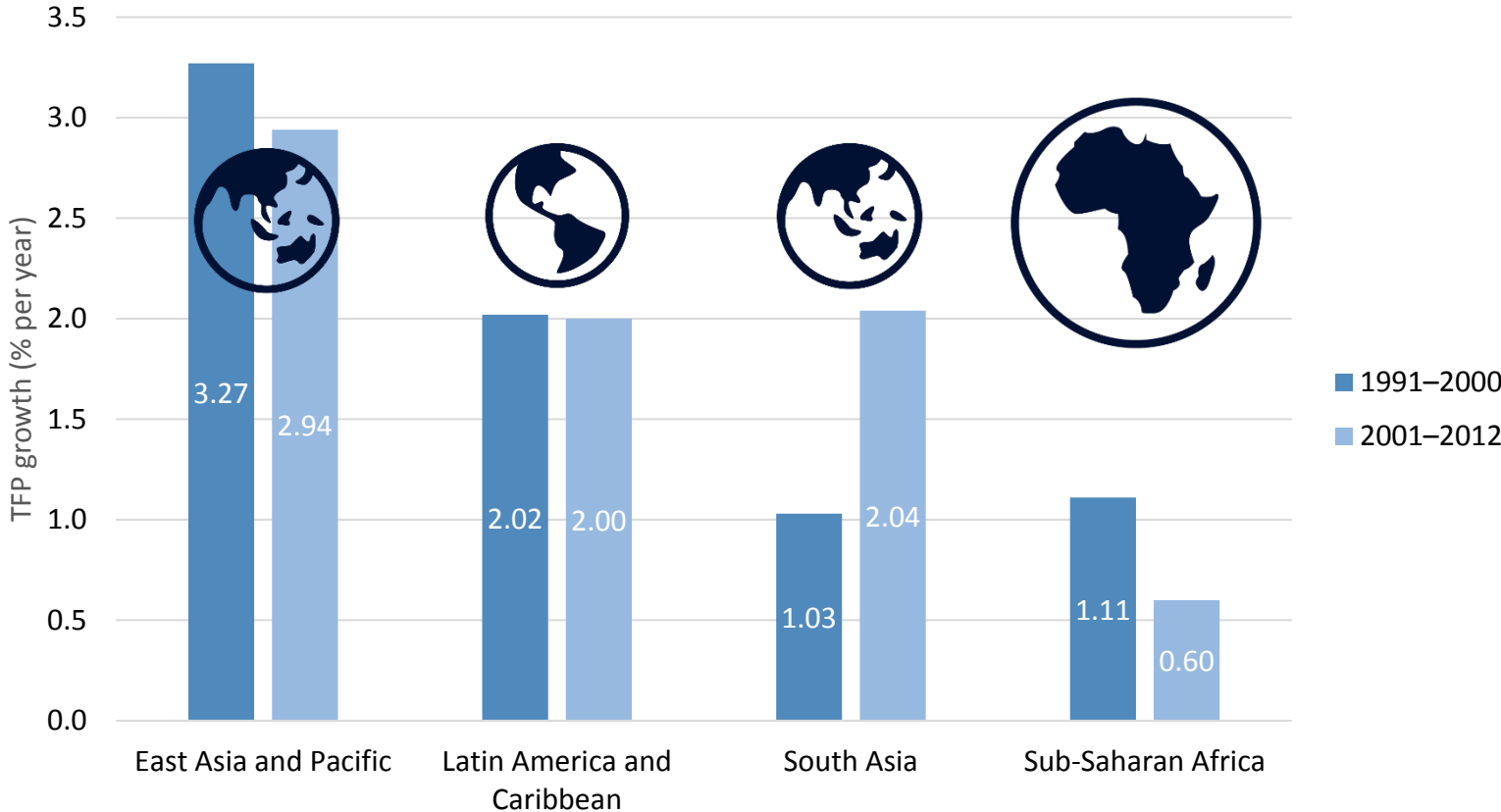
## Cereal Yields



- Sub-Saharan Africa
- South Asia
- East Asia and Pacific

# Africa is Falling Farther Behind in Productivity and Competitiveness

## TFP Growth





# Spending Choices Matter

- Empirical evidence shows large differences in returns to different types of spending
- CAADP Declaration: African Governments have committed to improve the quality and the volume of spending



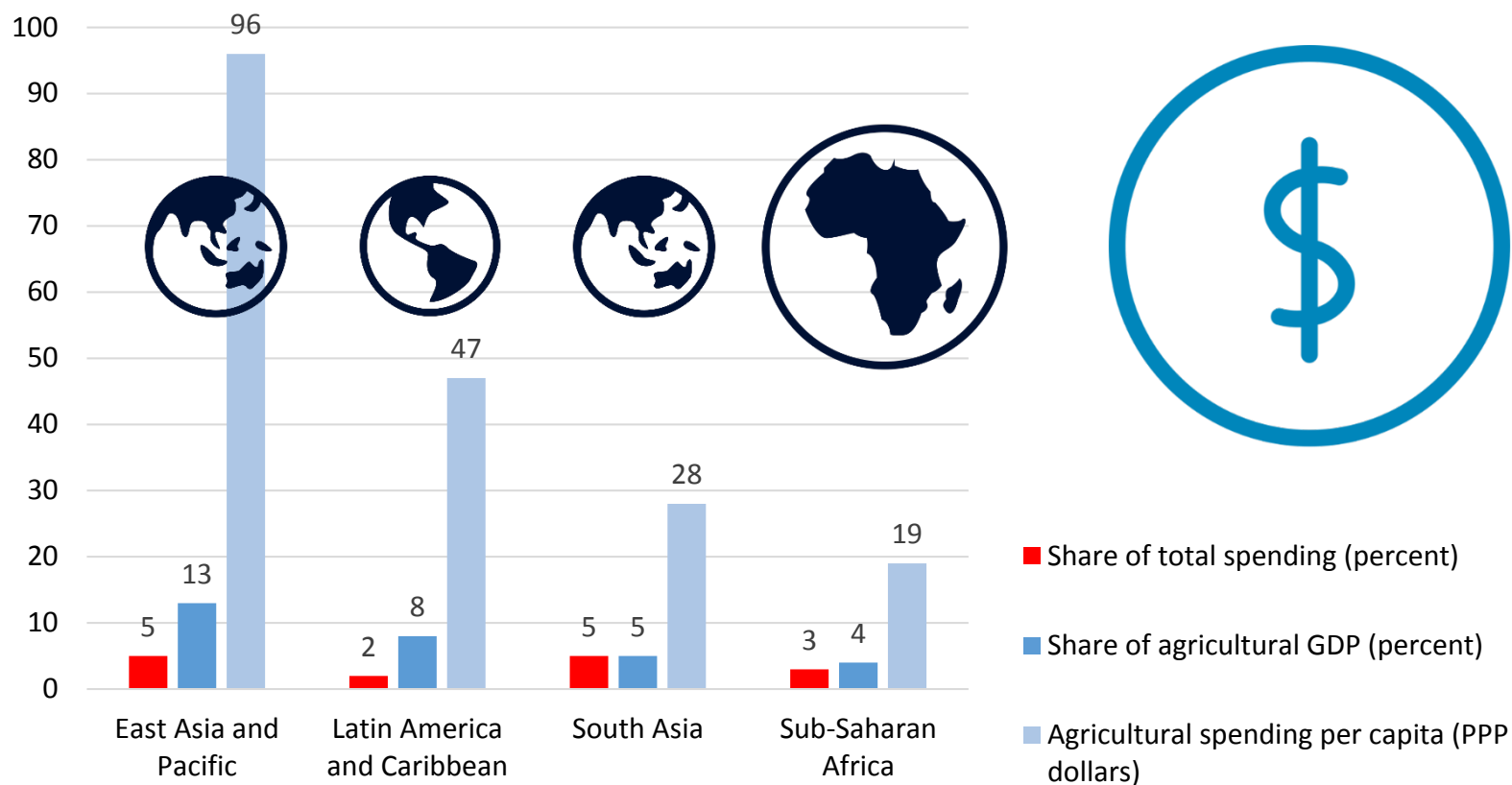
# Agriculture Public Expenditure in Africa - Contents

1. Levels and trends
2. Composition and Returns
3. Focus on Input Subsidy Programs
4. Improving Budgetary Processes for Higher Impact
5. Using Political Economy to Achieve Reforms in Ag PE



# Agriculture Public Expenditure in Africa is Lower than in Other Regions by Several Indicators

## Public Agricultural Spending Across Regions, 2000 – 2012

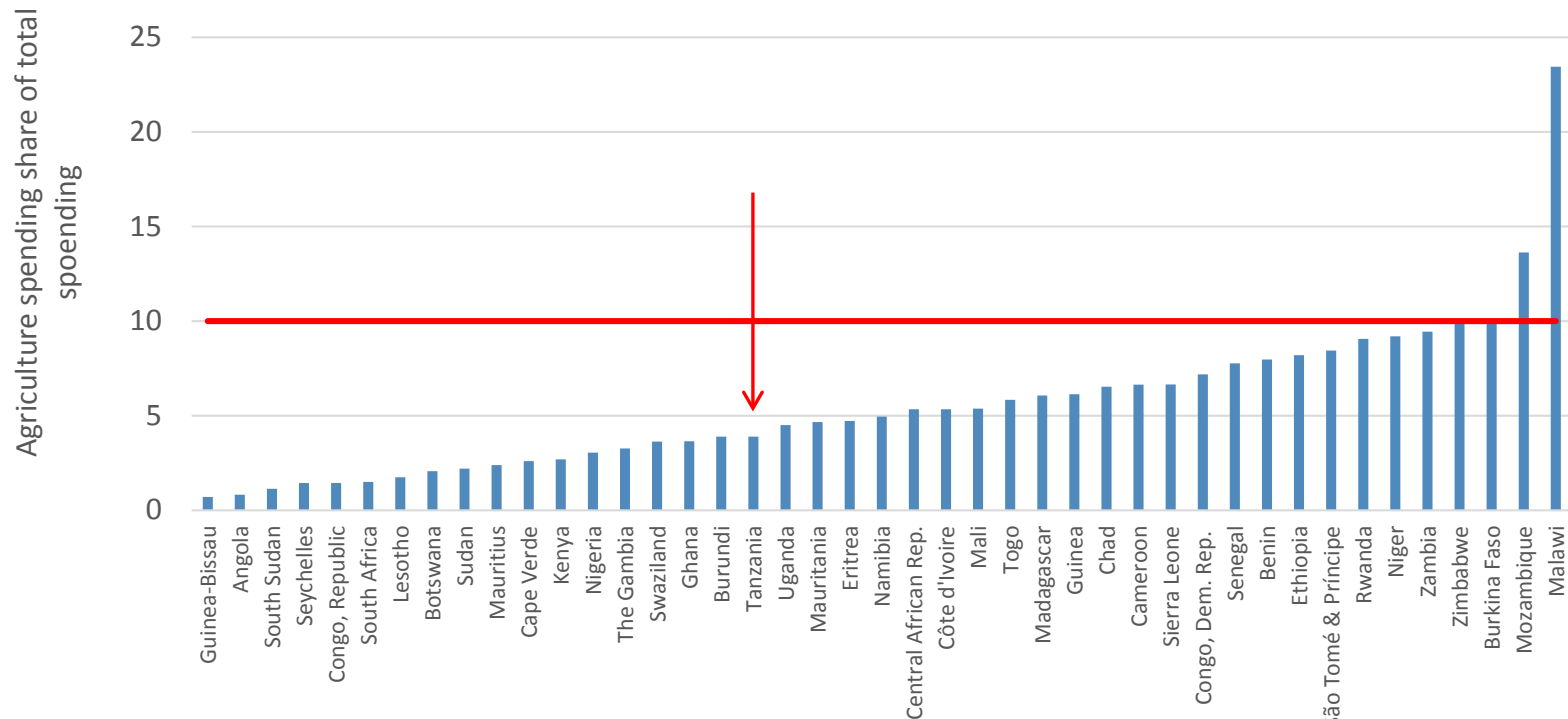




# Few Countries Are Even Close to the Target for Agriculture Public Expenditure

- Maputo Declaration (2003) & Malabo Declaration (2014): Target of raising Ag PE to 10% of overall PE

## Public Agricultural Spending in Sub-Saharan Countries, 2014



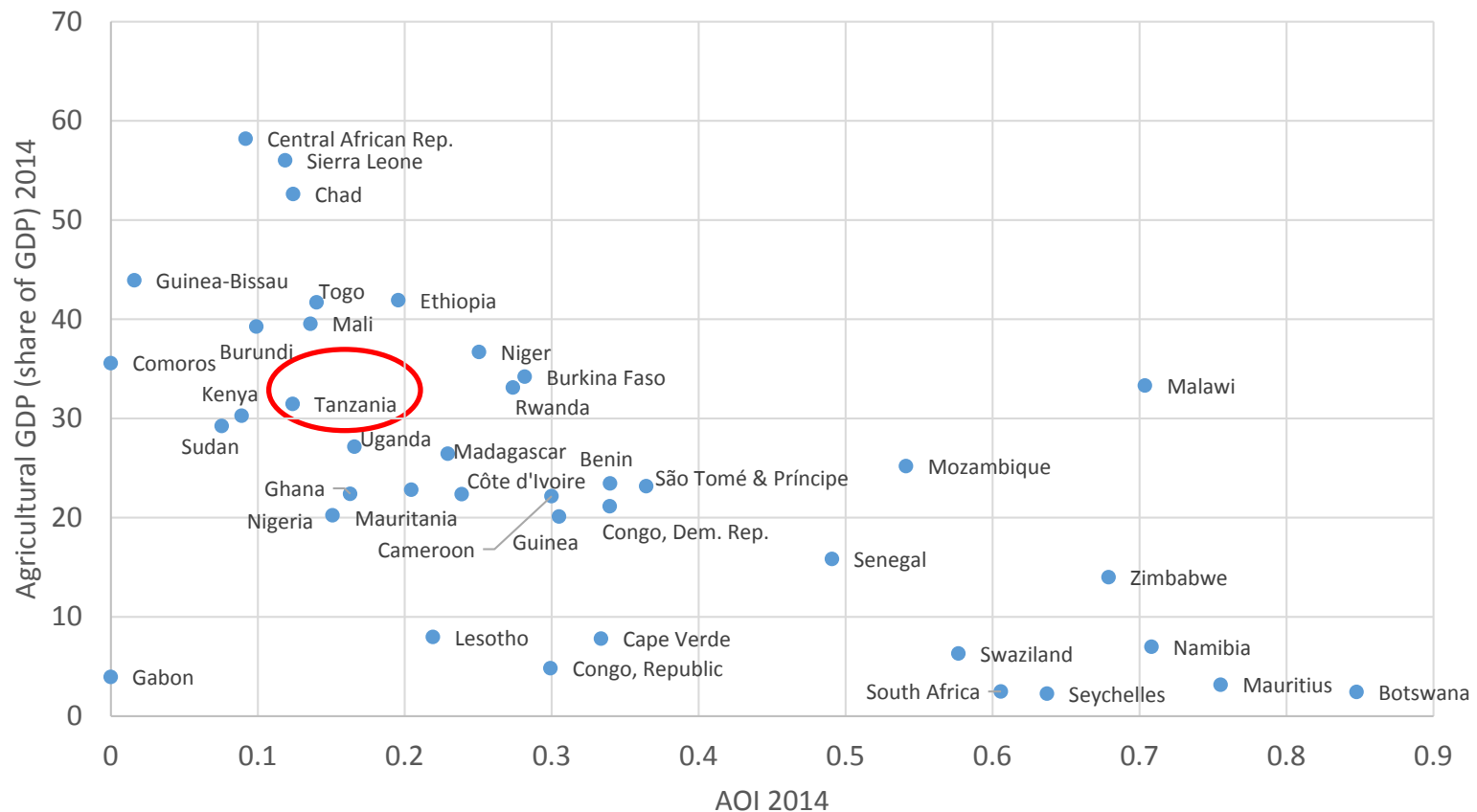
# AU 2017 Report - Countries Exceeding 10 Percent Target

## Share of Total Spending in Agriculture 2015/16.

Ethiopia	16.8%
Malawi	17.6%
Angola	14.8%
Egypt	14.0%
Sudan	13.4%
Mauritania	13.0%
Mali	12.4%
Senegal	11.0%
Burkina	10.5%
Equatorial Guinea	10.5%

# Spending is Especially Low in Countries where Agriculture is Most Important

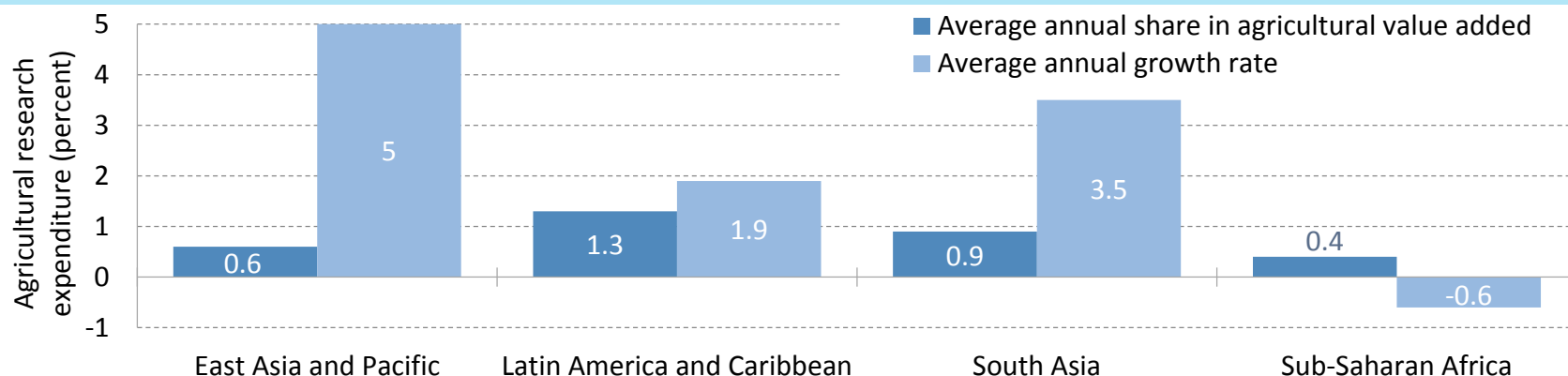
## Agriculture Orientation Index vs. Agriculture GDP



# Composition & Returns of Agriculture Public Expenditure

## ➤ Research Spending is Shrinking in Africa

### Public Agricultural Research Spending 2000 – 2011



Virtually All Studies Conclude:  
Research Yields Very High Returns

#### Returns to agricultural research

	Benefit–cost ratio	Internal rate of return (%)	IRR (%) without CGIAR
<b>Large countries</b> Nigeria, Sudan, Ethiopia, Kenya, Côte d'Ivoire, Ghana	4.4	43	36
<b>Mid-size countries</b> Uganda, Senegal, Mali, Mozambique, Madagascar	2.6	29	23
<b>Small countries</b> Gabon, Burundi, Gambia, Botswana, Swaziland	1.6	17	13

Source: Fuglie and Rada 2013.

Note: The benefit–cost ratio discounts future benefits at a yearly rate of 10 percent.

Source: Goyal, A. and Nash. J. 2017 AFR Regional Flagship Study, World Bank

# Brazil Cerrado

- » EMBRAPA (Brazilian Agricultural Research Company) established 1973 turned itself into the world's leading tropical-research institution.
- » Together with universities and private companies, Embrapa's major contribution was transforming the Cerrado
- » Today the Cerrado accounts for 70% of Brazil's crop output
- » Investment in scientific research, not subsidies





# African Guinea Savannah

## African Guinea Savannah

- 800 - 1,100 mm rainfall
- 150 – 220 days season
- 7 million km<sup>2</sup> total area
- 0.5 million km<sup>2</sup> cropped
- 3 cropping systems:
  - ➔ Cereal - root crop
  - ➔ Root crop
  - ➔ Maize mixed



## Chile Fundacion

Crucial to Chile's success following withdrawal of government funding for R&D in the 1980s.

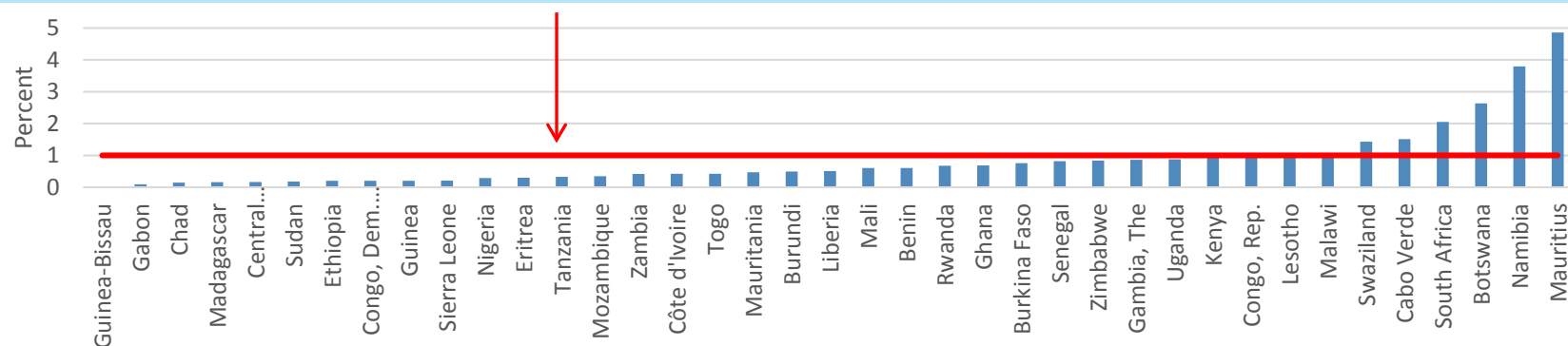
### Functions

1. Detecting potentially profitable subsectors
2. Developing/importing technology
3. Selecting appropriate technologies
4. Incubation support/ investment in pioneer firms
5. Diffusing technology results.

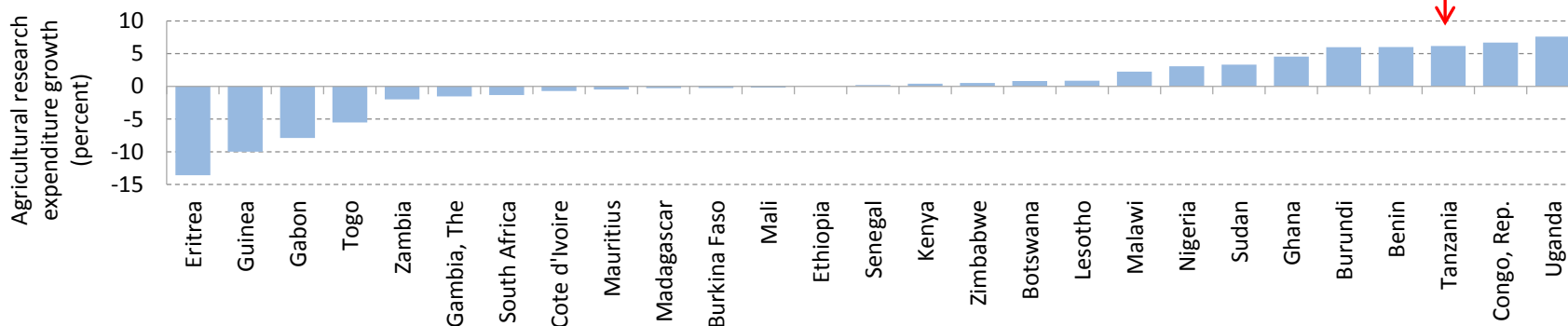
# Many Countries are Reducing Research Spending

- Majority of countries are below target of spending 1% of Ag GDP on research

## Agricultural Research Spending as a Share of Agricultural GDP, 2011



## Annual Growth in Agricultural R&D Spending, 2000 – 2011



# Land Governance Spending

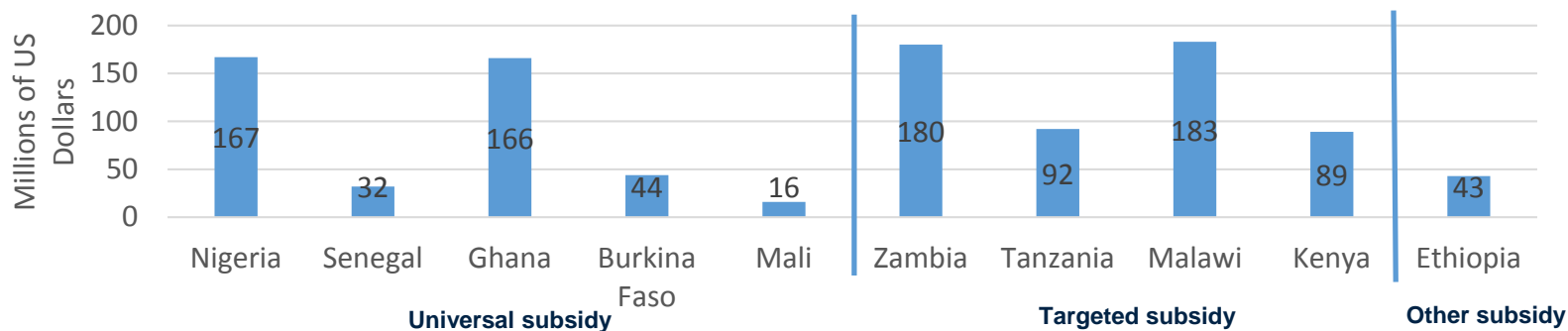
- Key public good, greatly undersupplied across Africa
- Only about 10% of rural land is registered
- Undocumented and informal arrangements are vulnerable to land-grabbing and exploitation
- Weak incentives for on-farm investments and rural credit market development



# Input Subsidies Are Large and Expanding in Share of Budgets

- Under the 2003 Maputo Declaration, at least 10 countries have (re-)introduced fertilizer subsidy programs

## The 10 largest African governments spend \$1.2 billion a year on input subsidies alone



## What's the Economic Rationale?

- Fact: Fertilizer used at very low levels in SSA, compared to Asia and other regions
  - Hypothesis: Farmers don't know how good fertilizer is, need subsidy to show them
  - Once they understand benefits, they'll keep buying on their own
- BUT...
- Conditions in SSA very different from Asia – poor soils and lower water availability mean yields are not as responsive
  - Weight of evidence is that Green Revolution technology adoption in Asia was not driven by subsidies





## Findings on ISPs from this and other studies

- Fertilizer use inhibited by diversion and **“crowding-out”**
- **Crop response rates** of smallholders are variable and usually low
- **Poor distributional outcomes:** regressive ISPs
- Limited evidence that ISPs kick-start dynamic growth processes

## Implications for Design and Implementation of Smarter Subsidy Programs

- Downsize Input Subsidy Programs
- Target Recipients More Effectively
- Evaluate Options: Targeted vs. Untargeted Universal Subsidy Programs
- Minimize “Crowding Out”
- Provide Transparency of ISP Costs and Prevent Diversion
- Ensure Complementary Public Sector Actions to make fertilizer use profitable, including a Program of Soil Fertility Management

## Complementary investments, including Soil Fertility Management

- Governments can support the effort to reduce prices by
  - **Improving the infrastructure for fertilizer distribution**
  - **Reducing regulatory barriers**
  - **Improving profitability by reducing transport costs**
  - **Enhancing research and extension**
  - **Investing in soil analysis and mapping**



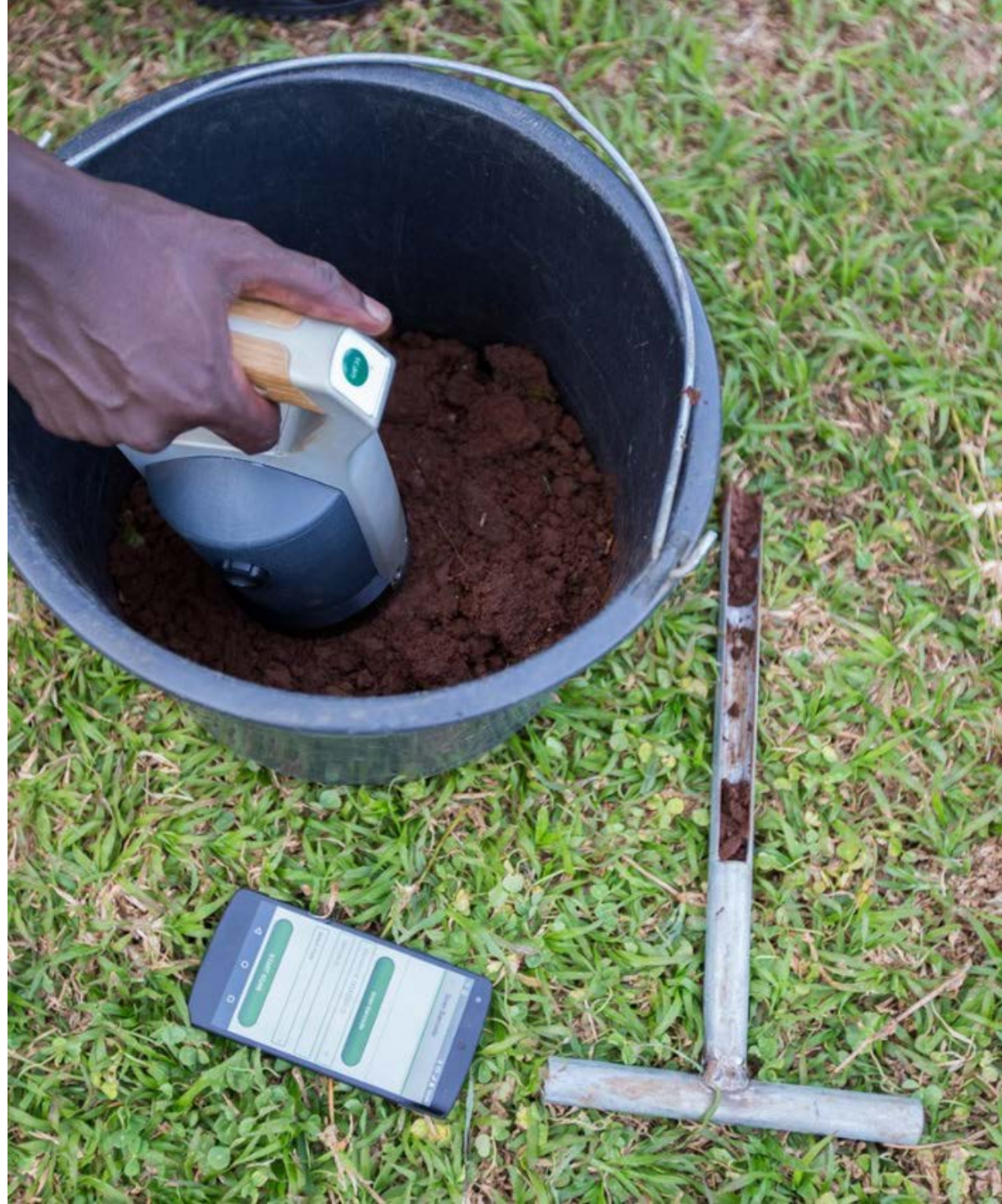
\$4  
billion

Cost to Africa's farmers due to reduced yields from low soil fertility; 50% loss of farm nutrient application with current production practices



### Soil Cares Scanner

On-the-spot quality soil checks + report using smartphone, sensors and scanners in 10 mins





65%

Percent of farmers adopting  
different soil management  
techniques on basis of SoilCares  
report

126%

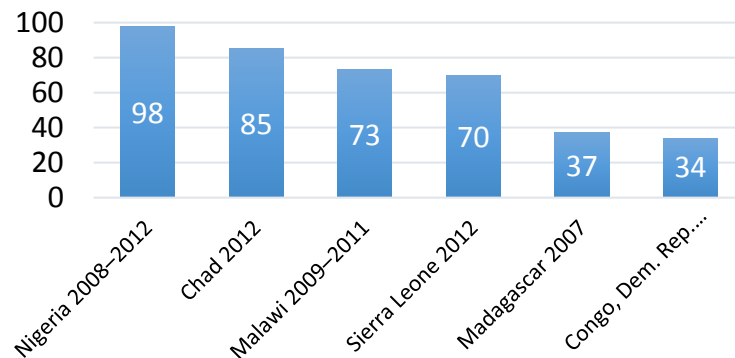
Average increase in yield as  
compared to conventional  
practices



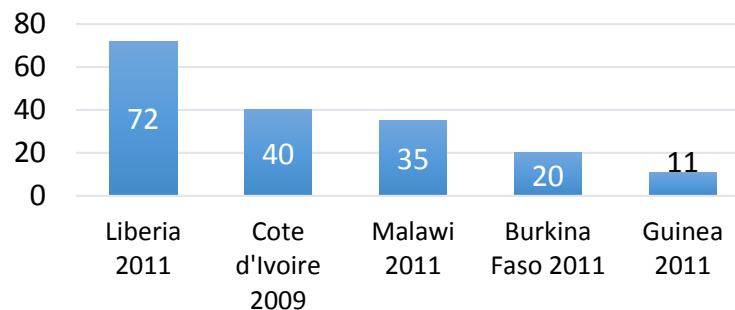
# Improving Budgetary Processes for Higher Impact

- Sector strategies and National Agriculture Investment Plans (NAIPs) need to provide guidance
- **Low execution rates** need to be raised – especially a problem with donor funds
- **Reduce transfers to SOEs** and make them more transparent
- Capacity for budget planning and execution needs to be beefed up at sub-national level as decentralization and deconcentration proceed
- Systems need to capture **off-budget spending (mainly donors)**
- Imbalances Need to Be Corrected
- Systematic underfunding of some **recurrent expenses**
  - Under-spending on monitoring & evaluation impedes ability to make good evidence-based decisions to continue programs or not
  - Shortage of budget to maintain capital investments

## Execution rates of total agricultural budgets can be dismal (percent)



## Off-budget shares of public agricultural spending can be substantial (percent)



# Using Political Economy to Achieve Reforms in Agriculture

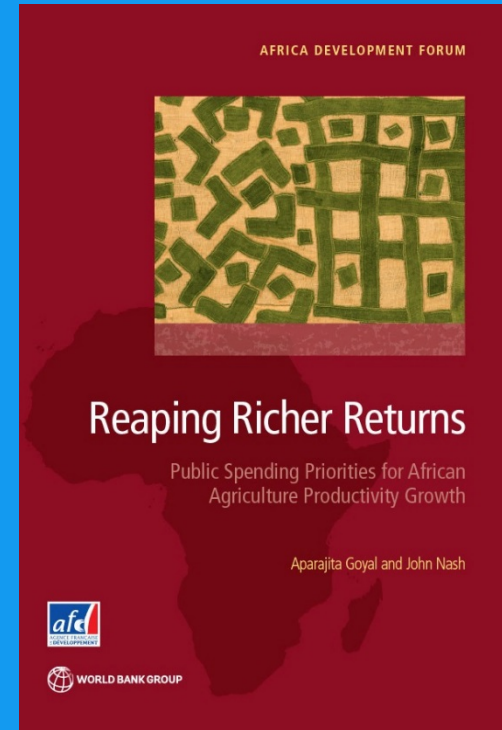
## Public Expenditure

- Shocks often precipitates reforms by disturbing political equilibria: reformers should be prepared
- Other ways to mitigate problems from difficulty of attribution and politicians' inability to make credible commitment
  - Many agents can increase transparency and knowledge of policies' impacts (cooperatives, CSOs, research institutes, press, etc.)
  - Credibility can be buttressed by commitment to external agent : CAADP's NAIP and JSR processes could perform this role.
- Considering fungibility of funds, donors should not plan to greatly influence overall spending unless they have an overview of whole budget: Ag PERs can be helpful
- Reforms are facilitated by partial compensation of losers – “spoonful of sugar”
- Ministries of agriculture need evidence that funds will be well spent and produce high returns to justify higher budget allocations



# Reaping Richer Returns

Public Spending Priorities for African  
Agriculture Productivity Growth



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<http://www.worldbank.org/en/programs/agriculture-in-africa-public-spending-priorities>

Goyal, Aparajita and Nash, John. 2017. Reaping Richer Returns: Public Spending Priorities for African Agriculture Productivity Growth. World Bank: Washington, DC



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# THANK YOU



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Dalberg

