Thoughts on Priority Research Topics to Support Agri-Food Systems Transformation in Africa

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Priority research issues always determined by key policy challenges

-- Some are known

-- Others are unseen

A FEW MAJOR TRENDS AFFECTING AGRI-FOOD SYSTEMS IN SUB-SAHARAN AFRICA

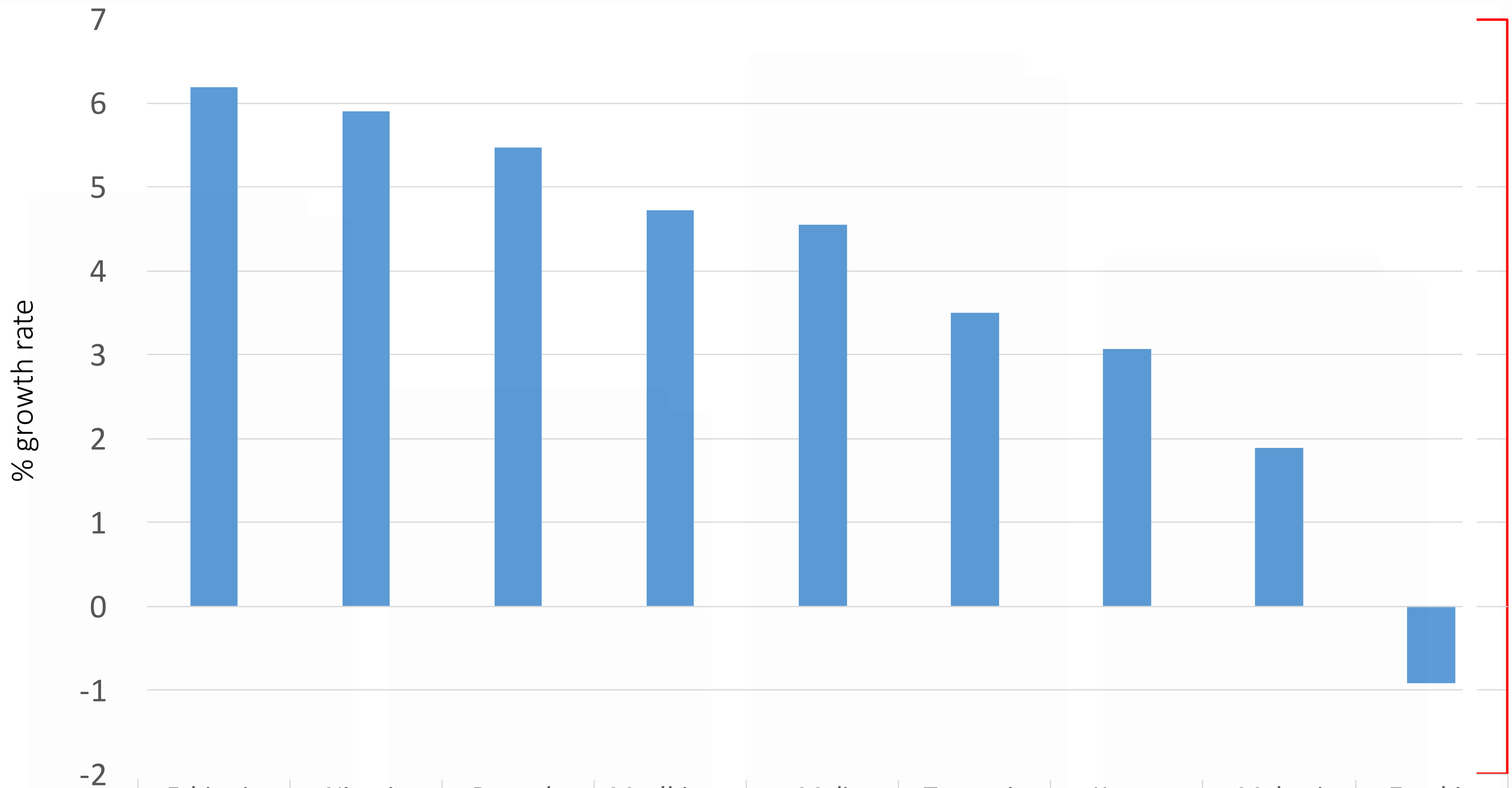
1. Major growth in per capita incomes
2. Impressive agricultural growth rates
3. Rise of commercialized African investor farmers
4. Rapid investment in agricultural value chains by African entrepreneurs
5. Diversification of the labor force into off-farm activities
6. Greater vibrancy of agricultural factors markets
7. Improved market access conditions for African farmers

IMPRESSIVE AGRICULTURAL GROWTH

Annual inflation-adjusted agricultural growth rates, 2000-2016:

• Sub-Saharan Africa:	**+4.62 %**
• East Asia:	+3.07 %
• South Asia:	+2.96 %
• Latin America:	+2.49 %
• World:	+2.75 %

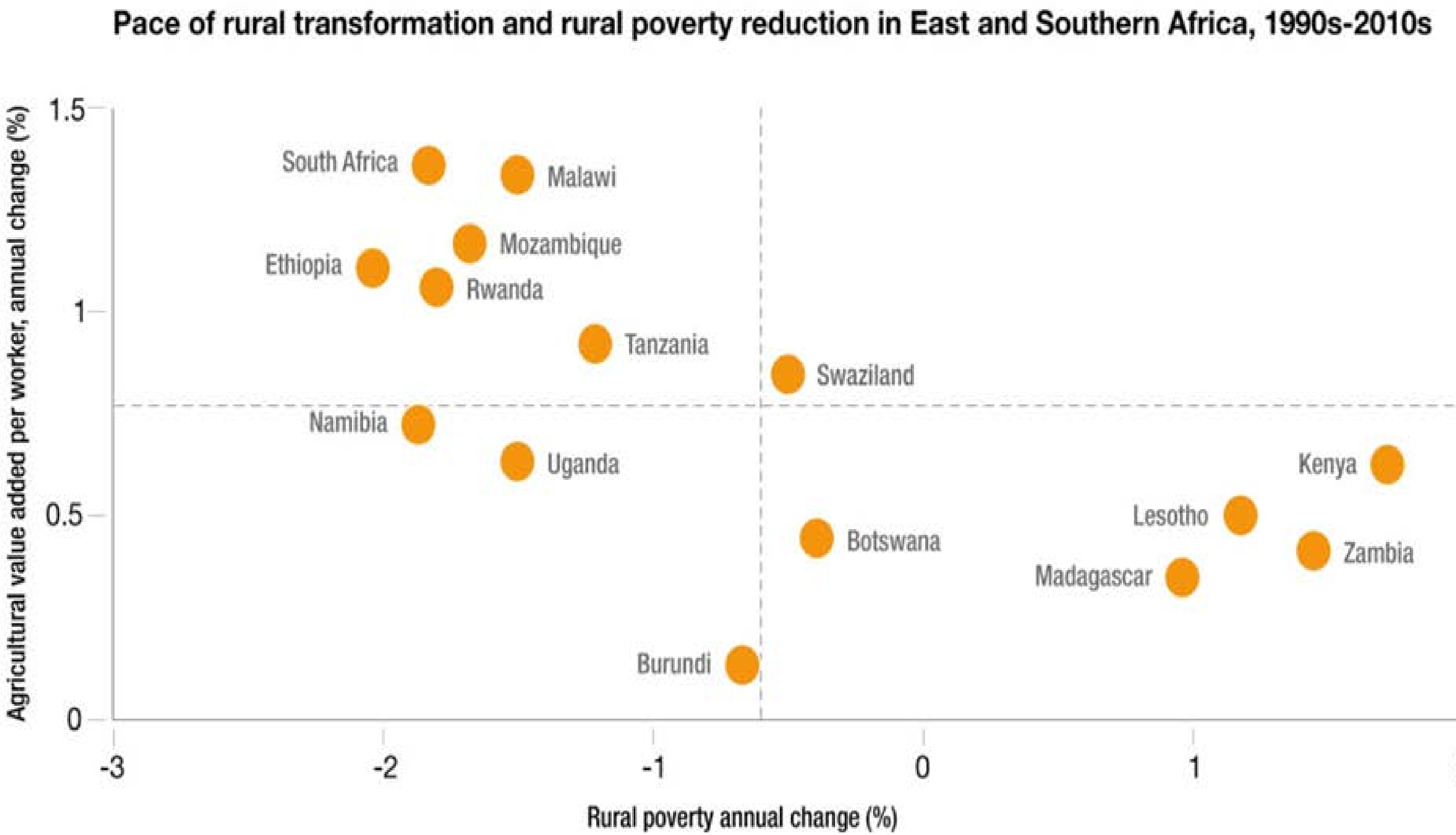
AGRICULTURAL VALUE ADDED ANNUAL GROWTH RATES 2000-2016 (constant local currency units)



	Ethiopia	Nigeria	Rwanda	Moz'bique	Mali	Tanzania	Kenya	Malawi	Zambia
% growth	6.2	5.91	5.47	4.72	4.55	3.5	3.07	1.89	-0.92

Source: World Development Indicators, 2017

RELATIONSHIP BETWEEN AGRICULTURAL GROWTH AND POVERTY REDUCTION



Source: IFAD Rural Development Report, 2016;
World Development Indicators database, 2016.

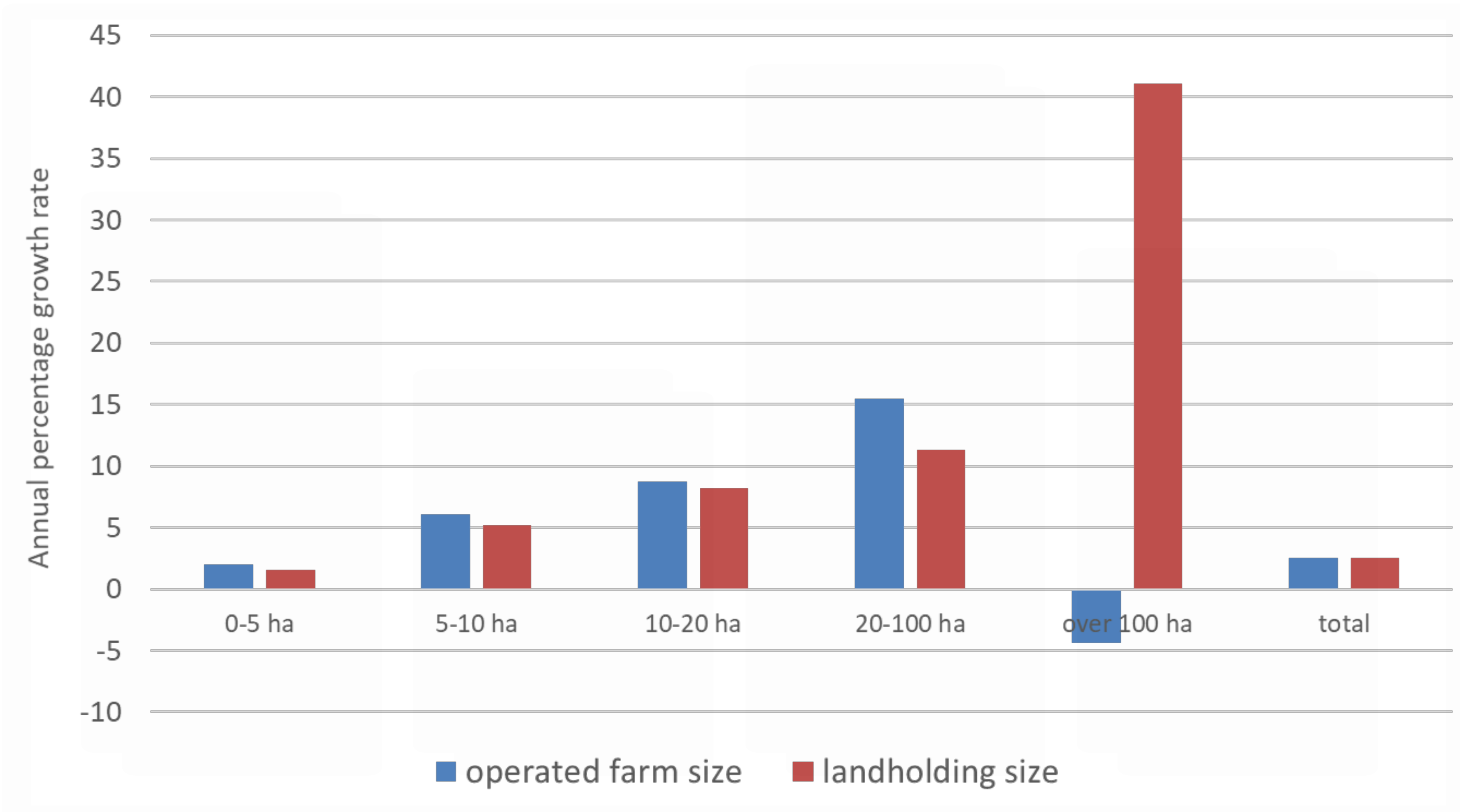
7 UNMISTAKABLE SIGNS OF AGRI-FOOD SYSTEM TRANSFORMATION IN SSA

1. Major growth in per capita incomes

2. Impressive agricultural growth rates

3. Rise of commercialized African investor farmers

Annual growth rates in numbers of farms by size category, Zambia, 2001-2015



Number of farms in Zambia by operated farm size category

	numbers of farms					
	0-5 ha	5-10 ha	10-20 ha	20-100 ha	Over 100 ha	All farms
2001	1,032,743	69,063	12,468	2,141	81	1,116,496
2008	1,473,238	77,250	13,650	2,346	69	1,669,861
2012	1,295,293	75,357	18,037	2,595		1,417,992
2015	1,320,354	128,169	27,765	6,791	32	1,512,378
Annual % change	1.99%	6.11%	8.76%	15.51%	-4.36%	2.53%

Number of farms in Zambia by landholding size category

	number of farms					
	0-5 ha	5-10 ha	10-20 ha	20-100 ha	Over 100 ha	all farms
2001	941,801	124,892	36,920	12,470	414	1,116,496
2008	1,399,775	120,311	30,073	13,829	2,565	1,669,861
2012	1,212,482	120,450	45,017	12,650	683	1,417,992
2015	1,153,318	215,945	79,153	31,905	2,789	1,512,378
Annual % change	1.60%	5.21%	8.17%	11.13%	41.04%	2.53%

Sources: Central Statistical Office, Government of Zambia, nationally representative supplemental Post-Harvest Surveys (2001 and 2008) and Rural/Agricultural Livelihoods Surveys (2012 and 2015).

Share of total value of marketed farm output by farm size category, Zambia

	Share of total value of marketed crop + animal product output by operated farm size group (%)					
	0-5 ha	5-10 ha	10-20 ha	20-100 ha	Over 100 ha	Total value of marketed crop produced
2001	74.2	15.0	8.3	2.5	0.06	100.00
2008	62.9	21.9	11.7	3.4	0.05	100.00
2012	60.9	20.5	11.7	2.9		100.00
2015	52.9	22.6	19.6	4.8	0.00	100.00
Annual % change	-2.04%	3.62%	9.78%	6.69%	-6.75%	

Sources: Central Statistical Office, Government of Zambia, nationally representative supplemental Post-Harvest Surveys (2001 and 2008) and Rural/Agricultural Livelihoods Surveys (2012 and 2015).

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RAPID INVESTMENT IN AGRICULTURAL VALUE CHAINS BY AFRICAN ENTREPRENEURS

- **8-fold increase** in the **volumes and value of food marketed** through rural-to-urban value chains **since 2000** (Tschirley et al, 2017)

- Underlying drivers:
  - rapidly rising urban demand
  - high global food prices
  - agricultural sectoral reforms of 1990s

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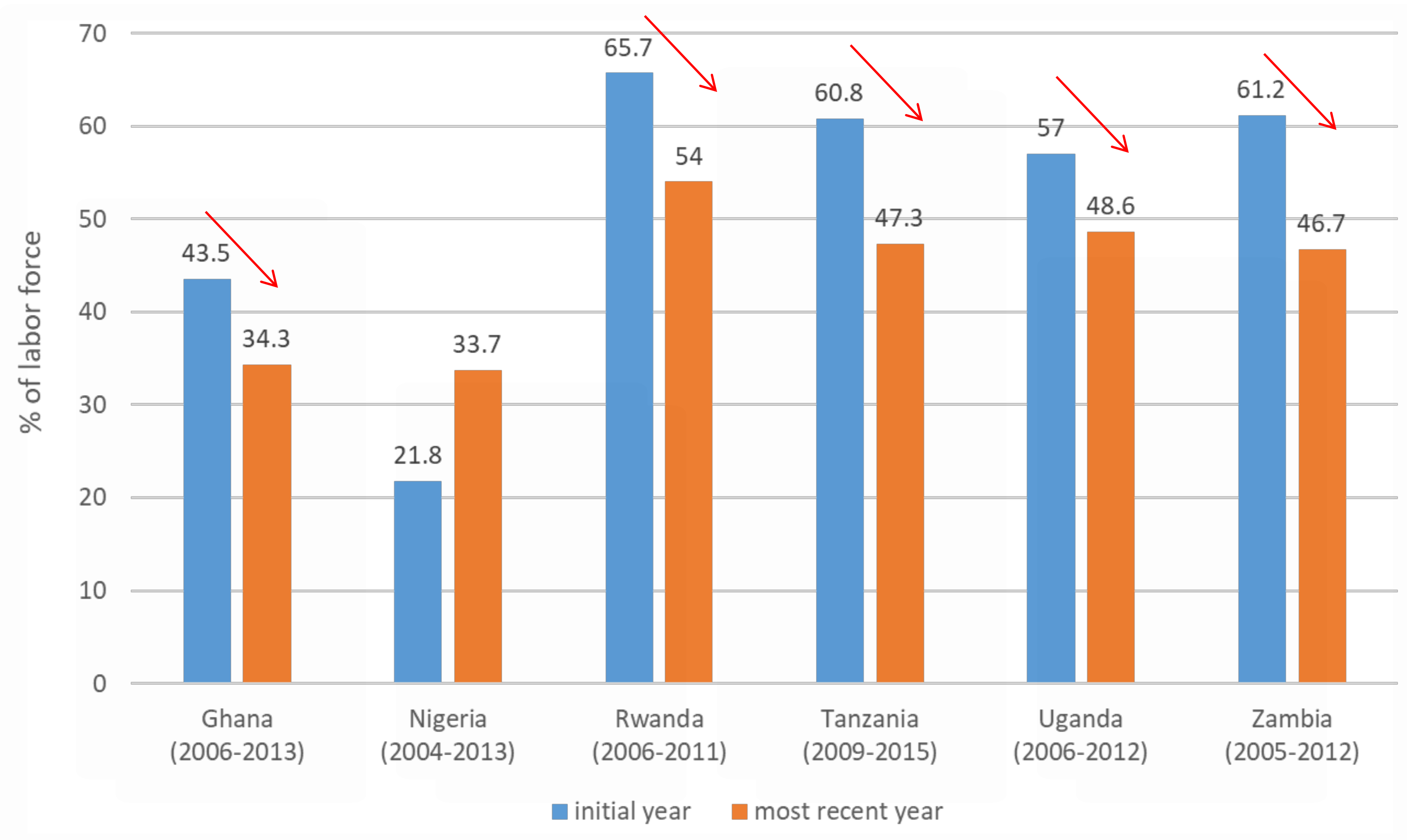
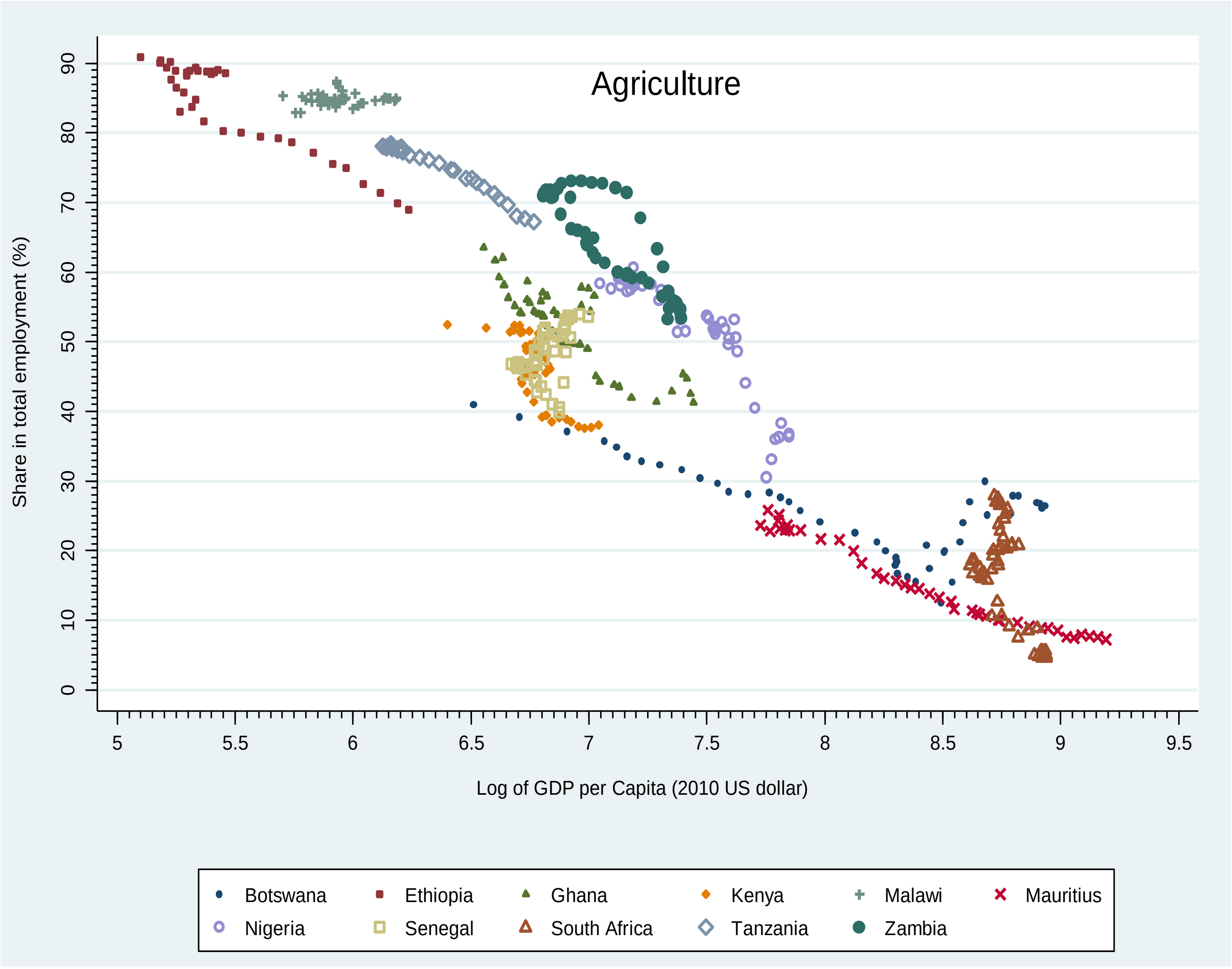
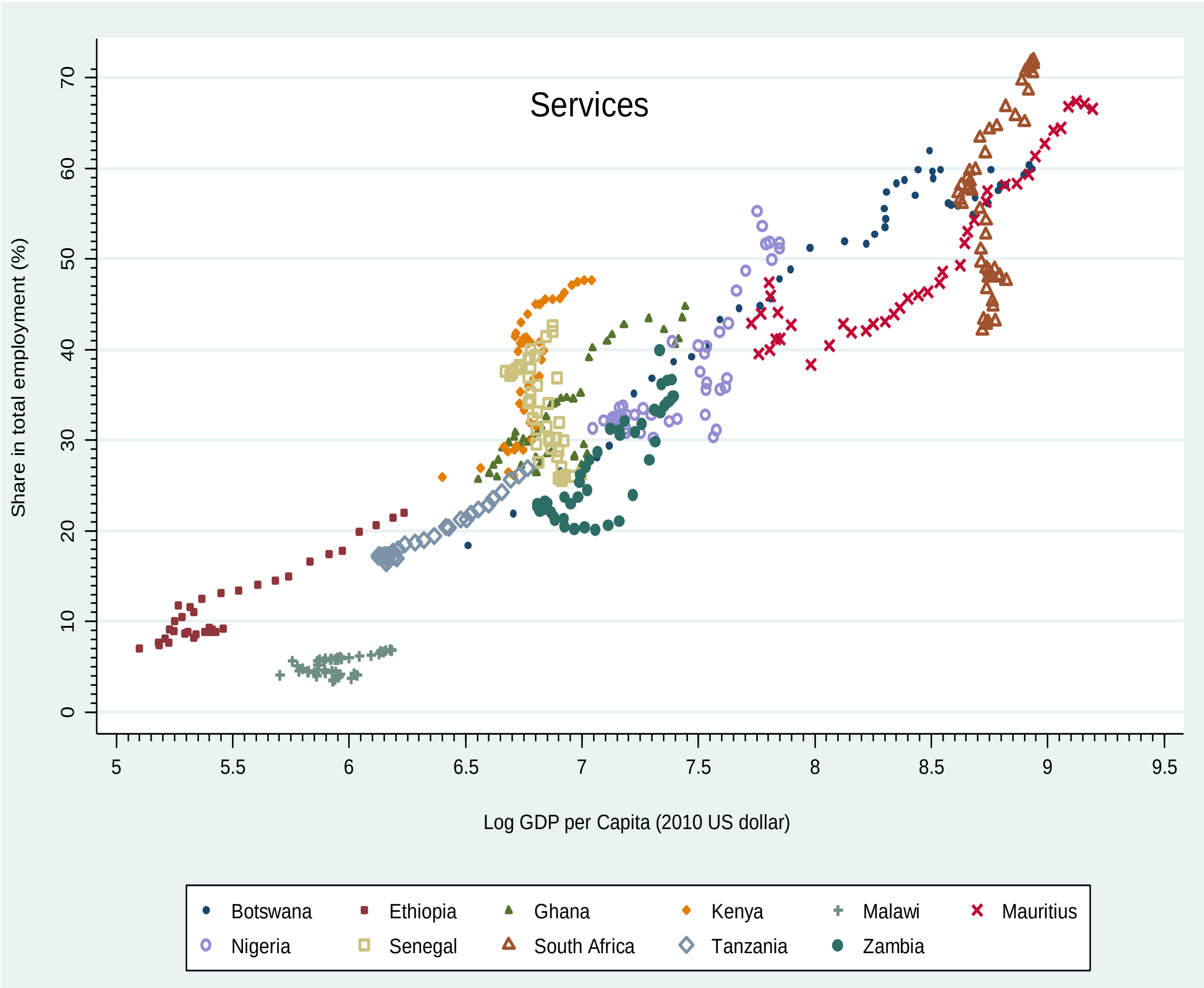
RAPID DECLINE IN SHARE OF LABOR FORCE IN FARMING
(IN FULL-TIME EQUVALENTS)



Source: Yeboah and Jayne (2018)


Agriculture
Share in total employment (%)
0
10
20
30
40
50
60
70
80
90
5
5.5
6
6.5
7
7.5
8
8.5
9
9.5
Log of GDP per Capita (2010 US dollar)
Botswana
Ethiopia
Ghana
Kenya
Malawi
Mauritius
Nigeria
Senegal
South Africa
Tanzania
Zambia


Services
Share in total employment (%)
0
10
20
30
40
50
60
70
5
5.5
6
6.5
7
7.5
8
8.5
9
9.5
Log GDP per Capita (2010 US dollar)
Botswana
Ethiopia
Ghana
Kenya
Malawi
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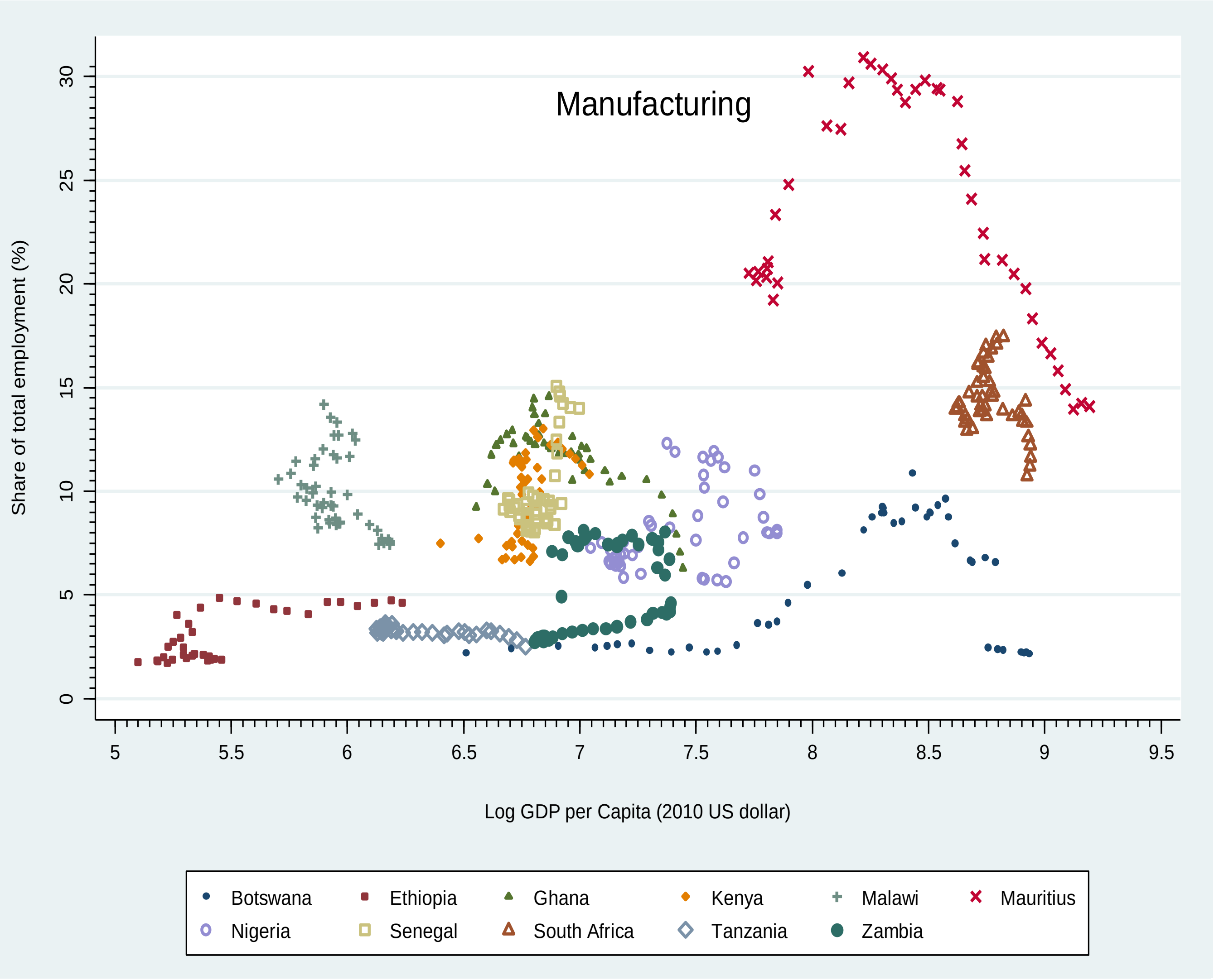
South Africa
Tanzania
Zambia



Manufacturing
Share of total employment (%)
0
5
10
15
20
25
30
5
5.5
6
6.5
7
7.5
8
8.5
9
9.5
Log GDP per Capita (2010 US dollar)
Botswana
Ethiopia
Ghana
Kenya
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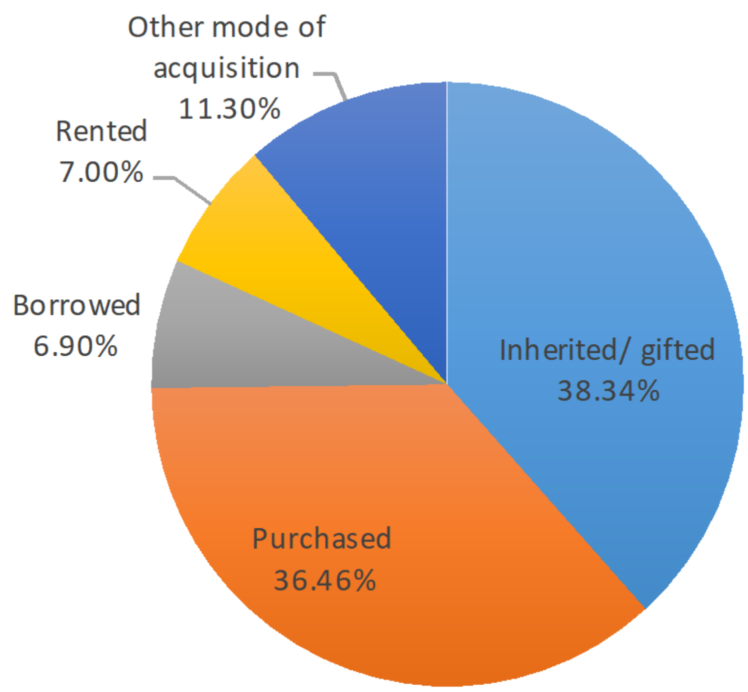
MODE OF ACQUISITION OF ALL FARM PLOTS IN TANZANIA

PERCENT OF PLOTS

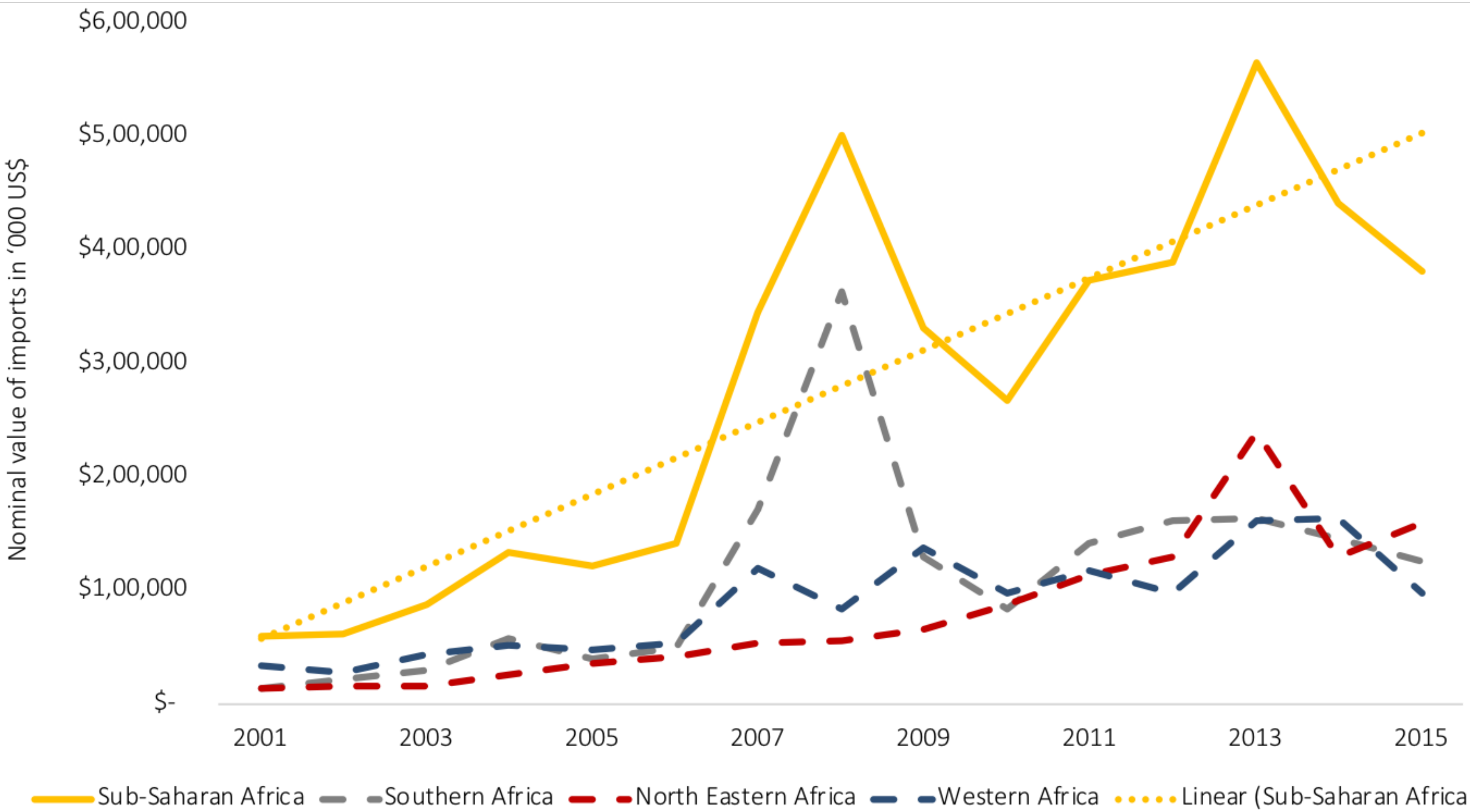
Inherited	33.17%
Gifted	10.33%
Purchased	29.63%
Borrowed	11.09%
Rented	9.63%
Other (squatting / cleared land/ allocated)	6.16%
Observations	4,291

PERCENT OF TOTAL FARMLAND AREA



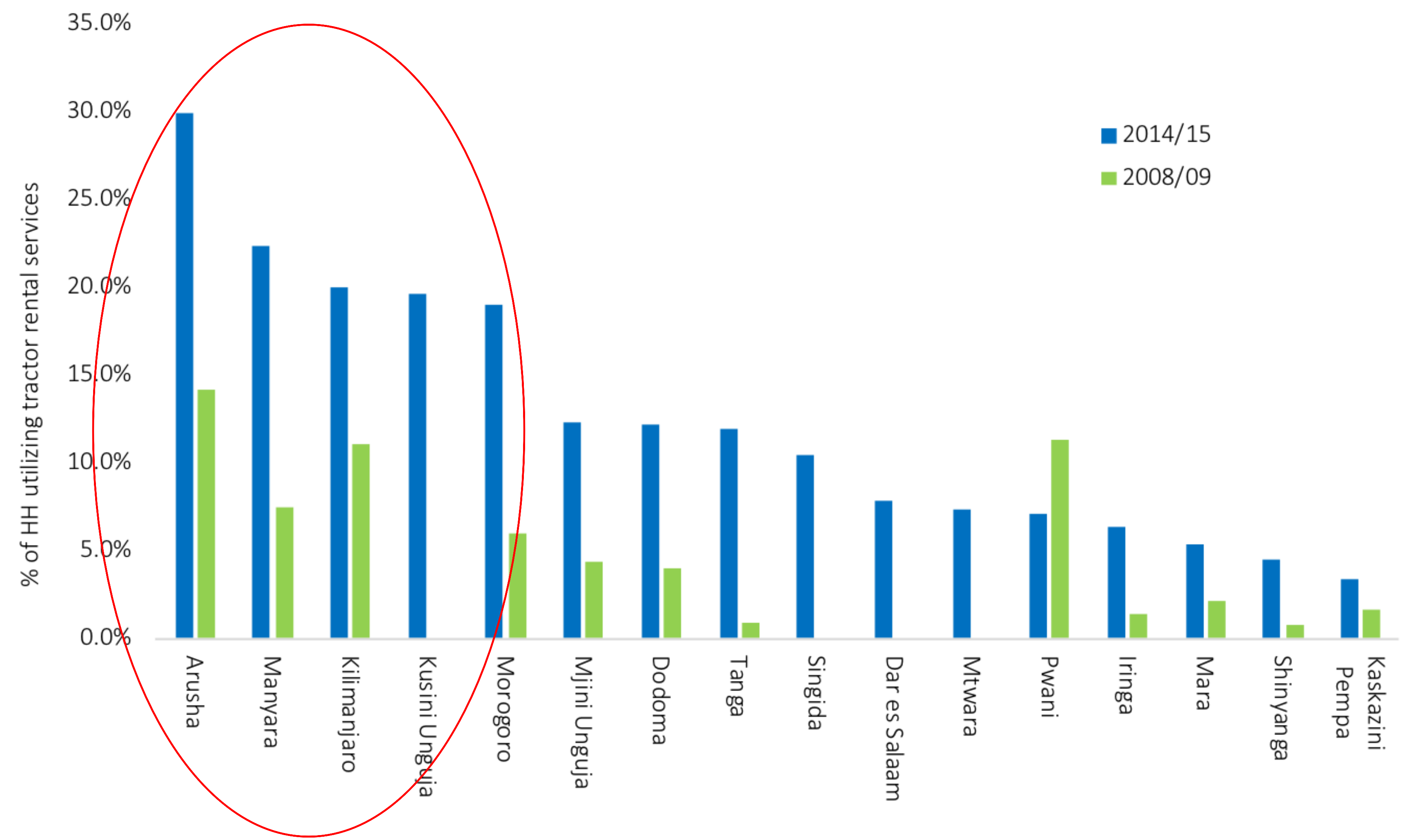
Source: LSMS/National Panel Survey 2014/15

NOMINAL VALUE OF TRACTOR IMPORTS TO SUB-SAHARAN AFRICA (EXCL. SOUTH AFRICA), 2001-2015



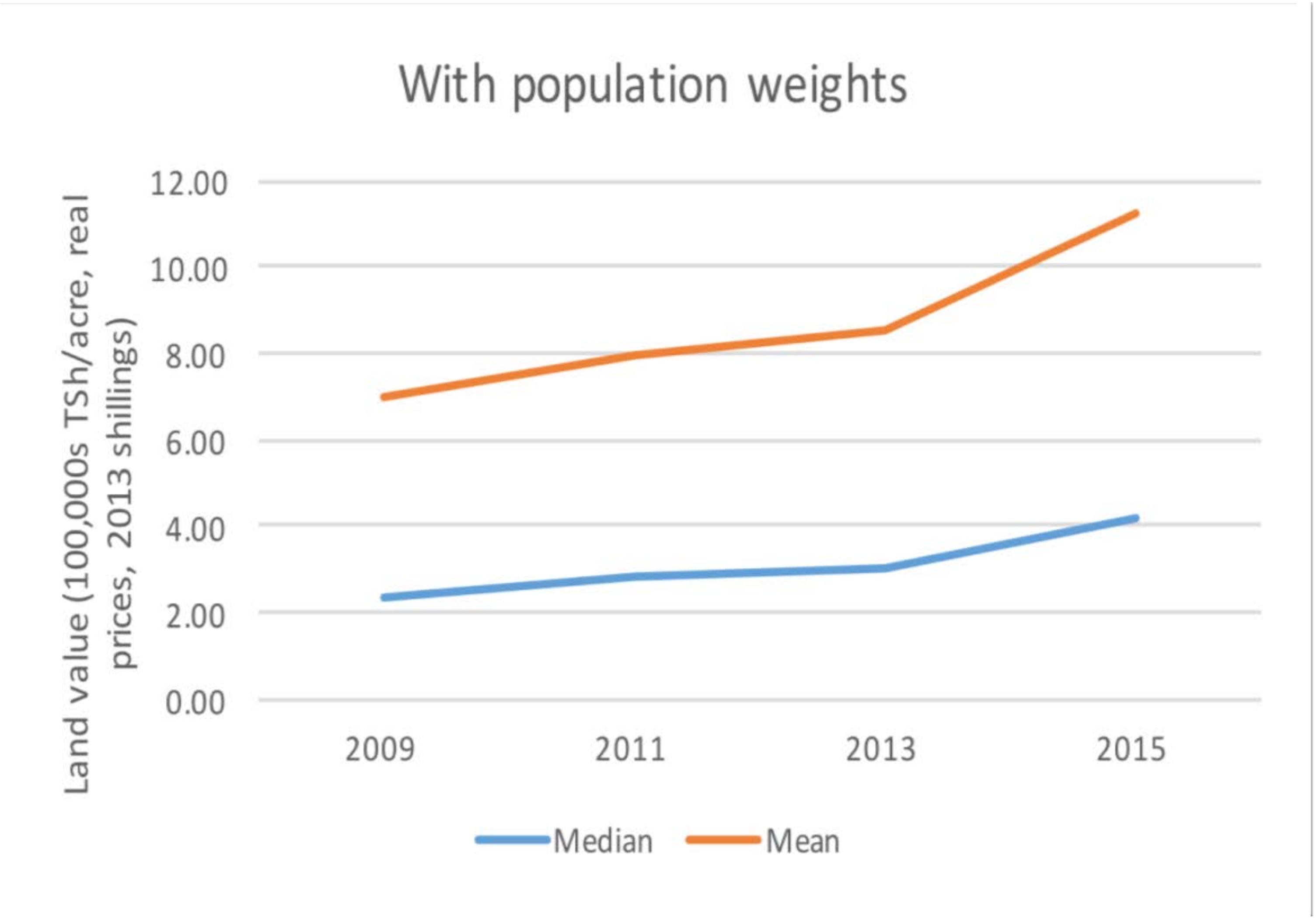
Source: Van der Westhuisen et al, 2018, based on Trade Map database

% OF FARM HOUSEHOLDS RENTING TRACTOR SERVICES IN TANZANIA, 2009 VS 2015



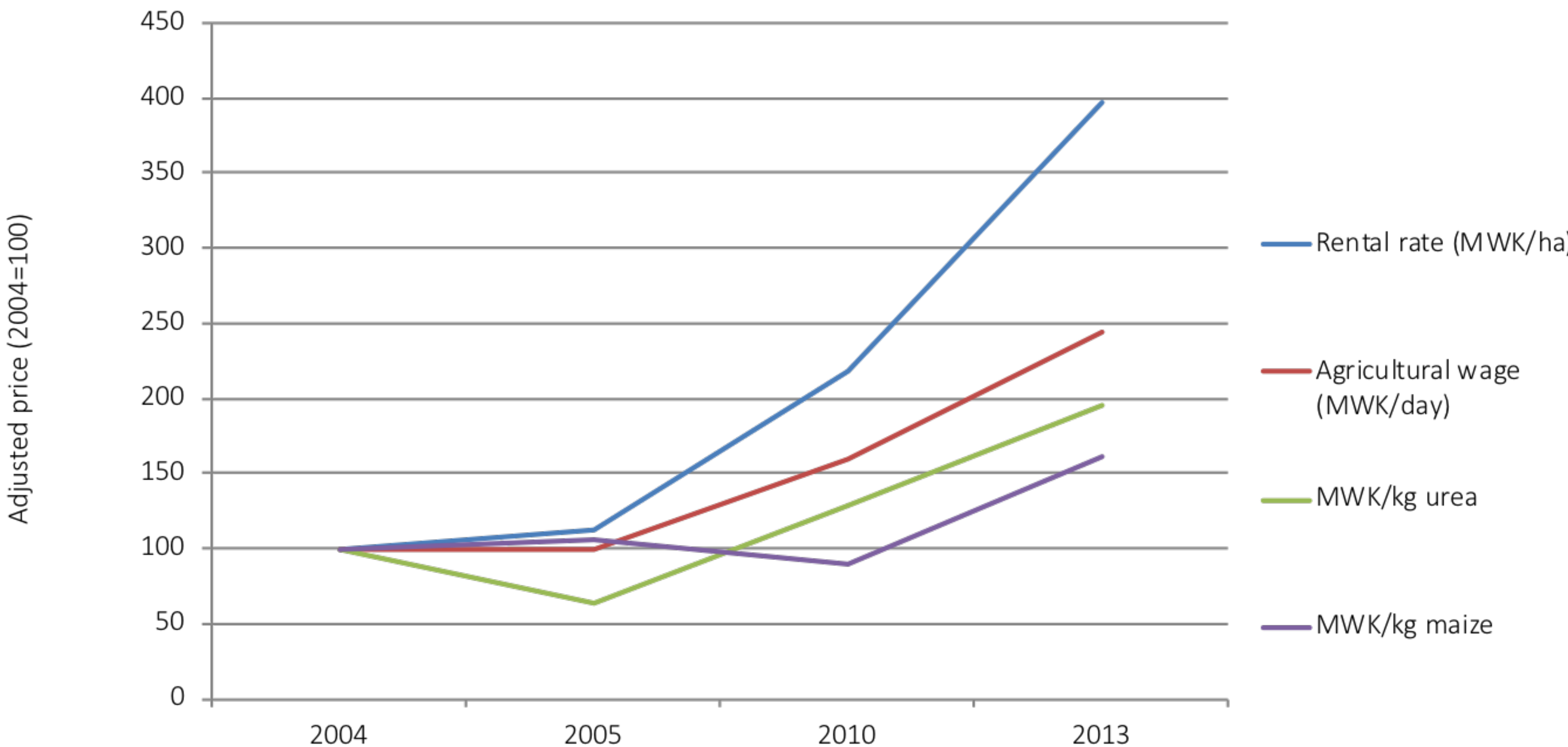
Source: Van der Westhuisen, 2018, based on LSMS/NPS surveys

MEAN LAND PRICES IN TANZANIA : +53.9% IN REAL TERMS IN 6 YEARS



Source: LSMS 2009, 2011, 2013, 2015

OUTPUT AND FACTOR PRICE INDICES, RURAL MALAWI, 2004-2013



Sources: LSMS-ISA and IHS for land and wages; FEWSNET for urea and maize

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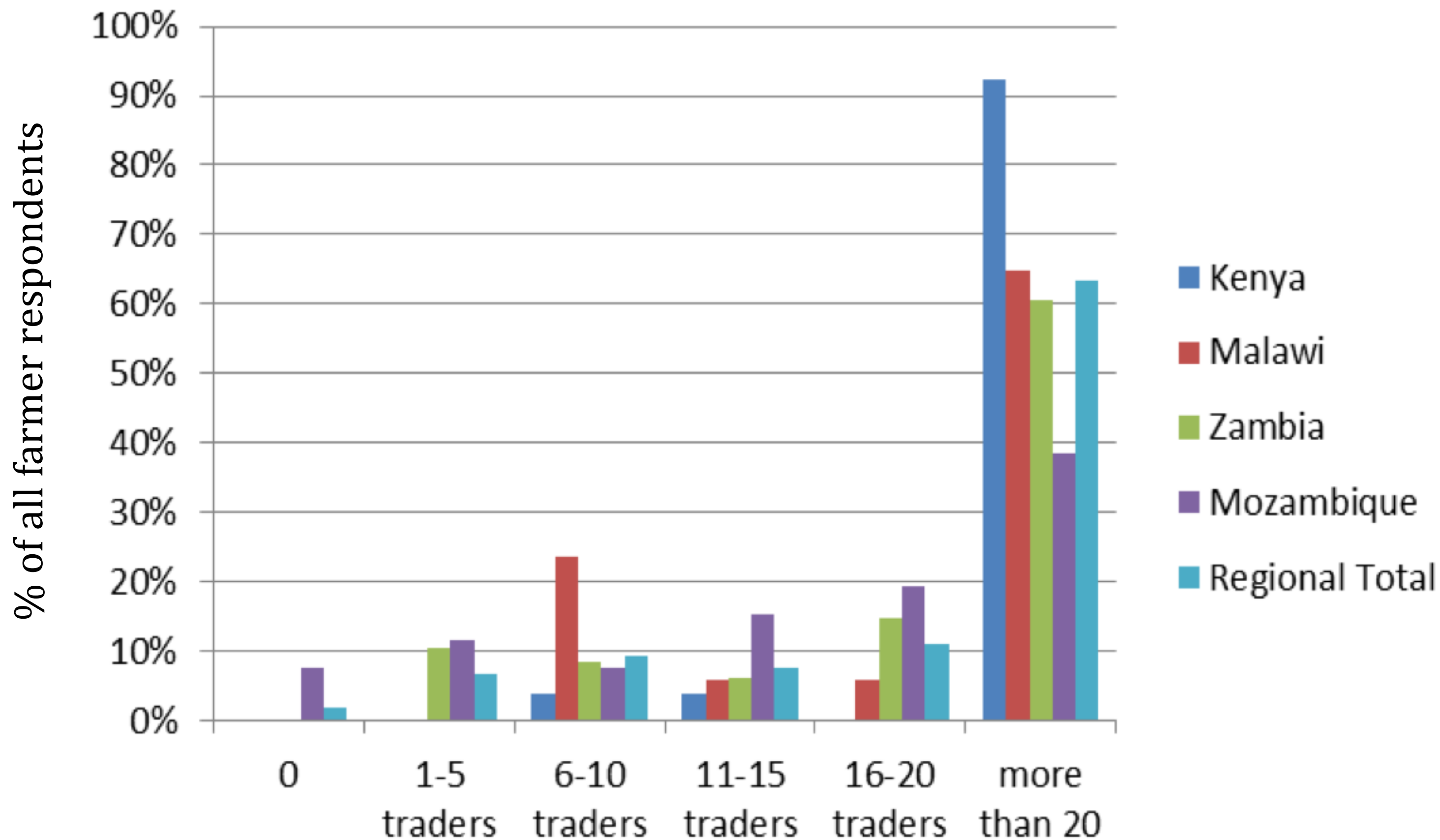
FARMER REPORTED NUMBERS OF TRADERS BUYING MAIZE IN THEIR VILLAGE, 2014

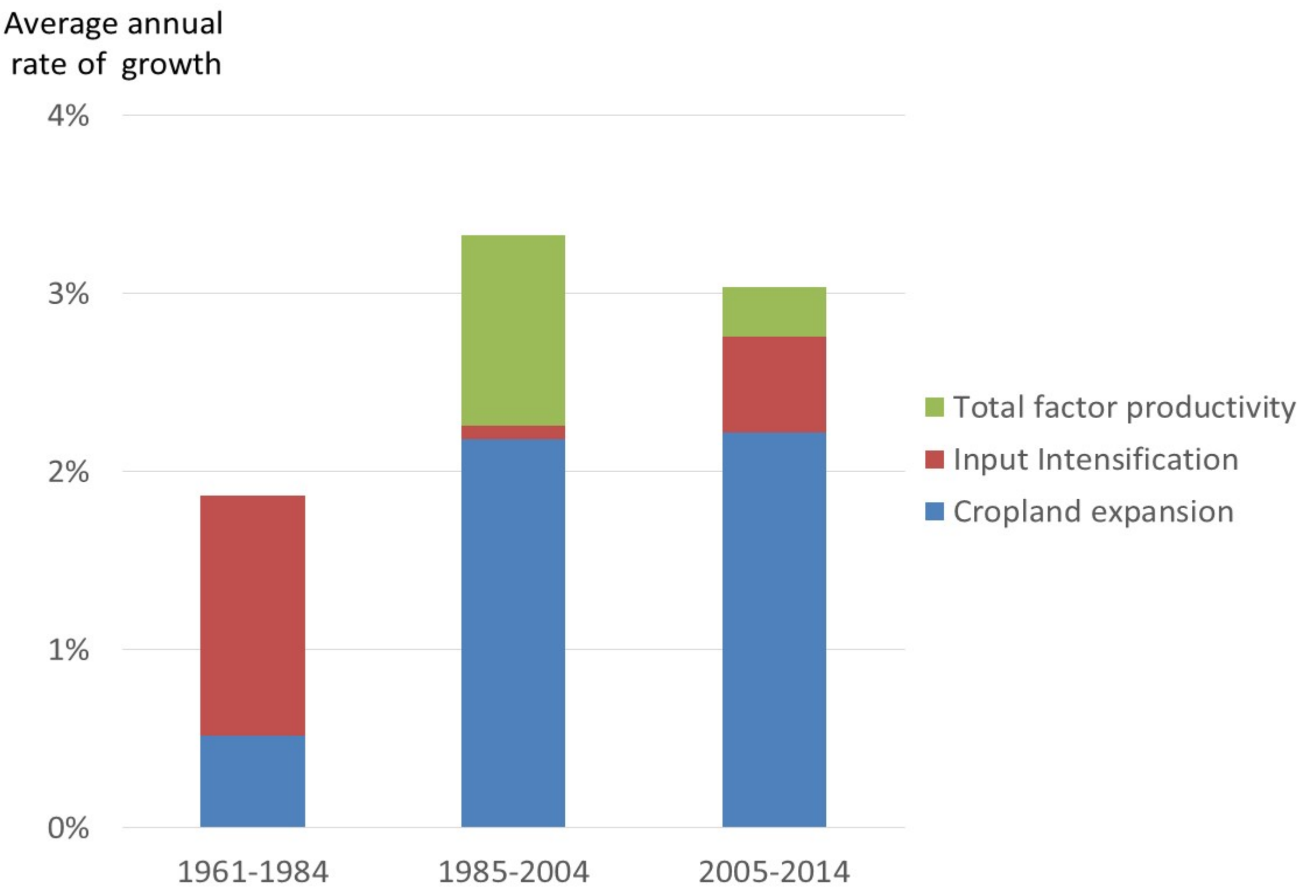


Source: Sitko and Jayne, 2014

MAJOR CHALLENGES TO BE TACKLED

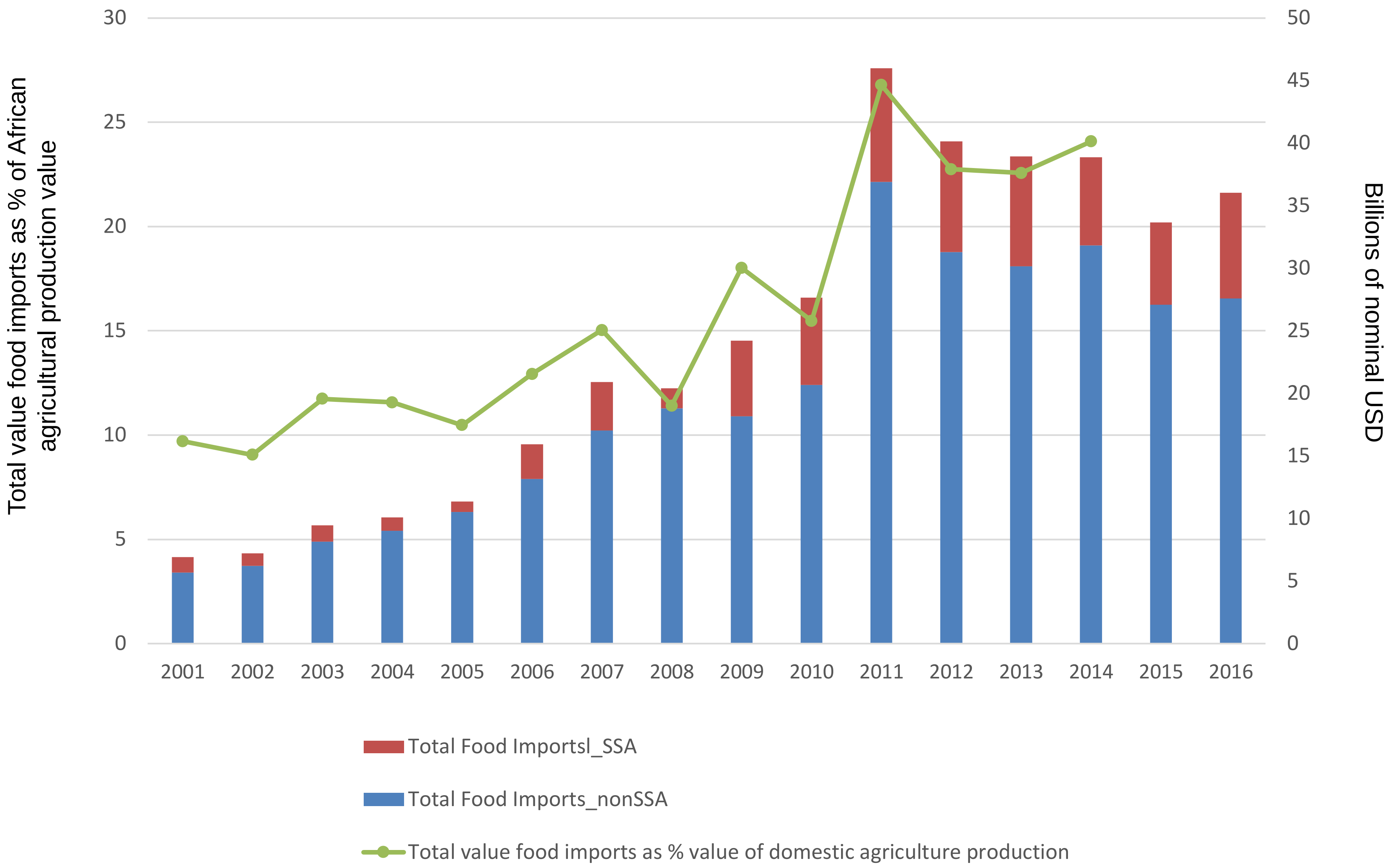
1. Future ag growth needed from higher value per hectare and per laborer, not just area expansion

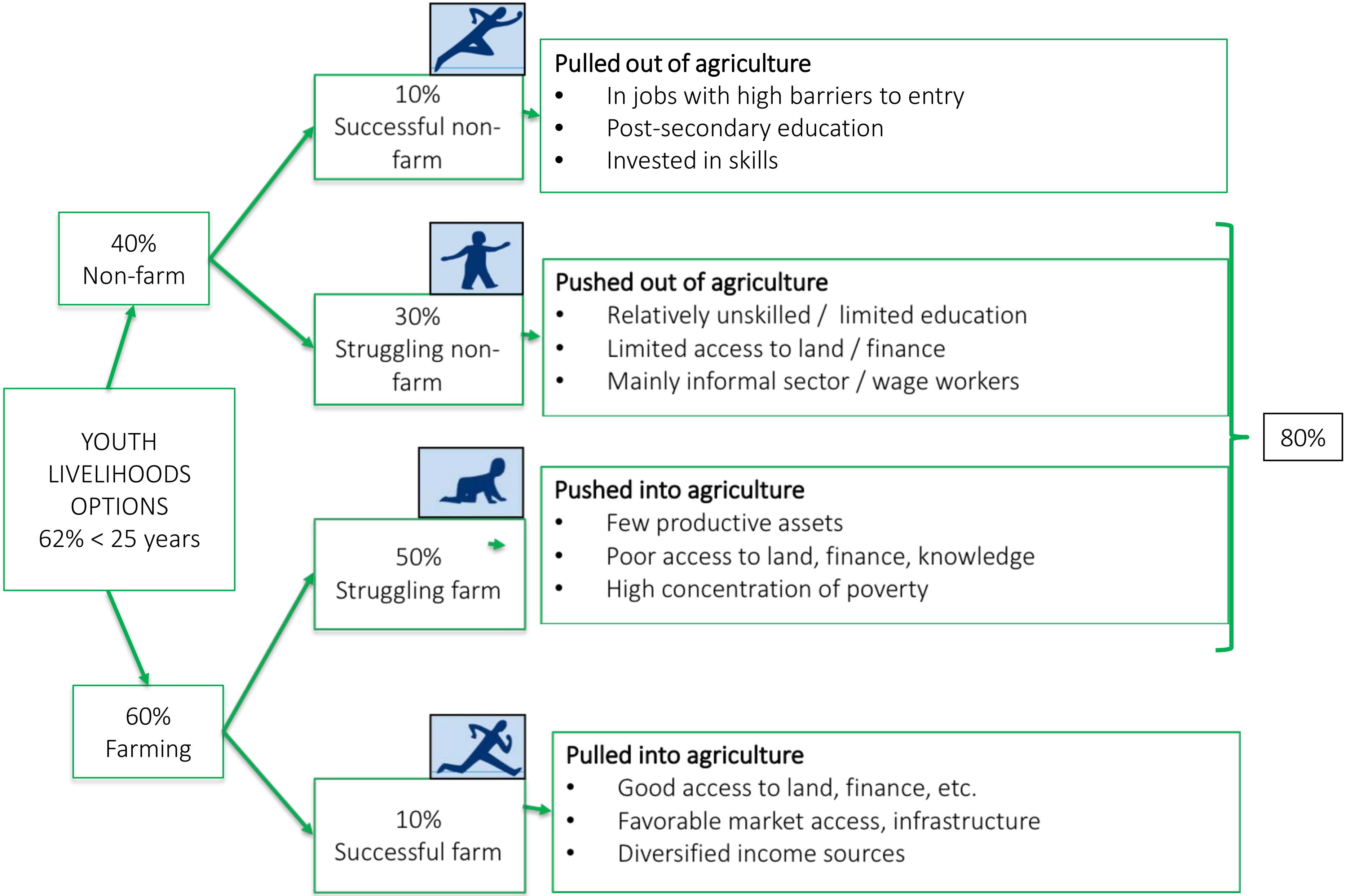
AFRICA'S AGRICULTURAL GROWTH STILL RELIES MAINLY ON CROPLAND EXPANSION, NOT ENOUGH ON PRODUCTIVITY GROWTH



Source: Economic Research Service, https://www.ers.usda.gov/data-products/international-agricultural-productivity/

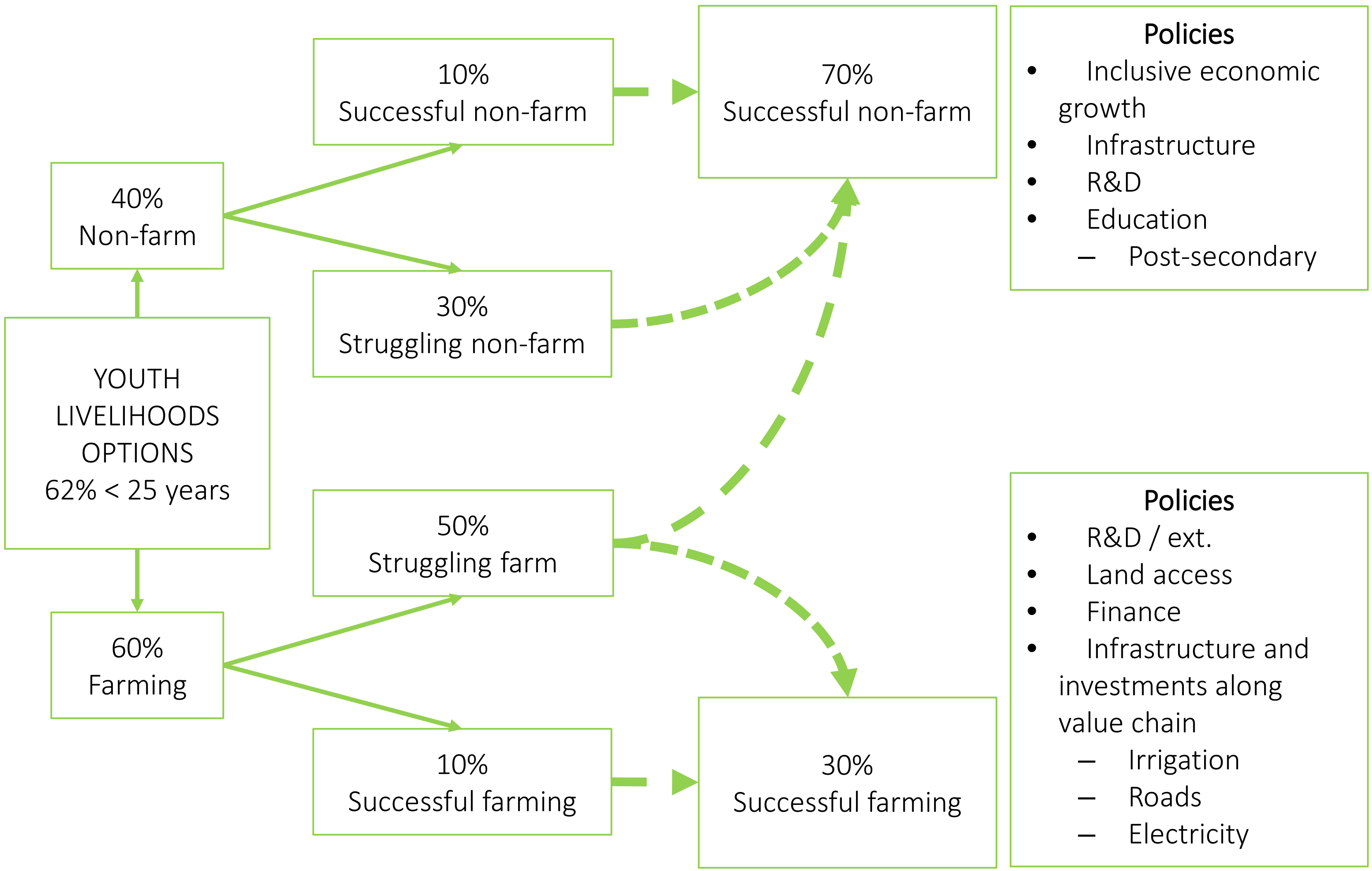
SSA Total Food Imports from 7 to 40 billion USD (2001-2015)
(intra SSA trade from 1 to 10 billion USD)





YOUTH LIVELIHOODS OPTIONS
62% < 25 years
40%
Non-farm
60%
Farming
10%
Successful non-farm
30%
Struggling non-farm
50%
Struggling farm
10%
Successful farm
Pulled out of agriculture
In jobs with high barriers to entry
Post-secondary education
Invested in skills
Pushed out of agriculture
Relatively unskilled / limited education
Limited access to land / finance
Mainly informal sector / wage workers
Pushed into agriculture
Few productive assets
Poor access to land, finance, knowledge
High concentration of poverty
Pulled into agriculture
Good access to land, finance, etc.
Favorable market access, infrastructure
Diversified income sources
80%

STRUCTURAL TRANSFORMATION PATHWAY



A few priority research topics

1. Youth employment – how to manage the transition
2. Is agriculture still the main engine of economic transformation?
   - How can agricultural growth better contribute to poverty reduction?
3. How to improve market access conditions for smallholder farmers
4. How to effectively cope with food supply instability – managing the instability / role of state in staple food markets

A few priority research topics (continued)

5. How to raise output per hectare in sustainable ways – not just relying on area expansion
6. Sustainable intensification
   – how to achieve it in farmers' fields?
   – … in light of changing factor prices? (induced innovation hypothesis)
7. Does sustainability also apply to integrated food-energy-water-land systems?
8. How can smallholders' raise crop response to fertilizer?
9. How can input subsidy programs be made effective?

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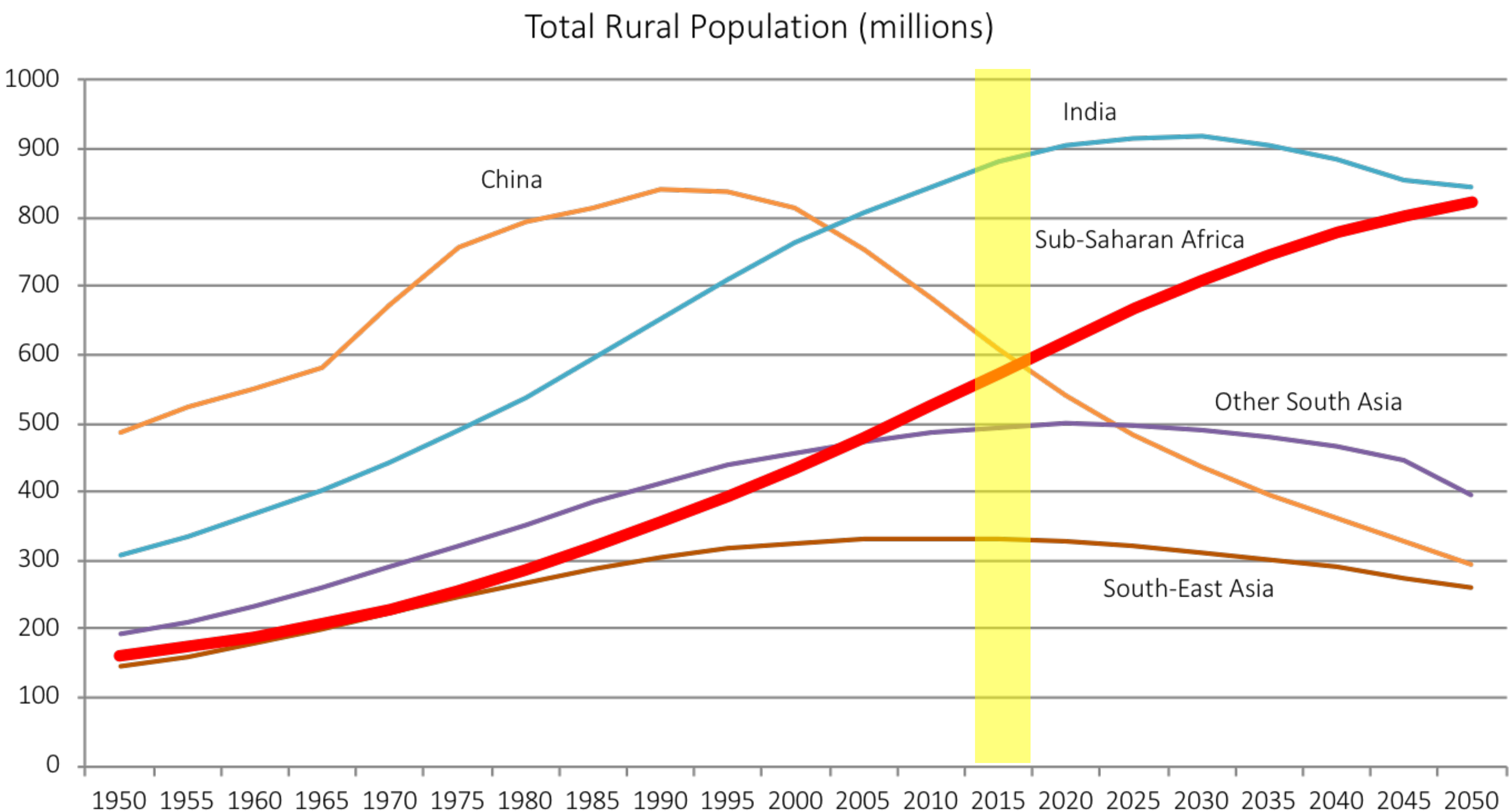
SUB SAHARAN AFRICA : ONLY REGION OF THE WORLD WHERE RURAL POPULATION CONTINUES TO RISE PAST 2050



Source: UN 2013

MAJOR CHALLENGES TO BE TACKLED

1. Future ag growth needed from higher value per hectare and per laborer, not just area expansion

2. Land/soil degradation – will make continued agricultural transformation more difficult unless addressed

   - Proximate causes: low adoption of “climate smart” and “sustainable” land management practices

   - Underlying culprits – ineffective national ag R&D and extension systems

3. The “employment challenge”: each year, roughly 17 million young Africans enter working age

LOOMING EMPLOYMENT CHALLENGE IN SSA