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Agriculture Transformation in Africa and Prospects for the Grain Sector: A case for Tanzania

David Nyange, Milu Muyanga, David Tschirley, Thomas S Jayne
Department of Agricultural, Food and Resource Economics
Michigan State University

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Agriculture Transformation in Africa and Prospects for the Grain Sector in Tanzania

- Why is agriculture and rural transformation receiving much attention in recent years?
- What is agriculture transformation?
- Is transformation really happening in Africa?
 - Drivers of transformation
- Evidence of transformation – upstream and downstream value chains
- The prospects for grain sector during transformation
- Policy implications for inclusive growth



Why Agriculture and Rural Transformation in Africa Are Receiving Much Attention Recently

- Reports by IFAD (2016), IFPRI, MSU, etc.
- Rapid economic growth during the last two decades but poverty level has remained high in some countries
- Evidence confirms that most of the African countries that registered high level of structural and economic transformation over the last two decades managed to cut poverty faster than slow transforming countries (IFAD, 2016)



What is Agriculture Transformation

- Is the process by which individual farms shift from highly diversified, subsistence-oriented production, towards highly specialized, market-oriented system.
- Increased integration of agriculture with other sectors in the domestic and international markets.
- Is part of a broader process of structural transformation, in which increasing proportion of output and employment are generated by sectors other than agriculture.



Is Agriculture Transformation Really Happening in Africa?

- There is a compelling evidence that structural and agriculture transformation is beginning to take root in Africa
- Caveat – there is paucity of data and fragmented information.
- However, case studies indicate that “Africa’s rural is transforming deeply and quickly” (IFAD)
- Macro-level: Evidence of declining share of agriculture labor force
- Shift in consumption pattern from basic staples towards high value/processed foods such as horticultural and livestock products

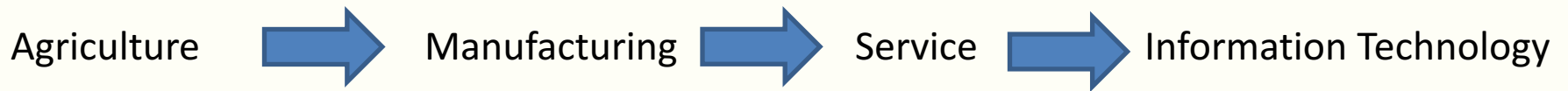


What is Driving Transformation

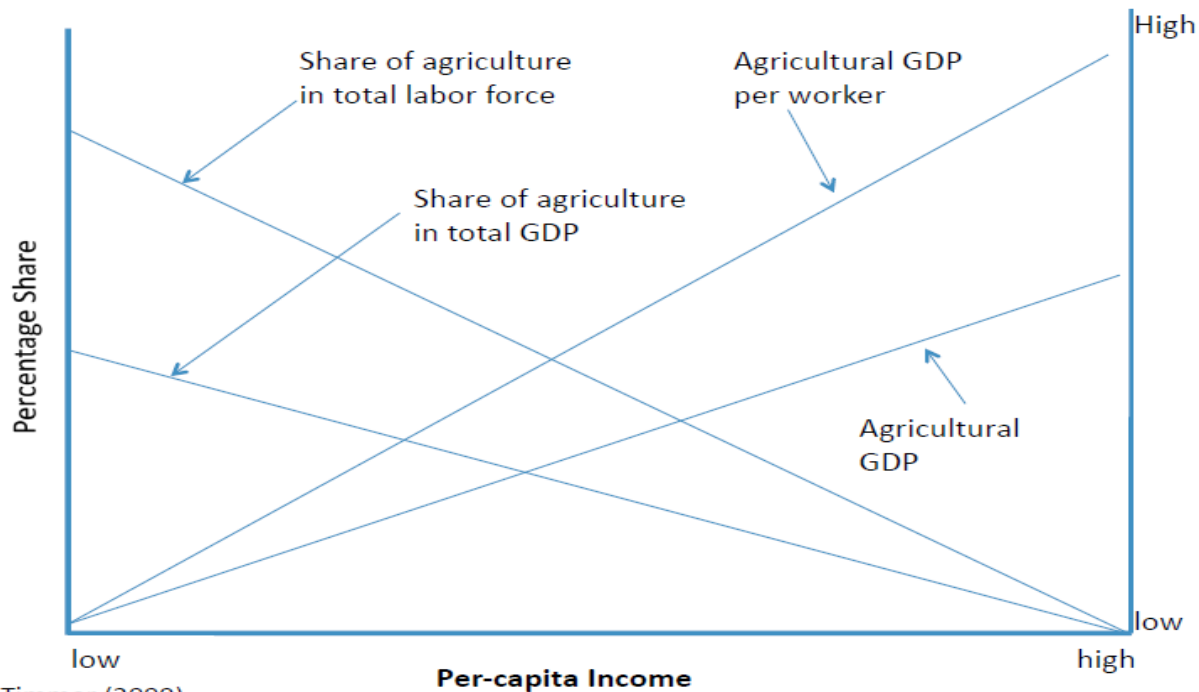
- Rising food demand and prices
 - Population explosion
 - Changing demographics
 - Rising incomes – emerging middle income class
- Rapid urbanization
- Other factors
 - Availability of productivity enhancing technologies
 - Climate change
 - Regional and international market integration



The Theory of Ag Sector Transformation



AGRICULTURE IN THE ECONOMIC TRANSFORMATION PROCESS



Based on Timmer (2009)

Ag Transformation Upstream the Value chain East and Southern Africa (Jayne, TS, Muyanga, M, et al)

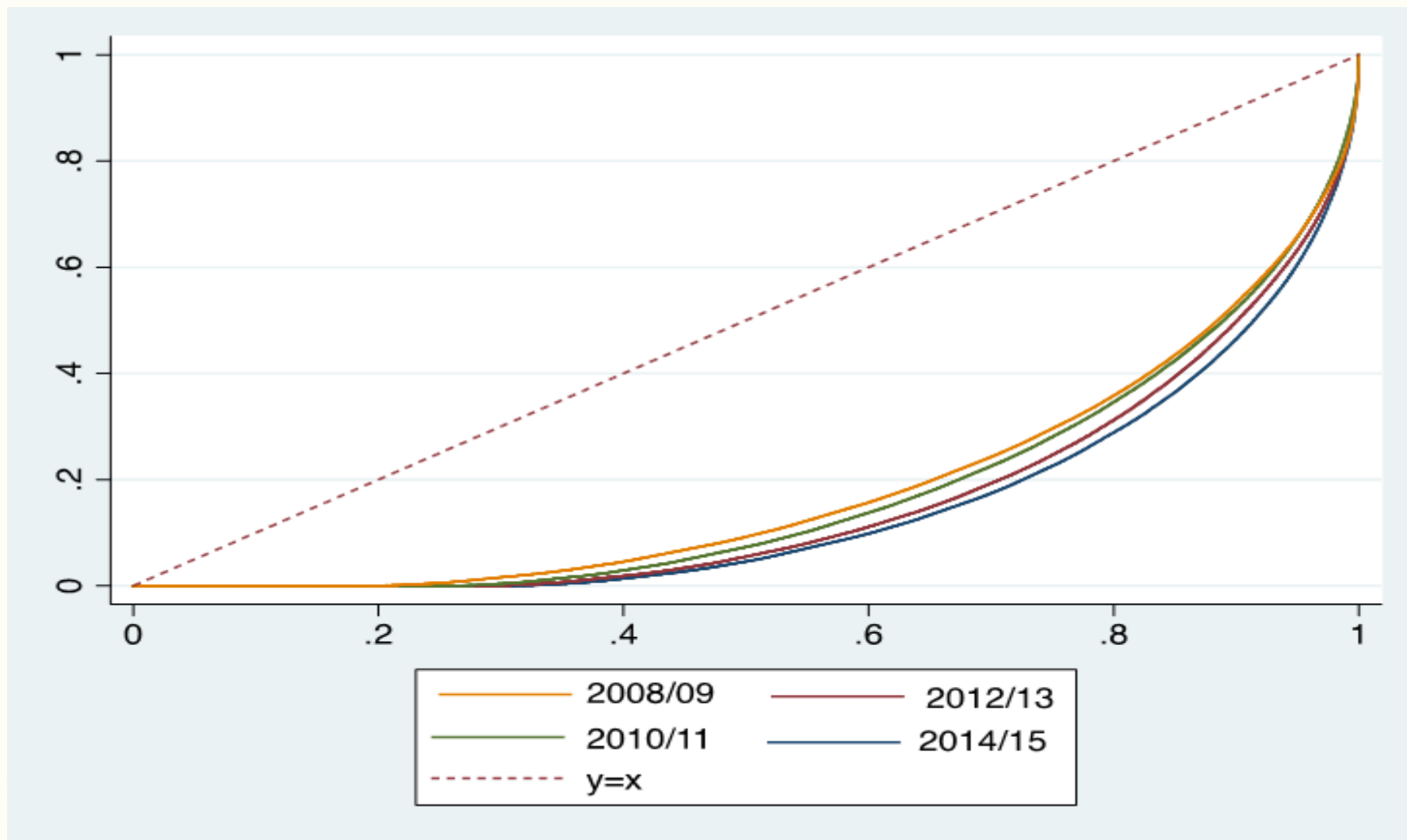


Changes in farm structure in Tanzania (2008-2012), LSMS/National Panel Surveys

Farm size	Number of farms (% of total)		% growth in number of farms between initial and latest year	% of total operated land on farms between 0-100 ha	
	2008	2012		2008	2012
0 – 5 ha	5,454,961 (92.8)	6,151,035 (91.4)	12.8	62.4	56.3
5 – 10 ha	300,511 (5.1)	406,947 (6.0)	35.4	15.9	18.0
10 – 20 ha	77,668 (1.3)	109,960 (1.6)	41.6	7.9	9.7
20 – 100 ha	45,700 (0.7)	64,588 (0.9)	41.3	13.8	16.0
Total	5,878,840 (100%)	6,732,530 (100%)	14.5	100.0	100.0

43.7%

Gini coefficient on land held by households in Tanzania (NPS)



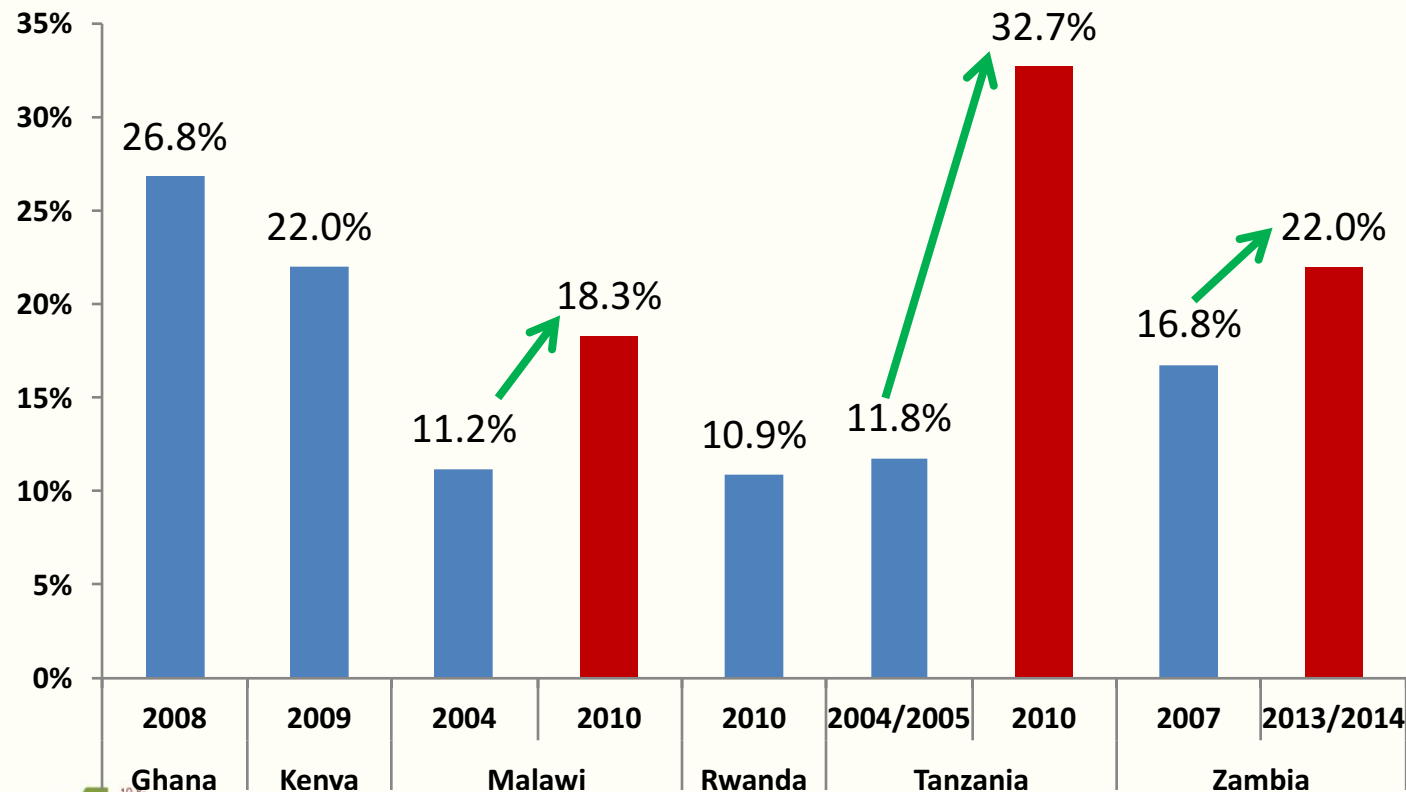
Changes in farm size distributions: Summary

1. Number of small farms growing slowly
2. Number of medium-scale farms growing rapidly
3. Share of area under small farms declining
4. Share of area under medium-scale growing, and currently over 40% of farm holdings (> 30% of cultivated area)

Who are these medium-scale farmers?

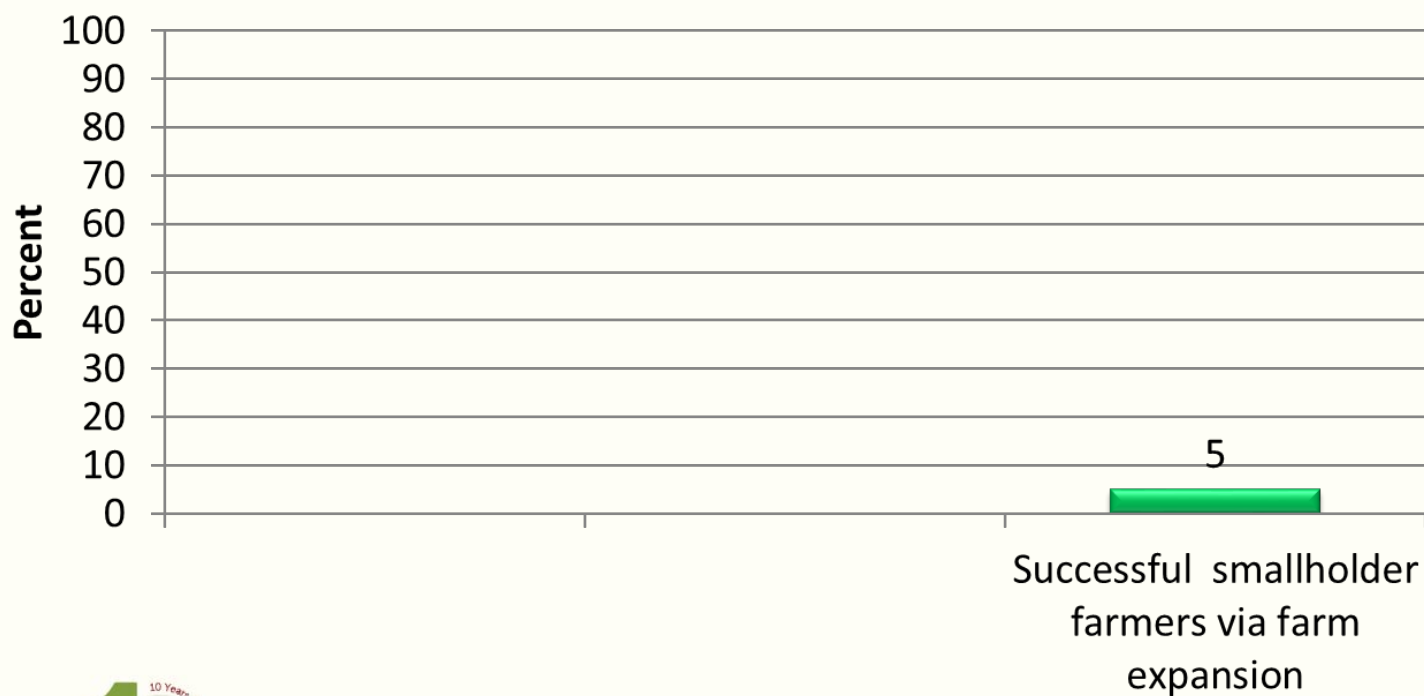


% of National Landholdings held by Urban Households



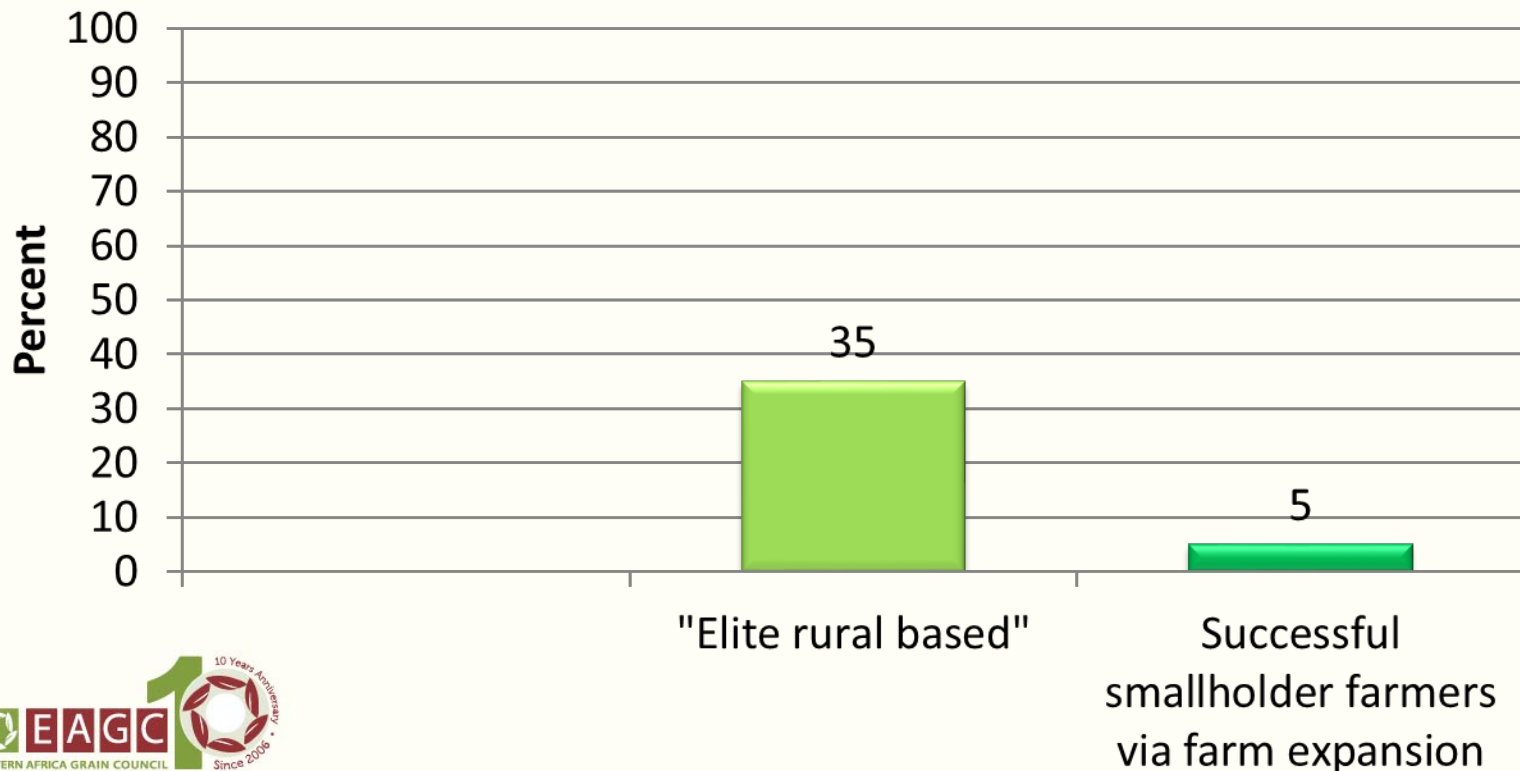
Rise of the medium-scale farmers

Three sub-categories of medium scale farmers (Kenya, Zambia, Ghana)



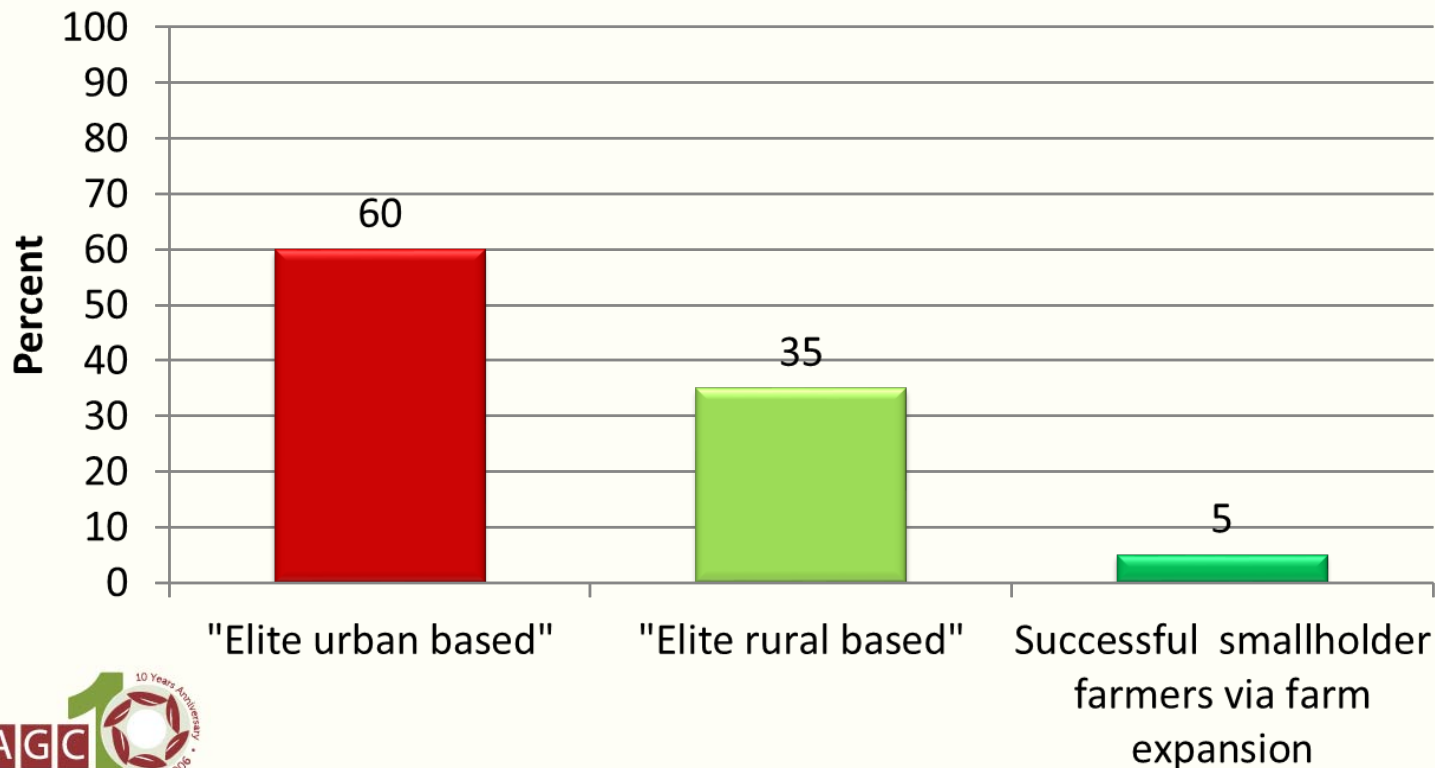
Rise of the medium-scale farmers

Three sub-categories of medium scale farmers: Kenya, Zambia, Ghana



Rise of the medium-scale farmers

Three sub-categories of medium scale farmers: Kenya, Zambia, Ghana



Type 1: Urban-based investor farmer

	Mode of entry to medium-scale farming status: acquire farm using non-farm income	
	Zambia	Kenya
	(n=164)	(n=180)
% of cases	58	60
% men	91.4	80
Year of birth	1960	1947
Years of education of head	11	12.7
Have held a job other than farmer (%)	100	83.3
Formerly /currently employed by the public sector (%)	59.6	56.7
Current landholding size (ha)	74.9	50.1
% of land currently under cultivation	24.7	46.6
Decade when land was acquired		
1969 or earlier	1.1	6
1970-79	5.1	18
1980-89	7.4	20
1990-99	23.8	32
2000 or later	63.4	25

Type 2: Rural-based 'elite' farmer

	Mode of entry into medium-scale farming status: expansion of rural elite	
	Zambia	Kenya
	(n=118)	(n=120)
% of cases	42	40
% men	92.9	82.5
Year of birth	1966	1945
Years of education of head	8.2	7.5
Have held a job other than as a farmer (%)	32.9	17.5
Landholding size when operator started own household (ha)	10.7	16.2
Current landholding size (ha)	38.2	32.7
% of land currently under cultivation	46.9	54.1
Decade when land was acquired		
1969 or earlier	3.9	29
1970-79	6.7	24
1980-89	14.8	20
1990-99	32.2	18
2000 or later	42.0	9

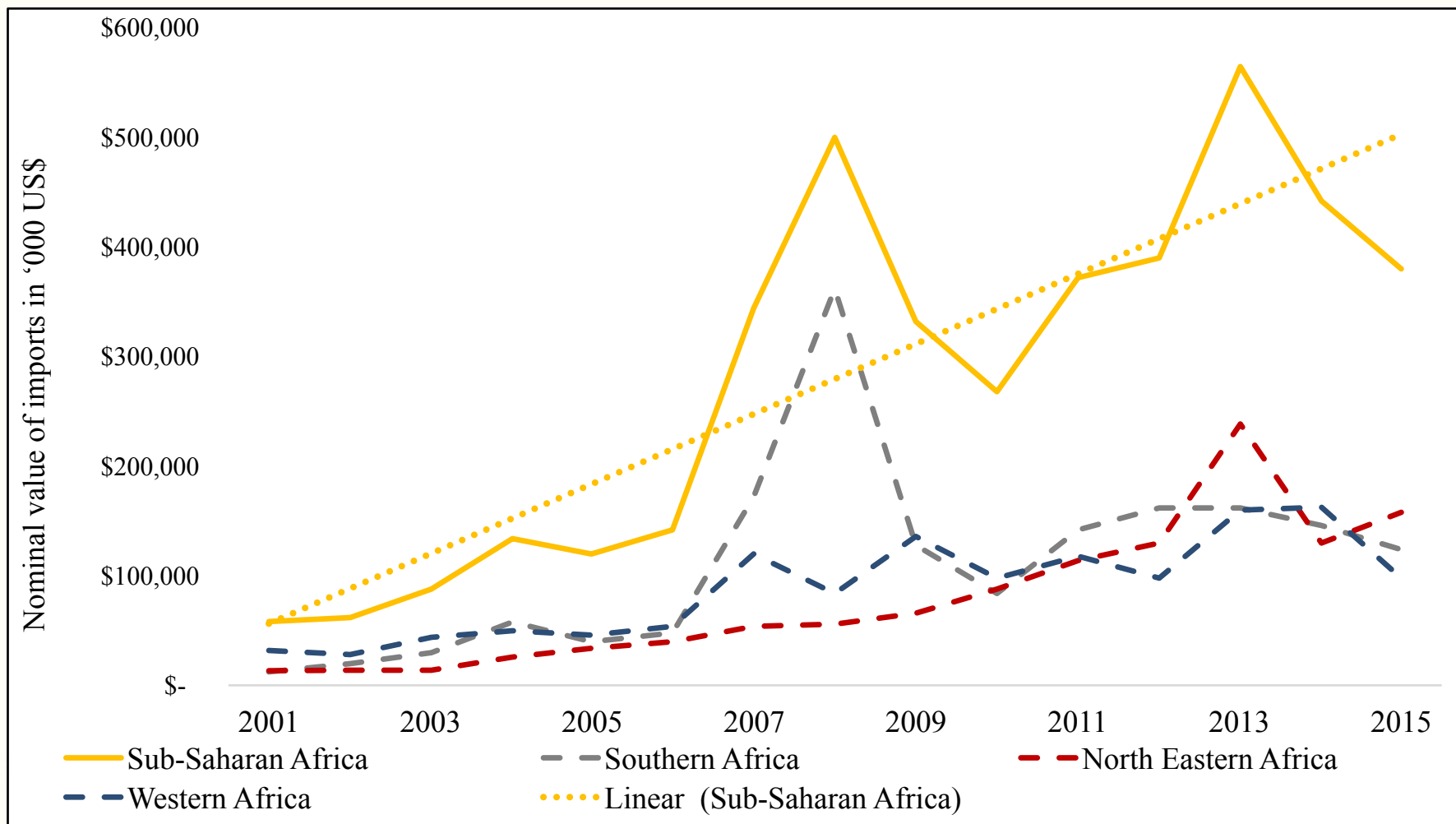
Consequences of changing farm size distributions



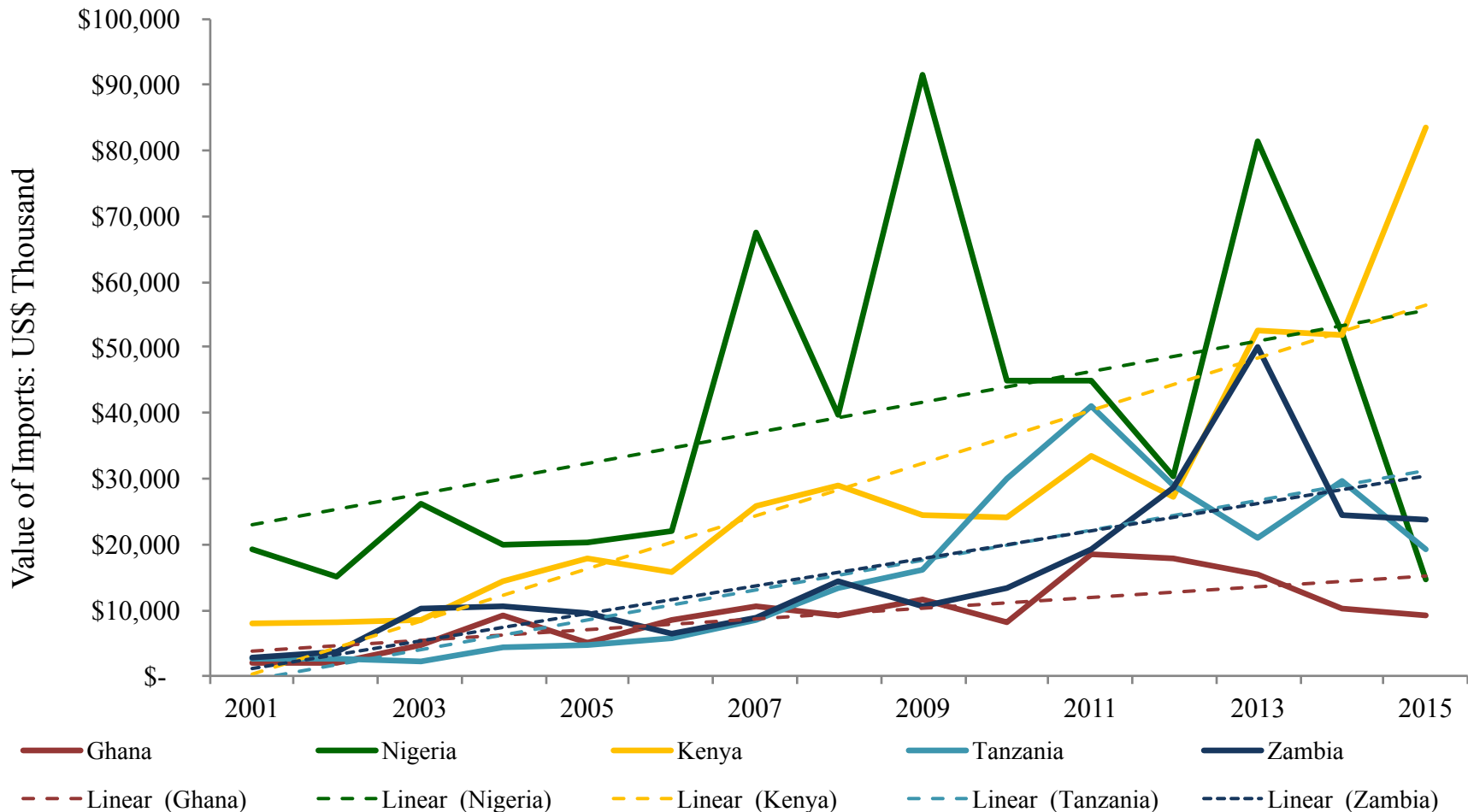
Consequences of changing farm size distributions

1. Rising use of mechanization
2. More capital using / labor-saving forms of agricultural production
3. Arable land less fully utilized, but better land mgt
4. Some displacement
5. Rising land prices → straining youth access to land
6. Multiplier effects of ag growth are changing
7. Govts less able to accurately estimate ag production

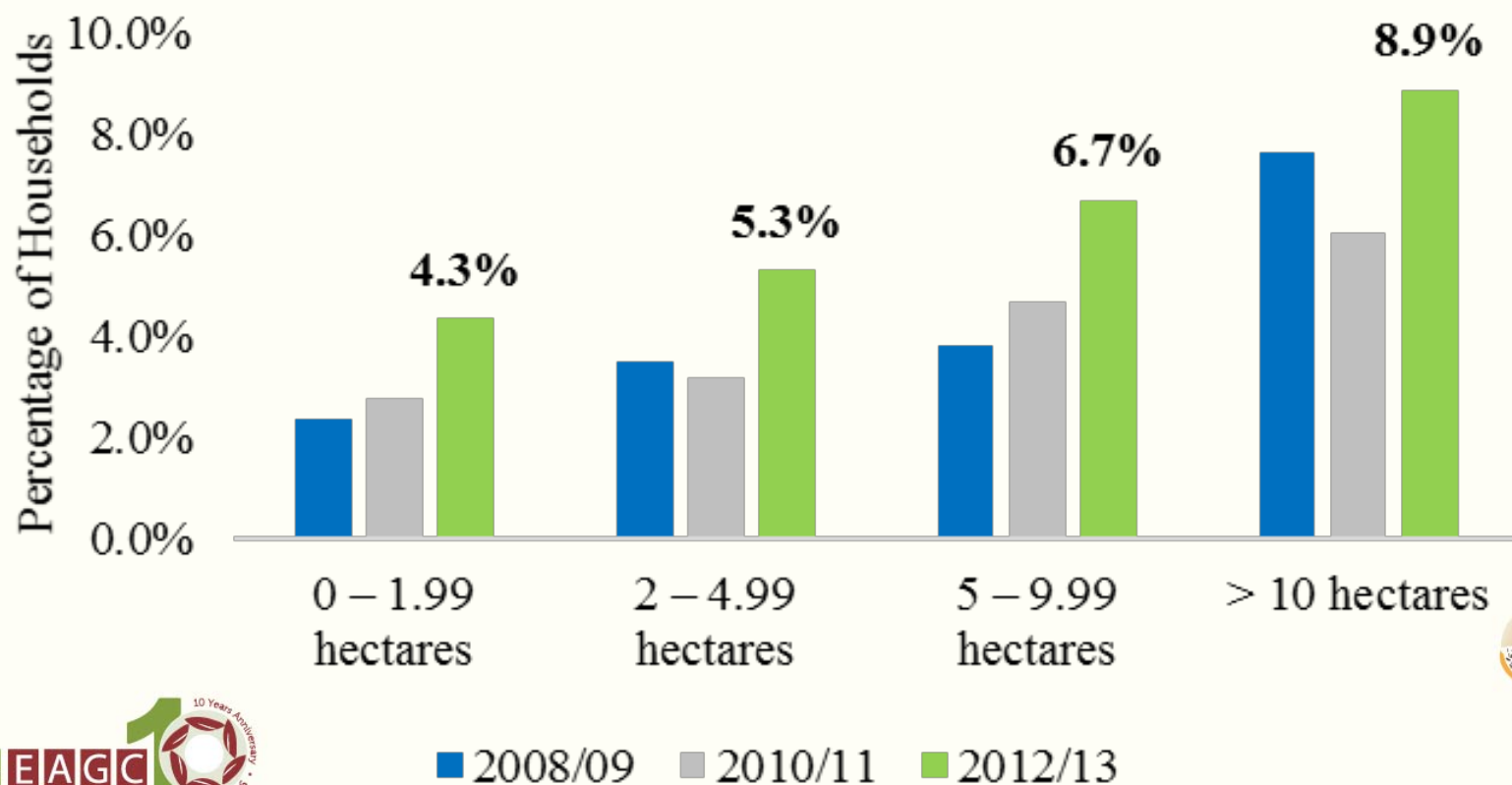
Nominal value of tractor imports to Sub-Saharan Africa (excluding South Africa), 2001-2015



Nominal value of tractor imports in selective Sub-Saharan African countries (2001-2015)



% of farm households utilizing tractors services (NPS data)

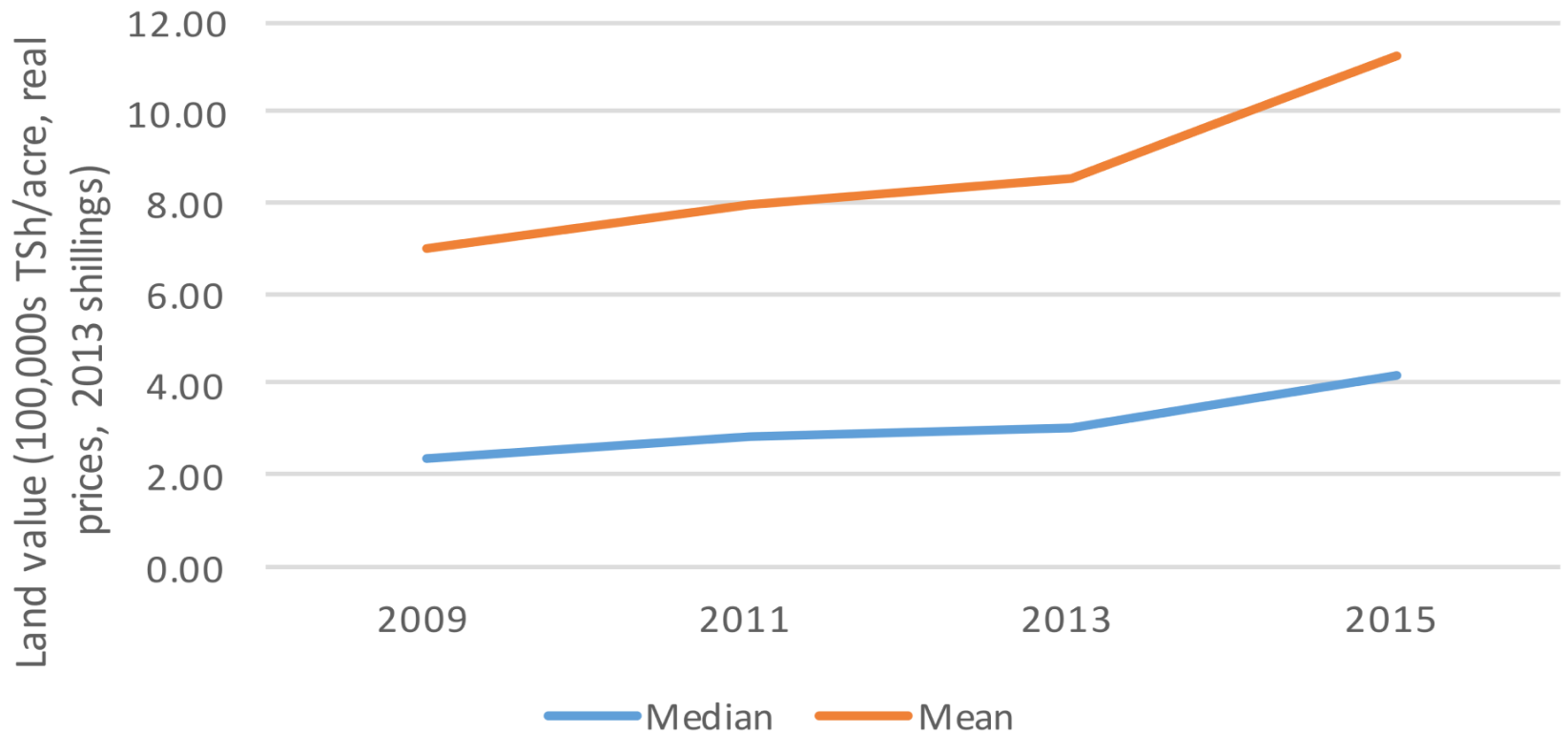


GINI coefficients in farm landholding

	Period	Movement in Gini coefficient:
Ghana (cult. area) (GLSS)	1992 → 2013	0.54 → 0.70
Kenya (cult. area) (KIHBS)	1994 → 2006	0.51 → 0.55
Tanzania (landholdings) (LSMS)	2008 → 2012	0.63 → 0.69
Tanzania (area controlled) (ASCS)	2008	0.89
Zambia (landholding) (CFS)	2001 → 2012	0.42 → 0.49

Prices have continued to rise up to 2015...

With population weights



Hypothesized correlates of land values in Tanzania

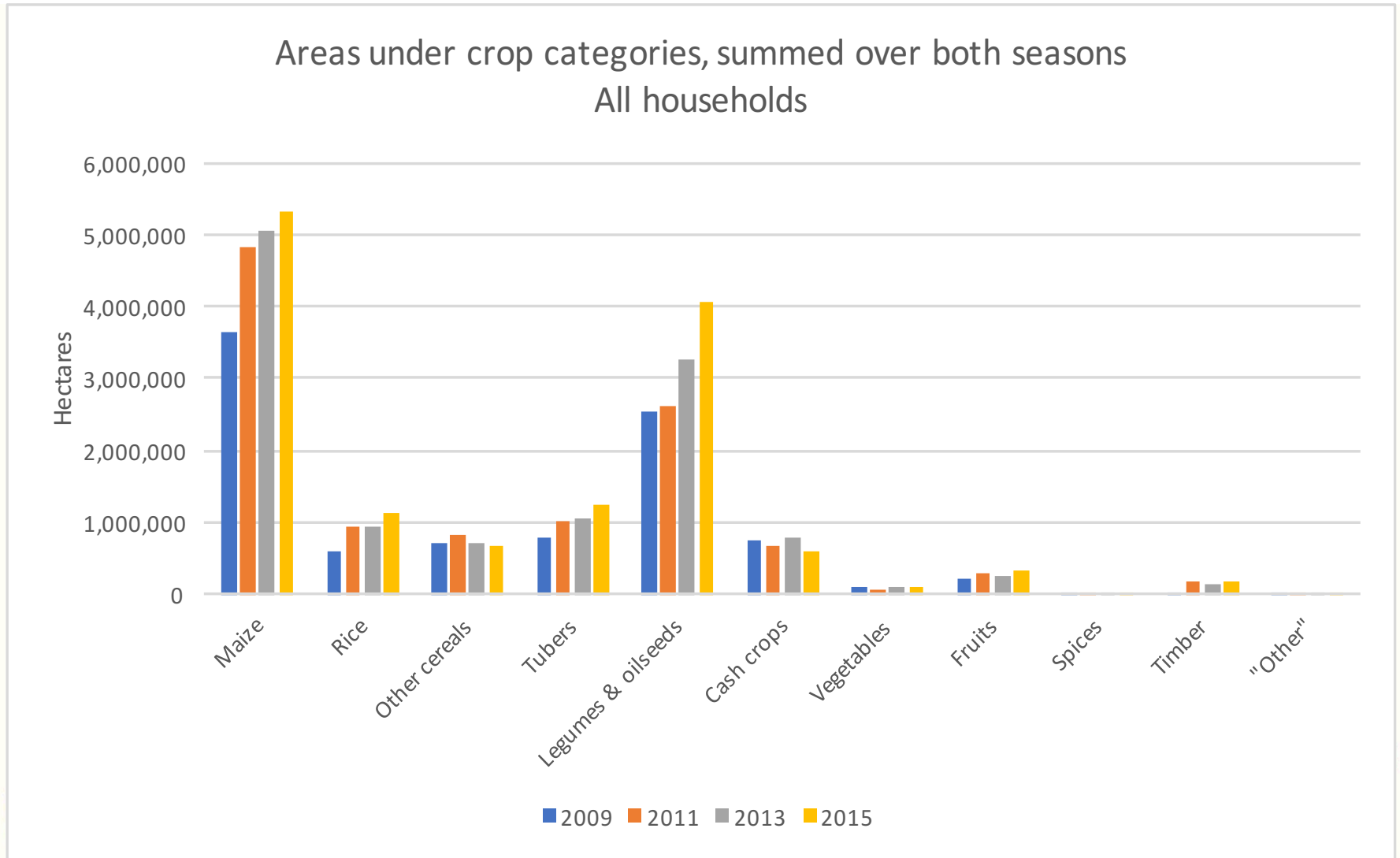
Topic	Factor	Hypothesized relationship
Miscellaneous	Plot size	Convex
	Population density	
	Tenure security	
	Forest / fallow / other use	
Agricultural potential	Soil quality	
	Slope	
	Average rainfall / temperature	
	On-farm amendments	
	Pre-harvest crop losses	
Market access / urban pressure	Rural location of homestead	
	Distance from road / town / market	-
	Household's market orientation	+

Correlates of land values (pooled OLS, cultivated plots)

Dependent variable: ln(land value, TSh/ acre, inflation adjusted)

	Coef.	P-value		Coef.	P-value
→ Area (acres, estimated)	-0.07***	0.00	Distance to road (km)	-0.02***	0.00
Area ²	0.001***	0.00	Distance to town (km)	-0.004***	0.001
1= At residence	0.26***	0.00	Distance to major market (km)	-0.002**	0.04
→ 1= Formal document	0.22**	0.02	Population density (100s persons / km ²)	0.01***	0.003
1= Less formal document	0.25***	0.00	Average annual temperature (10s °C)	-0.002	0.55
1= Can be left uncultivated	0.11	0.16	Average annual rainfall (100s mm)	0.04**	0.01 ←
→ 1= Good soil quality	0.12***	0.00	1= Agro-ecological zone (AEZ) is warm / semiarid ^b	-0.24	0.34
1= Bad soil quality	-0.09	0.14	1= AEZ is warm / humid	0.16	0.63
1= No slope (flat)	0.01	0.74	1= AEZ is cool / semiarid	-0.08	0.69
1= Steep slope	-0.02	0.82	1= AEZ is cool / subhumid	-0.05	0.67
1= Pre-harvest crop loss on plot	-0.02	0.54	1= AEZ is cool / humid	0.59**	0.04
1= Erosion control	0.15***	0.01	1= Year 2011	0.19***	0.004
1= Irrigated	0.35**	0.03	1= Year 2013	0.16***	0.00
1= Contains fruit trees or permanent crops	0.39***	0.00	Constant	12.21***	0.00
Proportion of crop value marketed	0.28***	0.00	Region fixed effects (FE)	Y	
1= Rural household	-0.22**	0.02	Observations	15,069	
			Adjusted R-squared	0.35	
			Mean variance inflation factor (VIF)	1.95	

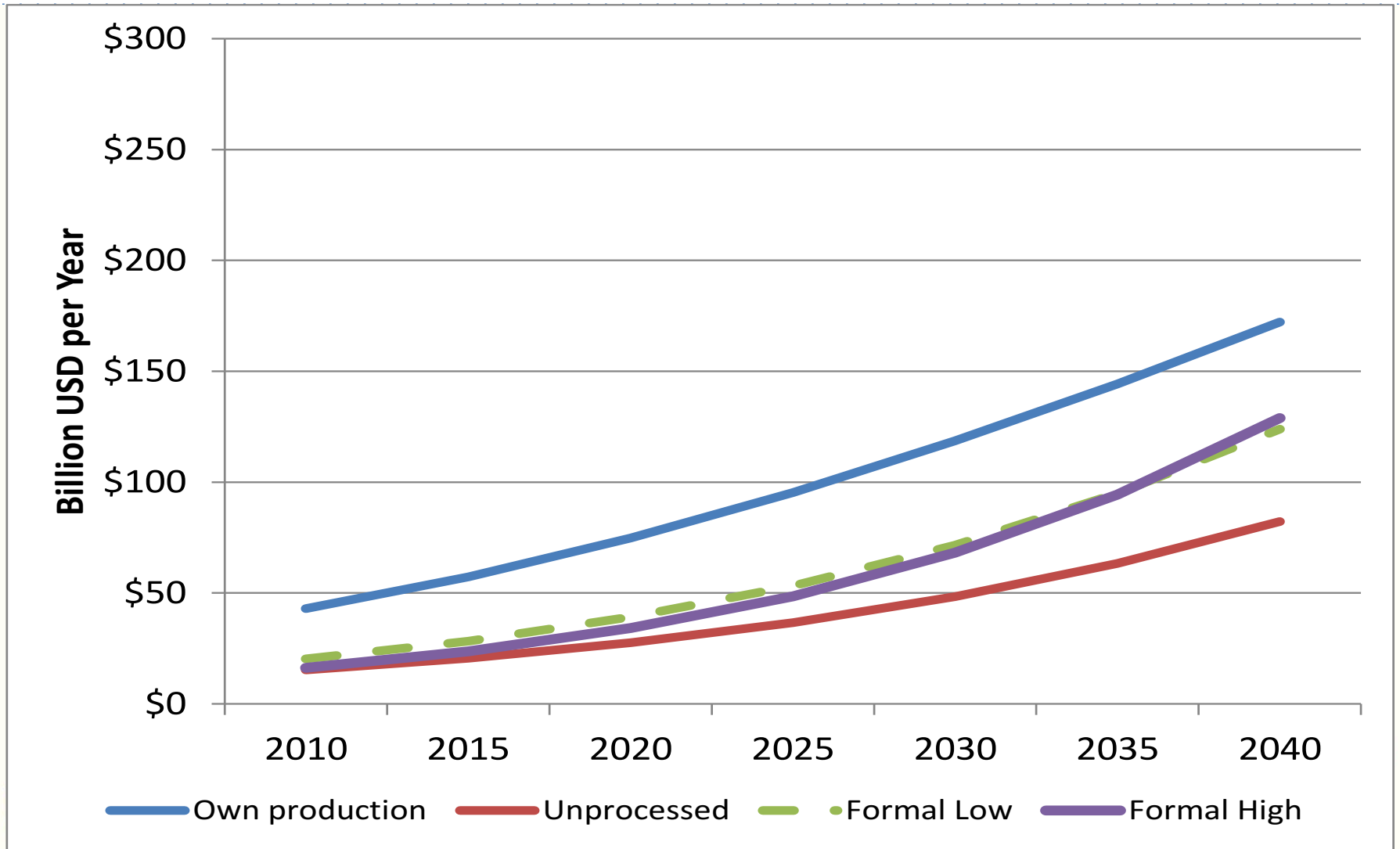
The Cropping Pattern is Changing – Area under legumes and oil seed increasing much faster, followed by maize and rice



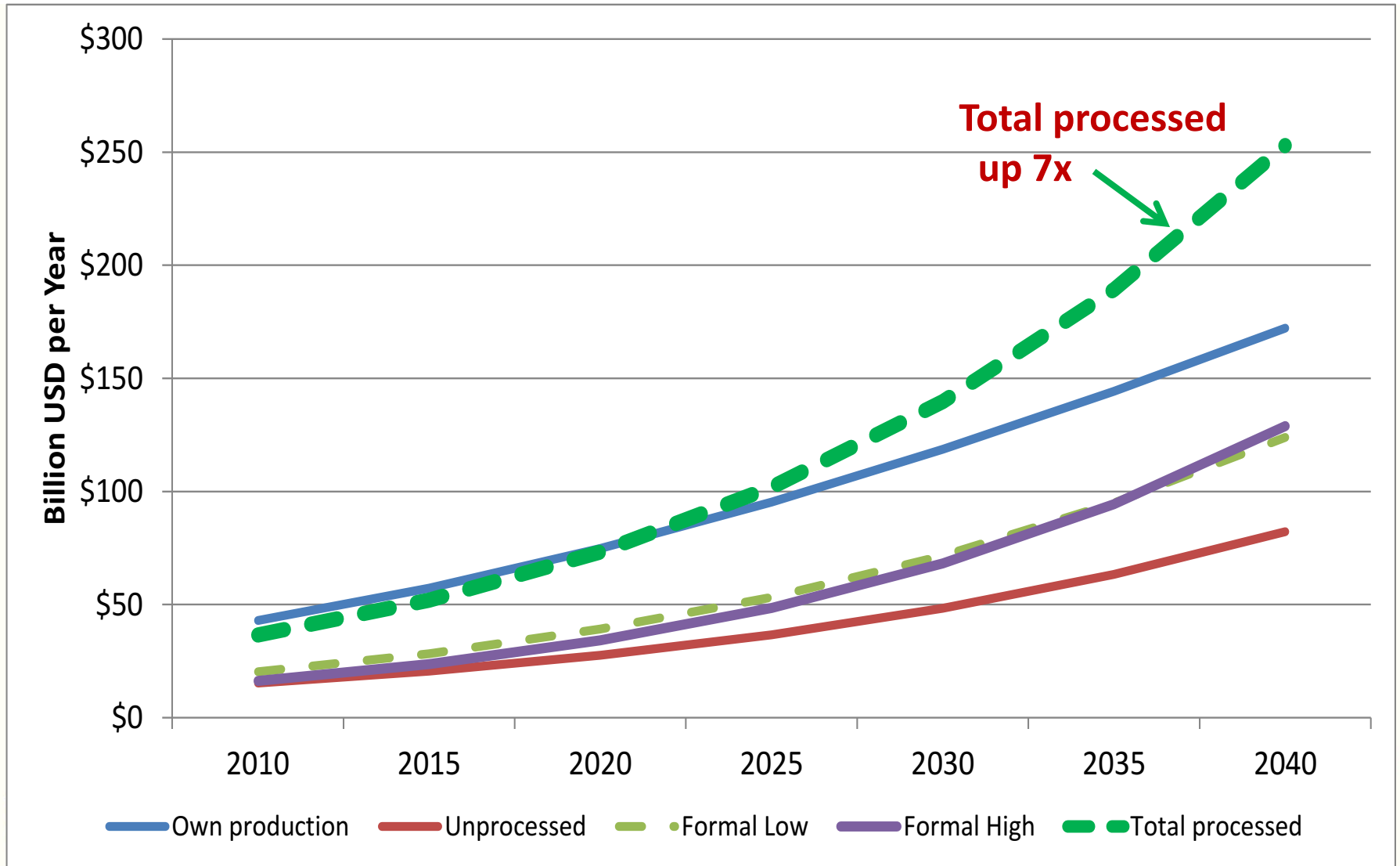
Ag Transformation Downstream the Value chain For East and Southern Africa (Tschirley, D., et al)



Evolution of Real Food Market Size in East & Southern Africa 2010-2040 (USD)



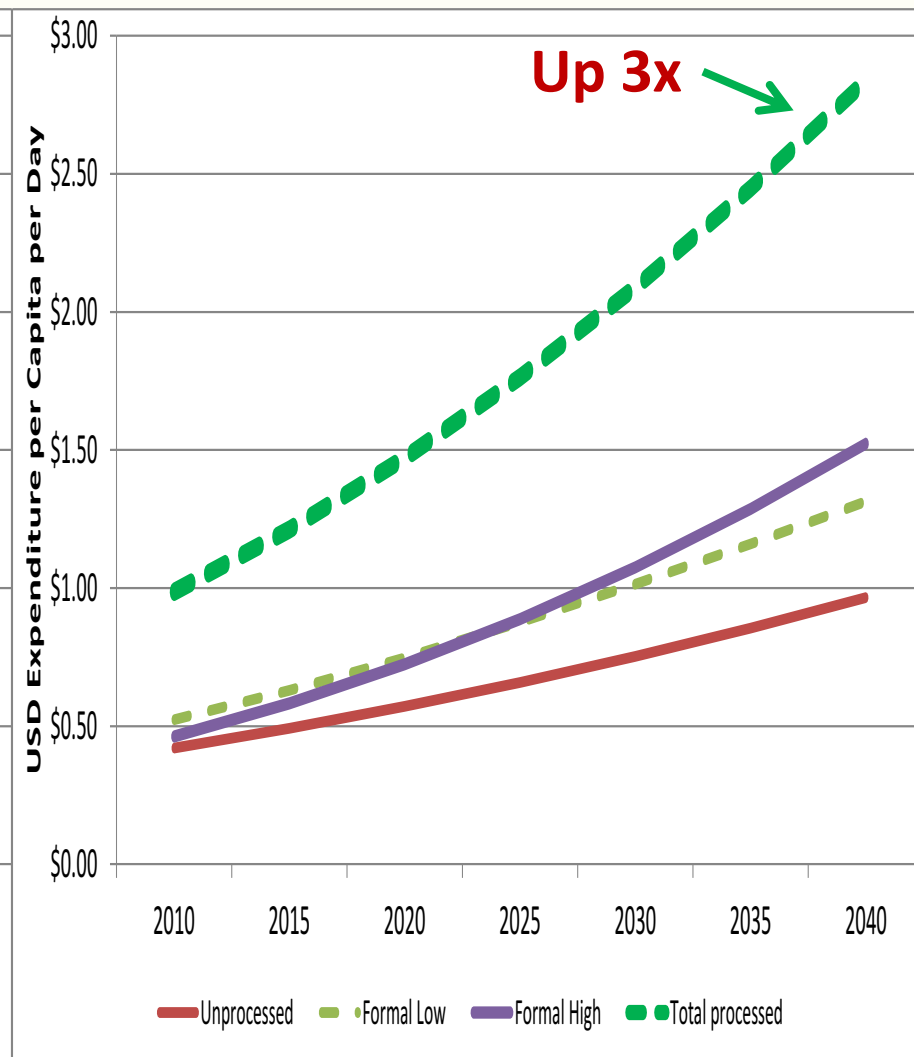
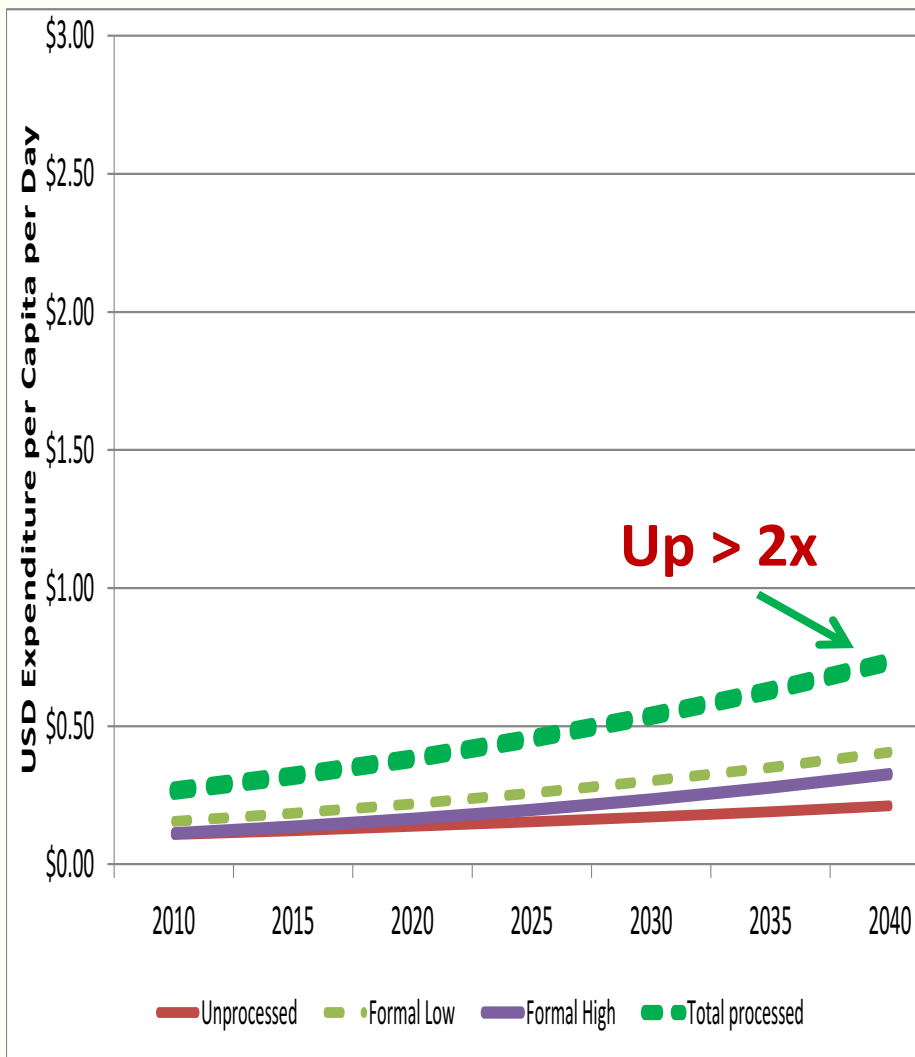
Evolution of Real Food Market Size in East & Southern Africa, 2010-2040 (USD)



Will rural areas
look different?



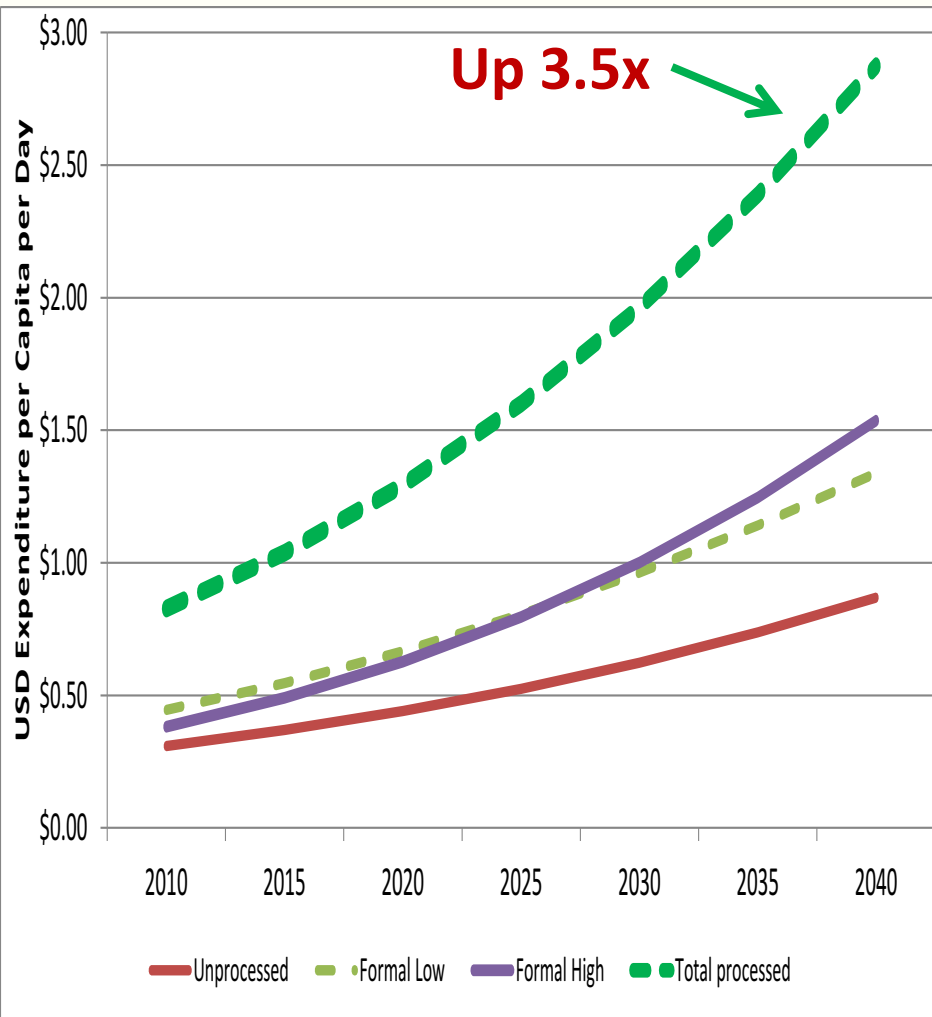
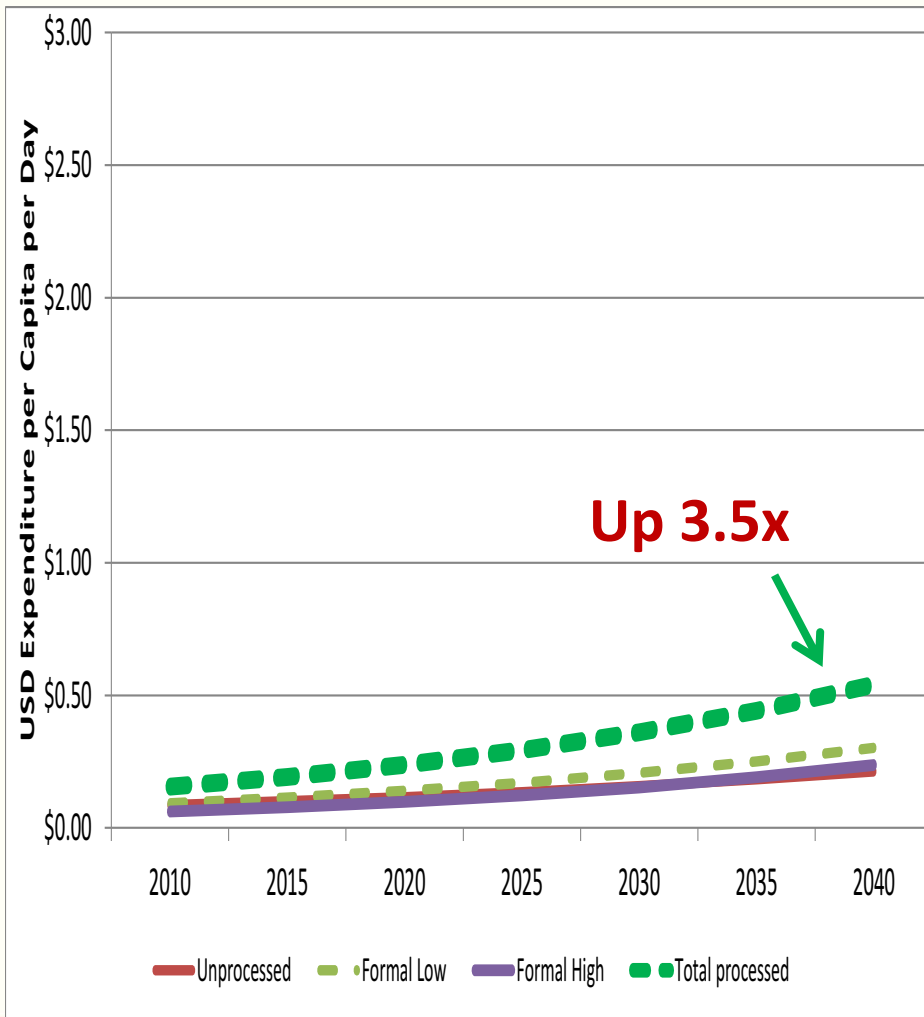
Evolution of Real per capita Food Expenditures in Rural & Urban ESA, 2010-2040



Will the poor look different?



Evolution of Real per capita Food Expenditures among Poorest & Richest One-Third of Population of ESA, 2010-2040



Take-home

Growth will be strong in rural and urban areas, and among the poor and non-poor (though from different starting points)



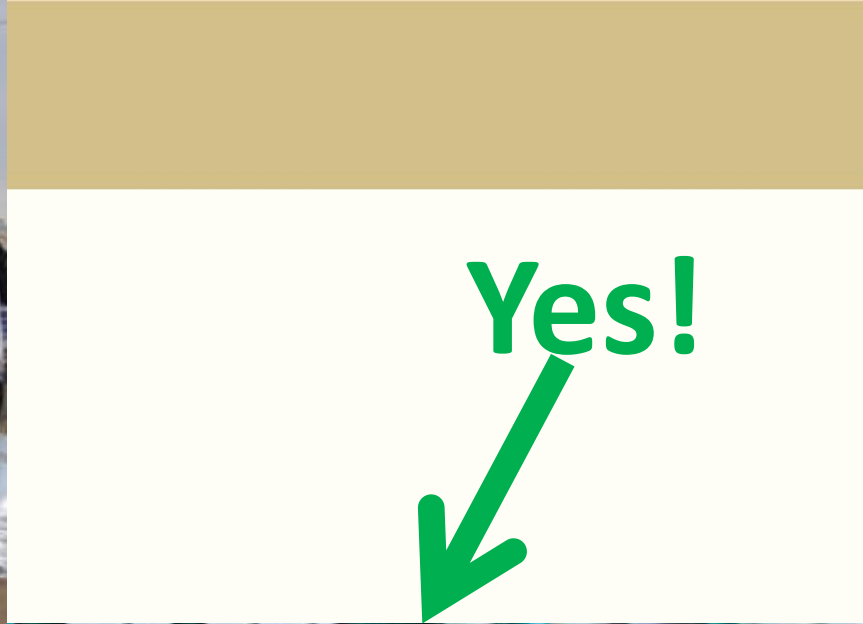
Will the “traditional” retail sector disappear?

- **No!**

- Share will fall from 90% to 65% by 2040
- But size will increase 6.5x
 - Due to growth in incomes, population, and urban share

- **But it will need to be a different traditional sector**

- Consumer incomes 3x-4x higher
- Will demand more quality, packaging, variety, safety
- Need for training, entrepreneurial assistance



No!



Conclusion and Policy Implications

- The grain sector will continue to grow amid the changing production and consumption pattern
- The slow down in production of maize may accelerate as the feed industry expands in response to increased consumption of livestock products
- The increase in demand for processed foods contribute to transformation in the food systems
- Failure to invest adequately in agriculture and the rest of the food system can choke off the process of structural transformation and food security.



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