

Urbanization and Smallholders in Africa:

From headwinds to tailwinds in African agricultural development

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Topics in Advanced Agriculture: Markets and Trade

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African cities, markets and trade are booming



Today: What's behind these headlines, and what do these trends imply for smallholder farmers?

BBC NEWS

15 April 2013

World Bank: Africa's economic growth to outpace average

Economic growth in sub-Saharan Africa should significantly outpace the global average over the next three years, according to the World Bank.

Higher commodities, increasing investment and a general pick-up in the world economy should all boost the continent's growth to more than 5%.



THE GLOBE AND MAIL

PORTFOLIO STRATEGY

For rapid growth, Africa is the new China

ROB CARRICK

The Globe and Mail

Published Friday, Apr. 18, 2014, 5:13 PM EDT

The Washington Post

Africa's emergence poses choice for US ties

Associated Press, May 6th 2014

...So far, the U.S. is lagging in the worldwide race to reap economic benefits in Africa...

Bloomberg

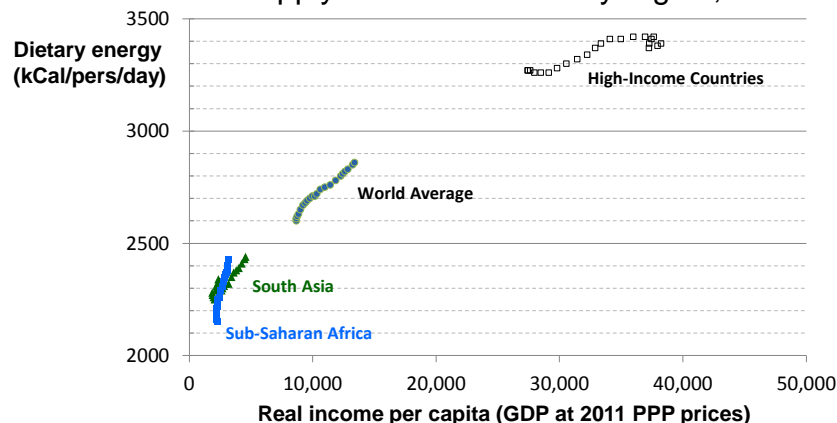
Sub-Saharan Africa Economy to Grow

By David Malingha Doya -- Apr 7, 2014

Economic growth in sub-Saharan Africa is forecast to accelerate to 5.2 percent this year...

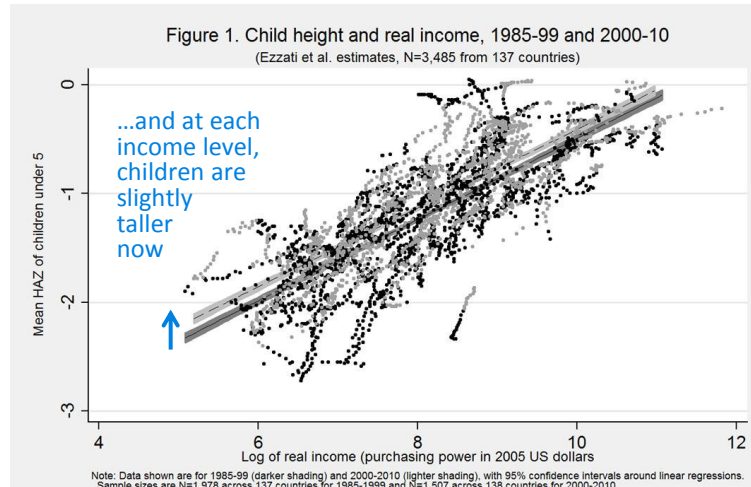
Africa is catching up, but still has very far to go

Food supply and real income by region, 1990-2012



Source: Author's calculations, May 2014. Real income is from World Bank, World Development Indicators (April 2014), downloaded from <http://data.worldbank.org>. Food supply is from FAO, Food Security Indicators (December 2013), downloaded from <http://www.fao.org/economic/ess/ess-fs>. Each point is a 3-year average, from 1990-92 to 2010-12.

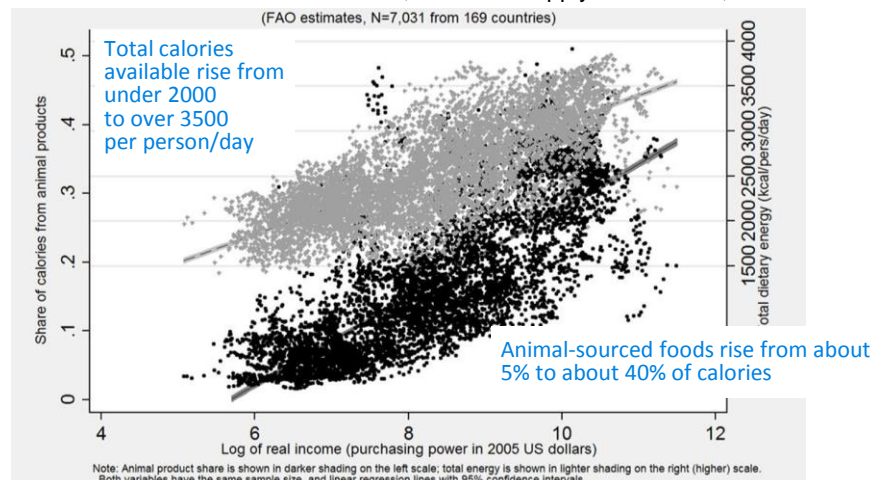
Higher income has enabled people to meet many goals, like taller childer



Source: W.A. Masters, 2013. "Child Nutrition and Economic Development", *Nutrition in Pediatrics*, 5th ed. (chapter 44), edited by C.P. Duggan, J.B. Watkins, B. Koletzko and W.A. Walke, Shelton, CT: PMPH-USA.

Income changes diet quality as well as quantity

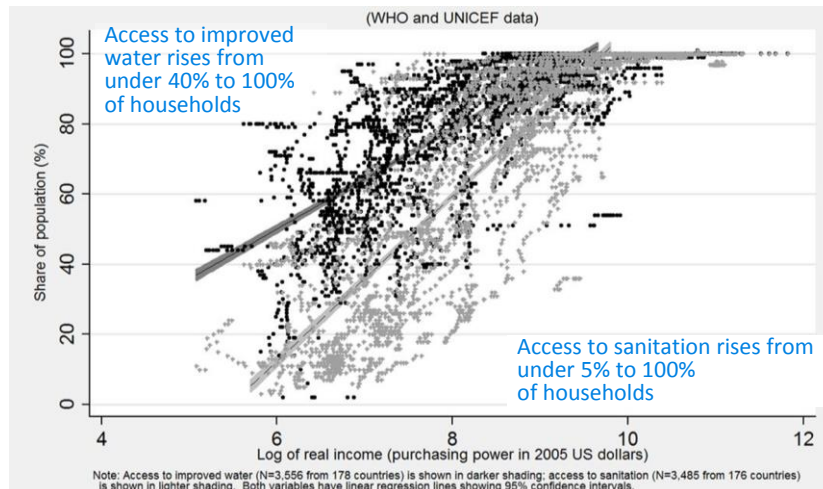
Share of calories from animal sources, total food supply and income, 1961-2009



Source: W.A. Masters, 2013. "Child Nutrition and Economic Development", *Nutrition in Pediatrics*, 5th ed. (chapter 44), edited by C.P. Duggan, J.B. Watkins, B. Koletzko and W.A. Walke, Shelton, CT: PMPH-USA.

Income also buys sanitation and clean water, etc.

Access to sanitation, improved water and income, 1990-2010



Source: W.A. Masters, 2013. "Child Nutrition and Economic Development", *Nutrition in Pediatrics*, 5th ed. (chapter 44), edited by C.P. Duggan, J.B. Watkins, B. Koletzko and W.A. Walke, Shelton, CT: PMPH-USA.

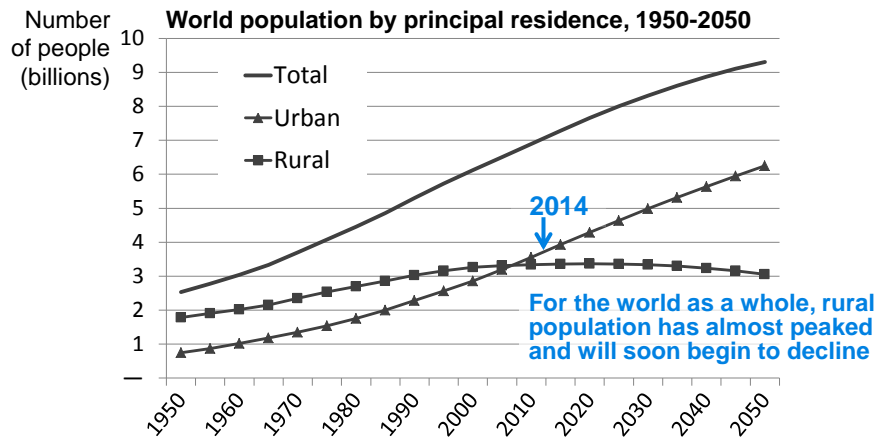
Income growth involves structural change

- Most of the poorest people start life in rural areas
 - they rely on agriculture for economic opportunity
 - and move to off-farm work as soon as they can



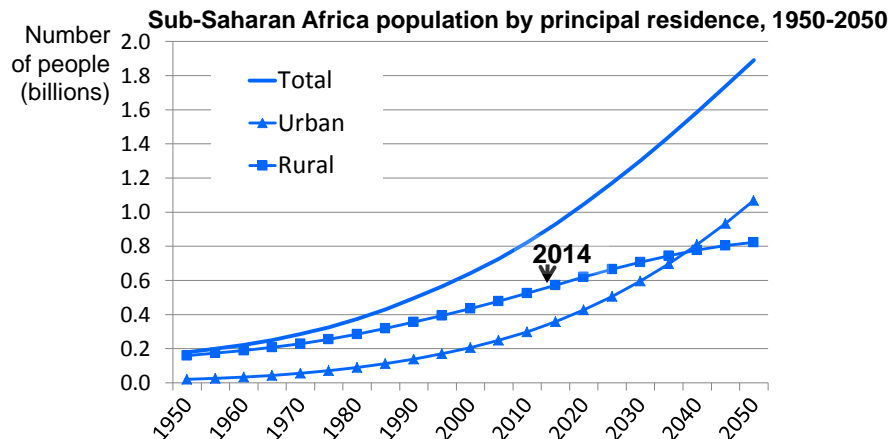
*Amai Nickson and family at Chakuma Village, Zimbabwe
25 years after I taught in the classroom at right (with Tadius Shumba)*

Urbanization and off-farm work can eventually employ all the children of farmers



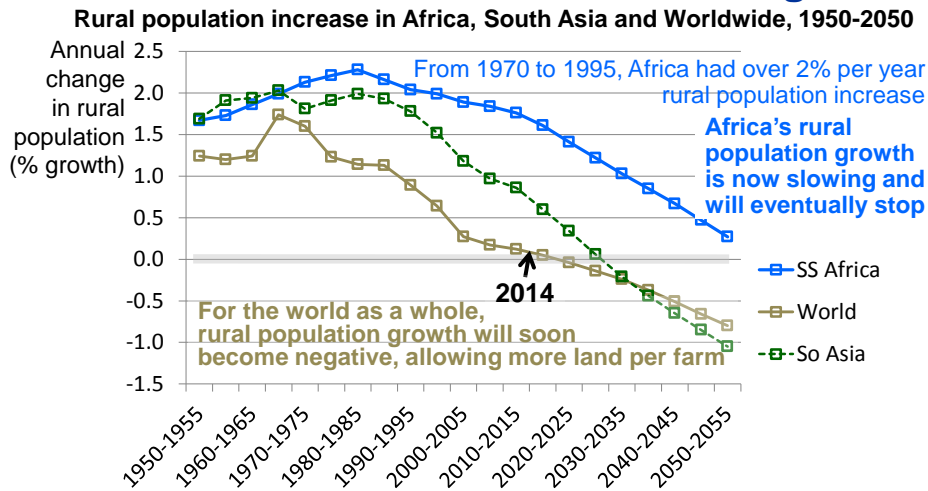
Source: Source: Calculated from UN World Urbanization Prospects, 2011 Revision, released October 2012 at <http://esa.un.org/unpd/wup/>. Downloaded 18 April 2013.

...but Africa still faces over 30 years of rural population growth



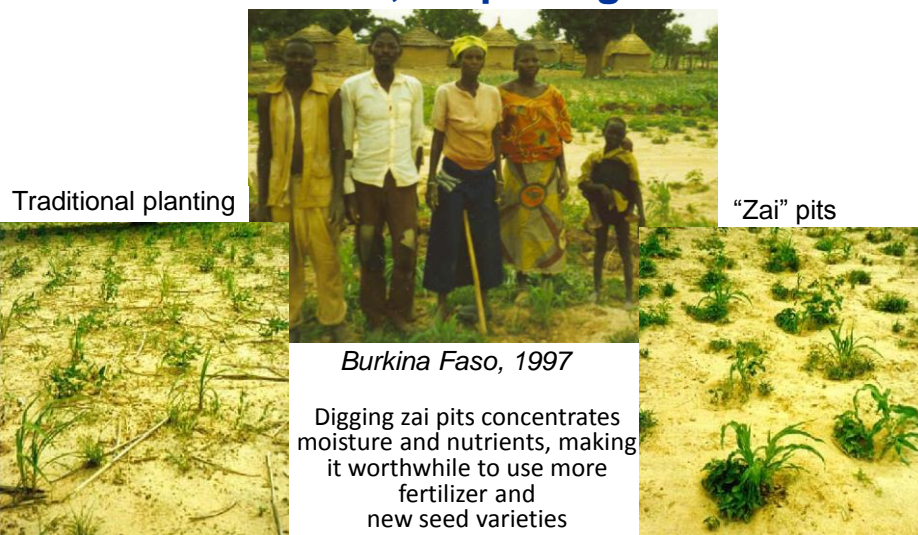
Source: Source: Calculated from UN World Urbanization Prospects, 2011 Revision, released October 2012 at <http://esa.un.org/unpd/wup/>. Downloaded 18 April 2013.

Africa's year-to-year rural population increase has been fast but is now slowing

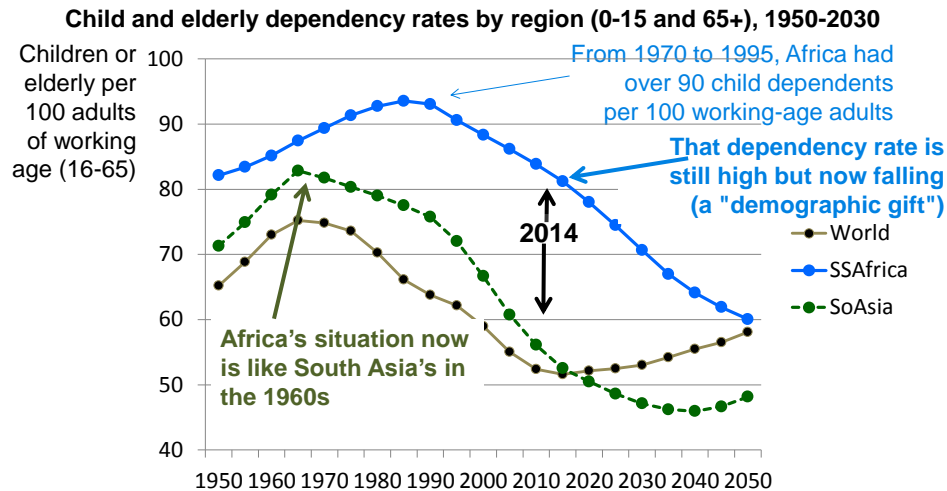


Source: Calculated from UN Population Division, World Population Projections (<http://esa.un.org/unpd/wpp>), accessed 11 Aug 2012, based on UN Population Prospects: The 2010 Revision and World Urbanization Prospects: The 2011 Revision.

Adapting to higher rural population density involves difficult, surprising innovations



Like population growth, child dependency was very high and is now falling



Source: Calculated from UN Population Division, World Population Projections (<http://esa.un.org/unpd/wpp>), accessed 11 Aug 2012, based on UN Population Prospects: The 2010 Revision (April 2011).

Africa is in the last stage of demographic transition from large to small families



Two families involved in USAID-Heifer International projects in Nakasongola and Luweero districts, Uganda (2011)

What do these trends imply for programs and projects in agriculture, food and nutrition?



Urbanization-Smallholder Linkages: The CGIAR ISPC Foresight Study

- **Five commissioned background papers**
 - Asia: Tom Reardon
 - Africa: Thom Jayne
 - Livestock: Cees de Haan
 - Geography: Agnes Andersson-Djurfeldt & Magnus Jirström
 - Cross-cutting: Peter Hazell
- **Fifteen discussants in a 2-day workshop, Jan 25-26**
 - Awudu Abdulai, Deborah Balk, Derek Byerlee, Cheryl Doss, Ken Giller, Margaret McMillan, Clare Narrod, Jerry Nelson, Kei Otsuka, Carl Pray, Agnes Quisumbing, Bharat Ramaswami, Anita Regmi, Steve Staal, Steve Wiggins
- **Active participation of ISPC**
 - Ken Cassman, Doug Gollin, Tim Kelley & Rashid Hassan



Implications of urbanization trends for smallholders

- Global agriculture is increasingly diverse, along two main axes:
 - **Commercialization: *dynamic vs. hinterland zones***
 - “Quiet revolution” from low transport cost to ports and cities, even as many farmers remain in hinterland areas,
 - big differences for input use and role of agribusiness
 - **Resource ownership: *family vs. investor-owned farms***
 - “Farm size” is tailored to family enterprise for most crops, despite scale economies in processing & marketing
 - family-size farms vary in area/worker and mechanization but demography drives trends in *average* area/worker
- === > ***Agricultural policies and programs should be tailored to diversity and change in farm size and commercialization , as well as climate change etc.***



Main implications for commercialization

- ***In “dynamic” zones along transport routes***
 - income growth relies on local input supply and product marketing, even as farm size remains tailored to family enterprise
 - => Interventions should aim to equip competing input suppliers and product marketers with increasingly productive innovations
 - ***In “hinterland” zones facing high transport costs***
 - income can grow but from a low base, with few inputs
 - => Interventions should aim to accelerate growth with public and community innovations adapted to farmers’ needs
- Watch out for exceptions and transitions as dynamism spreads***
- it is difficult to predict the path of commercialization
 - => Interventions can and should drive income growth in both dynamic and hinterland areas through both commercialized and public innovations



Main implications for farm structure

- **Most crops need family-size farms, whether small or large**
 - Farm size is tailored to family enterprise for most crops, because cost of supervising workers offsets scale economies in machinery and management
 - => Average farm size = land area / number of farm families, even as families diversify and then migrate as fast as possible
 - => Heterogeneity arises from land quality and family assets
- **Many investor-owned farms fail, but they sometimes succeed**
 - Large enough scale economies in machinery and management usually only in on-farm processing (e.g. tea, sugar, oil palm) or packaging for transport (e.g. cut flowers, high-value veg.) or easy supervision (e.g. livestock exc. dairy, some crops)
 - => Innovations can expand investor-owned farming (e.g. with GPS on variable-rate equipment) but is very difficult to do.



Main implications for farm size

- **In Asia, family-size farms are growing (from very small now!)**
 - Slowdown in total population growth + continued urbanization leads to negative rural population growth, rising land/farmer
 - => In dynamic zones, output per farmer can rise very fast; in hinterlands, farmers must mechanize or migrate
- **In Africa, family-size farms are getting smaller**
 - Slow fall in total population growth + recent urbanization leads to slowing but still rapid rural population growth
 - => In some regions, cropped area can still expand but most farmers experience falling land/farmer

==> Most Asian farmers seek labor-saving innovations, whereas most African farmers seek to *increase* labor/hectare



Data and methods behind our conclusions

*Average farm sizes are starting to grow in Asia,
but will continue to shrink in Africa*

Table 1: Trends in rural population, 1970 to 2050, Asia and Africa

	Average annual rate of change (%)		
	1970-2011	2011-2030	2030-2050
Asia	+0.85	-0.35	-0.83
Africa	+1.97	+1.35	+0.63

Source: Hazell 2013, from UN data.

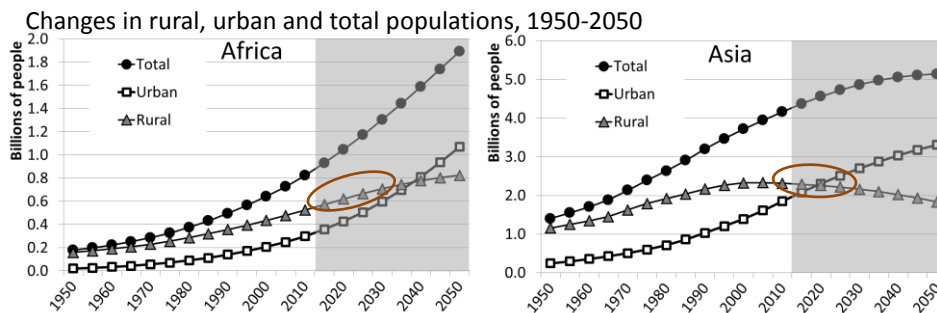
How accurate is this forecast?

- UN population projections are imperfect, but their biases probably understate the Asia-Africa difference;
- Places and people vary around regional trends, but rural population growth drives change in *average* farm size
- Settlement of new areas has been limited and difficult



Data and methods behind our conclusions

*Average farm sizes are starting to grow in Asia, but
in Africa land per farm will continue to decline*



Source: Adapted from Jayne, 2013 from United Nations (2012), World Urbanization Prospects: The 2011 Revision, online at <http://esa.un.org/unup>.)

Data and methods behind our conclusions

*Farmers diversify and migrate as fast as possible
to nonfarm work, but opportunities are limited*

Migration between major administrative regions, 2002

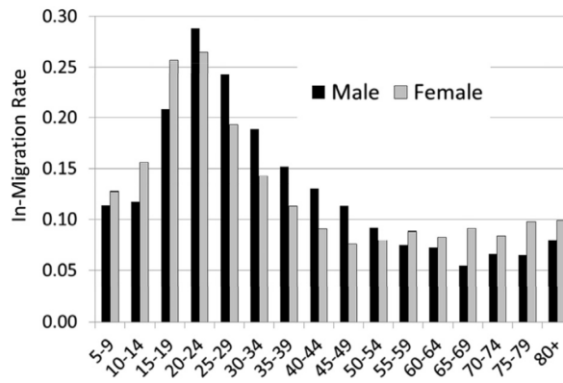


Fig. 2. Urban in-migration rate by age and gender in Uganda.
Source: Balk (2013). from Uganda census data.



Data and methods behind our conclusions

*The total number of farmers and total land area is largely fixed,
so expanding some farms implies that others will shrink*

Country (year of survey)	(a) Sample size	(b) Mean farm size (ha)	(c) Farm Size (hectares per capita)				(d) Gini Coefficients			
			Mean	Quartile			Land per household	Land per capita	Land per adult	
				1	2	3				4
Most farms got smaller... even as sometimes, the biggest get bigger										
Kenya, 1997	1146	2.28	0.41	0.08	0.17	0.31	1.10	0.55	0.56	0.54
Kenya, 2010	1146	1.86	0.32	0.07	0.12	0.25	1.12	0.57	0.59	0.56
Ethiopia, 1996	2658	1.17	0.24	0.03	0.12	0.22	0.58	0.55	0.55	0.55
Rwanda, 1984	2018	1.20	0.28	0.07	0.15	0.26	0.62	--	--	--
Rwanda, 1990	1181	0.94	0.17	0.05	0.10	0.16	0.39	0.43	0.43	0.41
Rwanda, 2000	1584	0.71	0.16	0.02	0.06	0.13	0.43	0.52	0.54	0.54
Malawi, 1998	5657	0.99	0.22	0.08	0.15	0.25	0.60	--	--	--
Zambia, 2001	6618	2.76	0.56	0.12	0.26	0.48	1.36	0.44	0.50	0.51
Mozambique, 1996	3851	2.10	0.48	0.1	0.23	0.4	1.16	0.45	0.51	0.48

Source: Jayne 2013, from various household surveys, and land distribution becomes more skewed

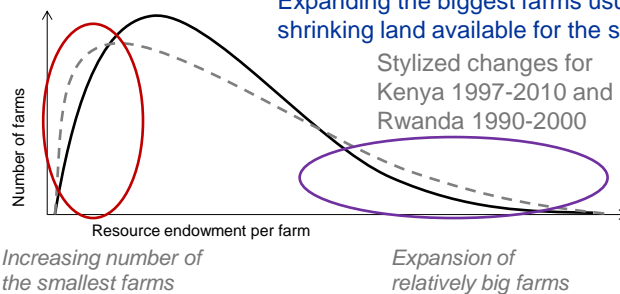


Data and methods behind our conclusions

The number of farmers is fixed by demography & off-farm opportunity and available land area is fixed by nature & infrastructure

Typical distribution of farm sizes (e.g. lognormal)

Farm size distribution is like a balloon:
Expanding the biggest farms usually implies shrinking land available for the smallest

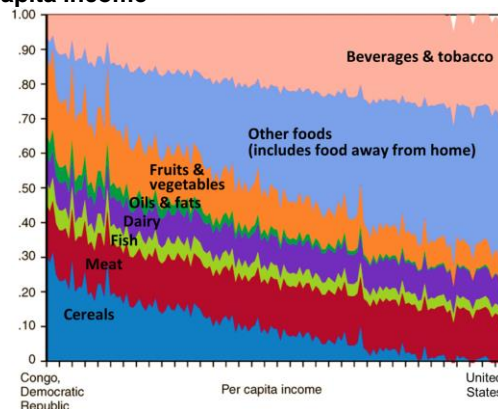


Source: Adapted from Giller (2013)

Data and methods behind our conclusions

Urbanization and income growth raises demand for starchy staples in the poorest countries, but not in the richest ones

Composition of one additional dollar of food expenditure across 144 countries, ranked by per-capita income

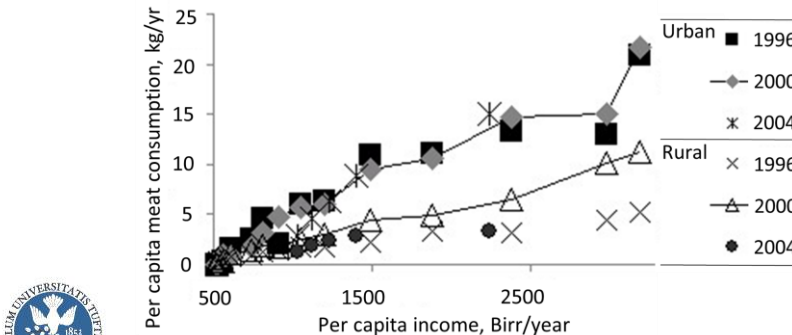


Source: Regmi (2013), from Muhammad et al. (2011)

Data and methods behind our conclusions

Urbanization and income growth raises demand for meat even in the poorest countries

Meat consumption and income in Ethiopia by urban/rural residence, 1996-2004

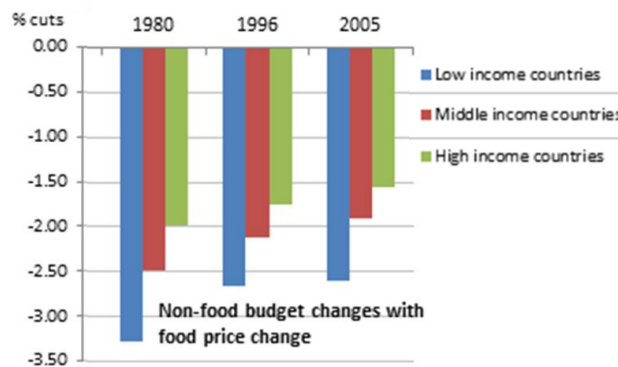


Source: De Haan (2013)

Data and methods behind our conclusions

Food productivity growth and food prices drive demand for non-food items and hence off-farm opportunities

Effect of a 10% rise in food prices on non-food expenditure



Source: Regmi (2013)

Summary of key points

- **Economic development involves slow, widespread trends**
 - Gradual improvement in nutrition and health
 - Urbanization and investment in off-farm activity
- **Demographic trends have U-shaped worsening before improving**
 - Farm sizes will keep shrinking in Africa, but less quickly
 - Farm sizes have already or will soon start rising in Asia
 - Child dependency rates in Africa are falling, but remain high
 - Africa's level has now declined to what was S. Asia's peak
- **Successful projects and policies anticipate and respond to trends**
 - To reach the poorest, must target small farms and busy moms
 - In dynamic zones, must anticipate rapid commercialization
 - In isolated hinterlands, farmers will remain very isolated

