

# EMERGING LAND ISSUES IN AFRICAN AGRICULTURE:

**Toward the Identification of Appropriate Rural Development Strategies**

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# Background

- Malthusian “perfect storm”?
- biofuels
- rising incomes in BRIC countries
- extreme weather events
- export bans



• Increased global demand for farmland

Ironically, Africa has the greatest and cheapest supply of unutilized arable land in the world

The collage features several news items:

- Land grab or development opportunity? Agricultural investment and international land deals in Africa** (headline on a dark background)
- guardian.co.uk** article: **Qatar looks to grow food in Kenya**. The Gulf state has joined a growing list of rich countries that want to grow food in poor countries. (Circled 1)
- V-A News.com** article: **Proposed Kenya-Qatar Land Deal Stirs Controversy**. (Circled 2)
- THE STANDARD** article: **66 year old killed over land wrangles**. Updated 13 hr(s) 47 min(s) ago. By George Olwenya. (Circled 4)
- DAILY NATION** article: **Why Qatar-Tana River land deal requires further discussion**. By CAROL PINLO. (Circled 3)
- SATURDAY NATION** article: **State seeks to take over land from foreigners**. (Circled 6)
- THE STANDARD** article: **Land crisis in the Tana River Delta**. Updated 20 hr(s) 7 min(s) ago. By LILLIAN ALUANGA. (Circled 5)

Other visible text includes: "East Africa's largest & most popular website presents the...", "Champion Irene J. Cheskuma crosses the GILBERT WANDER...", "Visiting South 7 Standard Bank...", "had reached the die...".



# Data sources

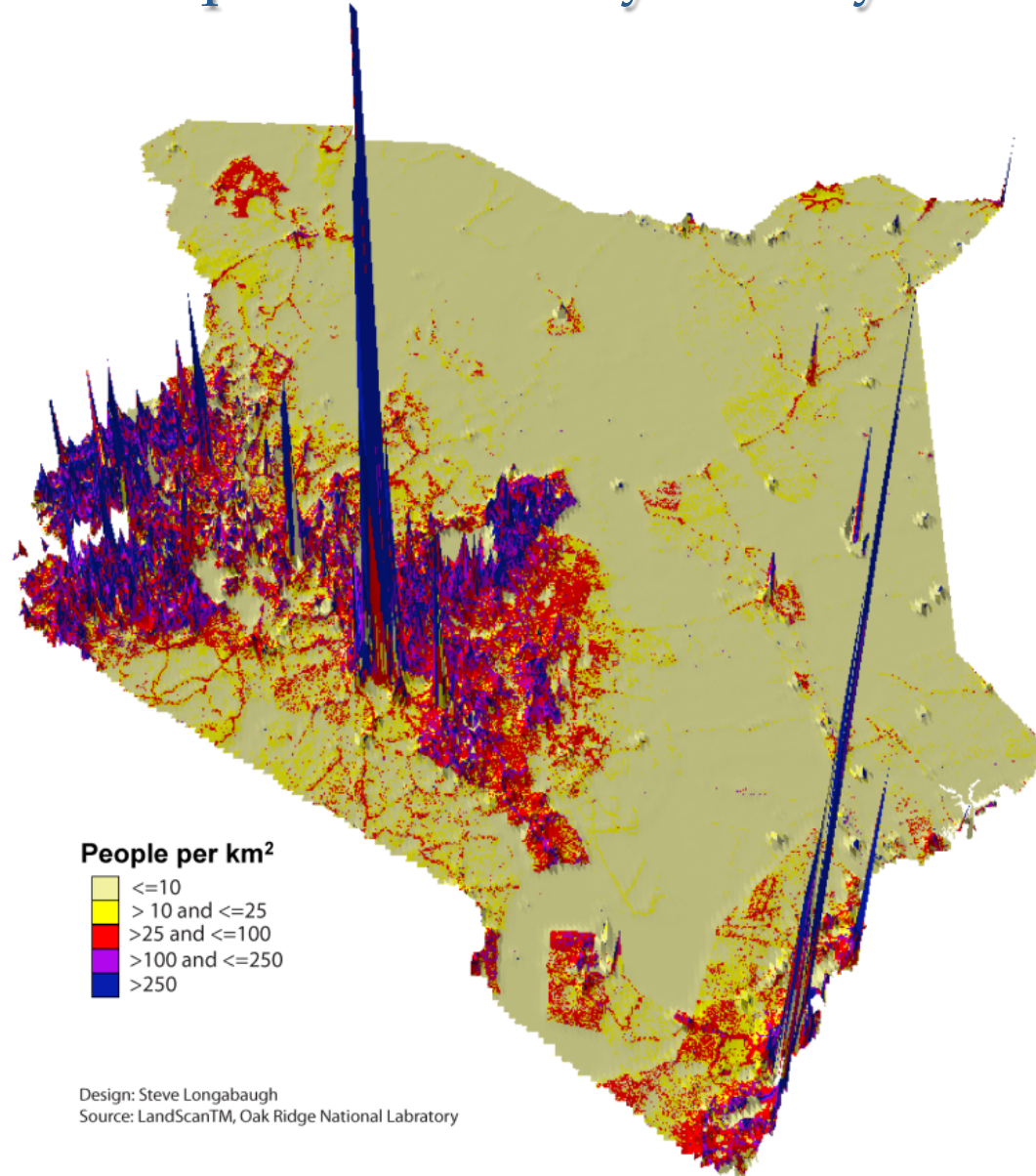
## 1. Nationally representative farm household survey data

- Longitudinal data sets: Kenya, Zambia, Mozambique, Malawi, Ethiopia
- Data on food production, farm size, input use, farm sales, non-farm activities/income, asset wealth, etc.
- Each farm is geo-referenced

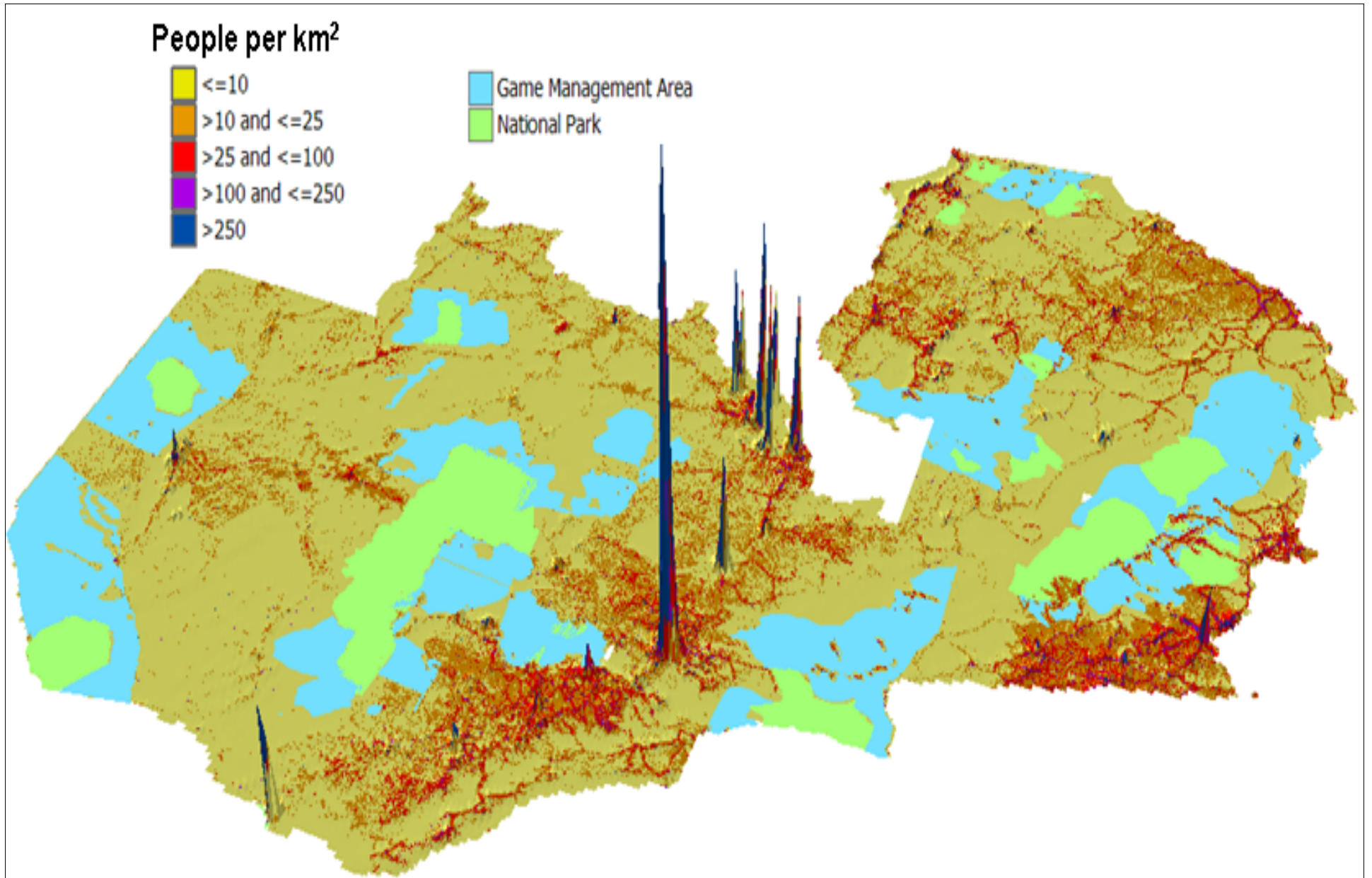
## 2. Spatial data sets based on most recent national population census

- Global Rural-Urban Mapping Project (GRUMP)
- AfriPop Mapping Project

# Population density in Kenya



# Population density, Zambia



## Main issues to be covered

1. To understand the nature and magnitude of emerging land shortages in African agriculture
2. What are the impacts of growing land constraints on farmer behavior and welfare?
3. Why there is (generally) no alternative to a smallholder-led agricultural development strategy?
4. What are the priority strategies for reducing hunger and poverty in Sub-Saharan Africa in light of growing land pressures?

# Major conclusions

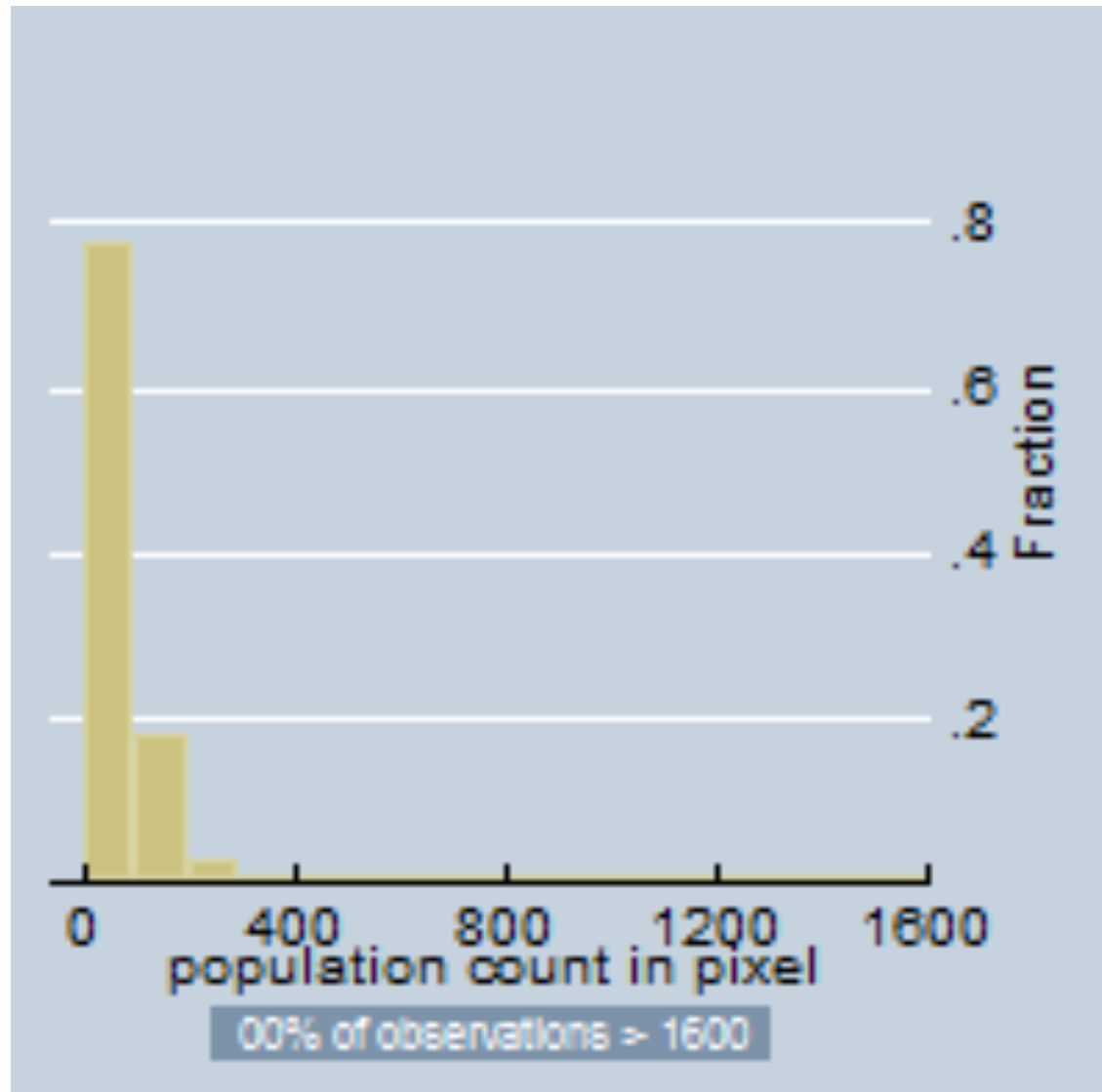
1. Elite capture of political process → agricultural growth having little impact on rural poverty reduction
2. Agricultural development and poverty reduction strategies need to take explicit account of land pressures in African agriculture
3. Promoting foreign investment to farm Africa's unutilized land diverts attention and public resources away from the more central problem: how to reduce hunger and poverty through broad-based, inclusive agricultural growth

I.  
Evidence of land pressures in  
African agriculture

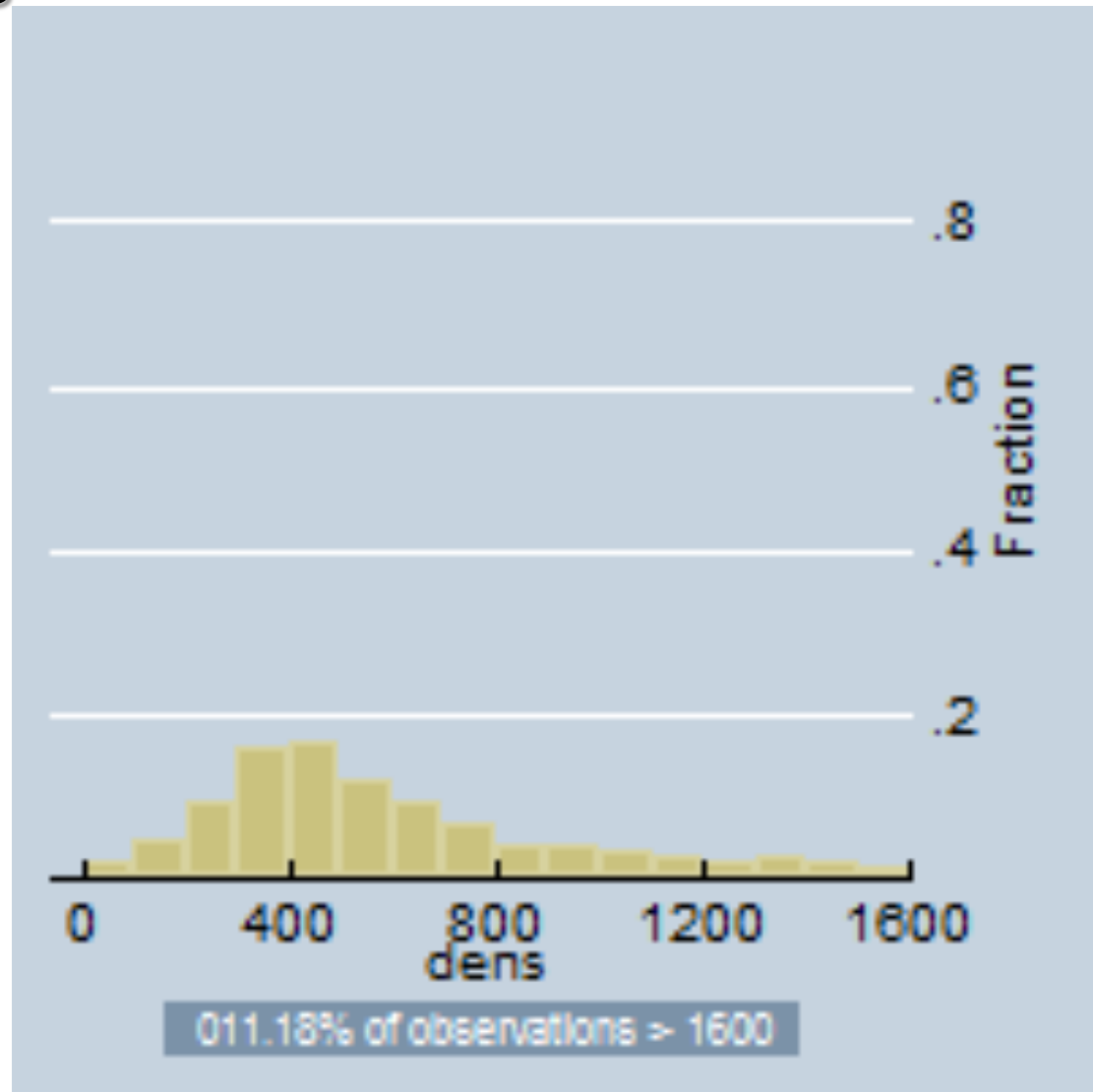




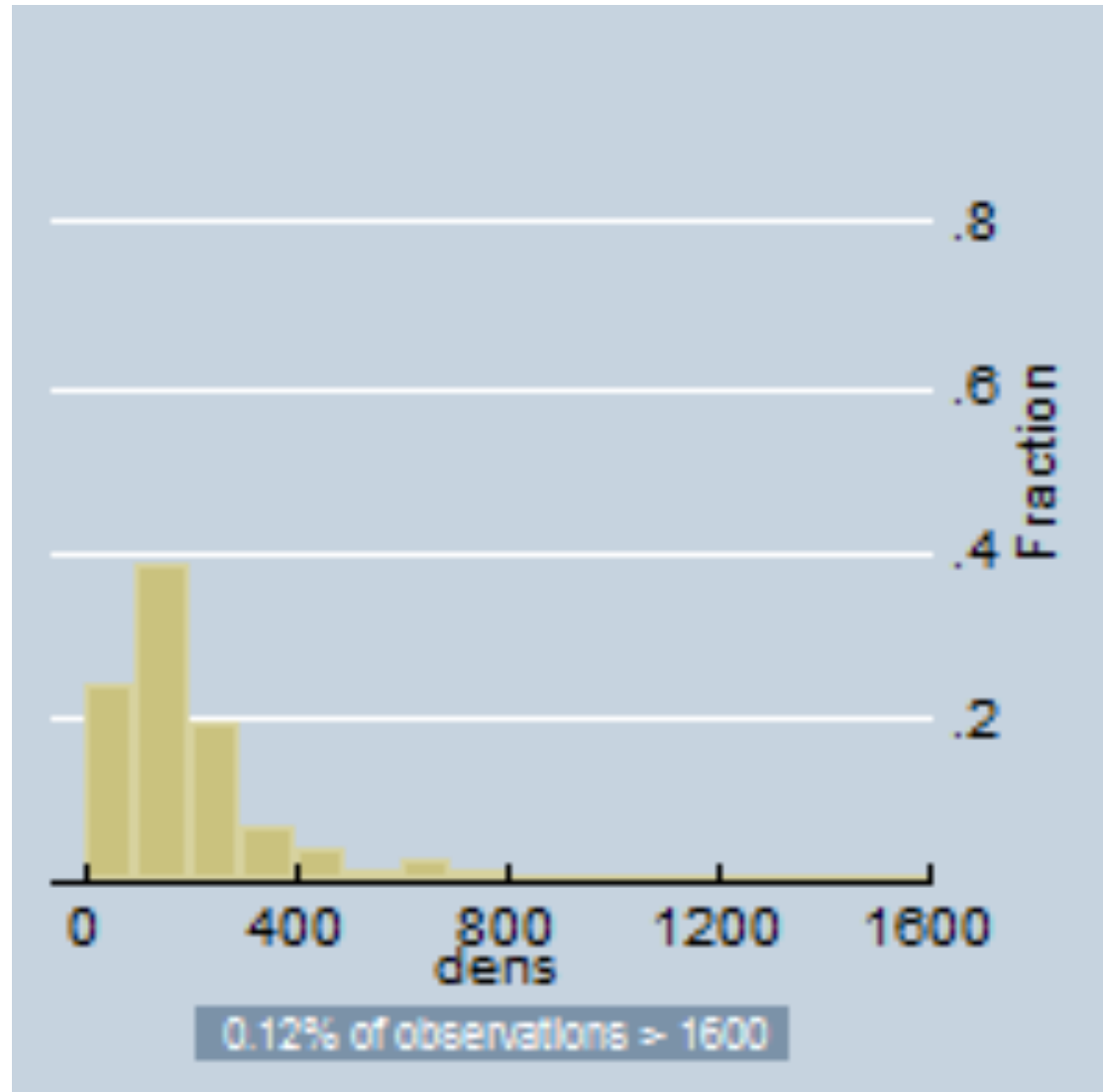
# Population density histogram, Ethiopia (counting all rural 1km<sup>2</sup> grid-cells)



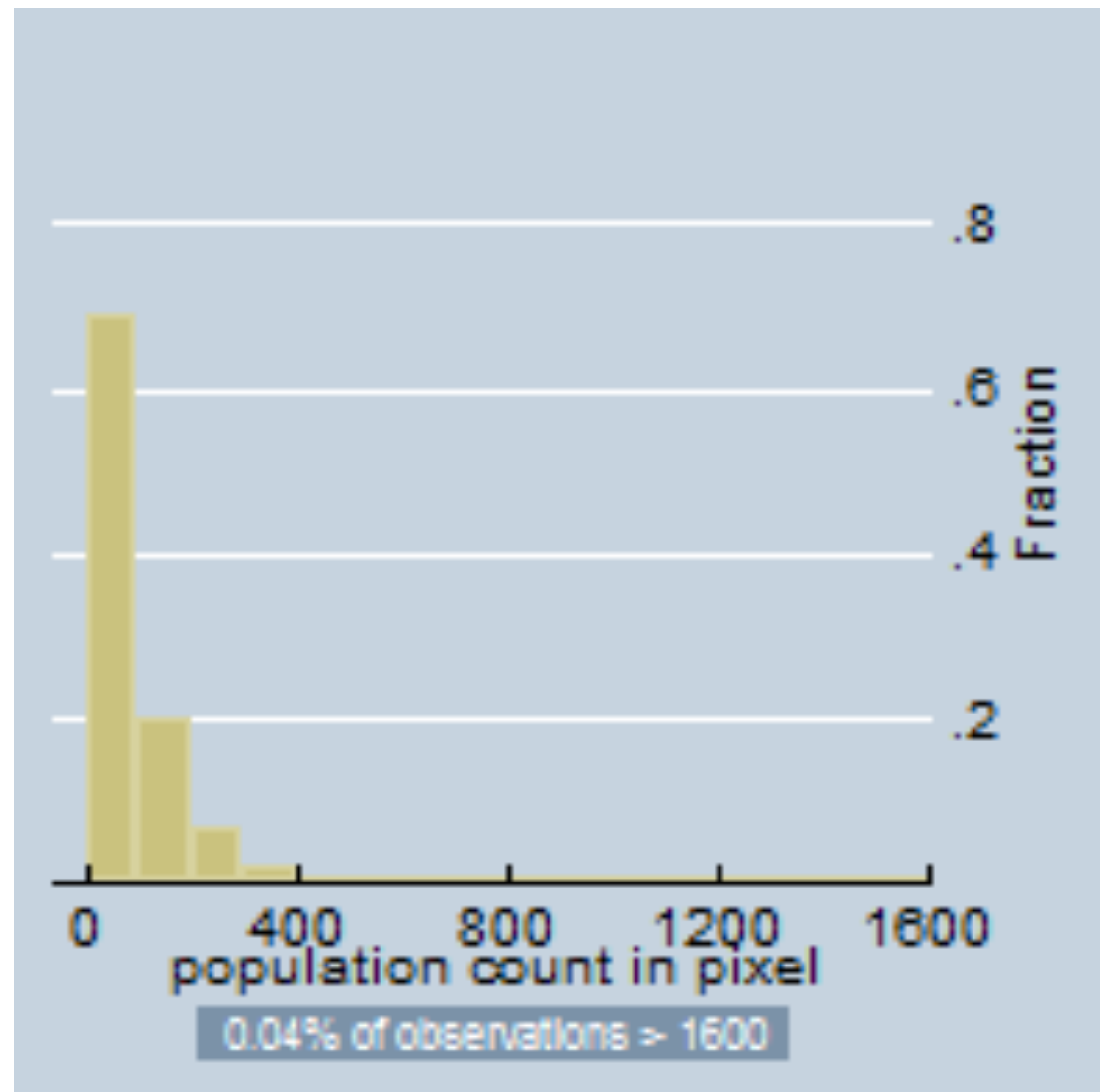
Population density histogram, Ethiopia  
(counting all 1km<sup>2</sup> grid-cells designated as arable and  
changing the unit of observation to be rural people)



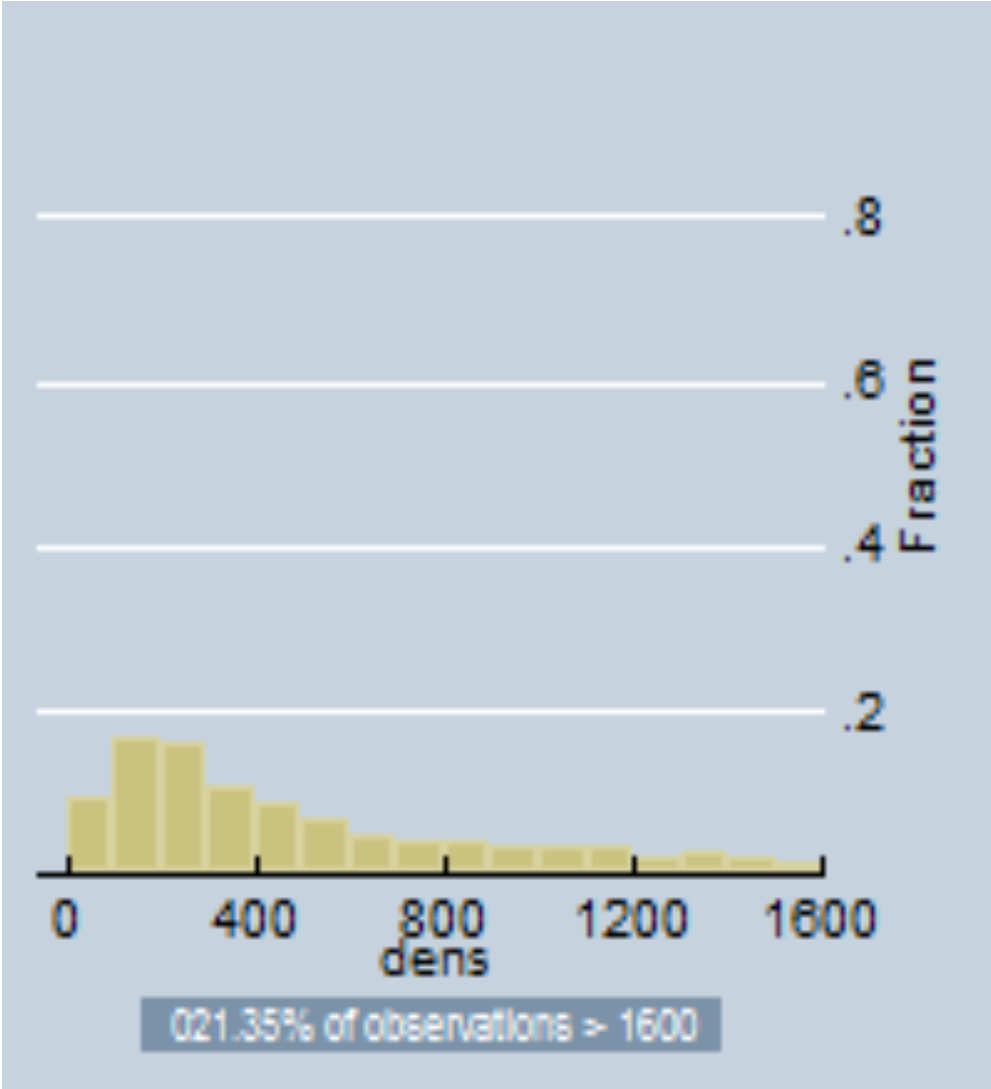
Population density histogram, Ethiopia  
(counting all 1km<sup>2</sup> grid-cells designated as arable+grassland  
+forest land, unit of observation: rural people)



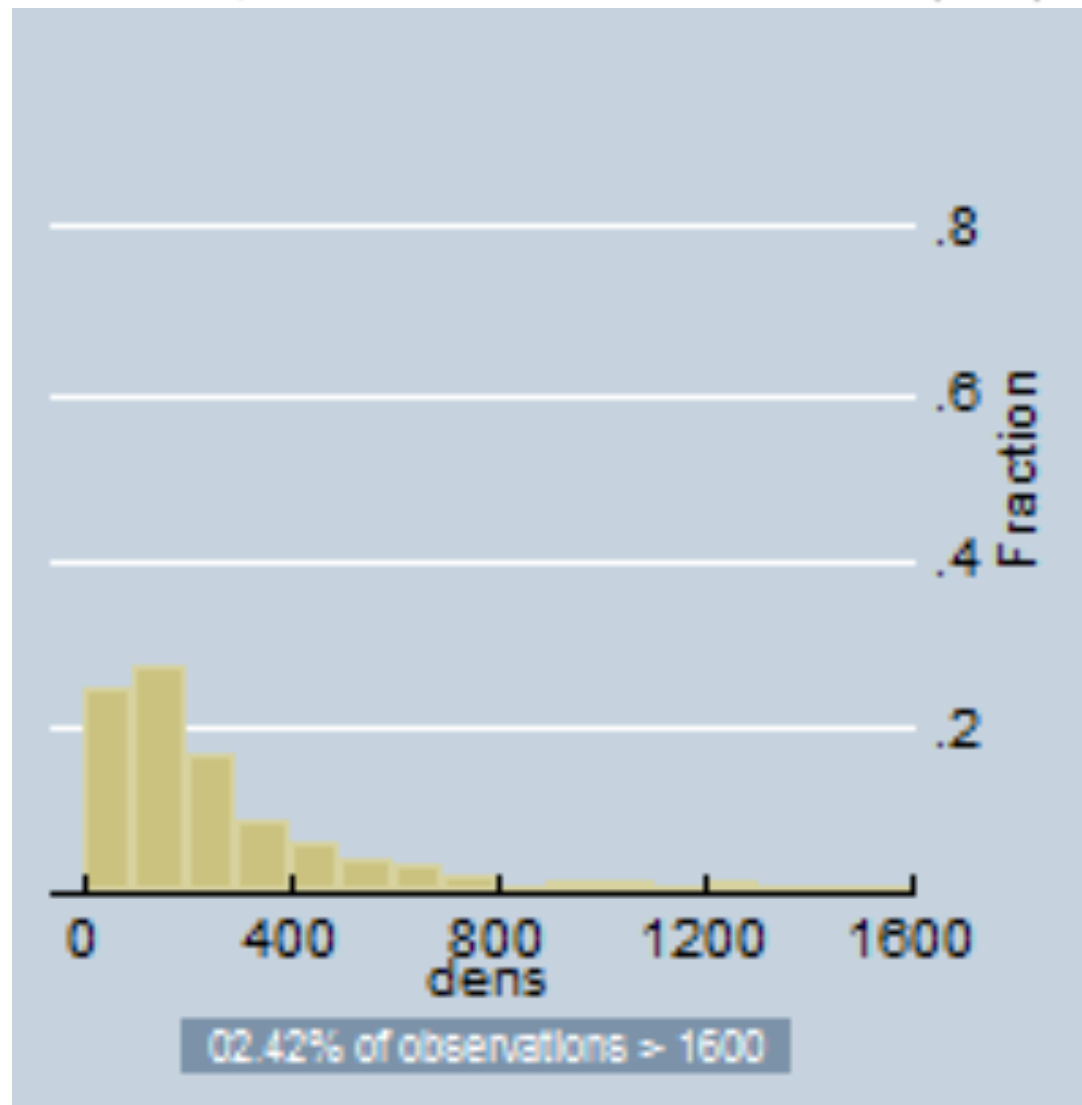
# Population density histogram, Nigeria (counting all rural 1km<sup>2</sup> grid-cells)



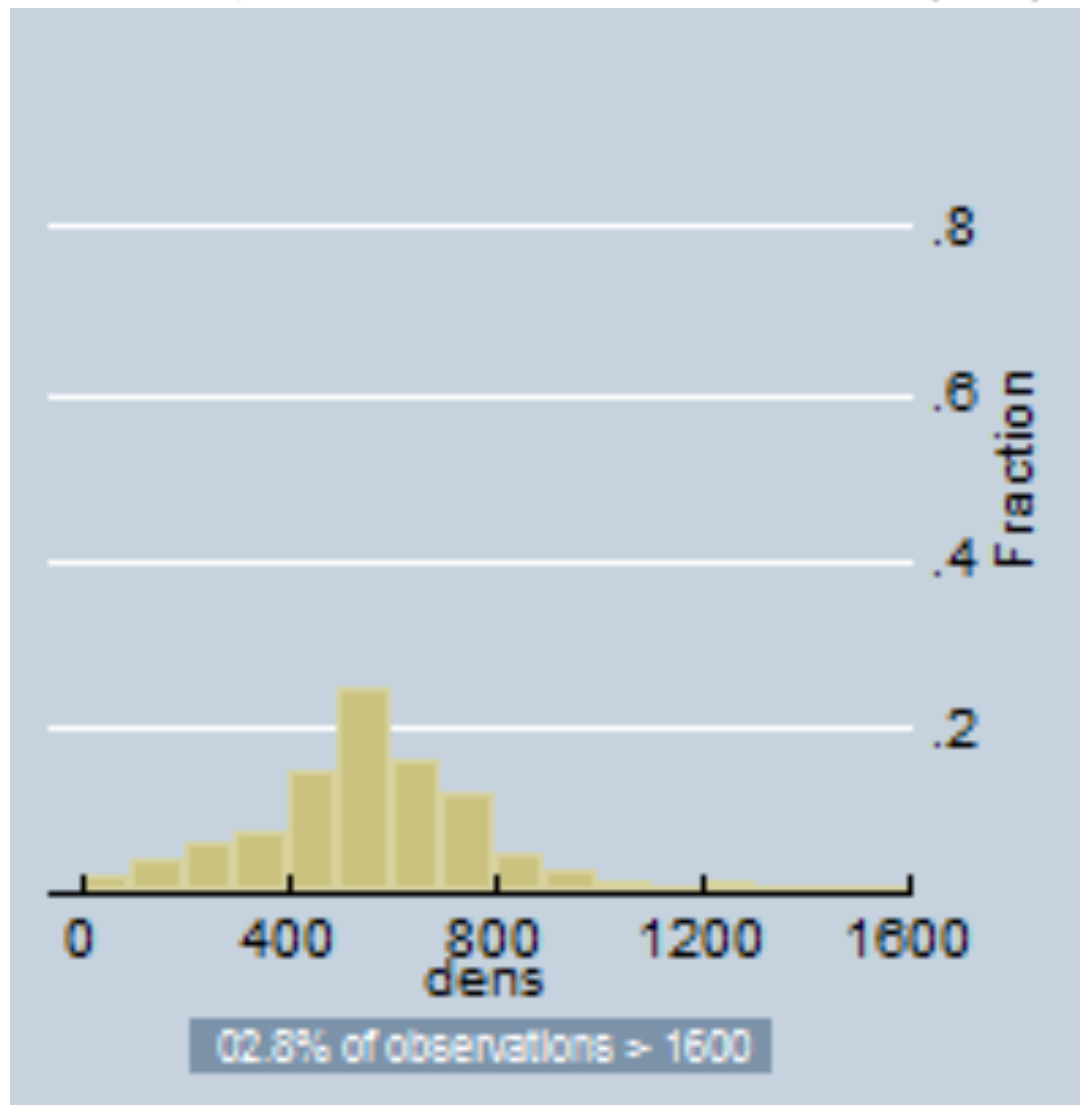
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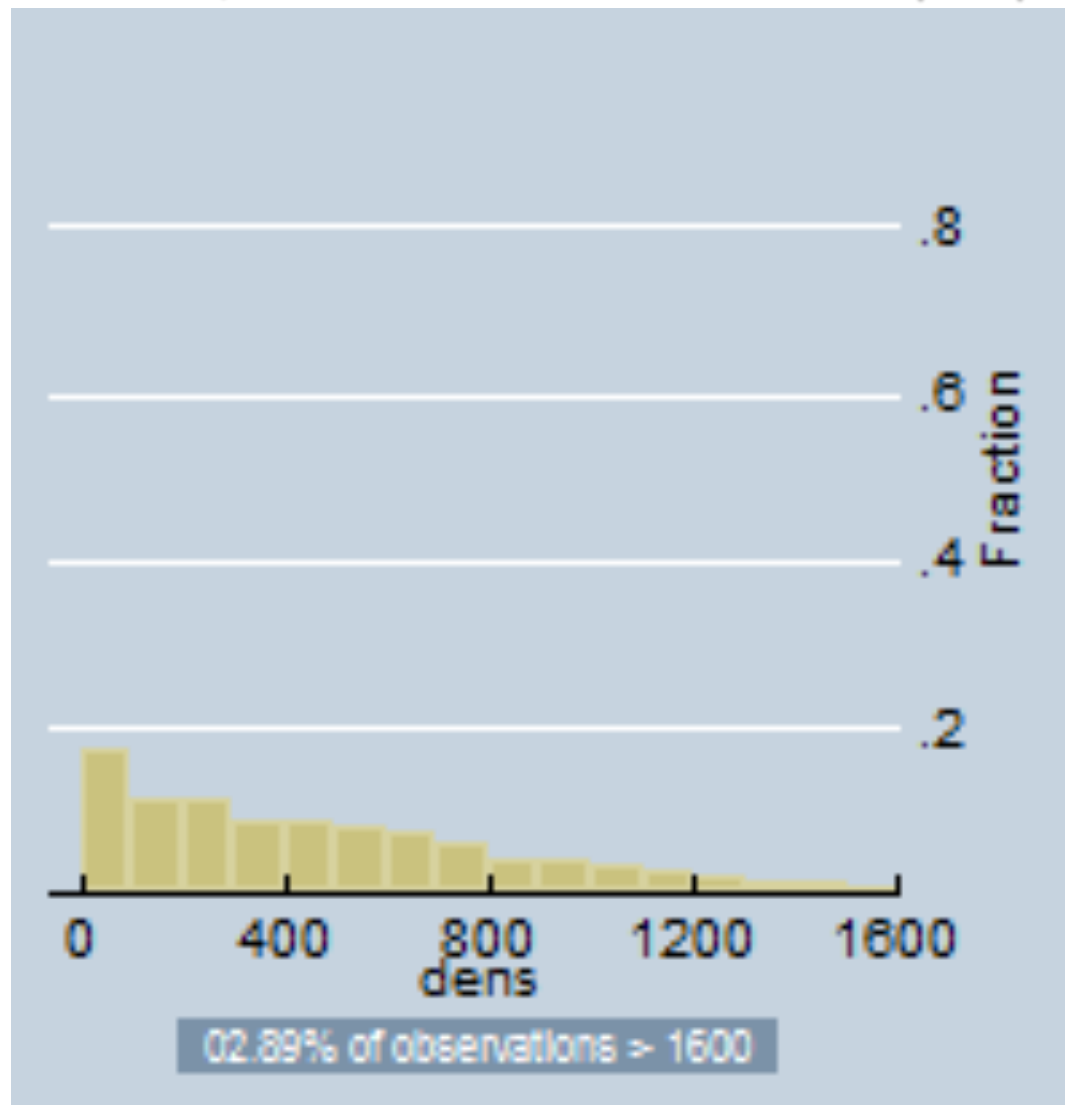
Population density histogram, Nigeria  
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Population density histogram, Rwanda  
(counting all 1km<sup>2</sup> grid-cells designated as arable+grassland  
+forest land, unit of observation: rural people)

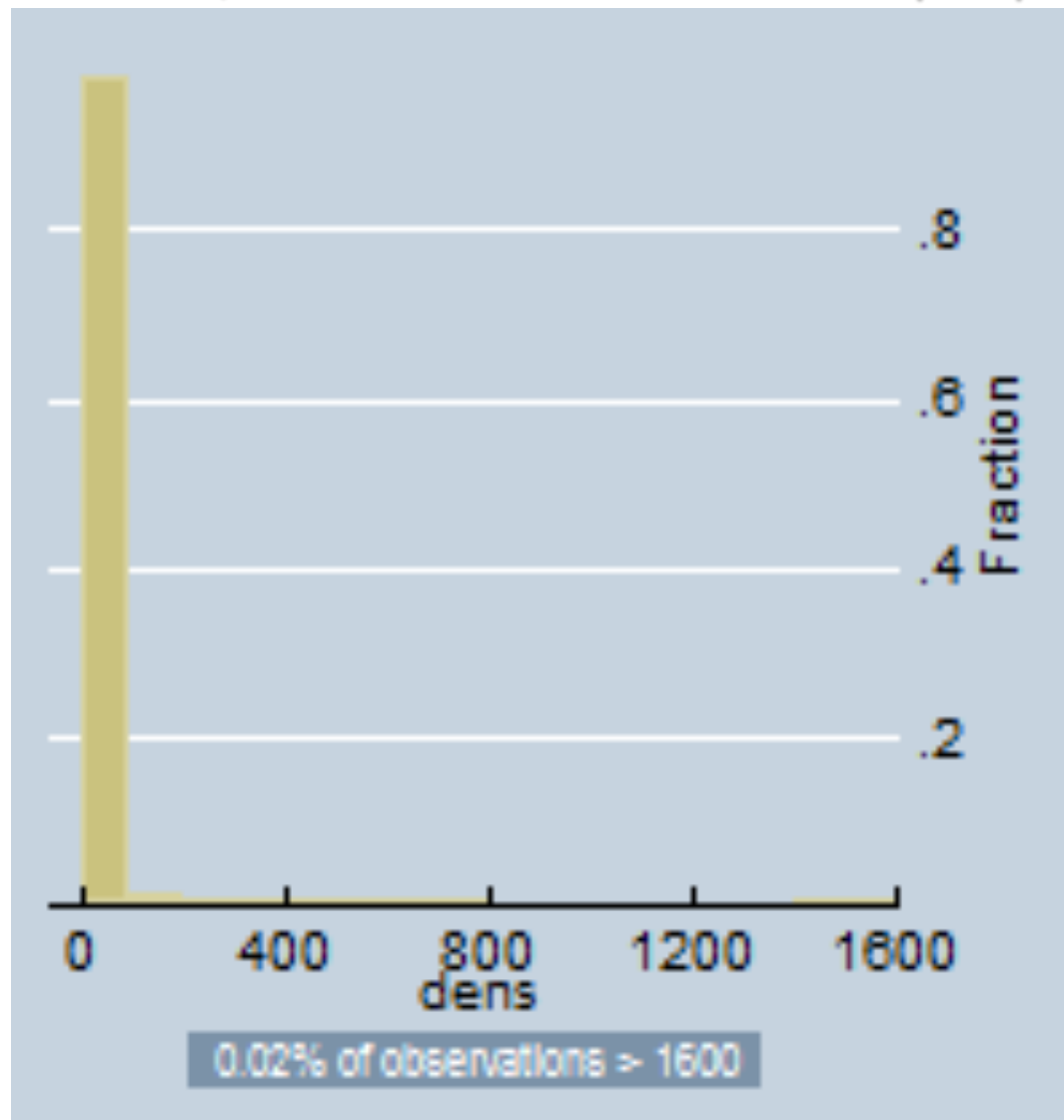


Population density histogram, Kenya  
(counting all 1km<sup>2</sup> grid-cells designated as arable+grassland  
+forest land, unit of observation: rural people)





Population density histogram, Zambia  
(counting all 1km<sup>2</sup> grid-cells designated as arable+grassland  
+forest land, unit of observation: rural people)



## Take-away messages:

- Much of sub-Saharan Africa's rural areas are sparsely populated
- A high proportion of the rural people in sub-Saharan Africa live in densely populated areas

## Land-to-person in agriculture ratio, selected countries

	1960-69	1970-79	1980-89	1990-99	2000-09	2000-09 land-person ratio as % of 1960-69
<b>Ethiopia</b>	0.501	0.444	0.333	0.224	0.218	43.5%
<b>Zambia</b>	0.643	0.607	0.398	0.342	0.297	46.2%
<b>Kenya</b>	0.462	0.364	0.305	0.264	0.219	47.4%
<b>Uganda</b>	0.655	0.569	0.509	0.416	0.349	53.3%
<b>Malawi</b>	0.480	0.466	0.357	0.304	0.307	64.0%
<b>Zimbabwe</b>						
<b>Rwanda</b>						
<b>Mozambique</b>						
<b>Ghana</b>						
<b>Nigeria</b>						

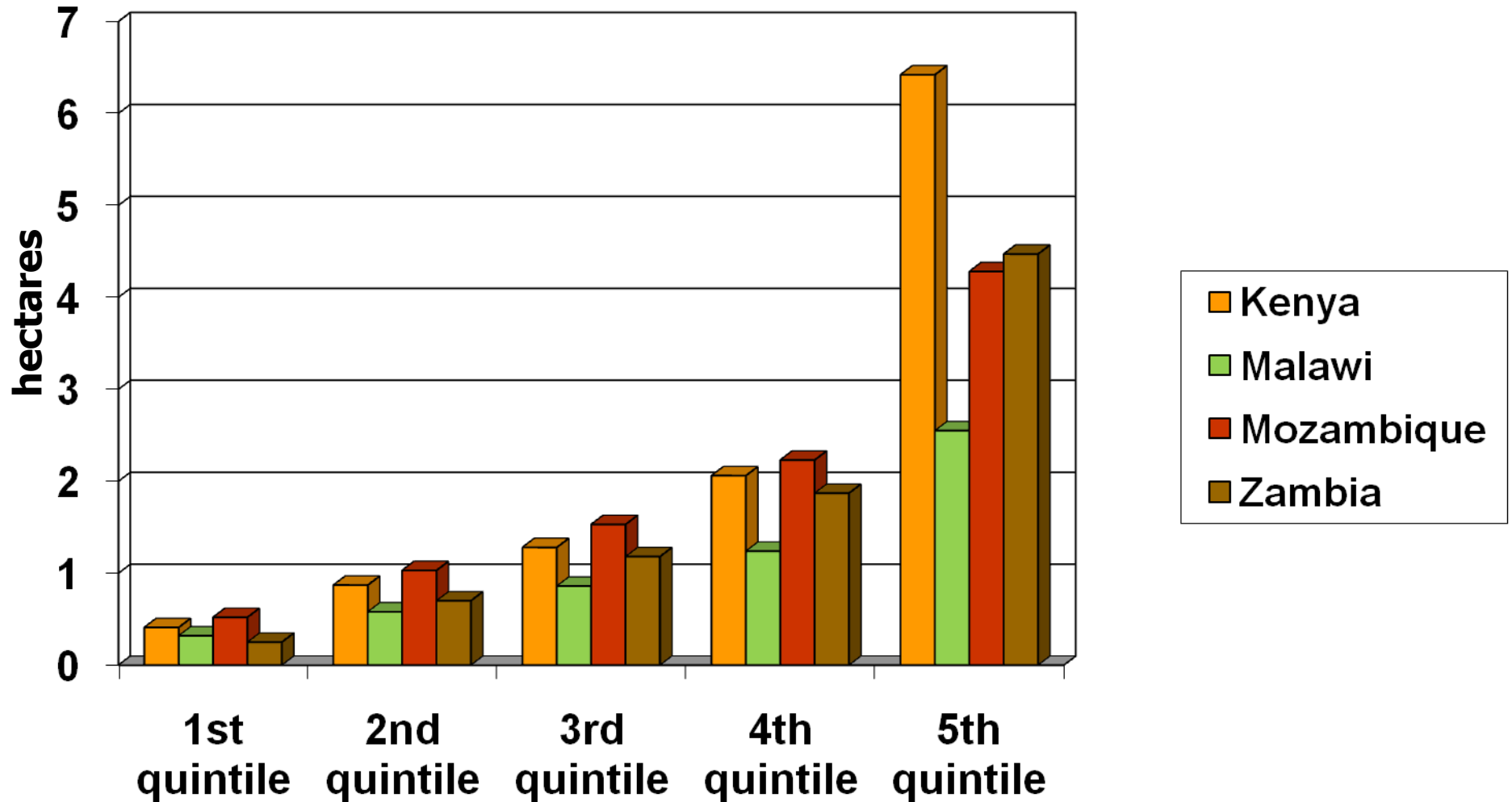
Source: FAO STAT (2010)

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<b>Malawi</b>	0.480	0.466	0.357	0.304	0.307	64.0%
<b>Zimbabwe</b>	0.613	0.550	0.452	0.420	0.469	76.5%
<b>Rwanda</b>	0.212	0.213	0.195	0.186	0.174	82.1%
<b>Mozambique</b>	0.356	0.337	0.320	0.314	0.294	82.6%
<b>Ghana</b>	0.646	0.559	0.508	0.492	0.565	87.5%
<b>Nigeria</b>	0.982	0.860	0.756	0.769	0.898	91.4%

Source: FAO STAT (2010)

## Distribution of farm sizes in smallholder farm sectors

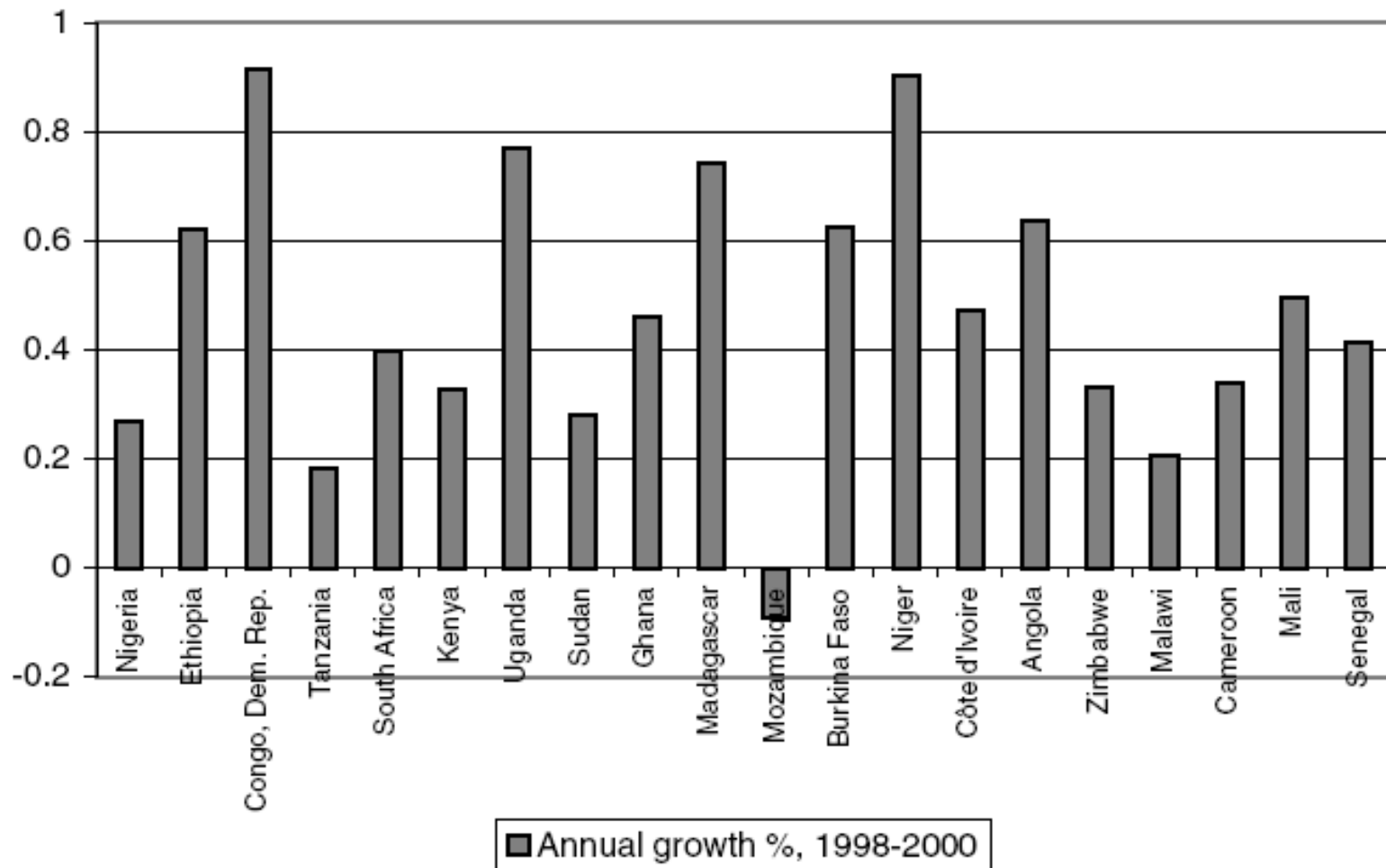


# Disparities within smallholder agriculture, Zambia - 2008

	N=	Farm size (ha)	Asset values (US\$)	Gross rev., maize sales (US\$)	Gross rev., crop sales (US\$)	Total hh income (US\$)
Top 50% of maize sales	30,150 (2%)	<b>7.2</b>	3,703	3,199	3,354	7,624
Rest of maize sellers	467,320 (30%)	<b>1.9</b>	257	172	252	1,272
Households not selling maize	1,010,014 (67%)	<b>1.1</b>	129	0	57	756

Source: CSO Supplemental surveys, 2008

# Rural population growth rates

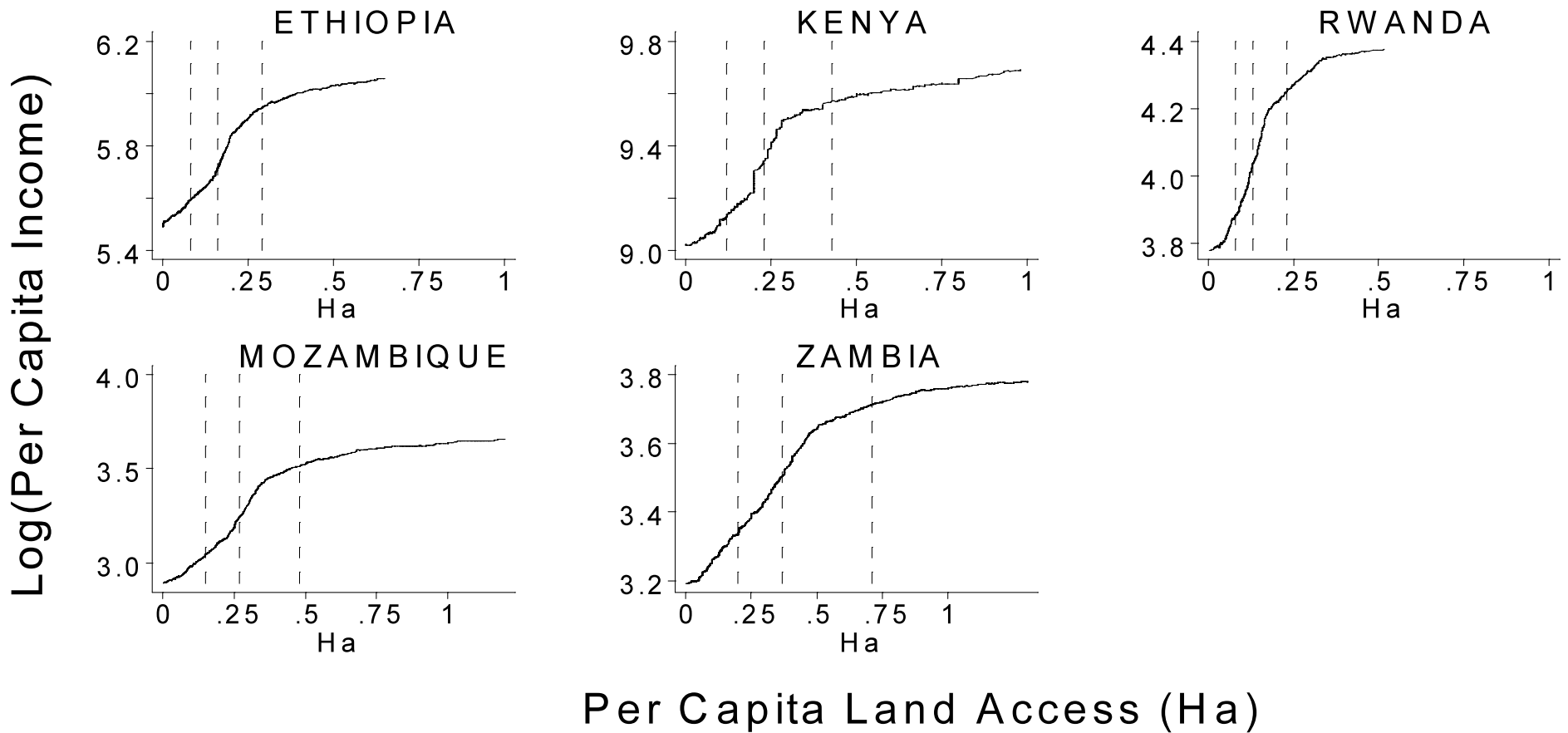


## II. Impacts of rising population density on African agriculture





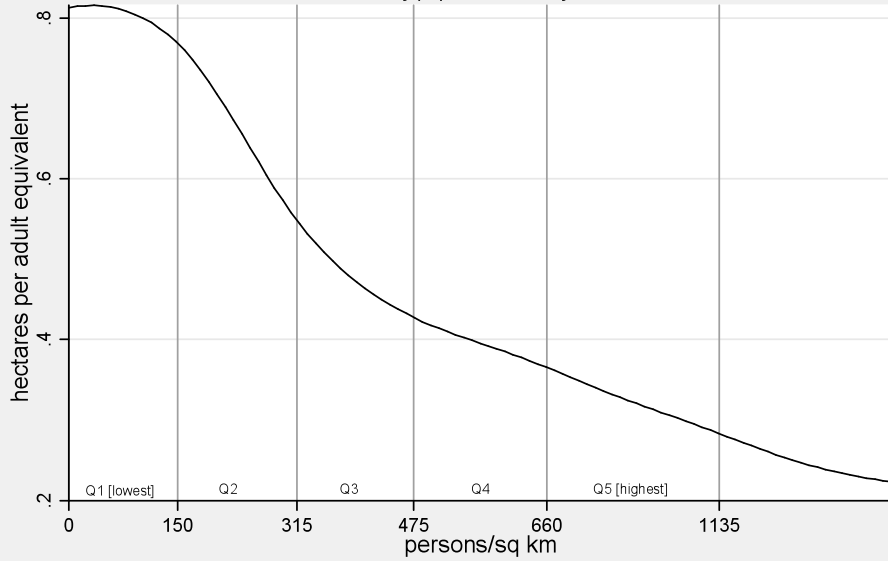
# Relationships between farm size and household income



Note: The vertical lines are drawn at 25th, 50th, and 75th percentiles of per capita land owned for each

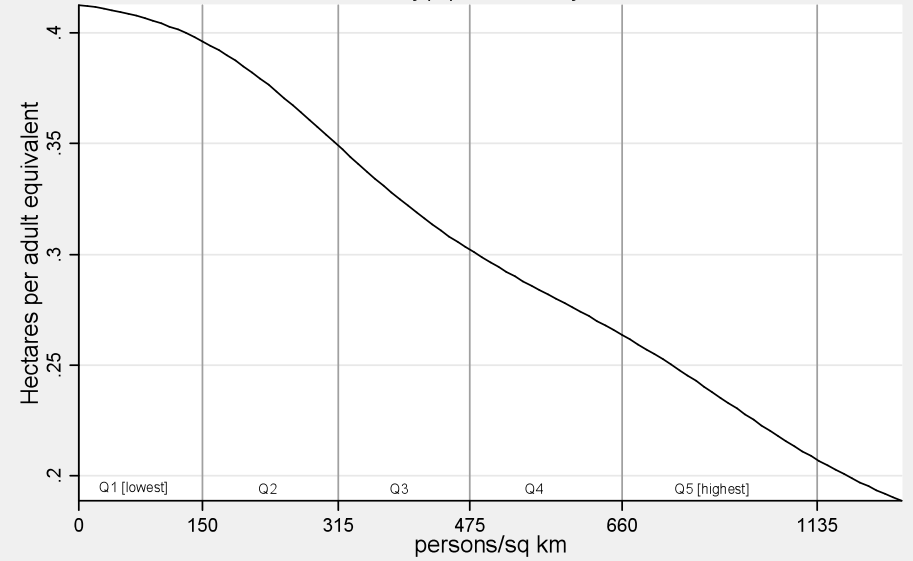
(a) Land holding

by population density

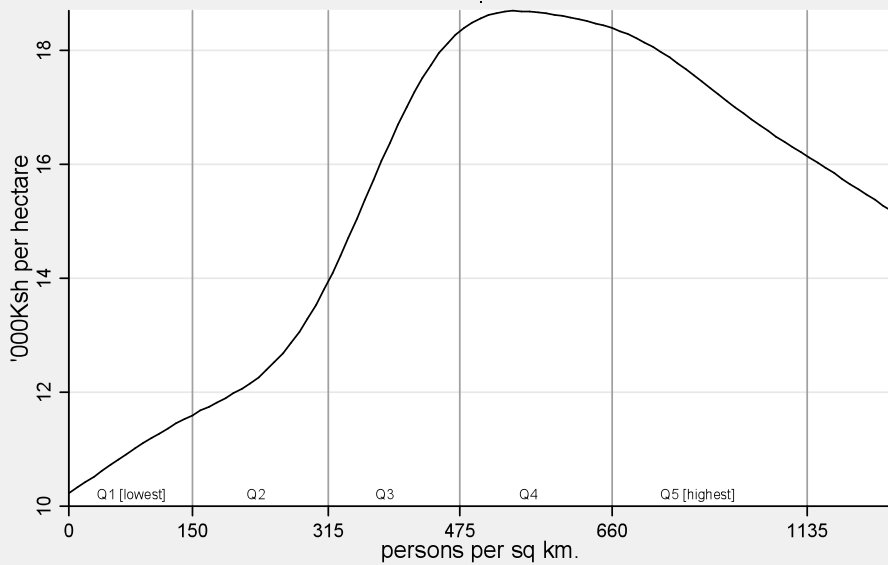


(b) Area under crop

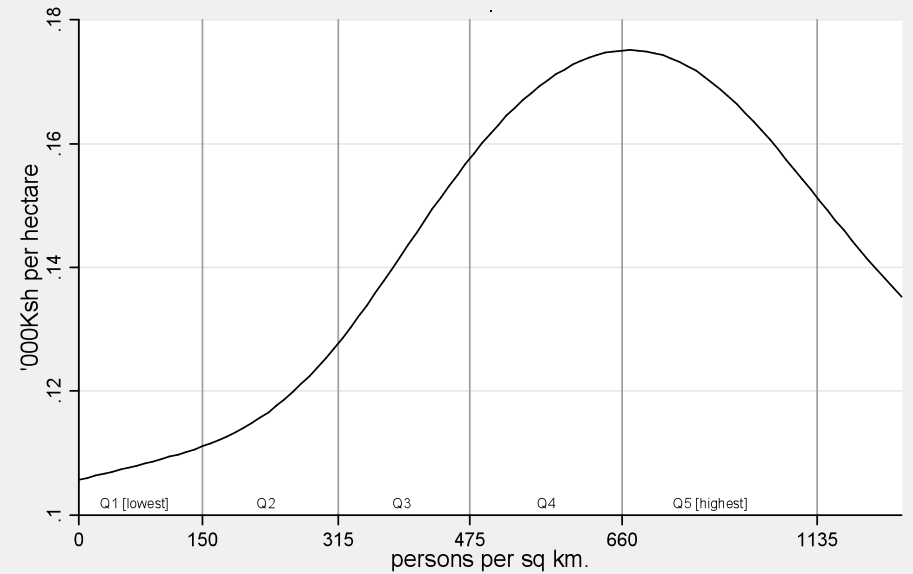
by population density



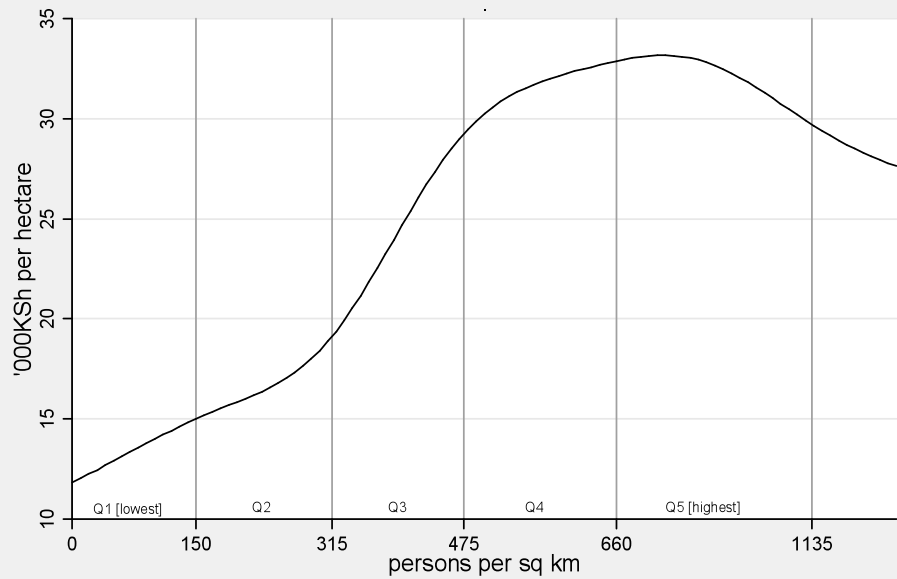
(c) Intensity of cash input use per hectare



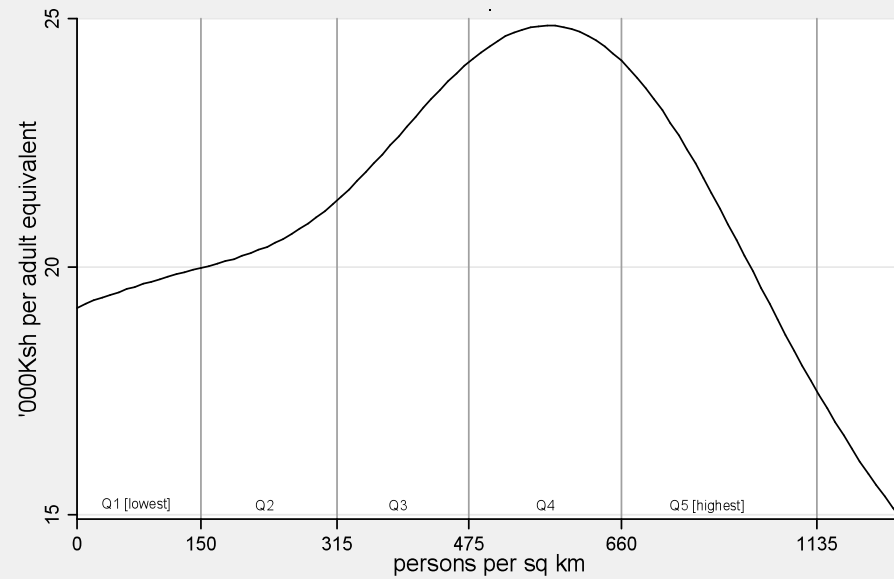
(d) Intensity of fertilizer input use per hectare



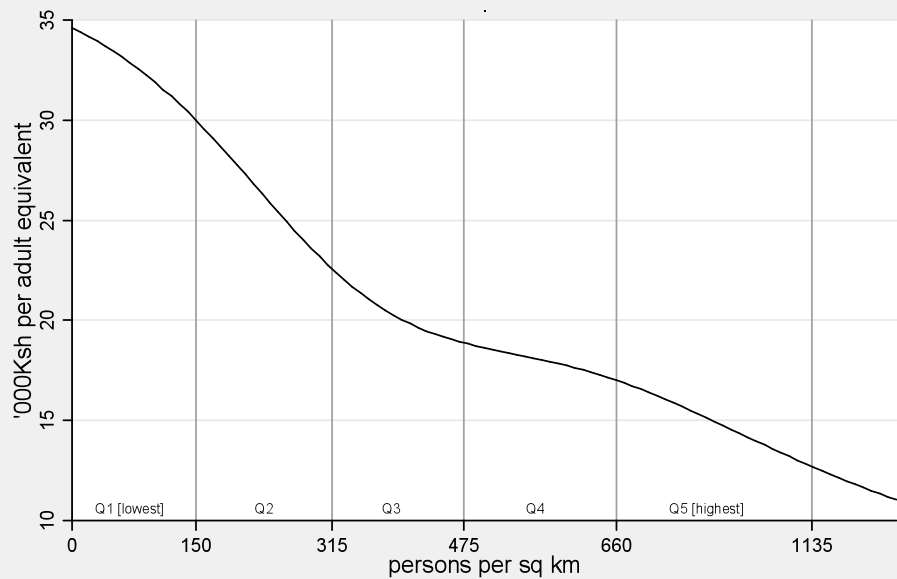
(e) Net farm income per hectare



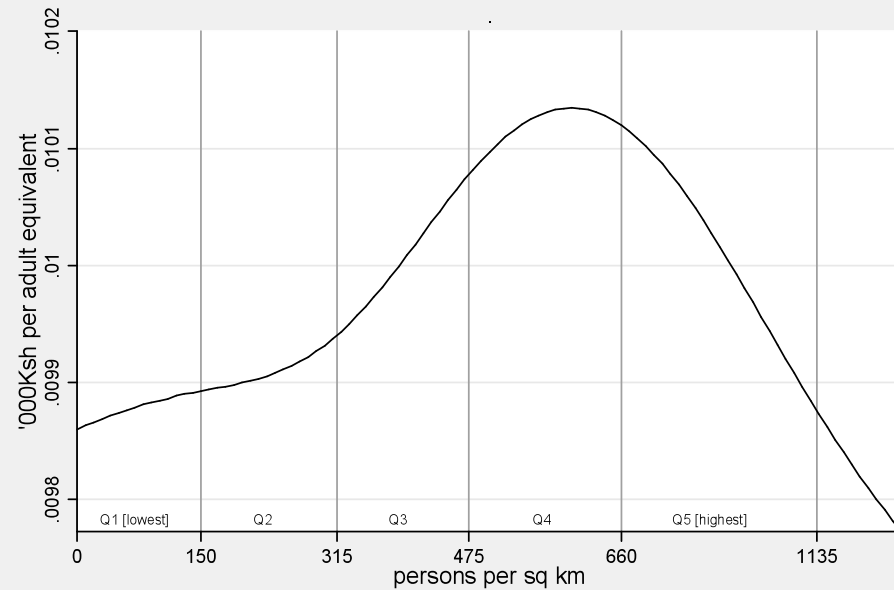
(f) Net farm income per adult equivalent



(g) Household asset value per adult equivalent



(h) Total household income per adult equivalent




# Main findings: how are farming systems changing?

1. Net outflow of adult labor highest in the relatively densely populated areas
2. Farm size is shrinking over time
  - e.g., fathers of hh respondents farm size 4.4 ha → 0.9 ha for respondents (in high density areas of Kenya)
  - 25% of young adults who grew up in rural areas did not inherit land in Kenya
3. Fallow area as % of total farm size is declining
4. Farmers in high density areas are devoting a higher proportion of their land to high value crops
5. Most farm households derive only a minority of their incomes from off-farm employment

# Take-away messages:

1. Many areas have reached a level of population density where negative threshold effects are occurring:
  - This is giving rise to significantly lower farm incomes and asset wealth per adult
  - About 14% of Kenya's rural population lives in areas exceeding this population density threshold
2. Reasons for potential threshold effects:
  - More difficult to produce a surplus as farm size declines
  - Capital constraints on farm intensification → lower productivity
  - Small farms tend to reduce fallows → soil nutrient depletion
  - Off-farm income opportunities are linked to education – most of the rural poor are both poorly educated and have small farm size

The background image shows a rural village scene. In the foreground, two women are standing in a field of green crops. Both women are wearing red headwraps and patterned dresses. The woman on the left is wearing a white top and a patterned skirt, while the woman on the right is wearing a white dress with a colorful pattern and has a baby strapped to her back. In the background, there is a simple wooden building with a thatched roof, surrounded by lush tropical vegetation, including palm trees and other green plants. The sky is clear and blue.

### III.

Why there is no alternative to a  
smallholder-led agricultural  
development strategy

# Why there is no alternative to a smallholder-led agricultural development strategy

- 50-70% of the population is engaged primarily in agriculture
- Agricultural growth with poverty reduction requires that smallholders be the engine
  - Large-farm-led model → latifundia
- Multiplier effects of agricultural growth are highest in smallholder agriculture
- Broad-based agricultural growth leads to virtuous symbiotic rural-urban development

## Illustration of how agricultural growth can fail to reduce poverty – Zambia (2005-2011)

- Zambia initiated a major input subsidy program and marketing board price support program starting in the mid-2000s
- Production of maize – the main staple -- doubled during this period
- But rural poverty remained stubbornly high at 78%



## Smallholder maize production growth from the baseline period (2005/06–2007/08) to 2010/11, by farm size category

		Total smallholder maize production		
Total area cultivated (maize + all other crops)	Average number of farms, 2005/06 to 2007/08, and 2010/11			
	(A)			
0-0.99 ha	616,867			
1-1.99 ha	489,937			
2-4.99 ha	315,459			
5-9.99 ha	42,332			
10-20 ha	6,626			
<b>Total</b>	<b>1,471,221</b>			

**Table 1:** Sources: MACO/CSO Crop Forecast Surveys, 2005/06-2007/08, 2010/11

## Smallholder maize production growth from the baseline period (2005/06–2007/08) to 2010/11, by farm size category

Total smallholder maize production				
Total area cultivated (maize + all other crops)	Average number of farms, 2005/06 to 2007/08, and 2010/11	% of Farms		
	(A)	(B)		
0-0.99 ha	616,867	41.9%		
1-1.99 ha	489,937	33.3%		
2-4.99 ha	315,459	21.4%		
5-9.99 ha	42,332	2.9%		
10-20 ha	6,626	0.5%		
<b>Total</b>	<b>1,471,221</b>	<b>100%</b>		

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Total smallholder maize production					
Total area cultivated (maize + all other crops)	Average number of farms, 2005/06 to 2007/08, and 2010/11	% of Farms	Annual mean during 2005/06 to 2007/08 baseline period (MT)		
	(A)	(B)	(C)		
<b>0-0.99 ha</b>	616,867	41.9%	212,335		
<b>1-1.99 ha</b>	489,937	33.3%	381,293		
<b>2-4.99 ha</b>	315,459	21.4%	490,102		
<b>5-9.99 ha</b>	42,332	2.9%	196,848		
<b>10-20 ha</b>	6,626	0.5%	103,156		
<b>Total</b>	<b>1,471,221</b>	<b>100%</b>	<b>1,383,735</b>		

**Table 1:** Sources: MACO/CSO Crop Forecast Surveys, 2005/06-2007/08, 2010/11

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	(A)	(B)	(C)	(D)	
<b>0-0.99 ha</b>	616,867	41.9%	212,335	309,324	
<b>1-1.99 ha</b>	489,937	33.3%	381,293	707,438	
<b>2-4.99 ha</b>	315,459	21.4%	490,102	1,130,527	
<b>5-9.99 ha</b>	42,332	2.9%	196,848	494,719	
<b>10-20 ha</b>	6,626	0.5%	103,156	144,888	
<b>Total</b>	1,471,221	100%	1,383,735	2,786,896	

**Table 1:** Sources: MACO/CSO Crop Forecast Surveys, 2005/06-2007/08, 2010/11

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Total area cultivated (maize + all other crops)	Average number of farms, 2005/06 to 2007/08, and 2010/11	% of Farms	Annual mean during 2005/06 to 2007/08 baseline period (MT)	2010/11 (MT)	Absolute change (MT) (D-C)
	(A)	(B)	(C)	(D)	(E)
<b>0-0.99 ha</b>	616,867	41.9%	212,335	309,324	96,989
<b>1-1.99 ha</b>	489,937	33.3%	381,293	707,438	326,145
<b>2-4.99 ha</b>	315,459	21.4%	490,102	1,130,527	640,425
<b>5-9.99 ha</b>	42,332	2.9%	196,848	494,719	297,871
<b>10-20 ha</b>	6,626	0.5%	103,156	144,888	41,732
<b>Total</b>	1,471,221	100%	1,383,735	2,786,896	1,403,161

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	(A)	(B)	(C)	(D)	(E)	(F)
<b>0-0.99 ha</b>	616,867	41.9%	212,335	309,324	96,989	157.2
<b>1-1.99 ha</b>	489,937	33.3%	381,293	707,438	326,145	665.7
<b>2-4.99 ha</b>	315,459	21.4%	490,102	1,130,527	640,425	2,030.1
<b>5-9.99 ha</b>	42,332	2.9%	196,848	494,719	297,871	7,036.6
<b>10-20 ha</b>	6,626	0.5%	103,156	144,888	41,732	6,298.4
<b>Total</b>	1,471,221	100%	1,383,735	2,786,896	1,403,161	953.7

Sources: MACO/CSO Crop Forecast Surveys, 2005/06-2007/08, 2010/11

## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

Total area cultivated (maize + all other crops)	Number of farms					
	(A)					
<b>0-0.99 ha</b>	616,867					
<b>1-1.99 ha</b>	489,937					
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Source: MACO/CSO Crop Forecast Survey, 2010/11

## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

Total area cultivated (maize + all other crops)	Number of farms (A)	% of farms (B)				
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<b>5-9.99 ha</b>	42,332	2.9%				
<b>10-20 ha</b>	6,626	0.5%				
<b>Total</b>	1,471,221	100%				

Source: MACO/CSO Crop Forecast Survey, 2010/11



## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

Total area cultivated (maize + all other crops)	Number of farms	% of farms	% of farmers receiving FISP fertilizer			
	(A)	(B)	(C)			
<b>0-0.99 ha</b>	616,867	41.9%	14.3%			
<b>1-1.99 ha</b>	489,937	33.3%	30.6%			
<b>2-4.99 ha</b>	315,459	21.4%	45.1%			
<b>5-9.99 ha</b>	42,332	2.9%	58.5%			
<b>10-20 ha</b>	6,626	0.5%	52.6%			
<b>Total</b>	1,471,221	100%	28.6%			

Source: MACO/CSO Crop Forecast Survey, 2010/11

## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

Total area cultivated (maize + all other crops)	Number of farms	% of farms	% of farmers receiving FISP fertilizer	kg of FISP fertilizer received per farm household		
	(A)	(B)	(C)	(D)		
<b>0-0.99 ha</b>	616,867	41.9%	14.3%	24.1		
<b>1-1.99 ha</b>	489,937	33.3%	30.6%	69.3		
<b>2-4.99 ha</b>	315,459	21.4%	45.1%	139.7		
<b>5-9.99 ha</b>	42,332	2.9%	58.5%	309.7		
<b>10-20 ha</b>	6,626	0.5%	52.6%	345.6		
<b>Total</b>	1,471,221	100%	28.6%	77.1		

Source: MACO/CSO Crop Forecast Survey, 2010/11

## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

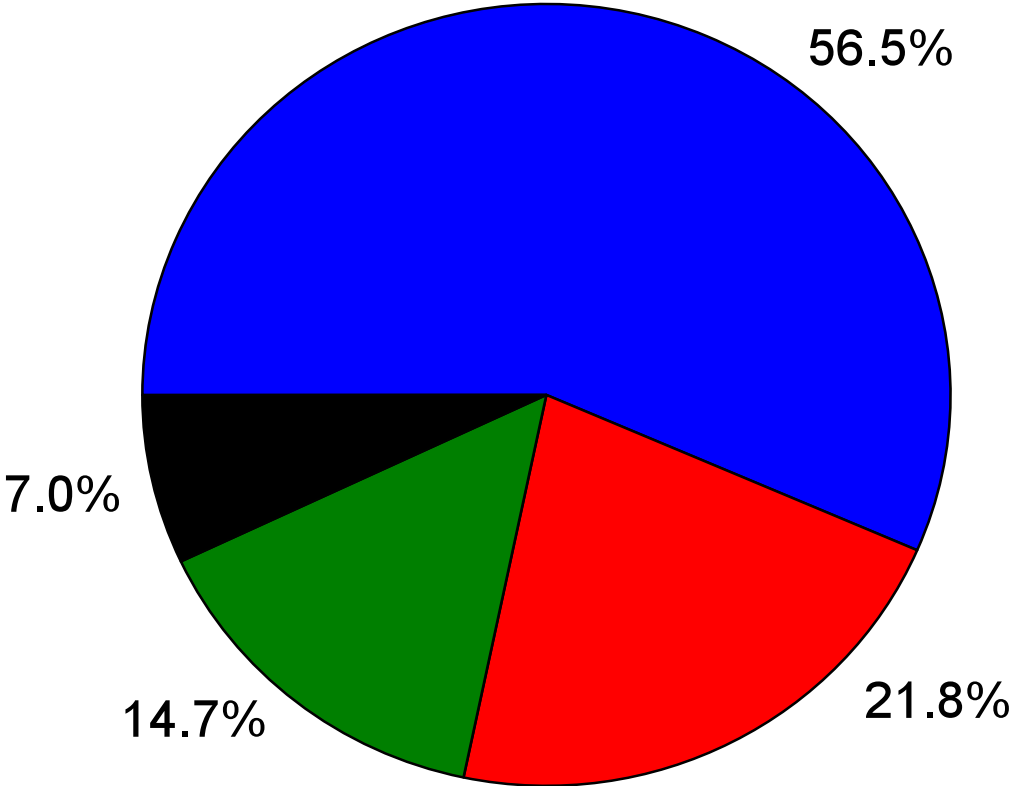
Total area cultivated (maize + all other crops)	Number of farms	% of farms	% of farmers receiving FISP fertilizer	kg of FISP fertilizer received per farm household	% of farmers expecting to sell maize
	(A)	(B)	(C)	(D)	(E)
<b>0-0.99 ha</b>	616,867	41.9%	14.3%	24.1	22.2
<b>1-1.99 ha</b>	489,937	33.3%	30.6%	69.3	47.7
<b>2-4.99 ha</b>	315,459	21.4%	45.1%	139.7	64.0
<b>5-9.99 ha</b>	42,332	2.9%	58.5%	309.7	82.1
<b>10-20 ha</b>	6,626	0.5%	52.6%	345.6	86.8
<b>Total</b>	1,471,221	100%	28.6%	77.1	42.7

Source: MACO/CSO Crop Forecast Survey, 2010/11

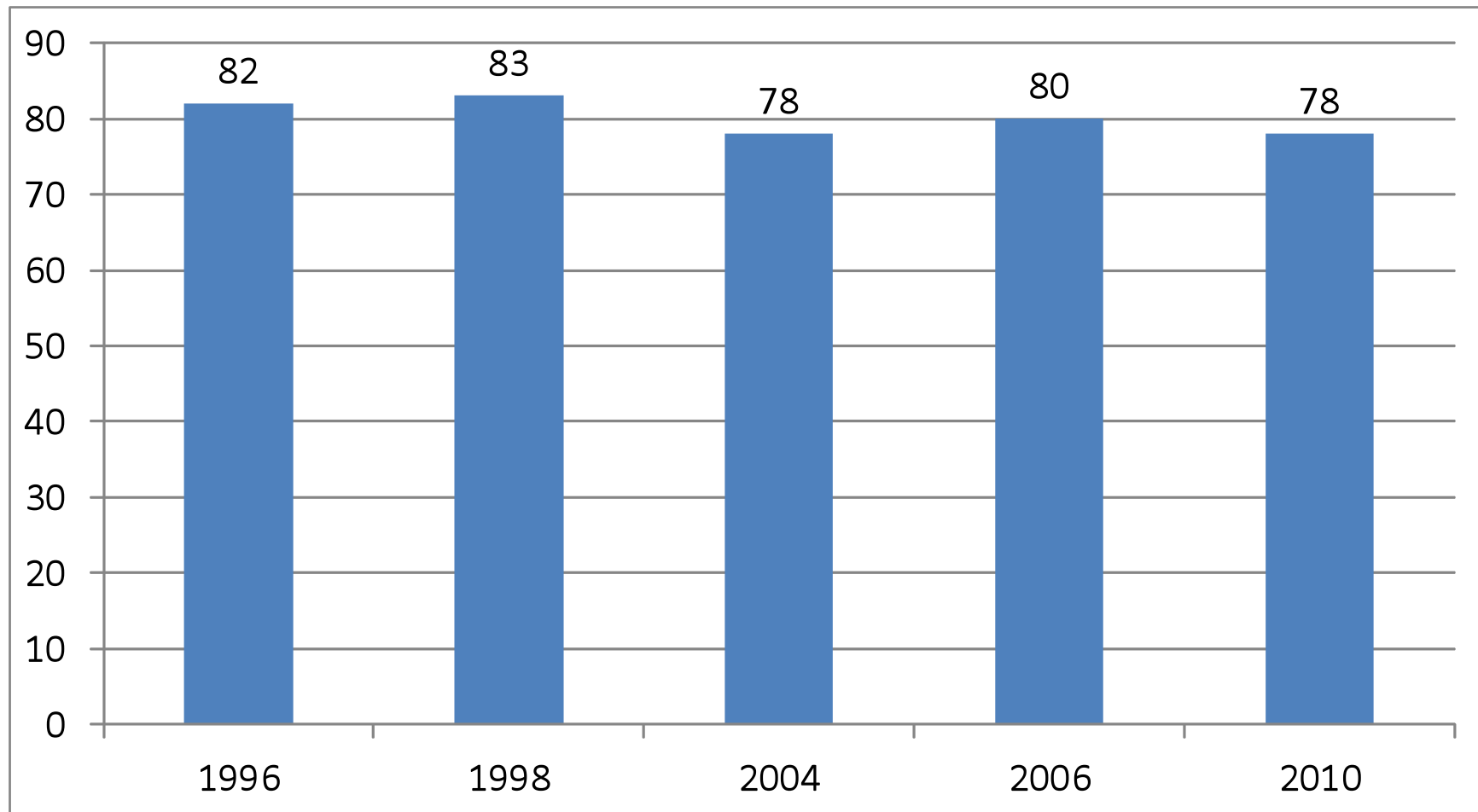
## FISP fertiliser received (2010/11 crop season) and expected maize sales, 2011, by farm size category

Total area cultivated (maize + all other crops)	Number of farms	% of farms	% of farmers receiving FISP fertilizer	kg of FISP fertilizer received per farm household	% of farmers expecting to sell maize	Expected maize sales (kg/farm household)
	(A)	(B)	(C)	(D)	(E)	(F)
<b>0-0.99 ha</b>	616,867	41.9%	14.3%	24.1	22.2	135
<b>1-1.99 ha</b>	489,937	33.3%	30.6%	69.3	47.7	609
<b>2-4.99 ha</b>	315,459	21.4%	45.1%	139.7	64.0	1,729
<b>5-9.99 ha</b>	42,332	2.9%	58.5%	309.7	82.1	6,613
<b>10-20 ha</b>	6,626	0.5%	52.6%	345.6	86.8	15,144
<b>Total</b>	1,471,221	100%	28.6%	77.1	42.7	950

# Public expenditures to agriculture, 2010, Zambia



# Rural headcount poverty rates, Zambia



## Take-away message:

- A broad-based, inclusive form of agricultural growth has much greater prospects of reducing rural poverty
- Consistent with documented structural transformation processes in Asia (Mellor, Johnston, etc):
  - Lipton (2006): "except in the cases of a handful of city-states, there are virtually no examples of mass poverty reduction since 1700 that did not start with sharp rises in the productivity in small family farms"

A close-up photograph of two large, round, green melons hanging from a vine. The melons are in sharp focus, showing their smooth, slightly textured skin. They are set against a background of lush green leaves and a bright, sunlit sky, creating a bokeh effect. The lighting is natural, highlighting the curves of the melons and the vibrant green of the foliage.

IV.  
Conclusions and Implications for  
Policy



# Conclusions

1. Problems of inadequate access to land almost never features in national development plans or poverty reduction strategies
2. To our knowledge, there has been little recognition of the potential challenges associated with increasingly densely populated and land-constrained areas of rural Africa, despite the fact that a sizeable and increasing share of its rural population live in such areas

# Conclusions

3. There is a growing perception that the development challenge for the region is how to productively utilize the continents' underutilized land resources.
4. Especially since the rise of world food prices, there have been concerted efforts to transfer land out of customary tenure (under the control of traditional authorities) to the state or to private individuals who, it is argued, can more effectively exploit the productive potential of the land to meet national food security objectives.

# Conclusions

5. Such efforts have nurtured the growth of a relatively well-capitalized class of “emergent” African farmers
6. The growing focus on how best to exploit unutilized land in Africa has arguably diverted attention from the more central and enduring challenge of developing agricultural development strategies that effectively address the continent’s massive rural poverty and food insecurity problems

**What to do?**

## Ranking of Alternative Investments: Meta-Study Evidence from Asia and Africa

	The Economist	IFPRI study
Policies		
Road investment		
Agricultural R&D		
Agricultural extension services		
Credit subsidies		
Fertilizer subsidies		
Irrigation		

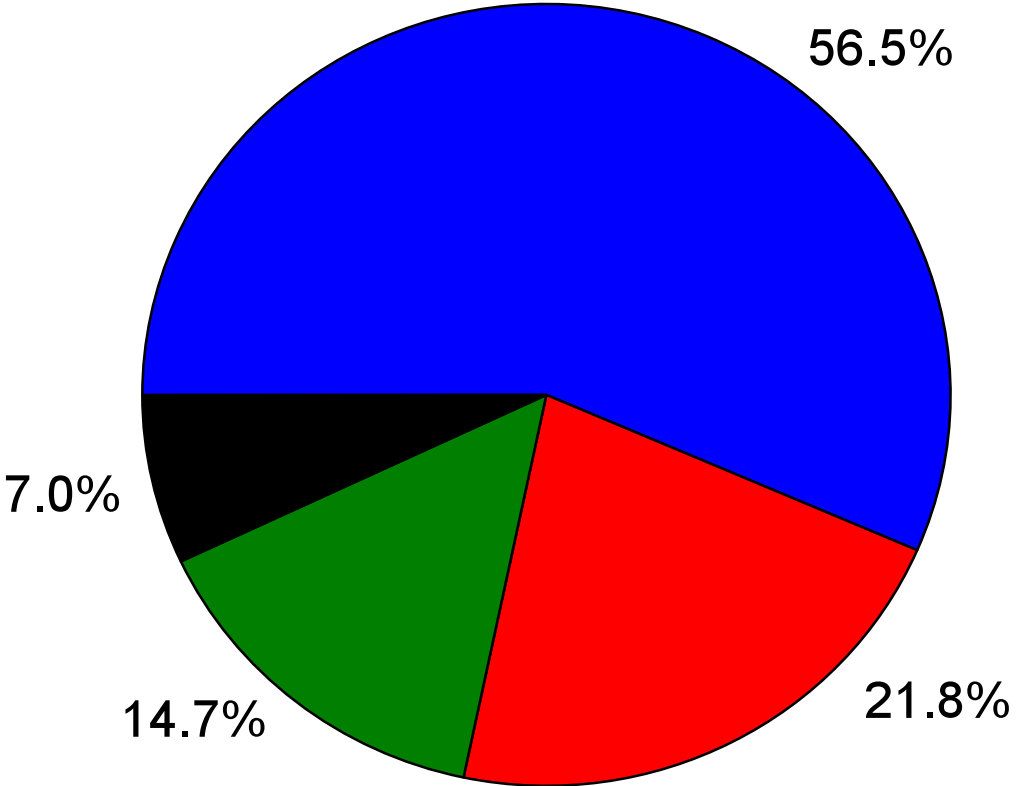
Ranking with respect to *agricultural growth*:  
Evidence from Asia

	The Economist	IFPRI
Policies	1	
Road investment	2	1
Agricultural R&D	3	2
Agricultural extension services	4	
Credit subsidies	7	3
Fertilizer subsidies	5	4
Irrigation	6	5

Ranking with respect to *poverty reduction*:  
Evidence from Asia

	The Economist	IFPRI
Policies	1	
Road investment	2	1
Agricultural R&D	3	2
Agricultural extension services	5	
Credit subsidies	7	3
Fertilizer subsidies	4	4
Irrigation	6	5

# Public expenditures to agriculture, 2010, Zambia



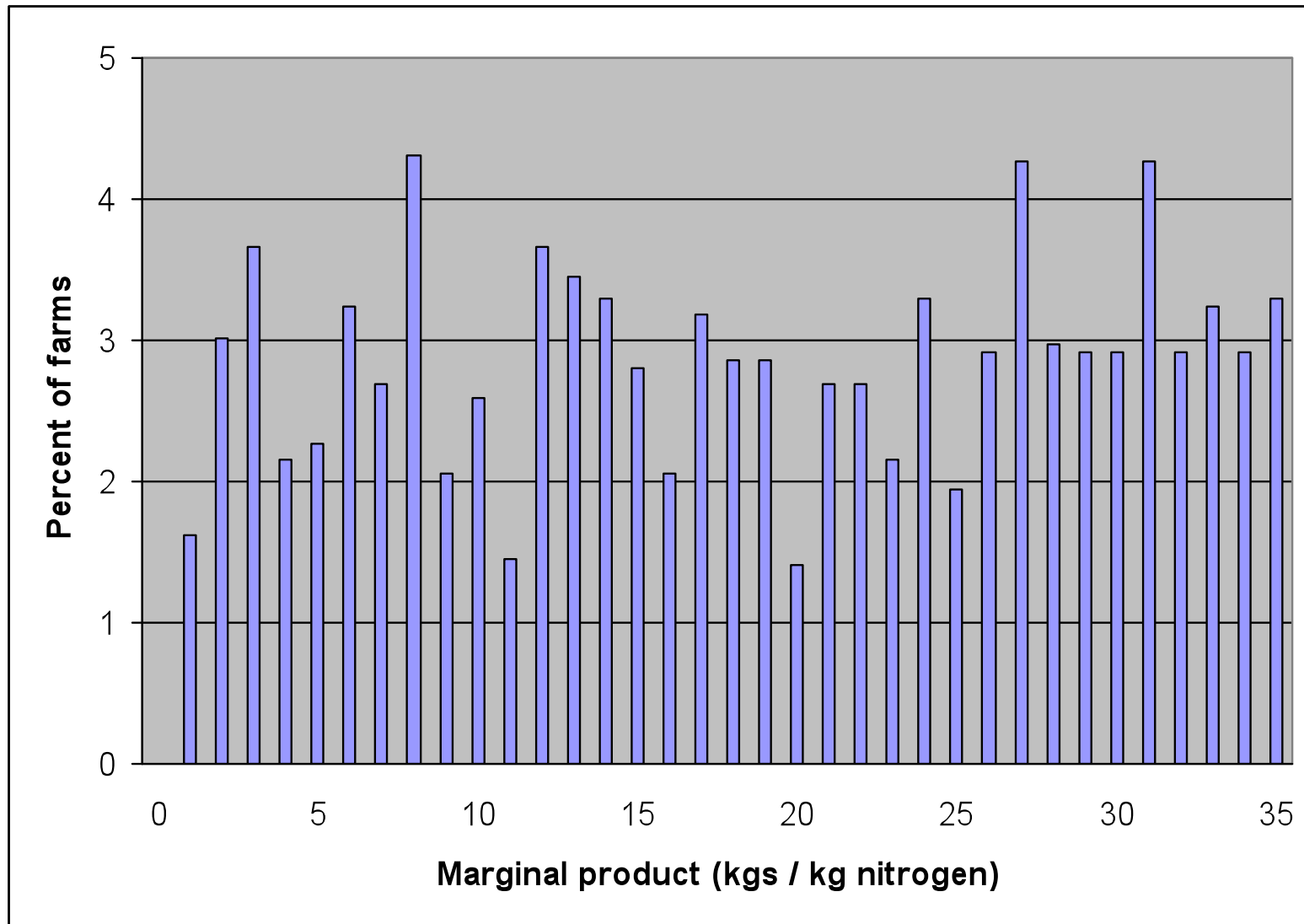


# What to do:

## 1. Research & Extension:

- redoubled public investment in the international and national agricultural research and extension systems
  - focus on new land-saving farm technologies and
  - practices appropriate for one-hectare farms

## Variation in farmers' efficiency of fertilizer use on maize, Agroecological Zone IIa, Zambia



Note: Zone IIa is a relatively high-potential zone suitable for intensive maize production

# What to do:

## 1. Research & Extension:

- redoubled public investment in the international and national agricultural research and extension systems
  - focus on new land-saving farm technologies and
  - practices appropriate for one-hectare farms or smaller

## 2. Physical infrastructure and land markets:

- physical infrastructure investment in the less populated regions– Gokwe example
- Public auction of land – raise Treasury revenue for small farm development

## 3. Address land inequalities:

- conduct land audit
- land tax on under-utilized land to provide incentives for non-farming landowners to release land.

## Consequences of “do nothing” option

- Inability of large % of rural population to participate in/respond to agricultural growth opportunities
- Closing off the most effective policy option for poverty reduction
- Unviable rural livelihoods contribute to rural-urban migration and the myriad problems associated with rapid urbanization:
  - rise of urban slums, poor sanitation, health crises, unemployment, etc.
- Possible civil instability?
- Inevitable rise of large commercial agriculture, not because large farms are more efficient but because the public sector didn't respond to the challenge

**Thank You**

