



African Agriculture Toward 2030: Changes in Urbanization and Agricultural Land Dynamics: Implications for CGIAR Research

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INDABA AGRICULTURAL POLICY RESEARCH INSTITUTE

Roadmap

2

1. Global drivers
2. Urbanization
3. Land dynamics (not farm size)
4. Sexy continuum vs. importance continuum
5. List of priority policy issues → CGIAR research priorities

3

Global developments affecting SSA

Global developments affecting SSA

4

1. Higher food prices (**)
 - peak oil theories (*)
 - global environmental change (***)
 - projected rate of growth in $D > S$ (**)
2. Probably more volatile food prices (**)
 - Rising linkage between food and fuel markets (***)
 - Energy market volatile transmits to food markets (**)
3. Environmental change may impede food productivity growth (***)

Global developments affecting SSA (2)

5

4. Food production a major contributor to greenhouse gas emissions (***)

- Primarily through use of fossil fuels in production
- conversion of forest/grasslands to cropland and high

5. Rising energy prices may affect

- modes of production (less energy-using, more labor using, zero-till, CF??)
- location of production (areas with high output/energy cost ratios)
- Composition of production (crops with high output value/energy cost ratios)

Global developments affecting SSA (3)

6

6. Rising share of R&D spending carried out by private sector (**)
 - Relative neglect of semi-arid areas?
 - Rising tangle of IPRs for public research systems to navigate through

7

Urbanization trends in SSA

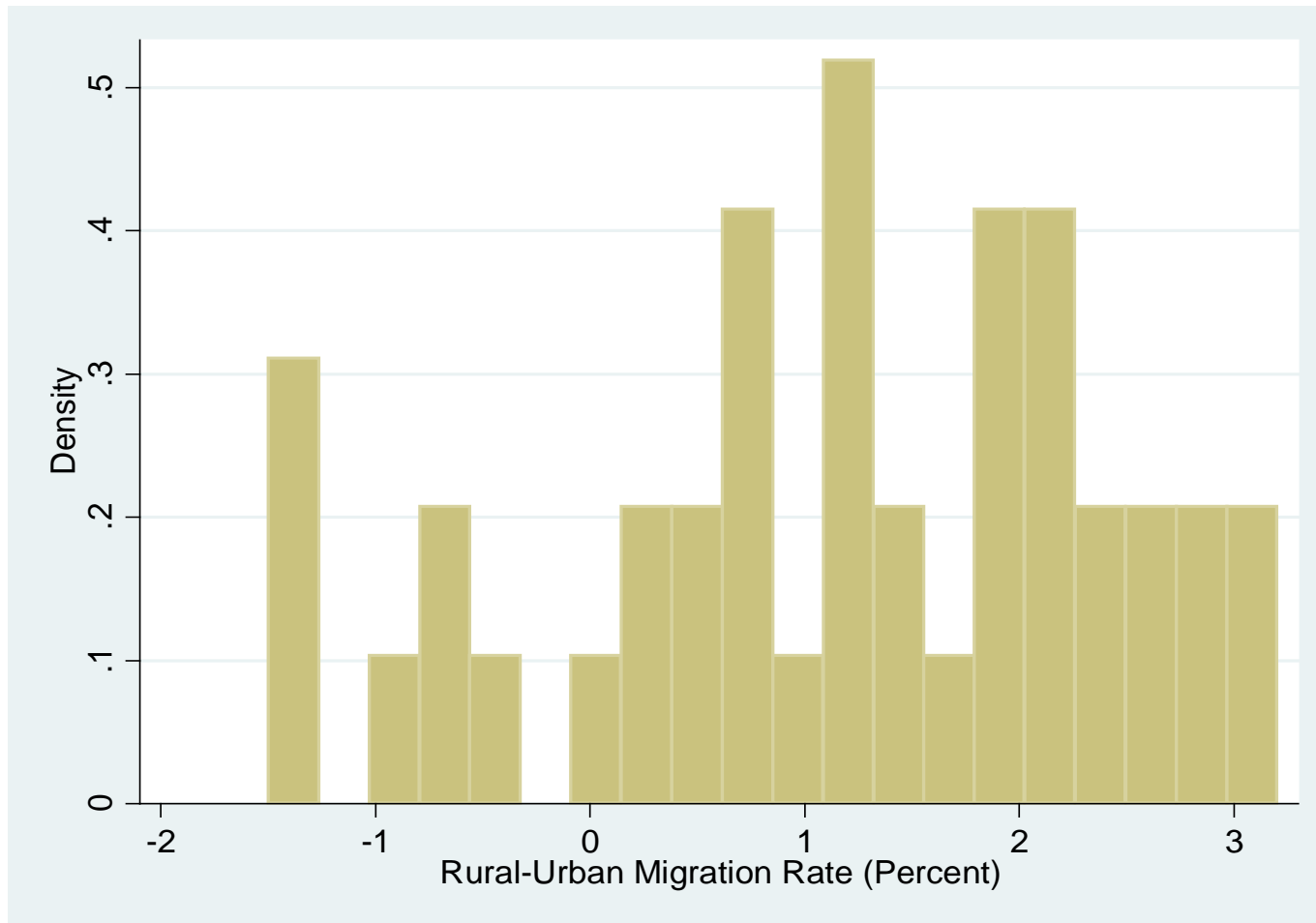
Trends in SSA urbanization

8

1. Continued rapid growth in SSA urban populations
 - Several mega-cities
 - Urban growth mostly occurring in small/medium-sized towns
 - Much variation across the continent
2. Urban pop. Growth: 3.3% per year
 - 2.2% per year natural growth
 - 1.1% per year rural-urban migration
 - About 1/3 of urban growth influenced by rural livelihoods

Rural urban migration rates, SSA

9



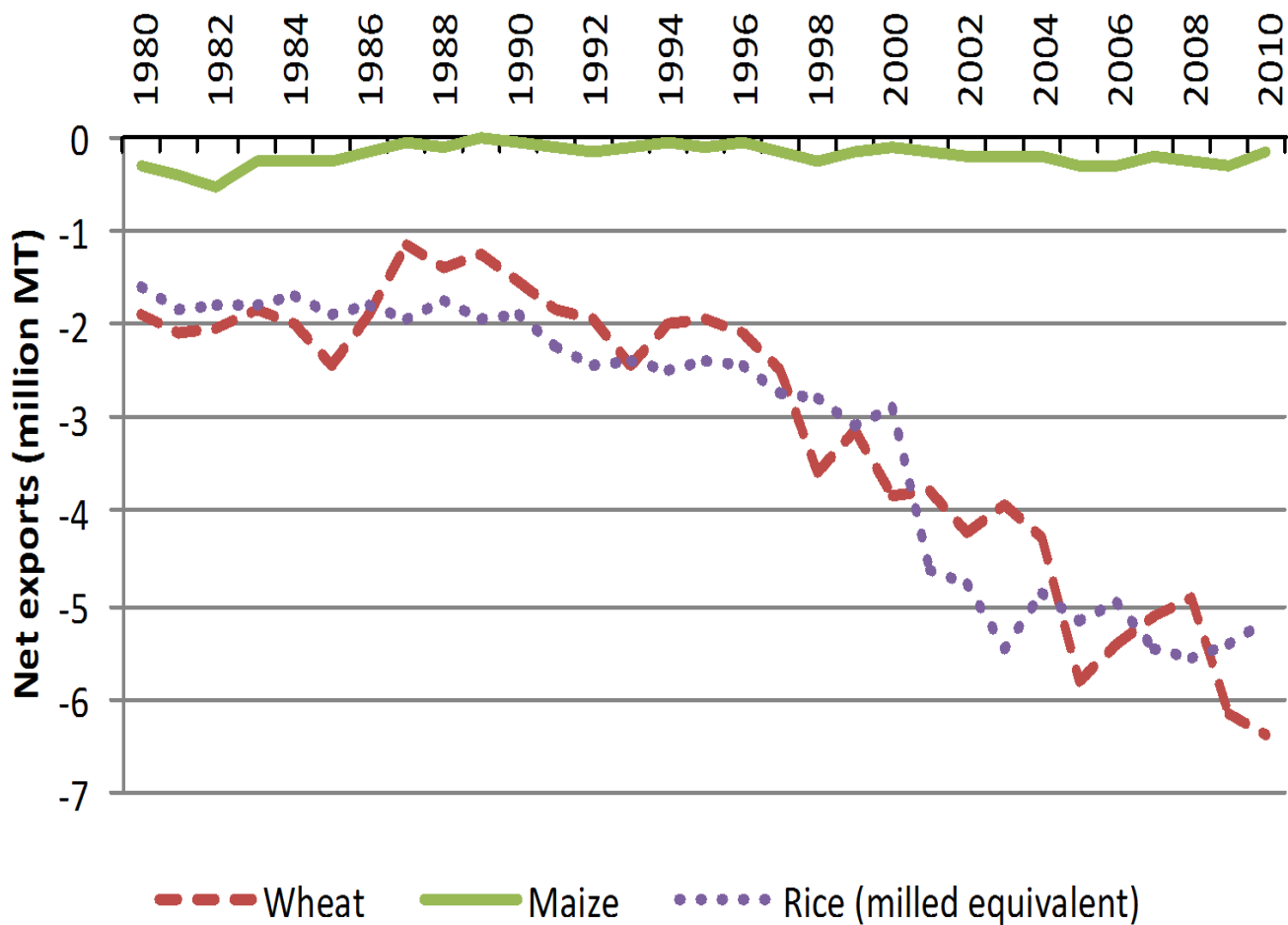
Trends in SSA urbanization (2)

10

3. Steadily rising dependence on world markets for food
 - Staples: wheat and rice

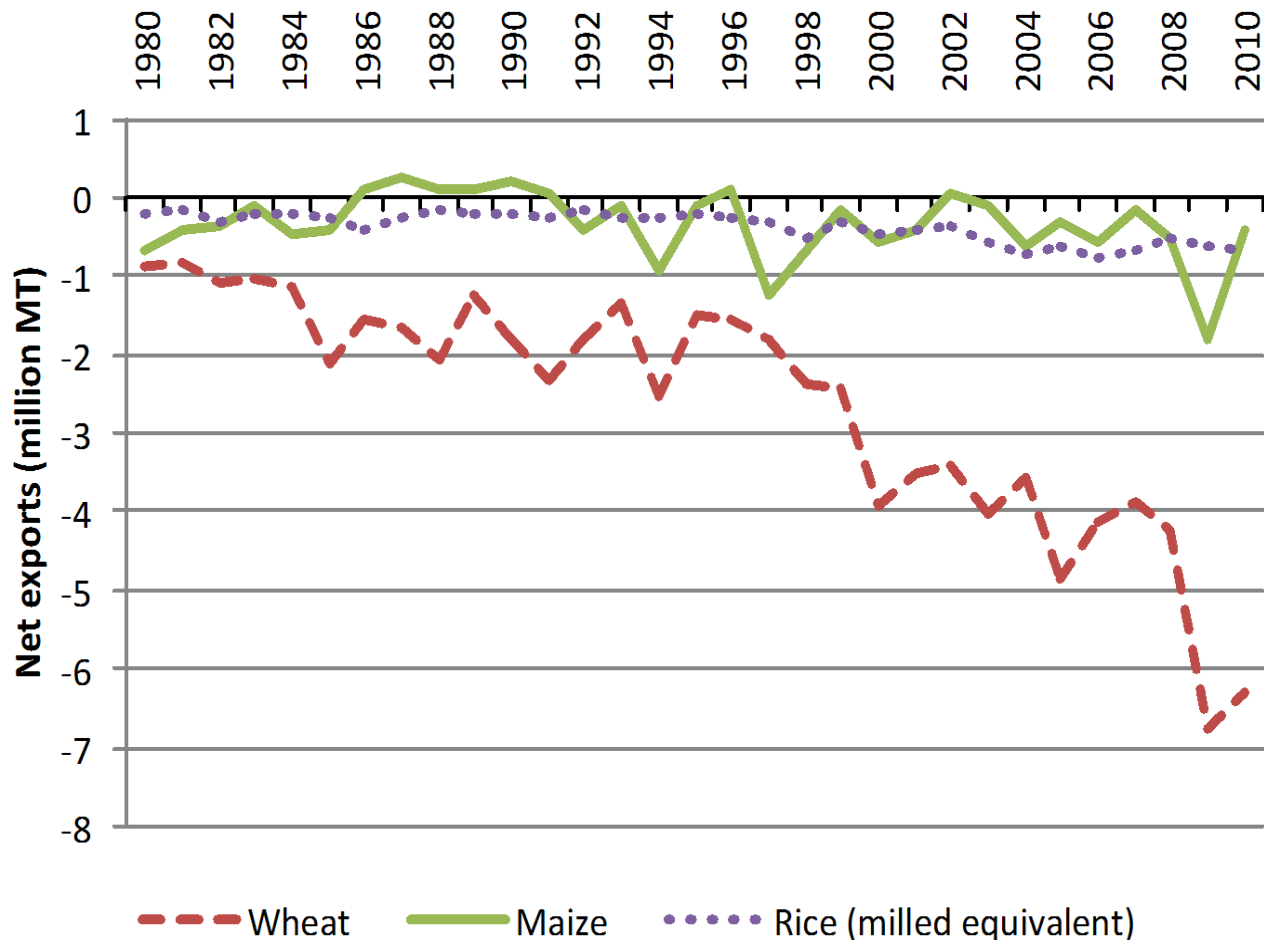
Net exports of wheat, maize & rice, West Africa, 1980-2010.

11



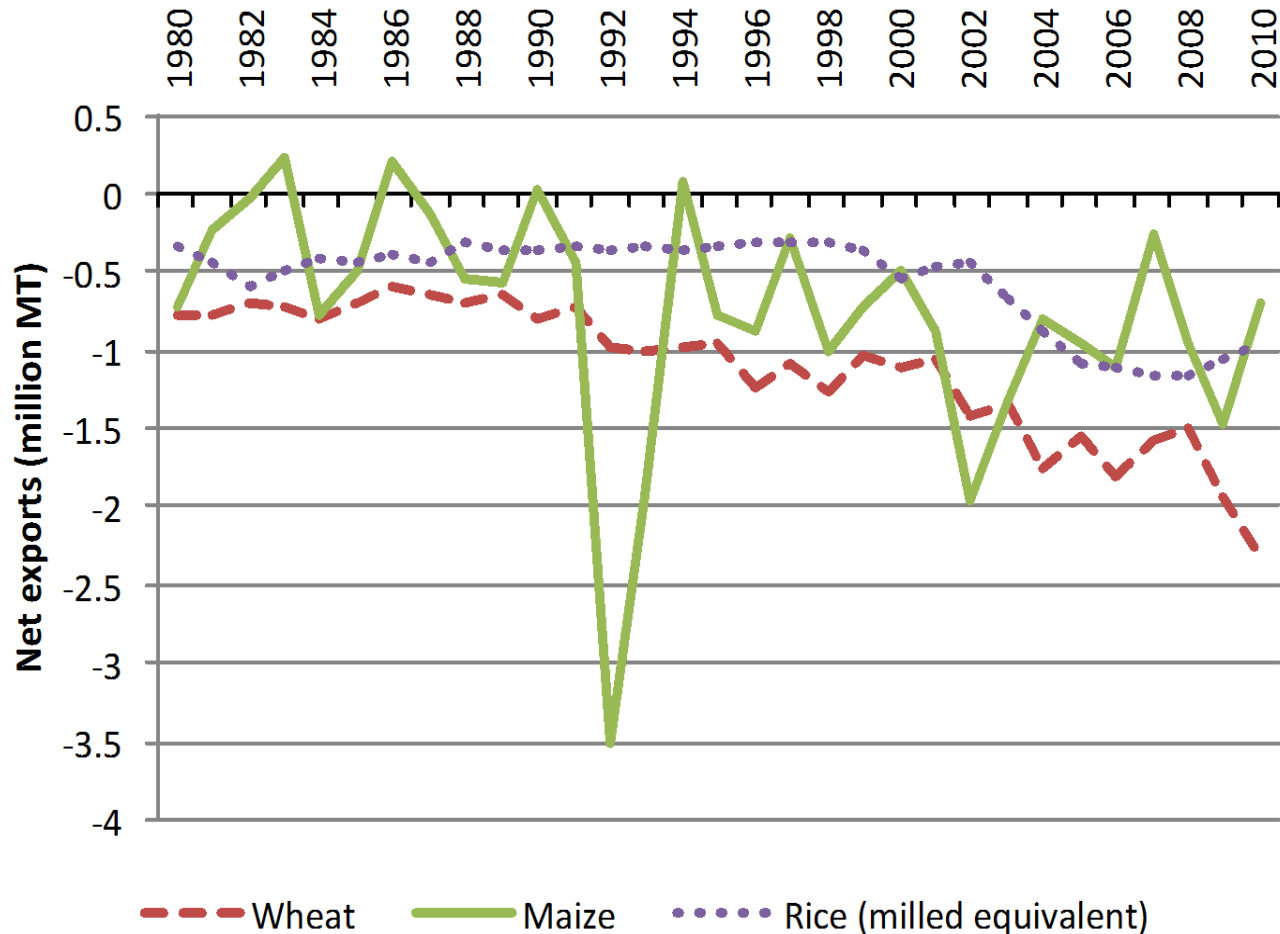
Net exports of wheat, maize & rice, East Africa, 1980-2010.

12



Net exports of wheat, maize & rice, southern Africa, 1980-2010.

13



Trends in SSA urbanization (2)

14

3. Steadily rising dependence on world markets for food
 - Staples: wheat and rice
 - Also animal products, especially poultry
4. Rising proportion of agricultural demand subject to more exacting requirements to meet end user specifications
 - Form of entry barrier to knowledge-poor farmers

Trends in SSA urbanization (3)

15

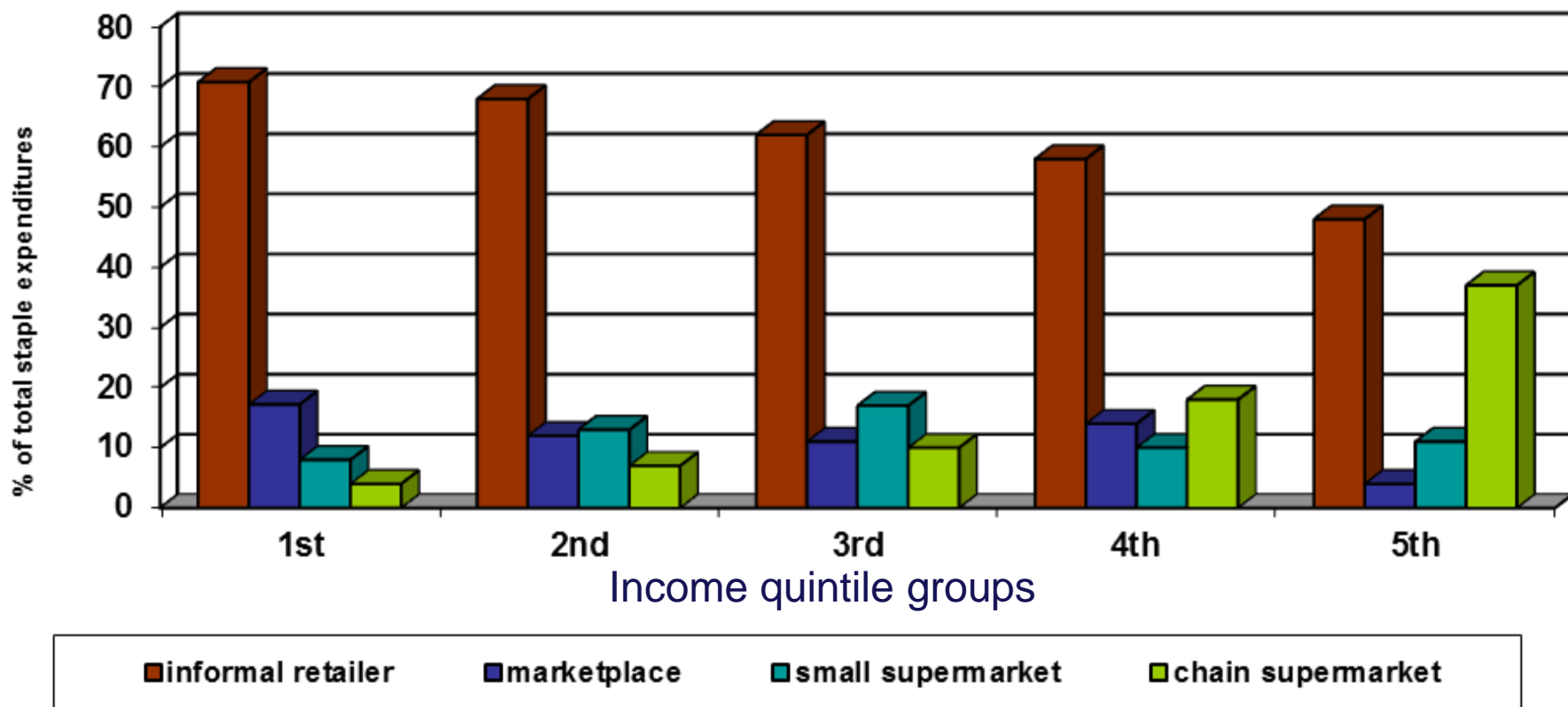
3. More diversified diets

- Staples: wheat and rice
- Also animal products, especially poultry
- Rise of westernized diseases: cardiovascular, obesity

4. How rapidly is the downstream processing/retailing stage of food system changing?

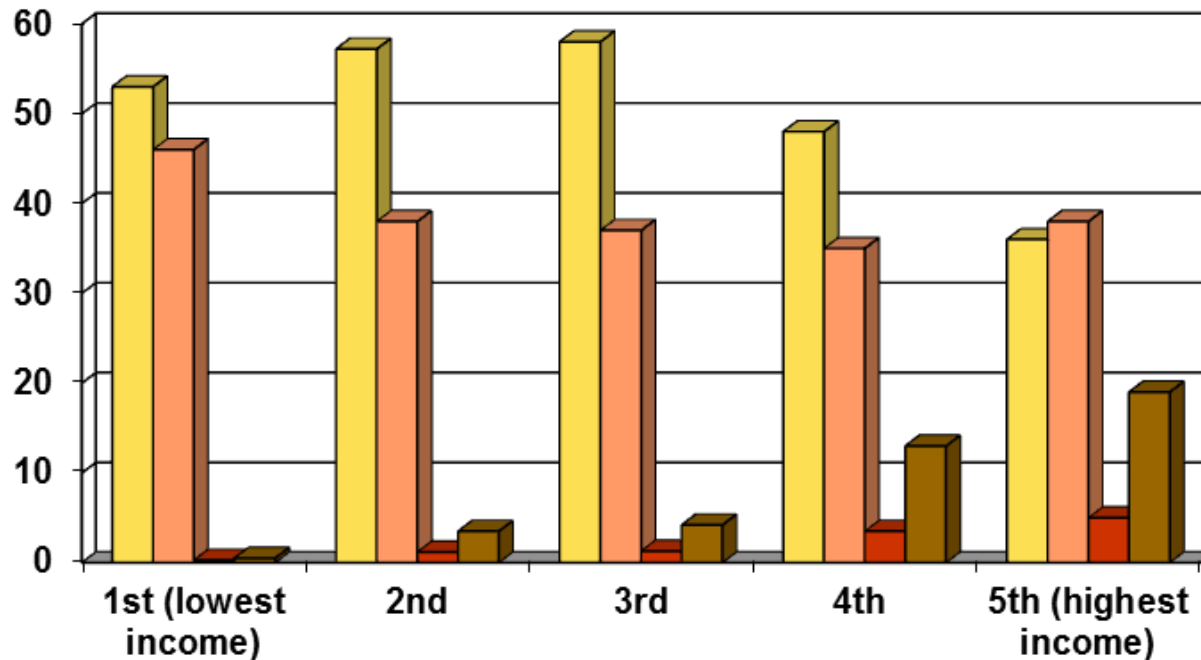
Staple food expenditure shares, Nairobi, 2004

16



Staple food expenditure shares, four cities in Zambia, 2008

17



5. Future structure of food systems in SSA will be determined by whether majority of demand is sourced domestically for through imports
- The latter will lead to
 - more concentrated processing and retailing systems
 - atrophy of investment in smallholder agriculture
 - transition toward Latin American latifundia model

6. Increased urban vulnerability to storms, flooding, and other impacts of global environmental change

20

“Land dynamics in SSA”

“Land dynamics in SSA”

21

- First, why frame it this way?
 - Ag/land policies and institutions will have profound welfare/distributional effects in ways that won't affect farm size for majority of farm hhs
 - Many important CGIAR research priorities and welfare effects will operate through how unutilized land is allocated in SSA, not through changes in the size of farms for most rural inhabitants.
 - Importance of land institutions (both political and markets)

Unutilized non-forest land availability in sub-Saharan Africa (1000s ha)

	Non-Forest	Share (%)	Cumulative Share
Sudan (former)	46,025	22.8	22.8
Congo, Dem. Rep.	22,498	11.2	34.0
Mozambique	16,256	8.1	42.0
Madagascar	16,244	8.1	50.1
Chad	14,816	7.4	57.4
Zambia	13,020	6.5	63.9
Angola	9,684	4.8	68.7
Tanzania	8,659	4.3	73.0
Central African Republic	7,940	3.9	76.9
Ethiopia	4,726	2.3	79.3
Cameroon	4,655	2.3	81.6
Kenya	4,615	2.3	83.9
Mali	3,908	1.9	85.8
Burkina Faso	3,713	1.8	87.7
South Africa	3,555	1.8	89.4
Congo	3,476	1.7	91.2
Gabon	954	0.5	91.6
Rest of sub-Saharan Africa	16,796	8.3	100.0
Total –sub-Saharan Africa	201,540	100	

Rural population density per km arable land, Nigeria

	p5	p10	p25	p50	p75	p90	p95	mean	N
<i>hours to city</i>									
0-2									
2-4									
4-6									
6-10									
10+									
Total	22.1	36.8	59.9	118	244.2	537	1060.8	751.3	10,455

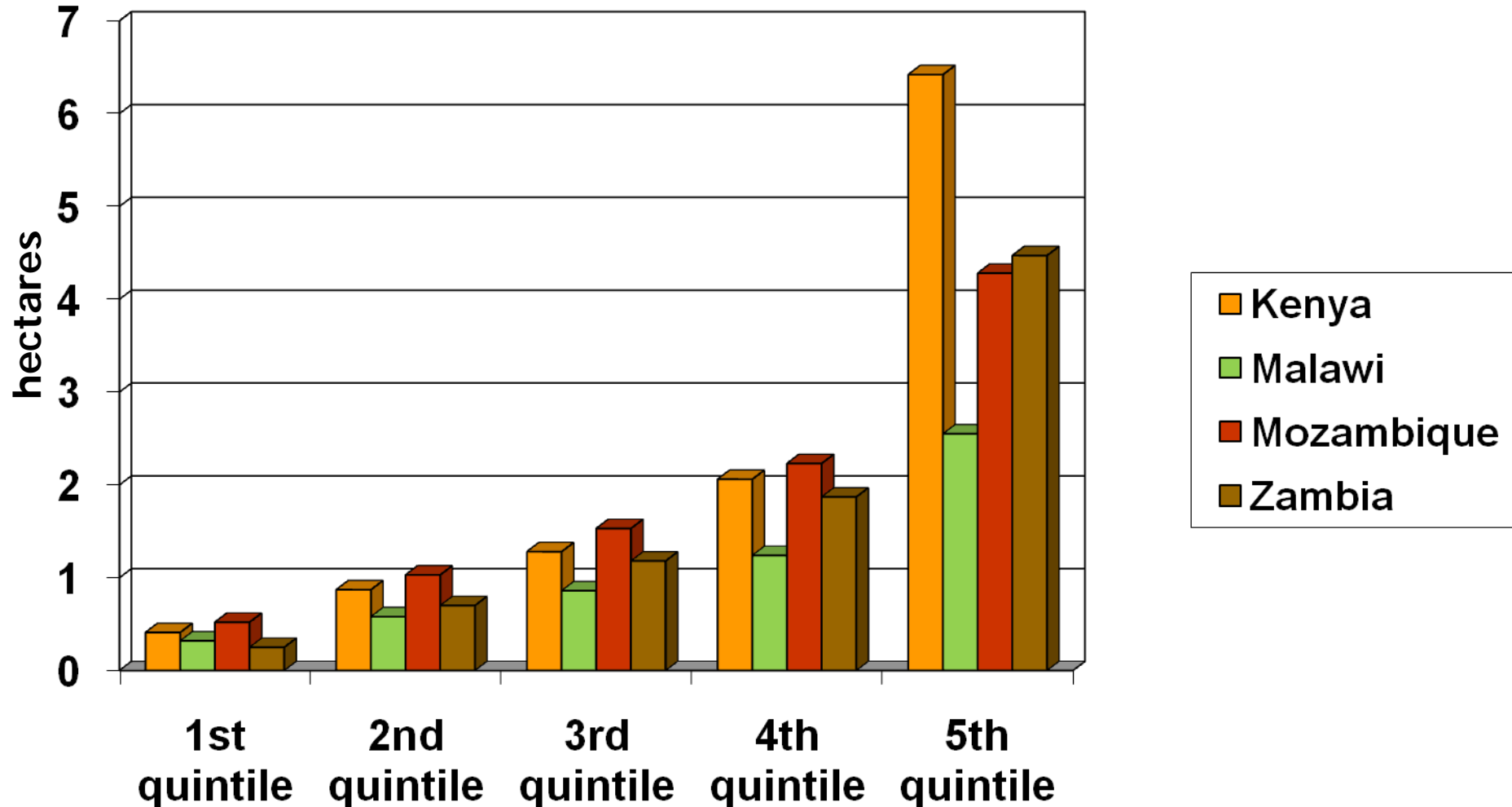
Source: Afripop

Rural population density per km arable land, Nigeria

	p5	p10	p25	p50	p75	p90	p95	mean	N
<i>hours to city</i>									
0-2	12.4	12.6	21.7	360.7	595.6	719.5	1251.1	408.1	123
2-4	17.2	37.1	98.7	212.7	318.4	605.9	1330.4	501.3	726
4-6	40.9	50.6	85.6	151.4	254.6	579.1	2054.1	2564	1,070
6-10	33.5	45	65.1	110.5	198	421.9	762.3	487.5	3,141
10+	20.4	30.8	53.7	105.8	247.3	564.1	1070.5	586.9	5,395
Total	22.1	36.8	59.9	118	244.2	537	1060.8	751.3	10,455

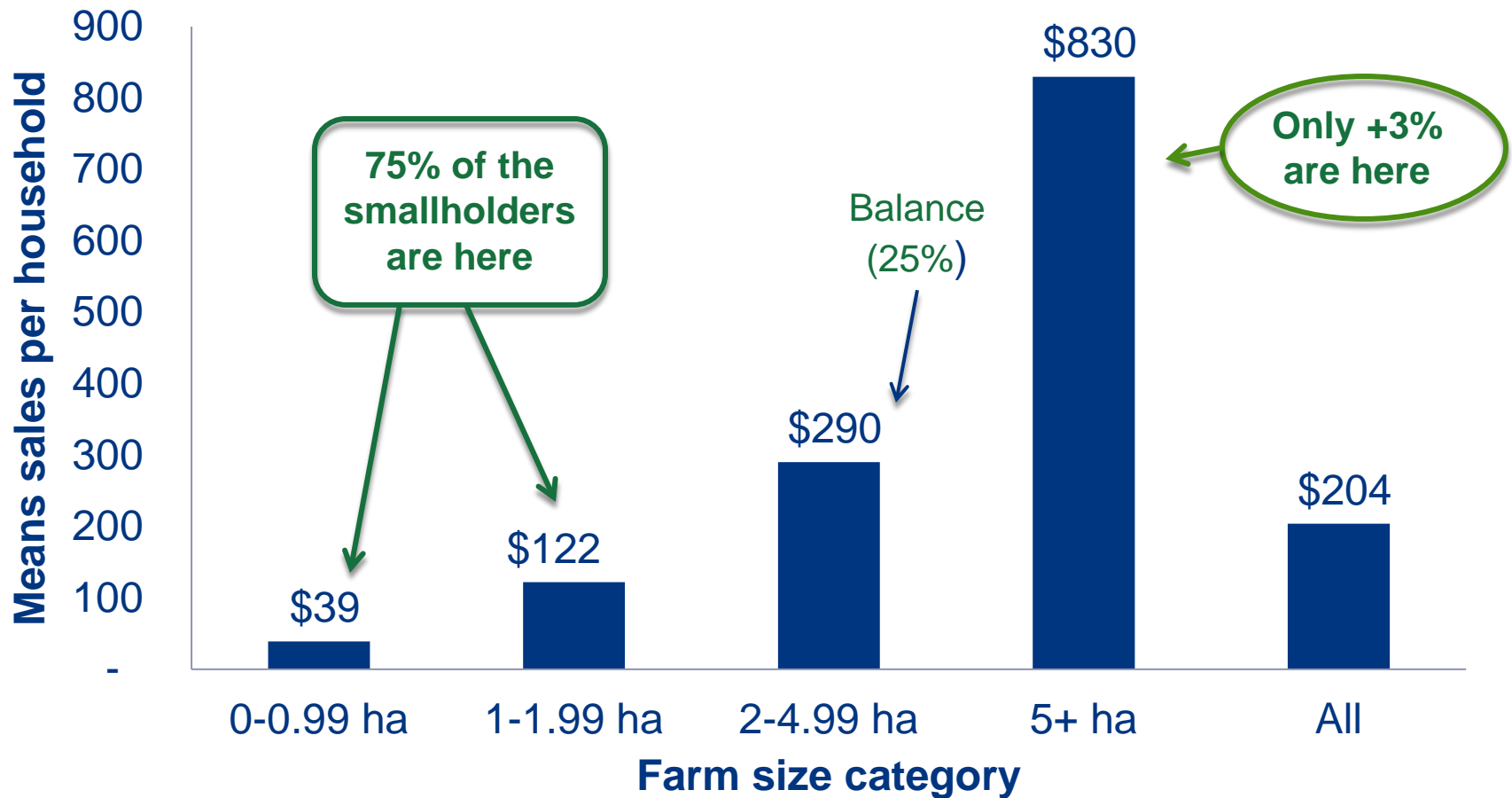
Source: Afripop

Most smallholder farms lack the land and other resources to produce a surplus



Mean agricultural sales by farm size (US\$), Zambia

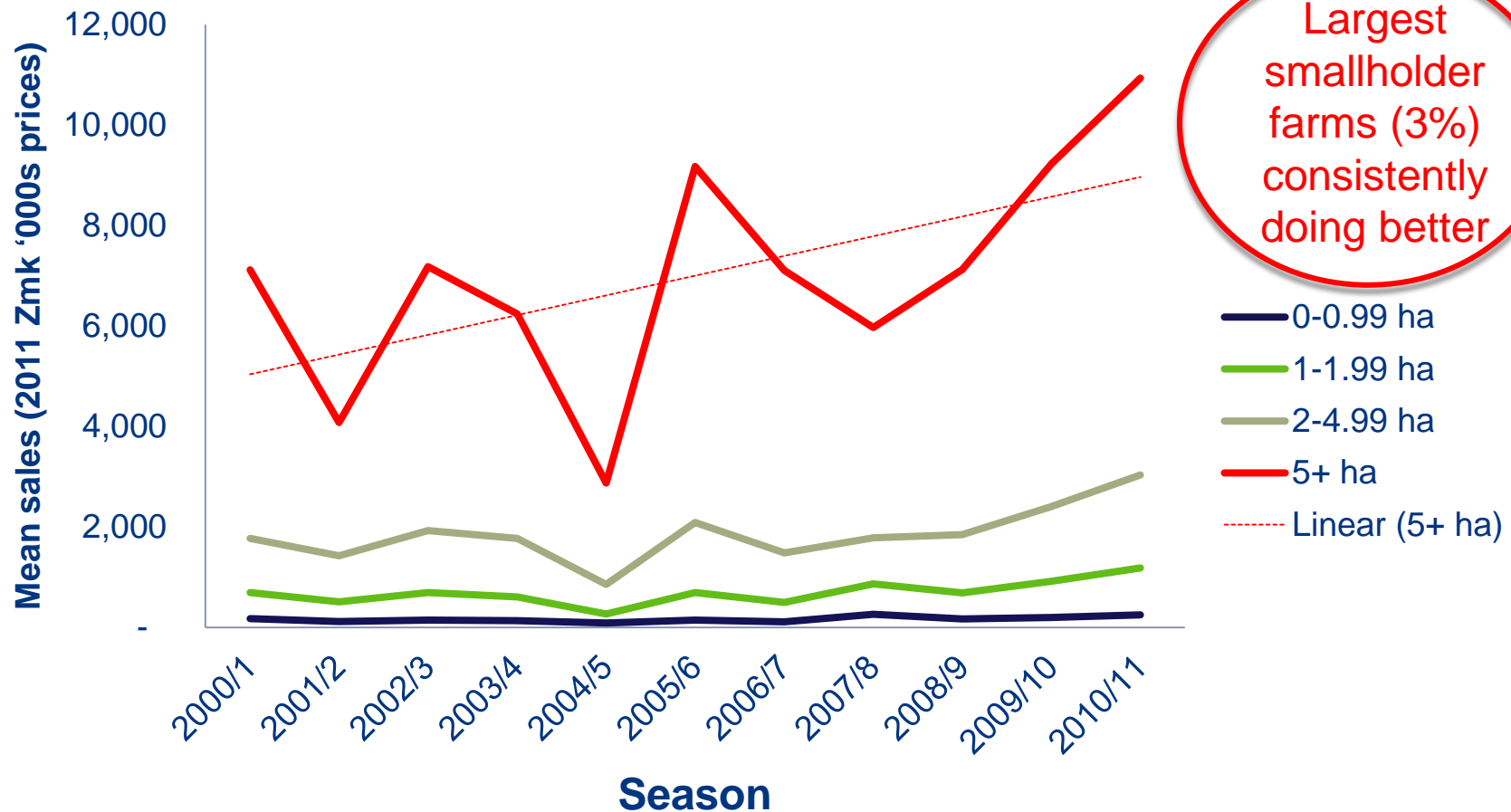
26



Source: 2001 and 2008 SS and authors' computations

Crop sales by farm size over time (2011 Zmk prices)

27



Source: MACO CFS 2000/1 to 2010/11 and authors' computations

- Hertel (2011):
 - Major scope for endogenous farm intensification in response to higher food prices...but how broadly-based can the process be?

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)
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%				
Total	1,471,221	100%				

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1-1.99 ha	489,937	33.3%	30.6%			
2-4.99 ha	315,459	21.4%	45.1%			
5-9.99 ha	42,332	2.9%	58.5%			
10-20 ha	6,626	0.5%	52.6%			
Total	1,471,221	100%	28.6%			

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5-9.99 ha	42,332	2.9%	58.5%	309.7		
10-20 ha	6,626	0.5%	52.6%	345.6		
Total	1,471,221	100%	28.6%	77.1		

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2-4.99 ha	315,459	21.4%	45.1%	139.7	64.0	
5-9.99 ha	42,332	2.9%	58.5%	309.7	82.1	
10-20 ha	6,626	0.5%	52.6%	345.6	86.8	
Total	1,471,221	100%	28.6%	77.1	42.7	

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1-1.99 ha	489,937	33.3%	30.6%	69.3	47.7	609
2-4.99 ha	315,459	21.4%	45.1%	139.7	64.0	1,729
5-9.99 ha	42,332	2.9%	58.5%	309.7	82.1	6,613
10-20 ha	6,626	0.5%	52.6%	345.6	86.8	15,144
Total	1,471,221	100%	28.6%	77.1	42.7	950

Other important land issues

34

1. Limited potential for irrigation area expansion
→ SSA agriculture largely dependent on rain-fed, dryland systems
2. 1.2 to 1 ratio of women to men in parts of rural SSA

-
- Not sexy \neq not effective

-
- Not sexy \neq not effective



Important entry points

	Hot	Not hot

Important entry points

	Hot	Not hot
Effective		
Not Effective		

Important entry points

	Hot	Not hot
Effective		<ul style="list-style-type: none">• Crop science (R&D)• Agronomic / crop husbandry training• marketing training• Organizing farmers into groups for marketing, input procurement• Infrastructural dev.• Supporting rural electrification
Not Effective		

CG system research priorities:

40

1. How to maximize yield growth in this period of tightening S-D conditions – crop science
2. Is the structural transformation process still the way?
3. Appropriate agricultural-rural development strategies for densely populated rural areas
4. Given the limited potential for irrigation expansion, what is the development pathway for semi-arid areas?
 - Performance contracts with R&D firms?

CG system research priorities: (2)

41

4. Implications of global climate change for sustainable agricultural development strategies?
 - Resilience strategies
5. How can Africa's farmers be supported to respond to more exacting requirements to enter into high-value crops and meet the evolving preferences of food retailing systems?

CG system research priorities: (3)

42

6. Identify ways to improve efficiencies/reduce costs within the major food value chains
 - identifying barriers to entry and expansion at various stages of the system
7. How can urban areas respond to rising pop growth and vulnerability to climate change?
8. Implications of many rural areas being composed of women? approaching 1.2:1.0 in some areas...anticipated social impacts?

Thank you

