FRESH PRODUCE AND THE DIET TRANSFORMATION IN AFRICA: CHALLENGES TO ENSURING A SAFE AND FRESH SUPPLY TO GROWING URBAN POPULATIONS

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Based on joint work with Thomas Reardon, Saweda Liverpool Tasie, Titus Awokuse, Bart Minten, Michael Dolislager, Christine Sauer, Jason Snyder, Laura Medwid, Sarah Chase-Walsh, and Joseph Goeb

BACKGROUND

Diet change: Extensive analysis of household expenditure data sets across East and Southern Africa + Nigeria

Earlier extensive work on domestic and regional horticultural systems in East and Southern Africa

- Including surveys of farmers selling to capital city in Mozambique and Zambia

More recent choice experiment work on training and pesticide toxicity in hort production (Joey Goeb)

A focus on local and regional markets

Perspective from nearly 30 years of work on African agrifood systems

OUTLINE

Changing diets

Changing supply chains

Changing farming practices

Takeaways

What do we know about changing diets?

#1: DIETS ARE CHANGING IN THREE WAYS

Food is becoming more <u>purchased</u>

- About 50% of food in rural areas of Africa (by value) is purchased

#1: DIETS ARE CHANGING IN THREE WAYS

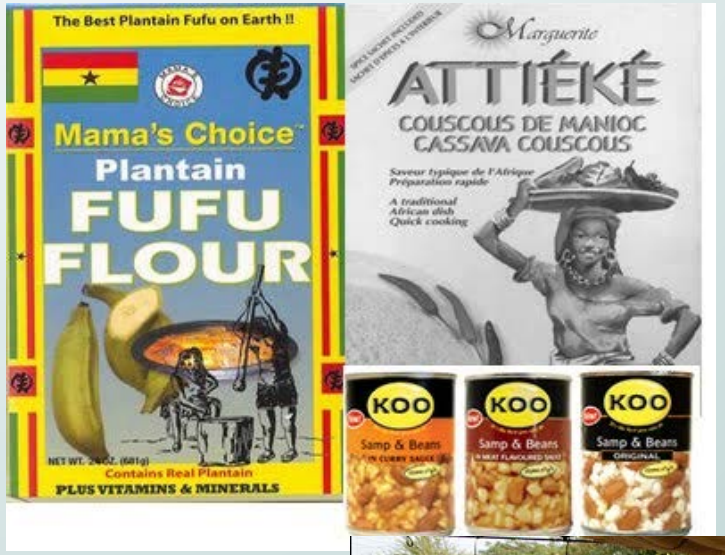
Food is becoming more perishable

- Meats, dairy, fresh produce
- Shares in total food:
  - Fruit: Typically 3-4%, as high as 12%
  - Veg: Typically 8%-10%, as high as 13%
  - Fresh produce: 10% - 20%

#1: DIETS ARE CHANGING IN THREE WAYS

Food is becoming more <u>processed and prepared</u>

- 70% to 80% of purchased food is processed in some way
  - Fruit & veg a small part of that so far
- Food away from home >15% of food expenditure in some countries
  - and growing everywhere > any other category
    - Not clear what role for F&V. Probably small



Every one of these transformations means the post-farm segment of the agrifood system is becoming ever more important

#2: DEMAND FOR VEGETABLES IS RISING … BUT PERHAPS NOT AS FAST AS SOME THINK

- Expenditure elasticities of demand
  - Typically around 1.0 for fruit – very rapid growth
  - 0.6 to 0.8 for vegetables
- Contribution to total growth in demand
  - (*takes account of starting consumption levels*)
  - Fruit: 4-5%
  - Veg: 7-8%
  - Fresh produce: 10-20%

#3: DEMAND THROUGH MARKETS IS RISING VERY FAST

Urbanization + income growth + expenditure elasticities

Roughly 5% per year for veg, 7% for fruit

Take-off of fruit juice production could push latter even higher

Lots of room for import substitution

What do we know about changing supply chains?

#1: THE SUPERMARKET REVOLUTION IS HAPPENING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SHRIJEE'S
SUPERMARKET

Small format supermarkets

New format retail clusters

tsn Supermarket

UCHUMI

SHRIJEE'S SUPERMARKET

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tsn
Supermarket

UCHUMI

Specialty supermarkets

SHRIJEE'S
SUPERMARKET

Major change at retail

Small format supermarkets

New format retail clust

Specialty supermarkets

#2: BUT THE INFORMAL SECTOR REMAINS DOMINANT

Overall shares in food probably <= 20% in the most advanced countries

- Kenya, Zambia

Single digits in many others

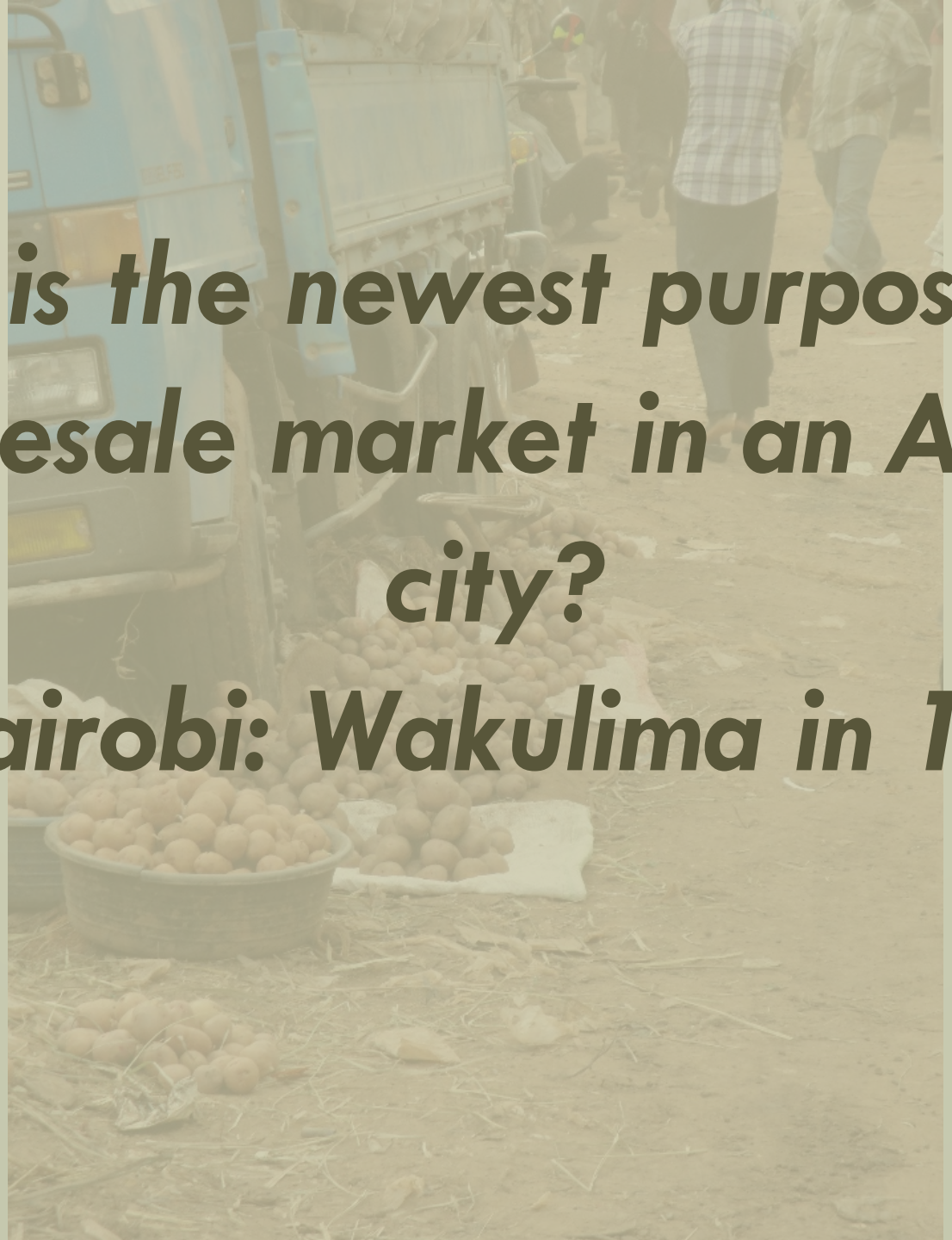
Still lowest in fresh produce

- One-half to one-third of overall food share

Sales have to grow 5%-6% per year <u>just to maintain market share</u>

#3: MARKET INFRASTRUCTURE REMAINS WOEFULLY INADEQUATE


POLICE ZONE
Together we fight HIV/AIDS



What is the newest purpose-built wholesale market in an African city?

In Nairobi: Wakulima in 1960s

. . . AND FOOD IS NOWHERE ON THE URBAN PLANNING AGENDA

- 10 Asian cities and 11 of SSA have signed the Milan Urban Food Pact
- But very little investment (certainly in SSA)
  - Unsuccessful attempts (Nairobi)
- Appalling conditions (at least in Africa)
- Outmoded models for investment and management in urban marketing infrastructure
- Food not being integrated into urban planning

#4: URBAN MARKETS ARE MAJOR DRIVERS OF GROWTH

- Urban demand now over 50% of all food demand through markets in East and Southern Africa
  - The least urbanized area of the continent
  - Up to 70% and 80% elsewhere
- Very rapid growth
  - 3% to 4% growth in urban populations PLUS …
  - 2% to 5% growth in per capita incomes …
  - means explosive growth in urban demand through markets
    - Up to 8x over 30 years

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#4: URBAN MARKETS ARE MAJOR DRIVERS OF GROWTH

- Especially secondary and tertiary cities
  - About 60% of urban population, growing rapidly
  - A chance to "get it right" in urban areas with little marketing infrastructure

#5: FOOD SAFETY RISK ARE PROBABLY INCREASING

Larger cities, longer supply chains

Green leafy vegetables in peri-urban areas

- Waste water

Pesticides …

What do we know about changing farming practices?

#1: FARMING PRACTICES ARE INTENSIFYING

Big take-off in developing country herbicide use since 2005

- Haggblade et al. (2017)

Continued intensification with insecticides, fungicides

#2: HIGHLY TOXIC PESTICIDES CONTINUE TO BE USED WIDELY

Percent of surveyed horticultural farmers using each pesticide (2012)

Active ingredient	Mozambique	Zambia	WHO Toxicity Class (toxicity to numans)
Methamidophos or Monocrotophos*	86.6%	74.5%	Ib - Highly hazardous
Mancozeb	41.4%	47.5%	U - Not Hazardous
Cypermethrin	35.8%	7.3%	II - Moderately hazardous
Abemectin	19.7%	38.3%	U - Not Hazardous
Acetamiprid	5.9%	-	II - Moderately hazardous
Acephate	2.5%	13.4%	II - Moderately hazardous
Endosulphan	2.1%	5.4%	II - Moderately hazardous
Copper Oxycloride	1.0%	16.5%	II - Moderately hazardous
Imidacloprid	0.5%	36.0%	II - Moderately hazardous
Lambda-cyhalothrin	-	31.4%	II - Moderately hazardous

*Note: Mozambique data show use of methamidophos exclusively and Zambia data show use of methamidophos as well as moncrotophos. Both pesticides are highly toxic, so we combined them to compare highly hazardous chemical usage across countries.

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Share of producers using chemicals from each toxicity class (2012)		
	Mozambique	Zambia
WHO Toxicity Class	% of prod'rs using	
Ib - Highly hazardous	87%	76%
II - Moderately hazardous	48%	77%
III - Slightly hazardous	1%	16%
U - Not Hazardous	53%	75%

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In both countries, rape (among rape, tomato, cabbage, and onion) had the highest share of WHO Ib chemical use

#3: FARMER KNOWLEDGE IS VERY POOR

Pesticide perceived toxicty by actual WHO toxicity class					
ALL farmers					
Country	Farmer Perceived Toxicity	WHO Toxicity Classification			Total
		Ib	II	U	
		---------- Percent of Producers ----------			
Zambia	Highly toxic	84%	78%	69%	80%
	Moderately toxic	14%	15%	24%	16%
	Not toxic	1%	2%	5%	2%
	Do not know	1%	5%	2%	2%
Mozambique	Highly toxic	87%	88%	75%	84%
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Most have an opinion

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Nearly all perceived as highly toxic

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Thinking that all are toxic can lead to INACTION

PESTICIDE SAFETY SUMMARY SHEET

NOT ALL PESTICIDES ARE VERY POISONOUS.

Some pesticides are SAFE (Green label) while others are very DANGEROUS (Red label).

Pesticide health risk information is found on the **colour band** at the bottom of pesticide packaging.

Phoskill is Red label meaning it is **EXTREMELY DANGEROUS**.

PESTICIDE HEALTH RISK COLOUR CODES:

RED	YELLOW	BLUE	GREEN
Extremely Dangerous	**Highly Dangerous**	**Moderately Dangerous**	**Slightly Dangerous**

Do you know anyone that has been sick after using pesticides?
Getting dangerous pesticides on your skin can make you sick quickly – including dizziness, headache, coughing, sneezing, nausea, diarrhea, and other symptoms.

Some pesticides have been shown to have LONG TERM health risks:
including Cancer, uncontrollable shaking, and chronic coughing.

YOU CAN CONTROL your pesticide illnesses

1) BUY LOWER TOXICITY PESTICIDES

Look at the colour label before buying pesticides.

Avoid RED label pesticides whenever possible.

Go for GREEN label pesticides.

2) WEAR PROTECTIVE CLOTHING

Use GLOVES when mixing pesticides.

Wear a MASK when spraying.

Using pesticides "Carefully" is NEVER enough to protect yourself.

HOW TO BUY PESTICIDES:

1) **What pests does the pesticide control?** Read the pesticide label first and foremost. Buy pesticides to control specific pests in your plots, but also consider additional pest controls.
2) **What is the toxicity level?** Look at the colour label. GREEN pesticides are safer.
   What is the PRICE? Price is always important, but price alone is NEVER enough to base your pesticide decisions on. A higher price DOES NOT MEAN higher quality.

It's supposed to be easy …

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It's supposed to be easy …

… but it's not

#4: FARMER KNOWLEDGE CAN BE IMPROVED (AND BEHAVIOR CHANGED)

Work by Joey Goeb (PhD student)

Controlled choice experiments among tomato farmers supplying Lusaka

Randomly chosen farmers given information on pesticide toxicity and efficacy, and personal protective equipment (PPE)

Training impact on knowledge

- None on PPE (already high)
- Strong effect on toxicity knowledge (low to start)
  - 25% more likely to correctly ID class Ib and U pesticides

#4: FARMER KNOWLEDGE CAN BE IMPROVED (AND BEHAVIOR CHANGED)

Training impact on choices

- No higher use of PPE
- Strong negative effect on demand for toxicity
  - 3-4 times more likely than controls to substitute low toxicity for high toxicity pesticide
- Training also broke the false price-efficacy perception of farmers
  - Possibility of equal pest control at lower cost

#5: BUT EXTENSION SYSTEMS FOCUS VERY LITTLE ON FRESH PRODUCE

Shares of ANY advice by source among farmers receiving advice, Zambia

Source of information	Weighted shares of advice
Family	43%
Neighbor/Farmer	28%
Radio	15%
NGO	8%
Other	3%
Government	3%
Dealer/Vendor	1%

Weighted shares are weighted by the number of times advice was received from each source

#5: BUT EXTENSION SYSTEMS FOCUS VERY LITTLE ON FRESH PRODUCE

Among two most trusted sources of information on hort production

Source of information	Most trusted
Neighbor/Farmer	62%
Family	61%
NGO	22%
Government	15%
Other	8%
Radio	5%
Dealer/Vendor	5%

Note: Each household listed 2 most trusted sources, so shares do not sum to one.

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Work through trusted farmer neighbors

Takeaways

TAKEAWAY #1

Huge opportunities for (the top tier of) small farmers

- Knowledge is key
- Open regional output markets
  - Producing tomato in lowland southern Mozambique for Maputo is a bad idea!
- Seed trade is also key

TAKEAWAY #2

More attention needs to be paid to food safety

- Pesticides: Crying need for:
  - education on pesticide safety
  - better regulation on fake pesticides
- More generally: food safety cannot be separated from physical and management marketing infrastructure (next slide)

TAKEAWAY #3

Helping cities break out of their dysfunctional approach to urban food marketing

- New models of ownership and management
- Integrating food into urban planning
- Modifying the food environment to promote healthy food choices
- Must deal with the political economy problem

Questions?