The Emerging “Quiet Revolution” in African Agrifood Systems: Challenges for Mozambique

David Tschirley, Michael Dolislager, Jason Snyder, Thomas Reardon
Presentation at MOZEF0, Agro-Industry in Mozambique
Maputo, Mozambique
19 March, 2015
Approach

Urbanization & per capita income growth

Diet & other transformations (farm, midstream, downstream)
Approach

Urbanization & per capita income growth

Rate of change

Policy

Private Investment

Public Investment

Rate & nature of transformations

Diet & other transformations (farm, midstream, downstream)
Approach

Urbanization & per capita income growth

Policy

Private Investment

Public Investment

Rate of change

Diet & other transformations (farm, midstream, downstream)

Rate & nature of transformations
Approach (2)

• Focus primarily on East and Southern Africa
  • LSMS data from Ethiopia, Uganda, Tanzania, Mozambique, Malawi, Zambia

• Mozambique’s characteristics fit very well into the regional picture

• Possible exceptions / differences
  • Pattern of urban population settlement
  • Import dependence now and moving forward
  • Effects of resource boom
Focus

• African urbanization and income growth
  • Although unequal, african income growth is not being captured just by an urban elite

• Agribusiness opportunities
  • Growing and changing demand among the poor is driving major agrifood system change now

• Imports
  • The story in SSA is very mixed but trends in Mozambique are worrisome

• Jobs
  • Much depends on how the natural resource boom is managed

Primarily focused on East and Southern Africa
Urbanization

• Africa is urbanizing rapidly
• Occurring more rapidly in smaller cities and towns than in large cities
  • Good for rural-urban linkages
  • Mozambique has the most deconcentrated urban population distribution in SSA
    • Major potential advantage
• Urban demand is already > 50% of the food market in ESA
• Food security – including rural – is increasingly about rural-urban supply chains
Income growth

• Widely known that growth has been much faster over past 15 years

• Its distribution across HHs in ESA – the equity of growth in the region - has been:
  • Generally unequal, but
  • Highly variable, and
  • Overall, broad enough to drive rapid transformation if it continues

    • Mozambique is right in the middle in terms of inequality of growth
If growth continues like this …

Populations and shares by income class in East and Southern Africa, 2010 and 2040 assuming continuation of rate and distribution of recent GDP growth

<table>
<thead>
<tr>
<th>Income Class (per capita PPP income)</th>
<th>2010</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESA-wide</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>$0-$2 (poor as per int’l poverty line)</td>
<td>72.5%</td>
<td>19.3%</td>
</tr>
<tr>
<td>$2-$4</td>
<td>19.9%</td>
<td>28.7%</td>
</tr>
<tr>
<td>$4-$10</td>
<td>6.5%</td>
<td>33.9%</td>
</tr>
<tr>
<td>$10-$20</td>
<td>0.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td>&gt;$20</td>
<td>0.2%</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

Source: Author calculations from PovcalNet
If growth continues like this ...

Populations and shares by income class in East and Southern Africa, 2010 and 2040 assuming continuation of rate and distribution of recent GDP growth

<table>
<thead>
<tr>
<th>Income Class (per capita PPP income)</th>
<th>2010</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESA-wide</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>$0-$2 (poor as per int’l poverty line)</td>
<td>72.5%</td>
<td>19.3%</td>
</tr>
<tr>
<td>$2-$4</td>
<td>19.9%</td>
<td>28.7%</td>
</tr>
<tr>
<td>$4-$10</td>
<td>6.5%</td>
<td>33.9%</td>
</tr>
<tr>
<td>$10-$20</td>
<td>0.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td>&gt;$20</td>
<td>0.2%</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

Source: Author calculations from PovcalNet
Focus

• African urbanization and income growth
  • African income growth is not being captured just by an urban elite

• Agribusiness opportunities
  • Growing and changing demand among the poor is driving major agrifood system change now

• Imports
  • The story in SSA is very mixed but trends in Mozambique are worrisome

• Jobs
  • Much depends on how the natural resource boom is managed

Primarily focused on East and Southern Africa
### The rise of processed foods

<table>
<thead>
<tr>
<th></th>
<th>Unprocessed</th>
<th>Processed, Low Value Added</th>
<th>Processed, High Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-perishable</strong></td>
<td>Legumes</td>
<td>Maize meal</td>
<td>Veg oils</td>
</tr>
<tr>
<td></td>
<td>Maize grain</td>
<td>Milled Rice</td>
<td>Breads</td>
</tr>
<tr>
<td></td>
<td>others</td>
<td>Sugar</td>
<td>Food away from home</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Others</td>
<td>Others</td>
</tr>
<tr>
<td><strong>Perishable</strong></td>
<td>Vegetables</td>
<td>Beef</td>
<td>Food away from home</td>
</tr>
<tr>
<td></td>
<td>Fresh fish</td>
<td>Other meat (incl. poultry)</td>
<td>Dairy</td>
</tr>
<tr>
<td></td>
<td>Fruit</td>
<td>Dried/pkgd fish</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>
The rise of processed foods

• Processed foods have penetrated
  • Deeply (69% share of all purchased food)
  • Broadly
    • comparable in rural- and urban areas,
    • among poor and upper class

• Dramatic change in consumption patterns below the international poverty line
Kernel regression results on purchased food budget shares, additionally weighted by population across 5 countries of ESA

Source: Author calculations from LSMS data sets
Kernel regression results on purchased food budget shares, additionally weighted by population across 5 countries of ESA

Source: Author calculations from LSMS data sets
Kernel regression results on purchased food budget shares, additionally weighted by population across 5 countries of ESA.

Source: Author calculations from LSMS data sets.
Kernel regression results on purchased food budget shares, additionally weighted by population across 5 countries of ESA

Most diet change has already occurred by the time a household rises up to the international poverty line.

Source: Author calculations from LSMS data sets
Measure of impact

• Velocity of diet change (V)
  • Sum of squares of slopes of the six budget share lines
• Total food expenditure (E)
• Each measured all along the total expenditure distribution
• Impact on food system change = V*E
ESA measure of total impact on food system change by level of income

Source: Author calculations from LSMS data sets
ESA measure of total impact on food system change by level of income

This group – all below international poverty line – is driving food system change

→ Major implications for structural change over coming decade and beyond

Source: Author calculations from LSMS data sets
Expenditure elasticities by perishability and processing classification, income class, and rural/urban (2010)

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Rural</th>
<th>Urban</th>
<th>ESA-Wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumed own production</td>
<td>0.95</td>
<td>0.39</td>
<td>0.82</td>
</tr>
<tr>
<td>Non-perishable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprocessed</td>
<td>0.81</td>
<td>0.55</td>
<td>0.75</td>
</tr>
<tr>
<td>Processed Low</td>
<td>0.87</td>
<td>0.70</td>
<td>0.83</td>
</tr>
<tr>
<td>Processed High</td>
<td>1.07</td>
<td>1.00</td>
<td>1.05</td>
</tr>
<tr>
<td>Perishable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprocessed</td>
<td>0.73</td>
<td>0.80</td>
<td>0.75</td>
</tr>
<tr>
<td>Processed Low</td>
<td>1.20</td>
<td>1.18</td>
<td>1.19</td>
</tr>
<tr>
<td>Processed High</td>
<td>1.36</td>
<td>1.28</td>
<td>1.34</td>
</tr>
</tbody>
</table>

Source: Author calculations from LSMS data
Expenditure elasticities by perishability and processing classification, income class, and rural/urban (2010)

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Rural</th>
<th>Urban</th>
<th>ESA-Wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumed own production</td>
<td>0.95</td>
<td>0.39</td>
<td>0.82</td>
</tr>
<tr>
<td>Non-perishable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprocessed</td>
<td>0.81</td>
<td>0.55</td>
<td>0.75</td>
</tr>
<tr>
<td>Processed Low</td>
<td>0.87</td>
<td>0.70</td>
<td>0.83</td>
</tr>
<tr>
<td>Processed High</td>
<td>1.07</td>
<td>1.00</td>
<td>1.05</td>
</tr>
<tr>
<td>Perishable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unprocessed</td>
<td>0.73</td>
<td>0.80</td>
<td>0.75</td>
</tr>
<tr>
<td>Processed Low</td>
<td>1.20</td>
<td>1.18</td>
<td>1.19</td>
</tr>
<tr>
<td>Processed High</td>
<td>1.36</td>
<td>1.28</td>
<td>1.34</td>
</tr>
</tbody>
</table>

Source: Author calculations from LSMS data
The rise of processed foods

*Projected market growth, 2010-2040*  
*(estimated purchased food budget share, 2040)*

<table>
<thead>
<tr>
<th></th>
<th>Unprocessed</th>
<th>Processed, Low Value Added</th>
<th>Processed, High Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-perishable</strong></td>
<td>4x (8%)</td>
<td>5.5X (17%)</td>
<td>7X (23%)</td>
</tr>
<tr>
<td><strong>Perishable</strong></td>
<td>6.5X (20%)</td>
<td>8X (18%)</td>
<td>10X (15%)</td>
</tr>
</tbody>
</table>
Focus

- African urbanization and income growth
  - *African income growth is not being captured just by an urban elite*
- Agribusiness opportunities
  - *Growing and changing demand among the poor is driving major agrifood system change now*
- Imports
  - *The story in SSA is very mixed but trends in Mozambique are worrisome*
- Jobs
  - *Much depends on how the natural resource boom is managed*

*Primarily focused on East and Southern Africa*
Will imports capture the surge in demand?

- We found in the region that net import shares in food consumption fall with income in urban areas.

- Why?
  - Local cereals ➔ imported cereals, BUT
  - Bennett’s Law: Cereals ➔ meat, dairy (also fresh produce)
    - all largely locally produced

- But Mozambique may be very different
Net Agricultural Imports as Share of Agricultural Production, Countries of ESA, 1980 - 2011

Source: Author calculations from FAOSTAT
Net Agricultural Imports as Share of Agricultural Production, Countries of ESA, 1980 - 2011

Source: Author calculations from FAOSTAT
Net Agricultural Imports as Share of Agricultural Production, Countries of ESA, 1980 - 2011

Source: Author calculations from FAOSTAT
Net Agricultural Imports as Share of Agricultural Production, Countries of ESA, 1980 - 2011

Source: Author calculations from FAOSTAT
Net Agricultural Imports as Share of Agricultural Production, Countries of ESA, 1980 - 2011

Source: Author calculations from FAOSTAT
Focus

• African urbanization and income growth
  • African income growth is not being captured just by an urban elite

• Agribusiness opportunities
  • Growing and changing demand among the poor is driving major agrifood system change now

• Imports
  • The story in SSA is very mixed but trends in Mozambique are worrisome

• Jobs
  • Much depends on how the natural resource boom is managed

Primarily focused on East and Southern Africa
The structural transformation
Exit out of farming

All SSA and Asia- Ag Share of Workforce vs Income per capita (PPP)
with Log fitted line
The structural transformation
Exit out of farming

All SSA and Asia- Ag Share of Workforce vs Income per capita (PPP) with Log fitted line

Without this transfer of labor out of farming, inequality increases between rural- and urban areas
The structural transformation

Exit out of farming

All SSA and Asia- Ag Share of Workforce vs Income per capita (PPP) with Log fitted line

Without this transfer of labor out of farming, inequality increases between rural- and urban areas

And resource-rich countries tend to have a very slow transfer out of farming
The structural transformation
Average labor productivity by sector
No natural resource effect (4.5% growth)
The structural transformation
Average labor productivity by sector
No natural resource effect (4.5% growth)
The structural transformation

Average labor productivity by sector
With & w/o natural resource effect (4.5% growth)
The structural transformation

Average labor productivity by sector
With & w/o natural resource effect (4.5% growth)

- Farming w/ NR effect
- Rest of economy w/ NR effect

9.7X
Poor management of a natural resource boom can lead to a rural sector that is larger and more impoverished than without the resource boom.
Summary & Implications

• Change is happening very rapidly now
  • Driven by rapid diet change among the poor
  • Huge opportunities for farmers, traders, transporters, processors

• How can Mozambique get the whole agrifood system productivity growth needed to capture these opportunities?
  • Benefit its own farmers and entrepreneurs rather than those in other countries
Summary & Implications (2)

• The emerging Quiet Revolution
  • Local micro-small-medium businesses

• Non-western multi-nationals becoming major players
  • OLAM, Export Trading Group, others
  • South Africans (Shoprite/Checkers, Tiger Brands, others)

• Also well known players such as Walmart, Carrefour, Nestle, Parmalat
Summary & Implications (3)

• Can micro, small, and medium local firms compete?
  • What packages of assistance can be effectively delivered?

• Can farmers respond?
  • Ag investment needs to increase dramatically and move away from subsidies towards productivity enhancers
“Take Home”

Mozambique’s spatially dispersed urban settlement pattern should be a huge help in building rural-urban supply chains to capture these opportunities.

But its low productivity, current high import dependence, and coming resource boom present huge challenges for doing so.

Public policy (enabling environment) and productivity enhancing public investment will be crucial.
Questions?