Analysis of Income & Poverty Dynamics in Rural Mozambique 2002-2005

Preliminary results based on TIA 02 and TIA 05 panel

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Prepared by Gilead Mlay, Cynthia Donovan
David Mather, Ellen Payongayong & Benedito Cunguara
Michigan State University

Context: using the TIA database to better understand rural income and poverty dynamics

- Objective of TIA analyses to inform GOM, USAID and NGO partners on agricultural strategies and policies to accelerate poverty reduction:
- Panel data analysis on
  - Rural HH income trend & its determinants
  - Rural HH poverty dynamics
  - Relationship between rural income and agricultural technology
Outline of presentation

- **TIA Data**
  - TIA02-TIA05 panel sample
  - Definition of rural HH income

- **Changes in rural HH income**
  - spatial and distributional patterns
  - Determinants of income changes

- **Rural HH poverty dynamics 2002-05**
  - spatial pattern
  - Characteristics of HHs which move from being poor (2002) to non-poor (2005), relative to HHs which remain in poverty
  - Characteristics of HHs which move from being non-poor (2002) to poor (2005), relative to HHs which remain non-poor

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TIA 02 and 05 panel

- **TIA02**
  - n=4908 rural households from 80 districts

- **TIA05**
  - n=6149 Rural households from 94 Districts

- **TIA02-05 panel**
  - n=4104 from the 80 TIA02 districts
  - 16% attrition rate (HHs which moved away or dissolved)
  - repeat & non-repeat HHs have similar HH characteristics

- **Very similar objectives and questionnaire design**
  - Both TIA 02 and TIA05 explicitly designed as rural income surveys

- **Similar weather patterns in some provinces, different in others:**
  - Niassa, Gaza had less rainfall in 1st quarter 2004/05
Components of Rural HH Income

- **Crop production**
  - Sales of food crops; value of retained food
  - Field cash crops, sales of tree crops & horticulture

- **Livestock**
  - Sales of live animals, meat, and dairy products

- **Wage labor**
  - Skilled vs nonskilled, ag vs non-ag, etc

- **Self-employment income**
  - Resource extraction (fish, forestry, etc); other

- **Remittance income**

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Table 1. Mean/ median Total Net Rural HH Income by Province - 2002 - 2005 (Mtn per AE)

<table>
<thead>
<tr>
<th>Province</th>
<th>2002 Mean</th>
<th>2005 Mean</th>
<th>% change in means</th>
<th>2002 Median</th>
<th>2005 Median</th>
<th>% change in medians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nampula</td>
<td>2,939</td>
<td>3,164</td>
<td>7.7%</td>
<td>2,097</td>
<td>1,487</td>
<td>-29.1%</td>
</tr>
<tr>
<td>Zambezia</td>
<td>2,176</td>
<td>2,111</td>
<td>-3.0%</td>
<td>1,400</td>
<td>1,265</td>
<td>-9.7%</td>
</tr>
<tr>
<td>Manica</td>
<td>2,112</td>
<td>2,883</td>
<td>36.5%</td>
<td>1,332</td>
<td>1,470</td>
<td>10.3%</td>
</tr>
<tr>
<td>Sofala</td>
<td>1,856</td>
<td>3,363</td>
<td>81.2%</td>
<td>1,243</td>
<td>1,872</td>
<td>50.6%</td>
</tr>
<tr>
<td>National</td>
<td>2,818</td>
<td>3,335</td>
<td>18.3%</td>
<td>1,747</td>
<td>1,690</td>
<td>-3.3%</td>
</tr>
</tbody>
</table>

Source: TIA 2002, TIA 2005

AE=Adult equivalents; Mtn=Meticais novo
Table 2: Median Net Income Change in Mtn/ AE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>482</td>
<td>350</td>
<td>-27.4%</td>
</tr>
<tr>
<td>2</td>
<td>1,055</td>
<td>902</td>
<td>-14.4%</td>
</tr>
<tr>
<td>3</td>
<td>1,745</td>
<td>1,684</td>
<td>-3.5%</td>
</tr>
<tr>
<td>4</td>
<td>2,791</td>
<td>3,091</td>
<td>10.7%</td>
</tr>
<tr>
<td>5</td>
<td>5,649</td>
<td>6,853</td>
<td>21.3%</td>
</tr>
<tr>
<td>Total</td>
<td>1,747</td>
<td>1,690</td>
<td>-3.3%</td>
</tr>
</tbody>
</table>

Source: TIA 2002, TIA 2005

AE=Adult equivalents; Mtn=Metical novo

Participation in Income Activities

Nampula

Zambezia

2002 2005

8Preliminary Results
Participation in Income Activities

<table>
<thead>
<tr>
<th>INCOME</th>
<th>Wage</th>
<th>Remitt.</th>
<th>Crop</th>
<th>Self-Emp</th>
<th>Livest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.2</td>
<td>1.0</td>
<td>0.8</td>
<td>0.6</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Determinants of Income Changes

- Methodology: Regression analysis using Change in Per AE Total Income from 2002 to 2005,
- Change in income \((\Delta Y)\) = Based on various factors: Location, demographics, assets, technology,
Determinants of Income Changes

- **Location:**
  - Some Districts have significantly lower or higher income changes
  - Examples: Micoso District Manica higher than average; Gile District in Zambezia lower
  - Capturing infrastructure, some aspects of soils and climate

- **Headship:**
  - **Gender:**
    - Going from male head to female head: loss of 533 Mtn per AE
    - Female head in both periods: decline of 211 Mtn
  - **Education of Head:**
    - Positive returns to education, at a decreasing rate

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Determinants of Income Changes

- **Technology/Crops**
  - Input use, animal traction: no significant effect
  - Improved crop seed and row planting:
    - Use in 2005 is associated with increased income
    - Tobacco production: adopting tobacco or continuing to grow tobacco from 2002 to 2005 increased income, but so did disadopting (lesser extent)
Determinants of Income Changes

- **Assets (2002 level)**
  - Chickens: having more than 30 is associated with positive change in income
  - Land: having more land in 2002 → increased income; increasing land from 2002-2005 → increased income
  - Livestock, trees, bikes, radios not significant

- **Sources of Income**
  - Non-Farm Sources
    - Gaining unskilled wage labor job: no significant improvement in income
    - Gaining skilled wage job: positive effect with gaining or keeping; negative effect with losing
    - Self-employment: larger positive change when activity is high-startup cost activity
  - Participation in activities is dynamic, a lot of switching from 2002 to 2005

**Table 4: Change in Poverty Incidence**

<table>
<thead>
<tr>
<th>Province</th>
<th>% HH below IAF Food poverty line 2002</th>
<th>% HH below IAF Food Poverty Line 2005</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nampula</td>
<td>66</td>
<td>71</td>
<td>8.0</td>
</tr>
<tr>
<td>Zambezia</td>
<td>69</td>
<td>69</td>
<td>-0.8</td>
</tr>
<tr>
<td>Manica</td>
<td>75</td>
<td>70</td>
<td>-6.7</td>
</tr>
<tr>
<td>Sofala</td>
<td>67</td>
<td>50</td>
<td>-25.5</td>
</tr>
<tr>
<td>National</td>
<td>70</td>
<td>67</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Source: TIA 2002, TIA 2005

IAF=Inquérito dos Agregados Familiares 2002; hh=Households
### Table 5: Poverty dynamics 2002 to 2005

<table>
<thead>
<tr>
<th>Province</th>
<th>Stayed poor</th>
<th>Escaped Poverty</th>
<th>Became Poor</th>
<th>Stayed non-poor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nampula</td>
<td>52</td>
<td>14</td>
<td>19.3</td>
<td>14.8</td>
<td>100</td>
</tr>
<tr>
<td>Zambezia</td>
<td>51.9</td>
<td>17.6</td>
<td>17</td>
<td>13.5</td>
<td>100</td>
</tr>
<tr>
<td>Manica</td>
<td>60</td>
<td>14.7</td>
<td>9.7</td>
<td>15.6</td>
<td>100</td>
</tr>
<tr>
<td>Sofala</td>
<td>38.8</td>
<td>28.4</td>
<td>11.2</td>
<td>21.6</td>
<td>100</td>
</tr>
<tr>
<td>National</td>
<td>52.2</td>
<td>17.8</td>
<td>14.7</td>
<td>15.3</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: TIA 2002, TIA 2005

IAF=Inquérito dos Agregados Familiares 2002; hh=Households

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For HHs that were poor in 2002, what factors increased likelihood of becoming non-poor? Positive dynamic

- **Location:**
  - HHs in some districts are more likely to escape poverty than others

- **Asset levels (in 2002):**
  - 1-30 chickens
  - No. of goats/sheep
  - 1.75 to 5 ha of total area

- **Technology used:**
  - improved seeds (food crops)
  - animal traction

- **Livelihood strategies:**
  - HH undertakes self-employment activities
  - HH receives remittances
For HHs that were non-poor in 2002, factors that increased likelihood of becoming poor: Negative Dynamic

- **HH Demographics:**
  - HH which becomes female headed

- **Asset levels (in 2002):**
  - HH head did not complete primary school
  - HH has no chickens
  - HH has less than 1.75 ha of total area
  - HH has no radio

- **Technology used:**
  - No access to extension

- **Livelihood strategies:**
  - Losing cash crops: tobacco, cotton
  - Losing self-employment activity
  - Losing skilled wage income

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Selected Take-away points

- Initial assets can make a difference: those with higher assets experience higher income change and can participate in higher income activities

- In a relatively poor rainfall year, HHs do shift to wage labor/ self-emp; but the poor into low income wage labor, low returns self-emp.

- Ag technology is associated with higher income changes: improved seed & row planting

- Female heads at a disadvantage

- Chickens associated with positive income changes
UPCOMING ACTIVITY ON TECHNOLOGY IDENTIFICATION, MONITORING, AND ASSESSMENT (Amended SOW)

- OBJECTIVES
  - Improve selection of best bet technologies
  - Harmonization of methodology for technology assessment and monitoring
  - Strengthen linkages and communications between technology development activities of IIA, USAID funded PVO’s and other partners

Activities planned and timing

- Workshop on best bet technologies (Date?)
- Workshop to present and adopt methodology for monitoring and impact assessment (Date?)
Obrigado

For further information,
Contact Gilead Mlay at
mlaygile@msu.edu

Or visit
www.aec.msu.edu/fs2/mozambique/index.htm