

**World Bank**  
**African Drylands Seminar Series**

**Household Resilience and Participation in Markets:  
Evidence from Ethiopia Panel Data**

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**January 29, 2014**

This presentation is part of a larger study financed by IFPRI and the World Bank and conducted by a team from the University of Rome "Tor Vergata" composed of Pasquale L. Scandizzo, Sara Savastano, Federica Alfani, and Adriana Paolantonio

# Study objectives

- Resilience it is defined as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard” (UNISDR)
- In our study we investigate the impact over time on poverty and nutritional shortfalls of several determinants of resilience along the three dimensions of **exposure to shocks**, **sensitivity to shocks**, and **coping capacity**, in the rural drylands of Ethiopia

# Context

- Ethiopia is the second-largest country in Africa, with an estimated population of nearly 92 million and a growth rate of 2.6 percent per year.
- It is a predominantly rural and young society, with 84 percent living mainly in densely populated highland settlements.
- The urban and the rural population are growing respectively at around 4 and 2.3 percent per year.
- The proportion of the population under age 15 is 45 percent, with only 3.2 percent above age 65.

# Context (continued)

- At the present rate of population growth, Ethiopia is adding 2 million people every year, inflating family sizes and increasing the number of dependents.
- The rapid pace and imbalanced distribution of growth gives rise to concerns.
- Increasing demographic pressure, mostly in the rural areas where 84% of the population is concentrated, goes hand in hand with degradation of the environment and natural resources, increased climate variability, and market vulnerability.
- Population growth in rural areas adds to the growing number of rural residents who are land-short and landless.

# Data used for the study

- Our data derive from the Ethiopia Rural Household Survey (ERHS), a unique multi-purpose longitudinal household dataset jointly realized by the Department of Economics at Addis Ababa University, the Centre for the Study of African Economies (CSAE), the University of Oxford and the International Food Policy Research Institute (IFPRI).
- The data were collected from some 1,100 rural households through four rounds of surveys carried out over a period of 15 years (1994, 1999, 2004, and 2009)
- The surveys cover four of the nine administrative regions in Ethiopia, where the largest proportion of country's farmers are located and include fifteen woredas (districts) stratified over the three major agricultural systems found in five agro-ecological zones
- Although not being nationally representative, the sample is representative of the main farming systems in the country

# Main findings

- Snapshots of poverty conceal important dynamics, with many households drifting in and out of poverty
- Family size increases (i.e. population growth) and droughts are the main causes of increasing poverty and reduced resilience
- Accumulated wealth, land and livestock are the main determinants of increasing resilience
- Increased reliance on markets for food and off farm employment of more vulnerable households may lead to both wider and deeper poverty

# Average conditions have been improving slightly over time

|   | Unit  | 1994    | 2009   |
|---|-------|---------|--------|
| Number of household members             | Nb.   | 5.75    | 5.74   |
| Share of adult females in the household | %     | 25.08   | 26.38  |
| Share of children in the household      | %     | 30.96   | 27.27  |
| Share of elderly in the household       | %     | 9.05    | 10.24  |
| Age of household head                   | Years | 50.74   | 52.72  |
| Years of schooling of household head    | Years | 1.36    | 1.78   |
| Total value of hh consumption           | US\$  | 1007.21 | 950.85 |
| Total amount of land used by the hh     | Ha    | 1.45    | 1.52   |

# Exposure to negative shocks has been decreasing, except for drought

|   | 1994     |       | 2009     |       |
|---|----------|-------|----------|-------|
|   | Non poor | Poor  | Non poor | Poor  |
| HH having experienced too much rain or flood in last 15 yrs.                        | 13%      | 18%   | 4%       | 1%    |
| HH having experienced. frost in last 15 yrs.  | 17%      | 30%   | 17%      | 11%   |
| HH having experienced pest or disease on livestock in last 15 yrs.                  | 4%       | 9%    | 5%       | 3%    |
| HH having experienced lack of demand of agricultural products in last 15 yr         | 12%      | 23%   | 15%      | 12%   |
| HH having experienced output prices shocks in last 15 yrs.                          | 52%      | 67%   | 30%      | 61%   |
| HH having experienced drought in last 15 yrs.                                       | 12%      | 13%   | 18%      | 22%   |
| Max shortfall in the previous 5 years over rainfall st. dev. of the previous 5 yrs. | 1.095    | 1.215 | 1.36     | 1.29  |
| Aridity index   | 0.602    | 0.634 | 0.608    | 0.642 |



# Extent and the depth of poverty have undergone significant changes

- Resilience and development make poverty a dynamic phenomenon, as people can enter and exit poverty permanently or temporarily in their lifetime
- Snapshot poverty measures therefore may be misleading, because they may exaggerate or underestimate the impact of poverty over a lifetime
- More reliable indicators of poverty are lifetime poverty measures or composite measures that combine snapshot and lifetime poverty indexes

# Most households tend to move in and out of poverty

|                     | Nutrition status (% of households)             |                                  |  |                                      |
|---------------------|--|----------------------------------|--|--------------------------------------|
|                     | Move into under-nutrition                      | Staying under-nourished          | Staying not under-nourished              | Move out of under-nutrition          |
| <b>1999 (N=914)</b> | 20%  | 23%                              | 32%                                      | 24%                                  |
| <b>2004 (N=912)</b> | 20%  | 20%                              | 39%                                      | 21%                                  |
| <b>2009 (N=990)</b> | 25%  | 21%                              | 35%                                      | 19%                                  |
|                     | Poverty and nutrition status (% of households) |                                  |  |                                      |
|                     | Move into poverty & under-nutrition            | Staying poor and under-nourished | Staying non poor and not under-nourished | Move out of poverty & undernutrition |
| <b>1999 (N=914)</b> | 17%  | 14%                              | 48%                                      | 20%                                  |
| <b>2004 (N=912)</b> | 16%  | 12%                              | 54%                                      | 17%                                  |
| <b>2009 (N=990)</b> | 20%  | 12%                              | 52%                                      | 16%                                  |

## Most households tend to move in and out of poverty (continued)

| Aggregate Classification | Classification        | Poor in monetary terms (%) | Poor in nutritional terms (%) |
|--------------------------|-----------------------|----------------------------|-------------------------------|
| <b>Non resilient</b>     | Persistently negative | 6,32                       | 7,39                          |
|                          | Hit, no rebound       | 15,19                      | 14,65                         |
|                          | Swinging              | 22,58                      | 31,59                         |
| <b>Resilient</b>         | Hit, with rebound     | 14,65                      | 11,29                         |
|                          | Stable exit           | 14,25                      | 17,74                         |
|                          | Persistently positive | 27,01                      | 17,34                         |
| <b>Total</b>             |                       | <b>100</b>                 | <b>100</b>                    |

# The depth of poverty changes significantly over time

## Poverty as Income Shortfall

| Variable                                  | Min    | Mean | Max   |
|---|--------|------|-------|
| <b>Snapshot Poverty Index</b>             |        |      |       |
| <i>Average p.c. Gap (\$ per year)</i>     | -491.1 | 75.8 | 91.7  |
| <i>Delta=Increase in Average p.c. Gap</i> | -297.3 | 2.0  | 447.0 |
| <b>Lifetime Index</b>                     |        |      |       |
| <i>Average(\$ per year)</i>               | -494.2 | 76.1 | 90.7  |
| <i>Delta</i>                              | -24.1  | 3.7  | 4.4   |
| <b>Composite Index</b>                    |        |      |       |
| <i>Average (\$ per year)</i>              | -492.6 | 75.9 | 91.2  |
| <i>Delta</i>                              | -155.9 | 2.9  | 212.6 |

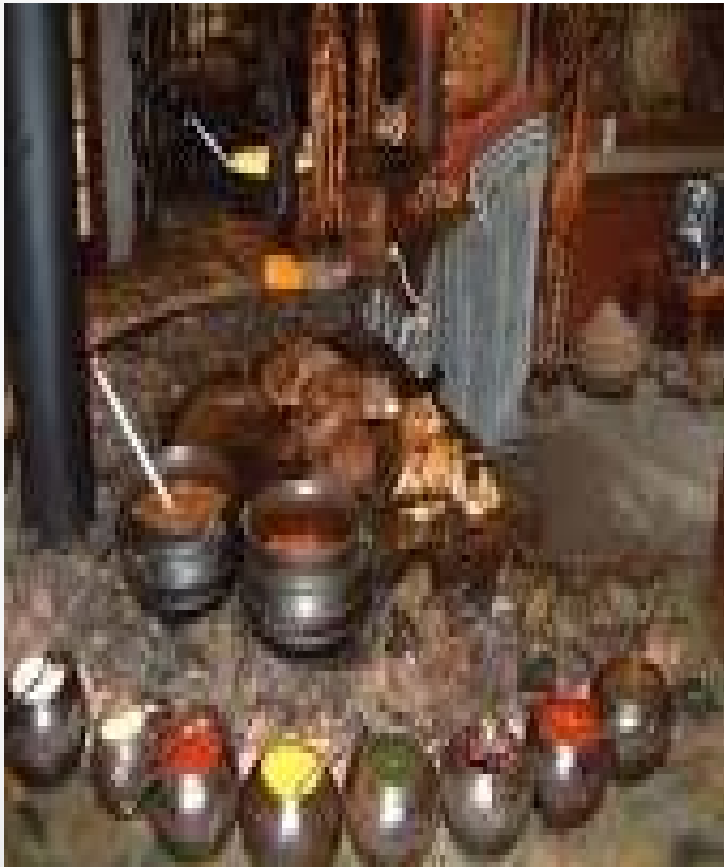
# Calorie shortfalls are negative on average, but change over time

| Poverty as Calorie Shortfall          |         |        |        |
|---------------------------------------|---------|--------|--------|
|                                       | Min     | Mean   | Max    |
| <b>Snapshot Poverty Index</b>         |         |        |        |
| <i>Average p.c. Gap (Kcal/pc/day)</i> | -1879.4 | -244.3 | 1280.4 |
| <i>Delta</i>                          | -1591.3 | -11.7  | 1207.2 |
| <b>Lifetime Index</b>                 |         |        |        |
| <i>Average(Kcal/pc/day)</i>           | -1999.9 | -214.7 | 1351.3 |
| <i>Delta</i>                          | -968.0  | -29.5  | 962.3  |
| <b>Composite Index</b>                |         |        |        |
| <i>Average (Kcal/pc/day)</i>          | -1939.7 | -229.5 | 1315.8 |
| <i>Delta</i>                          | -1279.6 | -20.6  | 1084.7 |

# Econometric analysis

- The Econometric Analysis aimed to test the relationships between important outcome variables (poverty, undernutrition, food consumption and life satisfaction) and the main components of resilience (exposure, sensitivity and coping capacity)
- Taking into account their simultaneous determination, the results showed significant correlations of outcomes with many household indicators of resilience
- Correlations were particularly significant and robust for a smaller set of key variables, such as family size, weather shocks, market dependence and wealth

# Some robust results from the econometric analysis



# Family size (population growth) as the single most important poverty factor

| An increase of 1% in family size is associated with an increase in % | Estimated Elasticity |
|--|----------------------|
| Probability of being poor  | 2.24                 |
| Probability of being under-nourished                                 | 2.08                 |
| Snapshot poverty gap   | 3.29                 |
| Lifetime poverty gap   | 0.62                 |
| Composite poverty gap  | 0.87                 |
| Snapshot calorie gap   | 1.67                 |
| Lifetime calorie gap   | 0.50                 |
| Composite calorie gap  | 0.60                 |



# Increase in family size also Important factor of increasing poverty

| 1% increase in the rate of increase in family size is associated with an increase in % | Estimated Elasticity |
|--|----------------------|
| Increase in Snapshot poverty gap   | 0.90                 |
| Increase in Lifetime poverty gap   | 0.43                 |
| Increase in Composite poverty gap  | 0.66                 |
| Increase in Snapshot calorie gap   | 2.20                 |
| Increase in Lifetime calorie gap   | 0.98                 |
| Increase in Composite calorie gap  | 1.59                 |

# Drought is the second most important poverty factor

| 1% increase in the incidence of (self reported) drought is associated with an increase in % | Estimated Elasticity |
|---|----------------------|
| Probability of being poor   | 0.66                 |
| Probability of being under-nourished  | 0.25                 |
| Snapshot poverty gap  | 1.50                 |
| Lifetime poverty gap  | 0.21                 |
| Composite poverty gap   | 0.35                 |
| Snapshot calorie gap  | 0.37                 |
| Lifetime calorie gap  | 0.17                 |
| Composite calorie gap   | 0.16                 |

# Drought also important as a factor of increasing poverty over time

| 1% increase in the incidence of (self reported) drought is associated with an increase in % | Estimated Elasticity |
|---|----------------------|
| Increase in Snapshot poverty gap  | 0.70                 |
| Increase in Lifetime poverty gap  | 0.36                 |
| Increase in Composite poverty gap   | 0.53                 |
| Increase in Snapshot calorie gap  | 1.21                 |
| Increase in Lifetime calorie gap  | 0.55                 |
| Increase in Composite calorie gap   | 0.88                 |

# Accumulated wealth is the most important factor of poverty reduction

| 1% increase in the value of accumulated wealth is associated with a reduction in % | Estimated Elasticity |
|--|----------------------|
| Probability of being poor  | 1.26                 |
| Probability of being under-nourished   | 0.64                 |
| Snapshot poverty gap   | 1.32                 |
| Lifetime poverty gap   | 0.45                 |
| Composite poverty gap  | 0.49                 |
| Snapshot calorie gap   | 0.30                 |
| Lifetime calorie gap   | 0.15                 |
| Composite calorie gap  | 0.16                 |

# Larger farm size is associated with small reduction of poverty

| 1% increase in farm size is associated with a decrease in % | Elasticity Estimate (absolute value) |
|---|--------------------------------------|
| Probability of being poor                                   | 0.04                                 |
| Probability of being under-nourished                        | 0.04                                 |
| Snapshot poverty gap  | 0.18                                 |
| Lifetime poverty gap  | 0.03                                 |
| Composite poverty gap                                       | 0.07                                 |
| Snapshot calorie gap  | 0.09                                 |
| Lifetime calorie gap  | 0.10                                 |
| Composite calorie gap                                       | 0.08                                 |

# Income from livestock is associated with lower probability of being poor

| 1% increase in income from livestock is associated with a decrease in % | Elasticity Estimate (Absolute Value) |
|---|--------------------------------------|
| Probability of being poor   | 0.37                                 |
| Probability of being under-nourished                                    | 0.18                                 |
| Snapshot poverty gap  | 0.13                                 |
| Lifetime poverty gap  | 0.01                                 |
| Composite poverty gap   | 0.03                                 |
| Snapshot calorie gap  | 0.04                                 |
| Lifetime calorie gap  | 0.01                                 |
| Composite calorie gap   | 0.01                                 |

# Purchasing food is a strategy to cope with poverty and shocks

| Elasticities: % Increases in Market Calorie Consumption in Response to a 1% increase in : |              |
|---|--------------|
| Per capita total calorie consumption planned  | <b>0.966</b> |
| Crop price ratio (consumer/producer)  | -0.003       |
| Household members are under-nourished (1=yes, 0=no)                                       | 0.019        |
| Drought shock in the previous five years (1=yes, 0=no)                                    | <b>0.082</b> |
| Avg. rainfall shortfall in the previous five years measured at PA level                   | <b>0.054</b> |
| Rainfall coefficient of variation (since 1983)  | <b>4.756</b> |
| Ratio of food to non food expenditure at time $t-1$                                       | 0.043        |
| Off-farm employment ratio   | <b>0.048</b> |

# But excessive reliance on market consumption tends to increase poverty

| 1% increase in the share of food market consumption (in calories) is associated with an increase in % | Estimated Elasticity |
|---|----------------------|
| Probability of being poor (abs. value)  | 0.44                 |
| Probability of being under-nourished (absolute value)   | 0.16                 |
| Snapshot poverty gap (share)  | 0.53                 |
| Lifetime poverty gap (share)  | 0.23                 |
| Composite poverty gap (share)   | 0.25                 |
| Snapshot calorie gap (share)  | 0.02                 |
| Lifetime calorie gap (share)  | 0.15                 |
| Composite calorie gap (share)   | 0.10                 |



# Purchasing food is also associated with increasing poverty

| 1% increase in the rate of increase in share of food market consumption is associated with an increase in % | Estimated Elasticity |
|---|----------------------|
| Increase in Snapshot poverty gap  | 0.70                 |
| Increase in Lifetime poverty gap  | 0.36                 |
| Increase in Composite poverty gap   | 0.53                 |
| Increase in Snapshot calorie gap  | 1.21                 |
| Increase in Lifetime calorie gap  | 0.55                 |
| Increase in Composite calorie gap   | 0.88                 |

# Greater off-farm employment is also associated with greater poverty

| 1% increase in off farm employment ratio is associated with an increase in % | Elasticity Estimate |
|--|---------------------|
| Probability of being poor  | 0.09                |
| Probability of being under-nourished   | 0.08                |
| Snapshot poverty gap   | 2.39                |
| Lifetime poverty gap   | 0.09                |
| Composite poverty gap  | 0.53                |
| Snapshot calorie gap   | 0.68                |
| Lifetime calorie gap   | 0.13                |
| Composite calorie gap  | 0.20                |

# Conclusions and policy implications

- **Development and resilience make poverty a dynamic condition**, with many households changing status, in terms of income and consumption shortfalls, in the course of their lifetime.
- **Development policies should aim to enhance the main factors that allow poor households to permanently exit poverty**, such as higher access to land and other natural resources and better opportunities to accumulate savings, and invest in livestock and other forms of wealth .
- **They should also complement enhanced access to markets with policies increasing self reliance**, such as increases in productivity.

# Conclusions and policy implications

- **Food markets play a crucial role** in ensuring flexibility and consumption smoothing, but, together with other forms of market dependence, **they may also be a source of instability and further risks**, especially for the less self-reliant households.
- **A new class of less resilient poor** may be created by unchecked population growth, increasing scarcity of land and capital, higher dependence on the market.
- **Development policies should address population growth and increasing market dependence**, by expanding the agriculture resource base, increasing productivity and stepping up and better targeting social protection policies toward less self-reliant households .

# Conclusions and policy implications:

## Three general principles

- 1. Policies aimed at reducing sensitivity should give higher priority to expand the poor households' resource base** (e.g. enhancing access to land and other production factors, increase investment and productivity)
- 2. Policies aimed at reducing exposure should give higher priority to managing poverty related risks** ( e.g. effective safety nets, insurance, stabilization and social protection programs . against weather and market shocks)
- 3. Policies aimed at enhancing coping capacities should give higher priority to sustainable and self reliable strategies** (e.g. storage, savings , human capital )

Thank you for your attention

