Two clear trends: 1) a remarkable decline in global poverty ...

Poverty headcount at $1.9/day (2011 PPP) poverty line by regions

Source: World Bank
2) along with a sharp increase in the incidence of natural disasters

Number of natural disasters

(1900-2014)

(1950-2014)

Source: EM-DAT
But still many people are a disaster away from poverty

Note: $1.25 per day is a widely used measure of extreme poverty. However, $2.50 per day is considered a more relevant measure of extreme poverty for some regions, such as Latin America and the Caribbean. Source: WDR 2014
Vulnerable people often dealing with a very risky environment

<table>
<thead>
<tr>
<th>Shocks</th>
<th>Afghanistan Urban</th>
<th>Afghanistan Rural</th>
<th>India Urban</th>
<th>India Rural</th>
<th>Lao PDR Urban</th>
<th>Lao PDR Rural</th>
<th>Malawi Urban</th>
<th>Malawi Rural</th>
<th>Peru Urban</th>
<th>Peru Rural</th>
<th>Uganda Urban</th>
<th>Uganda Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or more</td>
<td>16.4</td>
<td>48.9</td>
<td>61.6</td>
<td>34.4</td>
<td>72.1</td>
<td>40.0</td>
<td>66.8</td>
<td>20.7</td>
<td>34.4</td>
<td>29.7</td>
<td>56.2</td>
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<tr>
<td>Two or more</td>
<td>8.7</td>
<td>39.2</td>
<td>23.4</td>
<td>11.9</td>
<td>36.1</td>
<td>12.7</td>
<td>40.4</td>
<td>1.4</td>
<td>1.9</td>
<td>5.6</td>
<td>15.6</td>
<td></td>
</tr>
<tr>
<td>Natural disasters (drought, flood)</td>
<td>10.6</td>
<td>42.2</td>
<td>57.3</td>
<td>5.6</td>
<td>36.0</td>
<td>10.4</td>
<td>47.2</td>
<td>2.6</td>
<td>21.5</td>
<td>19.9</td>
<td>52.1</td>
<td></td>
</tr>
<tr>
<td>Price shocks$^c$</td>
<td>0.2</td>
<td>3.0</td>
<td>—</td>
<td>4.4</td>
<td>4.9</td>
<td>2.1</td>
<td>42.0</td>
<td>—</td>
<td>—</td>
<td>1.7</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Employment shocks</td>
<td>6.4</td>
<td>4.3</td>
<td>—</td>
<td>9.3</td>
<td>3.1</td>
<td>7.7</td>
<td>3.4</td>
<td>6.4</td>
<td>1.5</td>
<td>1.9</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Health shocks (death, illness)</td>
<td>6.9</td>
<td>14.0</td>
<td>30.2</td>
<td>23.2</td>
<td>33.8</td>
<td>10.1</td>
<td>18.0</td>
<td>9.1</td>
<td>8.9</td>
<td>11.8</td>
<td>14.9</td>
<td></td>
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<tr>
<td>Personal and property crime</td>
<td>1.8</td>
<td>6.6</td>
<td>0.9</td>
<td>5.8</td>
<td>1.9</td>
<td>8.5</td>
<td>8.4</td>
<td>3.2</td>
<td>3.1</td>
<td>6.6</td>
<td>8.7</td>
<td></td>
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<tr>
<td>Family and legal disputes</td>
<td>—</td>
<td>—</td>
<td>1.9</td>
<td>0.0</td>
<td>0.9</td>
<td>1.7</td>
<td>4.3</td>
<td>0.7</td>
<td>0.3</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Note: — = not available.
Source: WDR 2014 team based on data from household surveys, various years 2005-11.
The observable damaging effects of natural shocks are rather obvious – especially if not managed well.

Google Earth images of a neighborhood just off of Canape Verte before and after the earthquake

- The 7.0 magnitude earthquake in Haiti in 2010 killed around 220,000 people, injured 300,000 and affected 3,500,000
- The 8.8 magnitude earthquake that hit Chile (also) in 2010 killed 550 people
And are confirmed by a large (and growing) body of empirical evidence – household well-being is largely susceptible in the short-term …

Consumption per capita fell by 5.5% among households by Storm Agatha in Guatemala in 2010 ...

Source: Baez et al (2016)
and also in the long-term

Well-being of adult Indonesian women sensitive to environmental conditions early in life

Figure 1: Adult Outcomes on Rainfall in Birth District and Birth Year

Notes: Nonparametric Fan regressions (biweight kernel, bandwidth = 0.5), conditional on birth district-season fixed effects, birth year-season fixed effects, and birth district-season-specific linear time trends. Solid line is nonparametric regression estimate. Dashed lines bound 95 percent bootstrapped confidence intervals.

Source: Maccini and Yang (2009)
How can financial/insurance instruments help when, for instance, unpredictable rainfall is an important risk for agricultural activity?

Poorer people lack sufficient access to financial instruments

*(Fraction of poor and nonpoor people with savings at a financial institution)*

*Note: Each dot represents poor people or nonpoor people in one country. PPP = purchasing power parity.*

Insure the uninsured, e.g. rainfall index-insurance products

- Payouts determined on the basis of an observable variable (i.e. rainfall)
- Avoids traditional problems (moral hazard, adverse selection)
- High frequency rainfall data available in many agricultural contexts
- ‘Basis Risk’ (i.e. partial insurance)
- Low take up at market prices so many argue that it makes sense to subsidized it
But if poverty reduction is an objective, be aware of the unintended consequences

The agricultural system becomes more sensitive to rainfall for insured farmers

Note: Lowess-Smoothed Relationship Between Log Per-Acre Output Value and Log Rain per Day in the Kharif Season, by Insurance Treatment
Source: Mobarak and Rosenzweig (2014)
Current design of index insurance products could make the poorest of the poor worse off

Labor demand by insured cultivators is lower (relative to the uninsured) for negative rainfall shocks

Source: Mobarak and Rosenzweig (2014)
Take away: The design of financial protection against shocks matters a lot for poverty reduction!

Marketing insurance to landless laborers reduces the sensitivity of wages to rainfall

Source: Mobarak and Rosenzweig (2014)
Living on the Edge: Protecting the Poor (or not?) from Natural Shocks

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Poverty and Equity Global Practice
Venice, May 20, 2016