THE BASIS SMART DEVELOPMENT PILOT PROJECT AGENDA

Altering Poverty Dynamics with Index Insurance in Kenya

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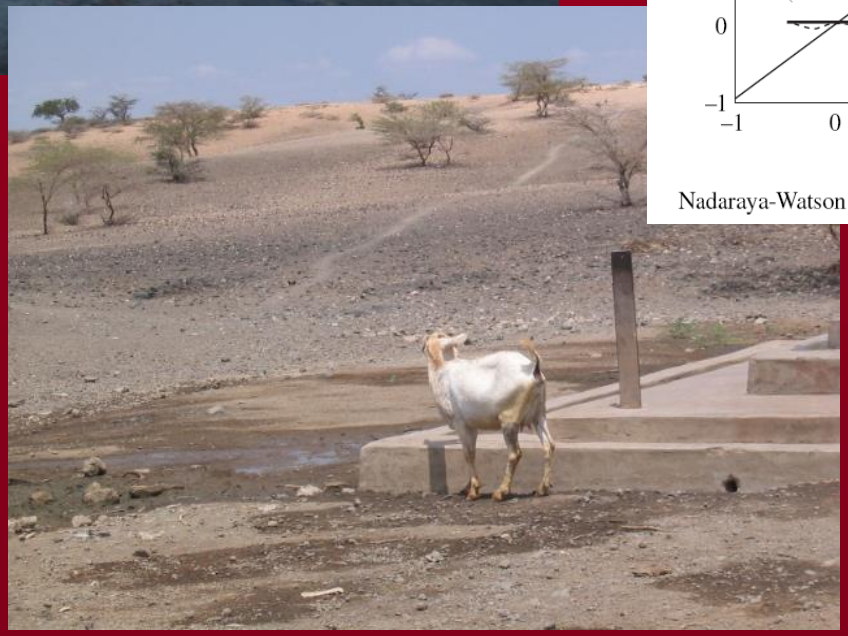
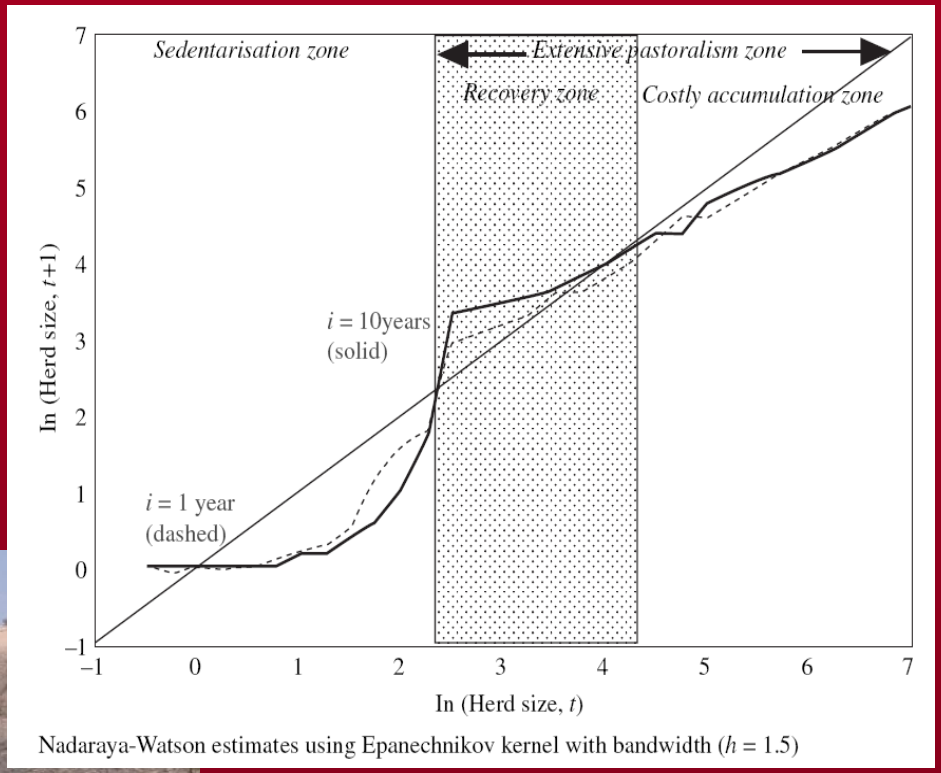
Getting Smart about Poverty Dynamics

- The Arid & Semi-arid Lands of N. Kenya
- Standard Humanitarian Response to Destitution
- But what about the dynamics that generate destitution?
- Are we falling into an Aid Trap?

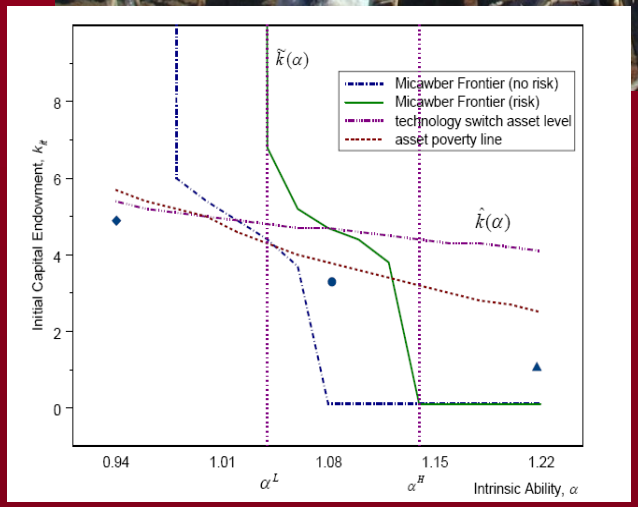
Getting Smart about Poverty Traps





Nadaraya-Watson estimates using Epanechnikov kernel with bandwidth ($h = 1.5$)

Forging Smart & Sustainable Solutions



- Logic of a 'Productive Safety Net' Staked-out at Threshold to Protect Assets
  - Brake downward slide
  - Crowd in Productive Savings & Accumulation
- But How Can We Implement such a Safety Net?
  - Standard insurance will not work
  - Index insurance?

Index Insurance Basics

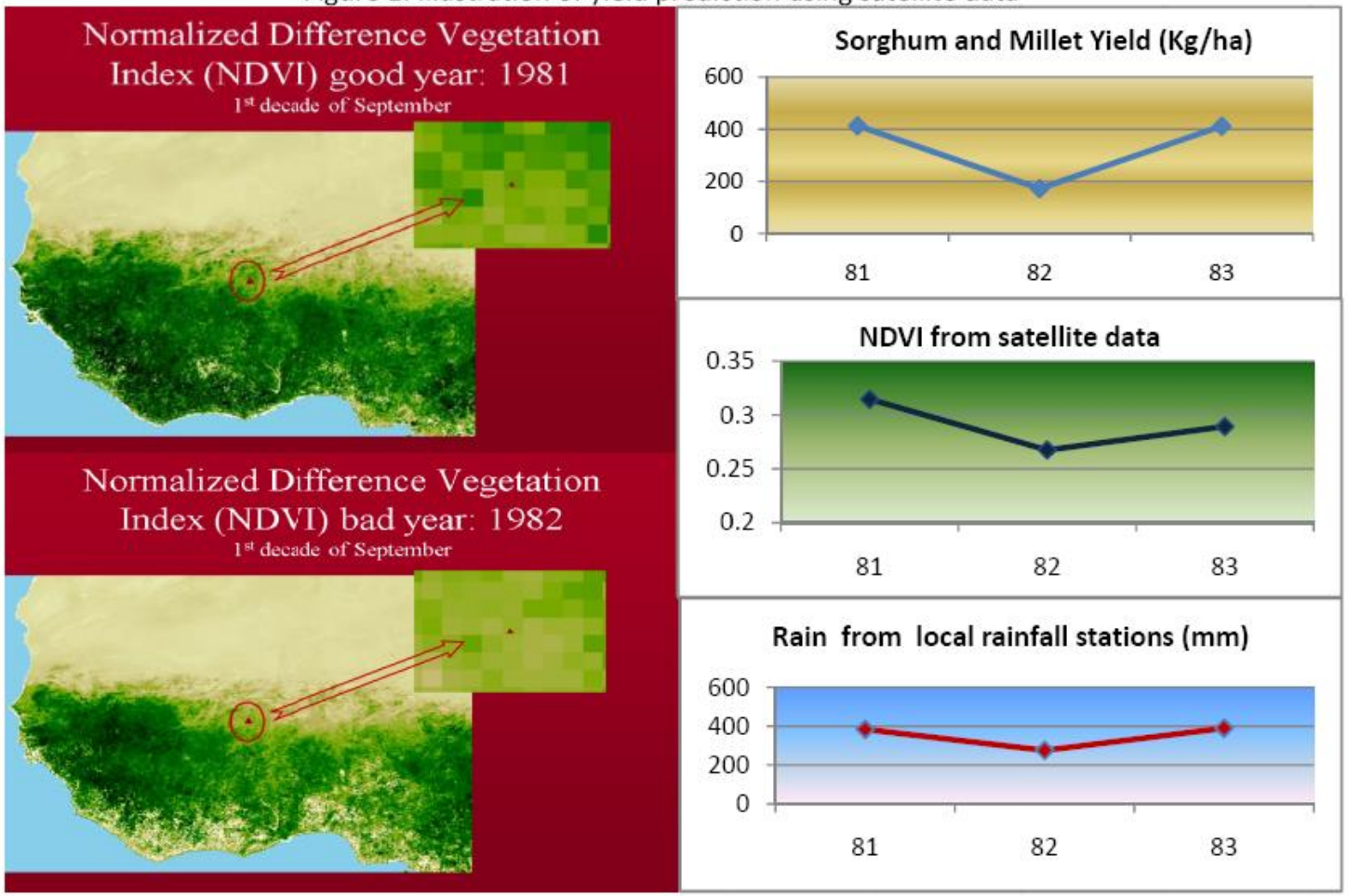
- Conventional insurance measures individual losses and makes indemnity payouts based on those losses.
- Index insurance does not require measurement of individual losses and makes common payments to insured based on the level of a single index (*e.g.*, regional yields or mortality rates) correlated with individual losses:
- One possible index is based on remotely-sensed (satellite) information on vegetative cover (NDVI):

$$M_{ls} = M_g(ndvi) + \varepsilon_{gls} \quad \text{if good climate regime } (Czndvi_pos_{ls} \geq 0)$$

$$M_{ls} = M_b(ndvi) + \varepsilon_{bls} \quad \text{if bad climate regime } (Czndvi_pos_{ls} < 0)$$

NDVI-based Index for Grains in Burkina

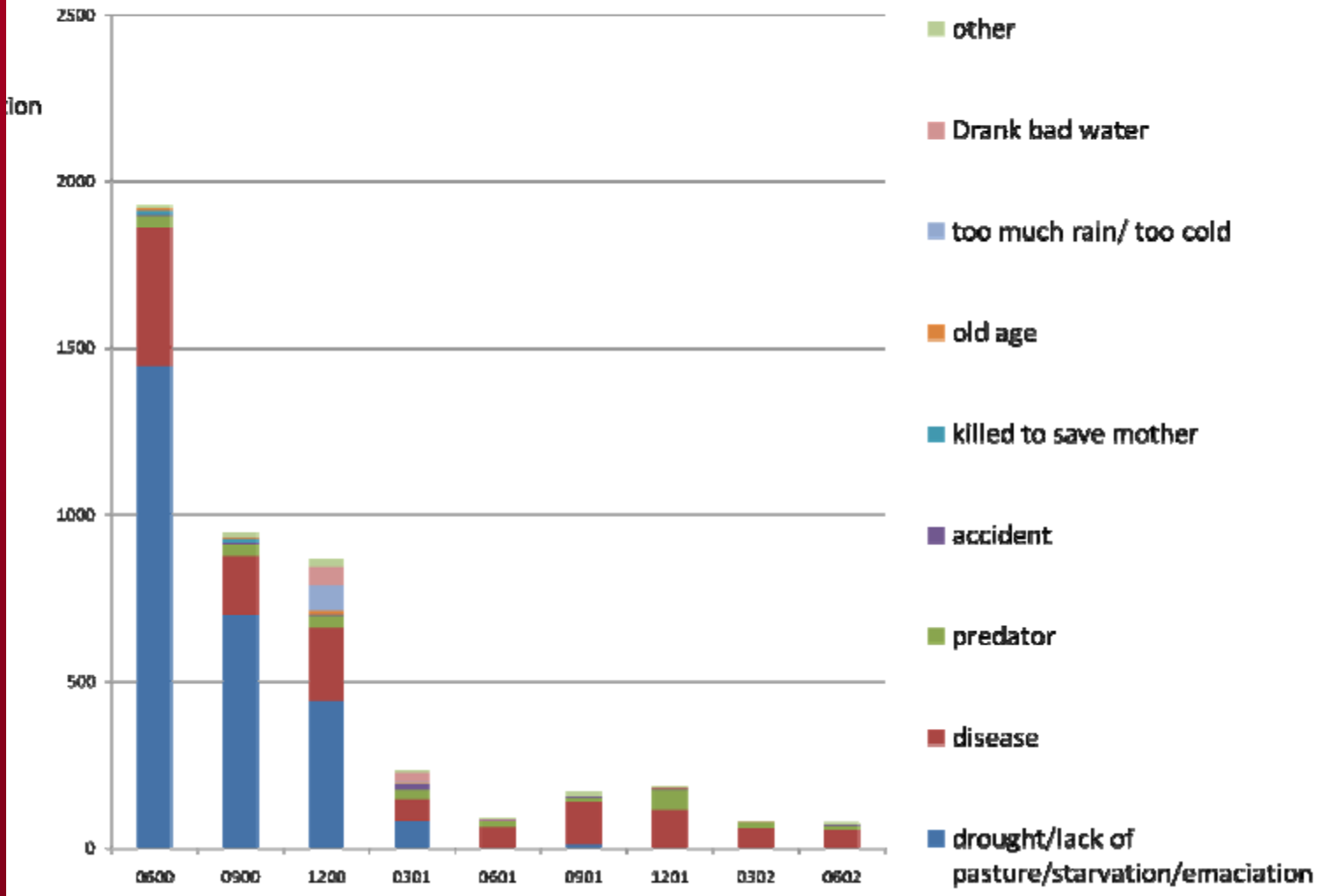
Figure 1: Illustration of yield prediction using satellite data



Potential & Pitfalls of Index Insurance

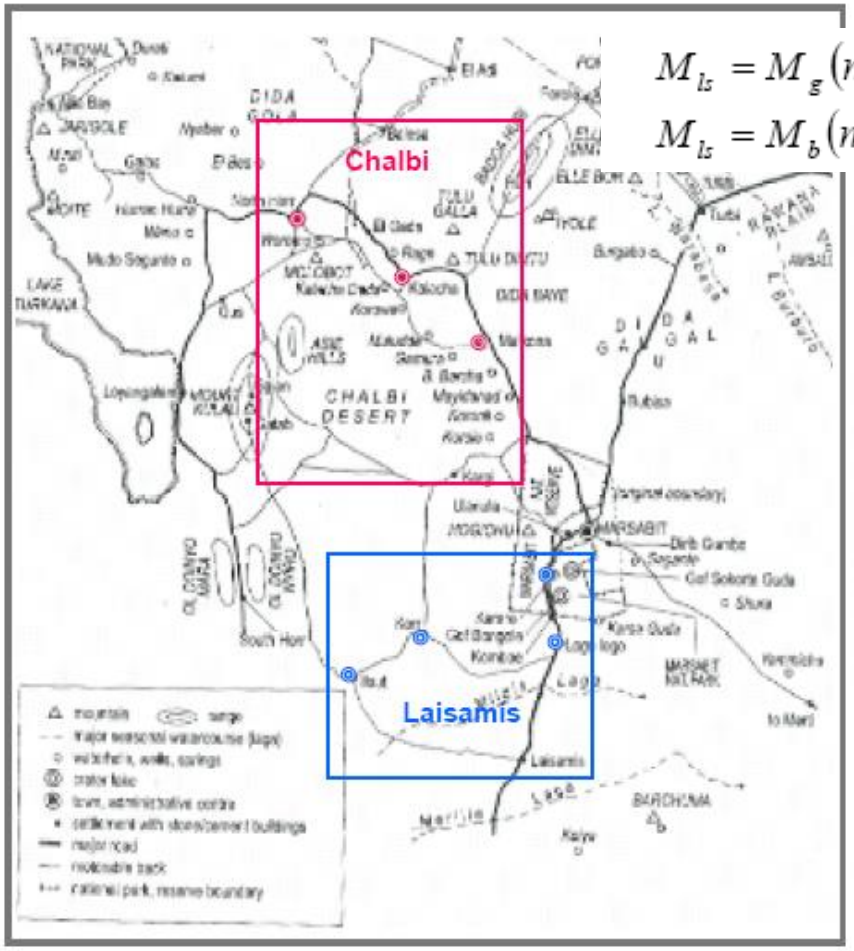
- Index insurance avoids problems that make individual insurance unprofitable for small scale agricultural:
  - No transactions costs of measuring individual losses
  - Preserves effort incentives (no moral hazard) as no single individual can influence index.
  - Adverse Selection does not matter as payouts do not depend on the riskiness of those who buy the insurance
- Insurance indexes can in principal be used to create the safety net needed to alter poverty dynamics
- But, potential pitfalls include:
  - Inadequate index (uncovered, ‘basis’ risk too high)
  - Understanding & trust by the never-before insured
  - Liquidity constraints to purchase

Figure 2B: Causes and Relative Number of Livestock Losses by Season



NDVI-based Livestock Insurance for Northern Kenya (Marsabit District)

Figure A1. Chalbi and Laisamis contract coverage clusters



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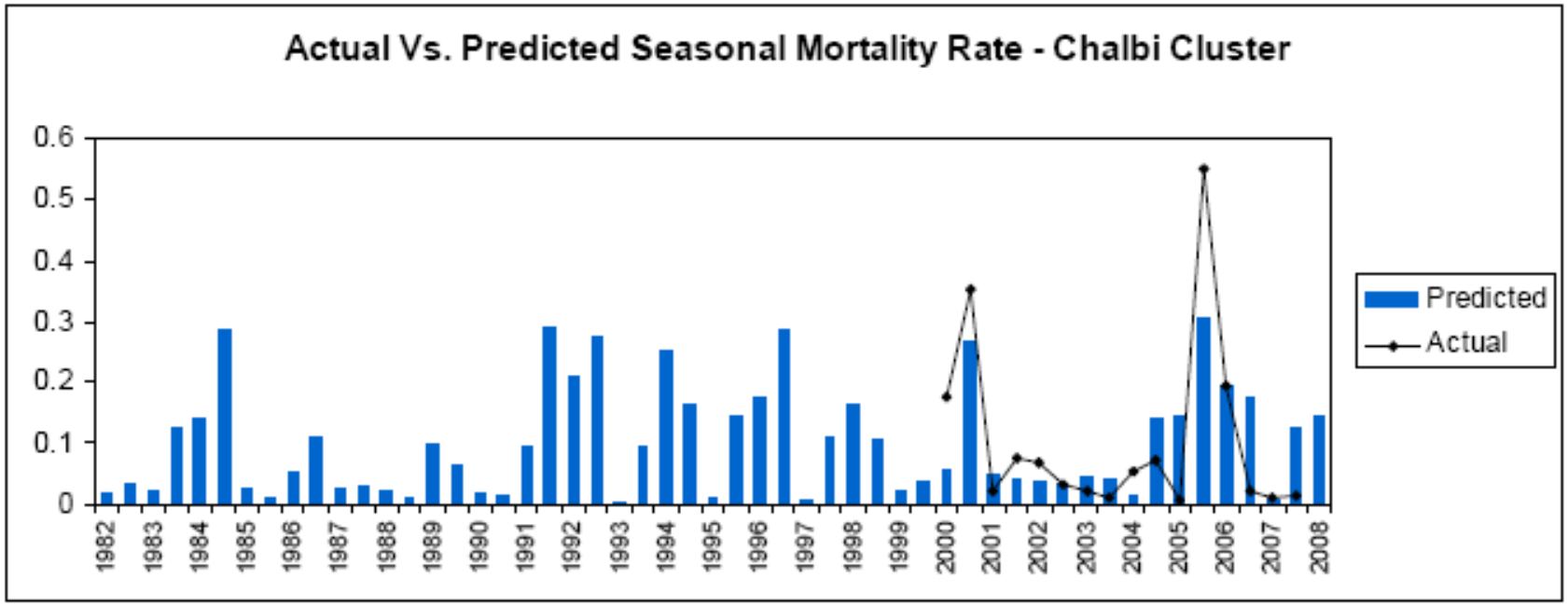
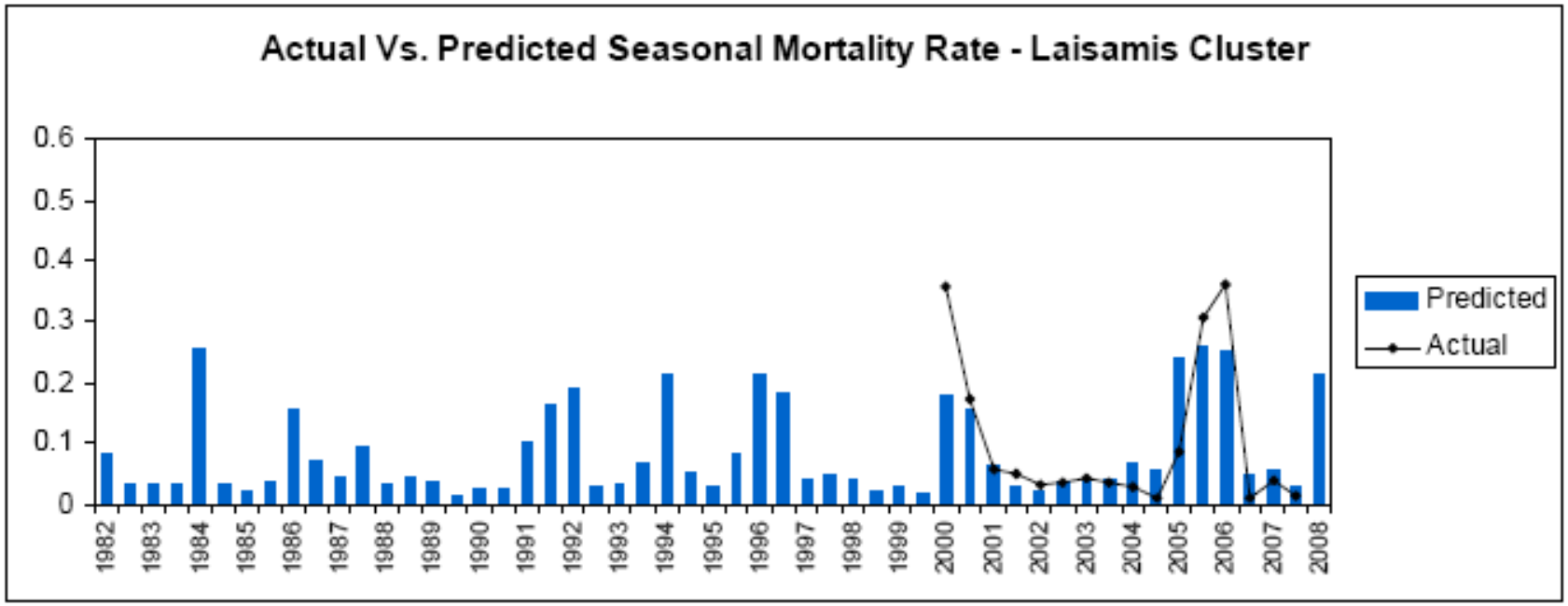

Actual Vs. Predicted Seasonal Mortality Rate - Chalbi Cluster
0.6
0.5
0.4
0.3
0.2
0.1
0
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Predicted
Actual


Actual Vs. Predicted Seasonal Mortality Rate - Laisamis Cluster
0.6
0.5
0.4
0.3
0.2
0.1
0
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Predicted
Actual

NDVI-based Livestock Insurance for Northern Kenya (Marsabit District)

Figure 4: Temporal structure of IBLI contract

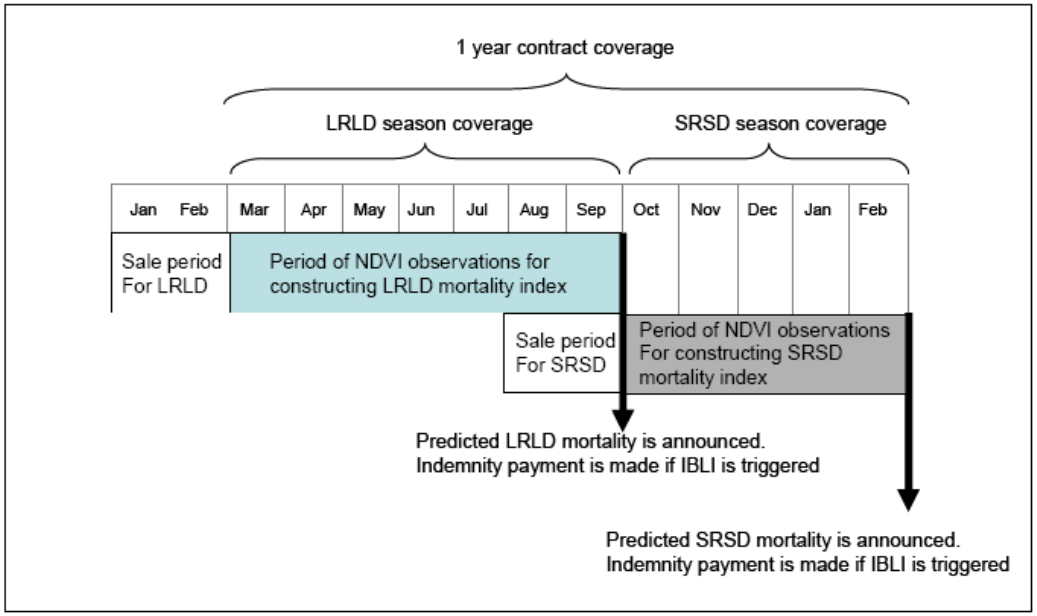


Table 1: Calculated Premiums for Unconditional Contracts across Strike

Cluster/Contract	Premium Rate (% of insured value)			
	10% Strike point	*15% Strike Point*	*20% Strike Point*	*25% Point*
Chalbi Cluster	9%	5%	3%	1%
Laisamis Cluster	5%	3%	1%	1%

Other Challenges to Index Insurance-based Productive Safety Net

- Understanding and trust
  - Insurance as an unusual commodity (stochastic benefits only)
  - Without understanding, no reason to expect behavioral change
  - Well-framed experimental economic games can help
- Liquidity constraints
  - Notional demand, but no upfront cash to pay premium
- Threshold-based targeting to maximize poverty impacts
- Impact evaluation
  - Hypothesized impacts striking
  - But we need to see it in practice

Kenyan farmers play the index insurance game.
Photo by John McPeak.

Getting Smarter through 5-year Program Evaluation

	Without HSNP Cash Transfers	*With HSNP Cash Transfers*
Without PSN Asset Protection	***1*** (Control Locations)	***2*** (HSNP Only Locations)
With PSN Asset Protection	***3*** (PSN Only Locations)	***4*** (HSNP^{+} Locations)

- Evaluating Impacts
  - Poverty & human development
  - Financial market deepening
- 'Smartening' Subsidies

For More Information

- Upcoming ILRI conference, 16 March 2009, Nairobi
  www.ilri.org/livestockinsurance
- Barrett, C. et al. (2008). "Altering Poverty Dynamics with Index Insurance," *BASIS Brief* 2008-08.
- Carter, M.R., *et al.* (2008). "Insuring the Never-before Insured: Explaining Index Insurance through Financial Education Games," *BASIS Brief* 2008-07.
- Barrett, C.B., M.R. Carter and M. Ikegmai (2008). "Poverty Traps and Social Protection," *World Bank Social Protection Discussion Paper* 0804.
- Barrett, C.B. and M.R. Carter (2007). "Asset Thresholds and Social Protection," *IDS Bulletin* 38(3):34-38.
- Carter, M. R. "Inducing Innovation: Risk Instruments for Solving the Conundrum of Rural Finance," paper prepared for the 6th Annual Meeting of Agence Française de Développement and European Development Network, Paris, November 2008.