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Livestock Roles and Managing Livestock Risk In East Africa

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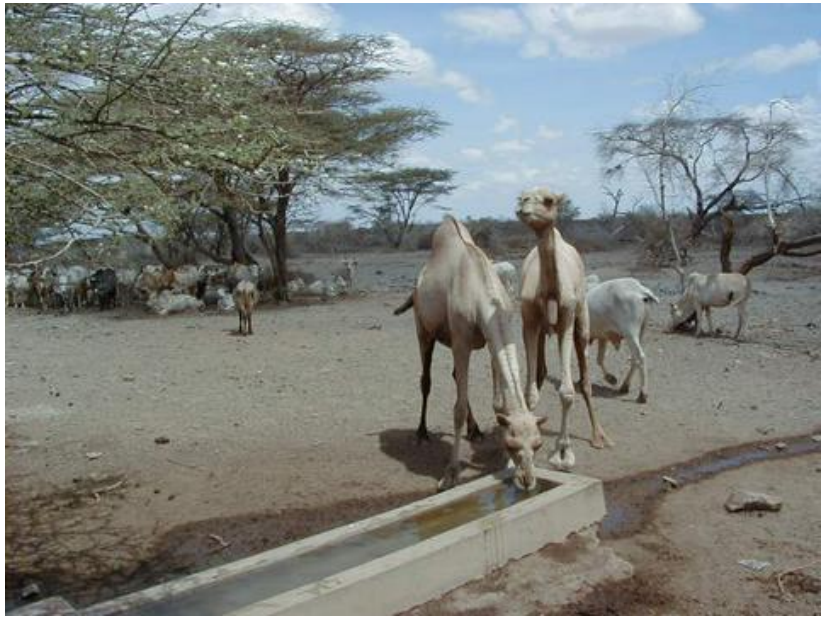
Guest Lecture to VetMed 6723: Veterinary Medicine in Developing Nations
February 23, 2016

Overview

- Livestock roles in east African arid and semi-arid lands (ASAL)
- Livestock price risk
- Livestock mortality risk
- A recent innovation: IBLI



Livestock Roles in Rural Development

Production input (indirect income):

Manure, traction, transport:

- boost productivity of crop/non-farm livelihoods (esp. non-ASAL areas)

Production system (direct income):

Meat, milk/blood, skins/hides, offspring:

- Renewable and non-renewable outputs

Sociocultural system:

Social status, bride wealth, etc.

Store of wealth:

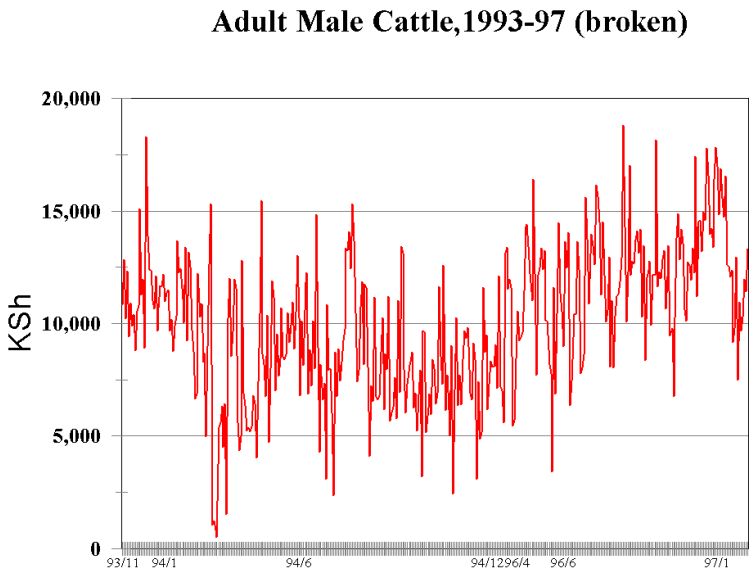
'Walking bank'; best IRR among assets

Managing livestock price risk

Market prices fluctuate dramatically.
No futures/options markets exist.

- Major price disconnects among markets … mobile phones help.

For local trade, market conditions key:
- Auction vs. dyadic exchange
- # traders/lorries (food aid backhaul)



Nairobi-Marsabit price differentials ("basis")

Managing livestock price risk

Negative correlation b/n price and mortality – opposite of crops! – b/c rainfall affects animal body condition, mortality and lactation/ reproduction.

Effects vary by species, geography, sex

Estimated Effects of Drought On Livestock Prices
(hypothetical drop of 200 and 300 mm over 3 and 12 months, respectively)

Percent Price Change		Males	Females
Camels	Marsabit	-3.1	-4.6
	Moyale	-8.1	-11.9
Cattle	Marsabit	-22.1	-52.3
	Moyale	-33.4	-47.5
Goats	Marsabit	-14.6	-17.4
	Moyale	-12.2	-16.3
Sheep	Marsabit	-21.3	-34.1

Source: Barrett et al. (2003 *J. African Economies*)

Managing livestock price risk

Estimated Effects of Quarantine On Livestock Prices

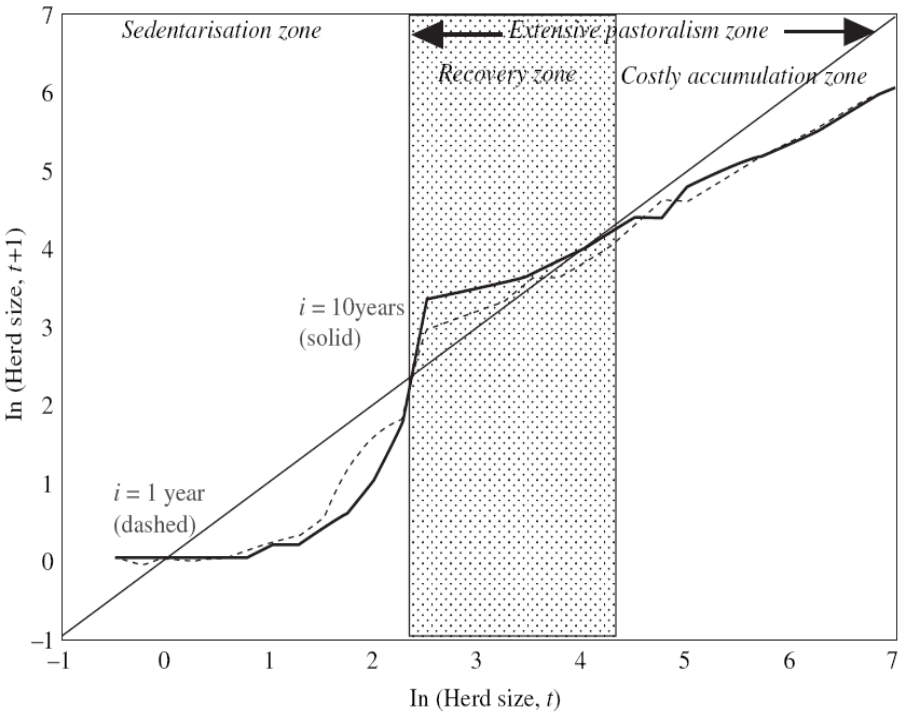
Percent Change		Males	Females
Camels	Marsabit	-9.1	-6.4
	Moyale	-6.2	-3.7
	Nairobi	0.2	0.1
Cattle	Marsabit	-23.7	-12.2
	Moyale	-16.1	-7.4
	Nairobi	2.4	2.2
Goats	Marsabit	-2.1	-2.4
	Moyale	-1.1	-1.0
	Nairobi	0.4	-0.1
Sheep	Marsabit	-5.9	-2.7
	Nairobi	0.2	0.1

Animal disease control measures matter to prices (Barrett et al., 2003 *J. African Economies*)

Managing Livestock Mortality Risk

There is strong evidence of poverty traps in the arid and semi-arid lands (ASAL) of northern Kenya and southern Ethiopia. Mortality risk mgmt therefore key.

Catastrophic herd loss risk due to major droughts identified as *the* major cause of these dynamics.



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

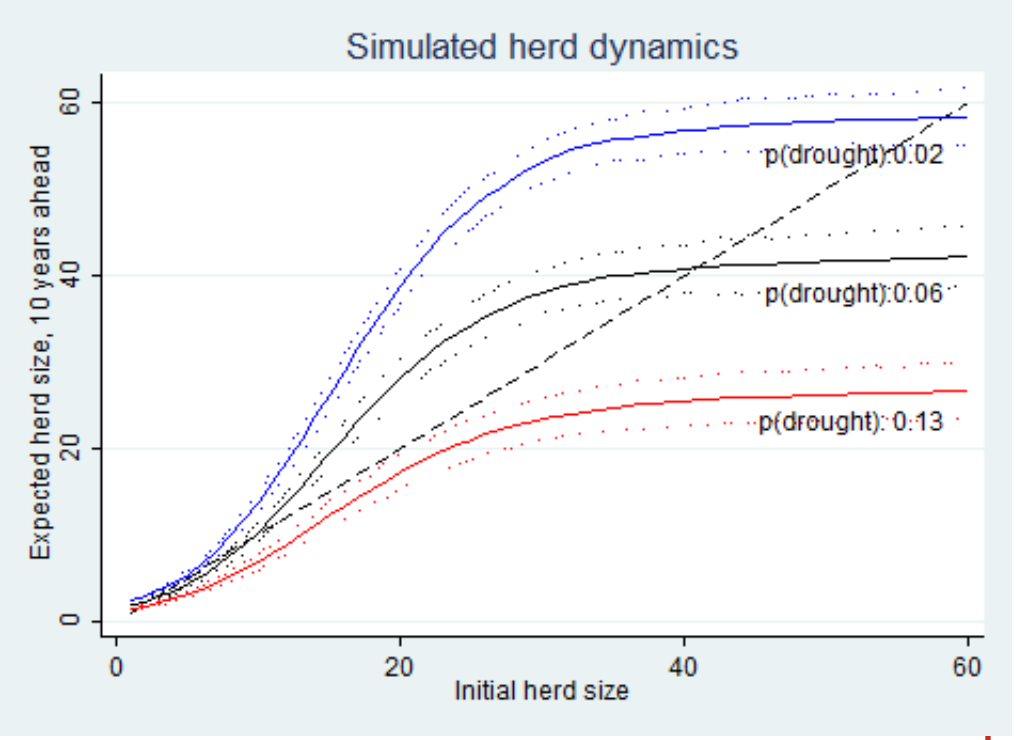
Source: Lybbert et al. (2004 *EJ*) on Boran pastoralists in s. Ethiopia. See also Barrett et al. (2006 *JDS*) among n. Kenyan pastoralists, Santos & Barrett (2011 *JDE*) on s. Ethiopian Boran.

Increased Risk From Climate Change

Pastoralist systems adapted to climate regime. But resilient to a shift in climate? Many models predict increased rainfall variability (i.e., increased risk of drought).

Herd dynamics differ b/n good and poor rainfall states, and so change with drought (<250 mm/ year) risk.

Key: In so. Ethiopia, doubling drought risk would lead to system collapse in expectation in the absence of any change to prevailing herd dynamics.



Source: Barrett and Santos (*EcolEcon* 2014)

Standard Responses to Drought

Standard responses to major drought shocks:

1) Post-drought restocking **2) Food aid**

Key Problems:

- **Slow; Expensive; Reinforces sedentarization**

An Innovative Approach: IBLI

For more information visit www.ilri.org/ibli/

Index-based livestock insurance to protect vs. drought

- Individuals buy policies to protect their herds
- Private underwriters, global reinsurers
- Commercial pilot in Kenya in 2010; worked in 2011 drought
- Now spread to Ethiopia, going nationwide in Kenya
- Major, positive effects in both countries: 12-20x the marginal benefit/cost of cash transfer programs

IBLI's Impacts: Less adverse post-drought coping

Marsabit HHs received IBLI indemnity payments in October 2011, near end of major drought. Survey HHs with IBLI coverage report much better expected behaviors/outcomes than the uninsured:

- **36% reduction in likelihood of distress livestock sales**, especially (64%) among modestly better-off HHs (>8.4 TLU)
- **25% reduction in likelihood of reducing meals** as a coping strategy, especially (43%) among those with small or no herds

IBLI appears to provide a flexible safety net, reducing reliance on the most adverse behaviors undertaken by different groups.

Source: Janzen & Carter 2013 NBER

IBLI vs. cash transfers: Normalized by cost

IBLI generates comparable impact/KSh on average at pilot scale. But philanthropic/public funding is largely fixed cost, so the marginal benefit/cost ratios are *> an order of magnitude* larger!

Cost structure		Cost/ Participant	Income from Milk Impact	Income from Milk Impact/ Cost	Income per AE Impact	Income per AE Impact/ Cost[1]	MUAC Impact	MUAC Impact/ Cost[2]
Total Program	HSNP	47,600	992	0.021	394	0.083	1.097	0.022
Cost/Participant	IBLI	37,600	2,631	0.067	263	0.070	0.337	0.026
Marginal Cost of an	HSNP	31,700	992	0.031	394	0.124	1.097	0.033
Additional Participant	IBLI	1,580	2,631	1.667	263	1.666	0.337	0.623

All in real 2009 Kenya Shillings. Impacts are estimated using the average client value and costs from administrative records, and parameter estimates. [1]Results are multiplied by 10. [2]Results are multiplied by 1,000.

Source: Jensen, Barrett & Mude in review

IBLI's Impacts: Household subjective well-being

Use randomized treatments to instrument for IBLI and then estimate how IBLI contracts in force and lapsed IBLI coverage affect SWB in so. Ethiopia.

At least two ways IBLI can influence SWB:

1) Non-monetary (psychological) benefits or costs
   - Insurance may give peace of mind about adverse outcomes
   - Insurance could increase stress if basis risk is high
   - Buyer's remorse wrt lapsed contracts

2) Monetary benefits or costs – effect on net income/wealth
   - Since premium payment reduces net income/wealth, indemnity payment increases it, net indemnity payments will influence SWB.

Even with prospective buyer's remorse, IBLI purchase significantly increases pastoralists' subjective well-being.

Source: Tafere , Barrett, Lentz and Taddesse, in review

Thank you for your time, interest and comments!