Importance of livestock production from grasslands for national and local food and nutritional security in developing countries

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International Grassland Congress
New Delhi, 20-24 November 2015
Overview

- The global livestock sector
- Contribution of animal source foods to nutrition and health
- The importance of rangelands in developing countries
- Some challenges in pastoral systems
- Opportunities for pastoral systems
Economic opportunities in the livestock sector

The 4 billion people who live on less than US$10 a day (primarily in developing countries) **represent a food market of about $2.9 trillion per year.** (Hammond et al. 2007)

- 37 billion domestic animals
- Asset value $1.4 trillion
- Employs 1.3 billion people
4 of 5 highest value global commodities are livestock

Cow milk has overtaken rice

Eggs have displaced maize

FAOSTAT 2014 (values for 2012)
Gains in meat consumption in developing countries are outpacing those of developed
% growth in demand for livestock products 2000 - 2030

Based on anticipated change in absolute tonnes of product comparing 2000 and 2030

FAO, 2011
Nutritional divides among 7 billion people today

11% of GNP lost annually in Africa and Asia from poor nutrition

Chronic disease likely to cost $35 trillion by 2030

- chronic hunger
- inadequate diets
- overweight
- obese
- balanced diets
Food insecurity and under nutrition remain persistent

- 72 developing countries have reached the 2015 MDG 1 target of halving the proportion of hungry people
- Hunger remains an everyday challenge for almost 795 million people worldwide, including 780 million in developing regions

2014-2016
Importance of animal source foods

• Source of:
  • High biological value protein
  • Vitamins (e.g. Vit A, B6, B12)
  • minerals (e.g. calcium, iron, zinc)
  • Omega 3 fatty acids
• Enhance the effectiveness of uptake of other plant-based micronutrients
• Heath protection (e.g. lactoferrin in milk)
Supplementation with meat increases arithmetic ability in school children.
Supplementation with milk and meat increases leadership behaviour in school children.
### Ranking of the most important causes of malnutrition among Somali pastoralists

<table>
<thead>
<tr>
<th>Cause of malnutrition</th>
<th>Median rank (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced milk/food availability</td>
<td>1.5 (1-3)</td>
</tr>
<tr>
<td>Childhood infection</td>
<td>1.5 (1-2)</td>
</tr>
<tr>
<td>Moving long distances</td>
<td>2.5 (1-4)</td>
</tr>
<tr>
<td>Mother’s work load, including separation from mother</td>
<td>2.5 (1-3)</td>
</tr>
</tbody>
</table>

Sadler and Cately, 2009
Importance of pastoralism

- Grazing land covers 32M km\(^2\) - \(\frac{1}{4}\) of land surface
- Supports over 64M poor people\(^1\)
  - 30M of them in Sub-Saharan Africa

\(^1\)Robinson et al., 2011
Pastoralism

- Marginalized;
  - Economically
  - Socially
  - Politically
- Perceived as
  - Backward
  - Uneconomic
  - Environmentally degrading
Revenue per hectare from livestock, cotton and sugar cane – Awash Valley, Ethiopia

Behnke and Kerven, 2013
Challenges in pastoral systems

- Aridity
- High Temperatures
- Low soil fertility
- Sharp seasonality
- Inter-annual variability
  - Droughts
  - Climate change
- Animal disease
- Markets
- Conflict/political disturbance
Kazakhstan – Livestock numbers

Behnke 2003
Total animal biomass and five year running average of NDVI, Kajiado district, Kenya
## Forage production projections for arid systems and semi-arid savannas in the Greater Horn of Africa

<table>
<thead>
<tr>
<th>Area (millions km²)</th>
<th>Forage production (millions t/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline 2006-15</td>
</tr>
<tr>
<td>Hyper-arid to arid</td>
<td>2.68</td>
</tr>
<tr>
<td>Semi-arid savannas</td>
<td>1.97</td>
</tr>
</tbody>
</table>

Based on projections using G-Range model
• Drought is by far the leading cause of livestock mortality
The costs of uninsured risk in Kenya

- **Systemic Drought exposure**: 28 Droughts last 100 years, 4 in last 10 years

- **Frequency and Intensity increasing**

- **2008 - 2011: 4 consecutive years drought:**
  - Total value damages and losses US$ 12.1 billion
  - Agriculture US$ 1.51 billion (12.5%)
  - Livestock US$ 8.74 billion (72.2%)
  - 9% national livestock herd died – mostly cattle

- **Food Insecurity due to drought:**
  - 2009 = 3.8 million people
  - 2011 = 3.75 million people affected,
    - 1.8 million in marginal crop areas
    - 1.9 million people in marginal pastoral areas

*This magnitude of drought damage and losses to agriculture and livestock cannot be financed out of GOK’s budget and by the Donor community only.*
What is Index Based Insurance?

• Policy holders paid based on external “index” that triggers payments to all insured clients

• Avoids problems that make traditional insurance unprofitable for small, remote clients:

• Suited for risks affecting a large number of people simultaneously and for which a suitable index exists.

  – No transactions costs of measuring individual losses
  – Preserves effort incentives (no moral hazard) as no single individual can influence index.
Based on satellite data on forage availability- NDVI, this insurance pays out when forage scarcity is predicted to cause livestock deaths in an area.

\[ y = \lambda (I_T \otimes W_N)y + X^S_{\text{Int}} \alpha^S + X^S_{\text{Tr}} \beta^S + X^S_w \gamma^S + \varepsilon^S \]
IBLI Coverage

• First launched in Marsabit in January 2010
• Have developed contracts for all arid counties of Kenya
• Contract provision extended to Isiolo and Wajir in August 2013
• Also have a program in the Borana Zone of S. Ethiopia – launched in July 2012
Implementing IBLI

- Implementation of IBLI is a joint effort between ILRI (with support of its technical and development partners), commercial underwriters and implementing partners on the ground (government, NGOs, CBOs etc).

EXTENSION, MARKETING, SALES
Results

• 33% drop in households employing hunger strategies
• 50% drop in distress sales of assets
• 33% drop in food aid reliance
Mobility is the key to pastoral systems

• Movement of animals to take advantage of spatial and temporal variation in forage (and water)
• Allowing pastures to re-grow
• Easier to manage in private systems
• High transaction costs in communal systems
  • Need to be negotiated and maintained
Mobility is the key to pastoral systems

- Traditional institutional arrangements are under threat from:
  - Population growth
  - Pressure to increase crop land
  - Legitimate desire for development and prosperity
- Need new pastoral land tenure arrangements
  - Facilitated negotiations
  - Livestock corridors
- These are crucial to any management approaches to maintain and improve net primary production in grasslands.
Improving forage availability

- Technical intervention to increase productivity (pasture improvement) and reduce variability of feed supply (forage conservation) have had mixed success
  - Lack of market pull
  - Insecurity of land tenure
  - Lack of availability of financial services and other inputs
# Livestock exports from Ethiopia

<table>
<thead>
<tr>
<th>Year</th>
<th>Live animals</th>
<th>Value (US $ ‘000)</th>
<th>Meat (t)</th>
<th>Value (US $ ‘000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>163,000</td>
<td>27,252</td>
<td>7,717</td>
<td>15,598</td>
</tr>
<tr>
<td>2006-07</td>
<td>234,000</td>
<td>36,507</td>
<td>7,917</td>
<td>18,448</td>
</tr>
<tr>
<td>2007-08</td>
<td>298,000</td>
<td>40,865</td>
<td>5,875</td>
<td>15,471</td>
</tr>
<tr>
<td>2008-09</td>
<td>150,000</td>
<td>77,350</td>
<td>6,400</td>
<td>24,480</td>
</tr>
<tr>
<td>2009-10</td>
<td>334,000</td>
<td>91,000</td>
<td>10,000</td>
<td>34,000</td>
</tr>
<tr>
<td>2010-11</td>
<td>472,000</td>
<td>148,000</td>
<td>16,877</td>
<td>63,200</td>
</tr>
<tr>
<td>2011-12</td>
<td>800,000</td>
<td>207,100</td>
<td>17,800</td>
<td>78,000</td>
</tr>
<tr>
<td>2012-13</td>
<td>680,000</td>
<td>150,000</td>
<td>16,500</td>
<td>68,000</td>
</tr>
</tbody>
</table>
Cattle exports from Burkina Faso, Mali and Niger
• Market demand is stimulating interest in fattening animals
• Lack of credit facilities and collateral for buying/growing fodder
• Insurance could provide a mechanism for using livestock as collateral and stimulate the market for credit and financial services
• Stimulate fodder markets
Conclusions

• Pastoral systems have an important role to play in food and nutritional security
• Need to manage and mitigate the risks of variation in fodder supply
  • Index based insurance
• Market opportunities are increasing creating a demand for new technologies including fodder technologies (but also animal health and breeding)
• Land tenure systems need to be robust
  • Negotiated among stakeholders to ensure mobility
better lives through livestock

ilri.org