Livestock, livestock health and processes of poverty reduction: The challenge of improving the evidence base

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Acknowledgements

• SLU, SVA and Agri4D
• Erika Chenais
• Sofia Boqvist
Decisions, decisions...

• On epidemiology & economics contributions to technical aspects of animal disease control (Perry, McDermott, Randolph, 2001)
  – Prioritisation: where to start (for survey, investment, control)?
  – Controlling or eradicating: What policy and which strategy?
  – Implementing disease control: the how and the who?

• Evidence base? Weak, ....but among friends!
Decisions, decisions...

• On livestock (and animal health) contributions to poverty reduction
  – Why only economics? What about the natural resource base, environmental impact, climate change, conservation of genetic resources, societal implications, impact on non-infectious human diseases, .....?

• Evidence base? Even weaker; ....and no longer necessarily among friends!
Livestock: a pathway out of poverty for some; an expression of poverty for most

• The need to understand the complexities of poverty
  – The trend to oversimplify “poverty”
    • The obligatory use of “pro-poor” and “sustainable”
    • The differentiation from (but interface with) economic growth
Livestock: a pathway out of poverty for some; an expression of poverty for most

• The need to understand the complexities of poverty
  – The use of units:
    • Ravallion et al, World Bank: US$ 1/day.........$1.25/day (ppp data from 2005)
    • Alternatives: mean poverty lines weighted by number of poor
    • Key: the need for indicators of progress
Livestock: a pathway out of poverty for some; an expression of poverty for most

- The need to understand the complexities of poverty
  - The issue of inequality: the use of the Gini coefficient
Livestock: a pathway out of poverty for some; an expression of poverty for most

- The need to understand the complexities of poverty
  - The spatial distribution
And the population growth issue
Kruska, Deichmann, Thornton and Reid (1999)

Source: ILRI/UN
Kruska, Deichmann, Thornton and Reid (1999)
People living on less than $1.25 per day (2005)*

*Per 10x10km cell

The conflicting roles and perceptions of livestock

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The unfortunate polarisation trend
Livestock: the Cinderella sector?

- A study of the role of livestock in poverty reduction strategy papers (PRSPs)
  – Blench et al., 2003

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<td>Detailed strategy, budget, poverty reduction impact</td>
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| 45 |
The predominant focus on producers
Livestock can be a key lever of change for smallholders because the majority of our target population own livestock.

**Sub-Saharan Africa**

- Number of Poor by Daily Income Grouping (millions):
  - <$1: 279 (Total Population), 170 (With Livestock)
  - $1 - $2: 194 (Total Population), 116 (With Livestock)

**South Asia**

- Number of Poor by Daily Income Grouping (millions):
  - <$1: 542 (Total Population), 229 (With Livestock)
  - $1 - $2: 589 (Total Population), 249 (With Livestock)

Case studies have shown that livestock contributes to at least 30% of smallholder household income. However, there is lack of comprehensive data available.

Livestock intervention will help support the Agricultural Strategy goal of tripling income for 150m smallholder farmers in SSA and SA.

Livestock impacts: the need for greater consideration of the users and eaters

• Non-livestock keepers
  – Consumers of livestock products by far outnumber producers

• Formal and informal contributions to value addition
  – Street food sectors (hawkers)

• The broader consideration of value chain actors
The roles of different scales of enterprise

- Medium and larger livestock enterprises also contribute to processes of poverty reduction
  - The common demand for livestock services and medicines
  - Employment, educational opportunities
  - The prime example of vertically-integrated systems (the Kenyan Farmers Choice example)

An evidence void
The livestock revolution continues
Annual per capita meat consumption trends (from Thornton, 2010)
Past and projected consumption of livestock products

Source: FAO (2006a) and FAO (2006b).
The extraordinary opportunity for growth

• By 2050, 30 % more people
• 70 to 80 % more meat, milk and eggs
But.....

• Greenhouse gas emissions
• Climate change
• Livestock as a source of disease
• The perils of animal source foods
• The marker for backwardness

• The context of growing resource scarcity, particularly land and water
Relative contributions of livestock to greenhouse gas emissions along the food chain

- Deforestation
- Enteric fermentation
- Manure management
- Transport fossil fuel
- Processing fossil fuel
- On-farm fossil fuel
- OM release from ag. soils
- Pasture degradation
- Chemical N. fert. production
- N fertilization
- Legume production
- Manure storage / processing
- Manure spreading / dropping
- Manure indirect emissions

FAO 2006
10-18% of all global anthropogenic greenhouse gases

Ruminants require more fossil energy use, emit more CH$_4$ per animal

Source: de Vries and de Boer (2009)
The complicated climate change issue

Livestock production system in areas projected to undergo over 20 per cent reduction in Length of Growing Period to 2050
Thornton et al., 2010

Thornton et al., 2002
Predicted productivity impacts of climate change differ considerably by ecosystem/production system

Simulated percentage *maize* production changes to 2030 and 2050, by country and production system

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<td>9.1</td>
<td>14.4</td>
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<td>17.8</td>
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<td>-8.6</td>
<td>4.9</td>
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Mean of 4 combinations of GCM and emissions scenario

Thornton et al. (2010)
Livestock as a source of disease

• The figure of 60% of diseases being zoonotic
• The role of and increasing access to the media and social networking

But...

• *Per capita* burden of disease is declining
  – Increase of life expectancy of 20 years in some poor and middle income countries, and 10 years in rich countries
Countries with largest increase/decrease in life expectancy, 1970–2005

Belarus
Zimbabwe
Botswana
South Africa
Namibia
Kenya
Saudi Arabia
Libya
Egypt, Arab Rep. of
Vietnam
Oman
Zambia
Lesotho
Indonesia
Swaziland
Bangladesh
Nepal
Central African Republic
Yemen, Republic of
Gambia, The

Life expectancy (years)

Source: World Bank
The perils of animal-source foods

• Replacement of infectious diseases by lifestyle associated diseases
• The “double whammy” in one generation in developing countries

For the poor and hungry: health benefits outweigh risks?
Frameworks for understanding impacts of disease control: the pathways framework (Perry et al., 2002)

- **Reducing vulnerability of the poor**
  Securing assets, reduce vulnerability (non-cropping seasons, drought, conflict, disease)
  Cash emergencies (medical bills & school fees) permit accumulation and investment

- **Sustainably improve the productivity in systems of the poor (intensification)**
  Driven mainly by choice of technology inputs

- **Improve their market opportunities**
  Driven by combination of institutional and technological improvements
Disease fit with the pathways

• Reducing vulnerability:
  – High livestock mortality (Newcastle disease), demand drops with zoonotic disease (HPAI, Rift Valley fever)

• Improve productivity (intensification):
  – Endemic diseases (parasitism, vector-borne)
  – Mastitis, dystocia, metabolic disease

• Access to market opportunities:
  – Transboundary diseases
  – Health risk in commodities (cysticercosis)
Market access: local, regional and international

Local: the main driver

Regional: slow to change
Net trade in livestock products in Africa
• Is access to international higher-priced markets for commodities an opportunity?
• Is it achievable?

Foot-and-mouth disease: assigned incidence and prevalence (Sumption et al., 2008)
Benefits more likely to be felt in Argentina, Brazil & India, rather than in Africa

Some niche market opportunities in Africa

Opportunities in southern Africa, but dependent on continued preferential trade agreements

Africa, CBT: infrastructure, productivity and efficiency issues priority
Cost of achieving SPS requirements minimal compared to the feeding costs to achieve a competitive product
The disease impact metrics conundrum

• Data on prevalence, incidence, impact???
• Resource allocation on the basis of tradition, anecdote and advocacy?
• Over-representation of well-research diseases (e.g. zoonoses)?
• The Pareto principle (law of the vital few)
  – GBD study: 6 infectious diseases responsible for 75% of DALYs lost
Four studies on impact of cattle diseases plus OIE listing

- Different criteria used (not all poverty focused)
- Little agreement on relative importance
- Six diseases with most agreement
  - CBPP, ECF, FMD, HS, helminthiasis, trypanosomiasis
- Divergence between farmers and experts
  - Clinical signs vs diseases; strengths and weaknesses of both
- The need for a livestock DALY?
The divide between livestock-associated outputs and human development outcomes

The livestock sphere
- Productivity
- Yield
- Nutrition
- Health
- Mortality

Inputs
- Genotype
- Nutrition

The human development sphere
- Political stability
- Policy environment
- Poverty levels
- Gini coefficients
- Human health
- Employment
- Trade
- Institutions

??

The livestock sphere
The human development sphere
Improving the quality and availability of data to support livestock-for-development initiatives in sub-Saharan Africa:

Strategic Recommendations to the Bill and Melinda Gates Foundation, May 2009

Brian Perry¹ and Keith Sones²

World Bank’s Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA),
Livestock Data Innovation Project

Project News

January 2012
Livestock Survey - Tell us about your livestock data concerns and help us identify priority areas for investments to improve livestock data available to decision makers by participating in this on line ‘Livestock Data Survey’.

Why Statistics?

What we measure affects what we do; and if our measurements are flawed, decisions may be based on incorrect information.

CountrySTAT: Core Data

March 2012
CountrySTAT - A new module has been designed for CountrySTAT, titled ‘Global Strategy: Minimum Set of Core Data’. It includes 41 economic, social, environmental and geophrical-related variables, and represents the first pillar of the Global Strategy to Improve Agricultural and Rural Statistics.

LATEST PUBLICATION

What information is needed to measure the contribution of livestock to household livelihoods? Look at the Livestock Module of the Uganda National Panel Survey, developed with support from the Data Project...

more publications

VIDEOS

See video
Livestock Data Innovation Project

• WB – FAO – ILRI – AU-IBAR Project
• 3 year project (2010, Oct. – 2012)
• USD$ 2.5 mio
• **Objective**: ‘set up mechanisms and institutional linkages to improve the quality of livestock data and promote pro-poor investments in the livestock sector’
Pilot project

Identify / experiment with ‘new’ methods of livestock data collection and analysis that support pro-poor investments

http://www.africalivestockdata.org/afrlivestock/
Livestock in the balance

- State of Food and Agriculture, 2009
The worried well

The hotspots

The coldspots

The concept of 3 global livestock system trajectories (Perry et al., 2010)
The concept of 3 global livestock system trajectories
(Perry et al., 2010)

Underlying all three trajectories:

1. Global trend towards intensification of livestock systems
2. The risk of a third epidemiological transition; emerging and re-emerging disease.
3. A significant component of the world’s livestock enterprises in the hands of the very poor:
   • intensification is not a realistic option
   • most vulnerable to disease resurgence
The Worried Well of the Western World (W^4)

- **Animal health status & drivers**
  - Well controlled endemic disease
  - Changing and often stretched private health services to livestock enterprises
  - Heightened public awareness
  - Real/perceived threat from rest of world

- **Animal health risks**
  - Increased drug resistance
  - Expanded distribution of vector-borne and other pathogens
  - Multi-sector economic impacts of disease incursions or scares

- **Animal health service and response needs**
  - Better surveillance, including for new diseases
  - Appropriate and acceptable disease control measures
  - Incentives to develop new animal health products
The Hot Spots
The intensifying and increasingly market-orientated sectors of the developing world

• Animal health status & drivers
  – Increasing intensification, widening trade partnerships, endemic disease risk
  – Presence of several major infectious diseases
  – Absence of effective veterinary infrastructure
  – Limited voice in national animal health programmes

• Animal health risks
  – Endemic disease outbreaks
  – Powerless to prevent and contain disease in country and regional environment
  – Unachievable standards imposed by international authorities

• Animal health service and response needs
  – Greater private sector response capacity through vertical integration and other models
  – Greater interface with public sector health authorities
  – Greater understanding of returns this sector can bring to national economies
The Cold Spots

The smallholder systems dependent on traditional livestock-derived livelihoods

• Animal health status & drivers
  – Severely constrained economically
  – Limited livestock/feed/health resources
  – Multiple endemic diseases
  – Often in harsh environments
  – Inadequate or totally absent animal health services

• Animal health risks
  – Multiple endemic diseases
  – Limited or no movement controls
  – Source of infection to market orientated trajectory
  – Highest vulnerability to zoonotic disease

• Animal health service and response needs
  – Specific services targeted at smallholder and marginal producers
  – National systems bringing in NGO, private and donor-supported services
  – Particular attention to preparedness and response to shocks
Conclusions

• Livestock matter to poverty reduction: but how, how much? The polarised world needs answers, which currently available data do not yet provide.
• Need to understand livestock bads as well as goods, provide evidence of winners & losers, which contribute to appropriate remedial responses
• Rewards from livestock enterprises to *processes* of poverty reduction requires contributions from all the different scales of enterprise
• Diseases: severe difficulty differentiating the vital few from the trivial many
• Diseases: beyond impacts on productivity to those on human health, livelihoods, natural resources and the ecosystem
• Strengthen the pro-poor analytical framework