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

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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!

- 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



- 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

- The need to understand the complexities of poverty
 - The issue of inequality: the use of the Gini coefficient



 The need to understand the complexities of . the rest poverty are are high in the west, but most poor people are in the east poverty

The spatial distribution





b. Brazil: Poverty rates are high in the north and northeast, but most poor people live along the coast



c. India: Poverty rates are high in the central states, and many poor people live there



And the population growth issue













People living on less than \$1.25 per day (2005)*

Source: Wood et al 2009. Strategy & Results Framework Background Paper. CGIAR.

The conflicting roles and perceptions of livestock

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS

The conflicting roles and perceptions of livestock

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS			
Developing countries	Developed countries	Developing countries	Developed countries			
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



Coverage of livestock	Number of countries
Not mentioned	10
Mentioned	17
Discussed briefly (1-2 paras)	11
Discussed more fully; some budget	7
Discussed in detail, strategy, budget	4
Detailed strategy, budget, poverty reduction impact	0
	45

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



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

Bill&Melinda

GATES foundation

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 emmissions along the food chain



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

FAO 2006



10-18% of all global anthropogenic greenhouse gases



Ruminants require more fossil energy use, emit more CH₄ 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





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

	National Production		Mixed rainfed temperate		Mixed rainfed humid		Mixed rainfed arid	
	2030	2050	2030	2050	2030	2050	2030	2050
Burundi	9.1	9.1	14.4	18.1	-1.8	-8.8	-	-
Kenya	15.0	17.8	33.3	46.5	-4.6	-9.8	-1.1	-8.4
Rwanda	10.8	14.9	13.4	18.8	5.4	3.6	1.1	2.7
Tanzania	-3.1	-8.1	7.5	8.7	-1.6	-6.4	-5.1	-11.1
Uganda	-2.2	-8.6	4.9	3.1	-4.6	-12.9	-1.1	-6.3

Mean of 4 combinations of GCM and emissions scenario

Positive changes Negative changes

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

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 (noncropping seasons, drought, conflict, diseaseCash 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

Map G0.3 Division—what prevents progress in Africa does not in Western Europe Border restrictions to flows of goods, capital, people, and ideas



Figure 3.3 Tariffs are highest in Africa, South Asia, and Western Asia Average tariff, 2005



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)

Development Policy Review, 2011, 29 (3): 331-357

Whither Commodity-based Trade?

Karl M. Rich and Brian D. Perry*

- 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

International Food and Agribusiness Management Review Volume 12, Issue 3, 2009

Commodity-based Trade and Market Access for Developing Country Livestock Products: The Case of Beef Exports from Ethiopia

Karl M. Rich ^{®a} Brian D. Perry^b and Simeon Kaitibie ^c



 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



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



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'



Livestock Data Innovation in Africa

Numbers for Livelihood Enhancement



Pilot project

Identify / experiment with 'new' methods of livestock data collection and analysis that support propoor investments

http://www.africalivestockdata.org/afrlivestock/

Livestock in the balance

• State of Food and Agriculture, 2009





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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 (W⁴)

- 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