Food security, livelihoods and livestock in the developing world

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Outline

- Livestock systems are evolving
- Smallholders and food security
- How can we improve them?
- The future of smallholders: banking on the opportunities
- Conclusions
Systems are changing...

- Population / Urbanization / Incomes / Diets
- Increased competition for natural resources
- Climate change – warmer and more variable
- Trade / exchange of knowledge and products
Revised demand for livestock products to 2050

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual per capita consumption</th>
<th>Total consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meat (kg)</td>
<td>Milk (kg)</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>2050</td>
</tr>
<tr>
<td>Developing</td>
<td>28</td>
<td>44</td>
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<tr>
<td></td>
<td>44</td>
<td>78</td>
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<td>Developed</td>
<td>2002</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>94</td>
</tr>
</tbody>
</table>

Rosegrant et al 2009
An example of the changing nature of livestock systems

Can we influence the next transition for the benefit of society and the environment?

W. Africa 1966 – pastoral system → 2004 – crop-livestock system

Courtesy of B. Gerard
The balancing act

Livestock systems

Pros
- Nutrition
- Income
- Risk management
- Employment
- Nutrients
- Landscape maintenance
- Land use unsuitable for agriculture

Cons
- Large users of resources
- Polluters (in places)
- Significant GHG emissions
- Less efficient than other forms of food production
- Zoonosis

Livestock are not the same everywhere
Livestock and livelihoods
At least 600 million of the World’s poor depend on livestock

Thornton et al. 2002
complex!
different opportunities
Addressing complexity

There are always trade-offs
Smallholders and food production
Livestock – high value products

Milk has the highest value of production of all agricultural commodities (FAOSTAT 2008)
Livestock – high value products

(FAOSTAT 2008)
Mixed systems in the developing World produce almost 50% of the cereals of the World
Most production coming from mixed intensive systems (irrigation, high potential, relatively good market access)

Herrero et al 2010
Mixed systems in the developing World produce the staples of the poor
Mixed systems produce significant amounts of milk and meat

Developed countries dominate global milk production, significant exports...but...
Mixed systems produce 65% beef, 75% milk and 55% of lamb in the developing World
Sustainable intensification
Pros and cons

• Appropriate for some mid to high potential areas (mostly rainfed)

• Potentially very easy and cheap to increase productivity, especially in smallholder systems with large yield gaps

• ...will lead to lower GHG/unit of output but need to assess trade-offs

• How do we define it and when does it become unsustainable?
  – No guidelines or indicators widely applicable for a range of circumstances / systems
  – Though lots of progress in Europe

Herrero et al 2010
Some features

- Technology / management essential
  - Improved feeding systems / less animals
  - Better breeds
  - Inputs (fertiliser / supplementation)

- Market incentives / creation
  - Service and input provision
  - Regulations and standards

- Investment in infrastructure (roads, post-harvest facilities, cooling plants, others)

Herrero et al 2010
‘Moving megajoules’: fodder markets are likely to expand in areas of feed deficits as demand for milk and meat increases.

India quotes from M Blummel

‘Stovers transported more than 400 km to be sold’

‘Price has doubled in 5 years, now 1/3 (2/3) of grain value of sorghum’

‘Farmers paying for stover quality’

Herrero et al. 2009
Mixed intensive systems in the developing World are under significant pressures

- 2.5 billion people...3.4 by 2030, predominantly in Asia
- 150 million cattle increasing to almost 200 million by 2030
- Most pigs and significant numbers of poultry, increasing by 30-40% to 2030
- Crop yields stagnating: wheat, rice
- Others increasing: maize (East Asia)
- All in the same land!

- Severe water constraints in some places
- Soil fertility problems in others
- Feed scarcity an issue!
Some systems may need to de-intensify and others diversify to ensure the sustainability of agro-ecosystems

- Creation of incentives and regulations to protect the environment required
- Equitable, ‘smart’ schemes for payments for environmental services
- Need significant efficiency gains (in crops, in livestock, in other sectors)
- De-intensification: Indo-gangetic plains to protect water sources?
- Diversification: Pastoral systems – carbon sequestration?
Smallholder systems are here to stay

1. Partially resilient
2. Diversified
3. Options for increasing productivity
4. Low opportunity costs of labour
   - Europe – industrial revolution
   - Asia – manufacturing, cheap industries
   - Latin America – services, industry
   - Africa - ????
Some Conclusions

- Need to change investment paradigm and also start investing in the systems of the future (not only in what were the high potential areas)

- Infrastructure and market development essential … A key component to intensify

- Technology will play a key role but we need investment in provision of services
Some Conclusions (2)

- Sustainable intensification: essential to bridge yield gaps... (fewer but better fed animals)

- Need to think of also bridging efficiency gaps (more crop per drop, etc), especially in resource-constrained systems... but assessing carefully the trade-offs

- Is there a role for payments for ecosystems services as a diversification option for smallholders?
Contrasting agricultural development paradigms

- Land consolidation vs growth of the smallholder sector
  - Large commercial farms pro-efficiency (foreign capital investment)
  - Smallholder development possibly more pro-poor
  - Smallholders: low opportunity cost of labour
  - Do diversified smallholder farms promote more biodiversity and better management of ecosystems services?
Contrasting agricultural development paradigms

- Land consolidation vs growth of the smallholder sector
  - More diversified systems = Risk management
  - If smallholders where to disappear in places, are there sectors that can absorb the idling population, income effects, others?
  - Moving poverty from the rural to urban areas (social, issues, immigration, etc)
  - The reality check:
    Smallholder sector largely fragmented: who are the actors required for their fast development? What are the collective action mechanisms required?
Thank you!

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