Livestock Sector Strategy and Actions

Cees de Haan
World Bank consultant
With inputs from Juan Pablo Ruiz (WB) and Muhammad Ibrahim (CATIE)
Outline of Presentation

• Current strategic thinking on livestock development
  – The “Livestock Revolution” continues without public support, so why bother?
  – The strategic focus: three public goods, and the corresponding WB investments;
  – Potential areas of investment in GHG mitigation; and

• An action showcase for addressing one public good: PES and silvo-pastoral systems.
The Livestock Revolution and the resulting attention and investment void
The “Livestock Revolution”

<table>
<thead>
<tr>
<th>Some key growth characteristics</th>
<th>1990</th>
<th>2000</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Meat production (million tons)</td>
<td>186</td>
<td>235</td>
<td>465</td>
</tr>
<tr>
<td>% in developing countries</td>
<td>40</td>
<td>55</td>
<td>71</td>
</tr>
<tr>
<td>Per cap. cons. developing kg/yr</td>
<td>18</td>
<td>27</td>
<td>44</td>
</tr>
<tr>
<td>Per cap. con. Industrial kg/yr</td>
<td>90</td>
<td>99</td>
<td>103</td>
</tr>
<tr>
<td>Deflated price (1992=100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork</td>
<td>65</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Poultry</td>
<td>74</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Beef</td>
<td>80</td>
<td>99</td>
<td></td>
</tr>
</tbody>
</table>

Global Meat production, % in developing countries, Per cap. cons. developing and Per cap. con. Industrial kg/yr, Deflated price (1992=100) for Pork, Poultry, and Beef.
# The “Livestock Revolution”

## Some drivers: Technology and input prices

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Unit</th>
<th>Year</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed conversion broilers USA kg feed/kg gain</td>
<td>1960</td>
<td>1.92</td>
<td>2001</td>
<td>1.62</td>
</tr>
<tr>
<td>Milk production OECD countries (kg/cow/year)</td>
<td>1980</td>
<td>4226</td>
<td>2005</td>
<td>6350</td>
</tr>
<tr>
<td><strong>Amazon Area:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertility rate (%)</td>
<td>1985</td>
<td>50-60</td>
<td>2003</td>
<td>88</td>
</tr>
<tr>
<td>Calf mortality (%)</td>
<td></td>
<td>15-20</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Daily gain (Kg/day)</td>
<td></td>
<td>0.30</td>
<td></td>
<td>0.45</td>
</tr>
<tr>
<td>Corn US $/bushel (deflated)</td>
<td>1972</td>
<td>5.5</td>
<td>2002</td>
<td>1.7</td>
</tr>
</tbody>
</table>
In summary, at little public cost

There have been

• Major increase in production
• Major increase in efficiency
• Significant declines in price to the consumer
• Major increase in employment

• So, why bother?
The strong private sector growth within a public sector void, has affected

- The equity position of the livestock farmers,
- The global environment and
- Global public health.

Increased public sector attention and investments are needed to correct these negative externalities, and ensure that the sector

- Contributes to an equitable, sustainable and healthful development.
The Strategic Focus

Public goods and World Bank investments
The Three Public Good Domains

- Human
- Domestic animals
- Wildlife

- Equity
- Finding the balance
- Health
- Environment
Health: Preparing for the next emerging zoonosis: From veterinary health to “One Health”

World Bank’s Global Involvement:
- Support to control HPAI, now being restructured to general zoonotic disease control projects

World Bank LAC involvement:
- HPAI projects in 8 countries, major H1N1 iprojects n Mexico and Argentina, FMD control in Uruguay
Equity: Integrating smallholders in the value chain

World Bank’s Global Involvement:
- Value chain in East Asia, major smallholder dairy projects in Bangladesh and India (Operation Flood 2)

World Bank LAC involvement
- Value chain, competitiveness and agricultural technology projects dealing with livestock in Colombia, Brazil, Uruquay, and Central America
Environment: From mining to minding

World Bank’s Global Involvement:
- Biogas and pollution control in East Asia and ECA, drought and range management in Arid Africa, Mongolia and China;

World Bank LAC involvement
- Biogas in Value Chain in Mexico, pollution in Brazil, payment for environmental services through rehabilitation of degraded pastures in Colombia (to follow).
Possible areas of investment in GHG mitigation

• Diet improvement:
  – Provide advisory, credit and input services for pasture improvement, fodder banks;
  – Support for equipment to better balance concentrates

• Genetic improvement
  – Greater efficiency reduces GHG/Kg. Product

• Support matching species and environment
  – Promote move from beef to non-ruminant meat

• Manage manure
  – Improve regulations and subsidize treatment infrastructure
An Action Showcase

Silvo-pastoral systems and payment for environmental services
PES in Colombia, Costa Rica and Nicaragua

Low productivity cattle ranching systems

Conversion to

Land uses with high density vegetation
The first silvo-pastoral project

- Regional (Colombia, Costa Rica, Nicaragua) project (2002-2009);
- 265 farms, 12,000 ha;
- Payment of US $ 7.50/Ton CO2 eq.;
- Changes in land-use as proxy for level of carbon sequestration and bio-diversity;
- Use of GIS to measure land-use changes;
- Upper limits for payment levels; and
- Multiple partners.
Results: Changes in land-use in Colombia

![Graph showing changes in land-use in Colombia](image)

- **Degraded Pasture**
- **Pasture without trees**
- **Silvopastoral systems**

Hectares

![Graph legend](image)
Results: Carbon sequestration and soil erosion

• GHG emission:
  – Incremental CO2 eq. fixed 2004-2007 19,558/ton/yr; and
  – in intensive silvo-pastoral systems: CH4 reduction 21% and N2O reduction < 36%

• Soil erosion
  – Reduction 45%
    • (80,9 tn/ha/year to 44,1 tn/ha/year)
### Results: Bio-diversity

<table>
<thead>
<tr>
<th></th>
<th>2002 (baseline)</th>
<th>2008</th>
</tr>
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<tbody>
<tr>
<td>Birds</td>
<td>140</td>
<td>197</td>
</tr>
<tr>
<td>Butterflies</td>
<td>67</td>
<td>130</td>
</tr>
<tr>
<td>Mollusks</td>
<td>35</td>
<td>81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment</th>
<th>BSA</th>
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</thead>
<tbody>
<tr>
<td>Native pasture</td>
<td>0.21</td>
</tr>
<tr>
<td>Native pasture + trees</td>
<td>0.57</td>
</tr>
<tr>
<td>Improve pasture + trees</td>
<td>0.52</td>
</tr>
<tr>
<td>Fodder bank</td>
<td>0.14</td>
</tr>
<tr>
<td>Secondary forest</td>
<td>0.75</td>
</tr>
</tbody>
</table>

- IBSA: Index of Biodiversity Status Assessment.
# Results: Water quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2002</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>11 ppm</td>
<td>&lt;1.2 ppm</td>
</tr>
<tr>
<td>Turbidity</td>
<td>&gt; 40 UNT</td>
<td>9.2 UNT</td>
</tr>
<tr>
<td>% EPT</td>
<td>5%</td>
<td>27%</td>
</tr>
</tbody>
</table>
Results: Productivity increases

The adoption of SPS in cattle farms resulted in:

- Increased milk production: From 5.0 to 6.1 kg/cow/day
- Increased beef production: From 450 to 800 kg/ha/year
- Increased on-farm employment: + 30%
- Improved carrying capacity: From 1.8 to 2.5 TLU/ha
- Reduced pesticide use From 13.913 to 7.899 lts. for total project area
## Results: Farmers income

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>US$ 162</td>
<td>US$ 252</td>
</tr>
<tr>
<td>Colombia (iSPS)</td>
<td>US$ 440</td>
<td>US$ 1,597</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>US$ 111</td>
<td>US$ 180</td>
</tr>
</tbody>
</table>

PES is an important incentive for farmers to adopt conservation practices and land valorization.
Lessons learned

Three types of technologies

I: Highly profitable:
   • Need only TA and access to credit: Intensive silvo-pastoral systems

II: Moderately profitable, but still important for bio-diversity and carbon sequestration:
   • Need PES for their implementation (multi species-live fences)

III: Unprofitable, but providing strong environmental services:
   • Need long term PES: Biological corridors, fallowing hillsides
The Follow-up Project: Colombia Sustainable Cattle Project

Proposed Instruments:
1. US $ 24 million in loans for the implementation of SPS
2. US $ 6 million for capacity building, including the farmers training, PES services and the development of green Markets for cattle ranching products and promotion of agro-ecotourism
3. US$ 7 million for PES for land uses that are biodiversity friendly, increase Climate Change adaptation and mitigation and promote water conservation
4. US $ 5 million farmers contribution
Regional Project 12,000 has

National Project 52,000 has

How to go for 10 million has ?? SPS as adaptation and mitigation Strategy CC
Editorial: Meat and the Planet

There are no easy trade-offs when it comes to global warming — such as cutting back on cattle to make room for cars. The human passion for meat is certainly not about to end anytime soon.

...our health and the health of the planet depend on pushing livestock production in more sustainable directions.

NYT, December 27, 2006

Thank you