

Silvopastoral systems can reduce emissions and create multiple wins in beef production

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agri benchmark Beef and Sheep Network, CIPAV



Aims of the conference and this presentation

„Evaluate options, global potentials and visions to the mitigation of greenhouse gases and the enhancement of carbon sinks by the agricultural sector“

Organising team 22.08.2018

Our analysis reveals that there are options to create multiple wins with the introduction of silvo-pastoral systems:

- Mitigation of GHG emissions plus release of land for carbon sinks**
- Improvement of productivity and economics**
- Improvement of animal welfare**

What are silvopastoral systems?

Principles

1. Increasing plant biomass
 2. Reducing soil degradation
 3. Protecting water sources
 4. Increase animal productivity
 5. Conserve regional biodiversity
 6. Ensure animal welfare
 7. Ensure economic stability
- ~~8. Ensuring animal health and welfare~~



Case study approach to analyse silvo-pastoral systems

Institutions participating in the case studies



agri benchmark Beef and Sheep Network



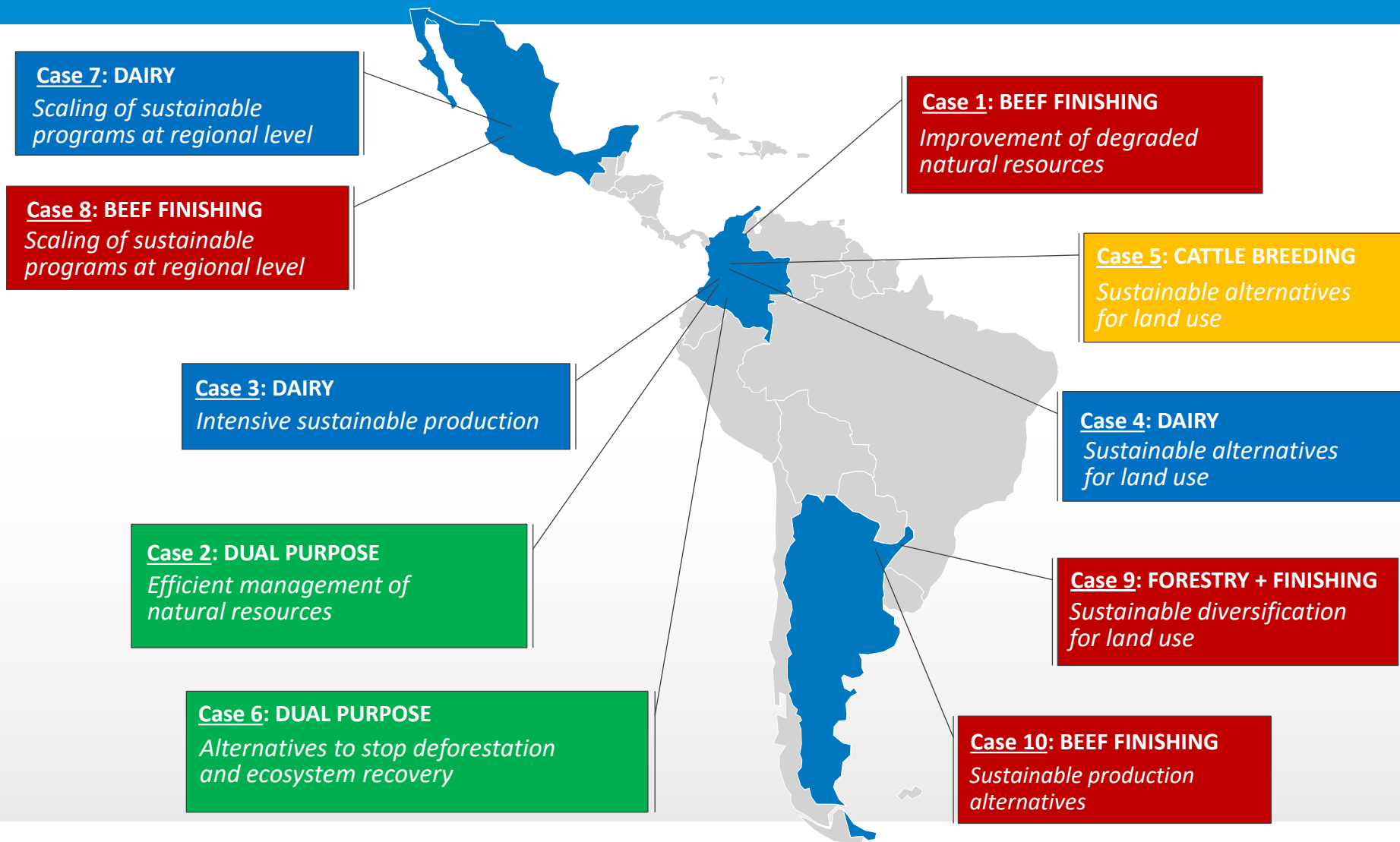
Centre for Res
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Sustainable Agricultural
Systems, CIPAV

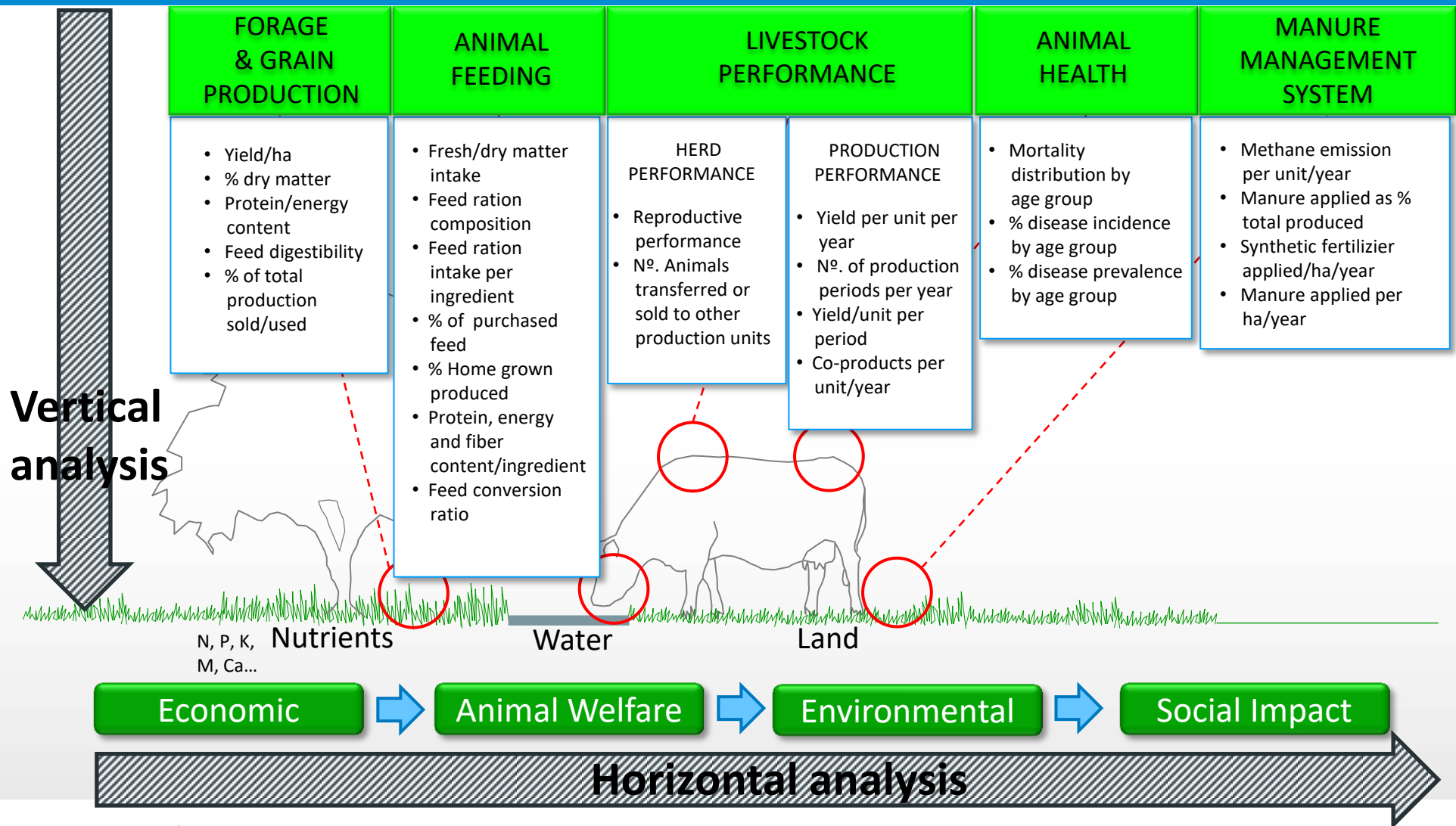


Case study approach to analyse silvo-pastoral systems



A framework: Efficiency matrix

(Focus Area 1 GASL: Closing the efficiency gap)



Areas analysed and steps

- ▶ **Baseline** (status quo) and **scenarios** of silvopastoral systems
- ▶ Close cooperation with **producers** and **local experts**
- ▶ Analysis of the following areas and elements:
 - **Performance** and **productivity**
 - **Economics**
 - **Environment** (GHG-emissions, nutrients, soils, water, energy)
 - **Animal welfare**
 - **Social** impacts
- ▶ Calculation and aggregation of all elements in one tool

Results silvopastoral systems

Case 1 – BEEF FINISHING

COLOMBIA

Region: Cesar



Climate condition: Dry tropical

Baseline vs. SPS

From degraded soils to intensive sustainable production

SPS strategy implemented

Intensive SPS

Leucaena + Panicum + Eucalyptus

Sustainability issue to illustrate

Restoring degraded natural resources

Emphasis on SDG



FORAGE PRODUCTION

Ton. dry matter/ha



compared to baseline

LAND PRODUCTIVITY

Kg. meat/ha



compared to baseline

ANIMAL WELFARE

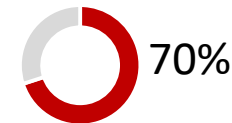


Feeding
Housing
Health
Behaviour

compared to baseline

Total area: 200 ha.

% Area under SPS



reached: 8th year

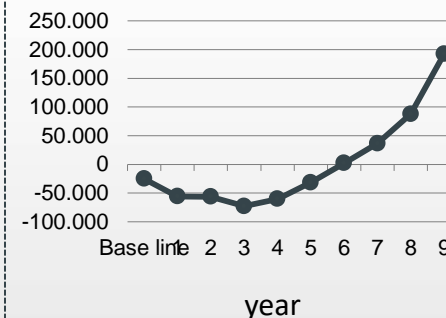
ECONOMIC RESULTS

Initial investment

USD/Ha. **1,850**

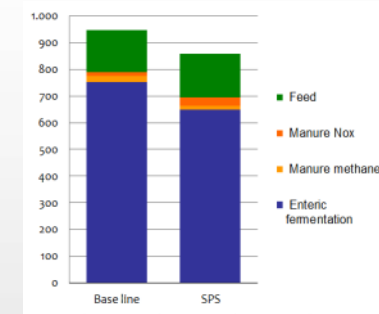


Profit (USD/year)



ENVIRONMENTAL IMPACT

Kg CO₂ per 100 kg LW added



Case study results GHG emissions I

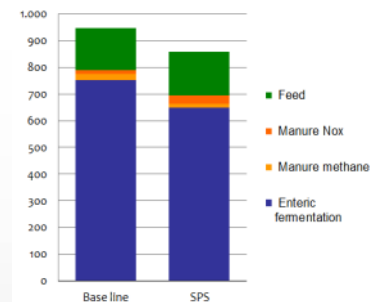
1 – BEEF FINISHING

COLOMBIA
Cesar



Increased stocking rate

Kg CO₂ per 100 kg LW added



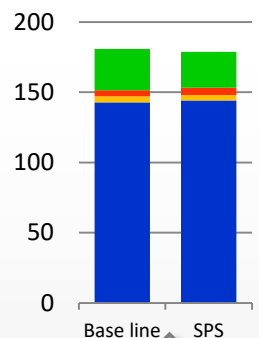
2 – DUAL PURPOSE

COLOMBIA
Valle del Cauca



Already high milk yield in Baseline

Kg CO₂ / 100 kg ECM



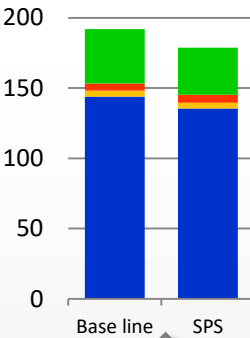
3 – Dairy

COLOMBIA
Valle del Cauca



Already high milk yield in Baseline (Lucerna breed)

Kg CO₂ / 100 kg ECM



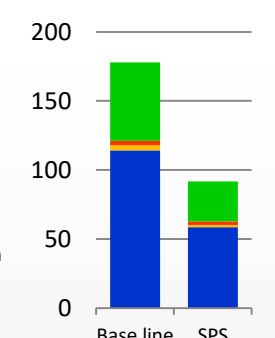
4 – DAIRY

COLOMBIA
Quindío



Change of breed

Kg CO₂ / 100 kg ECM

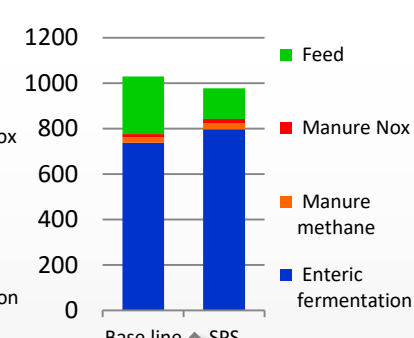


5 – CATTLE BREEDING

COLOMBIA
Quindío



Kg CO₂ per 100 kg LW added



Productivity increase mainly through increased stocking rates and not via individual animal performance
→ Less reduction of GHG emissions on a per kg output basis but less land needed for same production

Case study results GHG emissions II

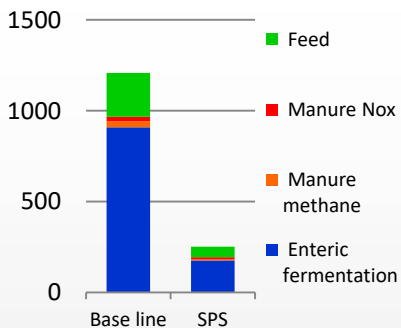
6 – DUAL PURPOSE

COLOMBIA
Caquetá



Very low milk yield in Baseline

Kg CO₂ / 100 kg ECM



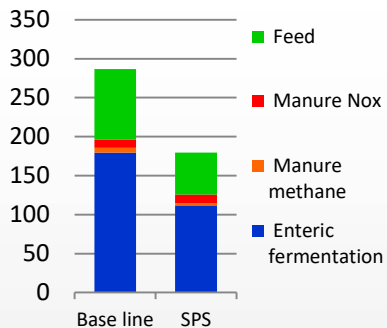
7 – DAIRY

MEXICO
Michoacán



Change of breed

Kg CO₂ / 100 kg ECM

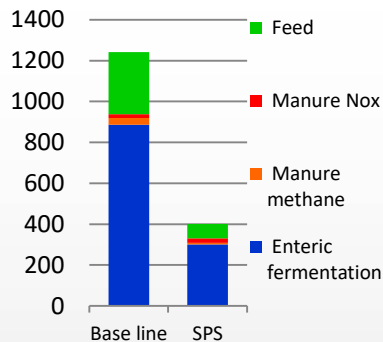


8 – BEEF FINISHING

MEXICO
Michoacán



Kg CO₂ per 100 kg LW added

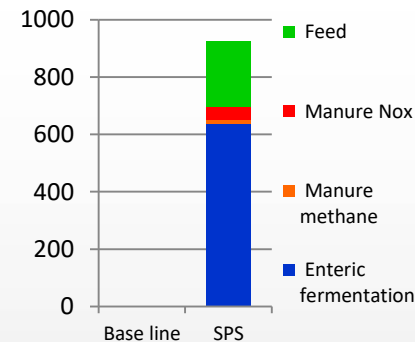


9 – FORESTRY & FIN

ARGENTINA
Misiones



Kg CO₂ per 100 kg LW added



No Baseline figures because there were no cattle in the Baseline

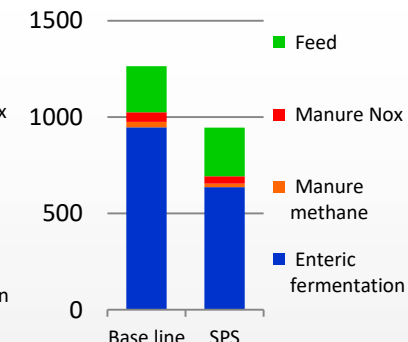
10 – BEEF FINISHING

ARGENTINA
Corrientes



Increased animal performance + stocking rate




Kg CO₂ per 100 kg LW added




Main conclusions

- ▶ The case studies provide sound evidence that SPS simultaneously deliver gains in productivity and profitability, environmental improvements, and animal welfare benefits and thereby support a number of SDGs
- ▶ The same quantity of product can be produced on less land which can be released to native vegetation / carbon sinks. To avoid undesired rebound-effects, good governance, policies and incentives are required
- ▶ Public-private alliances, driven by strong farmer's organizations, have proven crucial in overcoming technical barriers
- ▶ National policies should support SPS adoption with specialized training for extension workers and technicians, dedicated credit lines and payment for environmental services and other incentives

Recent publications

agri benchmark   



Briefing paper 17/2

Measuring sustainability on cattle ranches
Silvopastoral systems

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³ Good Food Futures Ltd, Polling, UK
⁴ World Animal Protection, London, UK
⁵ Colombian Cattle Ranching Farmers Association, Bogotá, Colombia



**Colombia
case studies**

**Colombia,
Mexico,
Argentina
case studies**

 Food and Agriculture
Organization of the
United Nations   



in print

**Silvopastoral Systems
and their Contribution to Improved Resource
Use and Sustainable Development Goals:
Evidence from Latin America**

Global Agenda for Sustainable Livestock 

agri benchmark – passionate about facts



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