Climate-Smart Agriculture Enhancing Food Security While Facing Climate Change
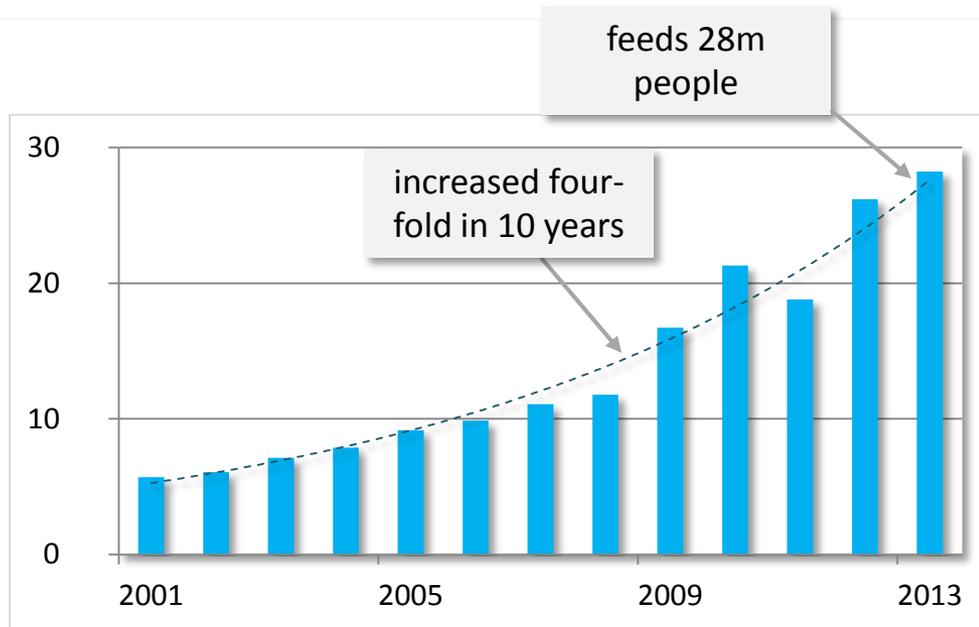
Holger A. Kray
Lead Agriculture Economist
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WORLD BANK GROUP
Agriculture

Uruguay: An Example also for Europe
Intensification at a Stunning Pace

feeds 28m people

increased four-fold in 10 years

30

20

10
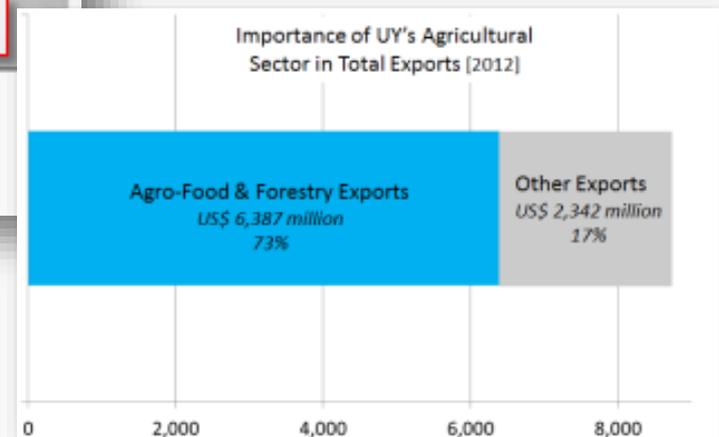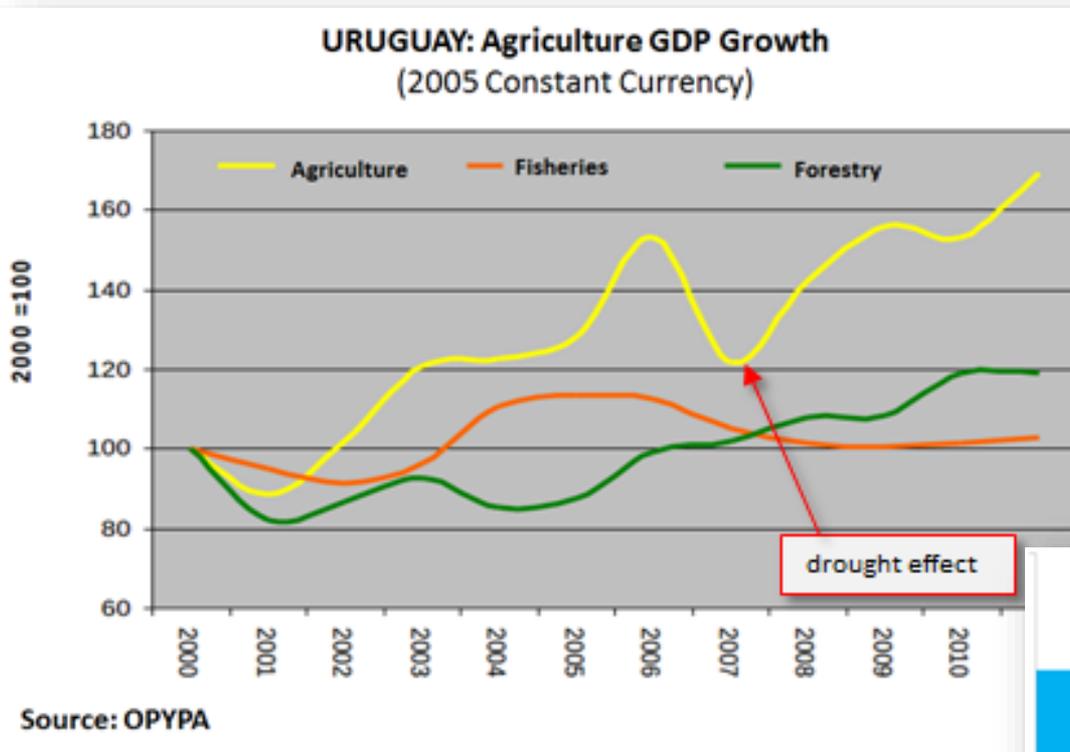
0

2001   2005   2009   2013

Number of People Fed By Uruguay's Agro-Food Exports

[million people at world average calorie intake]
*Source: MGAP OPYPA based on FAO & Trademap*

Challenge 1: UY's Economy Depends on Agriculture
Agricultural resilience is a key determinant of overall economic resilience

URUGUAY: Agriculture GDP Growth
(2005 Constant Currency)

drought effect

Source: OPYPA

Importance of UY's Agricultural Sector in Total Exports [2012]

Agro-Food & Forestry Exports
US$ 6,387 million
73%

Other Exports
US$ 2,342 million
17%

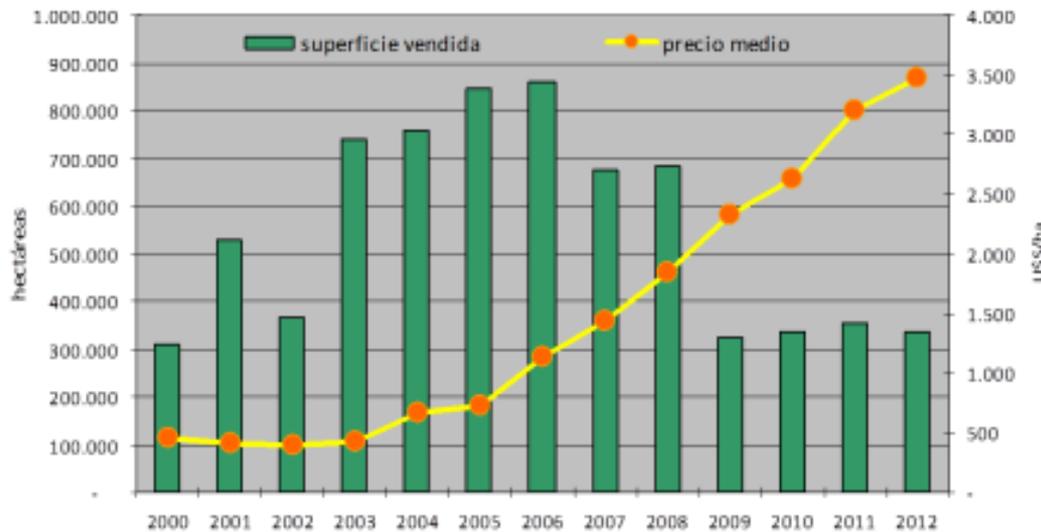# Challenge 2: Agricultural Growth Puts Pressure on Natural Resources
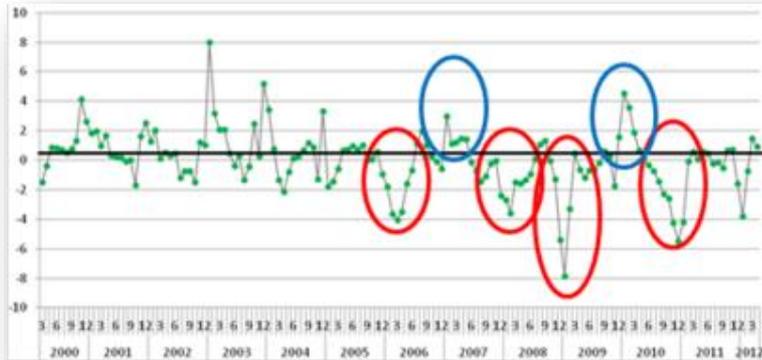## Production intensifies as consequence of increasing product and land prices

International Prices for Uruguay's Principle Exports
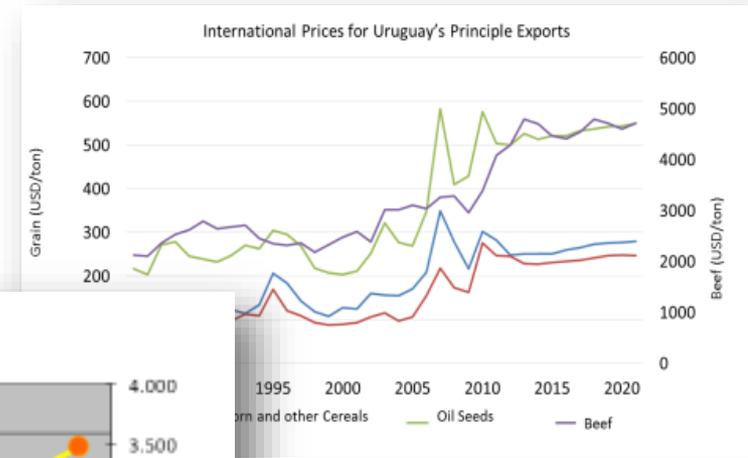
Development of UY Land Markets

Fuente: DIEA en base a DGR

Challenge 3: UY is Increasingly Vulnerable to Climate Change
The country faces an unprecedented number of adverse weather events

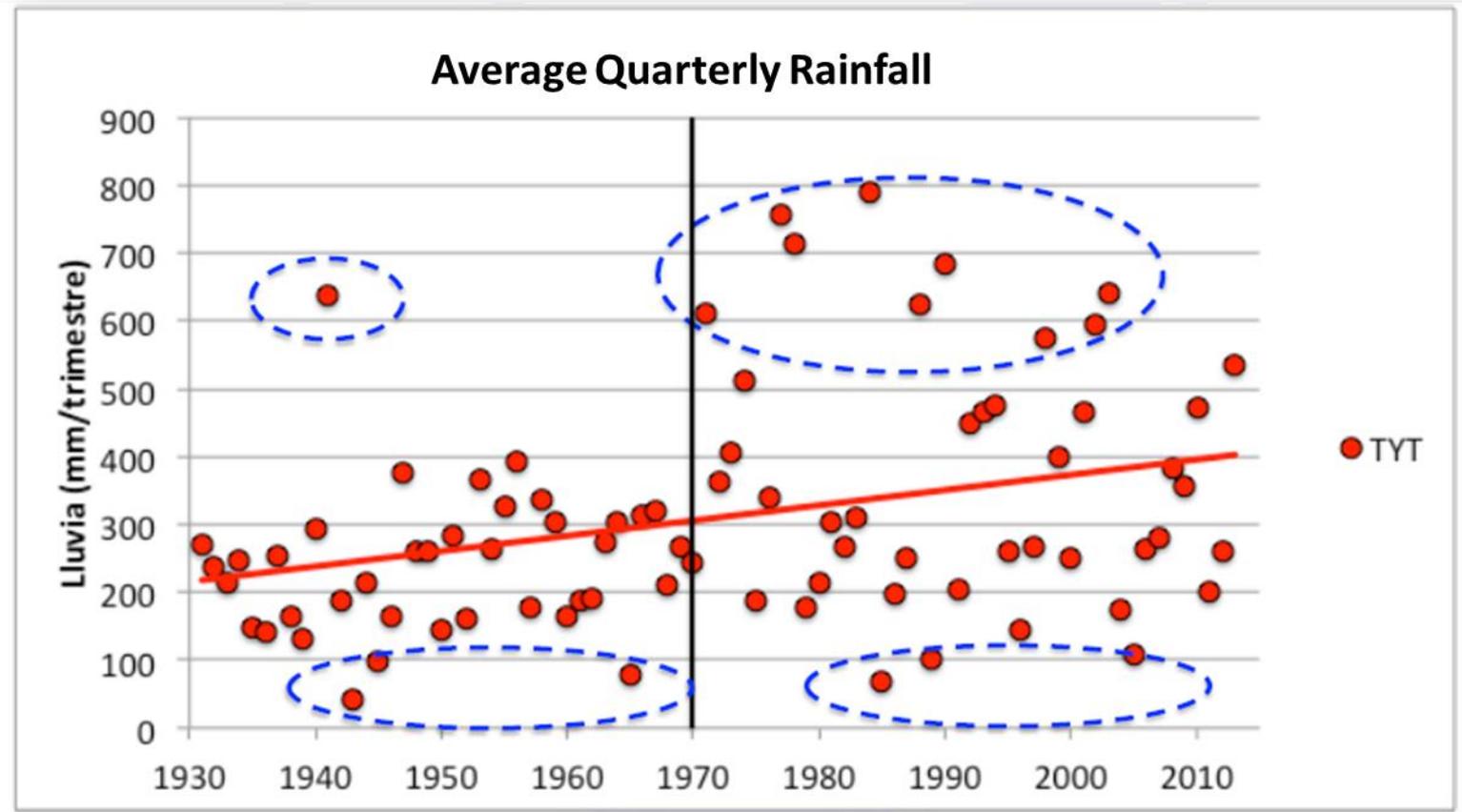**Precipitation Record**
[2000-2012]

Source: RENARE, 2013

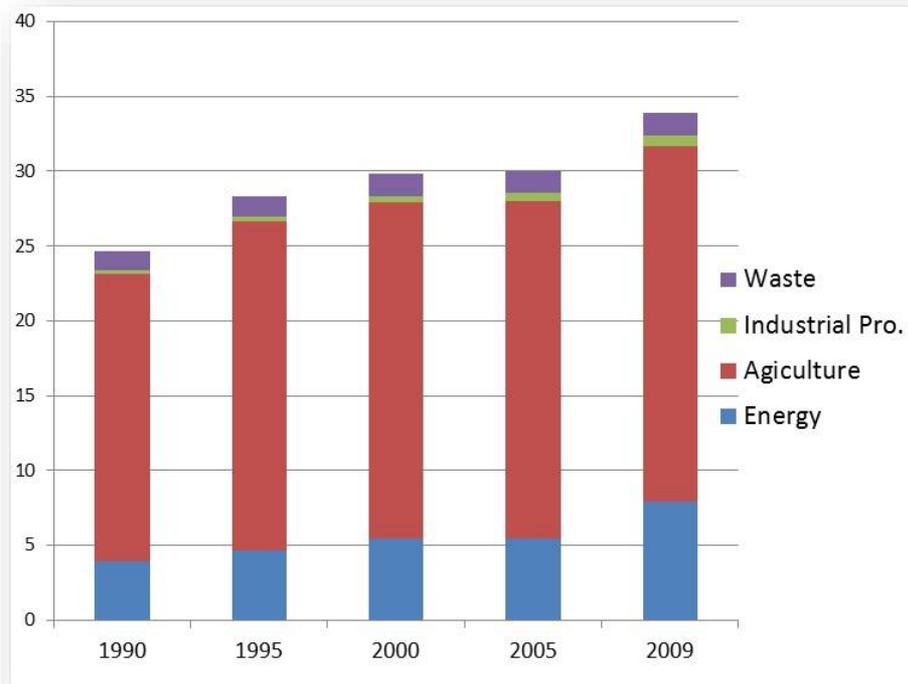**Storm Damage to (New) Grain Storage Facility** [Dolores, 2013]

Source: Bank team, 2013

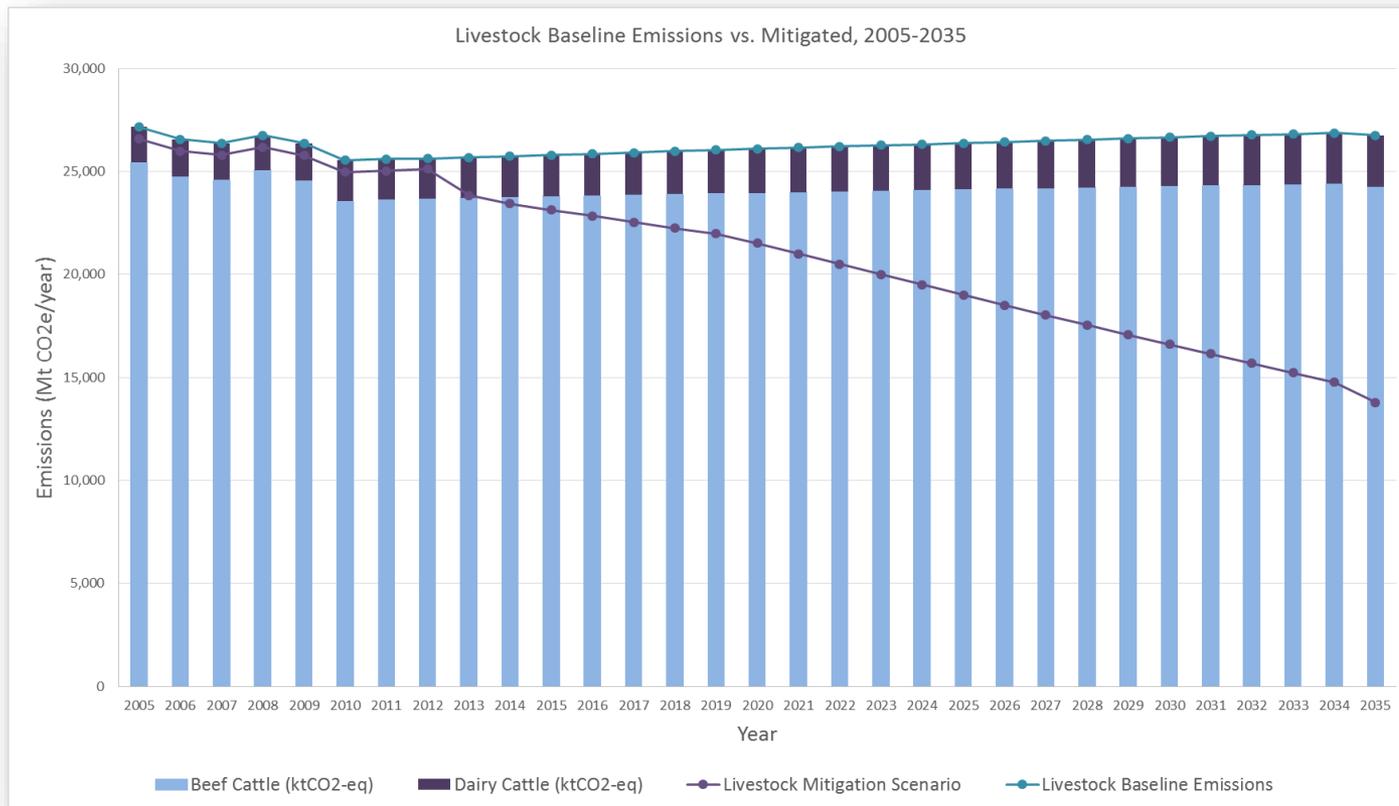# Understanding the challenge posed by climate change

Average Quarterly Rainfall

UY's emissions mix dominated by agriculture

Uruguay GHG Emissions Inventory in $MtCO_2$ e by sector

Livestock: Baseline vs. Mitigated Emissions

Livestock Baseline Emissions vs. Mitigated, 2005-2035

Local Solutions
The Case of Uruguay

Focus on Quality & Conservation Agriculture

Baseline scenario for hay production:
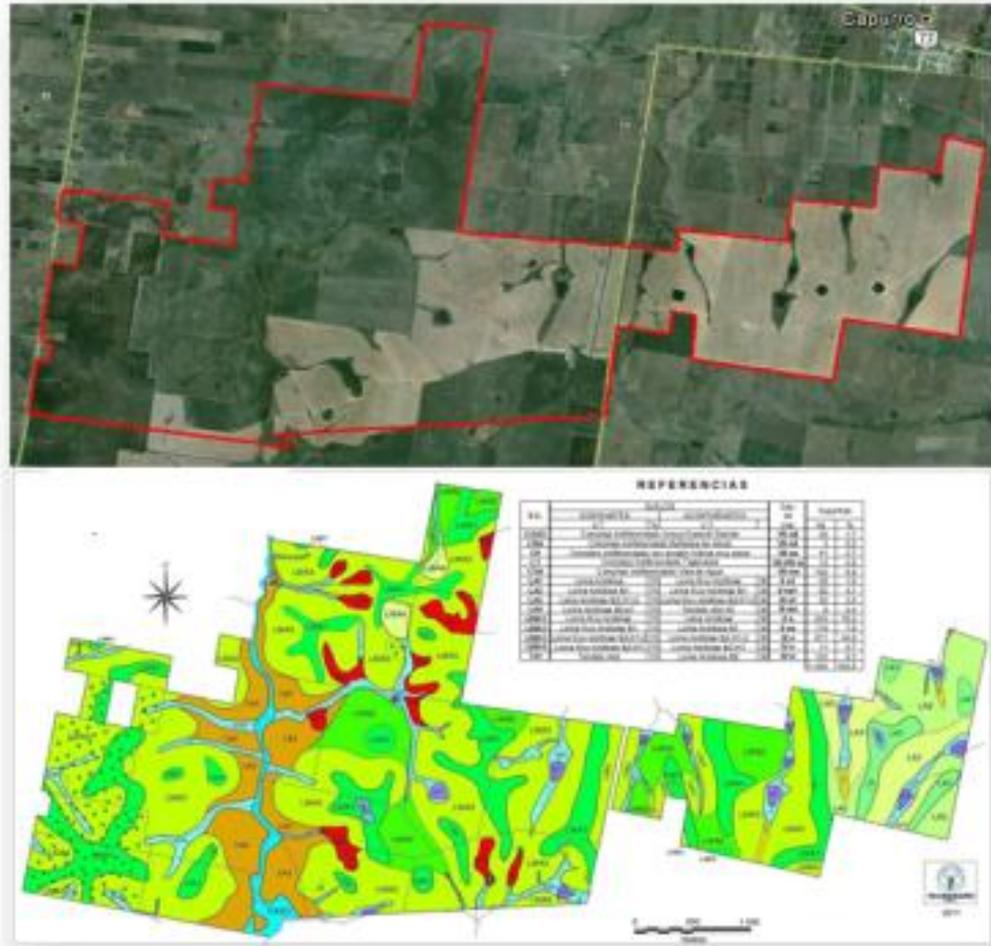
Fall	Winter	Spring	Summer

Scenario for better hay production with better management

Fall	Winter	Spring	Summer

Soil-Use Planning

Example of Soil Quality Mapping

Source: RENARE, 2014

Refining the Agricultural Information System

Actual Land Use relative to Sustainable Carrying Capacity [%]

Source: FAO, 2013

- **Identification of vulnerabilities and opportunitie**s
  - Which (sub)sectors, systems, components?

- **Understand, quantify and reduce uncertainties**
  - Understand the Past; Monitor the Present; Provide information for the Future

- **Identify technologies that reduce vulnerability**
  - Diversification; irrigation, storage and efficiency enhancement in water use; genetics; etc.

- **Identify institutional rules and interventions through policies that reduce/transfer risks**
  - Early Warning and Early Response Systems
  - Insurance (incl. Index-based); financing mechanism
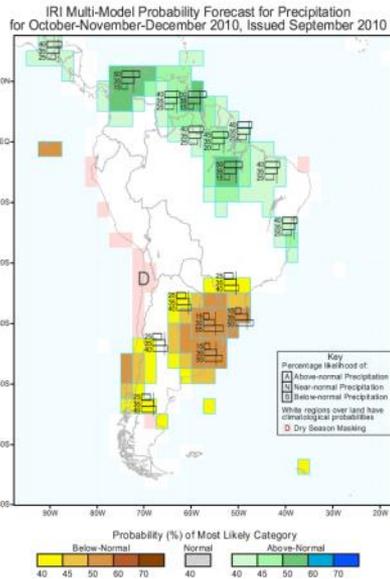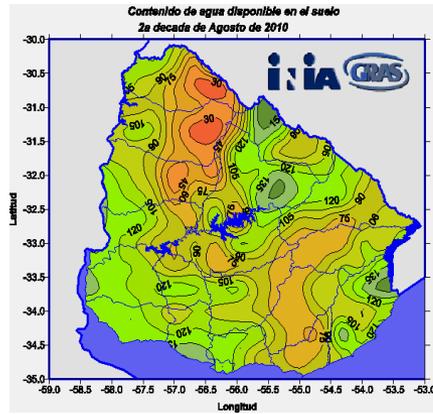 - Institutional framework and policies

Example: Better decision making in
Climate-adapted Policy and Enterprise Decisions

Climate Modeling from leading research universities
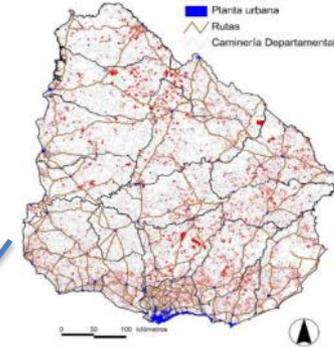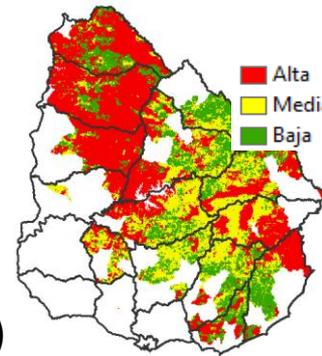
Water Monitoring

Family farmers

Risk Mapping

Early Warning on drought, production

Grasslands Monitoring

Livestock registration system (SNIG)
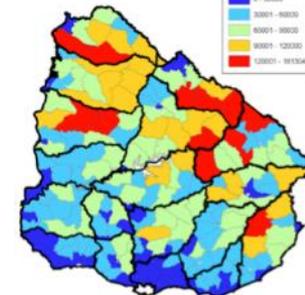
Example: Better decision making in
Water Resource Protection
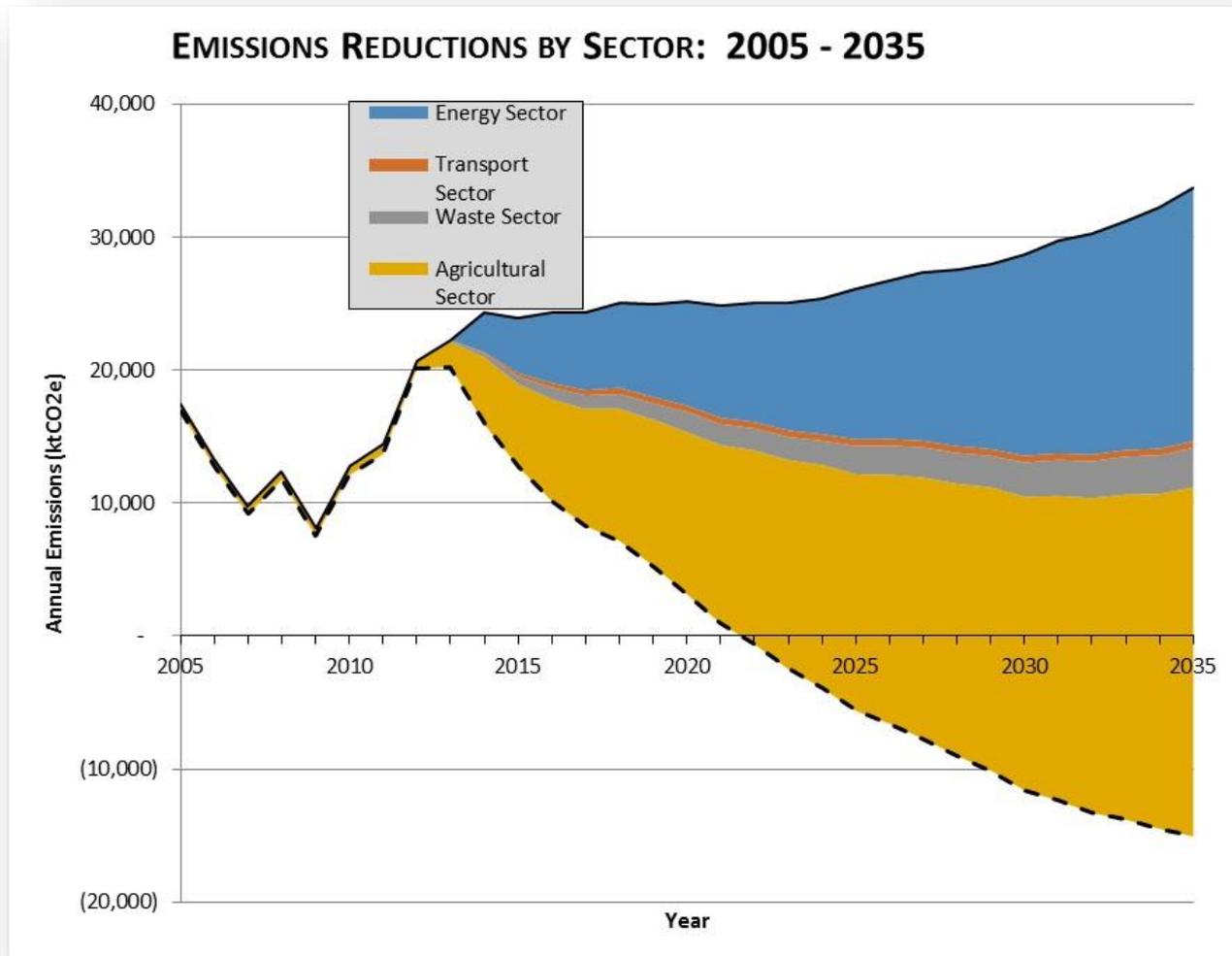

Farmers with more than 500 cows
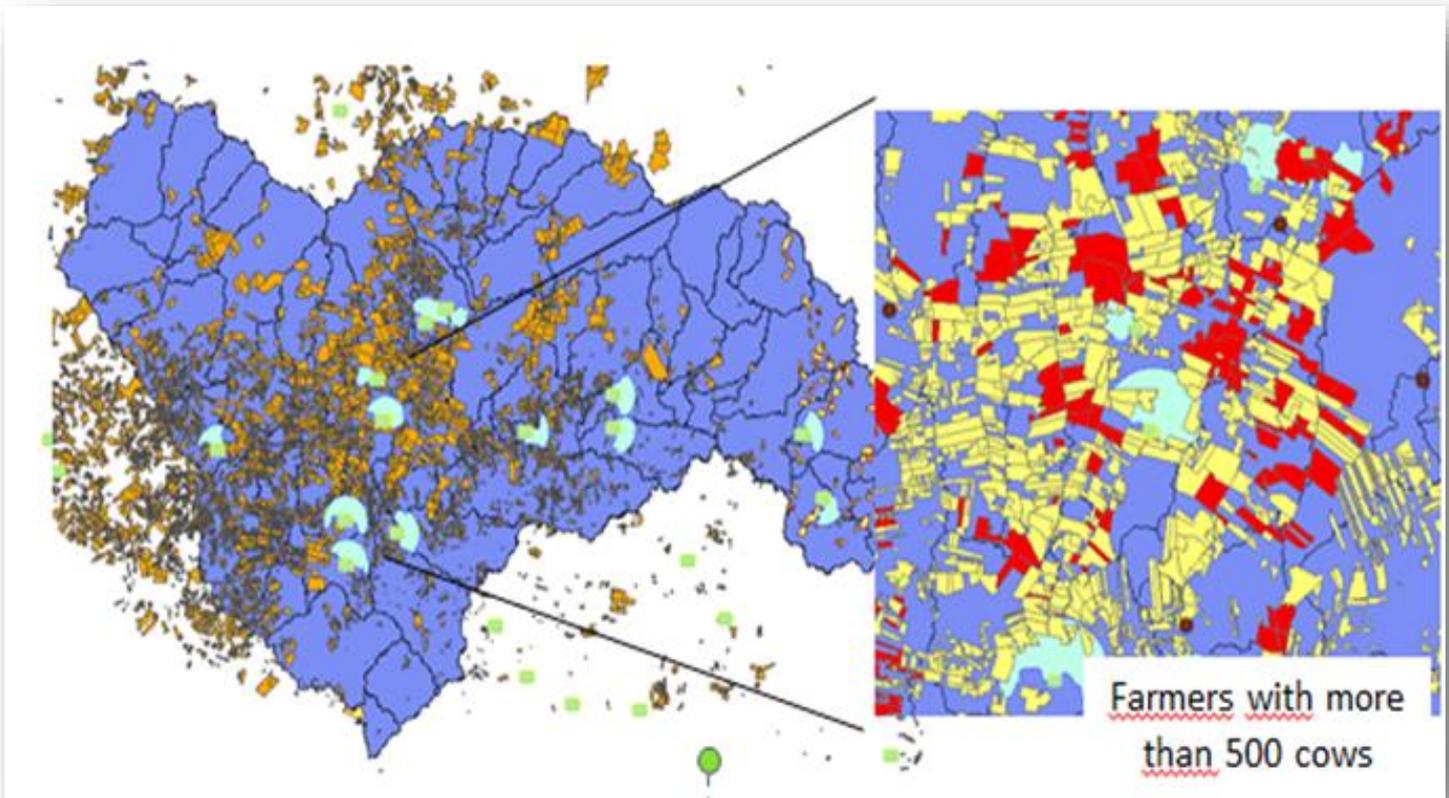
Example: Better decision making in
Resources Protection and Traceability

A Strategy for Low Carbon Growth
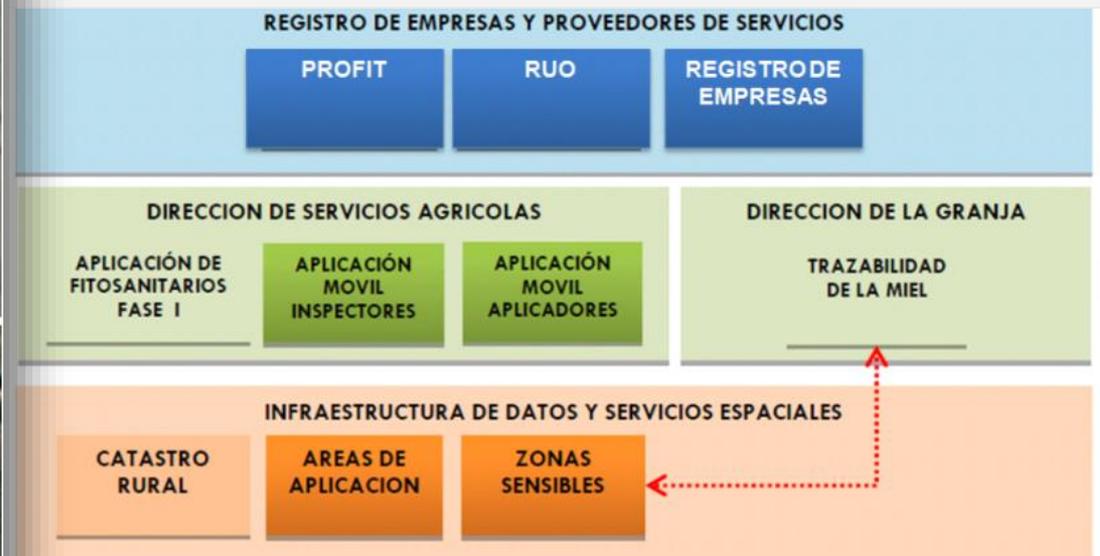
Solution 4
A Strategy for Low Carbon Growth

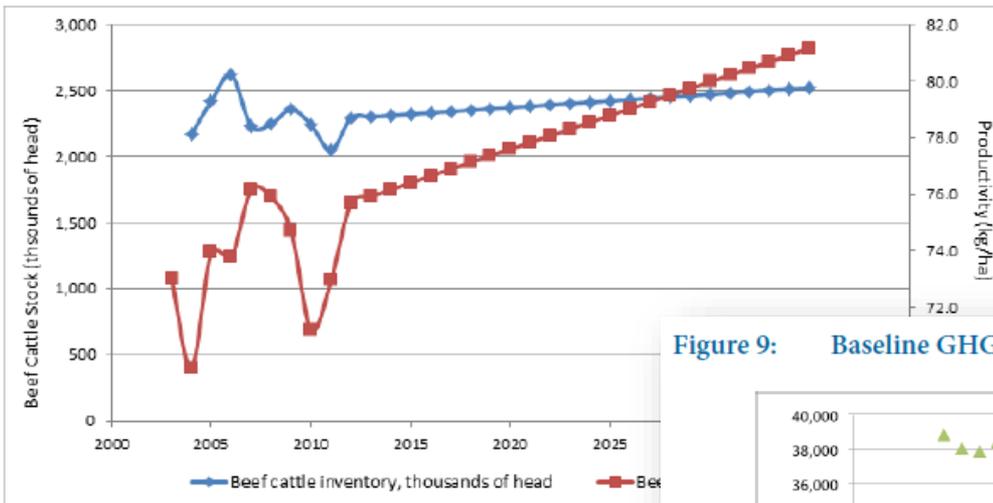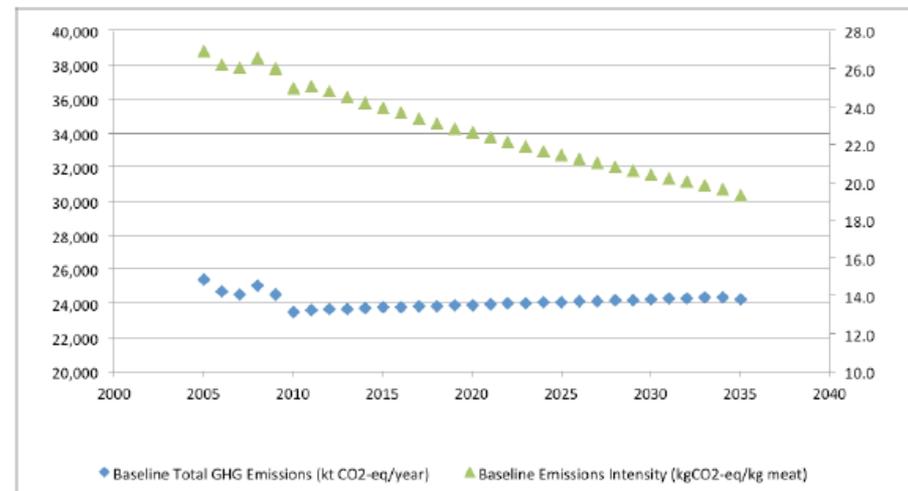Figure 7: Baseline Beef Cattle Inventory and Productivity, 2004-2035

Figure 9: Baseline GHG Emissions and Emissions Intensity for Beef Cattle, 2005-2035

Global Solutions

The Approach of the World Bank

1 **CLIENT COUNTRY ENGAGEMENT**
Advising clients and designing projects to increase productivity, build resilience and reduce emissions.

2 **MAINSTREAMING**
Applying a 'Climate Lens' to our work across sectors, both from adaptation and emission reduction perspectives.

3 **METRICS & TARGETS**
Of the current World Bank agriculture portfolio:

- *75% of projects improve productivity.*
- *31% build resilience.*
- *20% reduce emissions.*
- *12% are fully climate-smart, working towards all three goals.*

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