ARGENTINA

The pathways to carbon neutrality of Agriculture, Forests and Other Land Uses sector in Argentina

G20 Workshop on Agriculture and Climate Change

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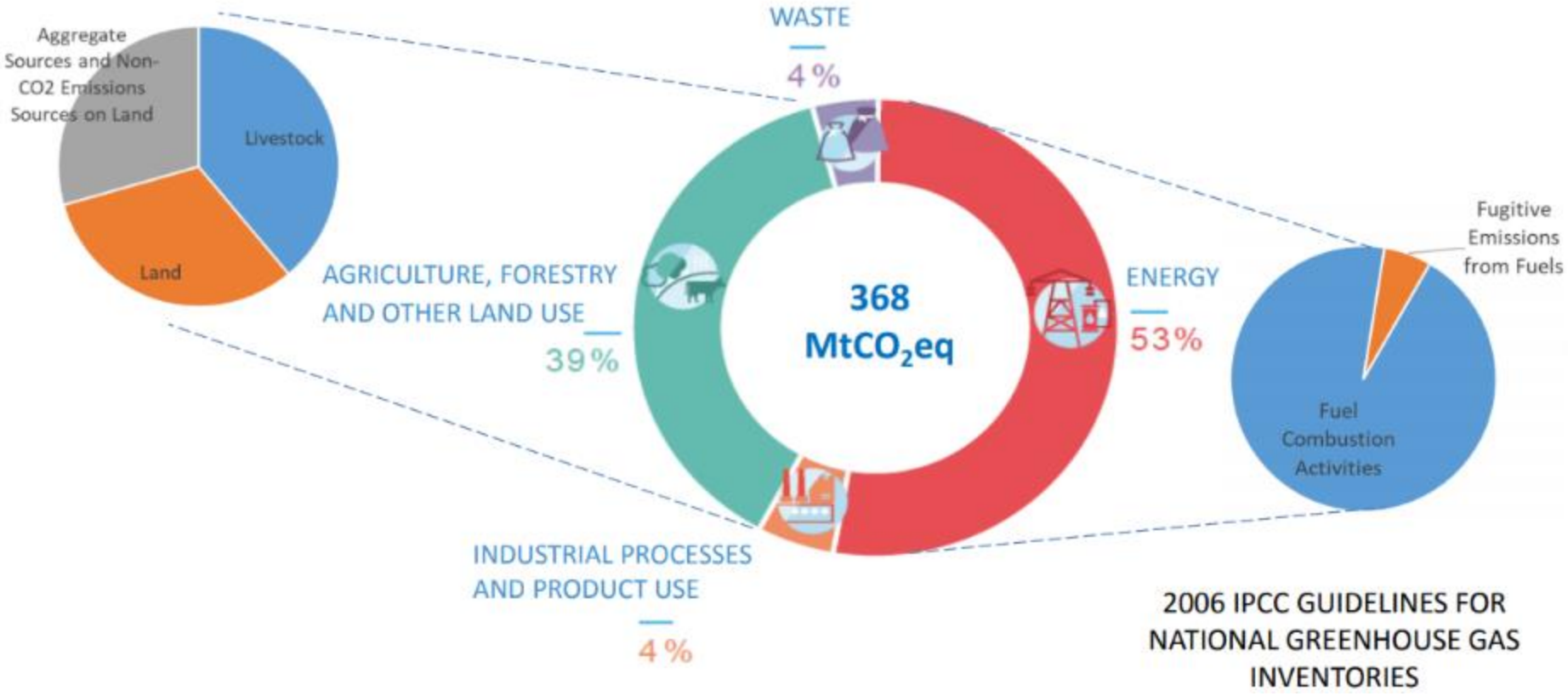
INTA

Ministerio de Agricultura, Ganadería y Pesca
Argentina

National context: Republic of Argentina

- **Total Land Area** 3.761275 km2 (2.791.810 km2 belonging to the American Continent)
- **Population:** 45.000.000 inhabitants
- **Arable land:** 40.000.000 ha (12.5 %)
- **Crop Production:** 135.000.000 t
- **Native forest Area:** 48.000.000 ha
- **Cultivated forest Area:** 1.200.000 ha
- **Livestock (Cattle):** 53.400.000 heads

GHG Inventory of ARGENTINA: main results

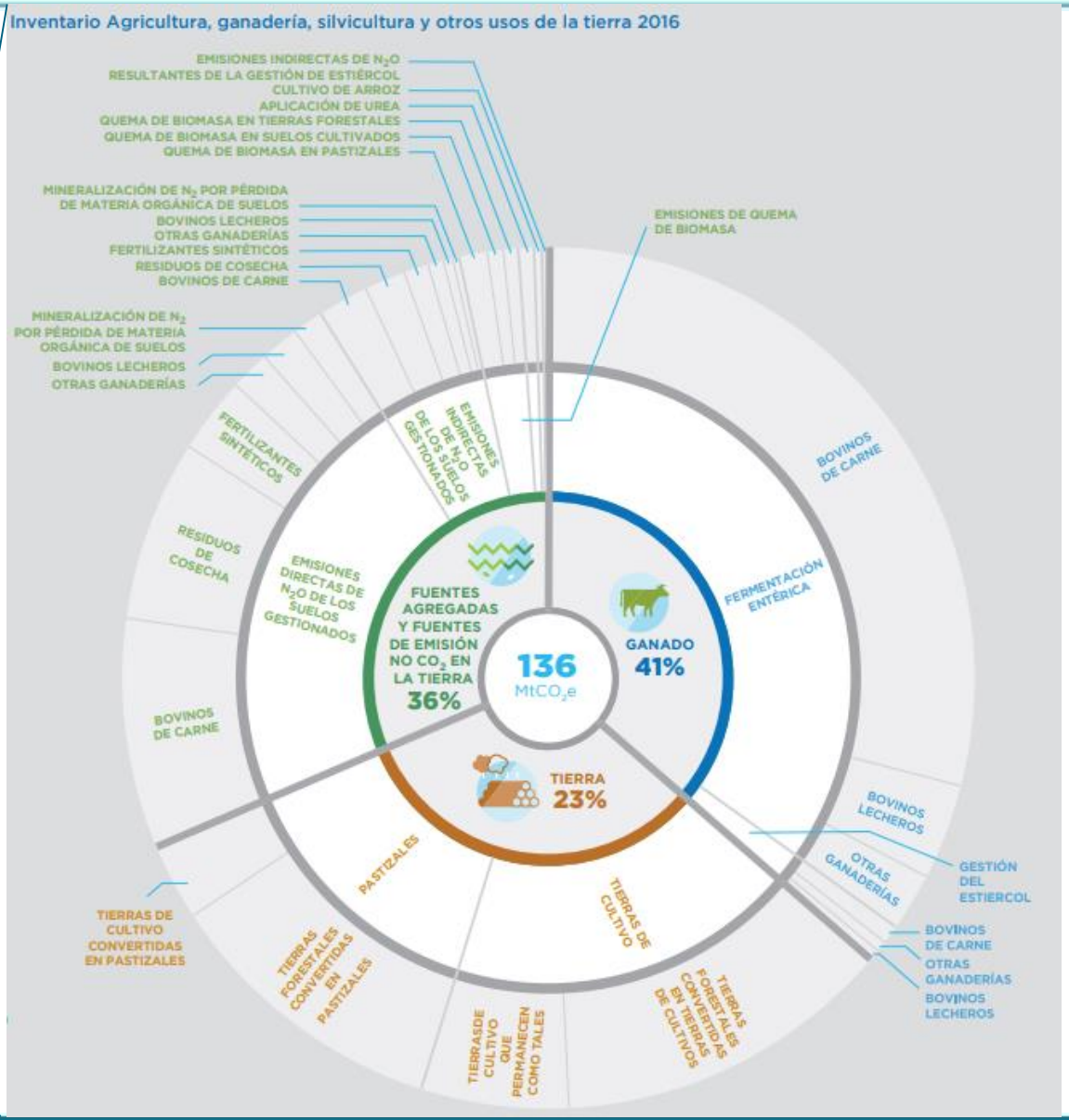


- Official 2017 national greenhouse gas inventory indicates that 39% of emissions come from agriculture, livestock and other land uses

SECTOR FARMING,CATTLE RAISING,FORESTRY AND OTHER LAND USES

Detailed inventory of greenhouse gas emissions

Ministry of the Environment and Sustainable Development, 2019



Argentina is working on the Long Term Strategies to carbon neutrality

- **Country level**
  - Strengthening of ecosystem protection policies (forests, wetlands, etc.).
  - Forest monitoring, to reduce deforestation, and encourage cultivated forests.
  - Land degradation measuring to contribute to Land Degradation Neutrality.

- **Landscapes level**
  - Diversification of production systems and practices, increasing production without significant expansion of the cultivated area.
  - Restore and recover native forests
  - Environment services driven
  - Carbon neutral integrated productive systems

- **Farm level**
  - Increased yields in livestock and agriculture through the use of new technologies based on the knowledge economy and sustainable intensification.

Adaptation & Mitigation Strategies in Agriculture Practices

Adaptation

- Increased crop rotation between grass and legume crops
- Integrating livestock with crop production systems.
- Inclusion of cover crops
- Improving soil and water conservation
- Minimizing off-farm flows of nutrients and pesticides
- Implementing more efficient irrigation practices
- Windbreaks made of native or cultivated forest

Mitigation

- More efficient fertilizer application technologies
- Biological nitrogen fixation in some crops
- Nitrogen inhibitors
- Crop rotation with grasses
- Zero-tillage
- Biofuel production - boost policies

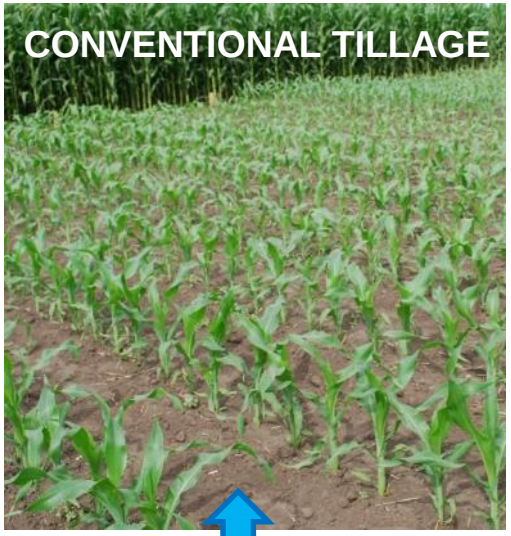
(Ministry of the Environment and Sustainable Development, 2019; Taboada, 2012; Vázquez Amábile, 2016;

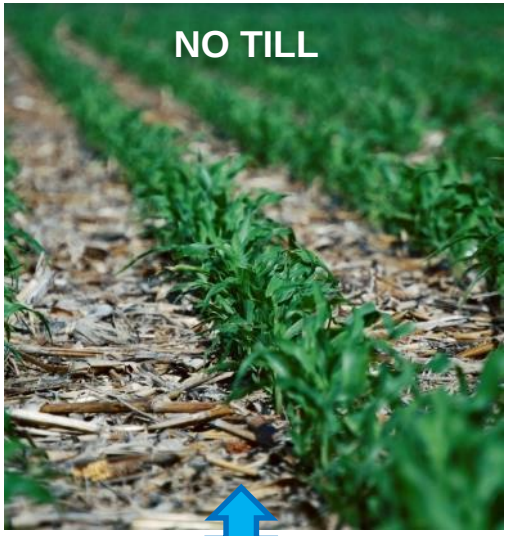
Example: No till cropping system

Benefits

- Biological Diversity
- Reduction in GHE
- Increase Carbon and Organic Matter in Soil
- Water Use Efficiency
- Wind and Water Erosion Control
- Less Energy
- Stability of Yields and Higher Productivity

A tillage system to i**ncrease the soil carbon stock, to contribute to achieve the long-term objective of mitigation**





(Bosch and Mercuri, 2016)

Adaptation & Mitigation strategies in cattle production

Adaptation

- Integrated beef, timber and grain farming
- On-farm integration and diversification of beef and dairy products
- System-based strategic intensification of production processes
- Development of circular systems for beef and dairy production
- Solar energy base water access and supply
- Forage species selection and improvement for climate extremes
- Animal breeding for emission efficiency (genomics assisted information-based selection
- Precision management

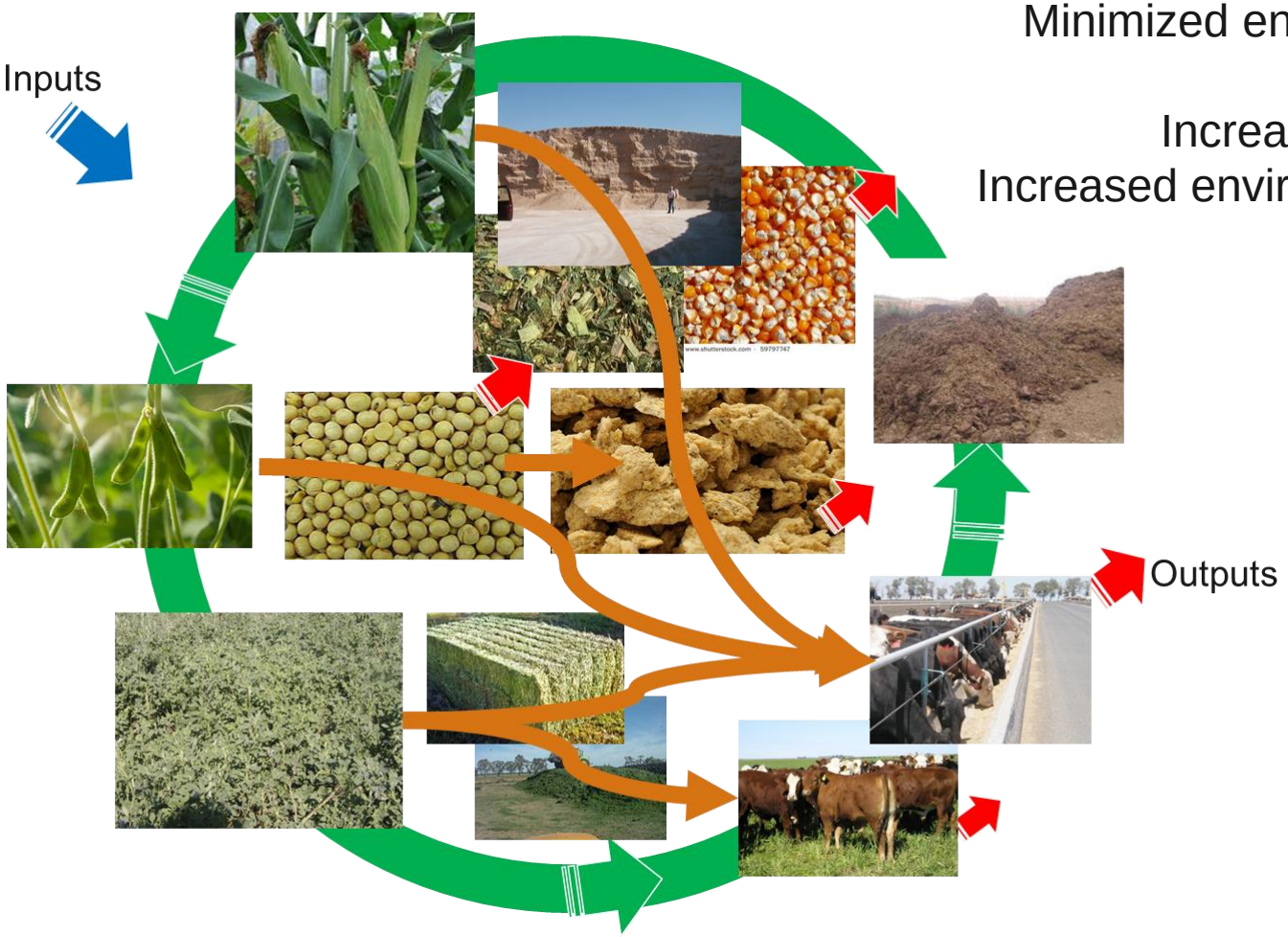
Mitigation

- Improved cow-calf performance
- Improved performance of grazing programs
- Acceleration of animal growth rate and individual performance
- Increased harvest weight
- Strategic use of confinement feeding (feedlot feeding)
- Environmental services (carbon, water fluxes and biodiversity)
- Use of industry byproducts and organic waste in animal feeding

Example: Advantages of beef -grain - byproducts integrated systems

Circular systems

Integrated, diversified,
Input efficient systems.
Minimized energy and nutrient leakage.
Increased output value.
Increased environment services.



Adaptation & Mitigation strategies in Forestry

Adaptation

Genetics of plantations adapted to stress and pests

More resilient production systems

Adapting the intensity and types of silvicultural treatments to CC

Management of irregular Forest structure
(more complex in composition and structure)

Mitigation

- Increase the amount of forest land
- Reduce deforestation and ag frontier expansion
- Restore forest landscapes

Example: National Forest Management Plan with Integrated Livestock

MBGI
MANEJO DE BOSQUE CON GANADERÍA INTEGRADA

- Contribute to the sustainable use of native forest
- Promoting capacity building for implementing MBGI
- Monitoring system

Principles:

- Maintain the productive capacity of the ecosystem
- Maintain the integrity of ecosystem services
- Farmer and communities welfare

The Role of Biotechnology in Sustainable Agriculture

How Biotechnology contributes to mitigation and adaptation?

Key points to be consider:

1. Any increase in yield or more efficient use of inputs, reduces the carbon footprint in production.
2. Any productive use on less suitable land reduces the pressure on land use change and indirectly on the carbon footprint

Adaptation

- Crops tolerant to drought or high temperatures
- Crops with resistance to biotic factors (CC: higher disease pressure)

Mitigation

- Crops with a higher rate of photosynthesis
- Crops suitable for growing in saline soils
- Crops with resistance to biotic factors (reduced emissions by reducing agrochemical spaying)
- Crops with greater efficiency in the use of nutrients
- Feed and Probiotics designed to reduce methane emission in animal production
- Nitrogen fixing bacteria and PGPRs with low NO emissions

Working together

Ministerio de Agricultura, Ganadería y Pesca
Argentina

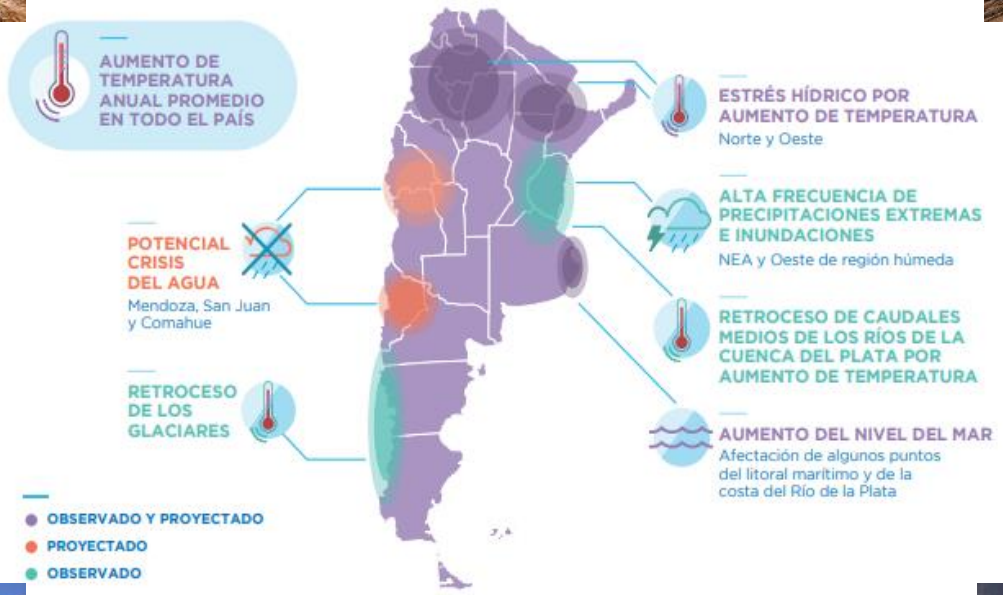
Federal Ministry
for the Environment, Nature
and Nuclear Safety

Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Vulnerability to CC: Observed and expected impacts

Drought is likely to be more regular, consecutive seasons, longer in duration, and broader in area

Parana River, severe dryness for three years with reduced water levels, record last 80 years



Ministry of the Environment and Sustainable Development, 2019

reduced supply of water from melting **snow**

Increased number of **fires** and hectares burned

Challenges ahead

- Argentina is currently producing food for more than 450 million people.
- The agricultural sector is also the country's main source of income.
- Argentina accounts for less than 1% of GHE globally. Agriculture, Forestry and Other Land Uses sector, for less than 0,39%.
- Argentina is part of the United Nations Climate Ambition Alliance, which is working towards net-zero CO2 emissions by 2050.
- However, extreme weather and climate events have increased in frequency, intensity and severity affecting our production and income.
- Our priority is adaptation. Argentina would benefit from International funding from central countries (major contributors of CO2 emissions), in order **to implement broad adaptation projects**, at both landscape and farm scales -under diverse productive systems- **to remain a supplier of food and feed to the rest of the world.**

Thank you

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