



Improved nutrient use and manure management towards sustainable and resilient agricultural systems: Chile

INSTITUTO DE INVESTIGACIONES AGROPECUARIAS (INIA)

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Chile

- ✓ 4.000 km long (17-54 SL)
- ✓ 756.096 km²
- ✓ Different weather conditions = a range of production systems
- ✓ Animal production (million heads)
 - Cattle 3.8
 - Sheep 3.9
 - Pig 3.3
 - Chicken 46.3



* "Acuerdo en República Argentina recorrido del Rey hasta el Aire, Arg 1988"

Extensive



Intensive



GHG Inventories and National Communications

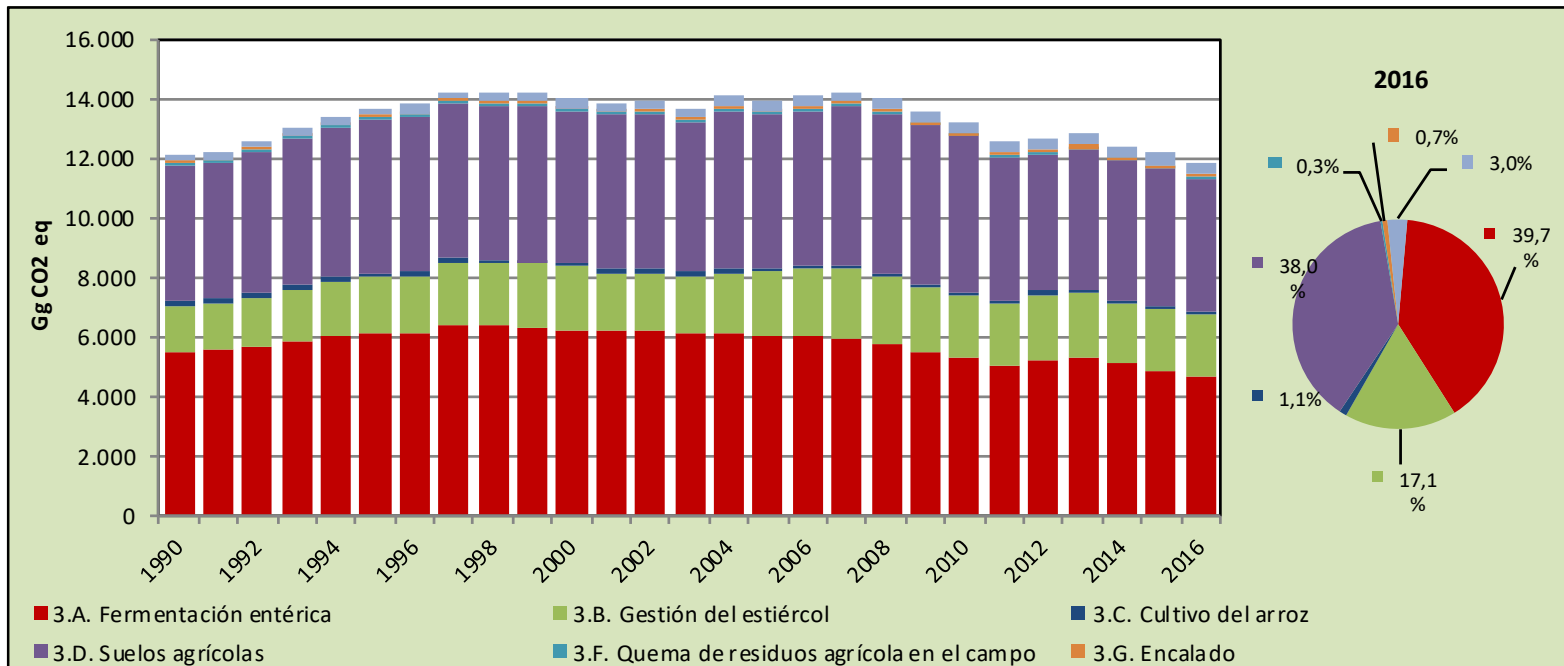
- **Non Annex I country**
- **National Inventory System**
- **5 GHG inventories, last series 1990-2016**
- **3 National communications**
- **3 BURs**
- **National Adaptation Plan for agriculture**
- **Climatic Change Law (under discussion)**





GHG Inventories and national communications

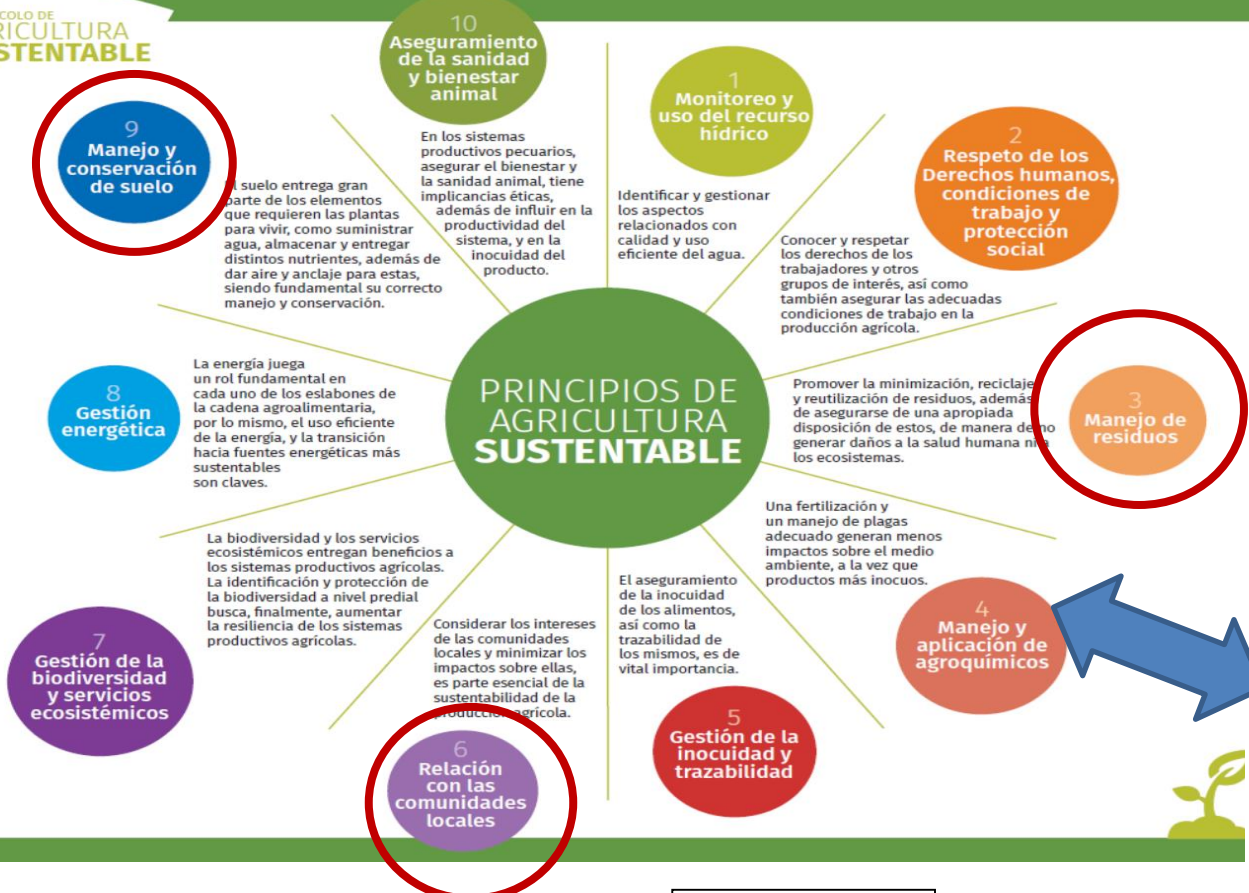
- **0.26% of global GHG worldwide**
- **Chile carbon neutral by 2050**
- **Agriculture 11% of national GHG**
- **Emissions from MM represent 17% of sectorial emissions, they are a key source for specific subcategories and gases**



Sustainable Agriculture Protocol

PROTOCOLO DE AGRICULTURA SUSTENTABLE

PRINCIPIOS DE AGRICULTURA SUSTENTABLE





Measuring GHG emissions...reduction of EFs

Laboratory scale

To understand processes and influencing factors



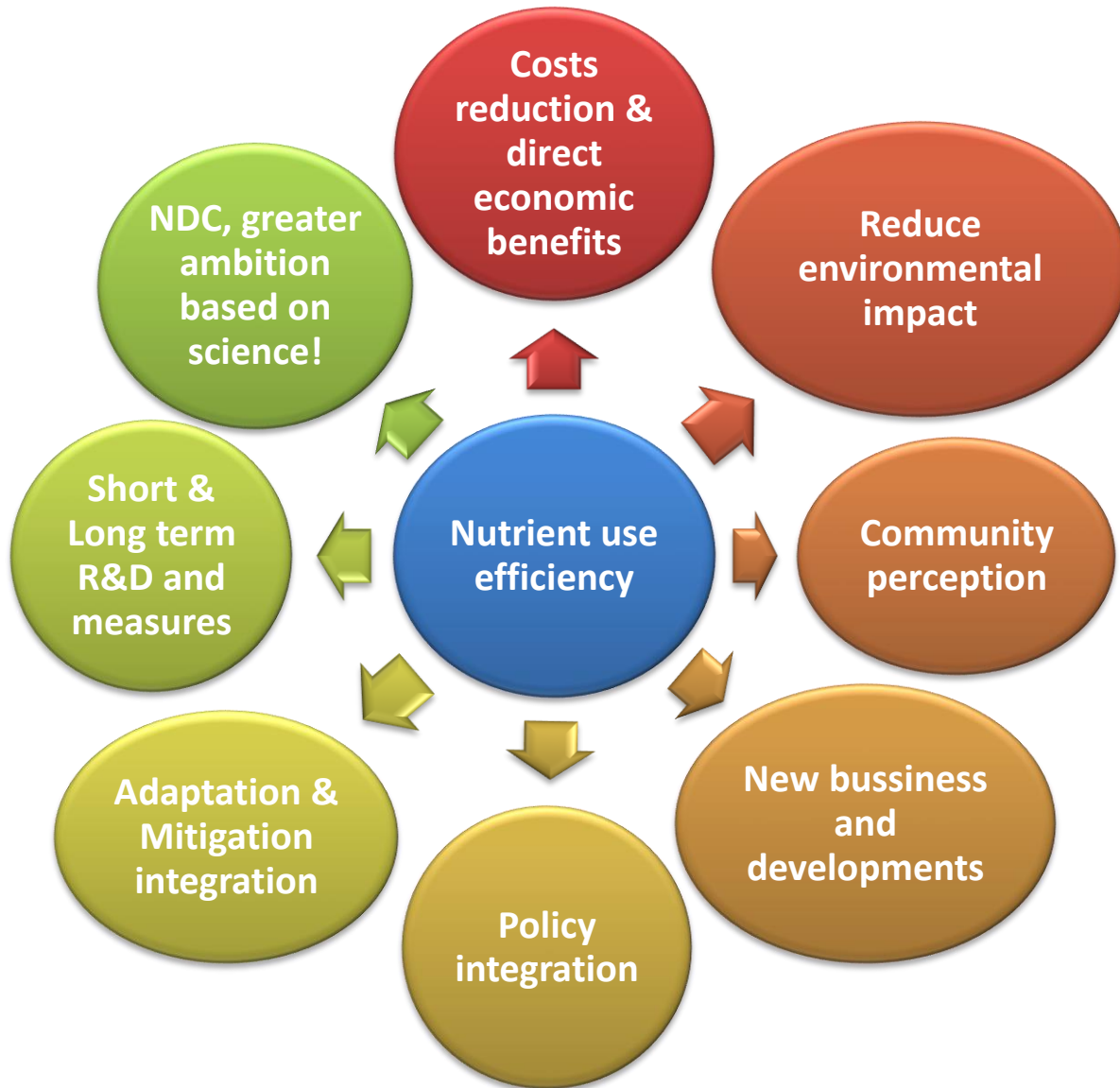
Source	N rate (kg ha ⁻¹ yr ⁻¹)	N-N ₂ O emissions (kg N-N ₂ O ha ⁻¹ yr ⁻¹)	EF (%)
Permanent pasture	0	0,2 a 0,4	-
Permanent pasture, urea	124	0,9 ± 0,03	0,25 ± 0,01 b
Permanent pasture, urine (bovine)	1.747	1,8 ± 0,16	0,08 ± 0,01 a
Permanent pasture, dairy slurry	134	0,6 ± 0,07	0,24 ± 0,05

Farm scale

under ambient conditions



Benefits, co-benefits...& challenges



Scaling up!!!



International collaboration

- 2009. N₂O course for LatAm countries
- 2014-2015. Course on N₂O and CH₄ methodologies
- 2014. 1st Latin American conference on GHG (GALA)...next Perú 2020
- 2018. GHG Workshop for rice crop & postgrad students and short stay reseach visits



CLIFF – GRADS



PROGRAMA DE INVESTIGACIÓN DE CGIAR EN
Cambio Climático,
Agricultura y
Seguridad Alimentaria



- **International collaboration is a key, Koronivia network may provide a pathway for knowledge flow and capacity building**



The future...challenging but optimistic

- ✓ **DATAMAN: Creating a database of greenhouse gases and ammonia emitted from livestock animals for refinement of national inventories in developing countries**

New Zealand, UK, Germany, France, Denmark, Ireland, Australia and **Chile**




New Zealand Government

Aims

- **Build a publicly-accessible international database on GHG emissions from MM** ←→
- **Development of new EFs** **IPCC/UNFCCC**
- **Identify key factors driving GHG emissions, and with it mitigation options**
- **Integrate knowledge from developed and developing countries**
- ✓ 6th National GHG Inventory report
- ✓ Analysis and approval of new NDCs
- ✓continue working for the development of more sustainable agricultural systems

Thank you

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- **Global Research Alliance and DATAMAN project**
 - **National and international projects: Fondecyt 1040104, 1080368, 1100300, 1130718, 1151078, CONICYT, British Royal Society, IFS, FIA, FDI, FONTAGRO, GRA, GEF, UNIDO**
 - **Ministries of Agriculture and Energy**
 - **Milk consorptium, private companies and farmers federations**
 - **International research and funding partners**
 - **Agriculture and environment INIA Chile research team**