

# Livestock and environment: The reverse of the story

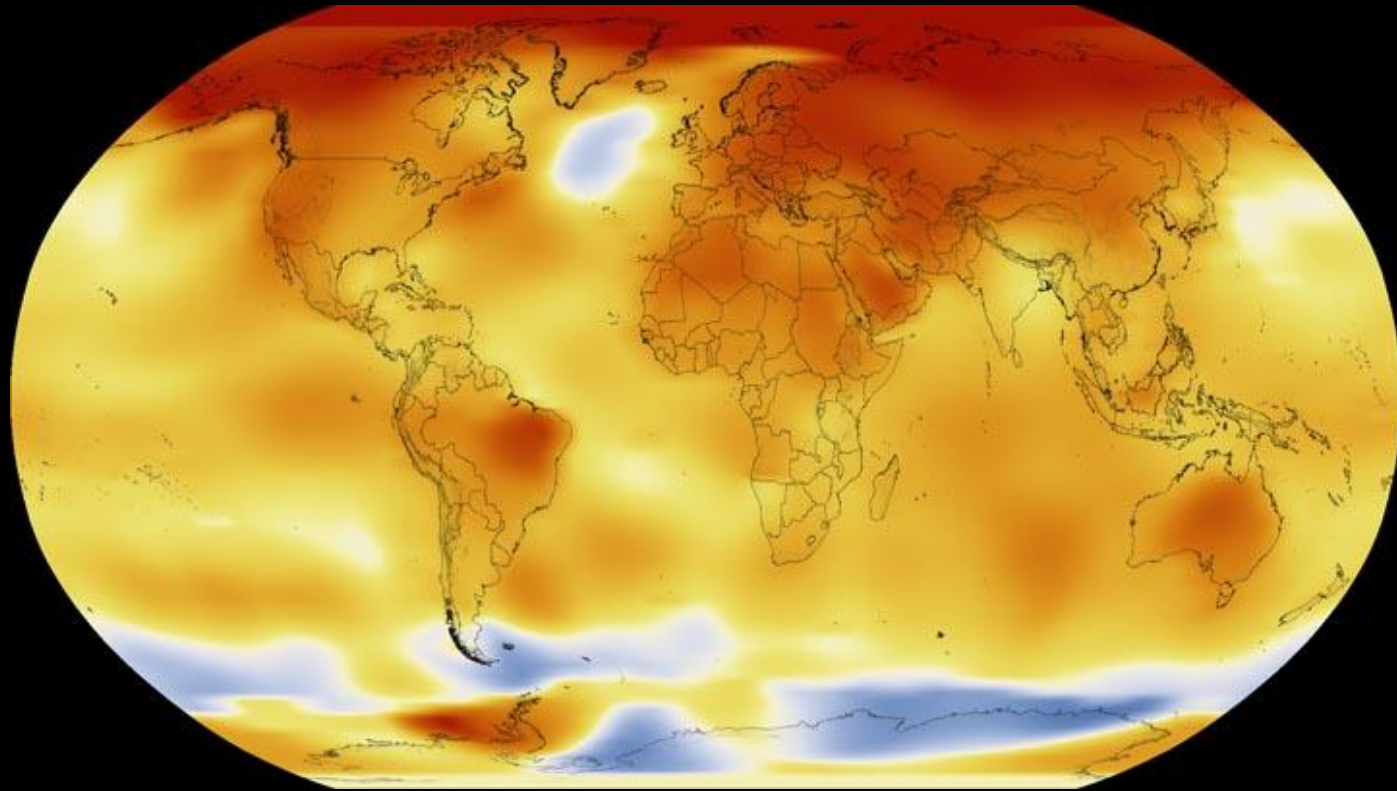


*Florencia Ricard  
CONICET / UNLPam / GPPS*



**Which is the environmental  
reality that we face?**

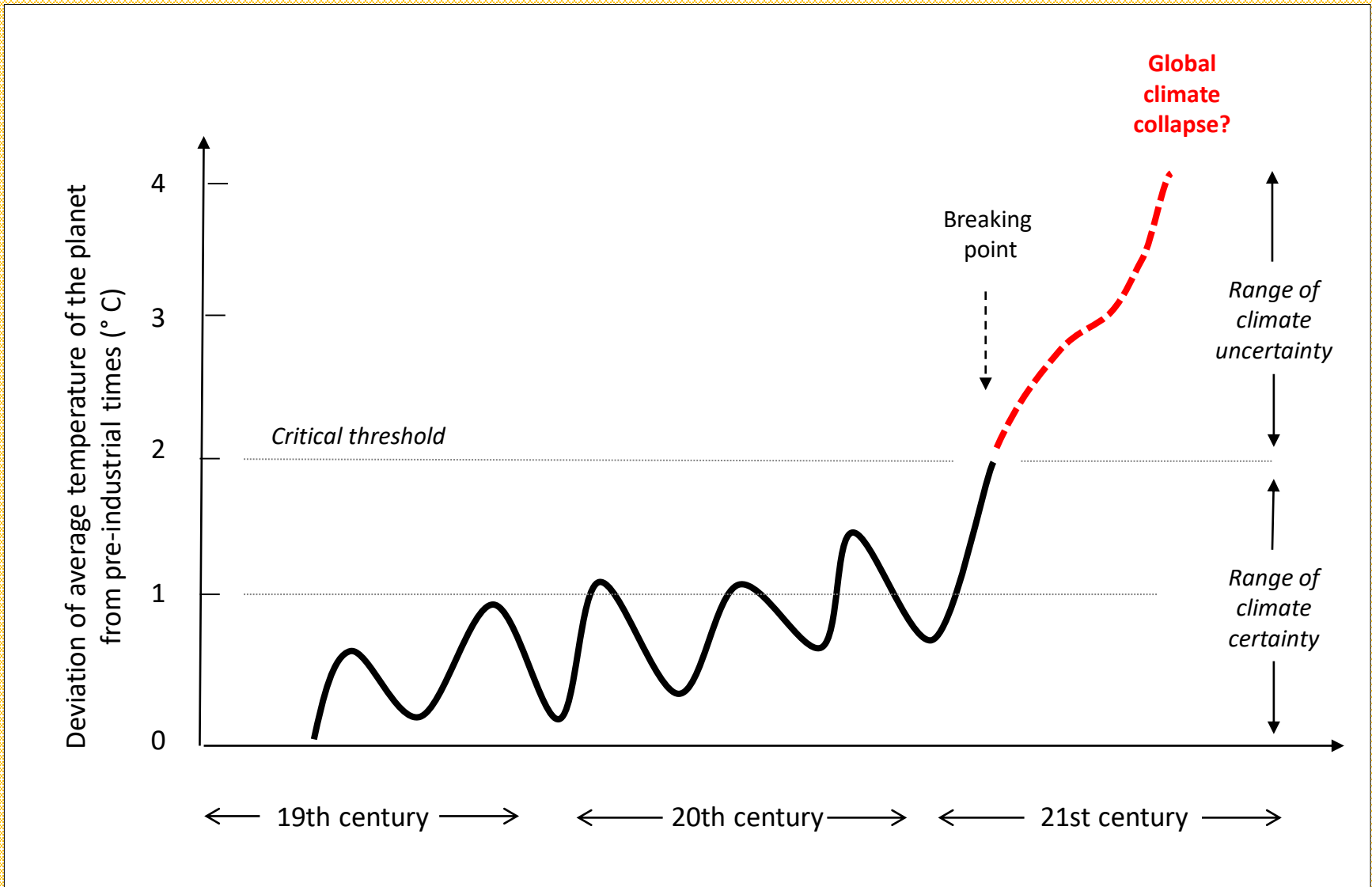
**2005**



Temperature Difference (Fahrenheit)

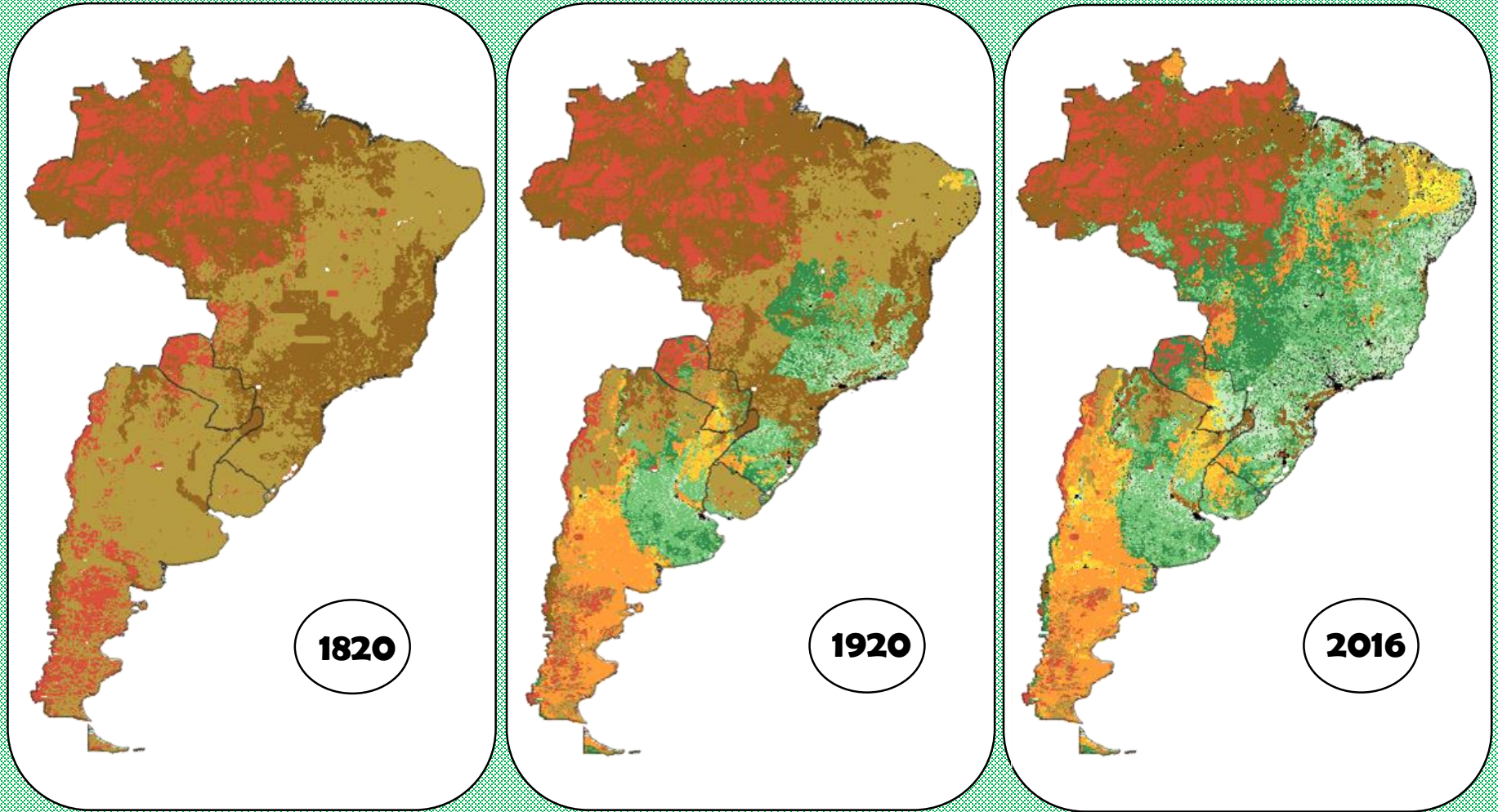


**Changes in the surface temperature of the Earth between 1884 and 2016. Areas in blue: colder than average. Areas in red: warmer than average. Source: NASA/GISS - NASA Scientific Visualization Studio**



Increase in the average temperature of the planet and projection of the global climate if a critical thermal threshold is exceeded (Source: Steffen et al., 2018).












# Evolution of MERCOSUR ecosystems of in the last 200 years



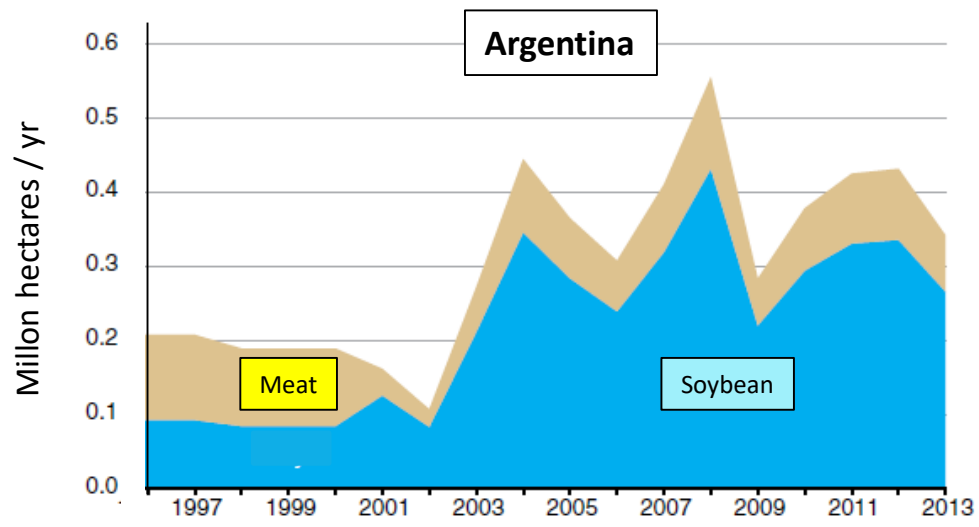
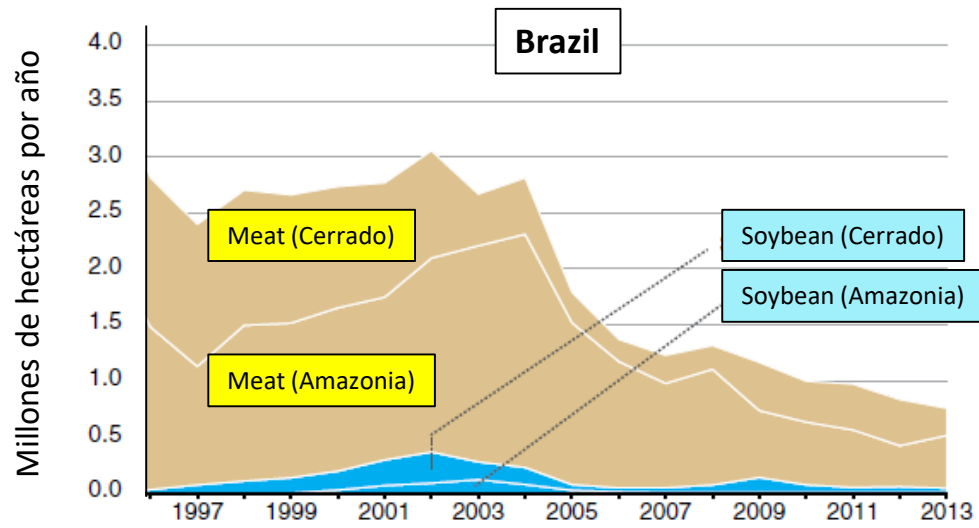
**1820**

**1920**

**2016**

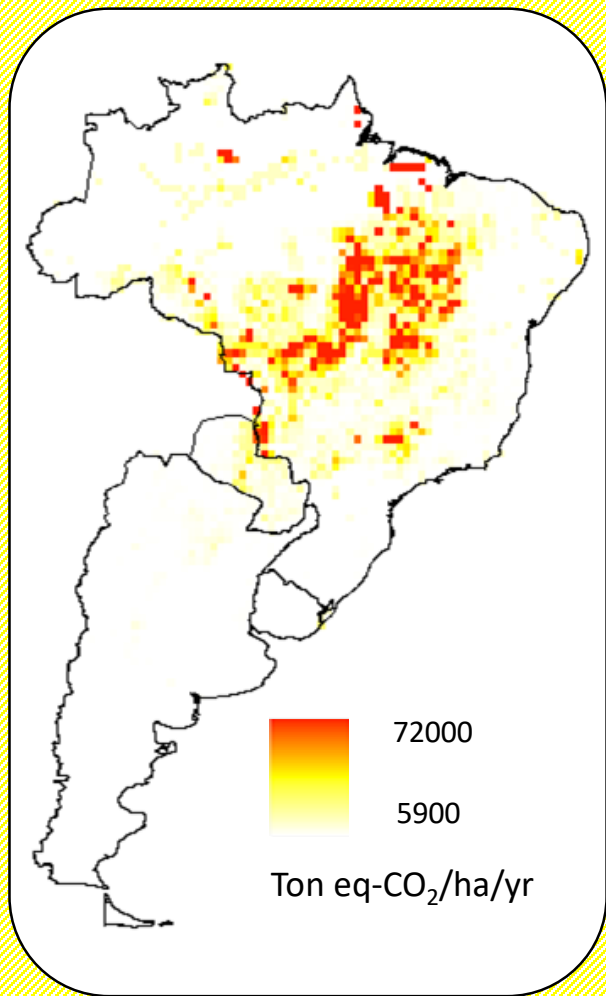
- |  |  |  |  |
|--|--|--|--|
|  Urban and dense settlements |  Croplands, residential |  Rangelands, residential |  Woodlands                                      |
|  Village                     |  Croplands, populated   |  Rangelands, populated   |  Treeless and barren lands                      |
|  |  Croplands, pastoral    |  Rangelands, remote      |  Wild remote<br>(woodland or treeless & barren) |

Source: Own elaboration from Goldewijk, et al. (2017).



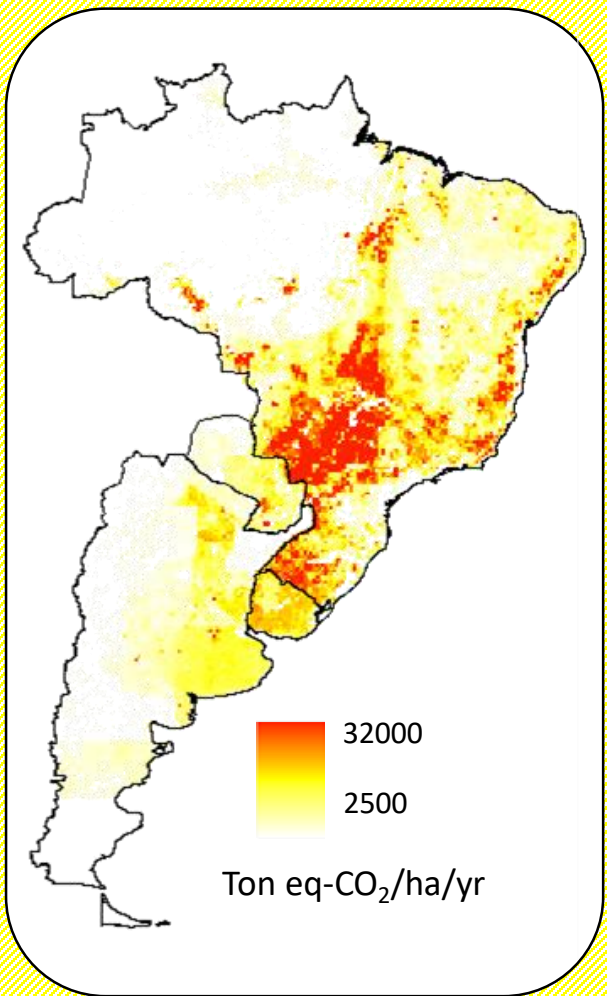
Destination (meat or soybean production) of hectares deforested in Brazil and Argentina between 1996 and 2013 (Source: USDA, 2017).

Large scale biomass burning



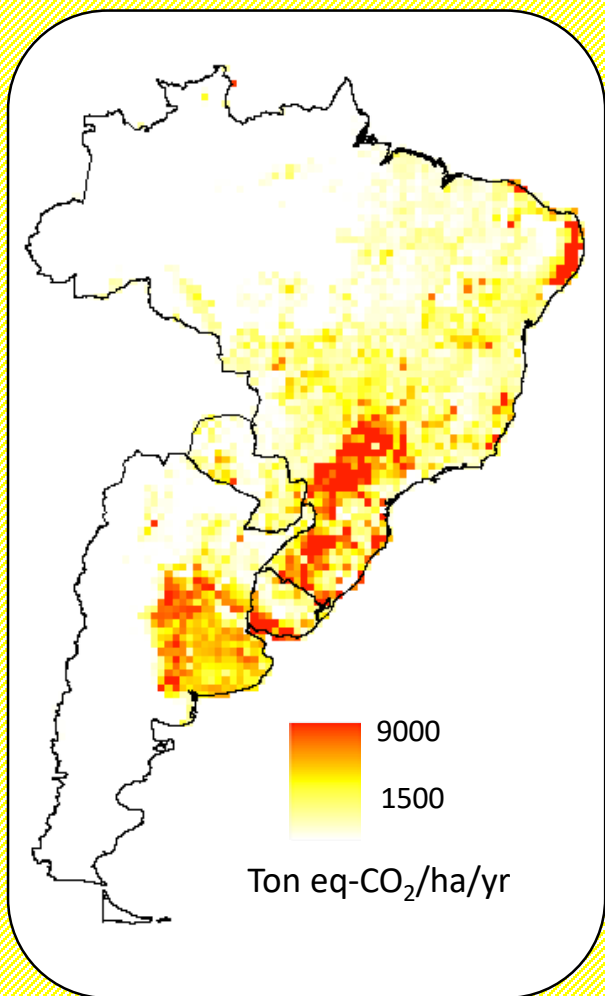
**16 %**

Enteric Fermentation



**23 %**

Agricultural soils

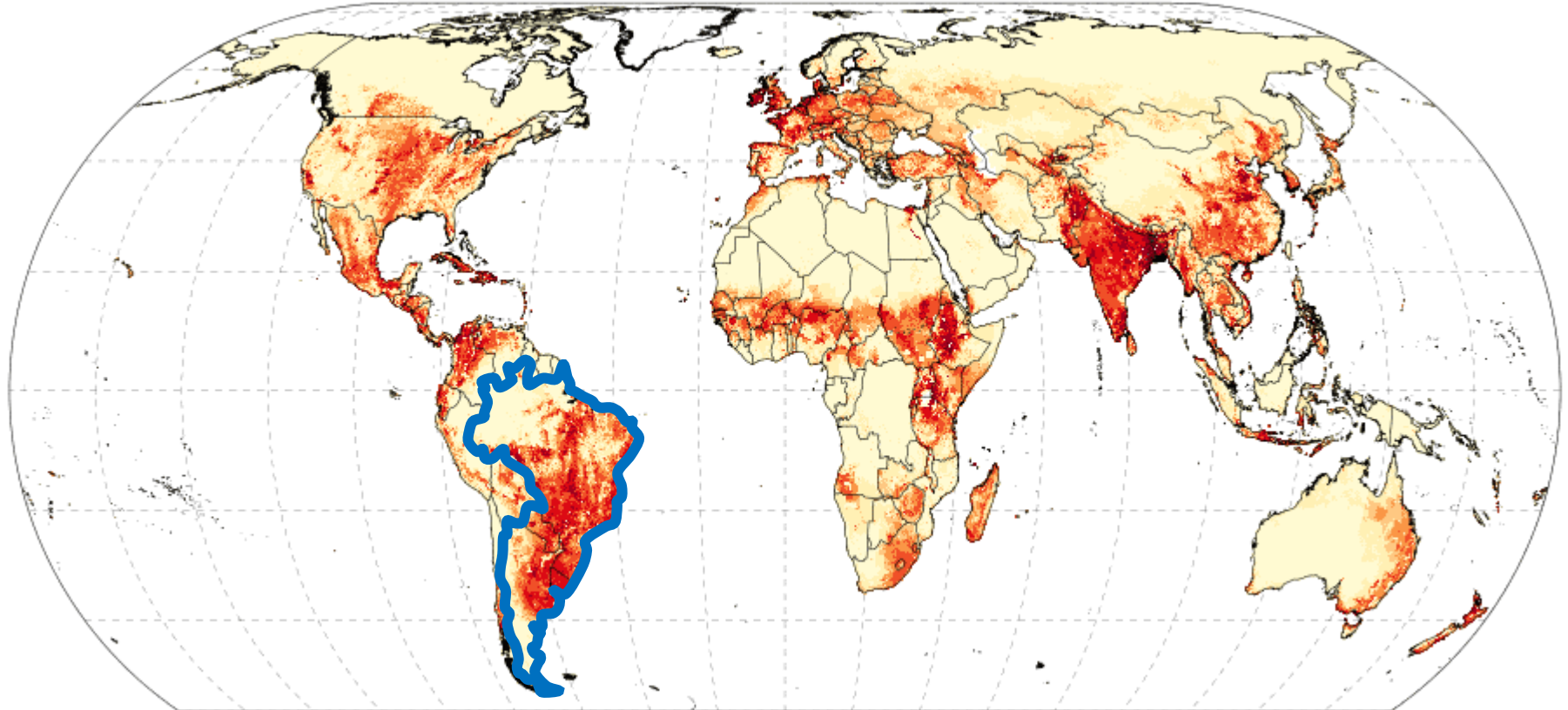
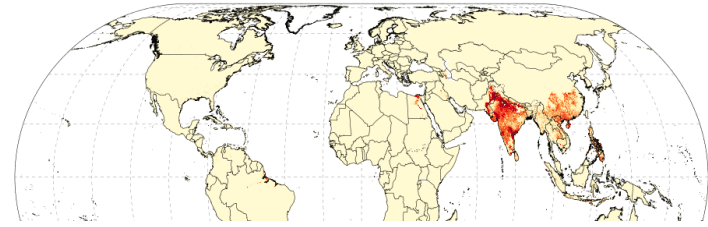
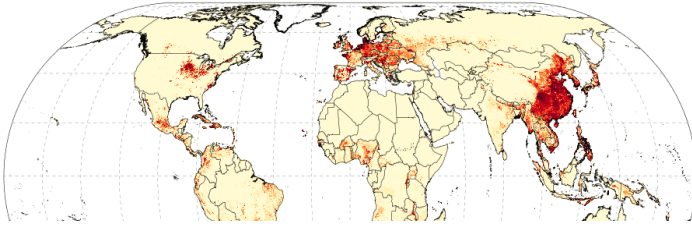


**12 %**

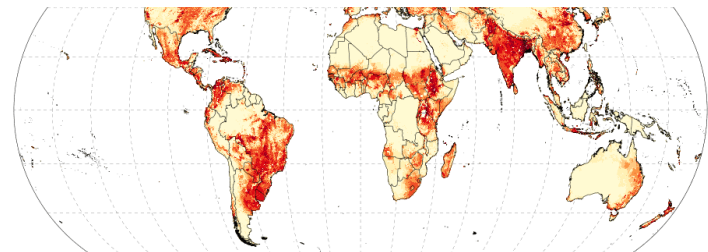
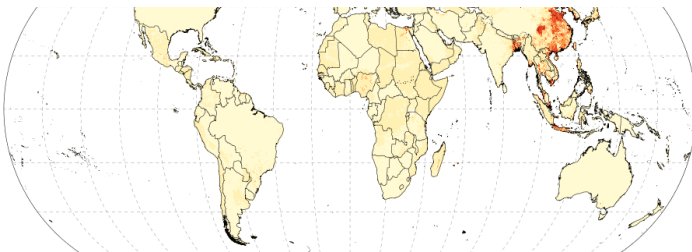
## Main sources of greenhouse gas emissions in MERCOSUR

Source: Ricard (2017) elaborated from Global Emissions EDGAR v 4.2 FT2010 (2013)

# Global distribution of livestock systems



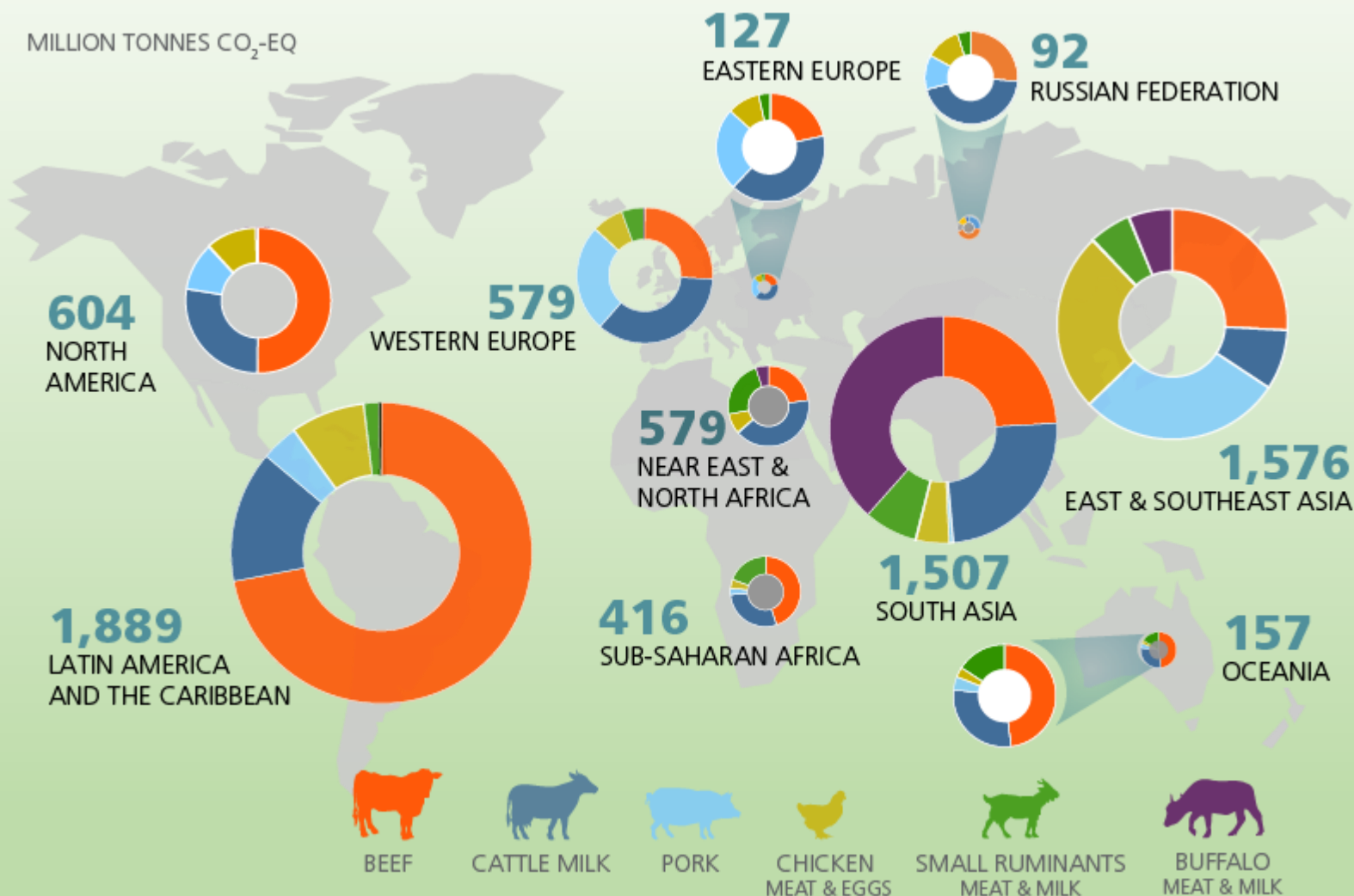
DUCKS



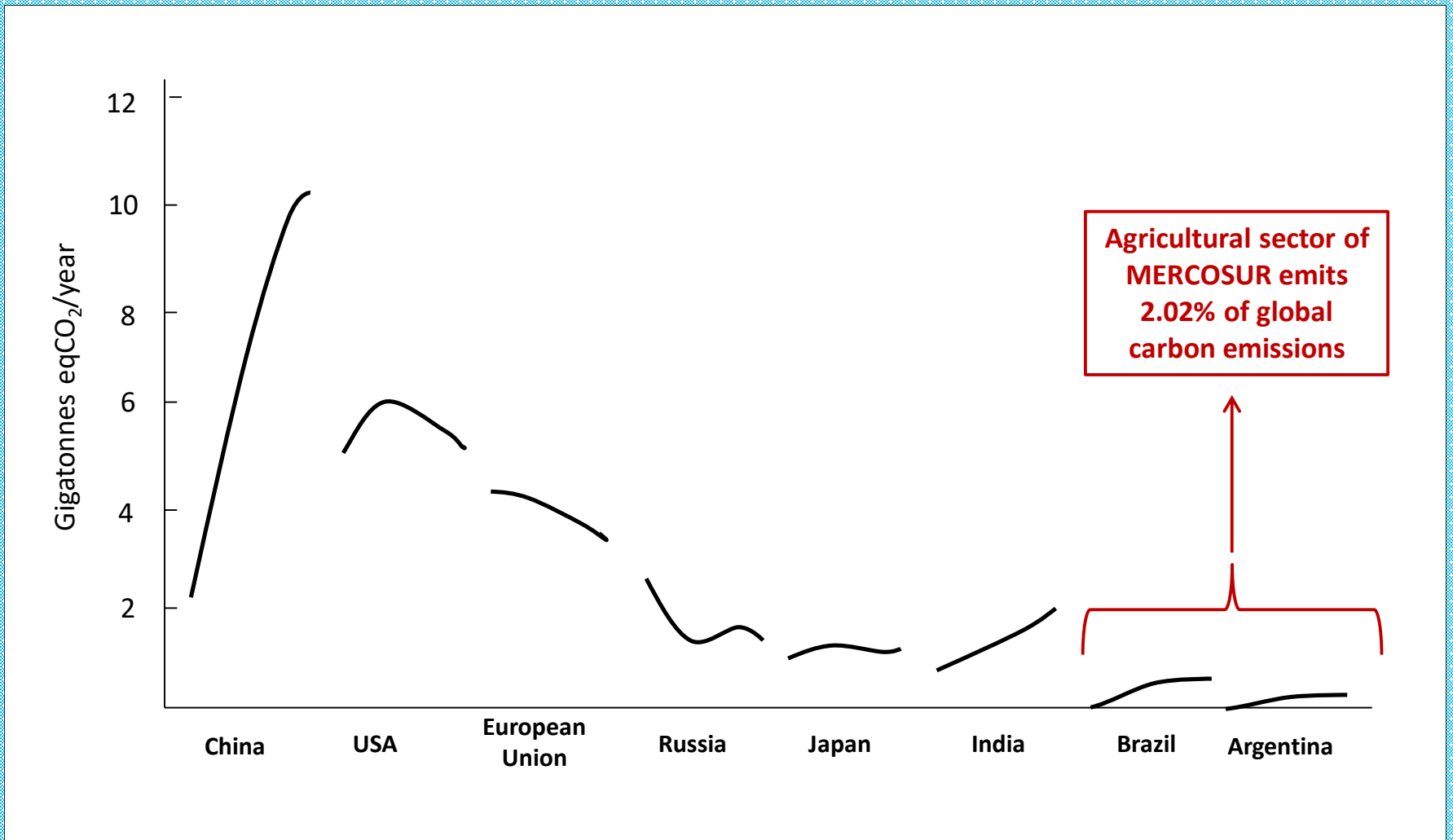
CATTLE



# MERCOSUR countries account for 23% of the global emissions of livestock



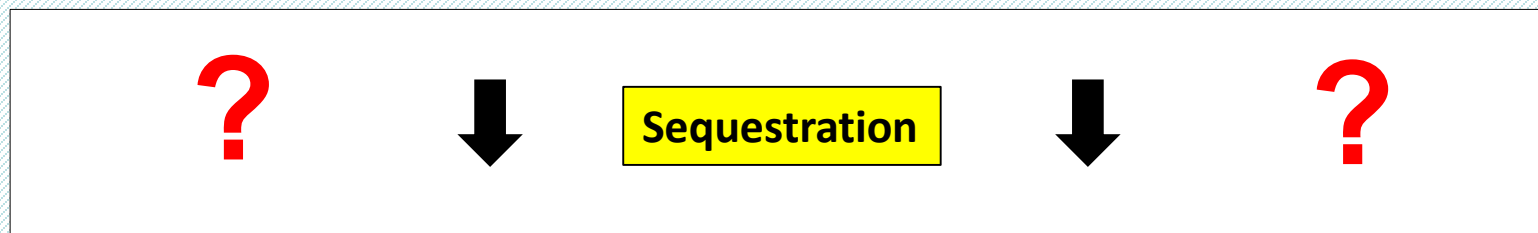
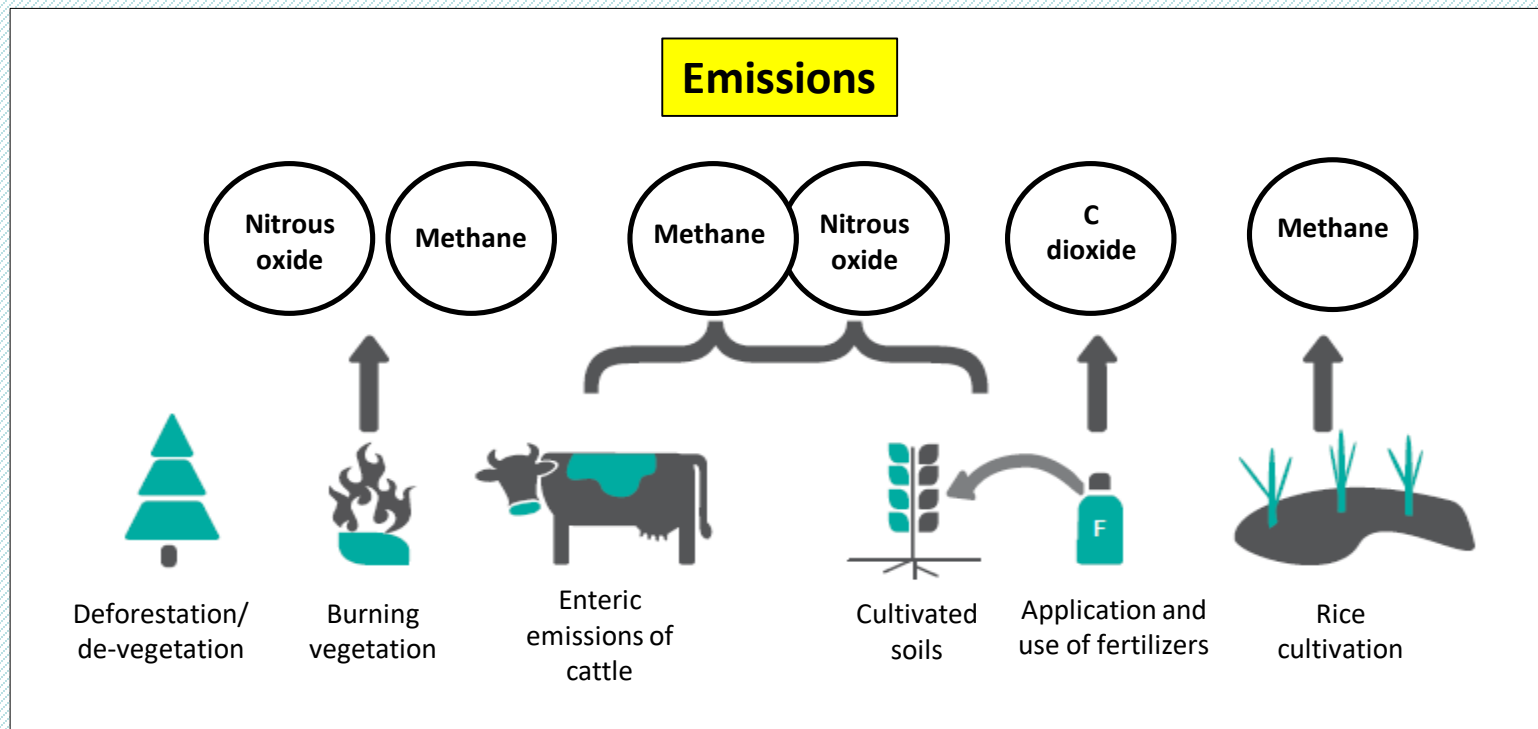
**Regional livestock emissions.** Regional total emissions and their profile by commodity are shown. Results do not include emissions allocated to non-edible products and other services.



Trend of total emissions from different countries between 1990 and 2015. Source: *Le Quéré et al. (2016); GEO-6 (2019)*.

**Regional strength:  
Carbon sequestration in  
grazing lands**

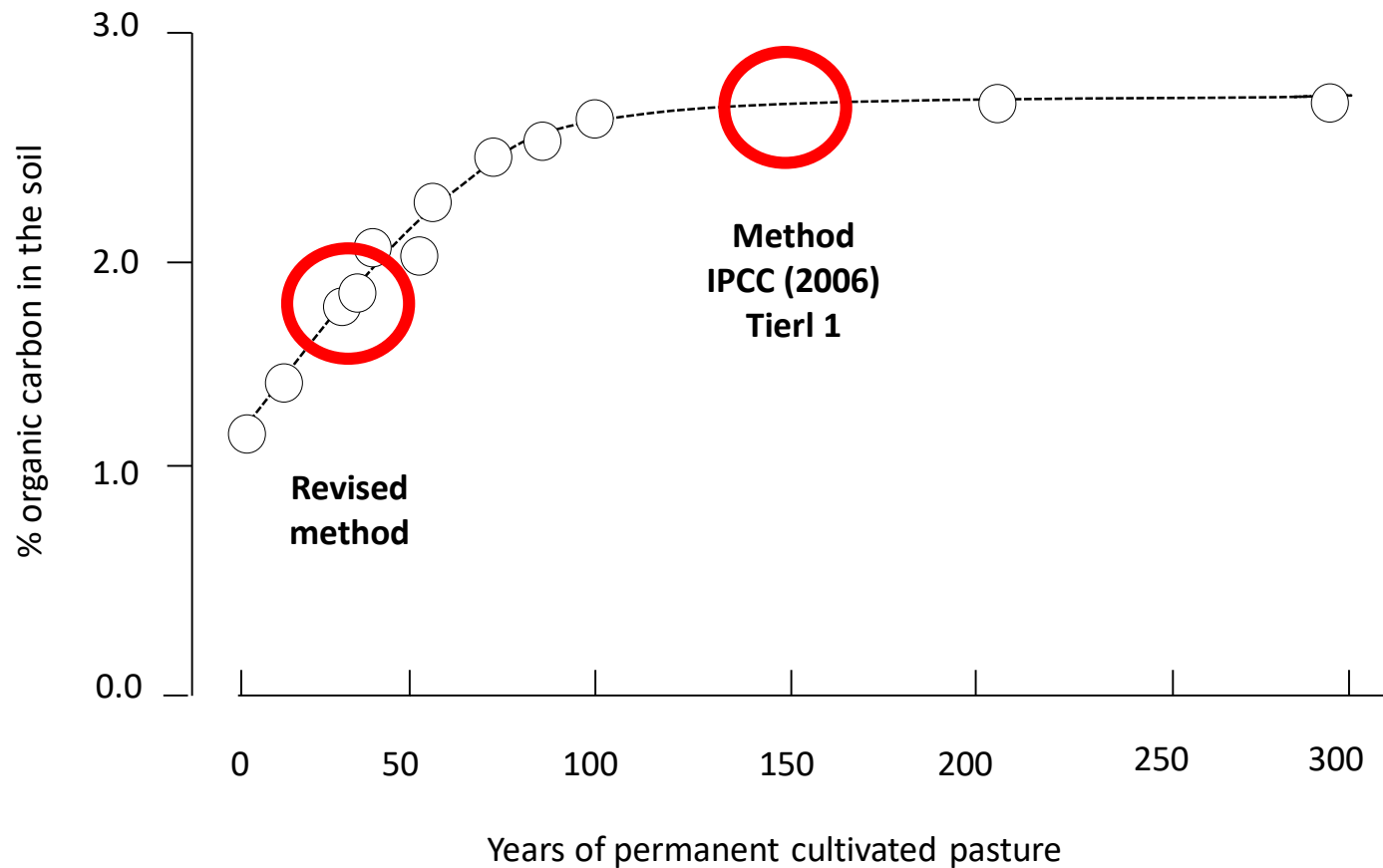
# What do the inventories calculate for the rural sector?



**An inventory of emissions is not a carbon balance**

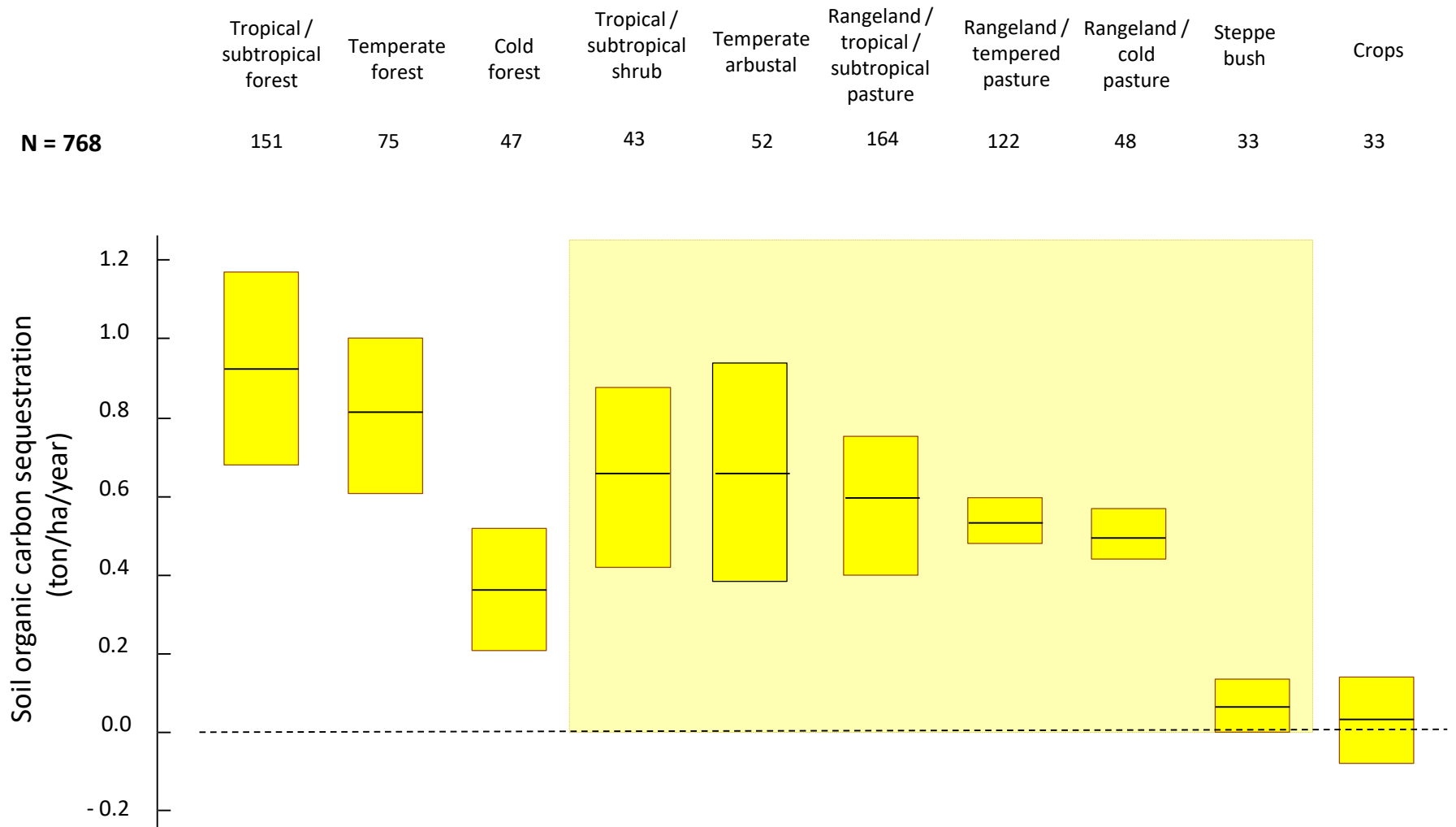
	Coverage (% of total territory)	
	<i>Forest</i>	<i>Grassing lands</i>
<b>Argentina</b>	7	81
<b>Brazil</b>	51	42
<b>Paraguay</b>	20	69
<b>Uruguay</b>	5	89

Percentage of territorial occupation of the biomes with the greatest carbon sequestration capacity in the MERCOSUR Region (Source: *Goldewijk et al., 2011.*)



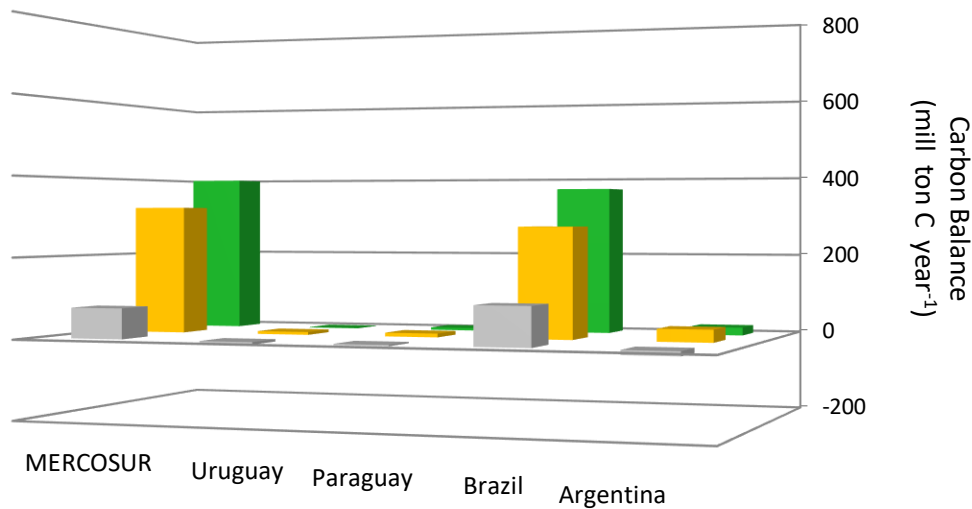
Curve of accumulation of organic carbon in the soil after the incorporation of a permanent pasture without grazing on arable land in long-term experimental plots at Rothamsted station in UK.

Source: *Jenkinson (1988)*.

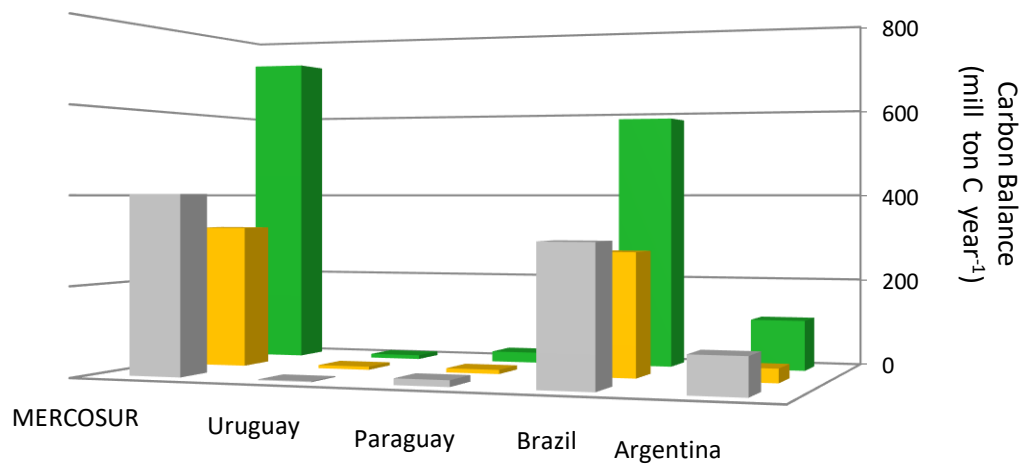


Results of a meta-analysis of 768 cases showing the sequestration of organic carbon (ton/ha/year) in soil of different biomes and climatic regions. Orange box: grazing land.

Source: *Viglizzo et al. (2019)*.



**Only forests sequester C  
(Tier 1 IPCC)**

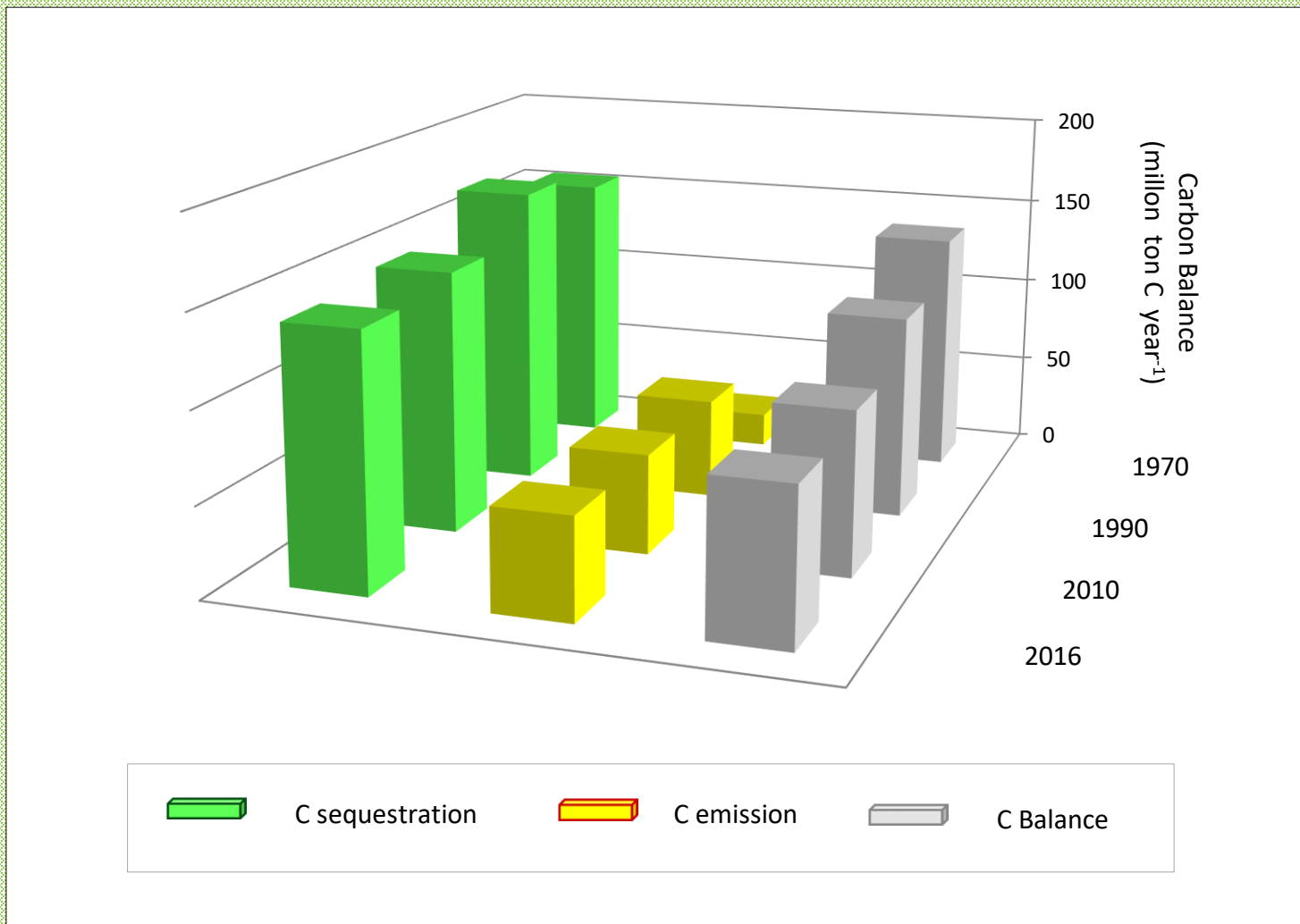


**Forests and grazing lands  
sequester carbon**

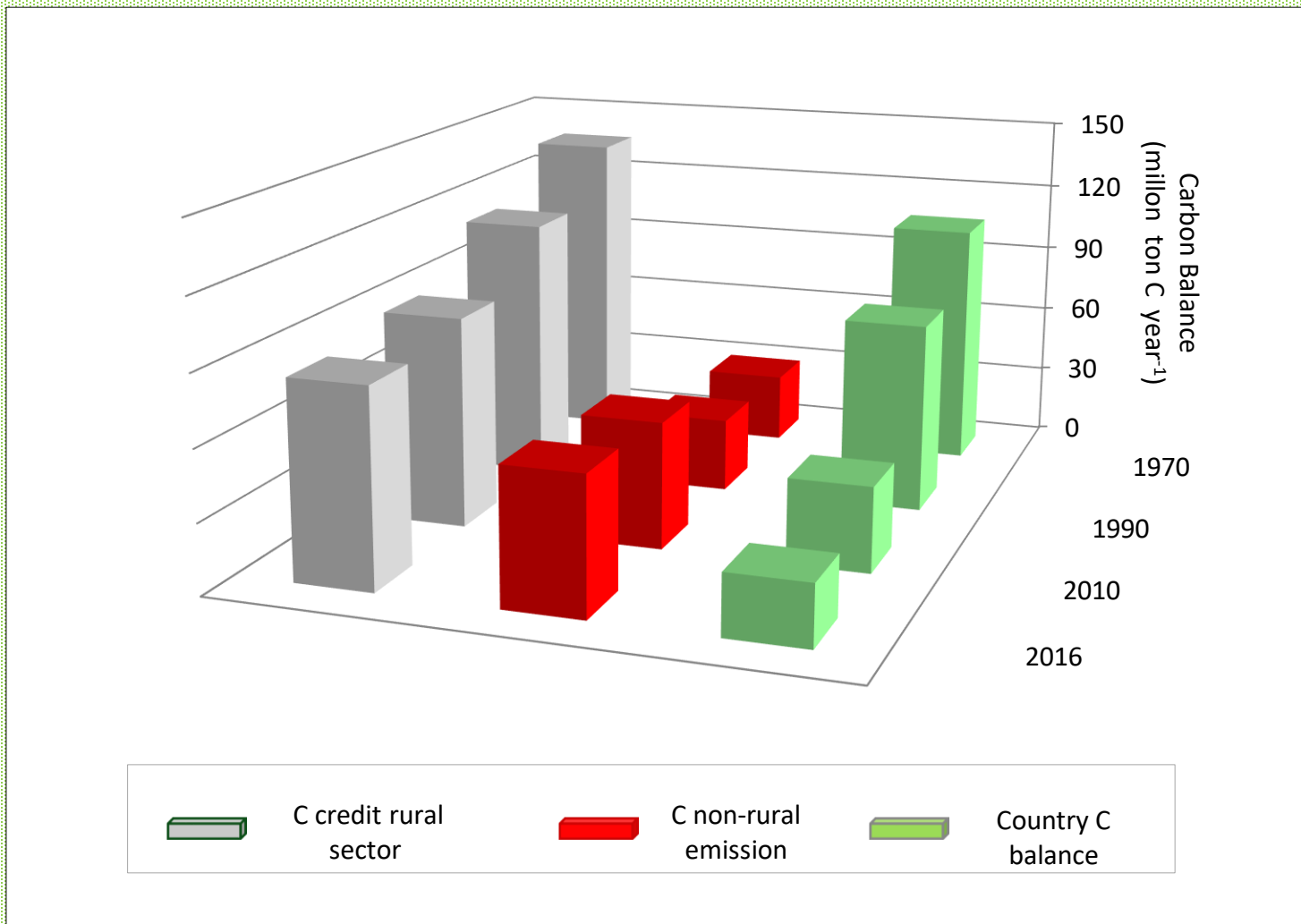


Carbon balance (year 2010) in rural lands of the MERCOSUR region applying two different calculation methodologies (Source: Viglizzo et al., 2019).





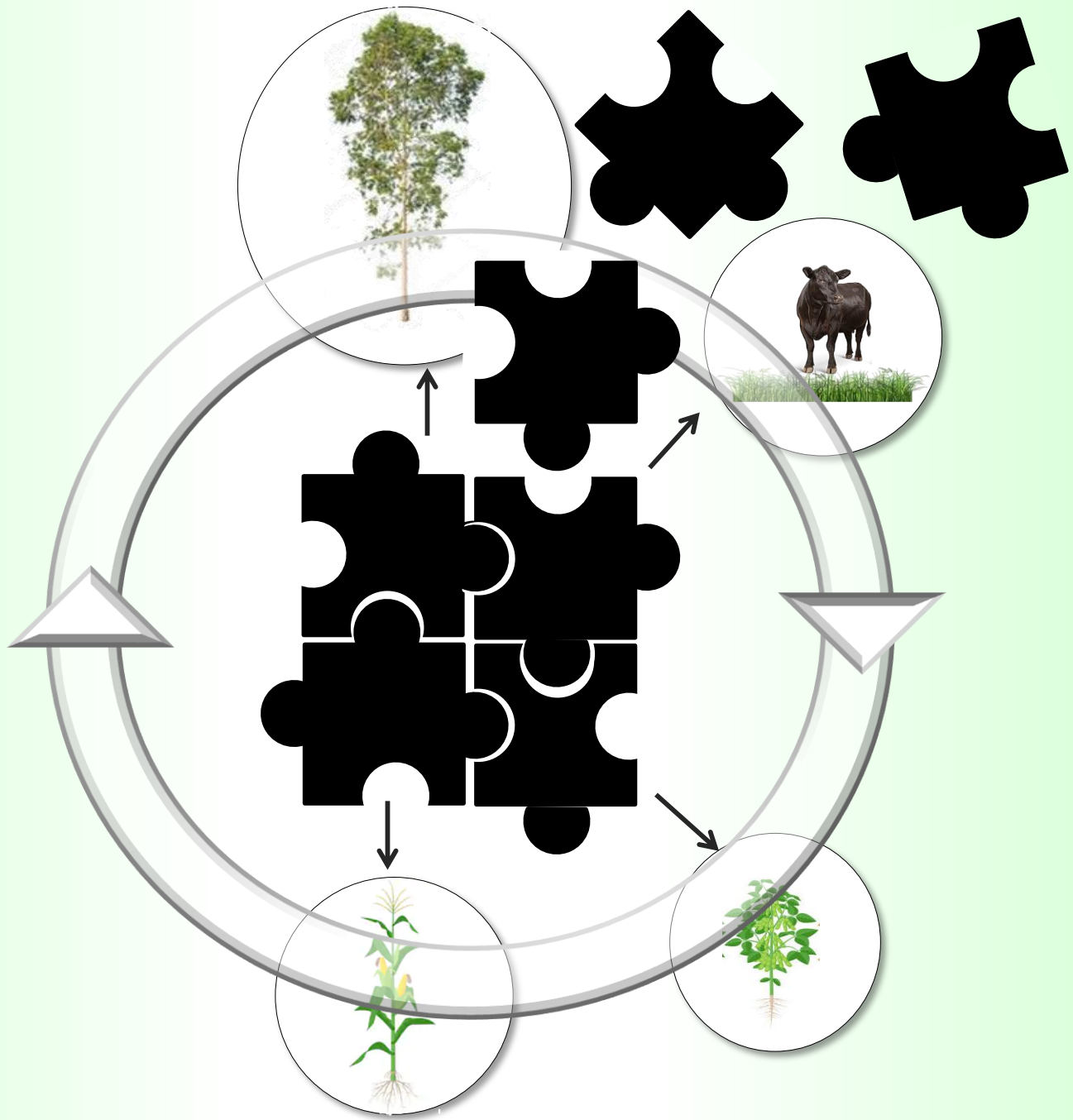
Detail of carbon balance in the rural sector of Argentina in 1970, 1990, 2010 and 2016 according to the calculation method that considers carbon sequestration in forests and grazing lands.  
 Sources: C emissions from *WRI (2019)*; C sequestration from *Viglizzo et al. (2019)*

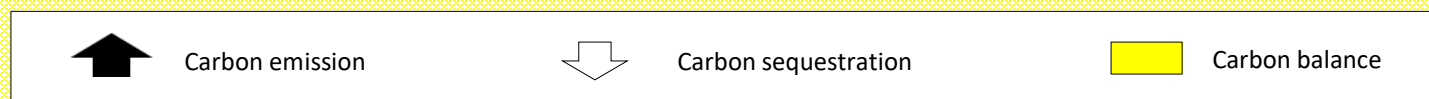
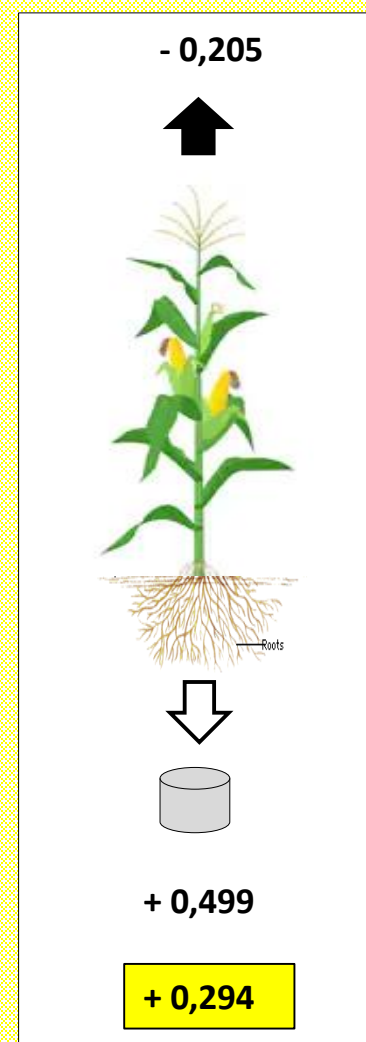
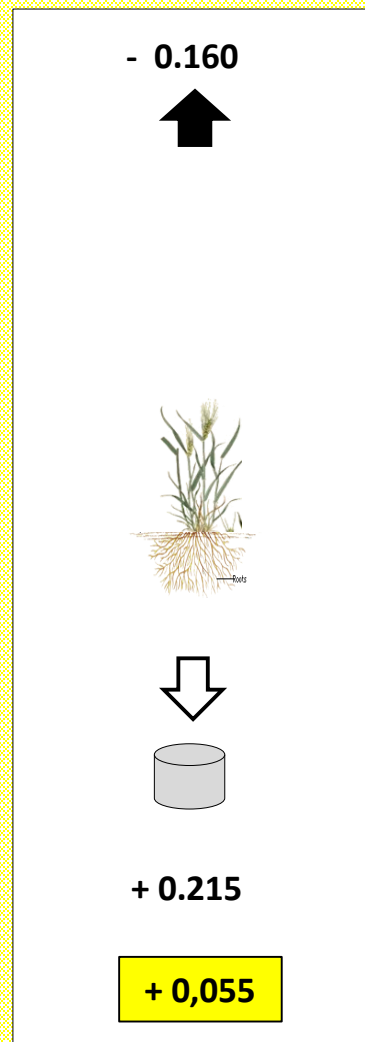
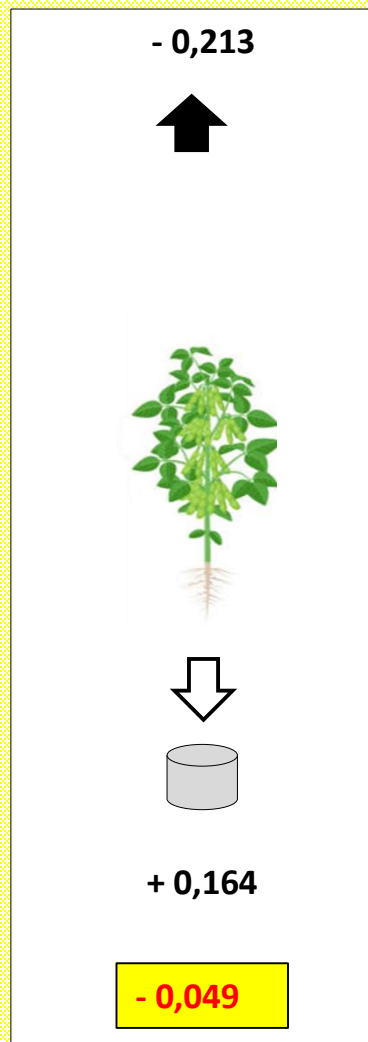


Detail of the total carbon balance of Argentina in 1970, 1990, 2010 and 2016 when the carbon surplus or credit of the rural sector and emissions from non-rural sectors are considered.  
 Sources: C emissions from *WRI (2019)*; C sequestration from *Viglizzo et al. (2019)*

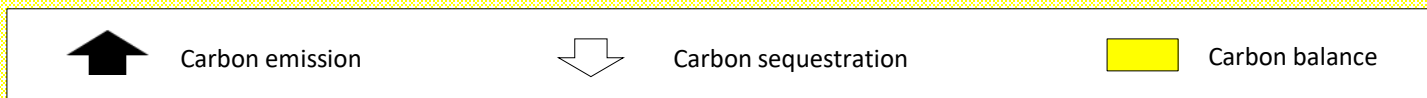
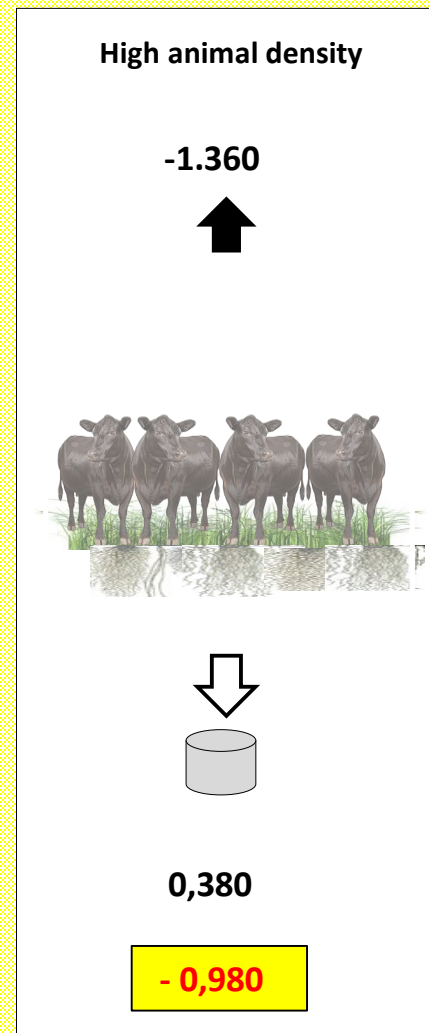
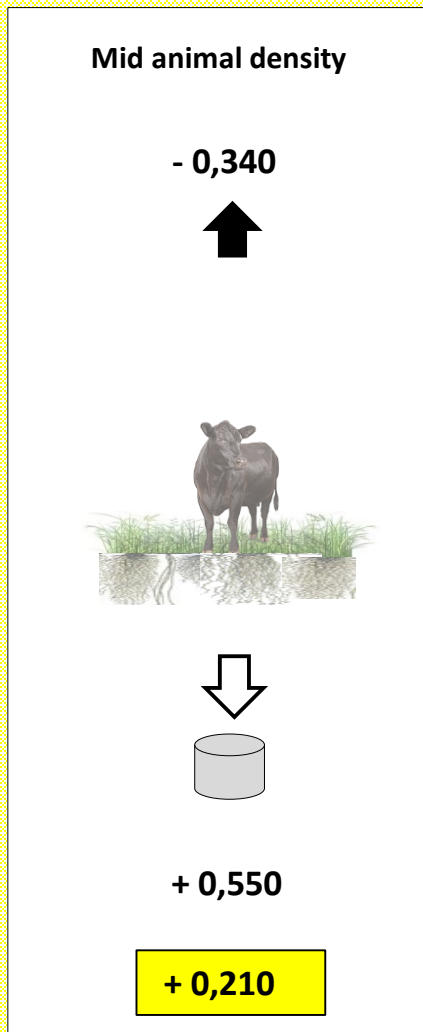
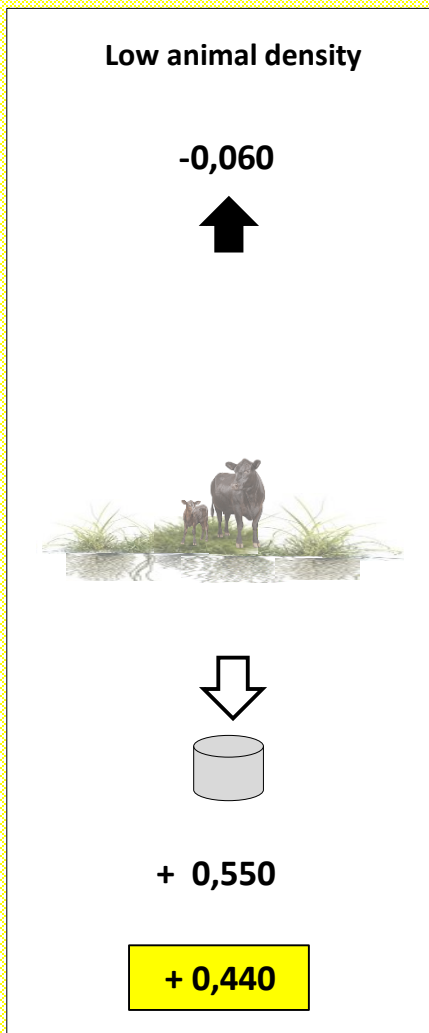


**Local challenge:  
To make the puzzle**

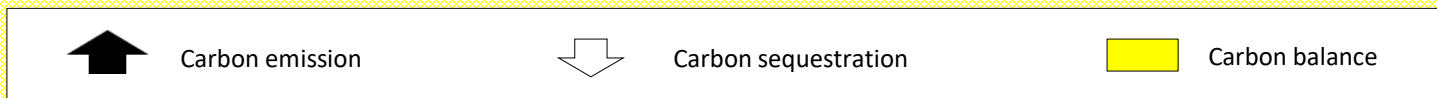
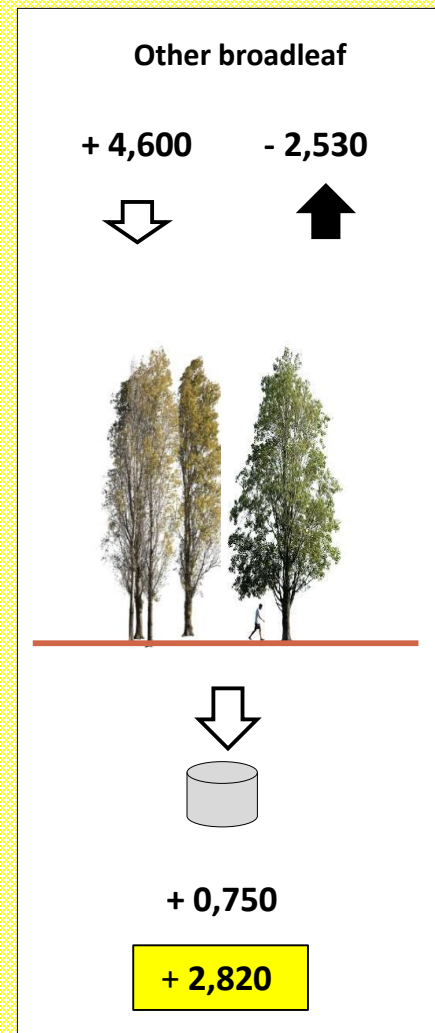
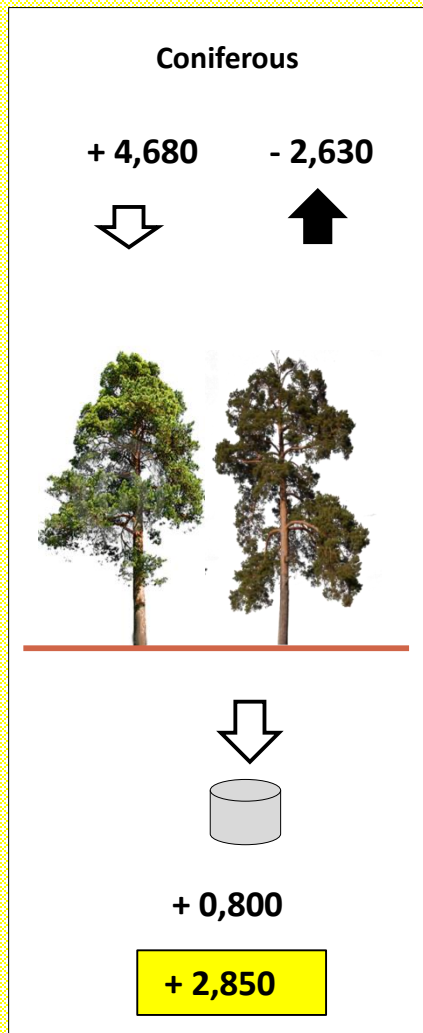
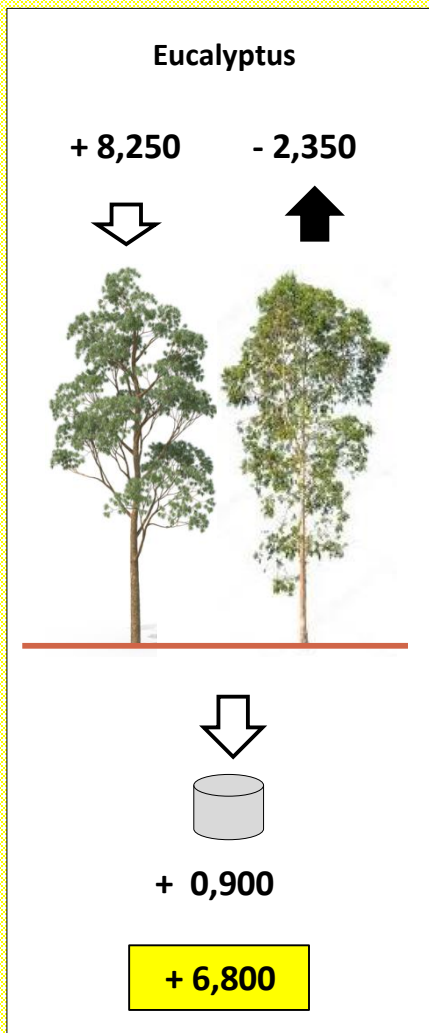




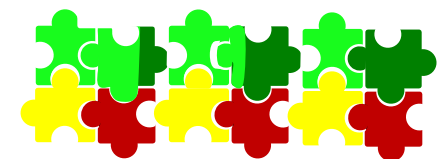
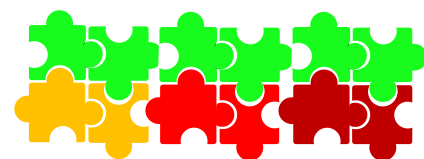
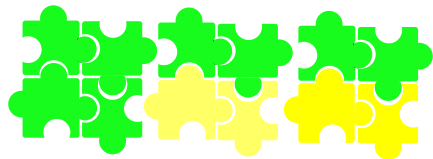
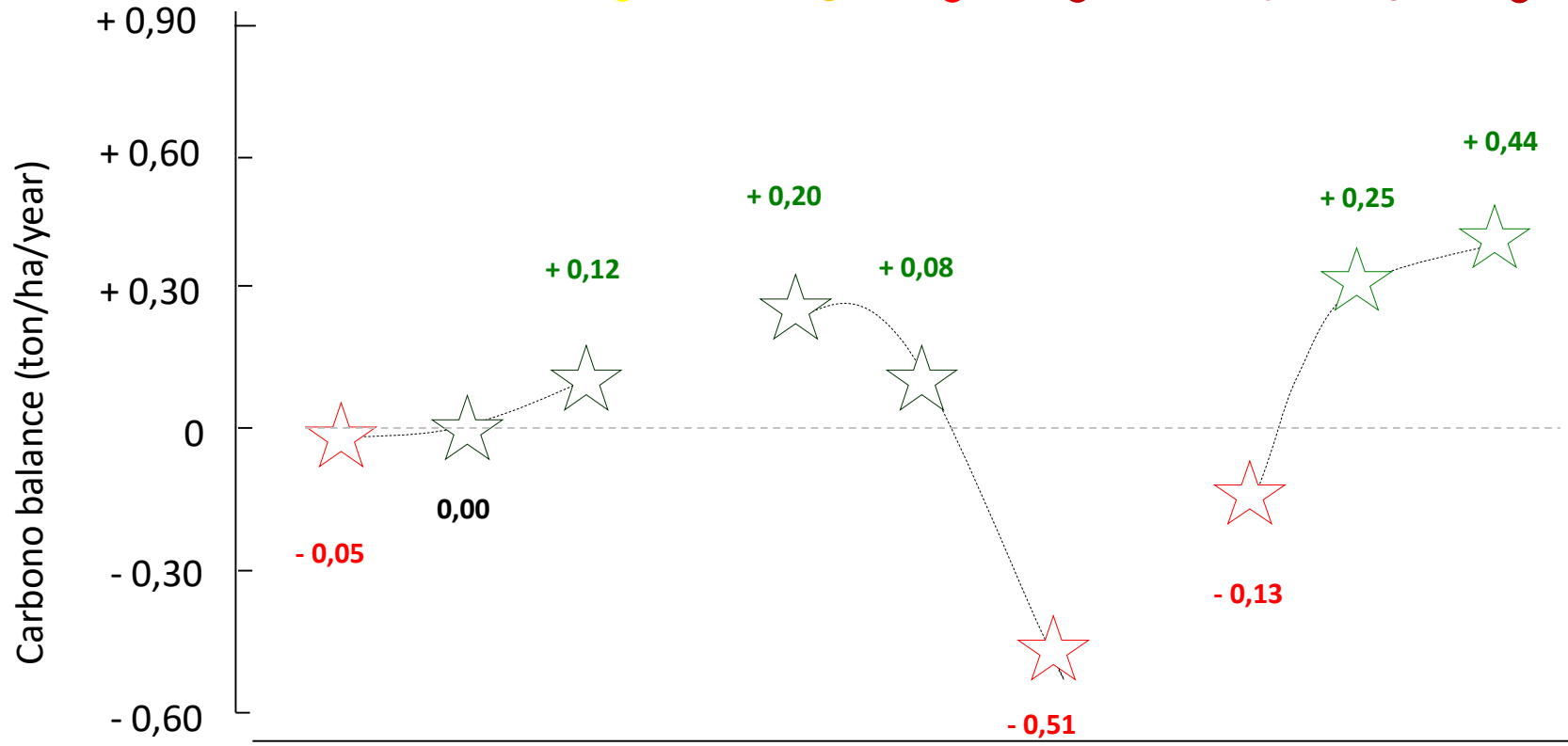
Emissions according to IPCC method plus estimates of carbon sequestration to estimate the annual carbon balance (ton C / ha / year) in a productive system.



Emissions according to IPCC method plus estimates of carbon sequestration to estimate the annual carbon balance (ton C / ha / year) in a productive system.



Emissions according to IPCC method plus estimates of carbon sequestration to estimate the annual carbon balance (ton C / ha / year) in a productive system.



 soybean



 wheat



 maíze



 extense livestock farming



 semi-extense livestock farming

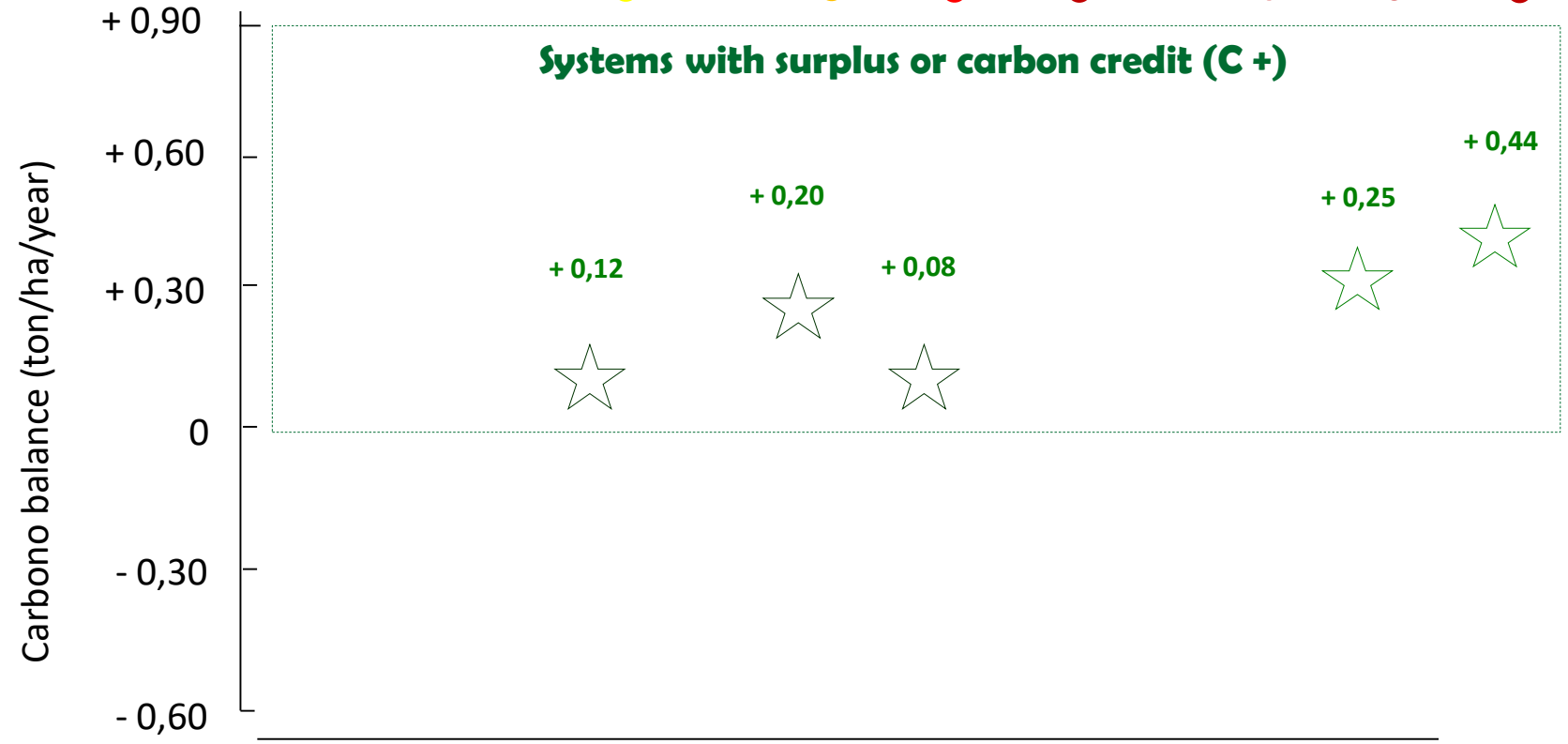
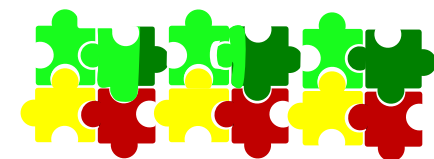
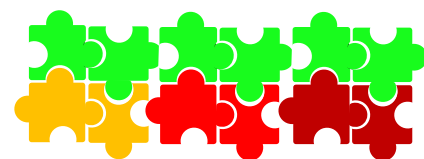
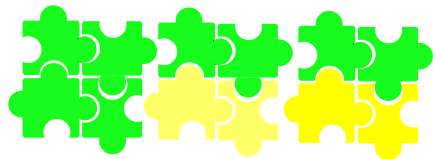


 intense livestock farming



 forestation





  
soybean



  
wheat



  
maíze



  
extense  
livestock  
farming



  
semi-extense  
livestock  
farming



  
intense  
livestock  
farming



  
forestation

# Carbon

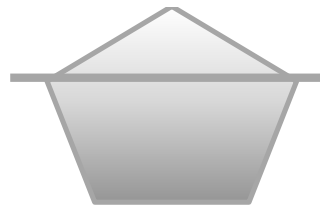
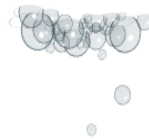


*Emission*

*Sequestration*



## Rural sector



## Other sectors



**Balance between sources (emissions) and carbon sinks (sequestration)**



**Regional strength:  
Livestock, trade and  
environment**

# Which countries export Frozen Bovine Meat? (2017)

TOTAL: \$22.4B

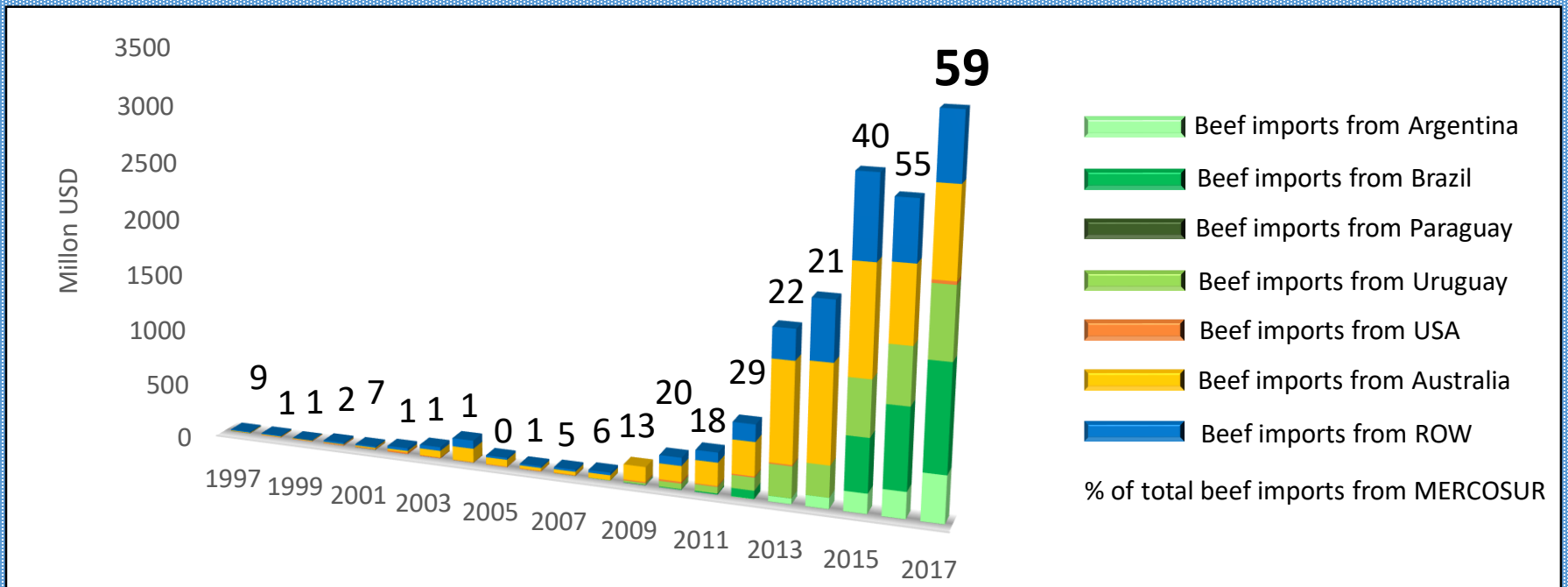
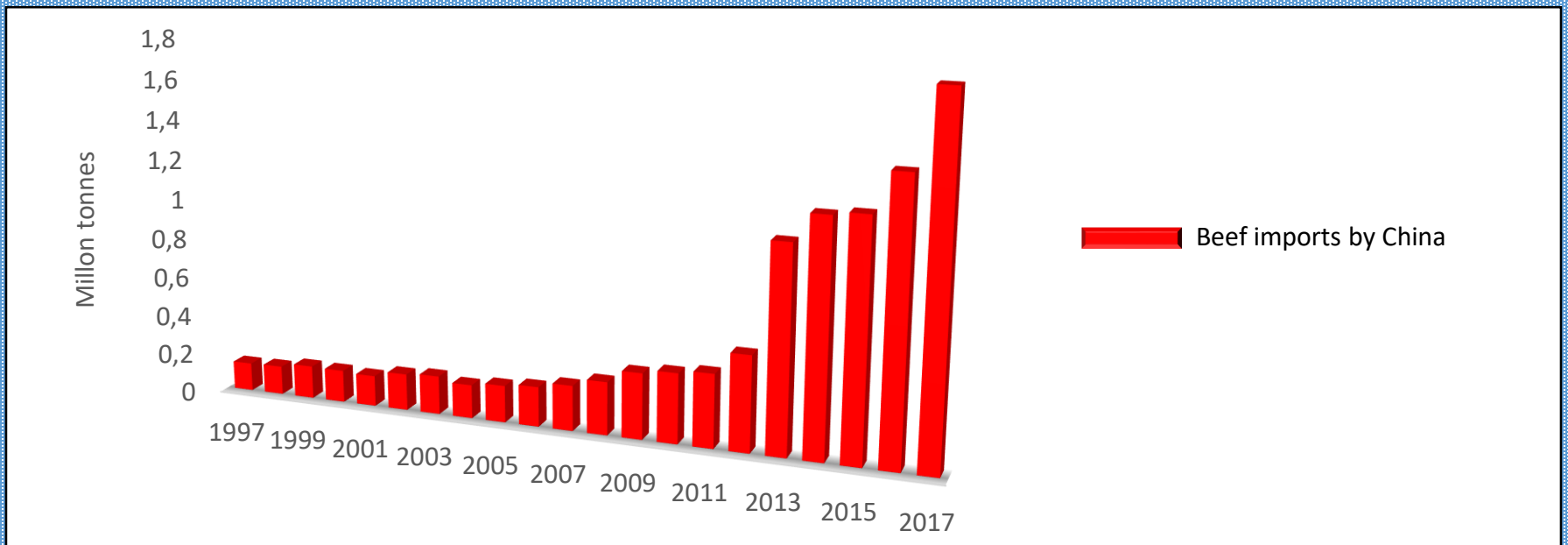


# Which countries import Frozen Bovine Meat? (2017)

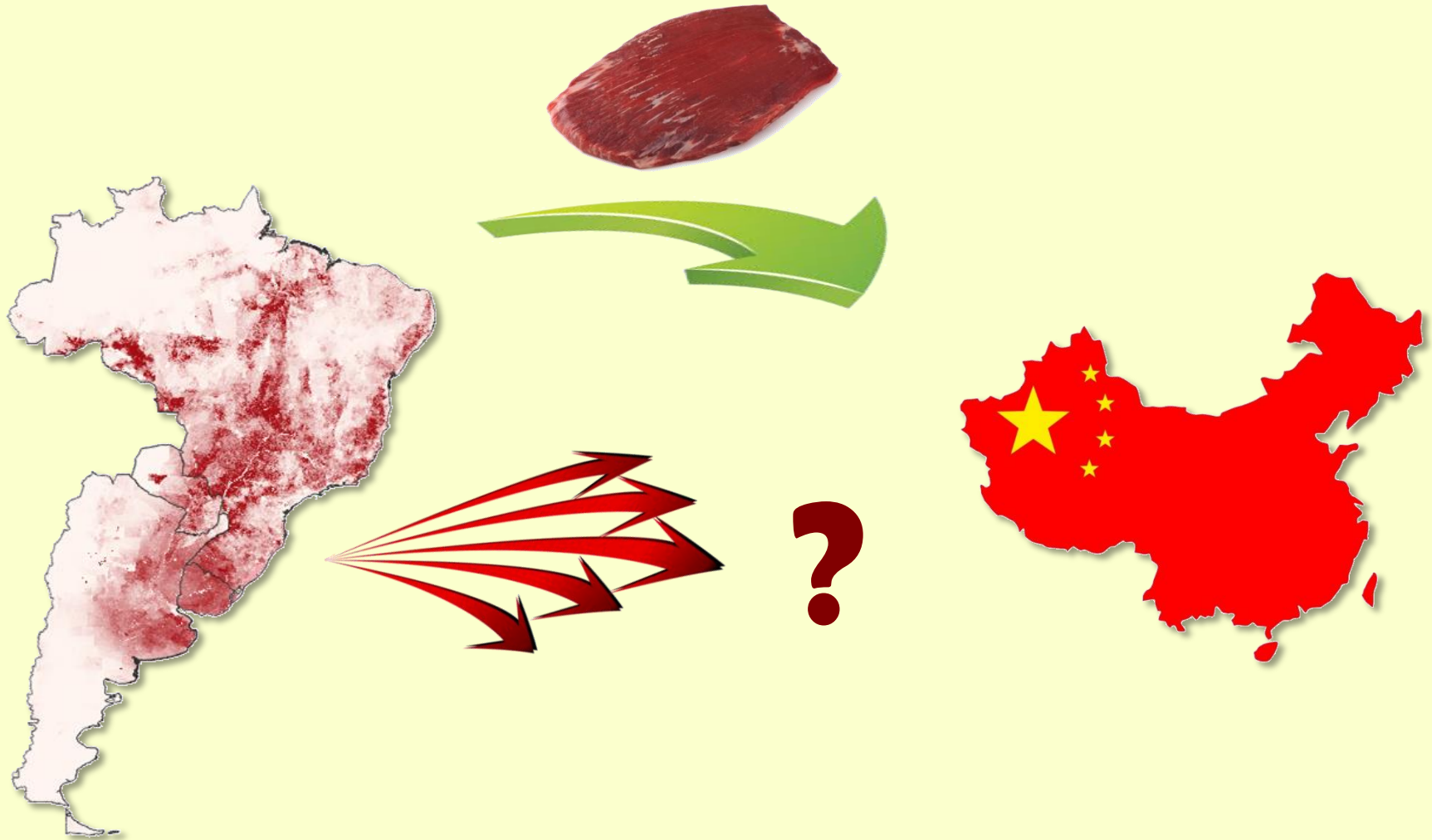
TOTAL: \$22.4B



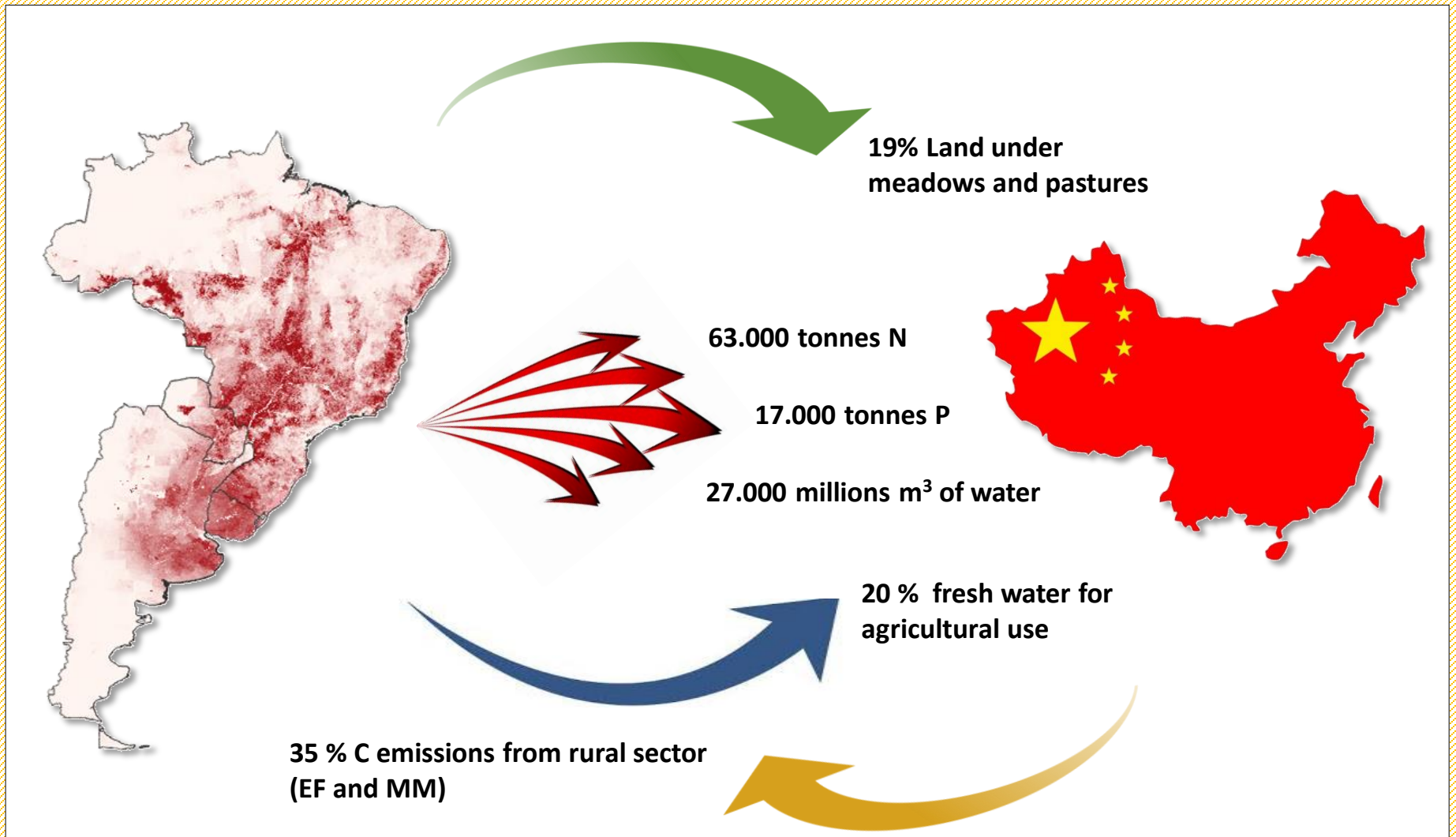
# Beef trade



**MERCOSUR region contributes decisively to China's protein consumption....**



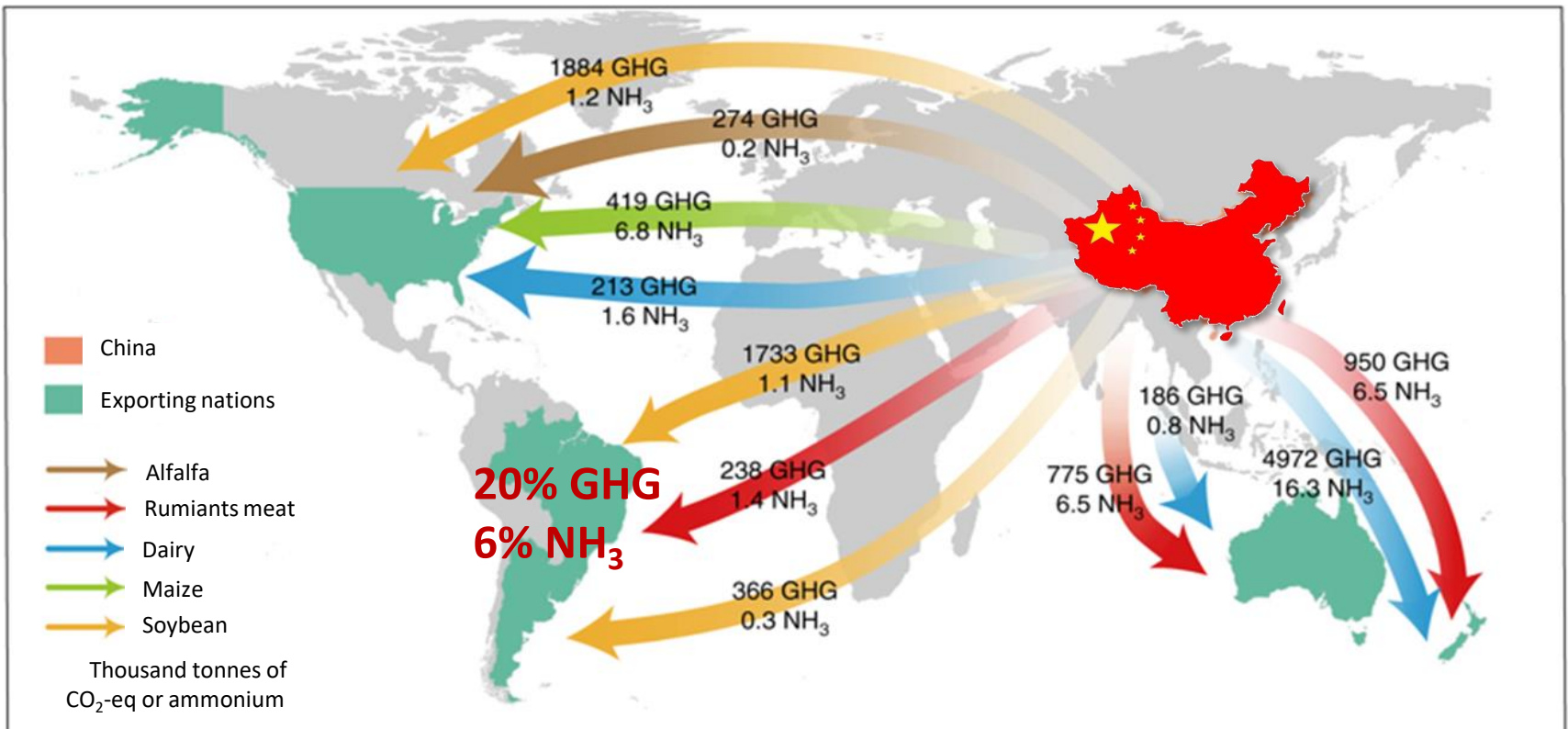
**... but, in addition to the transfer of tangible products, it also transfers intangible goods and services?**



Percentage of resources saved by China when importing bovine meat from MERCOSUR region

Source: own elaboration from FAOSTAT (2019); AQUASTAT (2019); Rasmussen, et al. (2011); Hoekstra (2012)





Global transfer of GHG and ammonia nitrogen emissions from China to countries from which it imports food and fodder (Source: *Du et al., 2018*).

*Despite imperfectly proven or unfounded criticisms, rural environments in the MERCOSUR region present more strengths than environmental weaknesses.*

*Countries like those of MERCOSUR have attributes that are insufficiently valued and disseminated to provide, at the same time, food and environmental security to countries that lack it. It is necessary to certify this comparative advantage  
Can we make it?*

Climate  
is changing

