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Assessing the global biodiversity impact of livestock production

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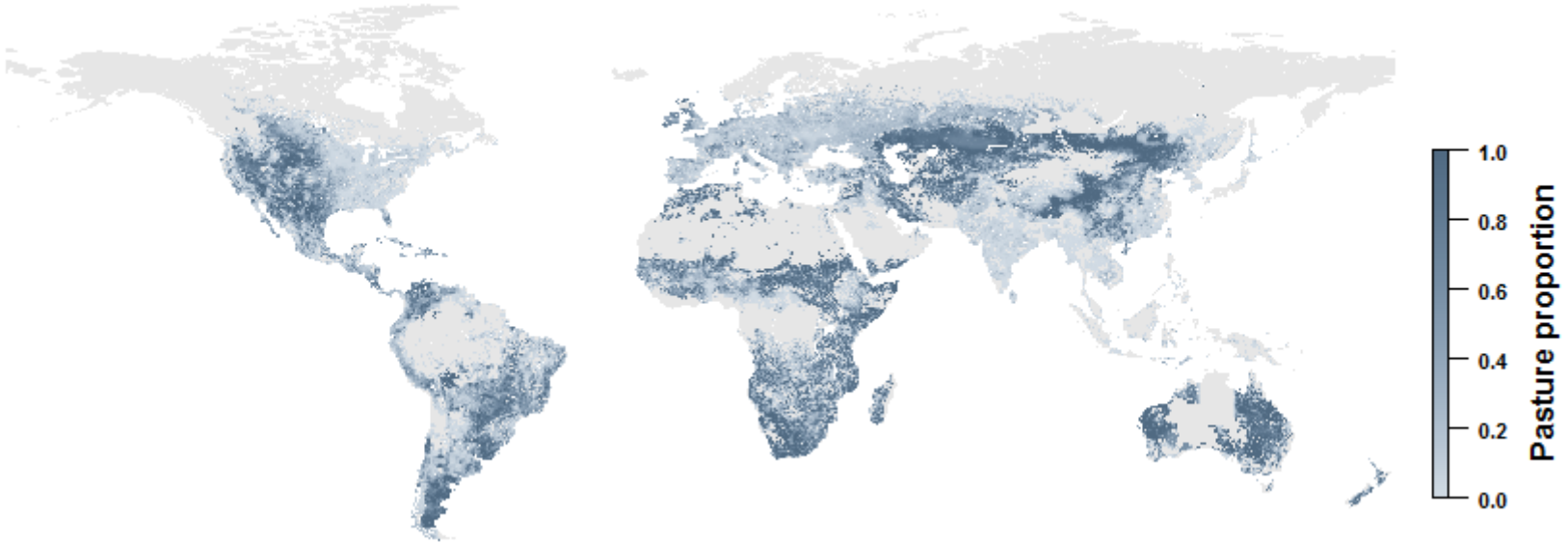
Félix Teillard, Alessandra Falcucci, Pierre Gerber

Introduction

The global impact of livestock production on biodiversity

Why measuring it?

- Livestock have a strong influence on biodiversity

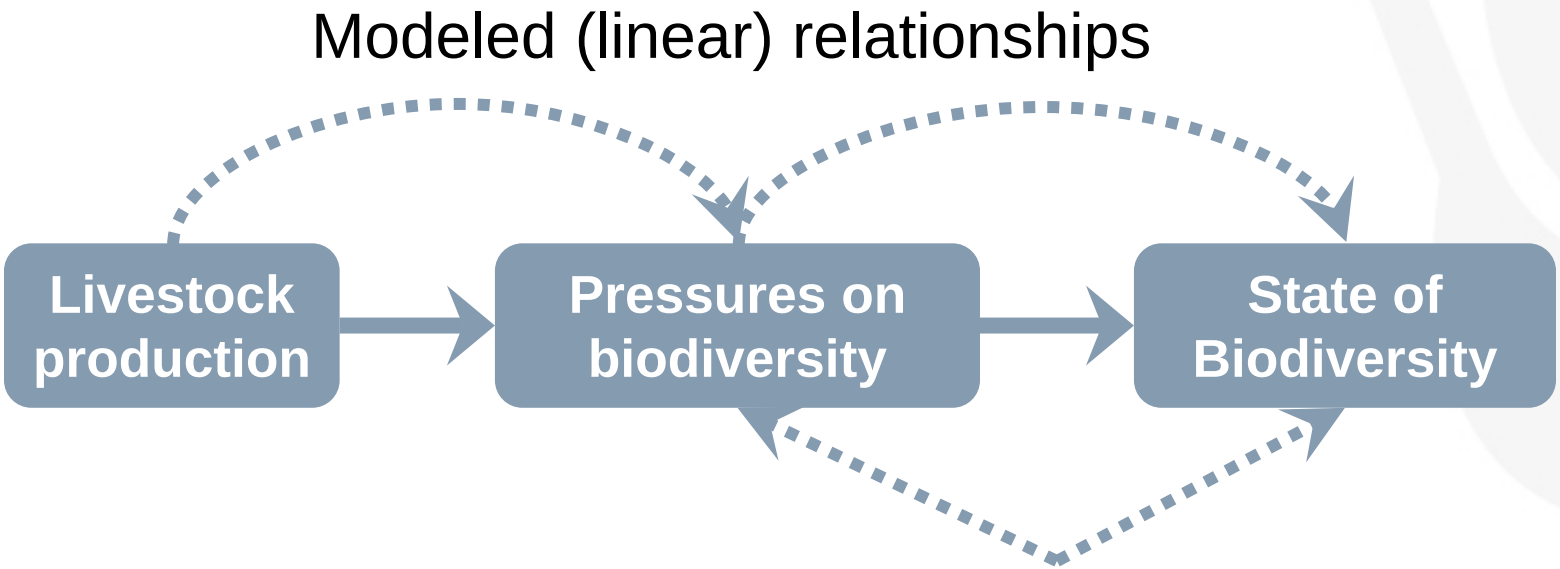


Introduction

The global impact of livestock production on biodiversity

How to measure it?

- **LCA Framework**



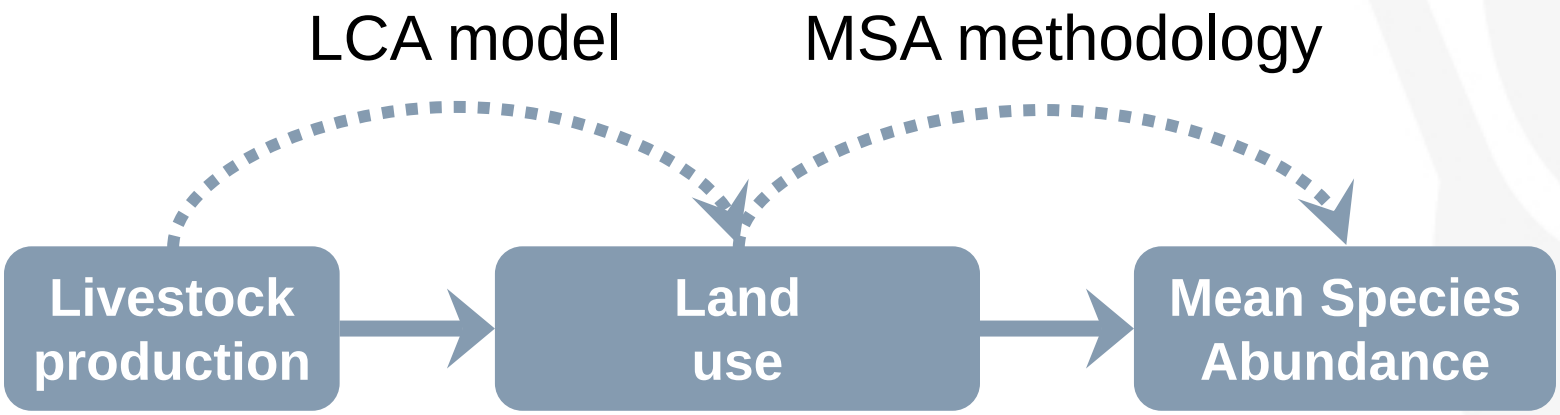
- **Indicator Framework**

Introduction

The global impact of livestock production on biodiversity

How to measure it?

- **LCA Framework**



Methods

The Mean Species Abundance (MSA, Alkemade *et al.* 2009)

- Meta analysis: MSA in disturbed vs. undisturbed situations
- MSA values for different land use/intensities
- Applicable at global scale

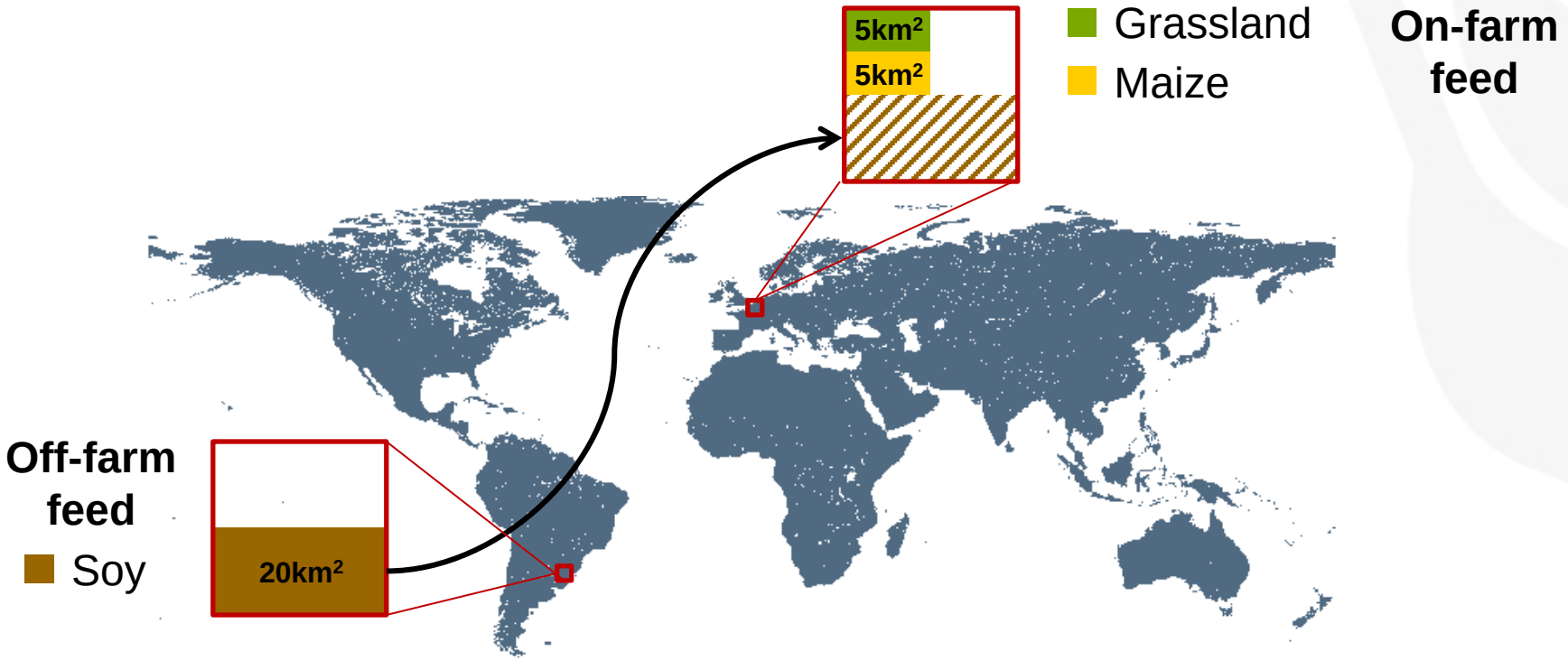
Arable land	**Impact on MSA**	Grassland
	0	Natural grassland
	0.3	Livestock grazing
Low input agriculture	**0.7**	
Intensive agriculture	**0.9**	Man-made pasture

90% loss of MSA compared to the undisturbed habitat

Methods

- We compute an MSA*km^2 impact of the livestock feeds
- The impact is allocated where the feed are consumed

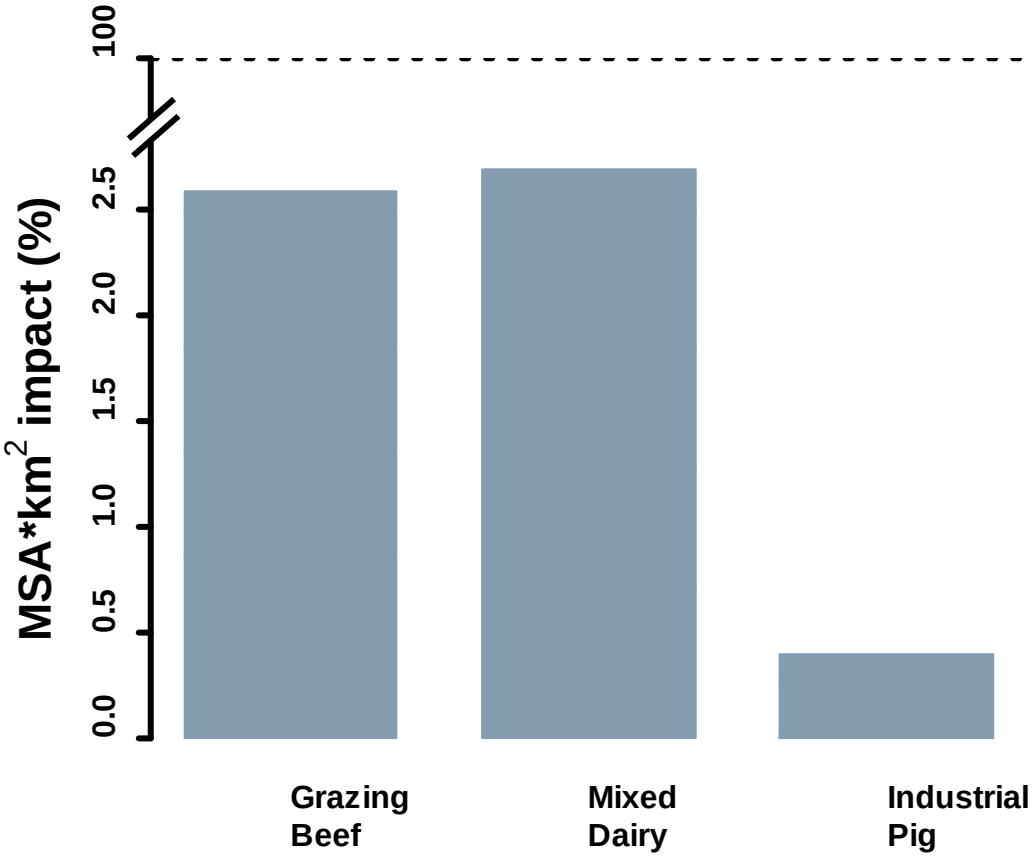
$$\text{MSA} \times \text{km}^2 \text{ impact} = \sum_{\text{lu}} \text{Area}_{\text{lu}} \times \text{MSA impact}_{\text{lu}}$$



Results

Global impact of three production systems on MSA

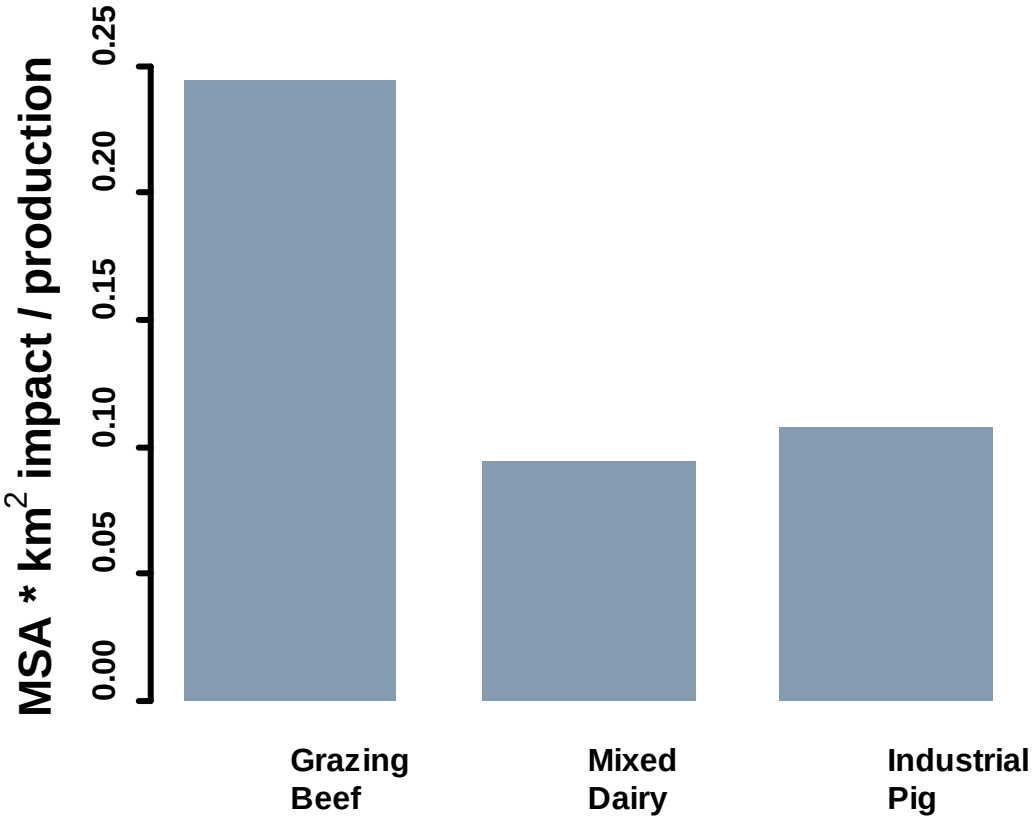
5.7% of a complete loss of MSA



Maximal impact:
MSA = 0 on all the global surface

Results

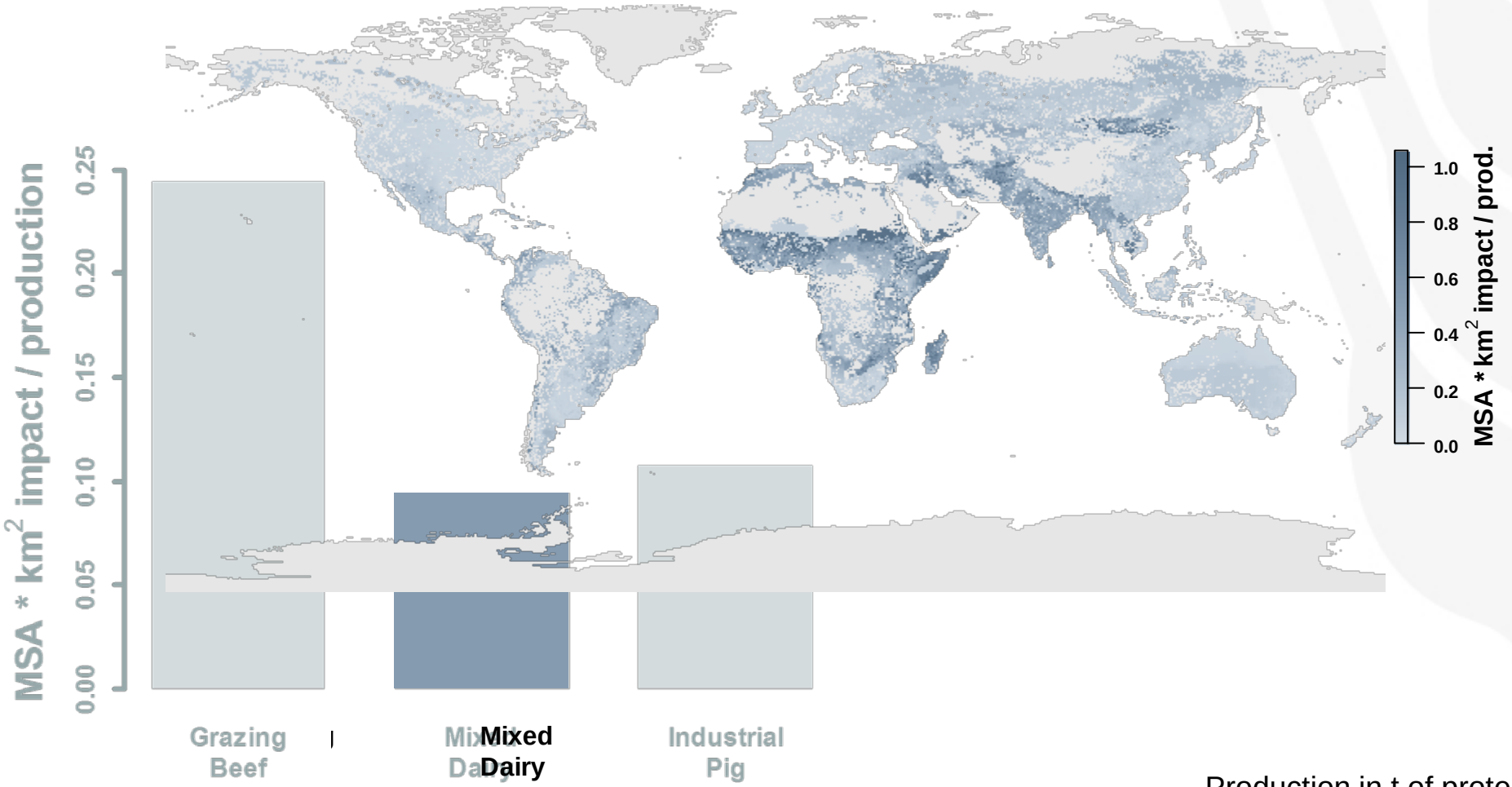
MSA*km^2 impact / production



Production in t of proteins

Results

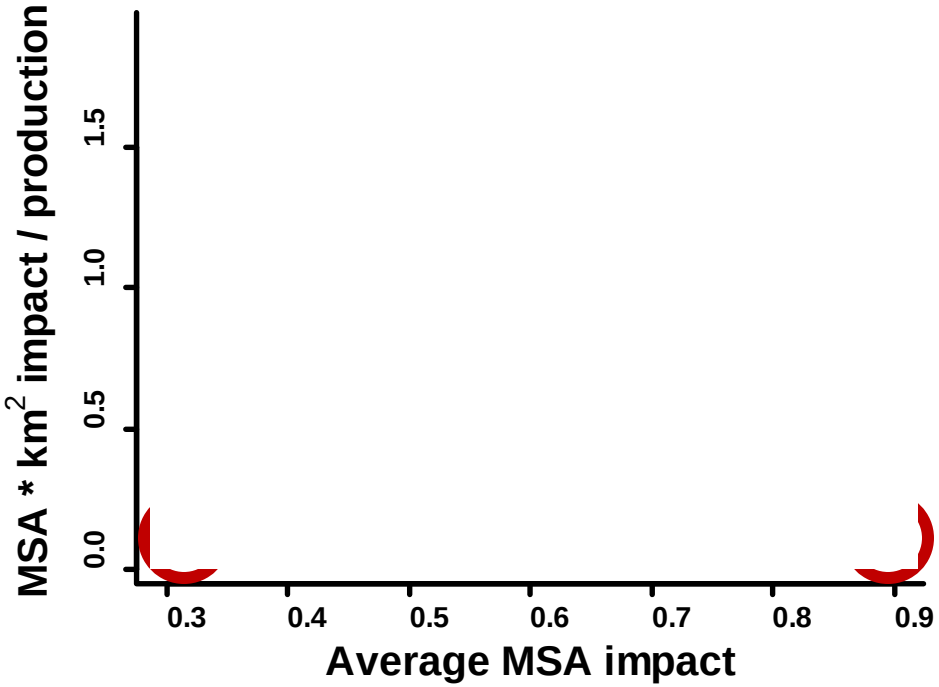
MSA*km^2 impact / production at regional scale



Production in t of proteins

Results

- Great diversity of systems at the pixel scale
- Efficient systems (○) exist all along the intensity range



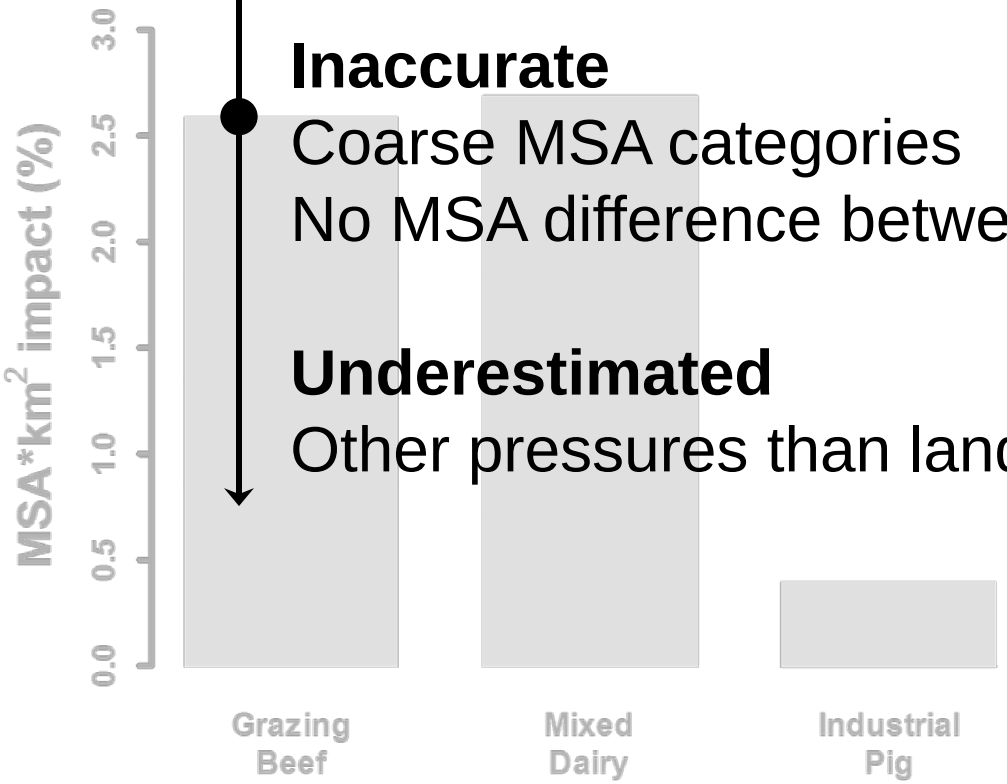
Arable land		Grassland
	0	Natural
	0.3	Livestock grazing
Low input	**0.7**	
Intensive	**0.9**	Man-made pasture

Limitations

Overestimated
Positive effects of livestock (*eg* permanent grasslands in Europe) not taken into account

Inaccurate
Coarse MSA categories
No MSA difference between global regions

Underestimated
Other pressures than land use (nonpoint pollution, CC)



Perspectives

- Consider positive effects of livestock on MSA
- Account for other types of pressures
- Reveal the properties of efficient systems, link to more local scales
- Explore synergies and trade-offs between environmental criteria

Thank you

Felix.Teillard@fao.org

LIVESTOCK ENVIRONMENTAL ASSESSMENT AND PERFORMANCE PARTNERSHIP