PAST INTENSIFICATION OF LIVESTOCK LED TO MIXED BENEFITS FOR SOCIAL AND ENVIRONMENTAL SUSTAINABILITY

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WHY SHOULD WE FOCUS ON SERVICES?

- Definition: positive contributions that livestock provides to society
- Different categories of positive contributions
  - Environmental, social and cultural
- Bundle of services: a set of services that repeatedly appears in time and space (Raudsepp-Hearne et al., 2010)
- Pioneering approach (Ryschawy et al., 2017)
  - rural vitality, cultural services
  - in addition to food provisioning, environmental services

- *"Need to understand socio-economic determinants of the composition of bundles of servies"* Ryschawy et al., 2017
- *Is the provision of bundle of services explained by current characteristics of livestock systems or rather by past transformations?*

To what extent the current bundles of services provided by livestock are determined by past intensification?

OBJECTIVE

DATA BASIS COMPILATION

60 NUTS3

1938

2010

Services indicators

Ryschawy et al. 2017

Cultural

Landscape quality

Product quality

Agrotourism

Rural vitality

Employment at industry

Employment at farm

% of livestock employ.

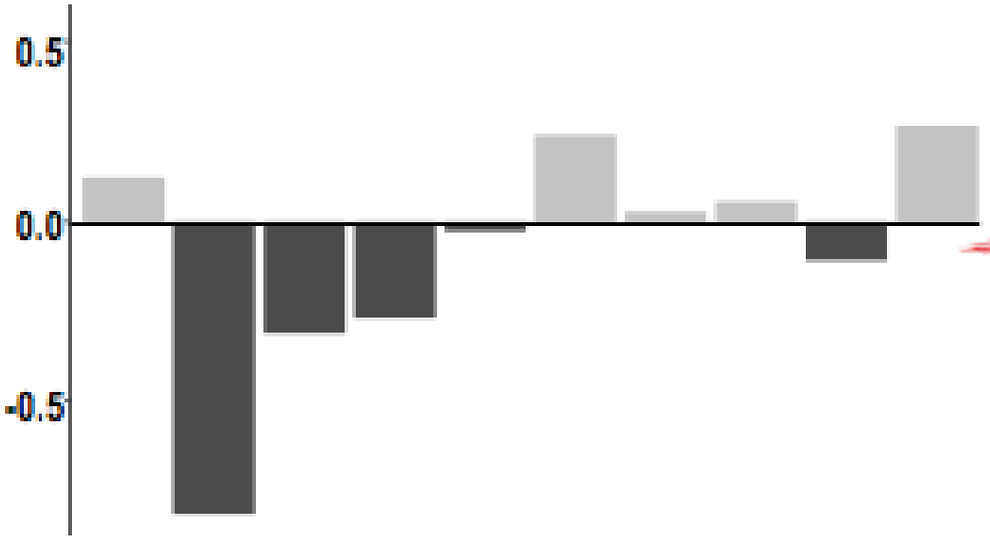
Biodiversity

Water quality

High Nature Value

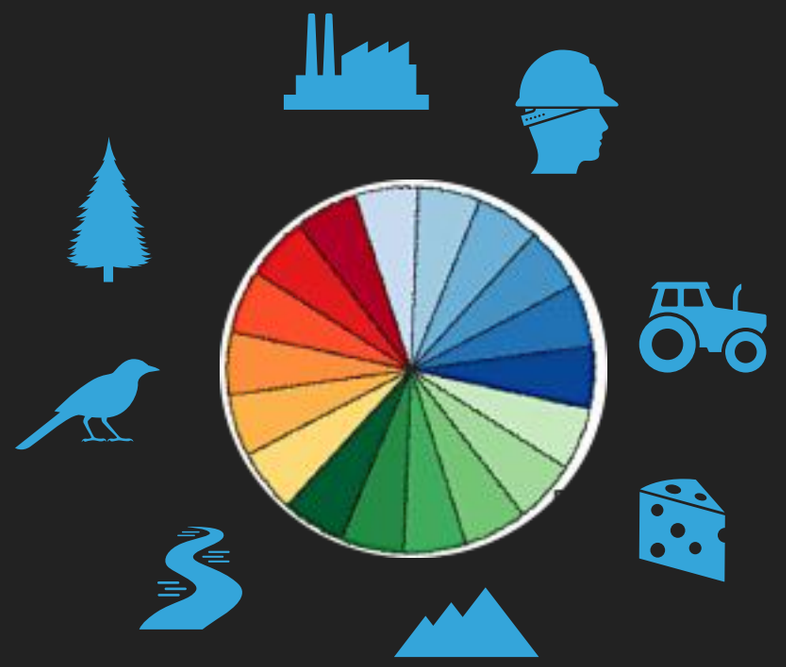
Environmental

Intensification changes



Co-inertia analysis

RESULTS



SERVICES PROVISION ASSEMBLED AROUND THREE INTENSIFICATION TRAJECTORIES

HIGH DEGREE OF CO-STRUCTURE

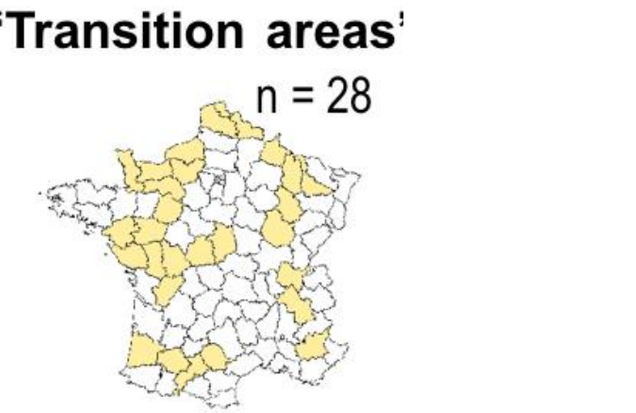
RV coefficient = 0.57, p-value < 0.05

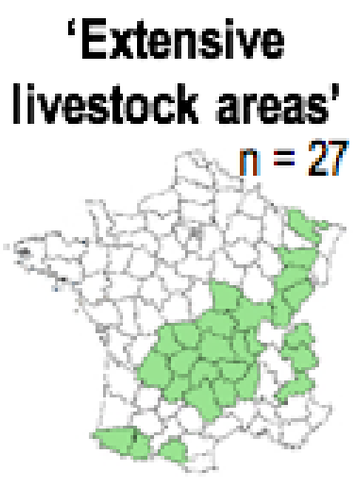
- intensification trajectories
- services provisioning

Correlations between tables' variables

- 17 moderate to strong (/90)
  - 10 livestock variables
  - 5 land use variables
  - 2 socioeconomic

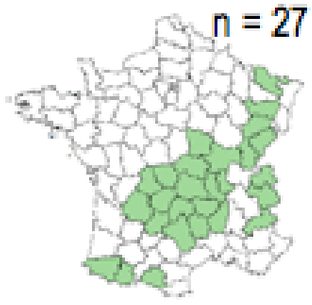
THREE DIVERSE PATHS

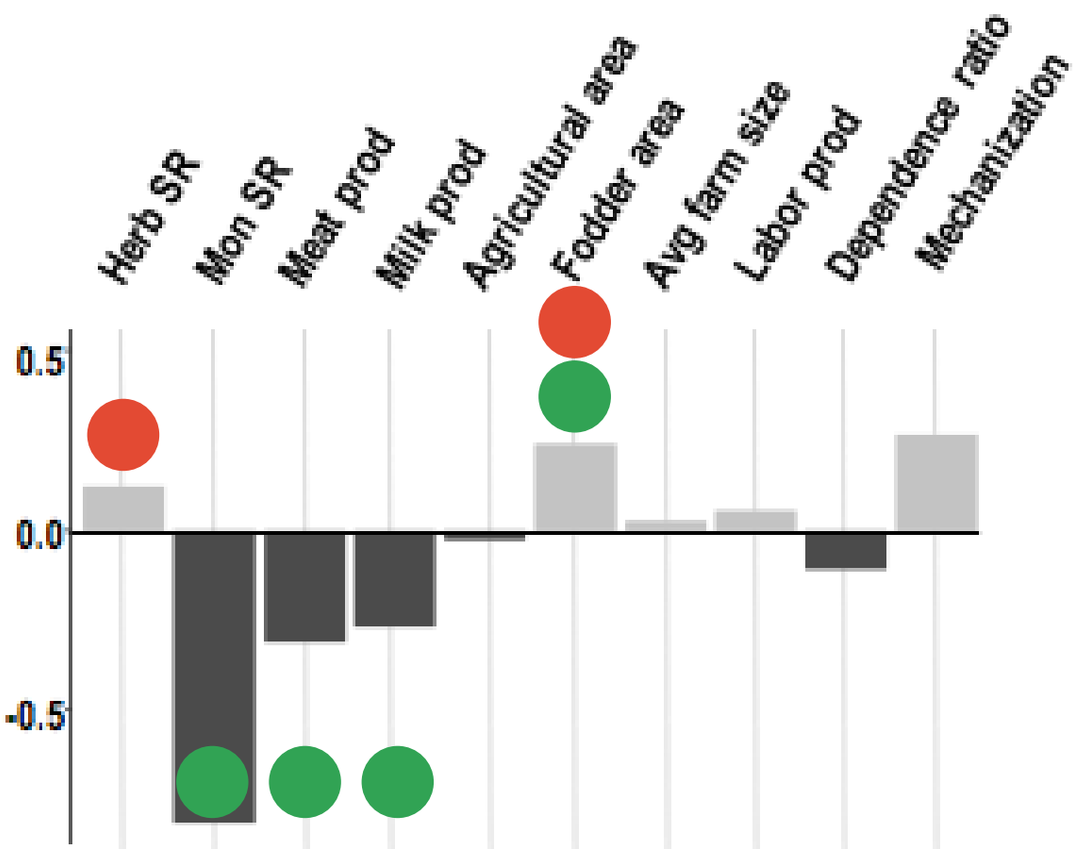


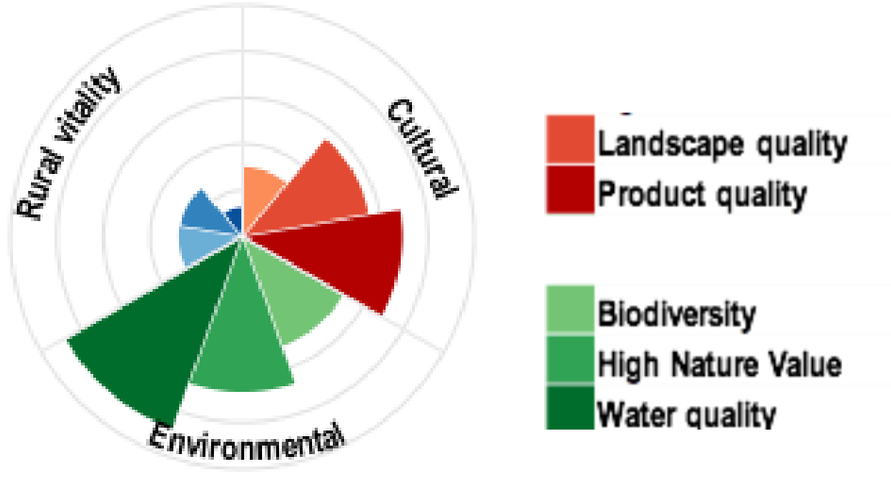


‘Extensive livestock areas’

n = 27







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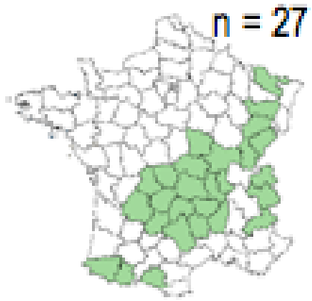
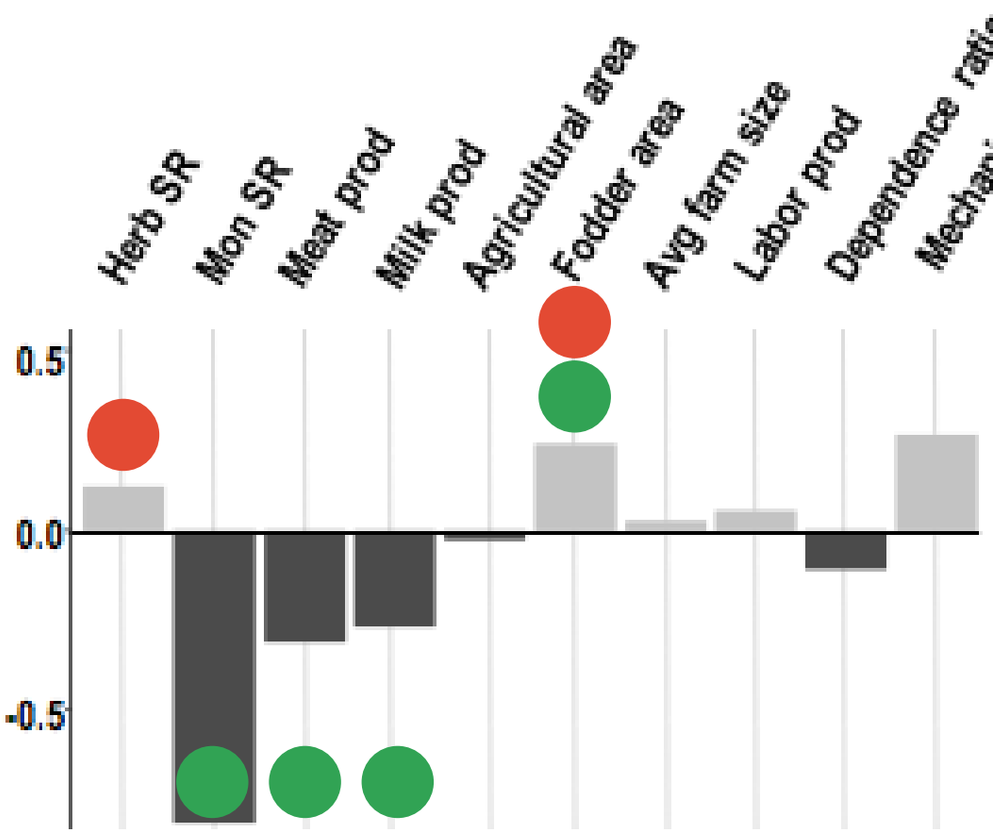
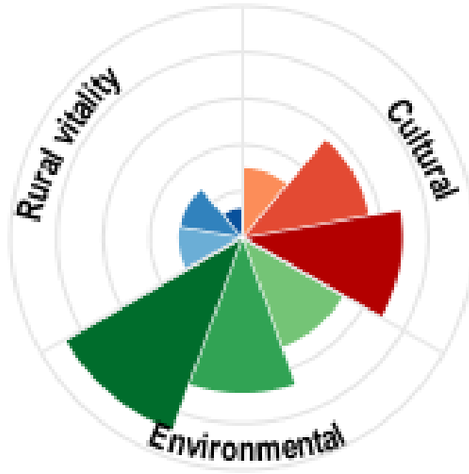


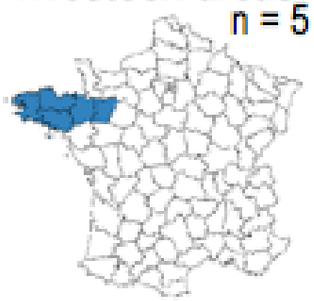


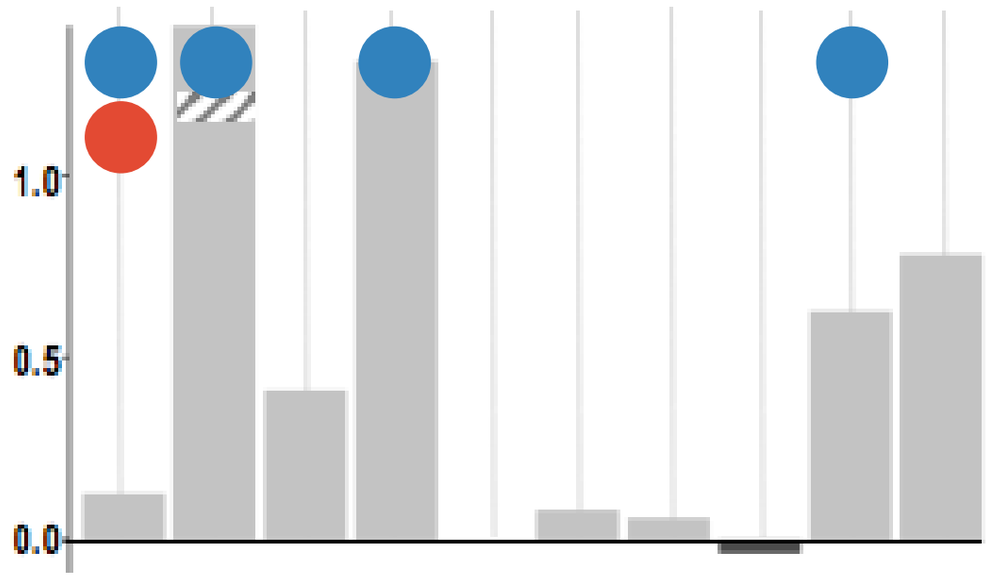


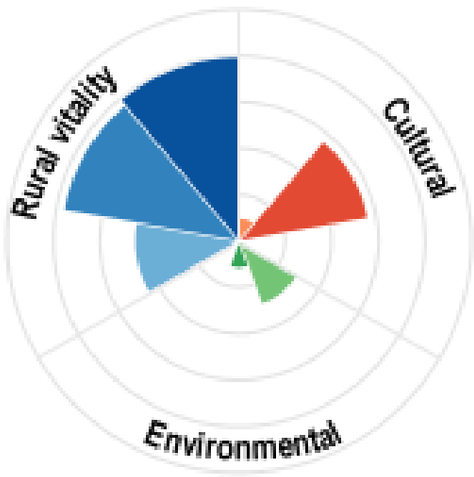
Landscape quality
Product quality
Biodiversity
High Nature Value
Water quality

‘Intensive livestock areas’

n = 5



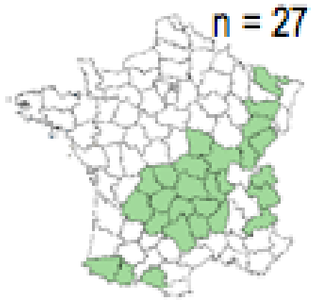


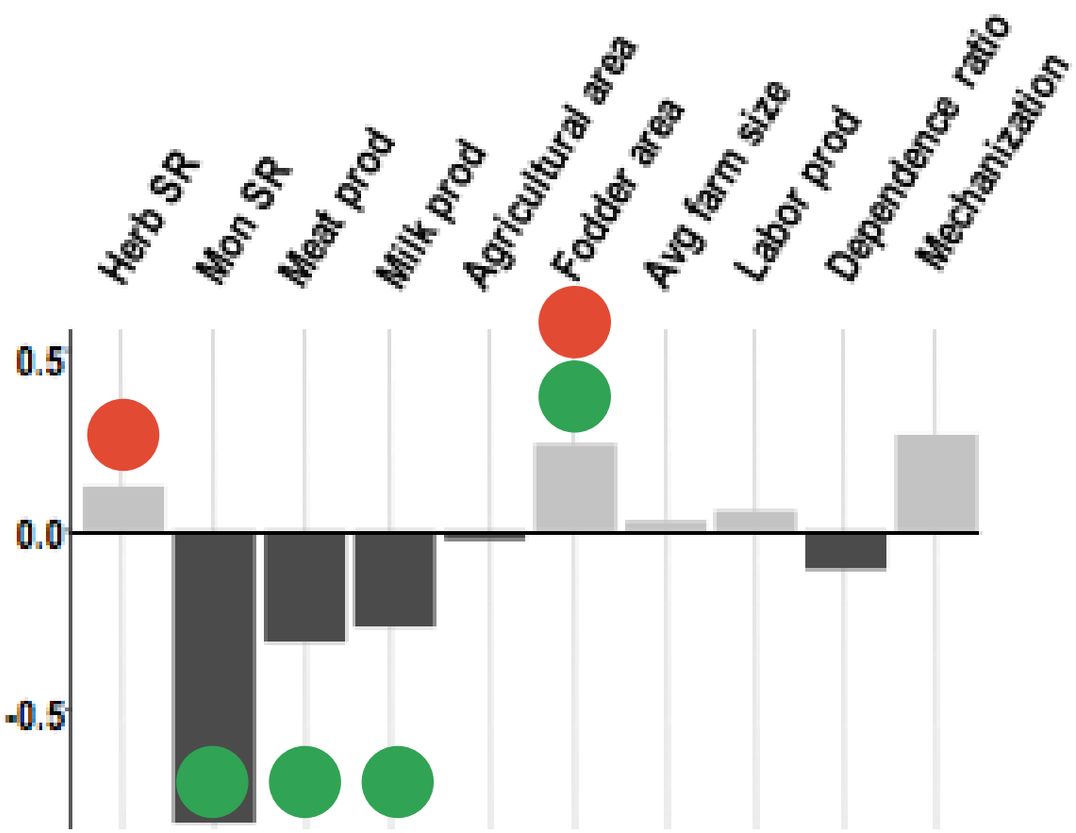


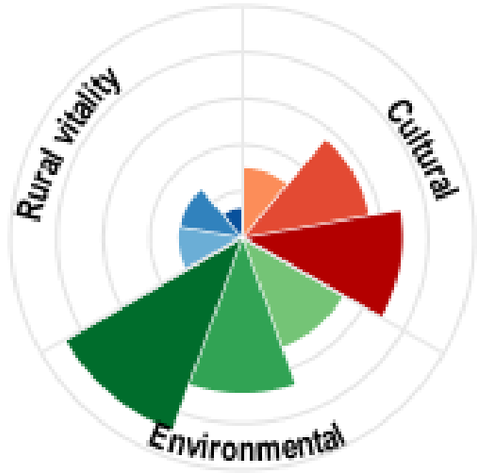
Landscape quality
% of livestock employ.
Employment at farm
Employment at industry

‘Extensive livestock areas’

n = 27







Landscape quality
Product quality

Biodiversity
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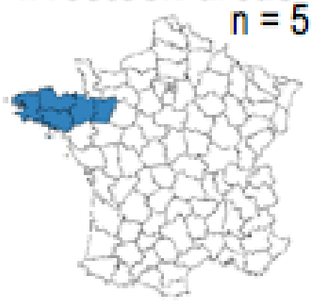
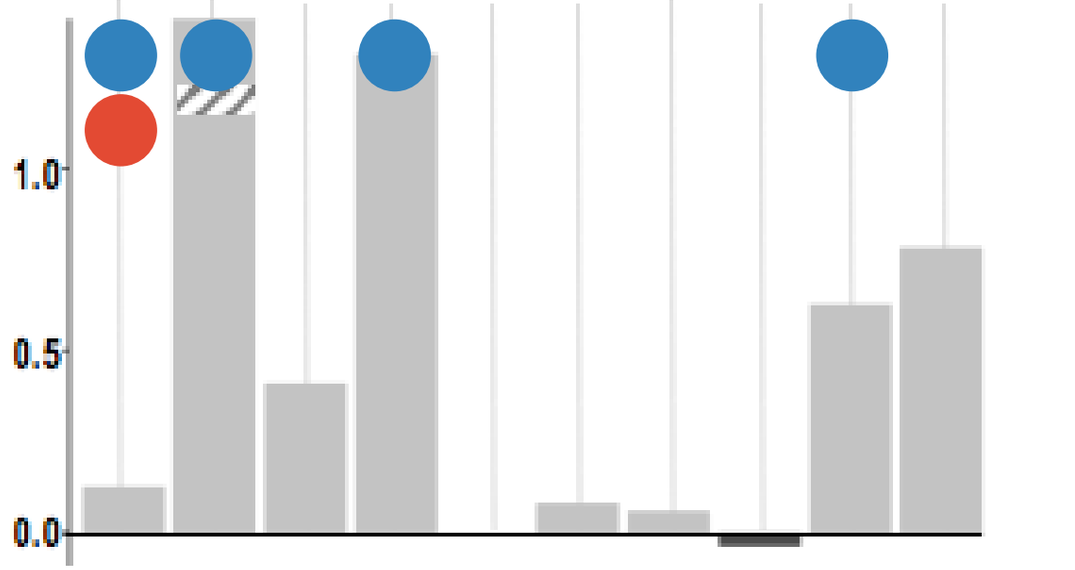
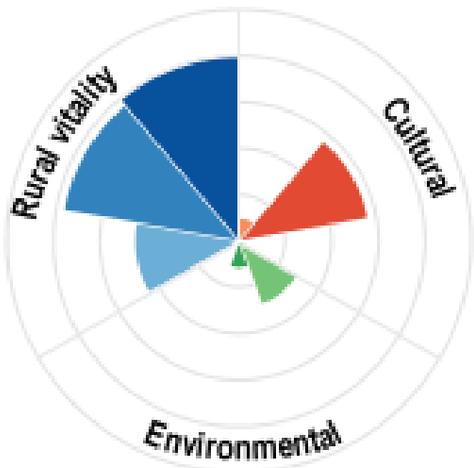




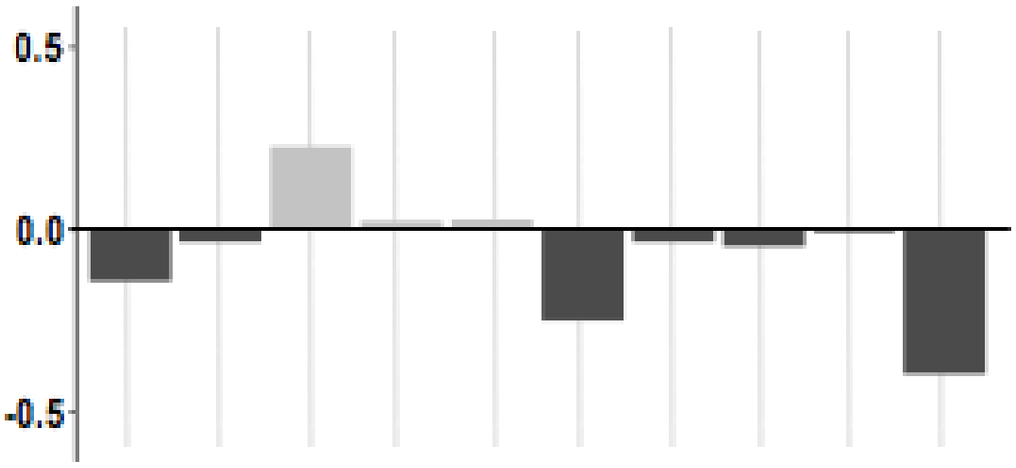


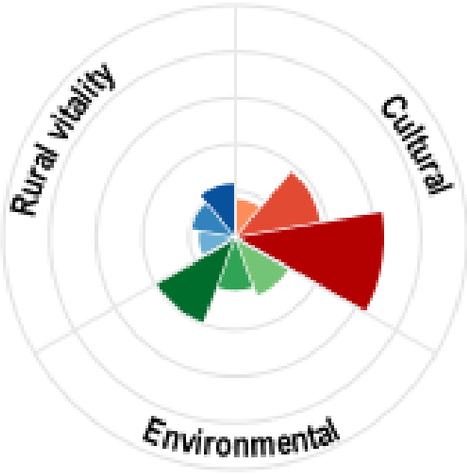
Landscape quality

% of livestock employ.
Employment at farm
Employment at industry

‘Transition areas’

n = 28





Product quality

DISCUSSION

SYNTHESIS OF SOCIOECONOMIC FACTORS

Initial farm size

Extensive **Intensive**

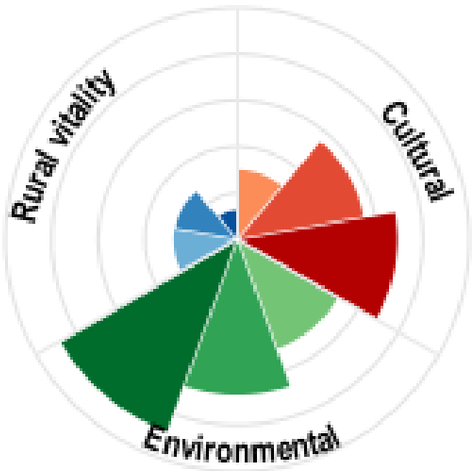
large

low

Feed industry

small

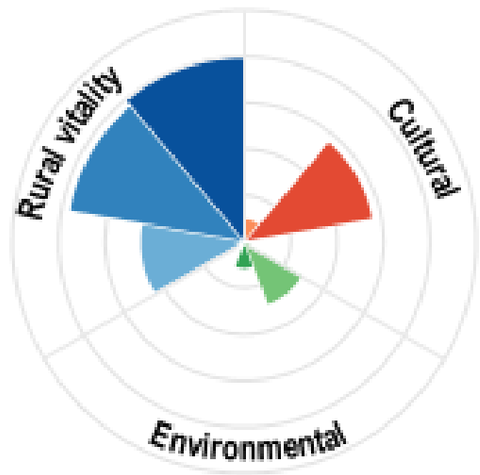
high



local

Breed

subs.



quality label

Supply chain

industrial

marginal

plains

Land suitability

CONSEQUENCES: INTENSIFICATION OF LIVESTOCK PRODUCTION

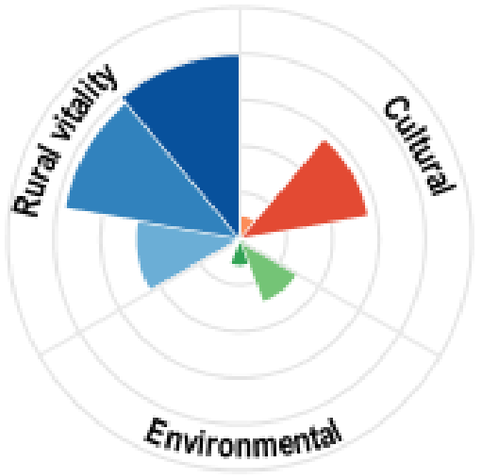
- Relative gains
  - Increased productivity trough adoption of technology
    - High rural vitality services
- Externalization of land needed for feed production
  - Increased dependence on external resourcess
  - Local and global impacts
- Does it pay off???

PATHS TO BETTER SERVICES PROVISION

- Grazing based areas offered more balanced bundle of services
- Moderate stocking rates
- Higher share of ruminants
- Better valorisation of marginal land and higher reliance on local feed resources

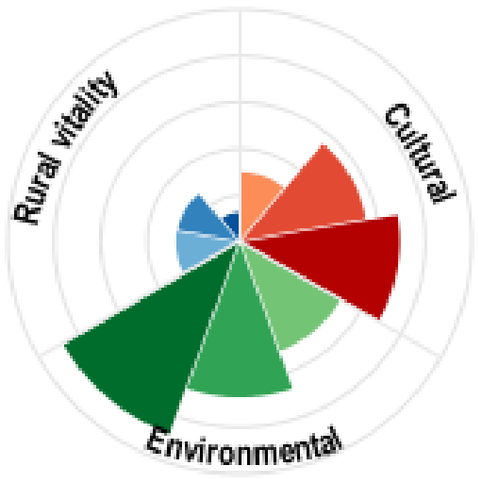
COMPLEMENTARITY BTW TWO REGIONS IN TERMS OF THE WHOLE SET OF SERVICES

Intensive



High provision of animal source food and employment

Extensive



Provision of labelled animal products

Biodiversity conservation

High nature value and water quality

IN A NUTSHELL

- A compromise is needed between food production and environmental quality and socioeconomic services

- Extensive areas deserves more attention, as they provide multifunctional bundle of social, cultural and environmental services to society.

THANK YOU FOR YOUR ATTENTION!

	Herbivore SR	Monogastric SR	Meat productivity	Milk productivity	Share of UAA	Fodder area : UAA	Average farm size	Labour productivity	Self-sufficiency	Mechanisation
Agrotourism	-0.01	-0.26	-0.26	-0.22	-0.25	0.24	-0.20	-0.13	-0.17	-0.14
Landscape	**0.68**	0.02	-0.23	0.03	-0.02	**0.64**	0.08	0.01	0.30	0.38
Product	0.19	-0.42	-0.02	-0.41	0.11	0.06	0.20	0.09	-0.09	-0.07
Biodiversity	0.36	-0.25	-0.45	-0.16	-0.10	**0.59**	-0.00	0.11	-0.19	0.23
HNV	0.28	-0.43	**-0.59**	-0.49	-0.31	**0.71**	0.02	0.14	-0.18	0.06
Water	0.23	**-0.57**	**-0.58**	**-0.58**	-0.24	**0.56**	-0.03	0.18	-0.32	0.06
Employ	0.46	0.25	-0.12	0.24	0.38	**0.50**	0.08	0.06	0.22	0.39
Emp Farm	**0.52**	**0.52**	0.13	**0.53**	0.06	0.44	0.11	-0.14	**0.50**	0.42
Emp Ind	0.09	**0.78**	0.38	**0.70**	-0.09	-0.04	0.20	-0.14	**0.57**	0.34

CORRELATION