

Linking agricultural practices and ecosystem services in Mediterranean agro-ecosystems: an expert knowledge approach

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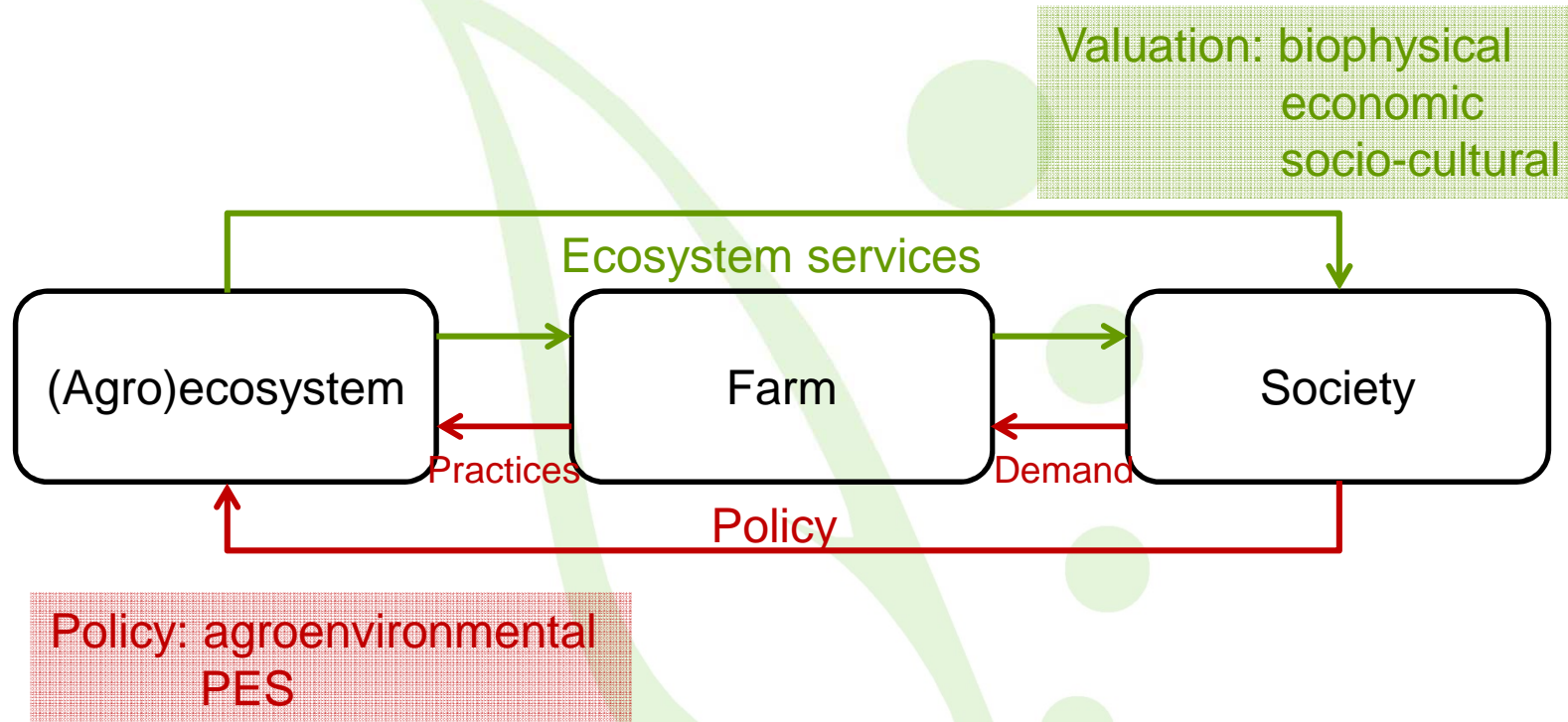
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Outline

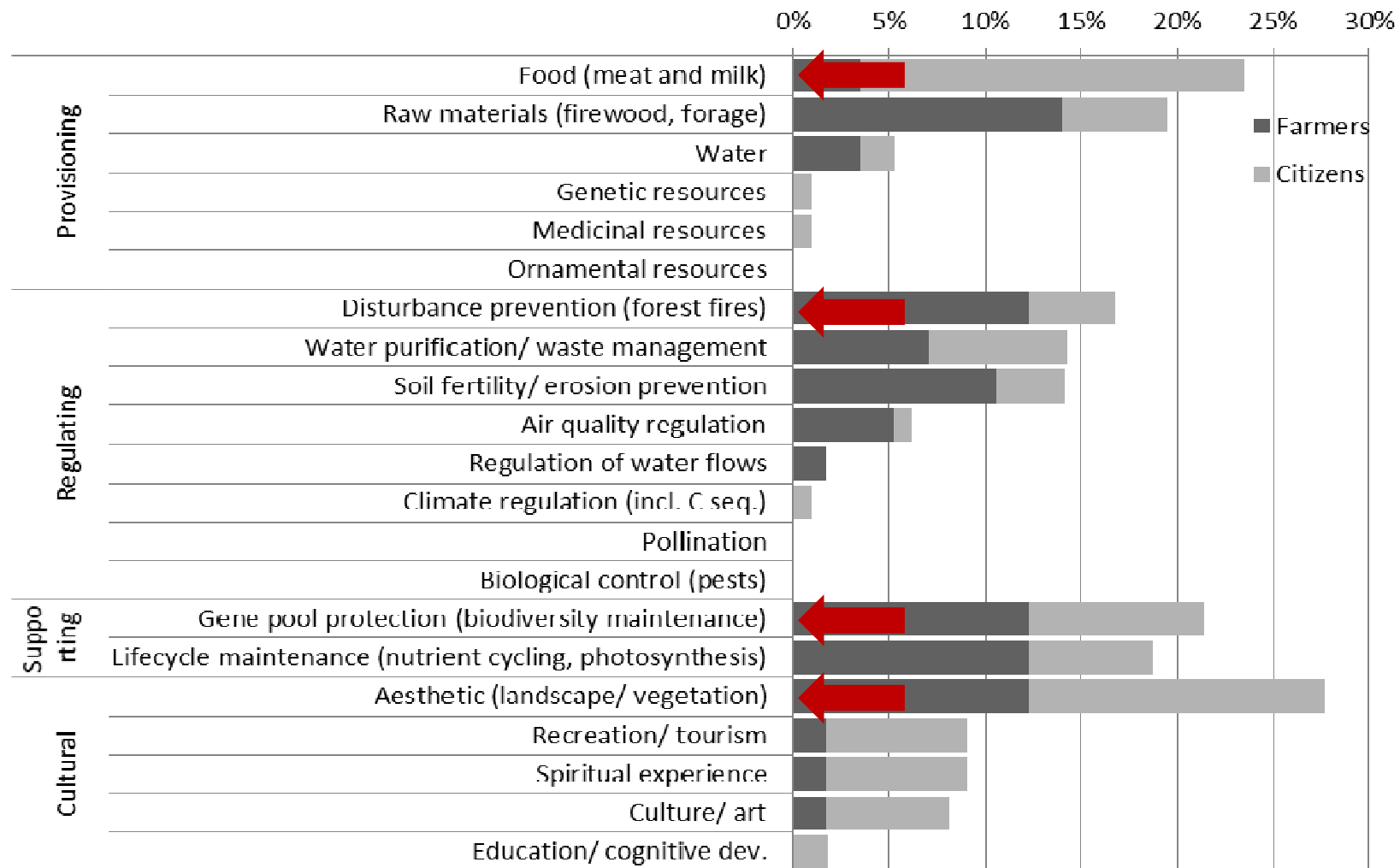
- Framework & objective
- Methodology
- Results
 - Effect of farming practices on ES
 - PES framework
- Conclusion

Framework & objective

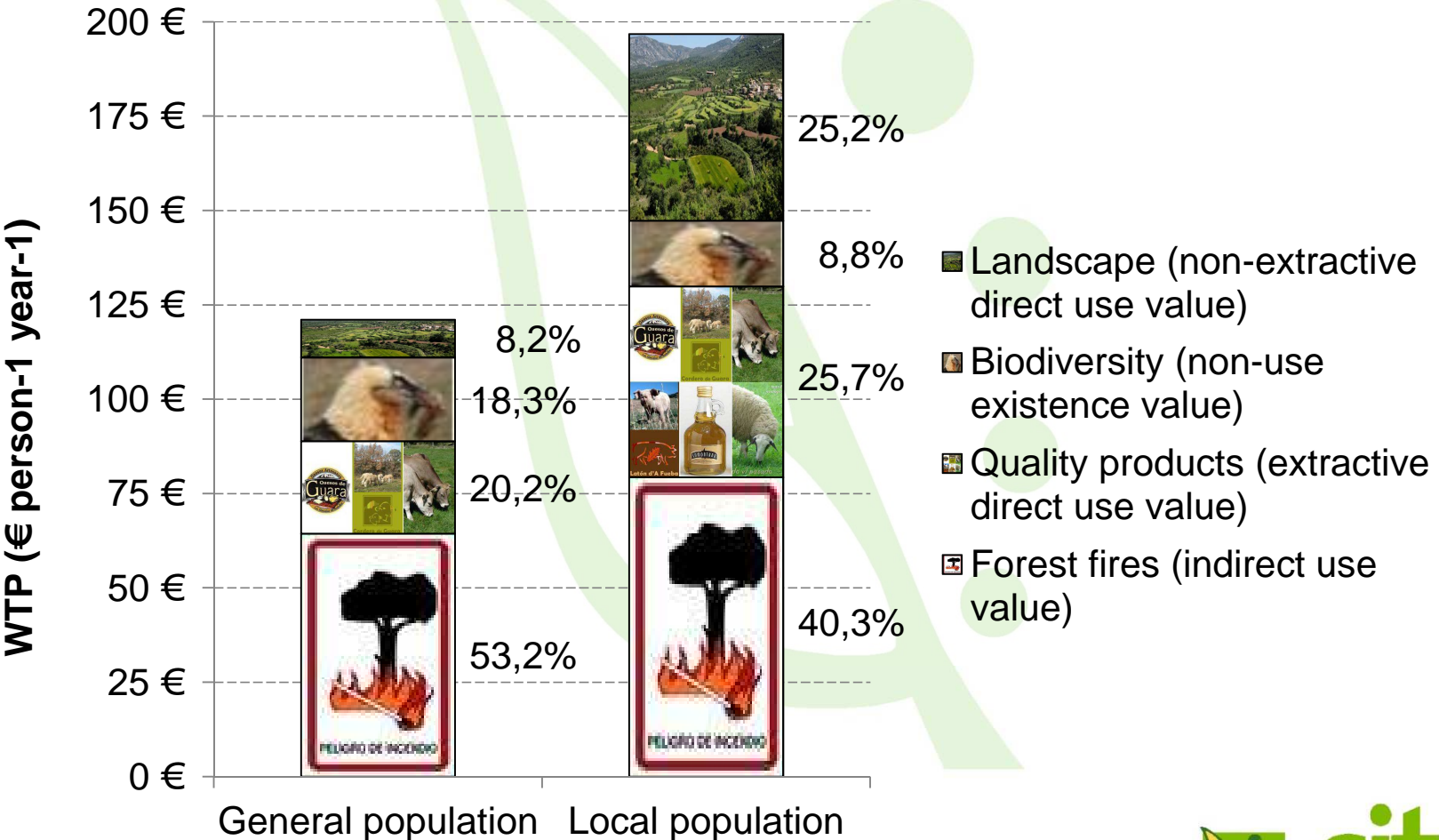


Objective evaluate, according to expert knowledge, the contribution of farming practices to ES in Mediterranean agro-ecosystems

What ES are relevant to society?



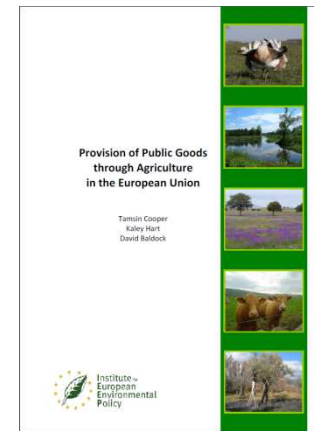
What ES are relevant to society?



Bernués et al, (2014)

Methodology

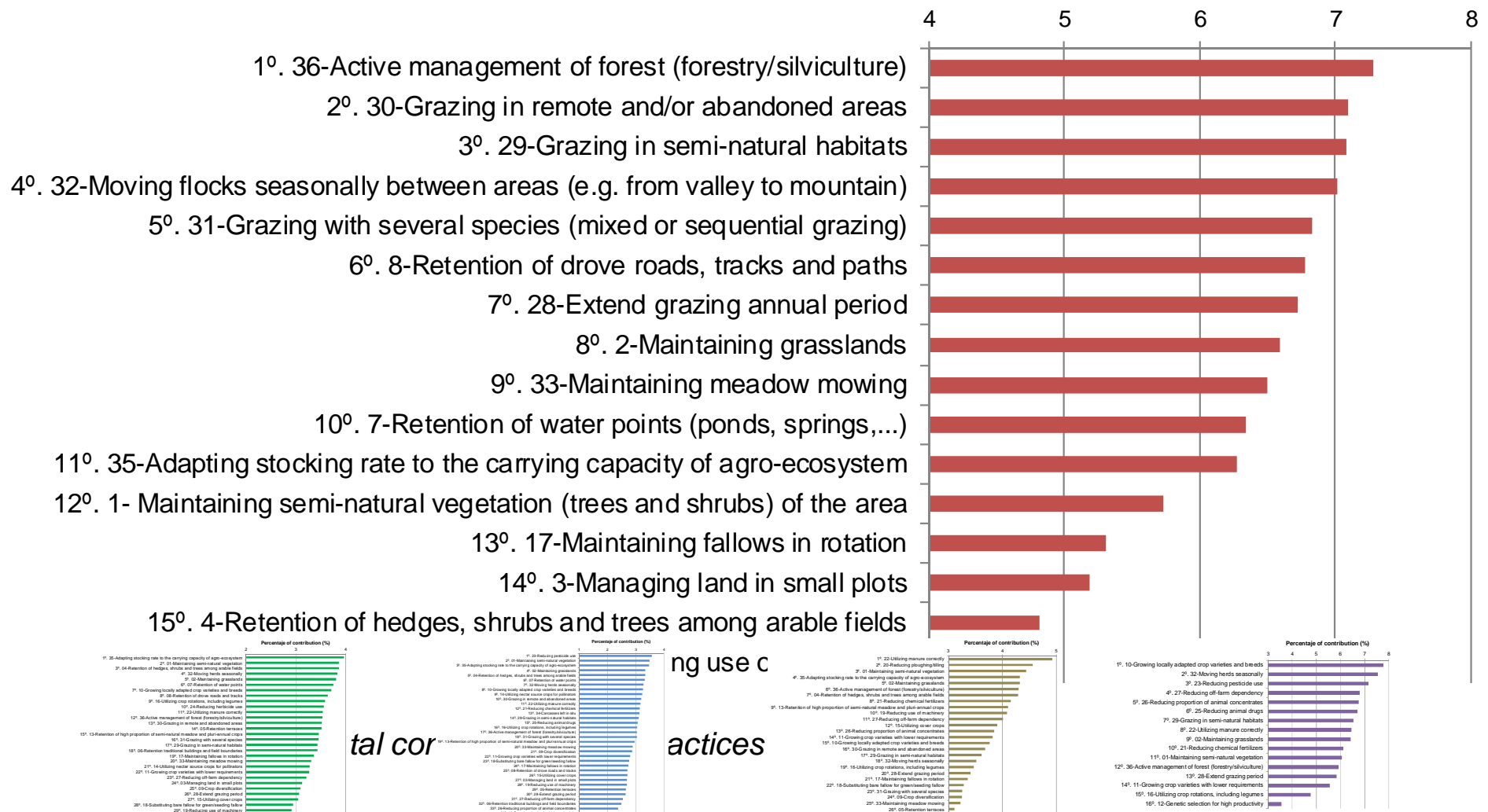
- 10 sheep and mixed farms monitored
- 36 farming practices (out of 66 possible)
- Delphi panel (2 rounds)
 - Researches (n=29)
 - Technicians/managers (n=32)
 - Self appraisal on knowledge
 - Contribution of practices to ES (Likert scale: 0 none to 5 very high)



Results: practices and ES

Contribution of farming practices on wildfires prevention

Percentage of contribution (%)



Results: practices and ES

Relevant farming practices contributing on ES

Ranking	Landscape	Biodiversity	Wildfires	Carbon seq.	Quality prod.
1st	35	23	36	22	10
2nd	1	1	30	20	32
3 th	4	35	29	1	23
4 th	32	2	32	35	27
5 th	2	4	31	2	26
...36 th

FARMING PRACTICES

1 - Maintaining semi-natural vegetation (trees and shrubs) of the area

2 - Maintaining grasslands

4 - Retention of hedges, shrubs and trees among arable fields

10 - Growing locally adapted crop varieties and breeds

20 - Reducing ploughing/tilling

22 - Utilizing manure correctly

23 - Reducing pesticide use

26 - Reducing proportion of animal concentrates

27 - Reducing off-farm dependency (e.g. feed, fertilizers)

29 - Grazing in semi-natural habitats

30 - Grazing in remote and/or abandoned areas

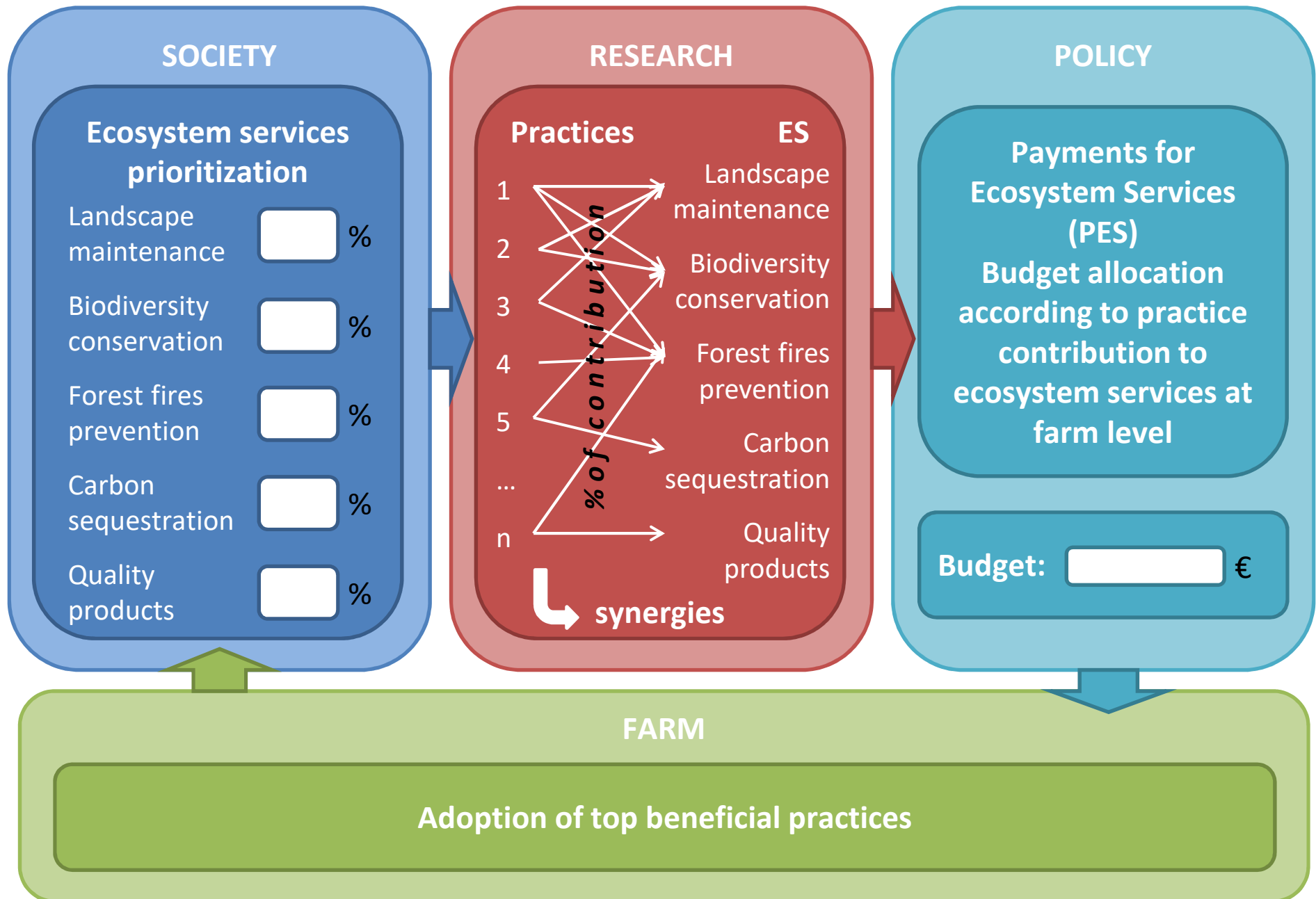
31 - Grazing with several species (mixed or sequential grazing)

32 - Moving flocks seasonally between areas (e.g. from valley to mountain)

35 - Adapting stocking rate to the carrying capacity of agro-ecosystem

36 - Active management of forest (forestry/silviculture)

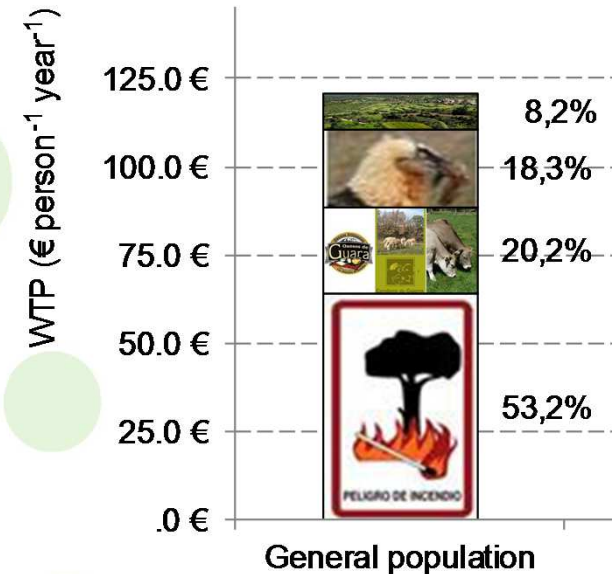
Results: PES



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Example 'Sierra and Cañones de Guara' Natural Park

Based on **Preference** of population according to their WTP for ES



Top 5 farming practices

- 1º. Moving flocks seasonally between areas (e.g. from valley to mountains)
- 2º. Grazing in semi-natural habitats
- 3º. Active management of forest (forestry/silviculture)
- 4º. Maintaining grasslands
- 5º. Extend grazing annual period

Conclusions

- Top farming practices:
 - **LANDSCAPE**: management of vegetation, stocking rates
 - **BIODIVERSITY**: pesticides, management of vegetation, stocking rates
 - **WILDFIRES**: forestry, grazing
 - **CARBON SEQUESTRATION**: management of manure, soil and vegetation
 - **QUALITY PRODUCTS**: local varieties and breeds, flock management, artificial/external inputs
- Flexible and generic PES system based on farming practices can be designed

World Congress Silvo-Pastoral Systems 2016
WG 10. Ecosystem services as an enabling framework towards the transition to sustainable silvopastoral systems

Thanks for your attention

