

Don't Put All your Eggs in One Basket:

Montado silvo-pastoral
system as a case study of
resilience



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MONTADO in Portugal / DEHESA in Spain

Open canopy woodland – cork and holm oak

Main understory use: native and sown pastures for grazing animals

Supports high levels of biodiversity

Human shaped ecosystem – high habitat heterogeneity

Traditionally, low intensity management

ACKNOWLEDGED AS A HIGH NATURE AND SOCIAL VALUE
FARMING SYSTEM



MONTADO

References since the 12th century - dominant system in the south of Portugal

Evolved from the mediterranean "maquis"

With the same components and complementarities as today

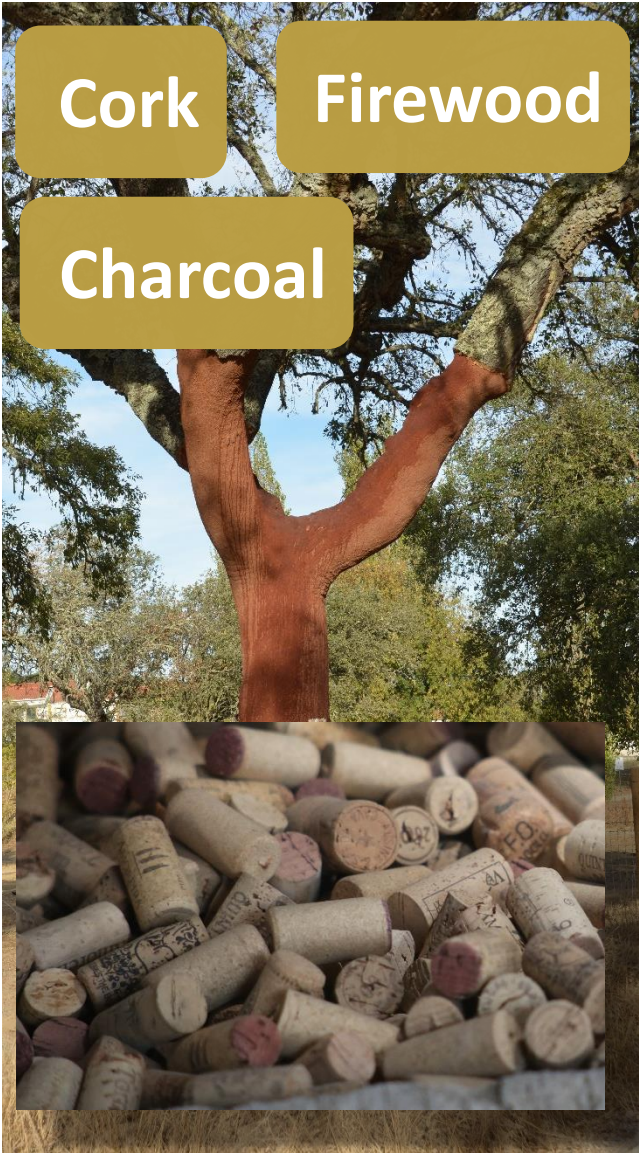


Highly multifunctional and strongly anchored in the regional identity

From the Book of prayers of D Manuel (1517).
Source: Dagoberto Markl (1983)

Multiple use and low intensity management

Diversity of products & income sources



Cork

Firewood

Charcoal



Alentejano pig for meat



Cattle for meat



Sheep milk for cheese

Multiple use and low intensity management

Diversity of products & income sources

Honey



Mushrooms



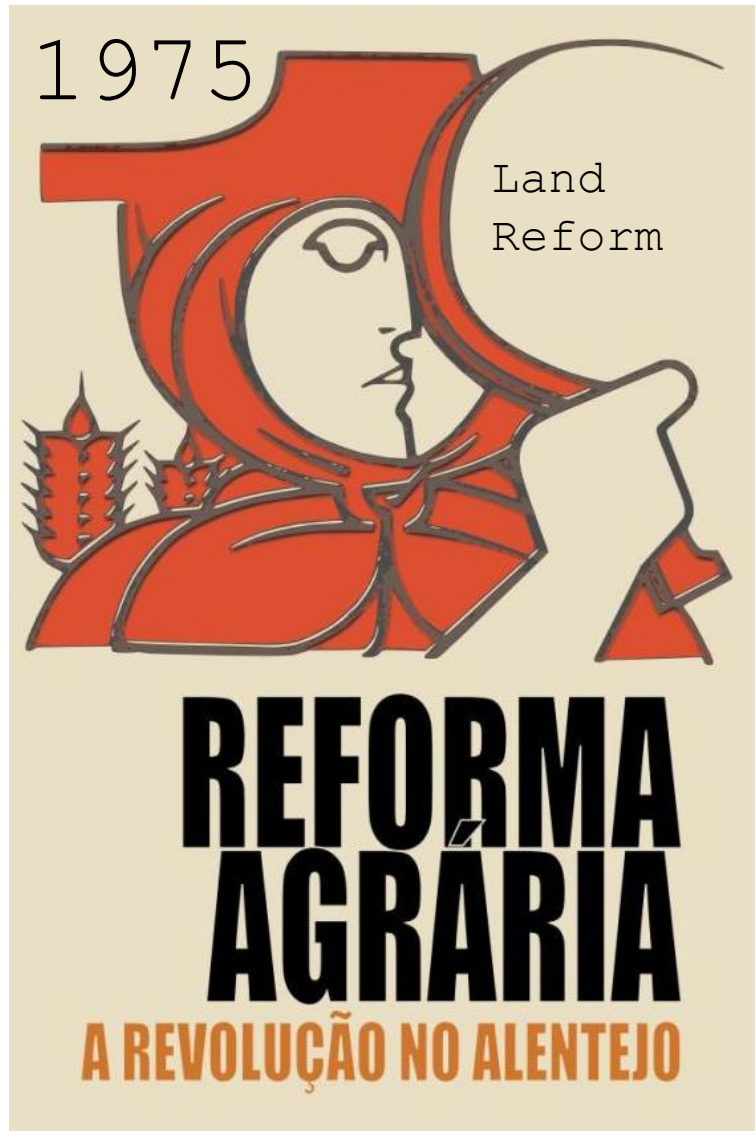
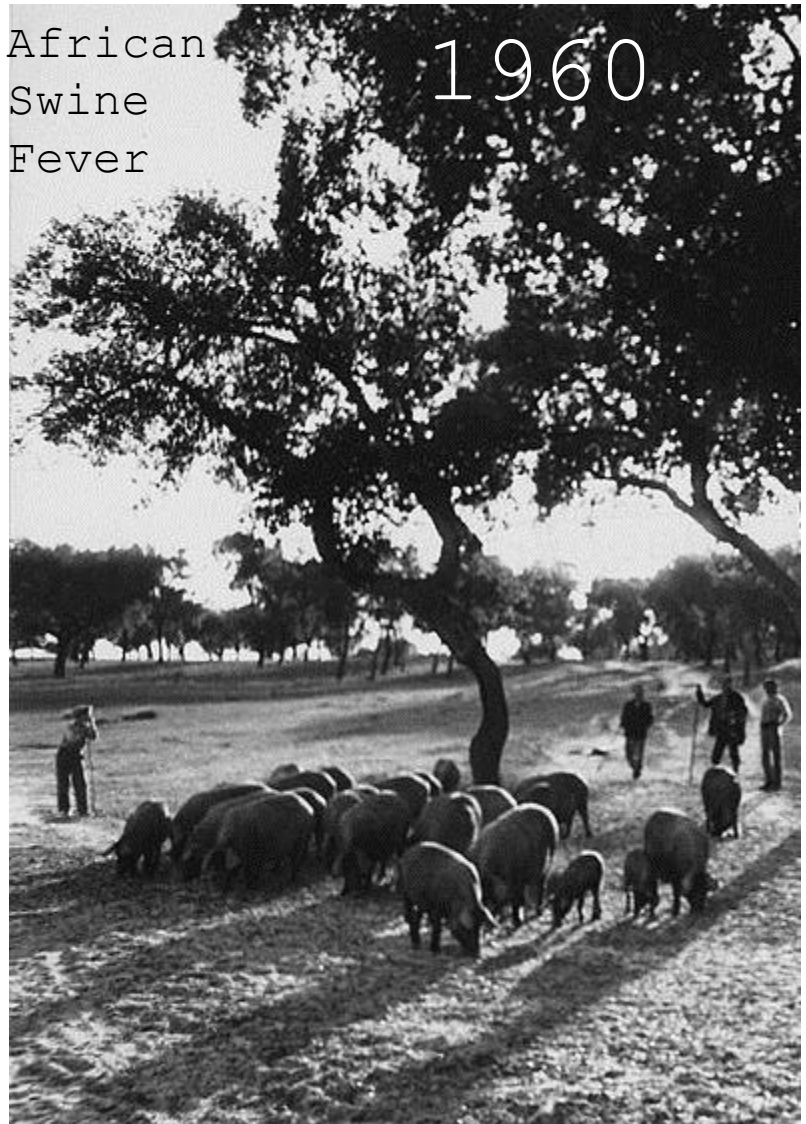
Aromatic plants



Hunting

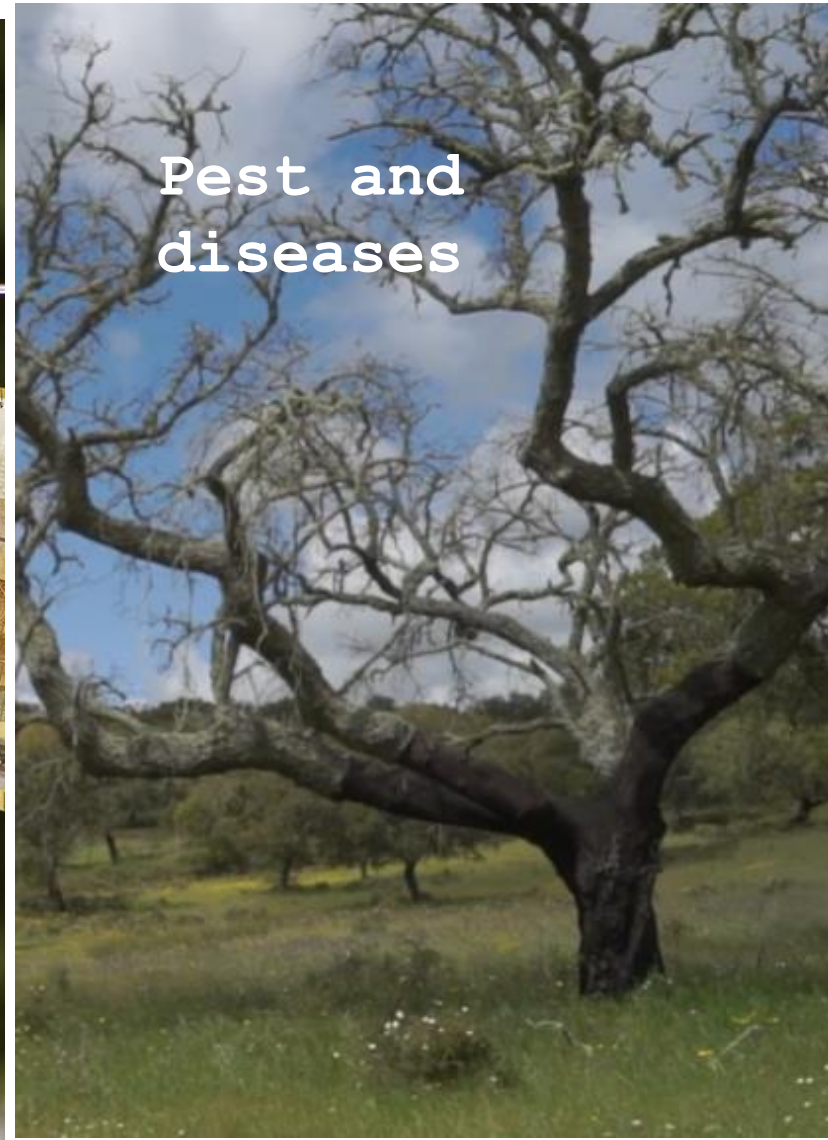


Historical crises & major threats



Recent crises & major threats

Comulative and sinergic factors

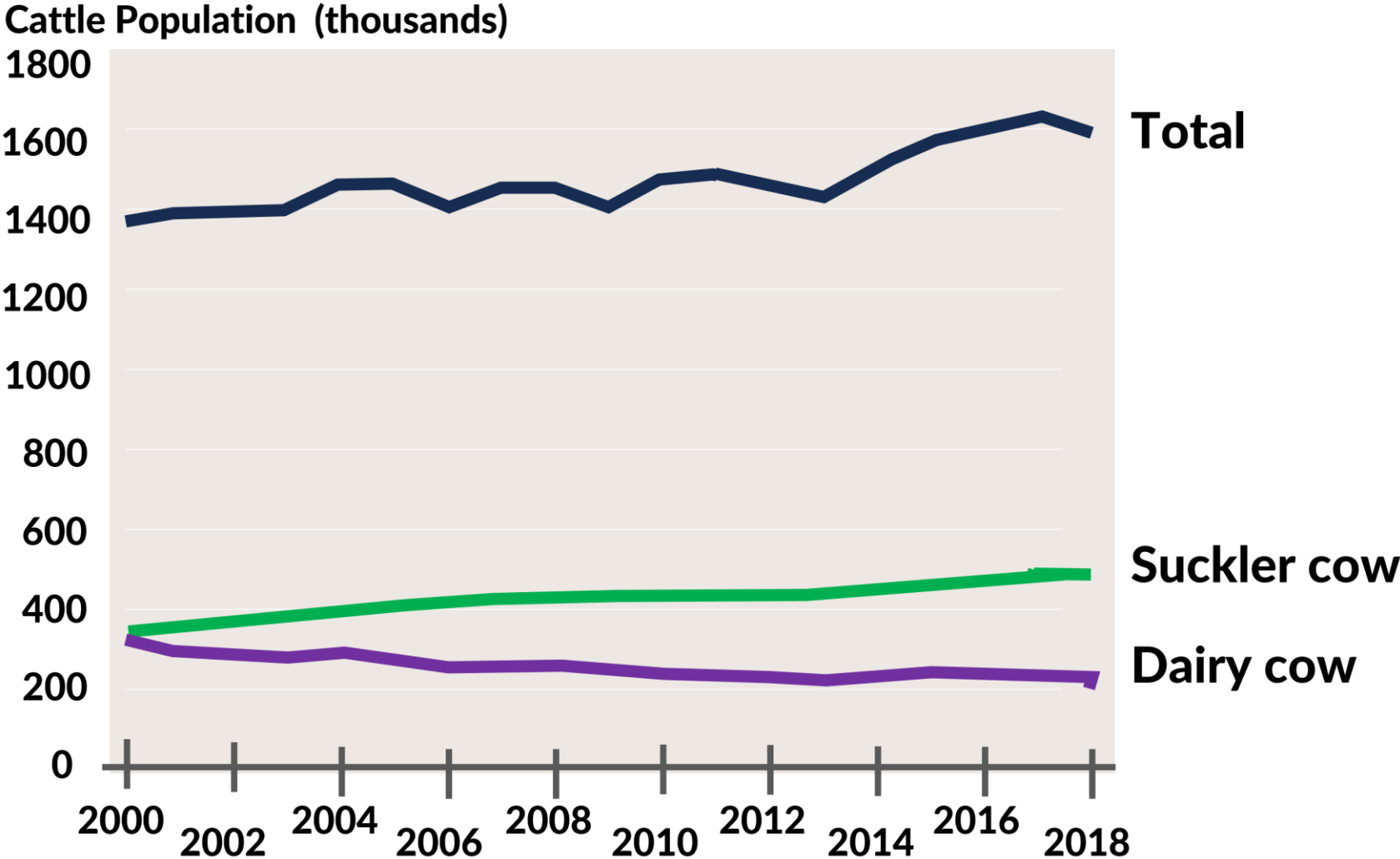


Trends

Suckler cows' population

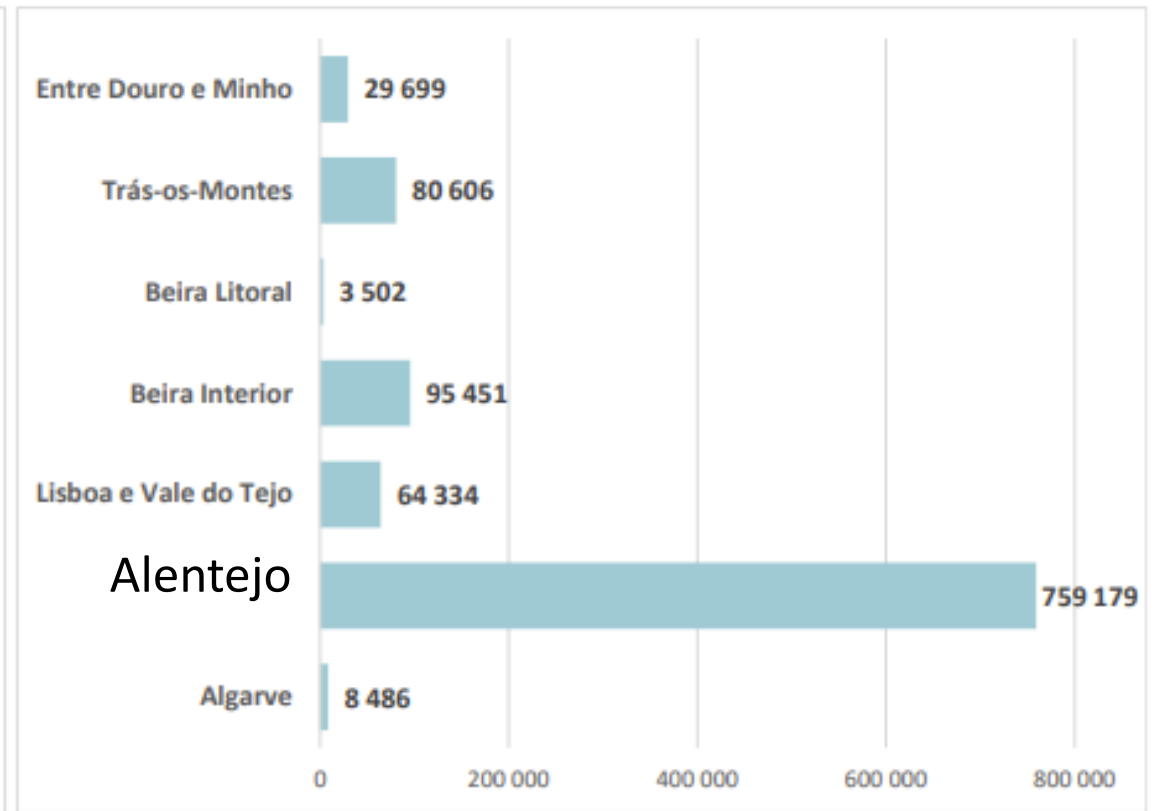
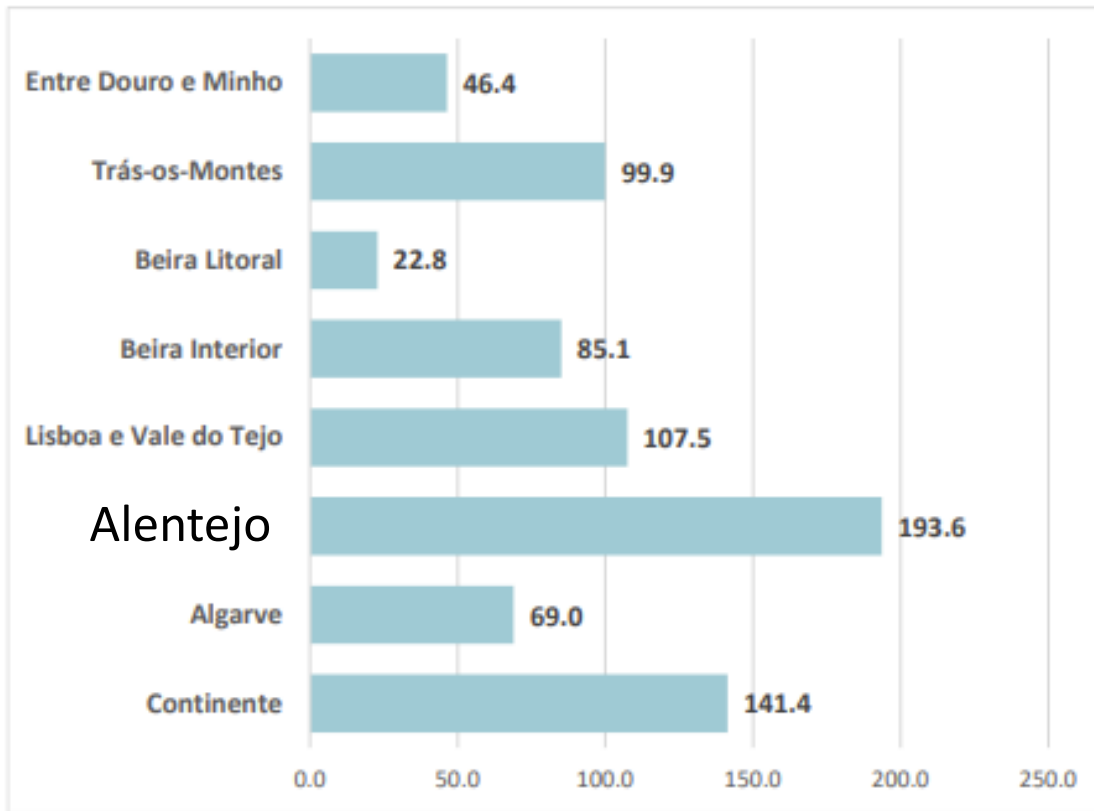
In the last 20 years increased 50%

70 % of Suckler cows' population is located in Alentejo



Relative variation (%)

Absolute variation (ha)



Fonte: INE

Trends The system is in “silent” decay

Assessment of environment, land management, and spatial variables on recent changes in *montado* land cover in southern Portugal

Sérgio Godinho · Nuno Guiomar · Rui Machado ·
Pedro Santos · Paulo Sá-Sousa · J. P. Fernandes ·
Nuno Neves · Teresa Pinto-Correia

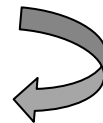
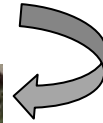
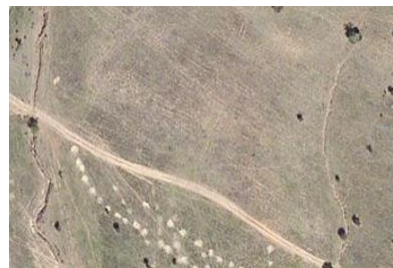
Reduction in area and tree density

1990 - 2006 **~90.000 ha lost**

Reduction **> 5500 ha/year**

Fragmentation

	1910	1960	1990	2006
Total area of montado (km ²)	3152.95	4030.35	3544.15	3466.77
Relative area (% Central Alentejo)	43.60	55.81	49.16	47.68
Number of patches	116	208	248	306
Mean patch size (km²)	27.18	19.38	14.29	11.33
Variance (%)	5.54	4.41	3.71	3.35
Maximum patch size (km ²)	1838.86	2496.06	2019.46	1987.46
Minimum patch size (hectares)	0.33	0.93	0.41	0.27



D >50% Dense Montado

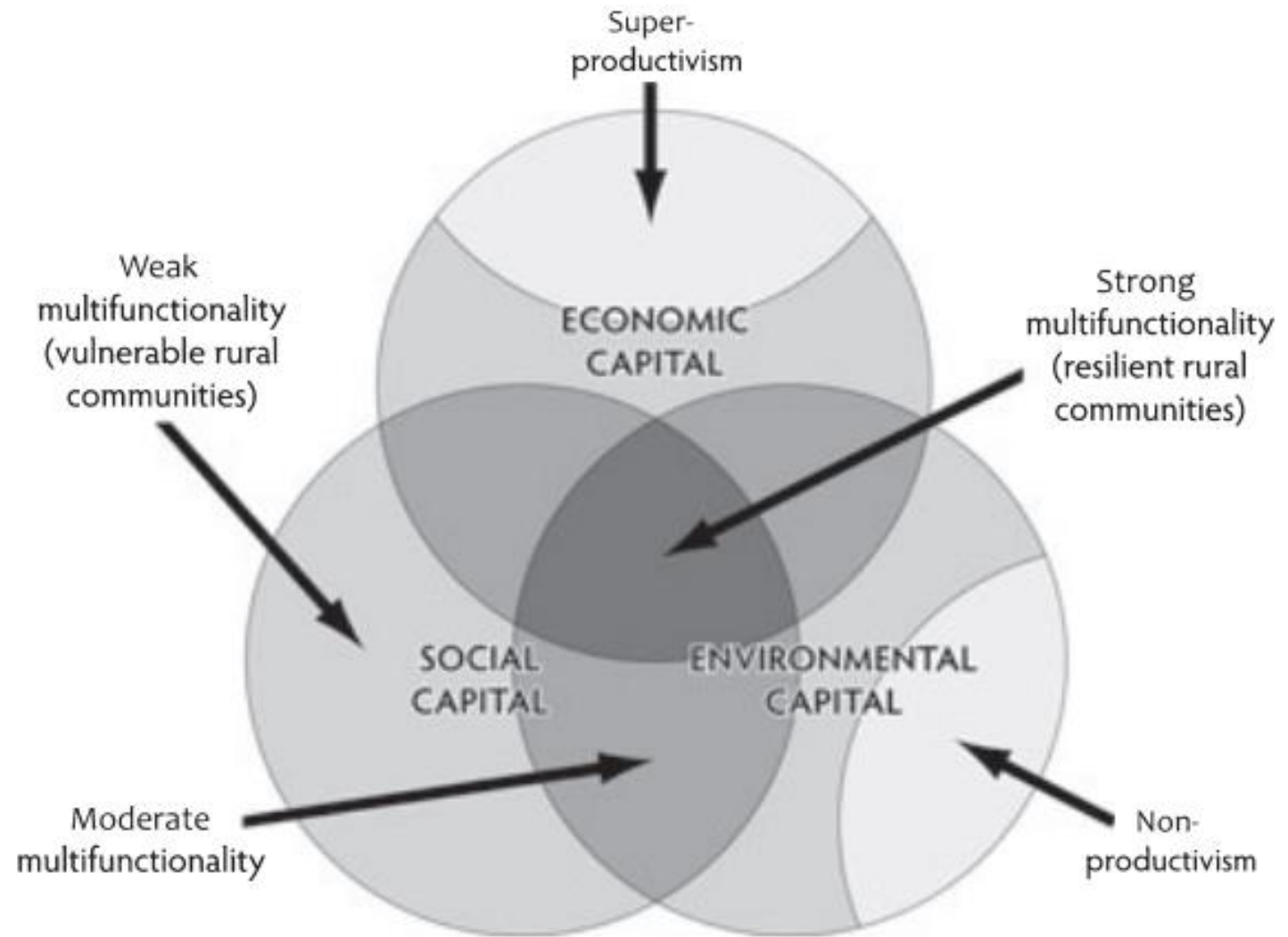
C 20 – 50% Open Montado

B 10 – 20% Clear Montado

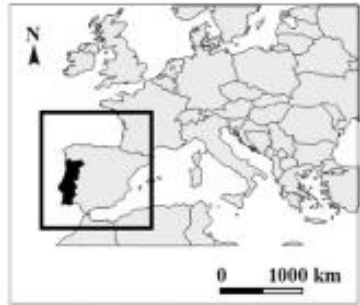
A < 10% Open Pastures

Montado **multifunctionality** as been a unifying principle that brought the productive and non-productive functions into harmony.

The montado has been **resilient** (in the context of ecosystem stability) to dynamic changes over time



2 different research projects focusing on grazing livestock production in Alentejo Central:



Alentejo Region



In Alentejo, 2013-2016 assessed the impact of grazing management options on biodiversity through field surveys (bats, reptiles, birds, macrofungi, trees regeneration, botanical composition) (17 farms; 29 plots x 2 grazing intensities)

SUFISA, 2015-2019: surveys, expert interviews, focus groups and participatory workshops to disentangle the financial sustainability of diverse options at the farm system level (n=150)

Results

- 145 macrofungal species
- 269 plant species
- 12 reptile species
- 63 bird species

No overall biodiversity variation associated to different grazing intensities was found.

However, species groups responded differently to high and low grazing intensity:



Macrofungi were negatively related to high-intensity grazing



Birds were positively related with high-intensity grazing

Lower tree regeneration related to high-intensity grazing

Field survey:
29 paddocks x 2

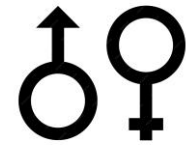
environmental capital



Producers were **simultaneously owners and managers** (60.4%) with tenants representing only 2.8%



Producers age was balanced with 48.9% of respondents younger than 50 years old



A clear **male gender** bias (87.5%) existed.



The overall **level of education** was high (43.8% held a University degree) and most of the participants had specific training in agriculture (79.2%).



None expect to sell the farm.

High diversity of livestock production models:

- Different holding areas
- Different herd sizes
- Different grazing species or combinations
- Different grazing management
- Different commercialization models
- Different product certification

High standards of resilience

Survey to 170 farmers

Apparent weaknesses of the economic and social capital :

Survey to 170 farmers

- High dependency of farmers on public funds



Table 10: CAP funding received by Montado beef producers surveyed (representing the percentage of beef producers amongst the total number surveyed)

Direct payments	100 %
Other Pillar I Payments	33 %
Agro-Environmental Schemes (AES)	67 %
Others	12.5 %
I do not Know	23 %

- Low cooperation levels among farmers



Only 23% of farmers belonged to a production organization

Conclusions

An aerial photograph of a savanna landscape. The foreground and middle ground are dominated by green grass with scattered, small trees and shrubs. Several animals, likely cattle or sheep, are visible grazing in the field. The background shows a vast, flat expanse of similar vegetation stretching to the horizon under a clear sky.

- No overall biodiversity variation because of different management practices was found.
- However, different groups of species react differently to specific management practices, namely grazing intensity.
- In low grazing intensity plots, macrofungi species richness was found to be higher, while bird species richness was lower.
- Using tree regeneration as proxy for montado sustainability, results show less tree regeneration in areas with higher forage quality and more intense grazing.

Conclusions



- The Montado continuity has been rooted in the long lasting land-family relationship
- An identity crisis in the farming community is also a widely unrecognized problem of the montado decay

The current governance practices are unable to preserve the multifunctionality of the montado, and thus its resilience.

Thank you!

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