Preferences for agricultural landscapes: The case of dehesa and sloping olive groves

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International Workshop

Ecological transition of agriculture: Opportunities and challenges

Córdoba, 19 June 2024

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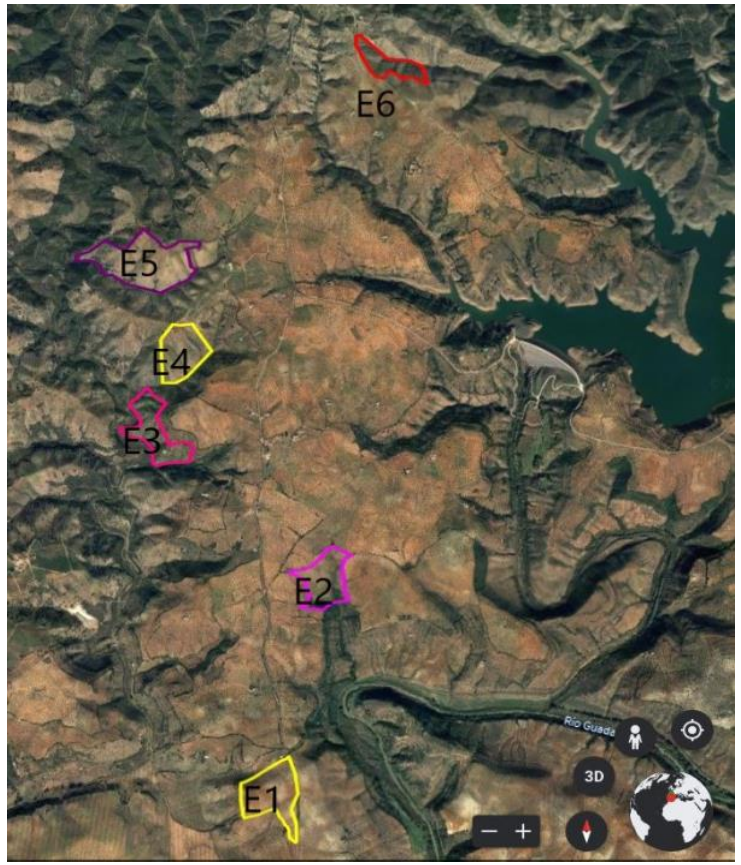
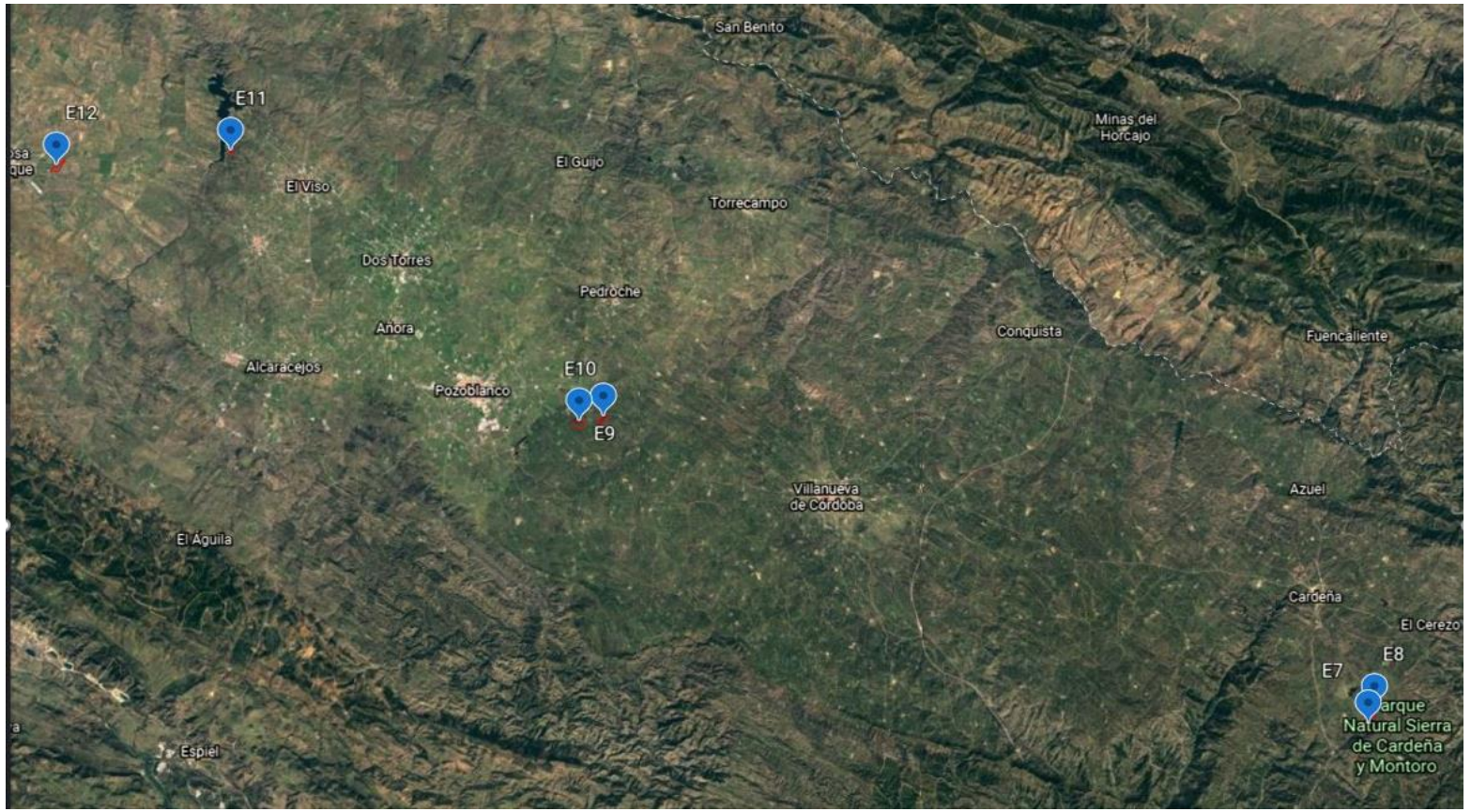
VISUAL QUALITY ASSESSMENT OF OLIVE GROVE AND DEHESA LANDSCAPES

Experimental plots

- Experimental plots: **6 olive groves.** (E1-E6) y **6 dehesa** (E7-E12)
- Treatment/Control (sustainable **environmental management yes/no**)



Sierra de Cardeña y Montoro



Valle de los Pedroches

Methodology of landscape visual quality assessment

- Taking photographs by experimental plot and season of the year
  - Transect: taking between 20 and 30 photographs to characterize the type of landscape and its temporal evolution (4 seasons of the year).
  - Selection of a subsample of photographs for each site and season (between 8 and 10).
- Discussion group:
  - Final selection of 4 photographs per plot and season of the year: 192 photographs
  - Characterization of the elements and attributes of the landscape in each photograph.
- Survey of a representative sample of the Andalusian population:
  - n>2000, gender, age, province, and rural/urban residence quotas. November 2023.
  - Comparisons between landscapes: selection of the best and worst photograph (BWS scale) of the trio shown to the citizen.
  - Design: random by treatment/control attributes and season of the year.
  - Contingent valuation plus ranking of services.
- Evaluation of the visual quality of the landscape:
  - Transformation of the visual preference ranking into a metric scale.

Methodology of landscape visual quality assessment

- Example. **Olive grove (E6) in Spring**

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Methodology

- **Choice set** best/worst. Example of olive grove
- **3 random pictures per set, 3 sets per respondent** followed by the selection of the best picture among the three best.
- **192 pictures** each, on average, showed 181 times.

Results. Olive grove

- **Low visual quality**

Selected as the best less than 10% times

Results. Olive grove

- **Low visual quality**

Selected as the best less than 10% times

Results. Olive groves

- **High visual quality**

  Selected as the best more than 80% times

Results. Olive groves

- **High visual quality**

Selected as the best more than 80% times

Result. Dehesa

- **Low visual quality**

Selected as the best less than 10% times

Results. Dehesa

- **Low visual quality**

Selected as the best less than 10% times

Results. Dehesa

High visual quality

Selected as the best more than 80% times

Results. Dehesa

High visual quality

Selected as the best more than 67% times

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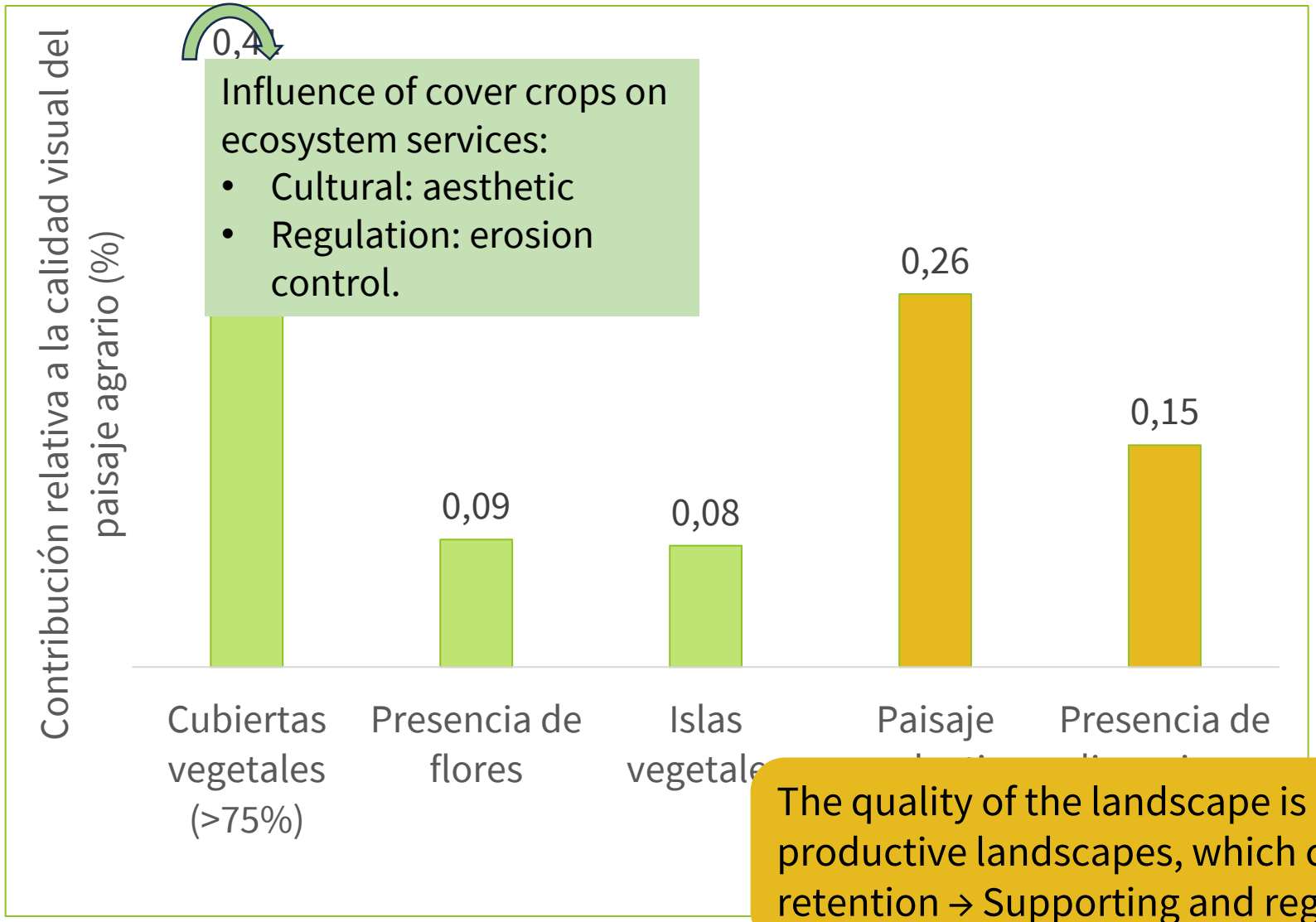
Results of the multiple regression model. Effects of elements and attributes of the landscape on its visual quality

Positive effect	No effect	Negative effect
Spring and Winter	Sky	Summer and Autumn
Presence of alignments	Width of focus	Strong colour contrast
Light colour contrast	Slope	No cover crops
Wide cover crop	Plantation age	Yellow cover crops
Intensive green color of the cover crop	Presence of bushes	Vegetation covering more less than 25% of the land
Vegetation covering more than 75% of the land	Presence of rocks	Visible power lines
Presence of flowers	Presence of animals	Land erosion
Presence of tree islands		
Cultivated landscape (anthropized landscape)		

RELATIONSHIP BETWEEN VISUAL QUALITY AND OTHER ECOSYSTEM SERVICES

Relationship between visual quality and other ecosystem services



Influence of cover crops on ecosystem services:

- Cultural: aesthetic
- Regulation: erosion control.

Landscapes with higher visual quality have superior biodiversity indices, which impact:

- Regulation services
  - CO2 capture
  - Pest and disease control
- Support services
  - Improved nutrient cycles
  - Soil formation

Increased resilience of systems, ensuring long-term ecosystem services.

The quality of the landscape is related to economically productive landscapes, which contribute to rural population retention → Supporting and regulation services.

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ECONOMIC VALUATION OF VISUAL QUALITY OF LANDSCAPES

Result. Willingness to pay (WTP)

Entre los paisajes que ha seleccionado como preferidos anteriormente, ¿cuál prefiere?



En las imágenes que se han mostrado de dehesa, ha podido ver que el paisaje era diferente según la parcela seleccionada ¿estaría dispuesto a pagar **24€** al año porque la **dehesa** en Andalucía fuese como la que ha elegido como preferido?

(el pago se realizaría a través del impuesto sobre la renta)

- (●) Sí
- ( ) No

¿Cuánto es lo máximo que estarías dispuesto a pagar al año por ello?

Results. Willingness to pay (WTP)

- How much would you pay for a landscape as the one chosen by you as the best?

Variable	Mean (€/year/ person)	sd	WTP=0 (%)
WTP olive groves	18.4	64.2	34.4%
WTP dehesa	19.1	59.3	32.6%

Results. Willingness to pay (WTP)

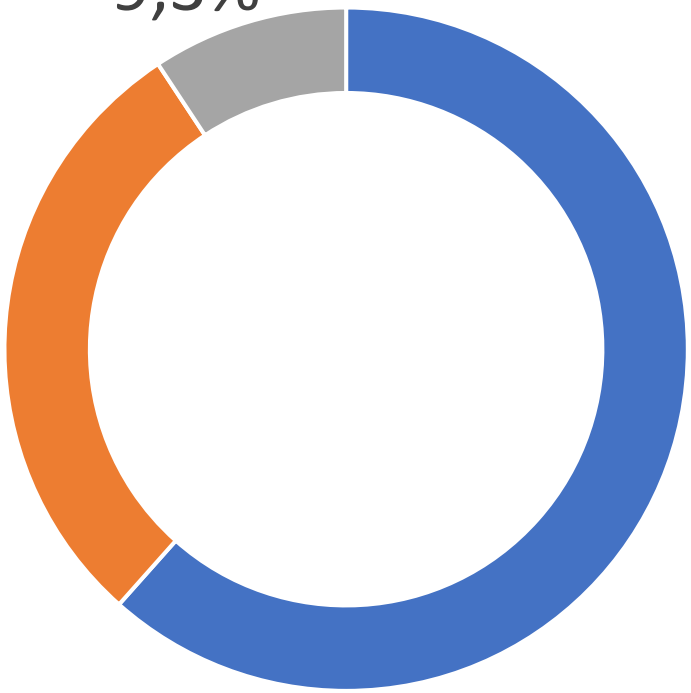
- When assessing your willingness to pay you have considered:

Only visual quality and I would pay more

9,3%

Only visual quality, but I would not pay more

29,1%



Visual quality and other ecosystem services

61,6%

Most respondents have considered in his/her payment not only the visual quality of the landscape but also its implications in terms of biodiversity, economic impact, etc.

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Results. Willingness to pay (WTP)

- Considering the ecosystem services provided by olive groves, rank their importance (1: highest)

Ecosystem Service	1	2	3	4	5
Landscape {1 or 2 = 23%}	13%	10%	15%	**24%**	37%
Biodiversity {58%}	**29%**	29%	22%	15%	5%
Soil conservation {60%}	31%	**29%**	22%	13%	5%
Carbon sequestration {13%}	4%	9%	16%	27%	**45%**
Vitality of the rural areas {46%}	24%	22%	**25%**	21%	8%

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Results. Willingness to pay (WTP)

- Considering the ecosystem services provided by dehesa, rank their importance (1: highest)

Ecosystem Service	1	2	3	4	5
Landscape {1 or 2 = 23%}	12%	11%	14%	**27%**	36%
Biodiversity {68%}	**37%**	31%	20%	9%	3%
Soil conservation {55%}	26%	**29%**	25%	15%	5%
Carbon sequestration {12%}	4%	8%	15%	27%	**47%**
Vitality of the rural areas {41%}	20%	21%	**27%**	23%	9%

Preliminary conclusions

- The visual quality of the agricultural landscape depends on various factors, including management (more environmentally sustainable practices imply highest visual quality), season, presence of green cover crop, flowers and vegetation islands, and the presence of positive anthropogenic elements.
- The Andalusian population is willing to pay to improve the landscape and its associated environmental services in dehesa and olive groves, although there is significant heterogeneity in this willingness.
- Among the services, the most important are biodiversity and soil conservation, followed by the vitality of rural areas, visual quality of the landscape, and carbon sequestration.

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