



A qualitative research on Spanish farmers and citizens perceptions of ecosystem services provided by mountain livestock farming

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Abstract

There is a strong debate nowadays on the public goods derived from certain agro-ecosystems and their valuation for establishing payments for ecosystem services (ES). In this context, we carried out a qualitative research on the spontaneous knowledge of ecosystem services and the perceptions of farmers and citizens on relationships between mountain farming and the environment. Five focus groups (2 with farmers and 3 with citizens; n=33) were organized in north-eastern Spain. Discussions were guided according to 5 general questions on links between pasture-based mountain livestock and the environment, lasted around 1.5 hours, were video recorded and transcripts were written for text analysis. Ideas or items from discussions were interpreted and organized according to the type of ES participants referred to (provisioning, regulating, habitat, cultural).

The ES that were mentioned and discussed a greater number of times were (in descending order): aesthetic (landscape/ vegetation); gene pool protection (biodiversity maintenance); disturbance prevention (forest fires); lifecycle maintenance (nutrient cycling, photosynthesis); raw materials (firewood, forage); water purification/ waste management; spiritual experience; recreation/ tourism; soil fertility/ erosion prevention; and culture/ art. Differences between farmers and citizens were observed: farmers gave more importance to regulating (in particular, prevention of forest fires and soil fertility) and provisioning (raw materials) ES, mainly related to their own farming activity or local circumstances; whereas citizens gave more importance to cultural (aesthetic landscape/ vegetation, spiritual experience, recreation/ tourism and culture/art) ES, showing in general more global concerns.

This study constitutes the base for a quantitative research on valuation (including monetary valuation) of ES derived from mountain farming systems in Mediterranean and North-Alpine areas.

Keywords: public goods, sustainability, valuation, focus groups.

Introduction

Mountain agriculture supplies private goods (e.g. animal products of differentiated quality), but also multiple public goods and services, which by definition are non-excludable (if the good is available to one person, others cannot be excluded from the benefits it confers), non-rival (if the good is consumed by one person it does not reduce the amount available to others) and non-marketable (the good does not have a known market price) and, therefore, people do not contribute to covering the costs associated with their provision. Among these, the conservation of biodiversity, the maintenance of cultural landscape and the prevention of environmental hazards, such as forest fires, are inherently linked to agricultural activities (Cooper *et al.*, 2009). For these reasons, there is nowadays a strong debate on the public goods derived from diverse agro-ecosystems (e.g. greening of the CAP) and their valuation for establishing payments for ecosystem services (ES).

Ecosystem services are defined as the direct or indirect benefits that humans get from nature and the concept is considered a good link between ecosystems, including agro-ecosystems, and human wellbeing (Kumar, 2010). The concept is becoming widely adopted by scientist and managers (Chan *et al.*, 2011), however, there are few studies on the understanding of ES by society, their demand or relative importance (Lamarque *et al.*, 2011).



In this context, the objective of this research was to gain information on the spontaneous knowledge and perceptions of farmers and citizens about ES provided by mountain agriculture.

Material and methods

We organized five Focus Groups (FG) (2 with livestock farmers, n=11, and 3 with citizens, n=22) to generically discuss about relationships between pasture-based mountain livestock and the environment in North-East Spain. FGs lasted approximately 1.5 hours and were conducted by a moderator according to 5 general questions. 1. Do you know the term “ecosystem services”? 2. How do you think livestock production affects the environment and vice versa? 3. How these relationships between livestock production and the environment affect you? 4. What geographical areas/ places can you identify that show the effect of livestock on the environment? 5. Should society pay for the delivery of environmental services? Who? In what way? Participants were asked to reflect individually on the questions for about 10 minutes previous to the discussion and to write in their own words the responses or give examples. The sessions were video recorded and transcripts written for text analysis.

Items of information appearing in texts were divided in mentioned and discussed (when a particular item originated substantial debate among participants) and were counted to facilitate the presentation of results. The items corresponding to ES were classified in *provisioning* (products obtained from ecosystems); *regulating* (benefits obtained from the regulation of ecosystem processes); *habitat* (necessary for the production of all other ecosystem services); and *cultural* (nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences), following the definitions by the Millennium Ecosystem Assessment (2005) and the classification proposed by TEEB (The Economics of Ecosystems and Biodiversity) (Kumar, 2010). Other items of information about mountain farming and agriculture in general were classified in *farm economics*, *social issues* at the farm level, *socio-economic context* and *policy/ legal context*, but are not presented in this paper.

Results and discussion

Not a single participant in the FG discussions affirmed to know the term “ecosystem services”. A number of them showed a good intuitive understanding of the concept; for example “*goods that nature provide to society*”, “*utility of diverse natural environments*” or “*economic benefits from nature*”. However, others interpreted the term as the responsibility of humans to preserve nature.

Figure 1 shows the relative frequency of number of times that ES were mentioned grouped per type (provisioning, regulating, habitat and cultural). Farmers tended to speak more often about regulating and habitat ES, followed by provisioning services. However, citizens spoke predominantly about cultural ES (around 50% of items mentioned), being the other types equal in relative importance.

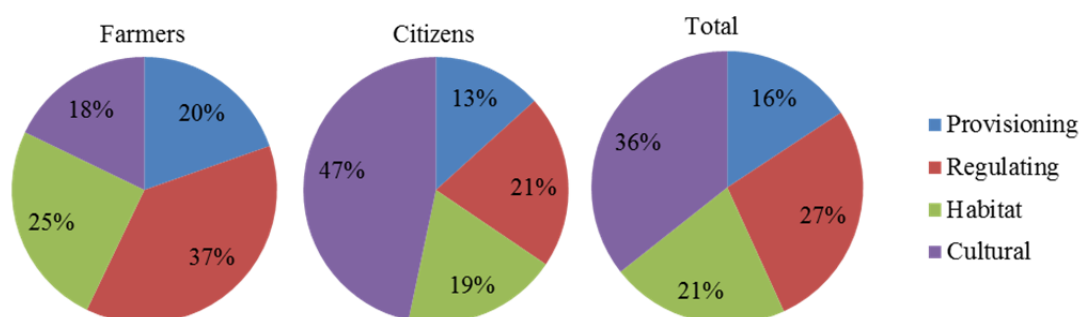


Figure 1: Relative importance of types of ecosystem services (% of times mentioned)

Figure 2 shows the number of times that individual ES were mentioned. Globally, the more frequent were (in descending order): aesthetic (landscape/ vegetation), gene pool protection (biodiversity maintenance), lifecycle maintenance (nutrient cycling, photosynthesis), provision of raw materials (firewood, forage), disturbance prevention (forest fires), water purification/ waste management, soil fertility/ erosion prevention, and other cultural ES such as spiritual experience, recreation and culture.



However, there were some differences between the perception of farmers and citizens. Farmers gave more importance (mentioned a larger number of times) to regulating ES such as disturbance prevention (forest fires) and soil fertility/ erosion prevention, and provisioning ES such as raw materials (mainly forage for animals and firewood). Citizens gave more importance to all cultural ES, in particular the aesthetic value (landscape/ vegetation).

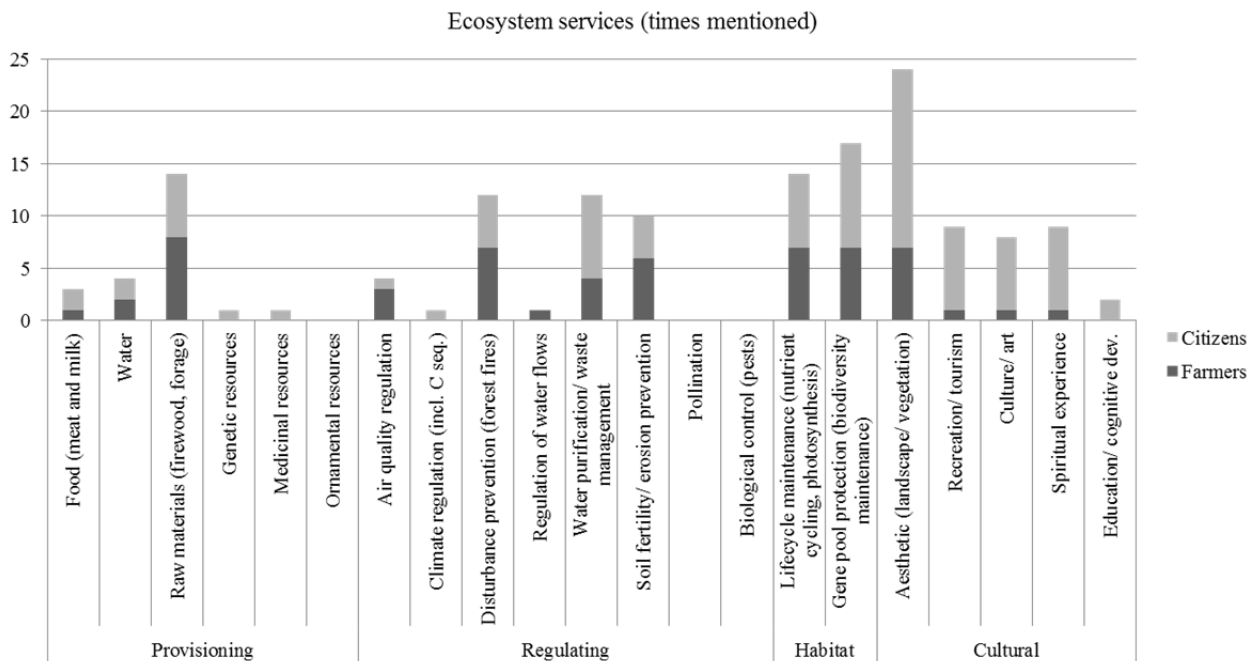


Figure 2: Number of times that different ecosystem services were mentioned in the FG

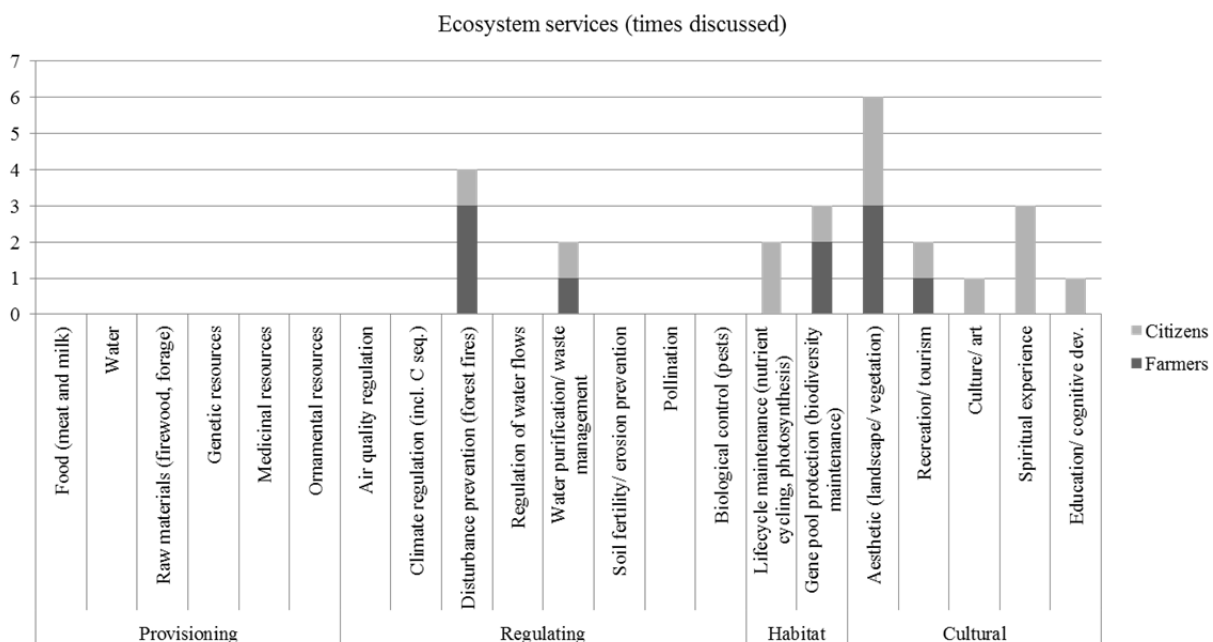


Figure 3: Number of times that different ecosystem services were discussed in the FG

Figure 3 shows the number of times that different ES originated discussions among FG participants. Two issues originated a large share of the discussions among participants; these were the maintenance of cultural landscape and natural vegetation and the prevention and control of forest fires (especially among farmers). The loss of cultural landscapes, the encroachment of vegetation and the risk of wildfires are often pointed out



as major concerns when discussing agriculture-environment interactions in Mediterranean conditions, for example Ruiz-Mirazo *et al.* (2011) and Riedel *et al.* (2013). All cultural ES originated a stronger debate among citizens, especially on issues related to spiritual experience (see Daniel *et al.* (2012) for a review on the importance of cultural services).

It is noteworthy the case of habitat ES. These basic ES were identified by participants but expressed in different manner to the formal terminology. For example, for lifecycle maintenance participants used other more familiar terms like “balance” and “equilibrium” of different components of nature. For gene pool protection, terms like diversity of wild species, flora and fauna, and biodiversity were used, but there were contrary opinions between farmers and citizens on the positive or negative effect of mountain farming of wild species and vice versa, as also pointed out by Ripoll-Bosch *et al.* (2012).

In general, the results indicate that farmers gave more importance to ES directly related to their own farming activity or local circumstances; whereas citizens showed in general more global concerns. These results are in agreement with Lamarque *et al.* (2011) that also found that ES that are more visible or familiar to humans, such as cultural landscape, are more easily identified and valued. Moreover, farmers and citizens valued differently some ES derived from mountain farming according to their capacity to satisfy individual needs or interests (Martín-López *et al.*, 2012).

A good understanding of the social demands in terms of ES should be required when designing agri-environmental policies. These policies should take into account the views of stakeholders with different roles and interests. However, although land use managers (farmers) and tax payers (citizens) have some divergent views, they also share a large number of concerns on the relationships between mountain farming and the environment and other sustainability issues not discussed here.

There is a need to establish concrete policy targets for the provision of public goods and objectively value (also in monetary terms) the positive externalities of pasture-based mountain agriculture, so we can compensate farmers in an equitable way for the public goods they deliver (Bernués *et al.*, 2011).

This study constitutes the base for a quantitative research on valuation (including monetary valuation) of ES derived from mountain farming systems in the Mediterranean and Northern Europe.

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