METHOD FACTSHEET

Photo-elicitation method

Introduction

This method aims to translate people's visual experiences and perceptions of landscapes in terms of ecosystem services. Although it's main objective is to explore the links between landscape features and social perceptions of ecosystem services. It has been particularly used to explore how landscape multi-functionality (defined as the capacity of ecosystems to provide ecosystem services to society) is related to public perceptions toward landscapes and ecosystem services (García-Llorente et al., 2012). This is based on the idea that visual stimuli could be understood as a socially shared communication channel, providing the potential to identify and analyse social perceptions of ecosystem services (García-Llorente et al., 2012, López-Santiago et al. 2014). Respondents specify the principal ecosystem services provided by each landscape from a list of potential services provided by the area (in some cases, this step is not conducted during the questionnaires but through an expert focus group; see García-Llorente et al., 2012).

Keywords

Landscape appreciation; Multi-functionality; Photo-questionnaire; Scenic beauty; Visual perception.

Why would I chose this approach?

This approach is useful to identify individual preferences associated with landscape views. First, it helps to explore whether people appreciate different landscapes and how they are related to different ecosystem services. If pictures are geo-tagged, when focusing on specific services, it could help to reflect in a spatially explicit way (with mapping) the areas where those services are most appreciated (hotspots) (Nahuelhual et al. 2013). Other possible objectives for its applications are: (1) to particularly explore which aesthetic value of landscapes constitute cultural ecosystem services (García-Llorente et al. 2012); (2) to assess how perceptions change when a landscape intervention is conducted (e. g. afforestation plan, river restoration, etc.) (Petursdottir et al. 2013) and (3) to understand whether there is a correspondence (synergy) or spatial trade-off between the ecosystem services perceived as provided by a particular landscape and the actual demand (Casado-Arzuaga et al. 2014; Casalegno et al. 2013).

The main problems associated with this method are the ones related to carrying out surveys (see Preference Assessment method factsheet). This approach could be applied to any ecosystem service that can be illustrated pictorially. This is more challenging for regulating services, but is especially promising for cultural ecosystem services (particularly aesthetic and existence values (García-Llorente et al. 2012).

The use of the approach depends on the decision context to which it has been applied, but it can be used for; 1) awareness raising, 2) to inform priority setting processes (hot spot analysis) and for 3) instrument design through the identification of the areas where specific ecosystem services are supplied and the identification of the human settlements where there is a high demand for such services.

This approach has been applied at project, county and regional scales, although is also suitable at national scales where different landscape units can be distinguished. It is worthy to note here that the higher the scale the more generic the photo-description of the ecosystem services. At the scale of the individual it can be very detailed (100 m^2 – 1 ha), but this highly resolved data can also be aggregated into larger spatial units (Nahuelhual et al. 2013).

What are the main advantages of the approach?

- Easy to understand and very dynamic, as long as respondents are receptive to its application;
- Can be used to assess a range of landscape views at the same time;
- It makes it possible to connect landscape views with ecosystem services or with more general landscape characteristics such as land-use patterns;
- Suitable to assess cultural services across a range of value types (e.g. spiritual, heritage, aesthetic);
- Results can help to identify potential conflicts between social groups through exploring the differences between stakeholders coming from different environments (e.g. rural-urban gradient).

What are the constraints/limitations of the approach?

- Some ecosystem services are not easily linked to the landscape views, being less visually evident (e.g. some regulating services);
- Photos only show a limited and framed view of the surrounding, captured at a specific moment in time (Petursdottir et al. 2013);
- In some cases, participants learn about ecosystem services during the interview or questionnaire. This 'learning happened' should be taken into account when interpreting results;
- Problems of generalisation with scale. It is important to have in mind that the higher scale, the more generic the photo description of the ecosystem services.

What types of value can the approach help me understand?

This method is suitable for uncovering and estimating socio-cultural values in quantitative and qualitative terms. It is suitable for exploring ecological values through the analysis of landscape features connected with different ecosystem services, particularly valued for the aesthetic appreciation of landscapes. It can also be used to estimate the instrumental values of nature's benefits (i.e. both use and non-use values of nature and ecosystem services).

How does the approach address uncertainty?

The method has limited ability to address uncertainty.

How do I apply the approach?

The data collection is required at different steps (see figure 1. below): (1) Identification of landscape units and selection of landscape views (and photographs) that are representative of the land units; (2) Photographs of the landscape views should maintain similar characteristics (e.g. constant weather, similar % of visible sky, etc.) to avoid biases; (3) Landscape views represented in pictures are ranked into levels (for example from 1= "do not like at all" to 5= "like very much"), according to how attractive participants find each picture (other criteria could be used); (4) Identification of main services provided by landscapes: respondents are asked to assess the degree of ecosystem services delivery by the different landscapes. In other cases, this latter step is not conducted during the questionnaires but through an expert focus group (see García-Llorente et al., 2012).

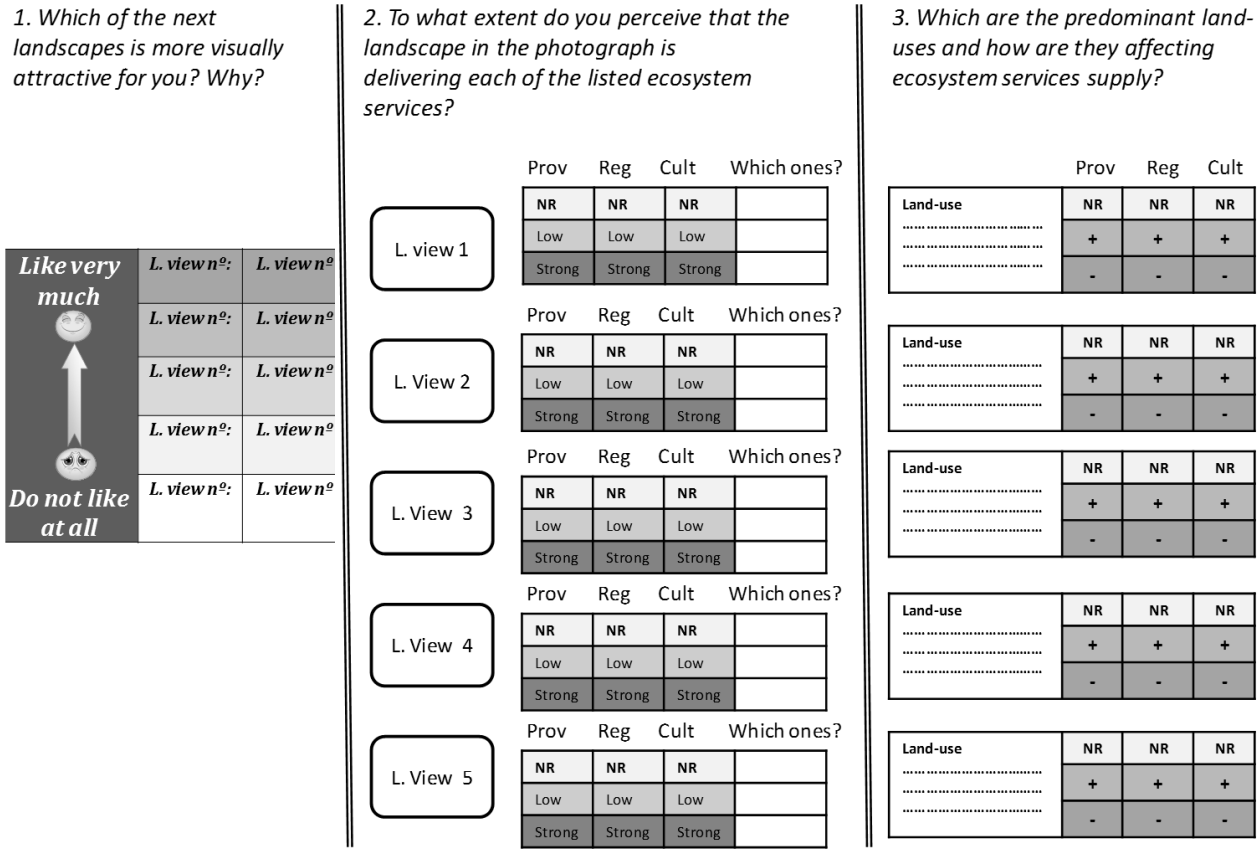

Figure 1. Methodological steps taken in a photo-elicitation survey related with preferences towards landscape views (based on García-Llorente et al., 2012). Not all the steps would need to be considered in an exercise, being stage 1 the key one. Landscape views relation with ecosystem services or with land uses are just potential complementary questions that could be assessed through other vehicles.

Requirements

Requirements		Comments
Data	☐ Data is available ☐ Need to collect some new data (e.g. participatory valuation) ☐ **Need to collect lots of new data (e.g. valuation based on surveys)**	
Type of data	☐ **Quantitative** ☐ Qualitative	Quantitative data is key, and qualitative data is recommended.
Expertise and production of knowledge	☐ **Working with researchers within your own field** ☐ **Working with researchers from other fields** ☐ Working of non-academic stakeholders	Working with researchers within your own field is required, including other fields is highly recommended. Non-academic stakeholders are the source of data gathering, however usually they do not participate in the data interpretation.

Software	□ **Freely available** □ **License required** □ **Advanced software knowledge required**	Statistical software is recommend to enrich the analysis performed.
Time resources	□ Short-term (less than 1 year) □ **Medium-term (1-2 years)** □ Long-term (more than 2 years)	Time required involve a minimum of 12 months (selection of landscape views, questionnaire design, data gathering in field, data analysis).
Economic resources	□ Low-demanding (less than 6 PMs) □ **Medium-demanding (6-12 PMs)** □ High-demanding (more than 12 PMs)	
Other requirements	-	

Where do I go for more information?

Contact: Marina García-Llorente (marina.garcia.llorente@madrid.org) and Berta Martín-López (martinlo@leuphana.de)

Casalegno S, Inger R, DeSilvey C, Gaston KJ (2013) Spatial Covariance between Aesthetic Value & Other Ecosystem Services. PLoS ONE 8(6): e68437. doi:10.1371/journal.pone.0068437

Casado-Arzuaga, I., M. Onaindia, I. Madariaga and P. Verburg (2014), 'Mapping recreation and aesthetic value of ecosystems in the Bilbao Metropolitan Greenbelt (northern Spain) to support landscape planning', Landscape Ecology 29, 1393-1405.

García-Llorente, M., Martín-López, B., Iniesta-Arandia, I., López-Santiago, C.A., Aguilera, P.A., Montes, C. 2012. The role of multi-functionality in social preferences toward semi-arid rural landscapes: An ecosystem service approach. Environmental Science & Policy 19-20: 136-146.

López-Santiago CA, Oteros-Rozas E, Martín-López B, Plieninger T, González E, González JA. (2014) Using visual stimuli to explore the social perceptions of ecosystem services in cultural landscapes: the case of transhumance in Mediterranean Spain. Ecology & Society 19 (2): 27. URL: http://www.ecologyandsociety.org/vol19/iss2/art27/

Nahuelhual, L., Carmona, A., Lozada, P., Jaramillo, A., Aguayo. M. (2013) Mapping recreation and ecotourism as a cultural ecosystem service: an application at the local level in Southern Chile. Applied Geography, 40, 71–82.

Petursdottir, T., Aradottir, A. L. and Benediktsson, K. (2012) An evaluation of the short-term progress of restoration combining ecological assessment and public perception. Restoration Ecology 21, 75-85.

Factsheet prepared by Marina Garcia Llorente and Berta Martin-López