DE4 (Märkische Schweiz, Germany): Analysis of Residents and Visitors Preferences of different Landscape Attributes using a visual choice Method

Objective

The main objective of this ad-hoc study was to investigate local residents' and visitors' visual preferences in an agricultural landscape, determining an important aspect of the landscape's cultural ecosystem service. The empirical study focusses on the differences between individual landscape attributes (presence of grazing livestock, crop diversity, linear green elements (i.e. hedges and tree rows), and green point elements (single and groups of trees, bushes, vegetation around pond). By using a visual choice experiment approach, we will answer the following three questions: (1) What is the level of preference for the different landscape attributes in the case study region? (2) Is there a universal preference pattern, or do users differ in their preferences, and if so, to what extent? (3) Which socio cultural characteristics determine landscape preferences and the possible heterogeneity among the respondents?

Methodology

We applied a stated-choice method that used photorealistic landscape images to assess how different landscape attributes were perceived in the case study region. Respondents were given a set of alternatives from which they could choose the most preferred image. The methodological advantage of using those images is the strong control over the attribute's visual representation and combination thereof. The four selected attributes (presence of grazing livestock, crop diversity, linear green elements, and green point elements) are differentiated into 3 levels (low, medium, high) or 2 levels (present, not present), respectively. The survey was conducted in July 2013 (*N*=200). The visual value of different landscape attributes was assessed using photorealistic images (Fig. 1).

Figure 1 Example of images with different levels of the 4 landscape attributes from a series of 54 photorealistic images.

Results

Generally, we found a general preference for a high abundance of all kind of landscape attributes. The more structured a landscape, the more favored it is. Regarding the attribute-level differences, the visual quality of the landscape is especially determined by point elements (level 3 & 2) and linear elements (level 3), followed by crop diversity (level 3) and grazing livestock (level 2), which are less important (Tab. 1).

Table 1. Results from the estimated MNL model with markings for the first four ranks of preference.

Attribute	*Level*	*Coefficient*	*Rank*
Grazing livestock	1 not present	0.00	8
	2 present	**0.75**	**5**
Cropping diversity	1 low	0.00	8
	2 medium	0.13	7
	3 high	**1.03**	**4**
Green linear elements	1 low	0.00	8
	2 medium	0.22	6
	3 high	**1.38**	**2**
Green point elements	1 low	0.00	8
	2 medium	**1.18**	**3**
	3 high	**2.10**	**1**

Another finding revealed that not all respondents have the same preference. Analysis of heterogeneity of the sample identified three different groups of respondents, with nearly the same size. There three groups possess very different preference pattern. Whereas, the first group strongly prefers high levels of crop diversity, green linear elements as well as the presence of grazing livestock in the landscape, the second group shows clear preferences for a rather empty and cleared landscape rejecting higher levels of crop diversity and linear elements. Also in favor for high attribute levels, the third group prefers green point and linear elements.
Because the preferences of group 1 and group 3 are relatively similar, one can say that 70 % of respondents clearly prefer structured landscapes. For them structuring elements such as trees, vegetation around ponds, hedgerows and tree lines have a high aesthetical value. This information is of importance, if these elements are endangered as a result of field enlargement and intensive agrarian practice.

In the assessment of the influence of socio-economic characteristics of respondents on the preference, we found that women have a considerably stronger preference for animals in the landscape than men. Also the age, connection to the landscape, activities in the nature, and attitude and value setting have an influence on the landscape preference. Very strong is the influence of the level of education. The higher the education, the higher is the preference for more structured landscapes (more crop diversity and more linear and point elements). A difference between the preference of visitors (mainly city dwellers from Berlin) and residents of the region could not be found.

Links connecting agents and causal connections through which landscape can potentially affect rural economies and societies

Natural and landscape amenities, such as managed landscape elements of high visual quality play an important role for the regional competitiveness and quality of life of the local population. It has been found in the ad-hoc study that most visitors in the region come on a day-trip basis for outdoor activities, including bicycle riding, hiking and horseback riding. These activities are closely linked to the landscape amenities. To some extent these activities are directly linked to economic turnover (guided tours, horse-keeping farms, etc.). However, it has been found, that many visitors also make use of additional cultural, hospitality and accommodation services in the region, which in turn

generates additional turn over, income, jobs, and business opportunities in tourism and related business networks. Natural amenity (attractiveness of a place) as territorial asset contributes to the regional development, economy and welfare, by improving its recreational value, quality of life of the local community, attractiveness as housing location and tourism. Valorising a region's amenity can therefore contribute to a positive socio-economic development.

Lesson learned / Policy Recommendations

Single characteristics of landscape (attributes) are of great importance for the visual quality of a landscape. And landscape management measures (mainly by the European Common Agricultural Policy (CAP)) have an impact on these landscape attributes like crop diversity, green linear and point elements. The measures first of all aim at environmental targets, while neglecting aesthetic values. But considering visual qualities and including an aesthetic value perspective (next to environmental values) would lead to a multi-objective targeting of policies, supporting a diverse set of ecosystem services.

The rural economy and competitiveness can be supported with policies targeting at maintaining and establishing the considered landscape attributes. Higher levels of attributes, such as a greater diversity of crops, more hedgerows and trees, and grazing livestock, would valorise landscape scenery and therefore cultural ecosystem services. The new CAP with the greening measures to (i) assign agricultural land as ecological focus areas (buffer strip, afforested areas) and to (ii) enhance crop diversification can make an important contribution in this direction.

Scale enlargement and intensification of agricultural practices are a threat to landscape structures and elements, as they are vanishing. This causes negative effects on landscape aesthetics and therefore the capacity to deliver cultural ecosystem services, affecting regional quality of life and economic activity and thus the socio-economic development and competitiveness as a whole.

Socio-economic characteristics of users of the landscape have an influence on the perception of landscapes. People do not have a common preference pattern. Therefore it is necessary to individually assess preferences in regions.

Reference

Häfner, K., Zasada, I., van Zanten, B.T., Ungaro, F., Piorr, A. (in review). Assessing Landscape Preferences: A visual choice experiment in the agricultural region of Märkische Schweiz, Germany. *Landscape Research.*

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