



Measuring societal awareness of the rural agrarian landscape: indicators and scale issues

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INTRODUCTION

1.1 Policy context of the study

The work presented in this report is part of the effort carried out by the Joint Research Centre of the European Commission to define the landscape state and diversity indicator in the frame of COM (2006) 508 “Development of agri-environmental indicators for monitoring the integration of environmental concerns into the common agricultural policy”.

The Communication classifies the indicators according to their level of development, which, for the landscape indicator is “in need of substantial improvements in order to become fully operational”. For this reason a full re-definition of the indicator has been carried out, following the initial proposal presented in the frame of the IRENA operation (“Indicator Reporting on the Integration of Environmental Concerns into Agricultural Policy”, launched after the publishing of the COM (2001) 144 final “Statistical Information needed for Indicators to monitor the Integration of Environmental concerns into the Common Agricultural Policy”).

The new proposal for the landscape state and diversity indicator is presented in the Report EUR 25114 (Paracchini and Capitani, 2011). The indicator is structured in three components: the first concerns the degree of naturalness, the second landscape structure, the third the societal appreciation of the rural landscape. While the first two components rely on a strong bulk of existing literature, the development of the methodology has made evident the need for further analysis of the third component, which is based on a newly proposed top-down approach.

This report therefore presents an in-depth analysis of the third component of the indicator, carried out by a consortium lead by Alterra Wageningen UR, and composed by the University of Reading and the University of Copenhagen, with contributions from the University of Evora and the University of Florence.

1.2 Context

The landscape addressed by the indicator is the one targeted by the CAP, identified broadly as rural-agrarian landscape. Its mere extension is intended as the soil surfaces where the agricultural activities (cultivations, grazing etc.) take place, plus the areas of natural/semi-natural vegetation functional to the agricultural management (hedges, field margins, ditches etc.), rural buildings and structural elements (dry walls, terraces etc.). As a wider concept the rural-agrarian landscape is a cultural landscape composed by spatial units characterised by the interrelation of different but identifiable components such as natural conditions/farming traditions/farming systems/cultural heritage, and the people who manage the landscape (the farmers).

The indicator component on societal appreciation concerns the ways society perceives, values and assesses landscape quality; the ways society plans, manages, and uses the landscape for productive or non productive purposes. This involves the assumption that such interest can be demonstrated by the regulations on landscape protection and the use and enjoyment that society makes of this type of landscape.

There are some constraints in the definition of the methodology:

- the indicator must be operational, therefore it has to be calculated on the basis of existing data, or data that become available in the short period;

- it is part of a monitoring frame, therefore the whole exercise of calculating the agrienvironmental indicators will be routinely repeated, and both methodology and data must allow doing so;
- the component addressed in this study is one of three components of one out of 28 indicators of the agrienvironmental framework identified in COM(2006)508, therefore it can address issues not already covered by other indicators (Paracchini and Capitani, 2011 – Annex 1)
- the aim of the study is not to measure landscape perception by individuals.

1.3 Objectives

The study presented in this report aims at providing a sound scientific basis to understand potentialities, limitations, and possibilities for further implementation of the indicator component on societal appreciation of the rural-agrarian landscape. Results can be used as well to provide recommendations for further data gathering at the EU level.

The aims of the study are:

- to verify if the methodology is sufficiently robust to be applied at different scales of analysis;
- to verify how the level of detail requested to illustrate societal appreciation changes across scales;
- to provide feedback to the exercise carried out at the EU scale, by verifying that all relevant components of the indicator have been taken into consideration, or to propose additional components for a better indicator definition.

The study therefore comprised the following steps:

1. Transposition of the methodology from the EU to the regional scale. Five regions in the EU have been identified (see Table 1:), representing different types of agricultural traditions and rural landscape. These regions contain a representative number of LAU2 polygons. The LAU2 level has been used as the reference level for data processing. The indicator has been calculated following exactly the protocol of the indicator as calculated at the EU level.

2. Implementation and calculation of the indicator on the basis of data available at regional level. An inventory has been made of alternative data sources on both European and regional level. For example certified products to be derived from regional data that are related to a specific landscape or land cover. The criterion selection for certified products has been tested. At the EU level a selection was made of certified products that have a link to landscape management, at regional level this can be done with a higher level of awareness.

3. Identification of those elements that can be used as a proxy for the awareness that society has of the rural landscape at regional level. The possibilities to include ‘complementary’ elements (indices) based on available data on European and regional level has been evaluated. This might give an indication of regional diversity across Europe. The indicator has been calculated including this additional information.

4. Analysis of the results, the analysis or results includes a critical analysis of constraints relative to the downscaling of the methodology, suggestions have been made on elements that could be included and data that might be gathered.

2 THE EU indicator on societal appreciation of the rural-agrarian landscape

The indicator is a linear combination of three indices, which refer to aspects representing the link society-landscape as mentioned above (*“the ways society perceives, reads and assesses landscape quality; the ways society plans, manages, and uses the landscape for productive or non productive purposes”*):

- society protects valuable landscapes that are considered as a common resource;
- it uses and enjoys the natural capital providing a recreational service;
- it consumes the products of the landscape and provides a market for such products sufficiently steady to guarantee the subsistence of the market itself, of the community providing the product and therefore, indirectly, of the associated landscape (Gauttier 2006).

Such aspects can be described through the following variables:

1. Agricultural areas in protected and valuable sites;
2. Tourism in rural areas;
3. Certified products, including food and spirits under the Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI) schemes, and wines under the Vin de Qualité Produit dans des Régions Déterminées (VQPRD) scheme.

In practice:

the first variable is the share of agricultural area in protected and valuable sites, specifically Natura 2000 sites, World Heritage Unesco sites related to agricultural landscape, European nationally designated areas, and category V – World Protected Areas. Many sites were included in more than one dataset, and so a unique database was built in order to avoid redundancy. Agricultural areas were extracted by CLC2000 taking into account all agricultural classes and the class “Natural grassland”. The index was calculated as the surface of agricultural area included in protected and valuable sites in each NUTS2 region.

The second variable is related to tourism activity in rural areas, for which data are both fragmented and incomplete at European scale. Therefore it was calculated according to FSS (Farm Structure Survey) declarations for “Tourism as other gainful activity”. The data refer to all activities in tourism, accommodation services, showing the holding to tourists or other groups, sport and recreation activities etc. where either land, buildings, or other resources of the holding are used. Despite of the fact that these data do not represent the whole touristic activity in rural areas, they are the only ones available for almost all Europe, at regional resolution. Data are missing for the following regions: Eastern and South Western Scotland, Highlands and Islands in the United Kingdom and Île de France in France. FSS statistic data from 2001 to 2005 were used, and for each region data were chosen from the last available date. The index was calculated as the number of holdings having Tourism as “other gainful activity”.

The variable for certified food and wine products was calculated from two different datasets. Firstly, PDO (Protected Denomination of Origin) and PGI (Protected Geographical Indication) products linked to landscape state and diversity were selected from the DOOR database (EC, DG Agriculture, <http://ec.europa.eu/agriculture/quality/door/>). The selection was based on the following criteria:

- 1) the product itself creates a specific landscape (i.e. vineyards, olive groves, etc.);
- 2) the production area is characterized by a particular landscape (i.e. montados, bocages, alpine meadows, maquis, etc.);
- 3) the production is explicitly related to the preservation of the landscape's characteristics;
- 4) the production is the result of a traditional management of rural landscape.

A geo-database of the spatial distribution of selected PDO and PGI products was created at NUTS3 level, according to the information on the production areas provided by producers. Then, the number of different certified product per NUTS2 region was calculated.

The inventory of wine produced under the VQPRD scheme (Vin de Qualité Produit dans des Régions Déterminées) was used to include information on wine areas, since VQPRD wines were not included in PDO or PGI schemes at the moment of calculations. For VQPRD wines, data on the number of certified products were only available at Member State level, thus data on the cultivated surface (ha) extracted by the "Inventory of quality wines produced in specified regions" (<http://ec.europa.eu/agriculture/markets/wine/prod/inventaire.pdf>) was used, available at NUTS2 level. The index was calculated as the surface under cultivation of quality wines produced in specified regions.

Taking into account that the PDO/PGI index was calculated as number of products whereas the VQPRD index was calculated as hectare of cultivated area, different weights had to be assigned to the two indices in the sum. These were calculated at country level, according to the proportion of PDO/PGI products and VQPRD wines on the total amount of products. The number of wines under VQPRD scheme was derived from the E-Bacchus database for each country (EC, DG AGRICULTURE <http://ec.europa.eu/agriculture/markets/wine/e-bacchus/>). The two rescaled indices were then weighted and summed.

All indices have been standardized by the UAA and rescaled to 0-10 range by means of Minimum-Maximum (Min-Max) method:

$$(1) I_{\text{rescaled}} = ((I_{\text{norm}} - I_{\text{min}}) / (I_{\text{max}} - I_{\text{min}})) * 10$$

Where:

I_{rescaled} is the result of the rescaling and final value of the index

I_{norm} is the result of the normalisation on the UAA

I_{min} is the minimum value of the population of I_{norm} calculated at NUTS2 level

I_{max} is the maximum value of the population of I_{norm} calculated at NUTS2 level

Finally, the three indices, equally weighted, were summed up to the final indicator which can range from 0 to 30. Results are illustrated in Figure 1, please see Appendix 5 and Paracchini and Capitani 2011 for the final version of this indicator.

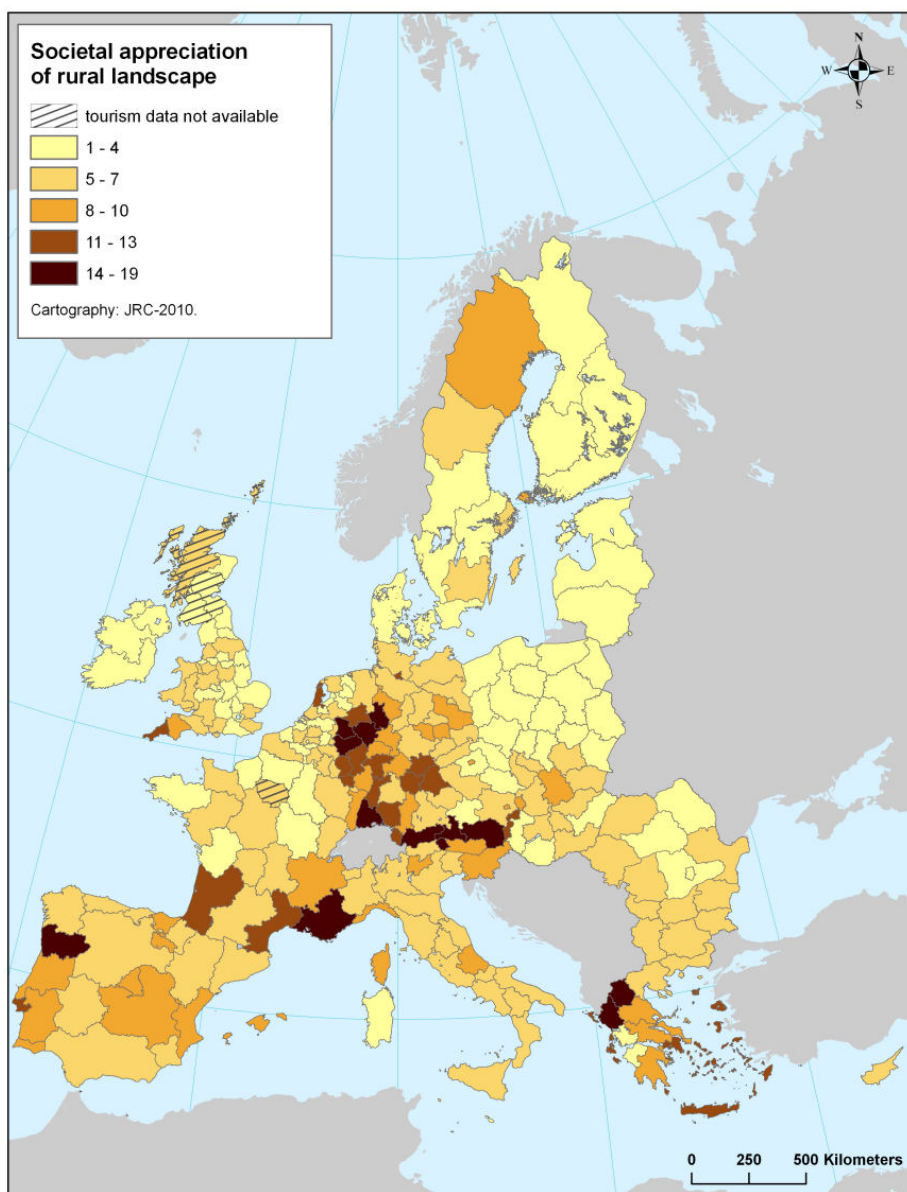


Figure 1: Distribution of societal appreciation of the rural landscape per NUTS2 region in Europe, as calculated according to a combined proxy indicator, including, per reference area, total protected agricultural area, farm units with income derived from tourism, and certified products with a link to landscape management. Please see Appendix 5 and Paracchini and Capitani 2011 for the final version of this indicator.

3 METHODOLOGICAL APPROACH

Five regions have been identified as test regions to carry out the downscaling of the indicator protocol. The identified unit of reference is LAU2 (municipal level). The regions represent different types of agricultural traditions and rural landscape (see case study regions in Table 1).

Table 1: Case study regions

Name		Type of agricultural tradition and rural landscape	Number of LAU2 polygons
Southern Denmark	DK	Intensively used agricultural landscape	22 municipalities (LAU1), 200 parishes (LAU2)
West Midlands	UK	Diversity of landscape is reflected in a diversity of farming types, including lowland grazing, arable in the east, including horticulture. In the north intensive dairy farming is common and the upland fringes are LFA.	171 MSOAs (lying between LAU1 and LAU2)
Groene Woud (province Brabant)	NL	Intensively used agricultural landscapes with high recreation and landscape values	26 municipalities (LAU1)
Tuscany	IT	Very diversified agricultural landscape with a great diversity of traditional food and beverages	10 Provinces (LAU1) and 287 municipalities (LAU2)
Alentejo	PT	Generally very low density of population, and concentrated settlement. Extensively used agricultural and silvo-pastoral landscape, maintained mainly through extensive grazing systems. These are combined with relatively smaller areas of small scale olive groves, mostly around small towns. There are also recently areas of intensive agriculture, with irrigation.	47 municipalities (LAU1)

3.1 Downscaling the EU Landscape Social perception indicator based on complementary European and regional data sets

The current study can be subdivided in three different sections:

Part 1 - Downscaling the EU landscape societal appreciation indicator to regional level

The initial task of the downscaling exercise is to provide European contextualisation by transposing the methodology from the EU to the regional scale and calculating the indicator at LAU2 level. This serves as reference for the analysis of the results.

Secondly an inventory of additional European and regional data to strengthen the EU indicator is carried out, to identify complementary landscape indicators which are considered to more adequately represent the regional landscape values of the case study regions. This is provided for all three assessment levels of the European indicator, namely (a) the presence of certified products (PDO and PGI), (b) tourism in rural areas (FSS data) and (c) agricultural areas in protected sites (designated areas). In the case of certified food products, the current European approach can in fact be strengthened by identifying data sets that inform about the spatial extent (surface area) of regional products associated with traditional landscapes (e.g. biological agricultural product networks such as Galloway livestock keeping, Organic asparagus farms, or on-farm product outlets). Though such a search is likely to involve private enterprise networks and might face insufficient European-wide data coverage and consistency, opportunities not yet discovered can be expected. In the case of tourist facilities, existing European information on rural camping beds (Wascher et al.

2008) might offer valuable opportunities. The international data on agriculture in protected areas could be referenced against designation as 'national landscapes' and also regional categories.

Part 2 - Downscaling the EU landscape societal appreciation indicator based on complementary European and regional data sets

It consists in identifying landscape dimensions not taken into account at the EU level, but that are relevant at the regional scale, that better characterise landscape appreciation taking into account regional variability across the EU, and for which data are locally available. The challenge here is to use the bottom-up approach of the case study research for identifying a complementary set of elements (indices). An example for complementary indices at the regional level is the presence of vernacular structures and architecture that reflects the type of products (e.g. in North-Brabant the relatively high density of cloisters, churches and other religious landmarks - in this case making reference to historical role of the church for wine import). For the index on tourism in rural areas, data on countryside weekend houses, rural recreational facilities, and multi-functional farm management structures (e.g. educational facilities) offers complementary possibilities. Protected area information can be complemented by inventories on natural monuments such as trees, Parks, cloister gardens etc.)

Part 3 - Validation of the EU landscape societal appreciation indicator

The third section of the study has three distinct components. The first is the validation exercise, involving the comparison of the outcomes of the previous steps, and the second is a critical analysis of the constraints of downscaling the EU landscape appreciation indicator. The final task is to produce a set of recommendations for improvements to the landscape appreciation indicator through changes to data collection and the addition of new, complementary variables to the compound indicator. Because of the nature and scope of these questions, it is appropriate that some of them be undertaken at the case study level, by the individual national teams, while other questions and issues are more appropriately addressed at the supra-national level, including by cross country comparison. By means of these three components of the study, it was intended to address a series of questions framed by the paper of Paracchini, et al. (2010):

- What are the consequences of the disaggregation to the LAU1/2 level?
- What could be measured at the local scale?
- Are the assumptions made at the EU level still applicable at a different scale?
- Are there mechanisms related to the selected proxies that are not visible at high levels of governance and become relevant at lower levels?

The work programme proposed to address the above questions is outlined below. For ease of understanding, it should be noted that the terms indicator and classification are used interchangeably.

1. Comparison of outcomes from 1) and 2)

The comparison addresses two primary questions: (i) the effect on the classification of the switch from EU-scale to national and regional datasets. The implication here is that use of locally available data will improve the accuracy of the classification at these scales; (ii) the impact on the classification of the addition of alternative and additional complementary elements (indices). In addition, value judgements should be made about the appropriateness and accuracy of the classifications resulting from these approaches.

A challenging aspect of the study is the development of a validation method – what criteria can be employed to determine whether the new mapping, across all case study areas, is an improvement on the macro-scale approach currently employed.

The questions addressed by these subtasks are:

For the downscaling of EU data

- What are the differences between the EU indicator and the downscaled indicator?
- How does the performance on each of these indices vary over different landscapes/farming systems among and within the case study regions?

For the use of locally available data

- To what extent can deficiencies identified with the use of EU data be rectified through greater data resolution, i.e. use of local data?
- What changes take place in the classification as a result of using locally available data?
- How might these differences be explained?
- Which of the variables are most affected?

For the use of complementary variables

- To what extent are alternative indices required to remedy deficiencies?
- How does use of more and complementary elements (indices) enrich the classification in terms of how they characterise different areas?

Common questions

- Extent to which use of local datasets and complementary elements (indices) increase level of differentiation between areas
- Which approach produces the most reasonable outcome?

These questions have been addressed at the case study and, where appropriate, landscape level, through literature review and reference to relevant local studies, and by expert judgement, supplemented by small-scale stakeholder consultation where necessary. The validation refers to stakeholders with an interest in the future management of landscapes e.g. local authority planners, national park officers, wildlife and conservation officers, rural tourism officers etc.

2. Critical analysis of constraints to downscaling

The outputs from the case study analysis feed into the critical analysis undertaken at the EU level, which has reviewed the outcomes arising from the case studies and identify more generalised trends and principles, based on the following questions:

- What weaknesses in the various downscaled classifications are evident in each case study?
- What common ground exists in terms of weaknesses?
- What common ground exists in terms of the data/complementary indices that might improve the classification?
- What data is currently available at EU level to improve the classification?
- What data would need to be collected and how feasible would it be to do this?

While the above questions form a useful framework for enquiry, a number of other specific issues have also been discussed, especially with stakeholders, some of which are outlined below.

A key issue is the appropriate scale at which to apply the landscape appreciation indicator/classification, i.e. at what scale would the classification be most valid - at the scale at which

policies for agriculture, environment and rural development are administered, or at the (more local) scale at which the impacts of these policies are best monitored?

If it is deemed most appropriate that the classification is applied at the level of policy administration, i.e. at a more aggregate level, what would be the implications of the associated loss of local variation in the measure of landscape appreciation?

What consideration should be given, if any, to the fact that some dimensions of the classification are impacted by factors other than landscape appreciation, for example levels of economic and social development and geographic location?

3. Recommendations for possible improvements to the appreciation indicator

A critical component this last sub-task is to review the results from across the five Case Study Sites in a robust and consistent manner. It is anticipated that, given variations in the physical and historical landscape between sites, there will be a range of approaches adopted based on locally available data. The task is to review these approaches and to distil and present best practice by way of recommendations, especially where the particular approach delivers a method with the potential to be rolled out across the EU27.

4 PART 1 - Downscaling the EU landscape societal appreciation indicator to regional level

4.1 Transposition of the methodology from the EU to the regional scale

In the first part of the study (hereafter referred to as “Part 1”) the methodology used in the Pre-study (see appendix 1) was transposed to LAU2 regions in the five case study areas (Alentejo, Brabant, Southern Denmark, Tuscany and Wets Midlands). The following subsections describe how the methodology was transposed and the deviations from the methodology of the Pre-study.

4.1.1 Agricultural areas in protected and valuable sites

Concerning the index on agricultural areas in protected sites it was possible to follow the same method as in EU indicator using GIS maps of the LAU2 regions instead of NUTS2 regions. So, the analyses are overlays of:

- The GIS map of protected areas including Natura 2000 areas, World Heritage List of UNESCO, the European inventory of nationally designated areas (CDDA) and World Database of Protected Area from IUCN (category V areas)
- Agricultural area defined as agricultural classes (class 2) and natural grassland (class 3.2.1) from CORINE
- The administrative borders (LAU2) for each region (in the case of Alentejo the LAU1 – municipality borders- was used)

The index is calculated in each region as the percentage of the agricultural area overlapping with the protected areas.

Results are then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method, using equation (1) ($I_{\text{rescaled}} = ((I_{\text{norm}} - I_{\text{min}}) / (I_{\text{max}} - I_{\text{min}}) * 10)$). Firstly, this is done using the minimum-maximum range for all study regions. Secondly, to illustrate potential shortcomings of the scaling at EU-level, this is done using the minimum-maximum range within the region only for Southern Denmark.

The method used in this note differs from the method used in the EU indicator in only one minor aspect: some regions in West Midland and a few regions in Denmark, Tuscany and Brabant have been filtered out as they have no UAA.

4.1.2 Tourism in rural areas

The index for tourism in rural areas uses the same calculations and data input as the EU indicator, that is the data from FSS on the number of farms “with other gainful activities” from tourism. Also the data on the size of the agricultural area was taken from the FSS database (see note on Brabant below).

The index was calculated as number of farms with other gainful activities from tourism normalised by UAA.

For each region the results were then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method. This was done using the minimum-maximum range for all study regions. However, a maximum value of the index was applied when calculating the range (see note below).

Only results on Alentejo, Brabant and Tuscany are included in this report. In West Midlands and Southern Denmark the FSS data the data are not available at the LAU2 level due to disclosure rules and inconsistencies at this level due to sampling.

The method used in this report differs from the method used in the EU indicator in three aspects:

1. Some regions are filtered out as they have no or very small UAA (< 50 ha)
2. For Brabant no data on agricultural area was available from the FSS and the UUA based on Corine classes was therefore used.
3. Furthermore, it became clear that in a few regions the calculated index would have extreme values. This is the case for some municipalities in Tuscany, where the 273 regions with the lowest values have below 20 farms with tourism per 1000 ha while the 14 with the highest values ranges from 20 – 333 farms/100 ha. This causes serious problems showing scaled results for Tuscany and when scaling other regions to EU range. It was therefore decided that the maximum value of the index used to define the range should be 10. All regions with more than 10 farms with farm tourism per 1000 ha will therefore be ranked with a score of 10.

4.1.3 Certified products

For the index on certified products the number of PDO/PGI/ VQPRD products per LAU2 regions is used for the calculations. These data were available for the regions Alentejo, Tuscany and West Midlands, whereas for Brabant and Southern Denmark no products are registered.

For each region the results were rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method. Firstly, this is done using the minimum-maximum range within the region only. Secondly, this is done using the minimum-maximum range for all study regions.

The method used in this study differs from the method used in the EU indicator in four aspects:

1. The number of products is not normalised by the agricultural area. When normalising with the UAA the results becomes quite skewed due to the uneven size of the LAU2 regions in the different case study areas combined with the fact that the landscape products normally are/can be produced in areas larger than the LAU2 regions. For example: West Midlands has 808 regions with an average UAA 1310 ha and Alentejo has 47 regions with an average UAA 36924 ha.
2. In this study wine regions are included as number of certified wines per LAU2 region. In the EU indicator wine areas are included as the surface under cultivation of quality wines.
3. The number of products counts equally whether it is wine or food product. In the EU indicator the ranks were firstly calculated separately for food and wine (as one was in numbers, the other in hectares). These two ranks were then added by using weights according to the number of wines and food products at the national level.
4. When moving to a lower regional level some regions are predominantly urban and have no agricultural area. In this study this is the case for some regions in West Midland. In theory landscape related high quality products can be grown in these regions, but in practice it does not make sense to perform the calculation as no agricultural area is available for the production. Regions with no agricultural area are therefore filtered out. As some regions with very small agricultural area have extreme values for the index all regions with less than 50 ha UAA is not included. Such threshold was set following the analysis of the statistical distribution of values, and the identification of a minimum size for a landscape unit.

4.1.4 Combined indicator of societal appreciation of the landscape

Finally, the combined indicator has been calculated. This is done by adding the values for all three indices as scaled to the EU-range. This gives a potential score of 0 to 30, which is then rescaled to 0 –

10 with the Minimum-Maximum standardization method. The actual highest score before the rescaling (F_{max}) is 21.14 occurring in Alentejo. The actual lowest score before the rescaling (F_{min}) is 0.

Note here that for the calculation of the combined indicator not all three indices are included for all regions. For farm tourism data was not available at LAU2 level for West Midlands and Southern Denmark. On the contrary, the fact that no PDO/PGI products were actually registered in Southern Denmark does not constitute a methodological problem. The combined indicator is therefore based on all three indices only in Tuscany and Alentejo.

4.2 Calculation of the EU landscape social appreciation indicator at regional level

In the following sections the results are presented of the calculation of the three indices at regional level.

4.2.1 Agricultural areas in protected and valuable sites

The maps in Figures 2 to 6 show the results of downscaling of the index on agricultural areas in protected and valuable sites in the five case study regions. The overall impression of the downscaling to LAU2 is that the differentiation within the regions is quite high. The finer detail of the LAU2 regions therefore appears to be more suitable for identifying the overlap between agricultural land and valuable and non-valuable areas.

In general the differentiation within the regions is not disguised when applying the rescaling at EU-level. In three of the four regions, Brabant, Tuscany and West Midland, no rescaling at all is implemented as these regions have LAU2 regions with 0 as well as 100% of the agricultural area under nature protection. In Alentejo there is a very minor rescaling as the highest percentage of the agricultural area under nature protection in a LAU2 region is 99.4%. Only for Southern Denmark the rescaling leads to severe changes as the highest percentage the agricultural area under nature protection in a LAU2 is as low as 48.1%. To illustrate the potential shortcoming of applying the scaling to the EU-level range the map in Figure 7 shows the results for the Southern Denmark region of downscaling the index, but scaling the results only to the range within the region. As can be seen this does not change the overall picture dramatically, so even for intensive agricultural regions the downscaled index can be applied ranking to the EU-range.

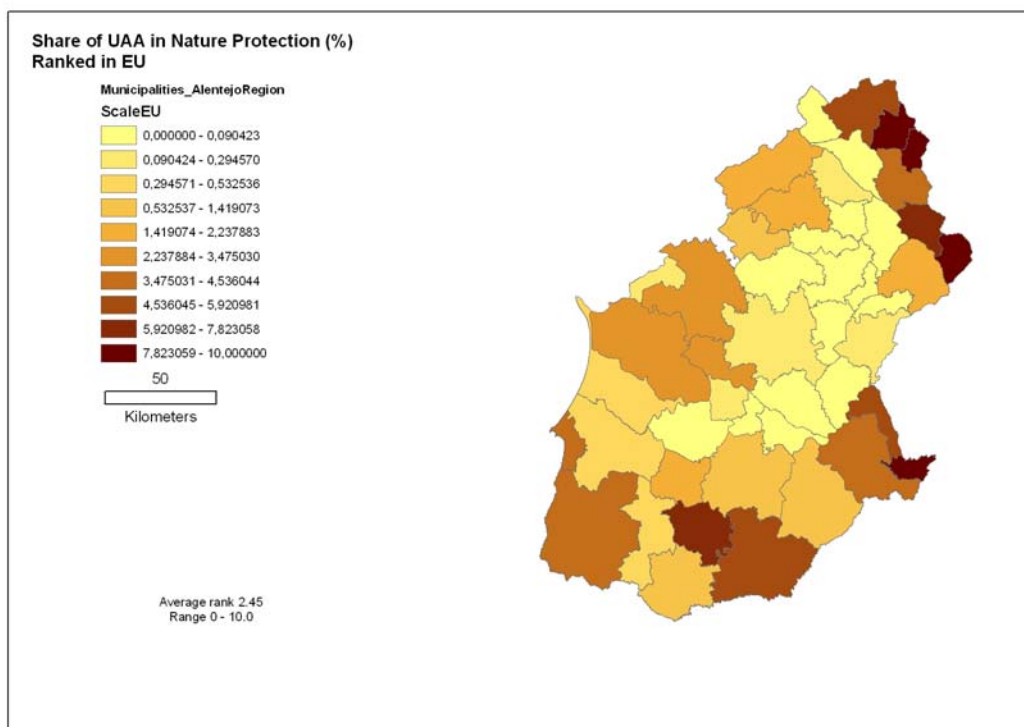


Figure 2: Index on agricultural areas in protected and valuable sites (ranked in Europe) downscaled for the case study region Alentejo

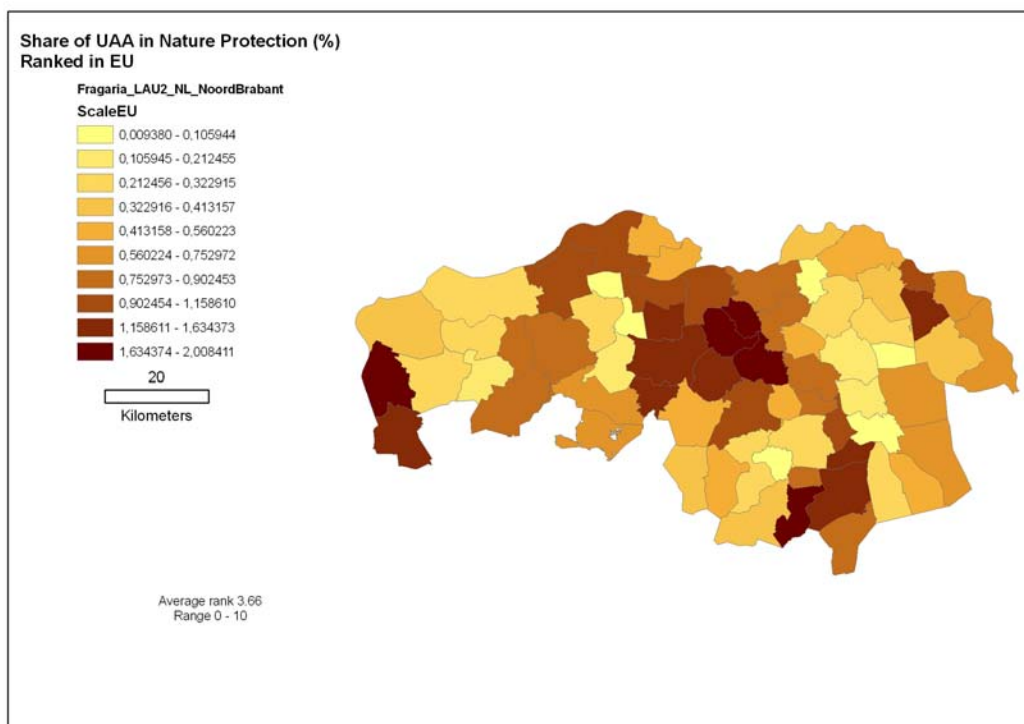


Figure 3 Index on agricultural areas in protected and valuable sites (ranked in Europe) downscaled for the case study region Groene Woud (Brabant)

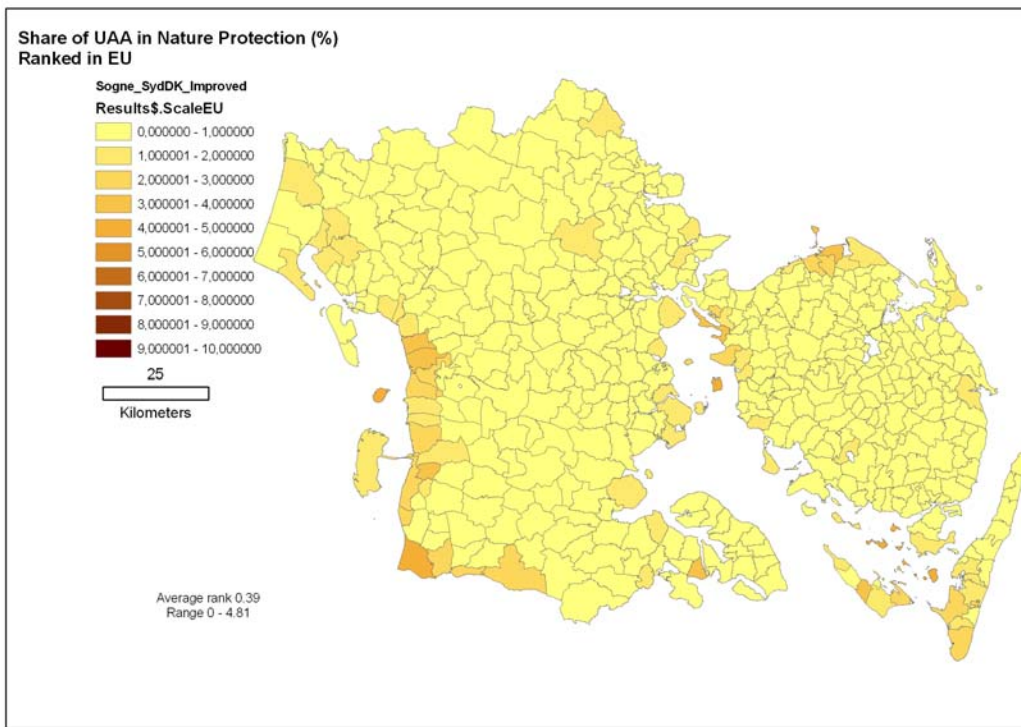


Figure 4: Index on agricultural areas in protected and valuable site (ranked in Europe) downscaled for the case study region Southern Denmark.

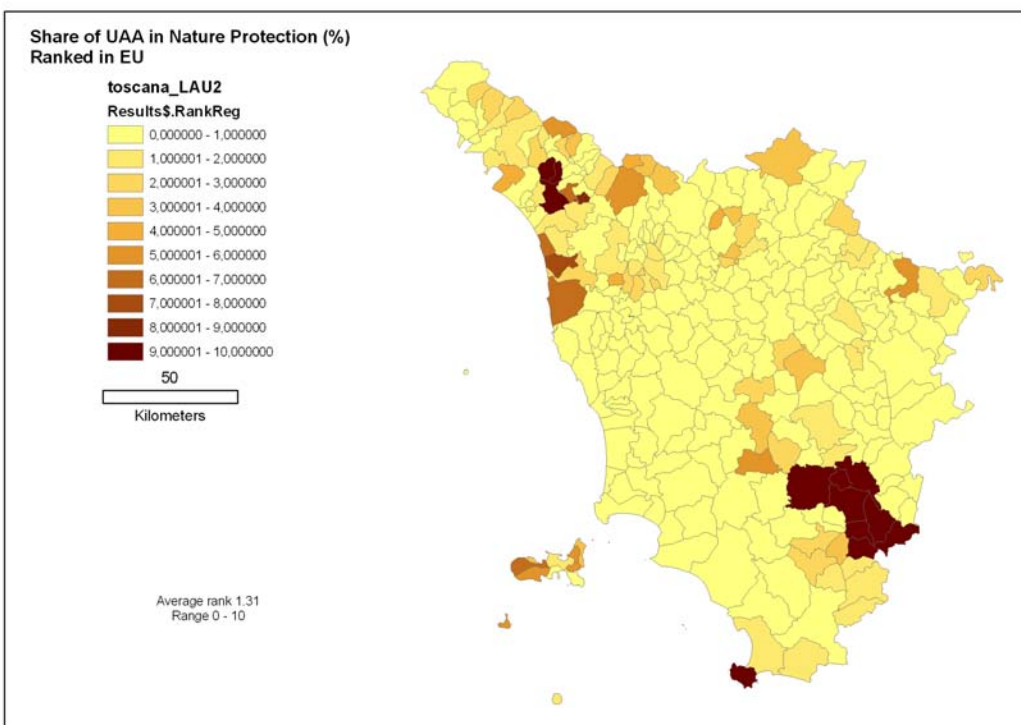


Figure 5: Index on agricultural areas in protected and valuable sites (ranked in Europe) downscaled for the case study region Tuscany

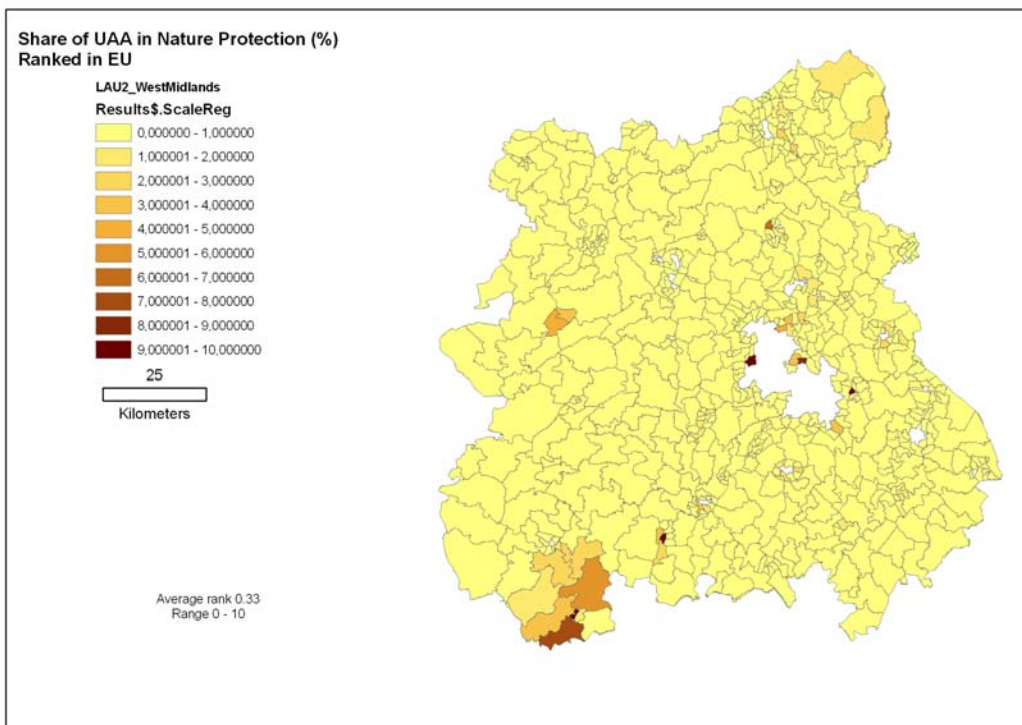


Figure 6: Index on agricultural areas in protected and valuable sites (ranked in Europe) downscaled for the case study region West Midlands. White areas are LAU2 regions with no agricultural area.

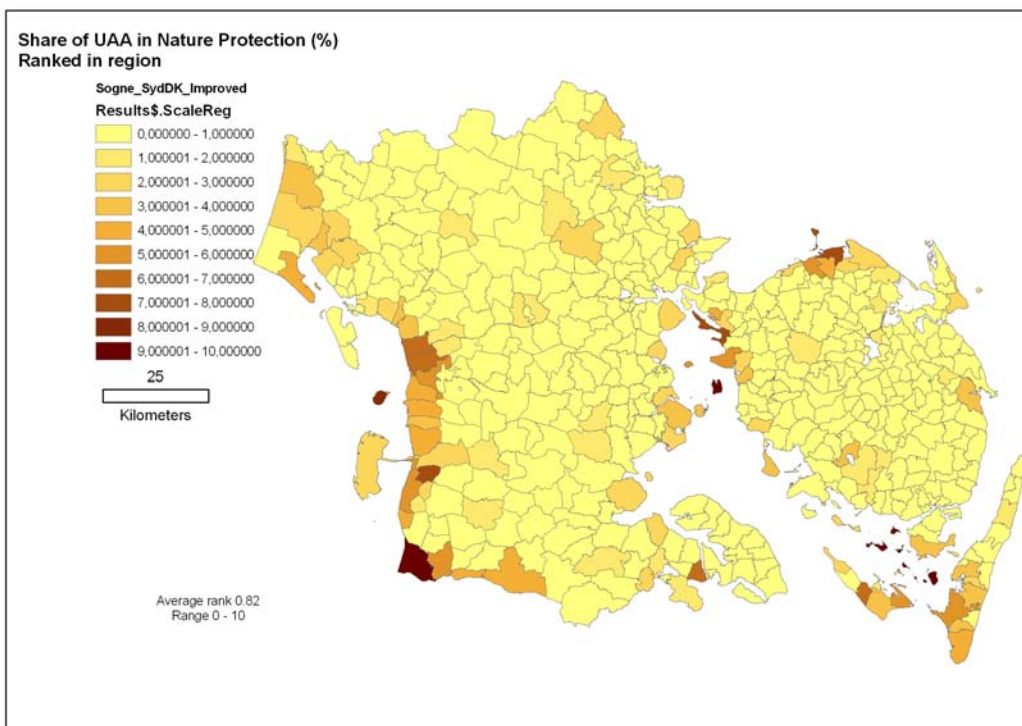


Figure 7: Index on agricultural areas in protected and valuable sites (ranked in region) downscaled for the case study region Southern Denmark.

4.2.2 Tourism in rural areas

The maps in Figures 8 to 10 shows the results of downscaling of the index on tourism in rural areas to three of the five case study regions. The overall conclusion is that for the regions Tuscany and

Brabant the differentiation within the region is quite high, whereas this is not the case for Alentejo, where all municipalities score low compared to the identified maximum.

However, when comparing the maps of the three regions, it should be kept in mind that a modified range across the case study regions was applied. The reason for doing so was that many Tuscan LAUS2 regions have very high values for this index, which would mean that for the other case study regions all municipalities would score close to zero when the Minimum-Maximum standardization method is applied. Instead the scores of the individual regions are calculated based on a range from 0 to 10 farms per 1000 ha, where all values higher than 10 are set to 10. A value of 10 is chosen as a good estimate for representing the difference among the case study regions, regarding the average index value for the entire case study region. Average number of farms with farm tourism per 1000 ha varies from 4.428 in Tuscany to 0.979 in Brabant and 0.044 in Alentejo.

For the results presented for Tuscany in Figure 10 the consequence is that for 35 of the 287 LAU2 regions a score of 10 has been assigned as the number of farms with farm tourism exceeds 10 per 1000 ha. For the remaining 252 LAU2 regions the differentiation is much clearer as they would all have had a score below 1 when applying the standardization method on the basis of the real maximum. For Brabant the alternative standardization method also means that it is possible to show the differentiation within the region, which would otherwise be impossible. Also, when comparing Brabant and Tuscany maps, the overall picture – Tuscany in average has four times more touristic farms per 1000 ha than Brabant – seems to be well balanced. For Alentejo no internal differentiation can be seen even when applying the alternative standardization method. As can be seen from Figure 11, where the results for Alentejo is ranked based on the range of values for Alentejo only, there is some internal differentiation. However, on Figure 8 this cannot be seen due to the low values in general compared to the values in Tuscany. On the other hand, the overall picture, that Tuscany in average has a 100 times higher density of touristic farms than Alentejo, is very well reflected in Figure 8.

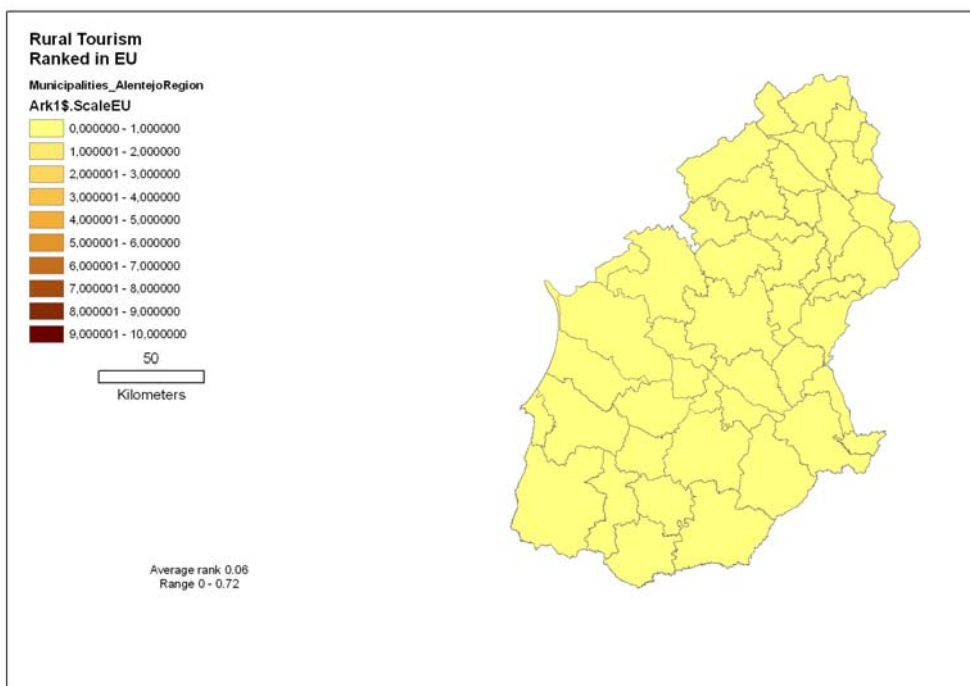


Figure 8: Index on tourism in rural areas (ranked in EU) downscaled for the case study region Alentejo

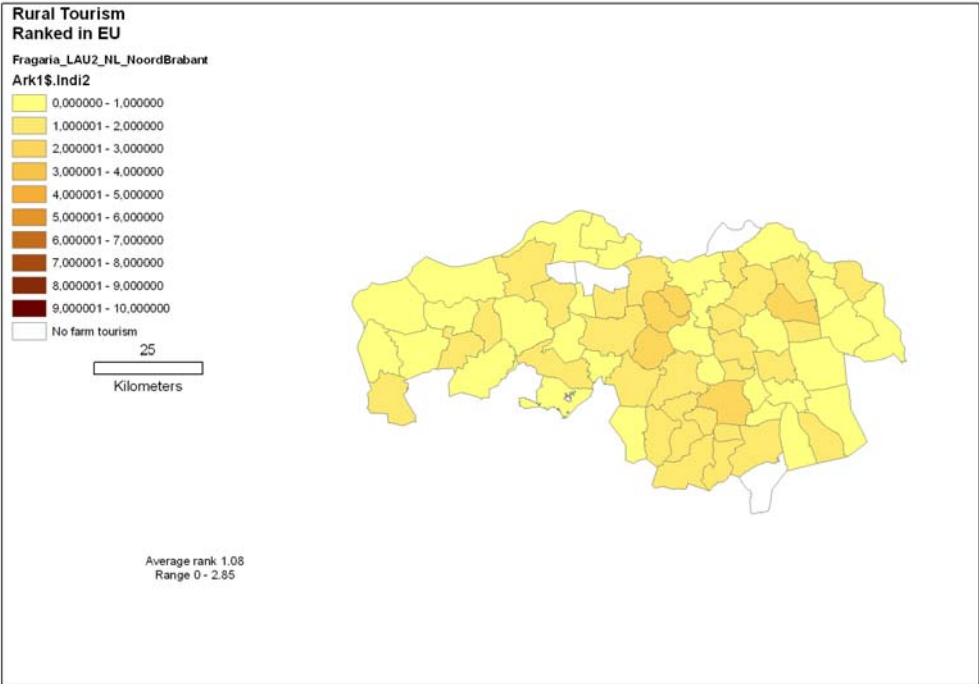


Figure 9: Index on tourism in rural areas (ranked in EU) downscaled for the case study region Groene Woud (Noord Brabant).

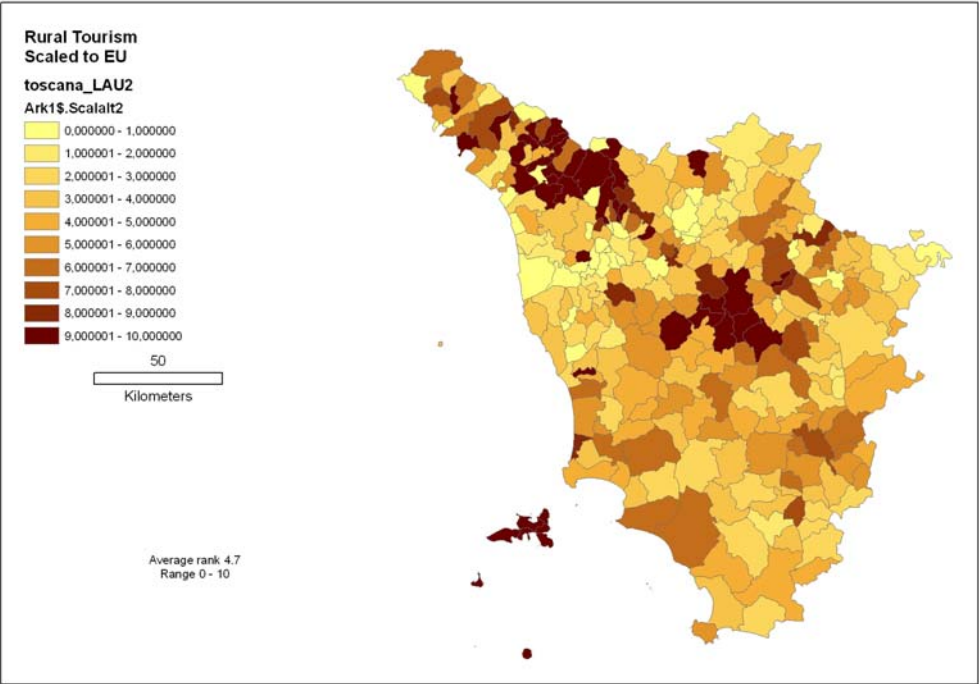


Figure 10: Index on tourism in rural areas (ranked in EU) downscaled for the case study region Tuscany

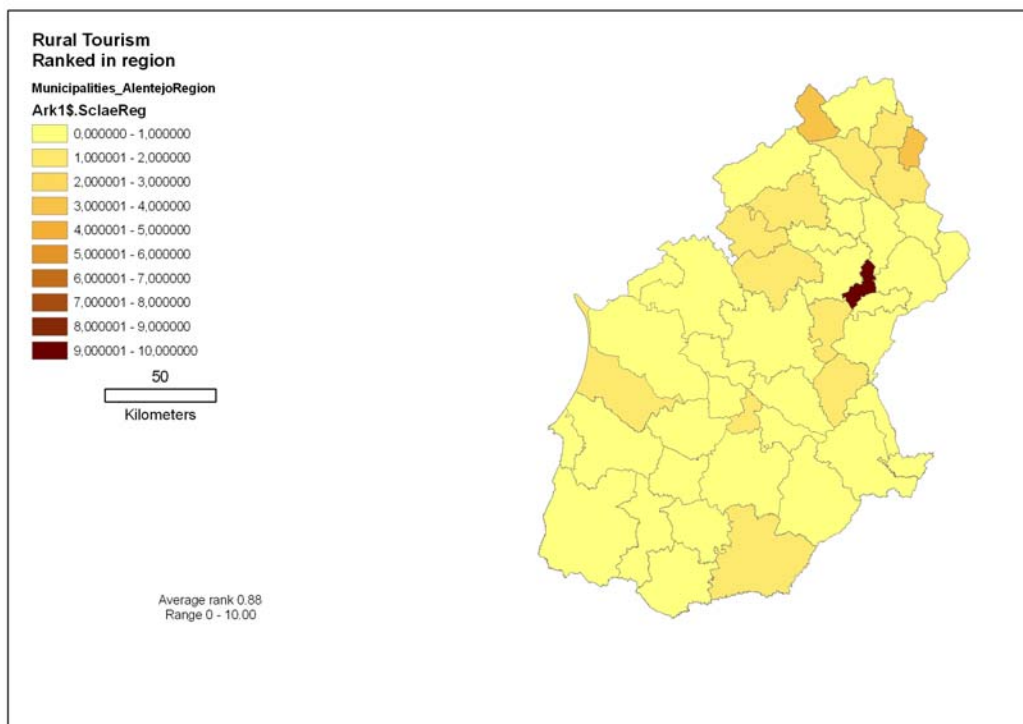


Figure 11: Index on tourism in rural areas (ranked in region) downscaled for the case study region Alentejo and ranked in region.

4.2.3 Certified products

The index on certified products has proven to be the most difficult of the three indices to be downscaled to the LAU2 regional level because of several and different limitations.

The biggest problem is that the possibility to produce landscape related certified products is rarely implemented at a level as detailed as the LAU2 level. For example, in Alentejo the option to produce a specific landscape product is available in average in a little more than 32 LAU2 regions. No landscape related certified products in Alentejo can be produced in one LAU2 region only. In some cases the option to produce products included in the analyses even goes beyond the borders of the case study regions. This is for example the case for 6 out of 22 PDO/PGI non-wine products that can be produced in Tuscany. The consequence of this is that the results of calculating the index as done in the EU indicator, by applying normalisation by agricultural area, would produce results depending completely on the size of the agricultural area of the LAU2 regions.

West Midlands has 808 regions with an average UAA 1310 ha, Tuscany has 287 regions with an average UAA of 2988 ha and Alentejo has 47 regions with an average UAA 36924 ha. The consequence of these differences are shown in Table 2, where it can be seen that the results are completely different when using the raw number of products occurring and the number of products per ha. In the first case the LAU2 region of Alentejo scores 7.1 to 10 and the regions of West Midlands score 0 to 0.9. In the second case the regions of Alentejo scores 0 to 0.9 and the regions of West Midlands score 0 to 10. This, of course, does not take into account the possibility that the same piece of land can produce more than one certified product.

Table 2: The range in number of products and in number of products per ha in the LAU2 regions of Alentejo, Tuscany and West Midlands and the range in the corresponding scaling to EU scale.

	No. of products	Max value EU scale using no. of products	No. of products per ha	Max value EU scale using no. of products per ha
Alentejo	25 - 35	7.1 - 10.0	0.000 - 0.005	0 - 0,9
Tuscany	2 - 13	0.6 - 3.7	0.005 - 0.045	0,9 - 7,9
West Midlands	0 - 3	0 - 0.9	0.000 - 0.057	0 - 10,0

In both cases Tuscany is placed in the middle, but actually Tuscany is the case study region with the highest overall average number of landscape related certified products per ha:

- West Midlands: 5 products giving an average of 0.005 products per 1000 ha
- Alentejo: 44 products giving an average of 0.023 products per 1000 ha
- Tuscany: 72 products giving an average of 0.084 products per 1000 ha

It is then clear that when the indicator is calculated on a small reference unit such as LAU2, the number of shortcomings is reduced by using the raw number of landscape related certified products that can be produced per LAU2 region without normalisation by agricultural area.

The results of the downscaling exercise are shown in the maps in Figures 12 to 14. As can be seen, and also illustrated in Table 2 above, the LAU2 regions of Alentejo have the highest scores from 7.1 to 10, Tuscany is placed in the middle with scores from 0.6 to 3.7 and West Midlands have the lowest scores ranging from 0 to 0.9. These results must, as pointed out above, be interpreted with caution, also because there is no information on products produced in the same area and potential overlaps.

The internal differences between the regions are clear in the maps for Alentejo and for Tuscany, whereas for West Midlands the relatively low number of products disguise the differentiation. To illustrate this we have added a map (Figure 14) showing that also within West Midlands differences can be found between the LAU2 regions.

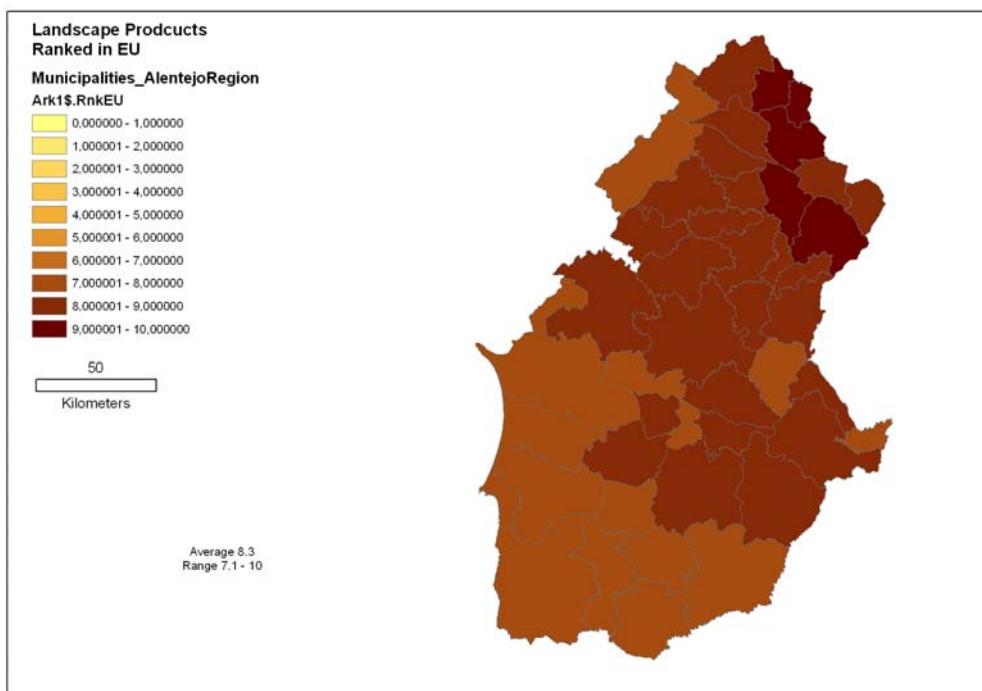


Figure 12: Index on landscape related high quality products (ranked in Europe) downscaled for the case study region Alentejo

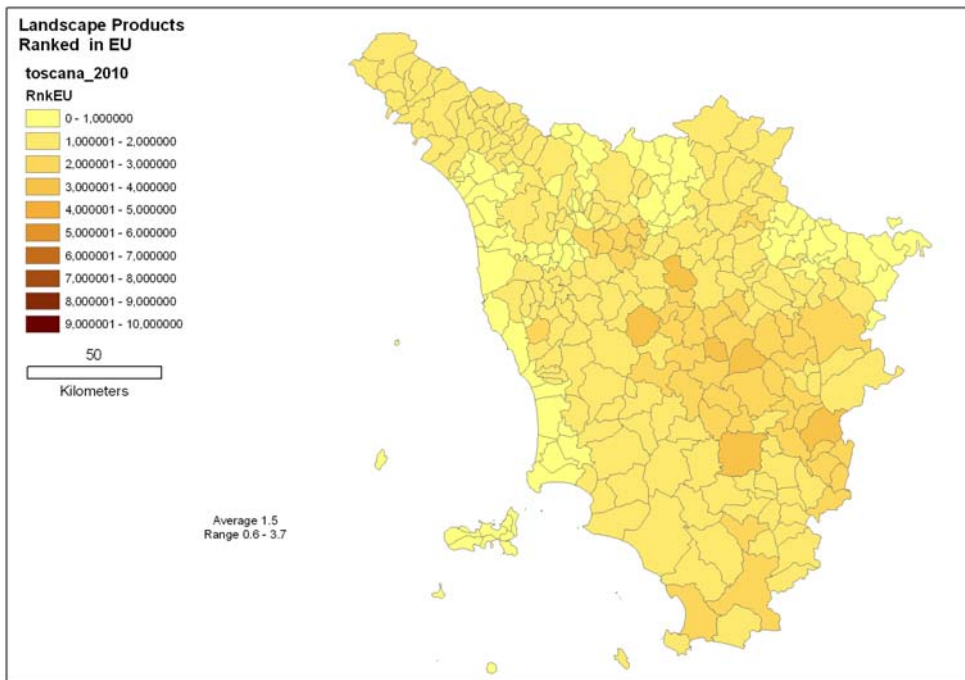


Figure 13: Index on landscape related certified products (ranked in Europe) downscaled for the case study region Tuscany

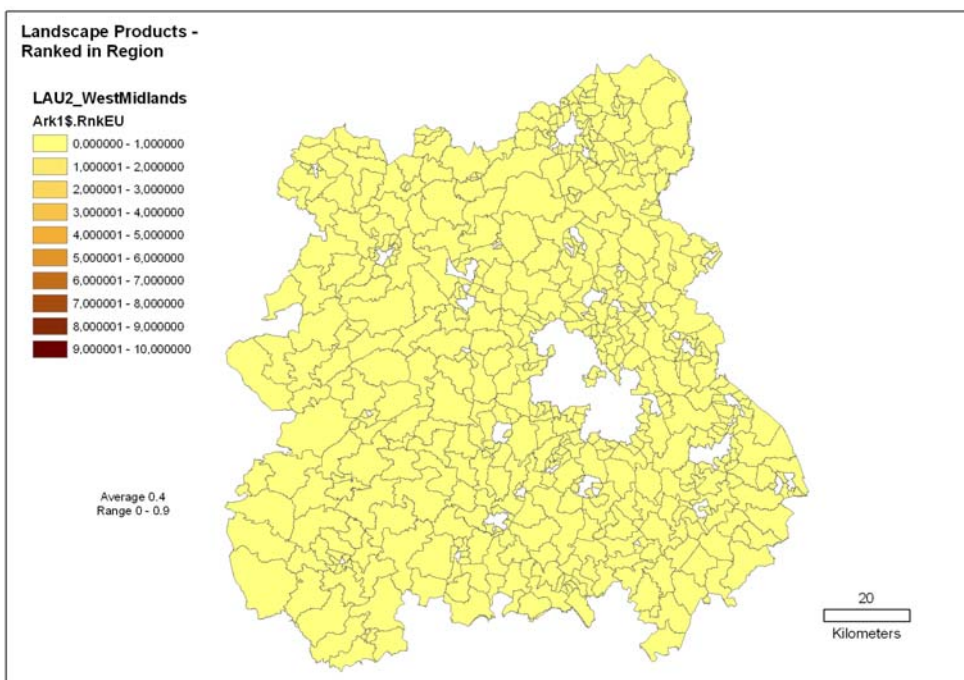


Figure 14: Index on landscape related high quality products (ranked in Europe) downscaled for the case study region West Midlands

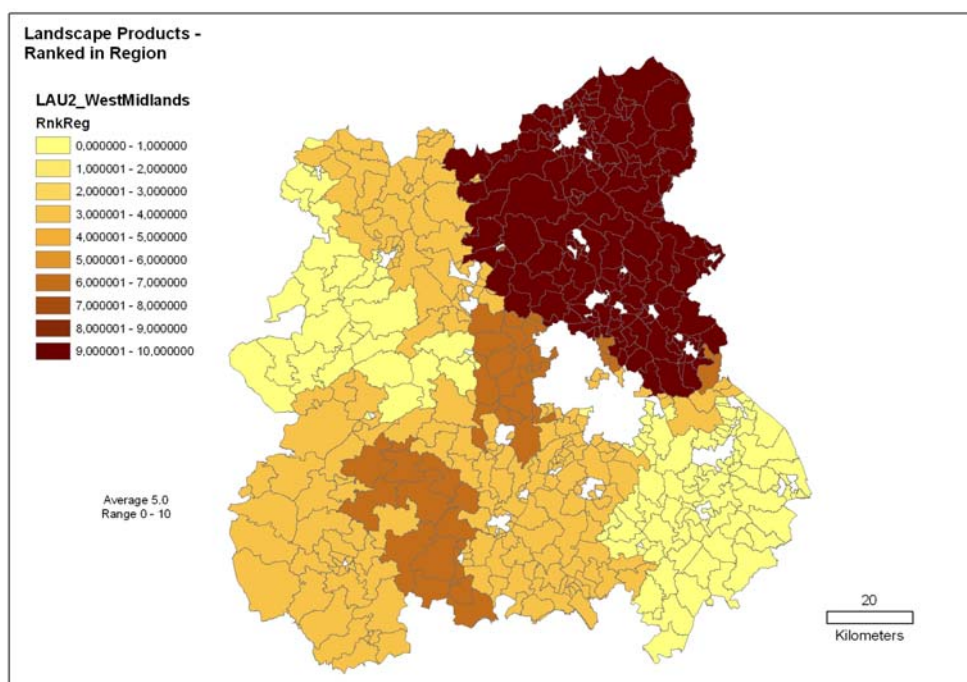


Figure 15: Index on landscape related high quality products (ranked in region) downscaled for the case study region West Midlands

4.2.4 Composite indicator social appreciation of the landscape

The maps in Figures 16 to 20 show the final results of downscaling the landscape societal appreciation indicator to the LAU2 level. The final indicator is composed by the sum of indices for agricultural areas in protected and valuable sites, landscape related certified products and tourism in rural areas scaled to the EU range. The two main observations that can be made on results are:

- the maps show that the downscaling provides new insight on the differences between the LAU2 regions within the case study regions. It is possible to present these differences even when the indicator is scaled to the EU range;
- it is also still possible to see in the maps the differences that exist between the NUTS2 case study regions with the highest scores in the two Southern case study regions, Alentejo and Tuscany, an lower scores in the three Northern regions, Brabant, Southern Denmark and West Midlands.

Some problems do occur that lead to a higher differentiation between the Southern and Northern case study areas in the maps than what is actually found in the regions. This is for example a general problem like the differences in traditions for implementing certified product policies or specific problems as the exclusion of the Area of Outstanding Natural Beauty in the calculation of the protected areas index for West Midlands.

At this level of analyses, the aggregation method as such, summing the indexes and rescaling to 0 to 10 using the range across the case study areas seems to be a good way to calculate the final landscape appreciation indicator.

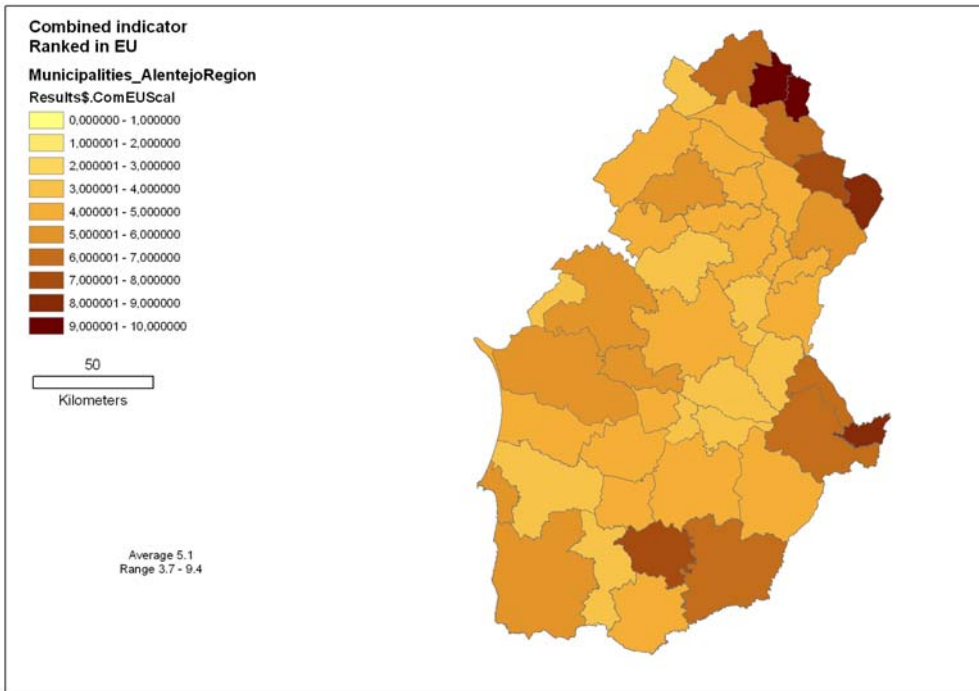


Figure 16: Combined indicator on social appreciation of the landscape (ranked in EU) downscaled for the case study region Alentejo

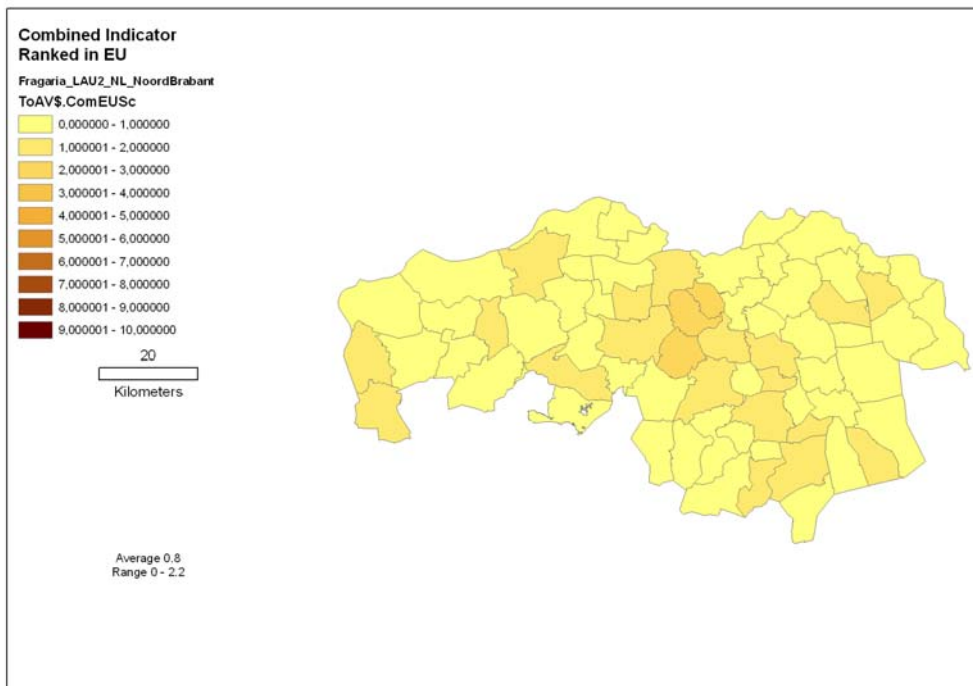


Figure 17: Combined indicator on social appreciation of the landscape (ranked in EU) downscaled for the case study region Brabant

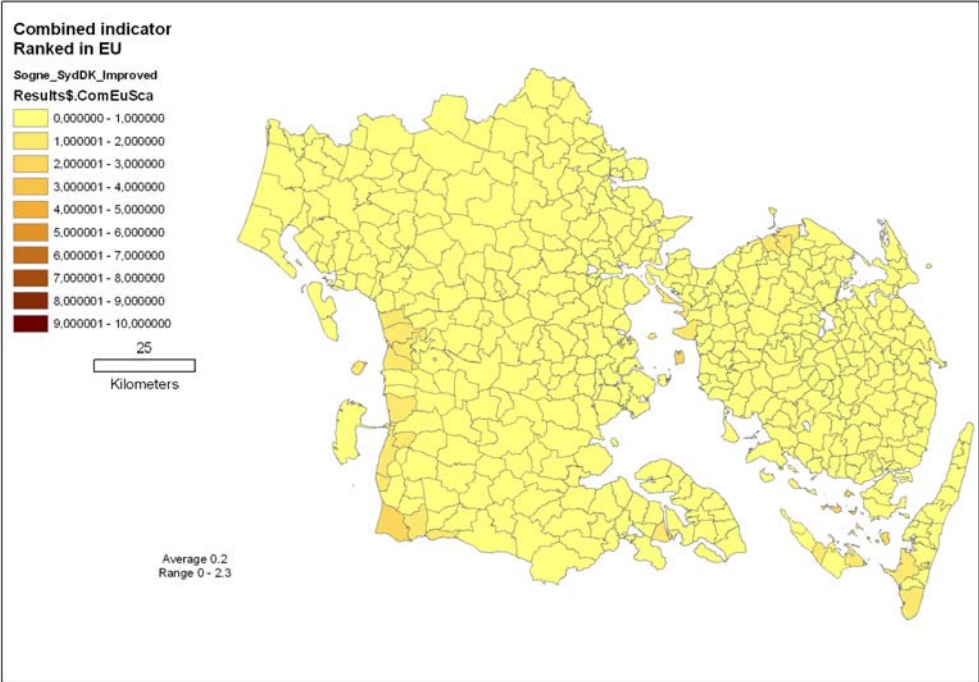


Figure 18: Combined indicator on social appreciation of the landscape (ranked in EU) downscaled for the case study region Southern Denmark. White areas are regions with no agricultural area.

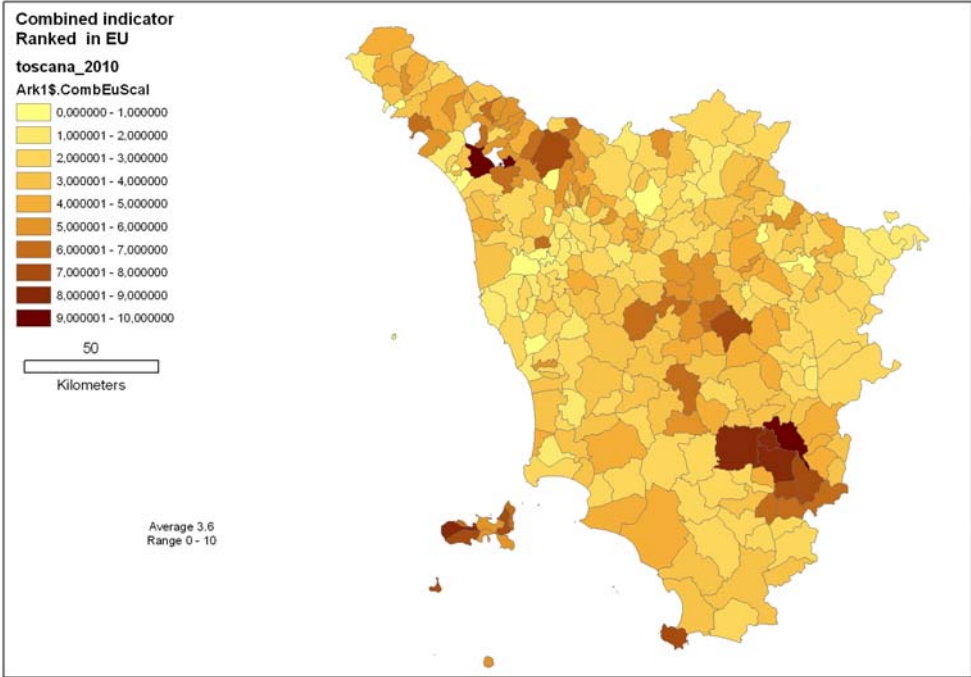


Figure 19: Combined indicator on social appreciation of the landscape (ranked in EU) downscaled for the case study region Tuscany. White areas are regions with no agricultural area.

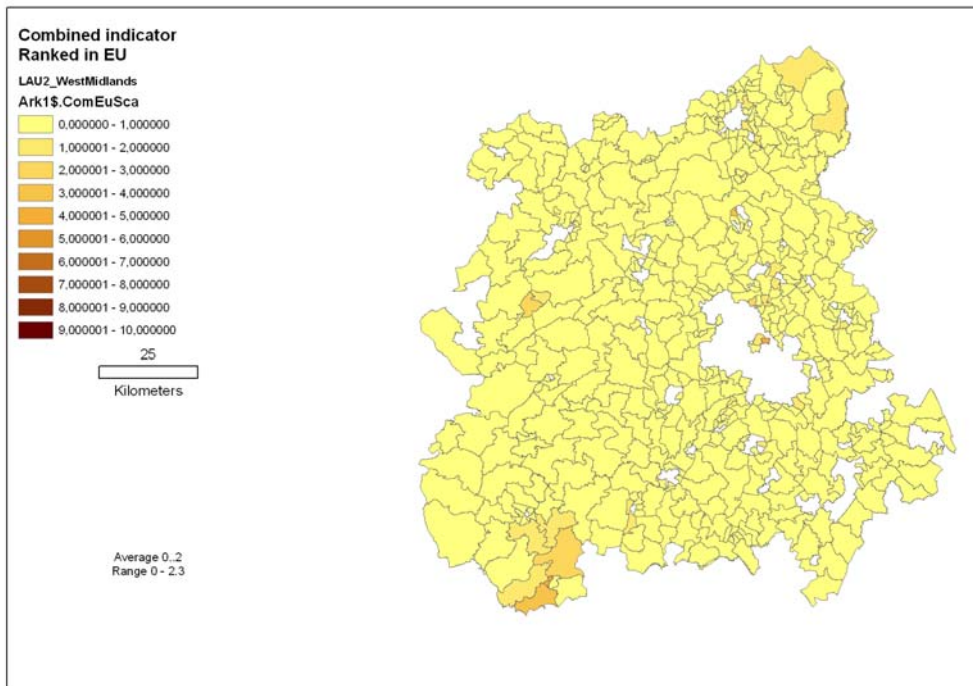


Figure 20: Combined indicator on social appreciation of the landscape (ranked in EU) downscaled for the case study region West Midland. White areas are regions with no agricultural area.

4.3 Part 1 conclusions

4.3.1 General conclusions

The overall conclusion is that the downscaling of the landscape social appreciation indicator from the NUTS2 level to the LAU2 level provides new insight into the relation between agriculture and landscape. The LAU2 level application reveals that the NUTS2 regions are highly differentiated and much more diverse than can be captured by the NUTS2 level. Also, it appears that the LAU2 level is closer to being ‘landscapes as perceived by people’ as stipulated in the European Landscape Convention.

However, some general problems do occur:

- When downscaling to as detailed a level as LAU2 regions with no or very little agricultural land will become much more frequent. These regions should be kept out of the analyses for example by applying a threshold for a minimum size of the UUA. In this study we tested and found 50 ha to be a suitable threshold from a technical point of view as many extreme values were sorted out. From a more theoretic point of view one might reach a considerable higher threshold value if taking into account a minimum size needed to constitute a landscape.
- Even when sorting out the regions with no or limited agricultural area the range of values for a given index will increase considerably when moving from NUTS2 level, where differences are averaged out, to the LAU2 level. This will mainly have consequences when comparing across regions, where the internal differentiation within regions with relatively low values will be hidden. But, also in regions with a relatively high differentiation at LAU2 level the differentiation can be blurred with a few high scoring regions and a lot of low scoring regions. An example from the present study is farm tourism in Tuscany, where it was necessary to put an upper threshold for the value of the index in order to be able to show the differentiation within Tuscany and between Tuscany and the other case study regions.
- A final general problem that also exists at the NUTS2 level, but becomes even clearer at LAU2 level is the differences in the implementation of the common spatial framework between the

Member States. This leads to very big differences in the size of the regions, which again can affect the calculation of the indices.

4.3.2 Specific conclusions

Index on agricultural areas in protected sites: the results for the calculation of the index on agricultural areas in protected sites provide a good picture of the distribution of protection of farmland within the regions. The LAU2 level seems to give a much better picture of the distribution and internal differences than the averaged values of the NUTS2 regions. The index is easily scalable as the input data are available in GIS format with sufficient resolution even for analyses below the LAU2 level.

However, it should also be highlighted that the dynamics of change of this index are less pronounced than for the other two.

Index on landscape related certified products: the downscaling to LAU2 reveals that there is some differentiation within the NUTS2 regions.

However, it also becomes clear that in most cases the option to produce landscape related certified products is linked to higher levels than the LAU2 regions and in some cases even beyond the borders of the NUTS2 case study regions of this downscaling exercise. Also, the variation in the number of landscape related certified products applying in the different case study regions are much differentiated creating problems when scaling across the regions. The index is also skewed because the Member States have different traditions for certified products, more or less rooted.

Optimally, this index should be calculated as the share of the agricultural area actually used for the production of landscape related products. If this is only possible for higher spatial levels than the LAU2 regions, this would still be preferred.

Index on tourism in rural areas: the downscaling to LAU2 reveals that there is a very high differentiation within the Tuscany region and a lower differentiation within the two other NUTS2 regions for which the calculations have been possible. The downscaling exercise is also affected by the fact that Tuscany probably is the region in the EU with the highest frequency of farm tourism. In general the number of farms with farm tourism normalised by agricultural area seem to give a fair picture of the issue and the differentiation between and inside the NUTS2 regions.

However, due to the sampling methods and disclosure rules of the Farm Structure Surveys combined with the low share of the farms involved in farm tourism in some Member States, it can be difficult to implement the index across the entire territory of the EU. As for the index on landscape related certified products it might be feasible to opt for a lower resolution than the LAU2 regions.

The combined indicator on social appreciation of the landscape: the downscaling of the final indicator on social perception of the landscape to LAU2 level provides new insights into the internal differentiation in the case study regions, while keeping the possibility to still compare across the regions. The final indicator as calculated in this study seems to underestimate the landscape social appreciation in the Northern case studies for methodological as well as cultural differences. The difference in social appreciation of the landscape in the results thus appears to be bigger than it actually is.

However, these problems are more linked to actual calculation of the indices when downscaling to the LAU2 level, than to the overall methodology and the calculation of the final landscape appreciation indicator.

5 Part 2 - Downscaling the EU landscape societal appreciation indicator based on complementary European and regional data sets

5.1 Inventory of additional European data to strengthen the EU landscape social perception indicator and implementation at the case study level

The second part of the study (hereafter referred to as “Part 2”) consists in refining the approach developed in Part 1, by including complementary European and national data sets. These additional data sets should address all three sub-components of the indicator, namely:

- (a) the presence of landscape related certified products (food and wine)
- (b) tourism in rural areas, and
- (c) agricultural areas in protected and valuable sites.

‘Societal appreciation’, compared to the other components of the landscape state and diversity indicator (degree of naturalness and structure) must be considered as one of the more challenging topics to be assessed in quantitative terms by means of indices. In fact, research on this issue at this scale of analysis is lagging behind, and very few references in literature can be found (Konkoly and Jombach, 2007).

The analysis carried out in Part 2 starts with a review of existing data sources and the preparation of a final list of possible alternative European indicators. Table 3 presents the results of the screening, and shows that no alternative indicators could be identified for quality products, but that there are two possible options for both rural tourism and protected areas. All approaches have their shortcomings, as there is no necessary connection between camping as a leisure activity on the one hand and the recreational facilities offered by farmsteads on the other hand with regard to the appreciation of the surrounding rural landscapes. In the next sections, these four alternative indicators shall be briefly explained.

Table 3: Alternative European landscape indicators at European level

	Quality products	Tourism in rural areas	Agricultural areas in protected and valuable sites
Dataset		Tourism intensity in agricultural areas	Agricultural land use in protected sites
Unit of measure		Percentage of tourist income from total income	Percentage of agricultural land unit from total in protected site
Spatial reference		NUTS 2/3	NUTS 3
Source		FADN	Corine CC & Designated Area
Dataset		POI camp sites in agricultural areas	Appreciation of cultural heritage
Unit of measure		Number	Area percentage
Spatial reference		LAU2	NUTS 2/3/ Corine CC
Source		TomTom (www.tomtom.com – permission to use acknowledged by TomTom)	Eurostat Tourism data & Designated Area Database

5.1.1 Camping sites and camping beds in Leisurescape

Building upon the conceptual approach behind the ‘appreciation’-indicator of Konkoly and using the landscape typology of Mücher et al. (2006) as a spatial reference, Wascher and Schuiling (2009) developed a European map of ‘leisurescapes’. One of the key components of mapping landscapes with recreational values has been the use of data on both camping beds (Eurostat) and camping sites (TomTom).

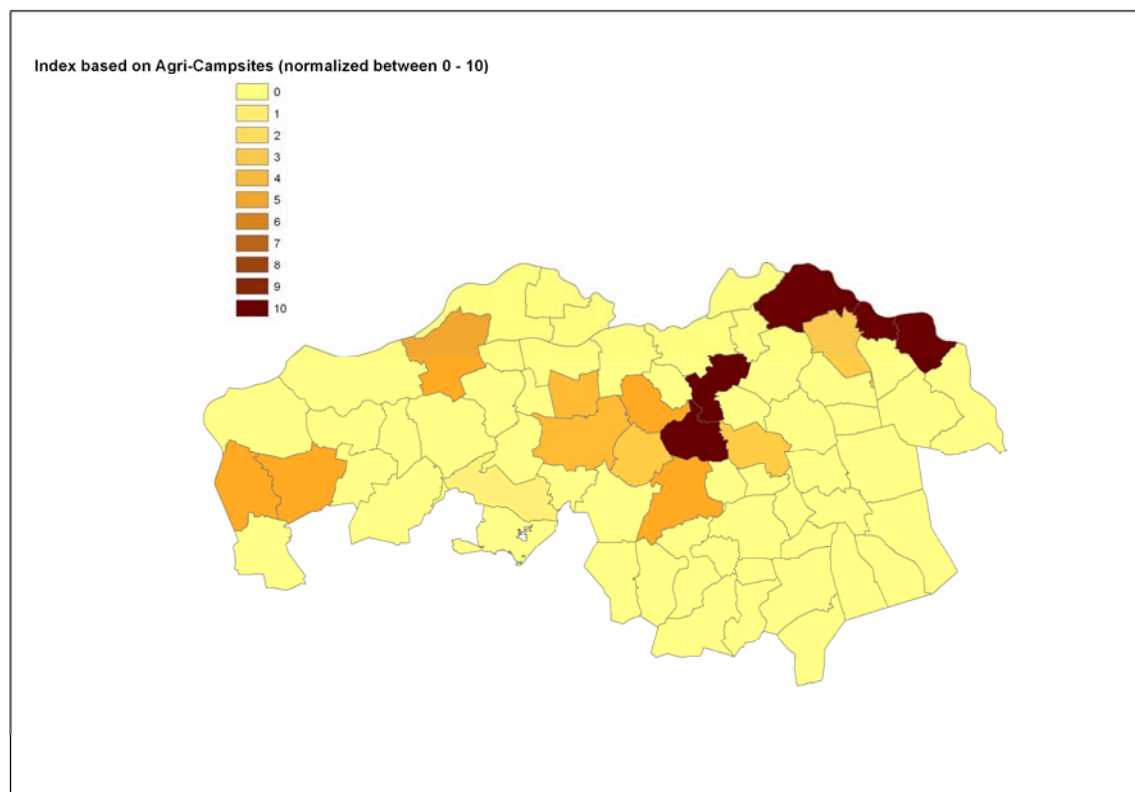


Figure 21 Number of camping sites in agricultural landscapes per LAU2 area (Wascher et al., 2011)

The datasets on point location for about 10.000 camping sites in the whole of Europe (see Annex 1 with an example) allows a specific assessment regarding their indicative role for agricultural areas. Figure 21 shows an assessment for the presence of camping sites within agricultural landscapes for the Province of North-Brabant. A comparison with the alternative composite indicator for the Province of North-Brabant (see Figure 40) shows in general a good congruence in many LAU2 regions, especially for the communities around the National Landscape Groene Woud. The Eindhoven region does not come out as strongly which is probably closer to the reality of the landscape appreciation.

More importantly, the database on camping sites is of European-wide coverage, allowing an instant European-wide assessment, provided the source (TomTom-navigation data) can be publicly used for such purposes.

This opens the representativeness issue for databases included in navigation systems, in particular on the completeness of data on i.e. accommodation facilities. Even considering that the overall number increases with time, databases contained in navigation systems are not complete, the coverage is not harmonised across Europe, and therefore it is difficult to assess the degree of accuracy in the results.

5.1.2 Tourism in rural areas based on FADN

The Farm Accountancy Data Network (FADN) organises the yearly collection of farm accountancy data from the Member States of the European Union. Data are collected on:

- Physical and structural data, such as location, crop areas, livestock numbers, labour force, etc.
- Economic and financial data, such as the value of production of the different crops, stocks, sales and purchases, production costs, assets, liabilities, production quotas and subsidies, including those connected with the application of CAP measures.

Data has been collected since the late 1960s and data are now collected from app. 80 000 agricultural holdings representing app. 5.000.000 holdings.

Tourism in rural areas

One of the variables collected in FADN is farm tourism defined as: *“the receipts of tourism, including returns from board and lodging, campsites, cottages, riding facilities, hunting and fishing and excluding value of products produced on the holding used for catering”*.

The FADN data are collected for so-called FADN region to some degree corresponding to NUTS2 or NUTS1 regions, but not with a perfect match. The results presented in this study are based on aggregated FADN data that in the SEAMLESS project have been disaggregated to so-called agri-environmental zones with relatively homogenous conditions for farming (see www.seamlessassociation.org). This allows for analysing the data at NUTS2 level as well as agri-environmental zone level. The results presented in the following are based on data from 2005 and 2006.

The map in Figure 22 shows the calculation of farm tourism for the NUTS2 regions. Firstly, the receipts from tourism is normalised by the agricultural area. Secondly, the results are scaled to EU range using the Minimum-Maximum standardization method. As can be seen the map shows some of the same tendencies as analysed in Part 1, with a markedly concentration in Italy, Austria and parts of Spain. Also the relation between the Northern case study areas is to some degree similar to Part 1 results with a slightly higher score in Brabant.

The map in Figure 23 shows the calculation of farm tourism for the agri-environmental zones. As can be seen the some differentiation can be found inside the NUTS2 regions leaving scope for an aggregation for LAU2 regions.

Finally the map in Figure 24 illustrates that there are some problems with the availability of data on the farm tourism variable in FADN. Compared to Part 1 analyses it is clear that the data from Alentejo is not sufficiently showing farm tourism in this region. It should be noted that the maps are based on 2005 and 2006 data and that especially the data linked to this type of other gainful activities have been in focus in the recent year. Data quality is therefore likely to have improved.

Certified products

FADN also includes variables related to the production of quality products:

- Support for the participation of farmers in food quality schemes (income)
- Grapes for quality wine with protected designation of origin (PDO) (area, production, income)
- Grapes for quality wine with protected geographical indication (PGI) (area, production, income)

These variables can be analysed similarly to the analyses of the farm tourism variable shown above.

Conclusions

The FADN data could be used to supplement the calculation of indices.

Positive characteristics:

- The data is updated yearly
- The data can be disaggregated to for example NUTS2 and LAU2

Limitations:

- FADN only includes ‘professional’ farms. Small farms with potential positive effects on landscape are not or not very well represented.
- No data on non-wine products.
- The data quality of the specific variables should be checked

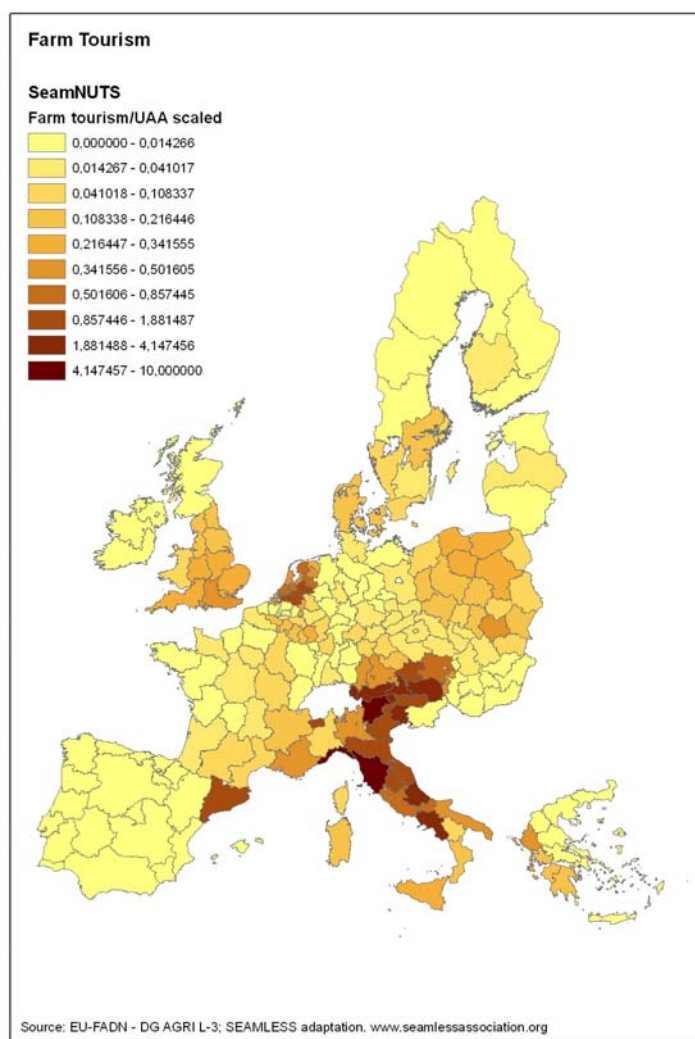


Figure 22: Index on rural tourism at NUTS2 level using FADN data.

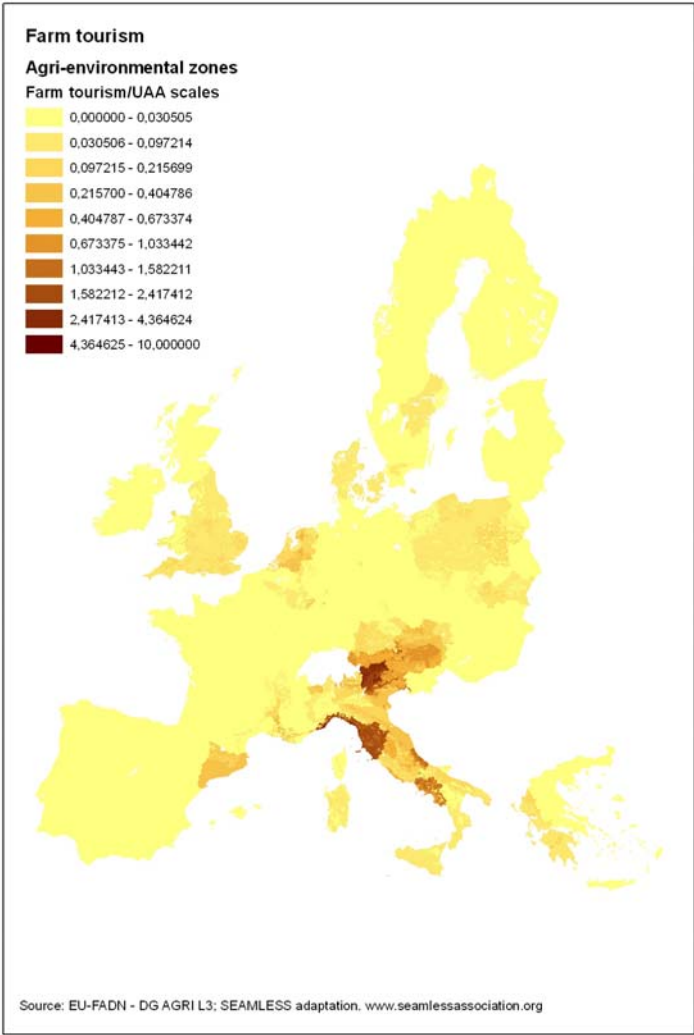


Figure 23: Index on tourism in rural areas at NUTS2 level using FADN data.

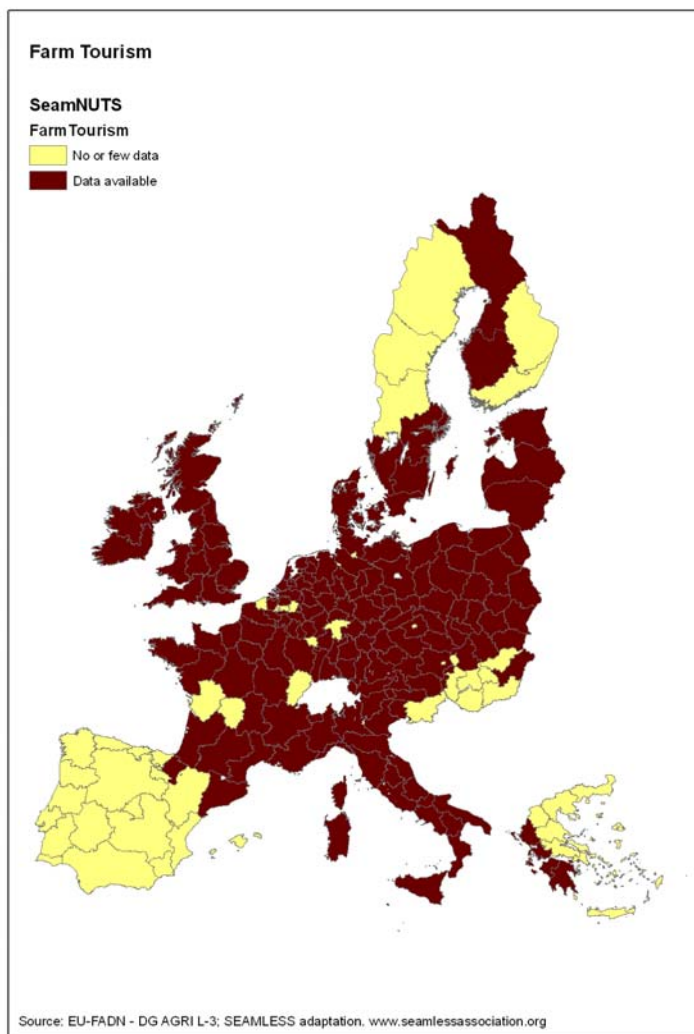


Figure 24: Data availability for calculating the index on tourism in rural areas from FADN.

Open Street Map

A new database with a fast growing potential for European wide use is the OpenStreetMap (OSM) database. OpenStreetMap creates and provides free geographic data such as street maps to anyone who wants them. The project was started because *“most maps you think of as free actually have legal or technical restrictions on their use, holding back people from using them in creative, productive, or unexpected ways”* (from <http://wiki.openstreetmap.org/wiki/>).

From the description of the OSM database it is clear that OpenStreetMap does not have any content restrictions on tags that can be assigned to what is put into the database. However, there is a recommended set of features and corresponding tags in order to create, interpret and display a common basemap. This is followed by most of the people uploading information to the map.

All features on the map are grouped together into higher levels. These higher levels of the OSM contain beside road categories some interesting physical themes. For FRAGARIA the most interesting are: *“Tourism”*, *“Leisure”* and *“Amenity”*

http://wiki.openstreetmap.org/wiki/Map_Features#Tourism

Places and things of specific interest to tourists: places to see, places to stay, things and places providing support. Within this category selections can be made based on names like *“Hotel”*, *“Restaurant”* etc.

http://wiki.openstreetmap.org/wiki/Map_Features#Leisure

The leisure tag is for places people go in their spare-time.

http://wiki.openstreetmap.org/wiki/Map_Features#Amenity

This is the primary tag for useful and important facilities for visitors and residents: toilets, telephones, banks, pharmacies (to buy medicines), schools ...

Of course it's difficult to judge the quality and the completeness of the dataset, however also main companies are supporting the development of the OSM database (e.g. Microsoft using and merging it with their Bing maps <http://wiki.openstreetmap.org/wiki/Bing>), so in the future OSM will be the main source of data not completely collected by statistical offices, but partly also by the citizens. This could provide also some interesting information on people point of view on what is really interesting for them (i.e. identifying which object is so interesting to be put on the map).

A quick comparison (by expert judgment) between the OSM database and the Complete Dutch database of all camping sites in the Netherlands shows that although there are clearly differences, the OSM database is characterised by a comparable density and dispersion over the different landscapes.

Again, an assessment as undertaken for North-Brabant (see Figure 25) does not specifically focus on agricultural landscapes. However, since the data is geo-referenced as point locations, linkages with agricultural landscapes can be established.

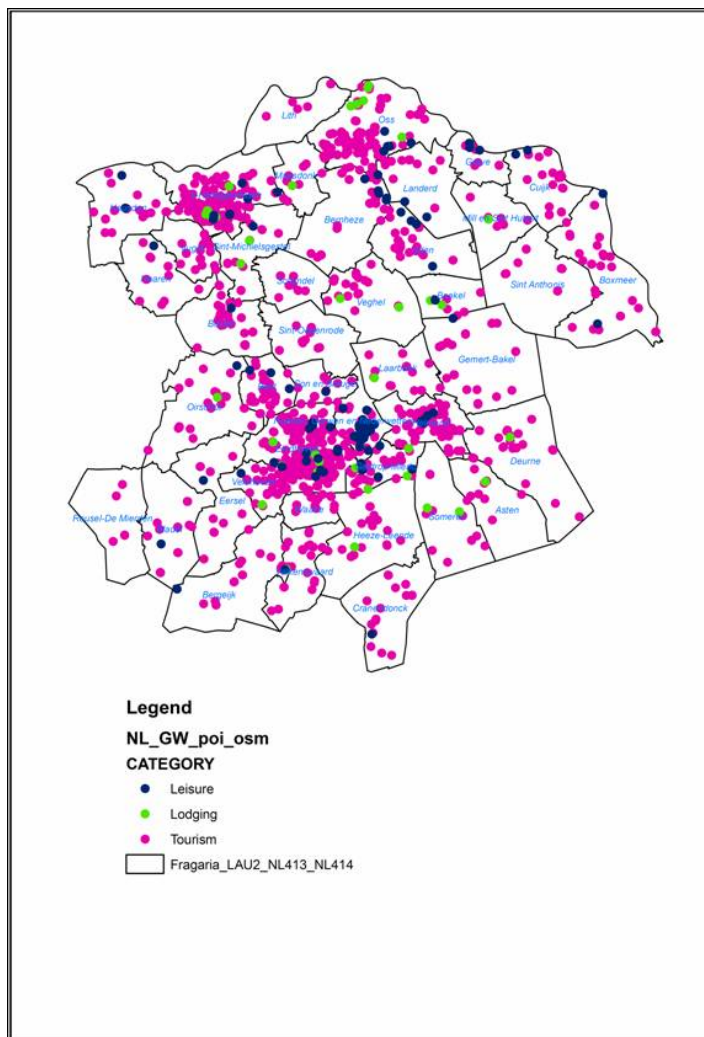


Figure 25: Assessment of Open Street Map themes 'leisure', 'lodging' and 'tourism' for the East-part of the Dutch province 'North-Brabant' (van Eupen, 2010).

5.2 Identification of complementary indicators that can be used as a proxy for the awareness that society has of a rural landscape at regional scale and implementation at the case study level.

The second section of Part 2 focuses on the identification of complementary landscape indicators which are considered to be of higher relevance at the regional level – both in addressing the same sub-indicator issues as in the EU landscape indicator, and by proposing, if appropriate, a different sub-indicator field (“the 4th dimension”) to complement existing information, in such a way to keep into consideration regional variability.

Table 4 presents the overview of the complementary or alternative indicators that can be used as a proxy for the awareness that society has of a rural landscape at regional scale. These indicators have been implemented in the case study regions as is described in the following chapters.

Table 4: Overview on proposed alternative landscape indices at regional level

	Quality Products	Rural Tourism	Protected Areas	Other
West Midland 1				
Datasets	Listed Barns	Camping and Caravan sites	Areas of Outstanding Natural Beauty and National Parks	Scheduled Ancient Monuments
Unit of measure	Number	Number	Ha/UAA	
LAU Level	LAU2	LAU2	LAU2	
Source	Ordnance Survey 'Strategy'	Ordnance Survey 'Strategy'	various	
West Midland 2				
Datasets		Picnic sites	Local designated areas for landscape	Listed Buildings
Unit of measure		Number		
LAU Level		LAU2		
Source		Ordnance Survey 'Strategy'		
West Midland 3				
Datasets			National designated areas for bio-/geo-diversity	
Unit of measure				
LAU Level				
Source				
West Midland 4				
Datasets			Local designated biodiversity areas	
Unit of measure				
LAU Level				
Source				
Groene Woud 1				
Datasets	food-processing farmsteads	tourist farmsteads	Agricultural land use in protected areas	Appreciated agri-landscapes
Unit of measure	percentage	percentage	percentage of agri-lu from total in protected areas	Number per LGN raster
LAU Level	LAU2	LAU2	LAU2	LAU2
Source	GIAB database	GIAB database	LGN5 classes 1, 2,3,4,5,6,8 & 11; UNESCO, NPs & EHS	Survey My-Place-To-Be

	Quality Products	Rural Tourism	Protected Areas	Other
Southern-Denmark 1				
Datasets	PDOs and PGIs applied for, not yet registered	'Landsforeningen for Landbo-turisme' member farms	Protected habitats	Rural landscapes ?
Unit of measure	UAA/Corine	UAA/Corine		UAA
LAU Level	LAU2	LAU2		LAU2
Source	www.vadehavspr oduktekter.dk	www.sogn.dk		LPIS
Southern-Denmark 2				
Datasets		Camping sites	Landscapes protected by conservation orders	
Unit of measure				
LAU Level				
Source				
Southern-Denmark 3				
Datasets		Holiday houses	Areas designation where afforestation is prohibited	
Unit of measure				
LAU Level				
Source				
Alentejo 1				
Datasets	Landscape Appreciation as certified products by provider	Trails and paths homologated by the Portuguese Federation	forest certification	Landscape diversity
Unit of measure	Number x UAA	Km/UAA		SHDI + IJI
LAU Level	NUTS2	NUTS2		NUTS2
Source	www.pefc.org	www.fcportugal.com		Corine
Alentejo 2				
Datasets		Tourist Hunting Zones		Complex Patterns
Unit of measure		percentage		percentage
LAU Level		NUTS2		NUTS2
Source		AFN		Corine 242
Tuscany 1				
Datasets	Stewardship farmers	Multiple Countryside itineraries	Protected Landscapes in Rural Areas	
Unit of measure	UAA Number	UAA Number	UAA Number	
LAU Level	LAU2	LAU2	LAU2	
Source	Regione Toscana	Regione Toscana	Regione Toscana	
Tuscany 2				
Datasets	PDO Wines			
Unit of measure	UAA Number			
LAU Level	LAU2			
Source	Regione Toscana			

5.2.1 Southern Denmark

Certified products

This index is calculated as share of the UUA on which production of certified products is an option.

Currently two products are under approval by the Commission: Steers and lambs from the Wadden Sea region. Both products can be produced within the same region delineated along the coastline of the Wadden Sea. The production of the two products includes rules on grazing in the salt marshes and on the production of a certain share of the winter fodder within the delineated area. As such the products have a very strong link to the highly appreciated salt marsh landscape.

With only two products of relevance and with these having the same area eligible for the production the indicator could simply be calculated as the share of the agricultural area within the parishes (LAU2) where the production can take place. The calculation has to be enhanced if more products with different eligible areas for production will be included in the future. The range of the indicator is 0-100.

Data sources:

Agricultural area: The GIS-layer based on CORINE and also used in the EU landscape indicator

PGIs: A map of the eligible area for the PGIs under approval was digitized based on the map available from:

http://www.vadehavsprodukter.dk/files/sysadmins/Indhold/Vadehavet/Kort_stort_format.jpg (last checked 24.02.2011).

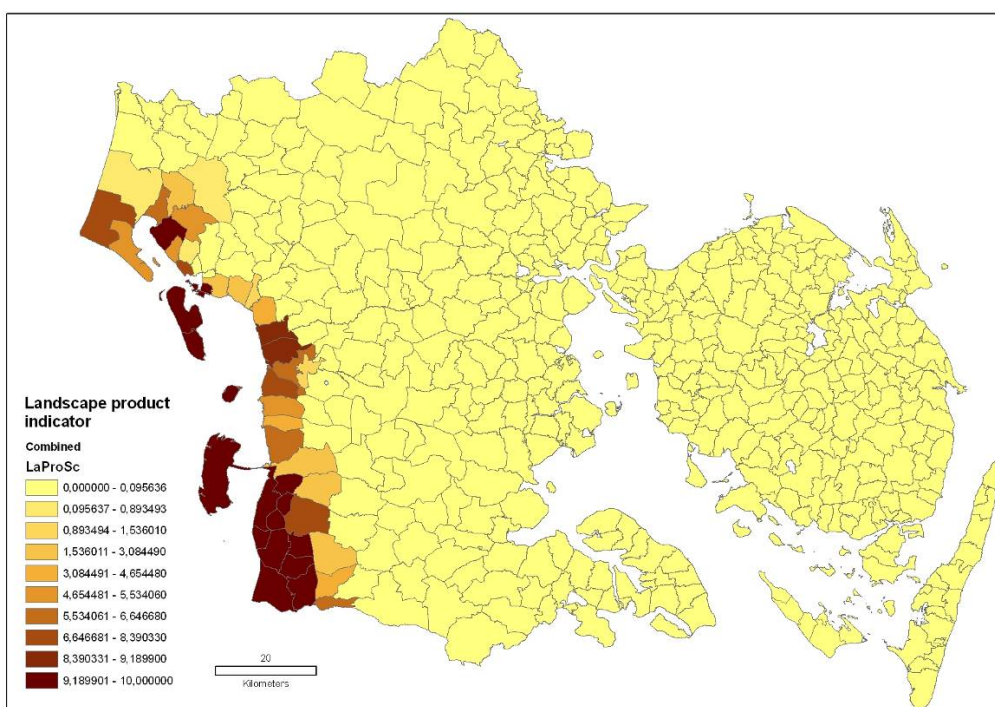


Figure 26: Index on landscape related high quality products based on alternative data sources for the case study region Southern Denmark.

Tourism in rural areas

This index is calculated as number of farms with farm tourism per ha of agricultural area.

The data from the FSS cannot be used meaningfully at parish (LAU2) level in Denmark due to the low number of farms with farm tourism. As an alternative the members of the National Association for Agri-Tourism was used as basis for the calculations. The objective of the association is "to promote and improve the conditions of Danish agri-tourism in order that agri-tourism becomes a real source of income for Danish farms" and the members are farms providing some kind of accommodation (B&B, apartments, cottages etc.). Nationwide app. 125 farms are members, in the region Southern Denmark 38 farms are included spread over 37 parishes.

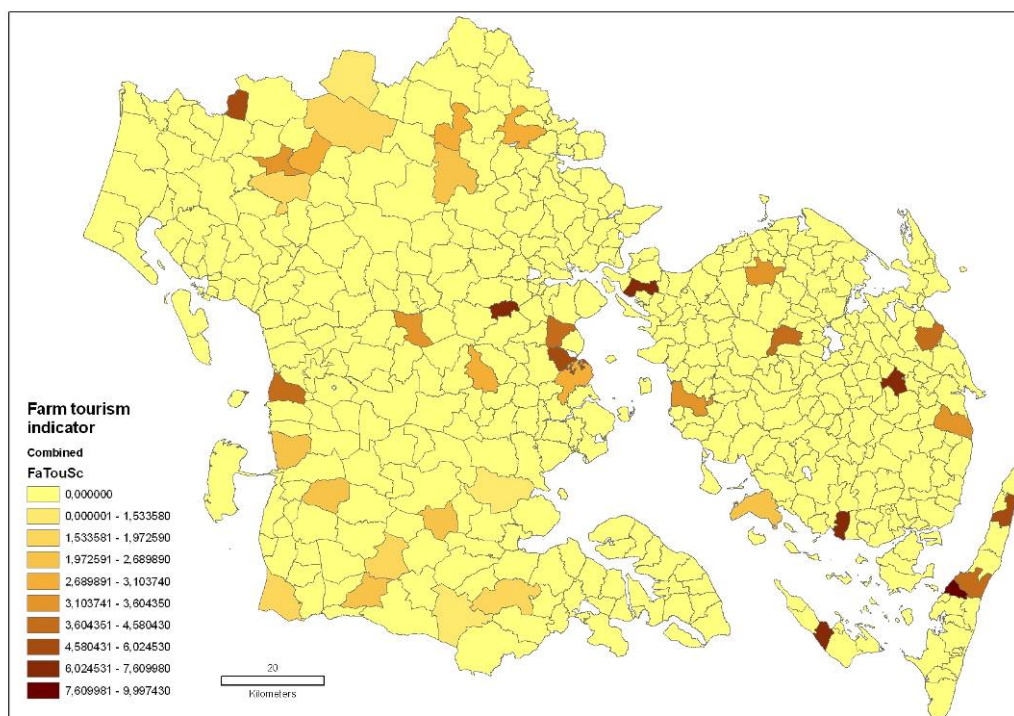


Figure 27: Index on tourism in rural areas based on alternative data sources for the case study region Southern Denmark

The calculation of the indicator depends very much on the size of the agricultural area of the parishes with the low number of farms present.

Range of the indicator is: 0 - 0,001127 farm per ha.

Data sources:

Agricultural area: The GIS-layer based on CORINE and also used in the EU-study

Farm tourism: Addresses on members of Landsforeningen for Landboturisme can be found on their website: <http://www.bondegaardsferie.dk/uk> (last checked 24.02.2011). The link from the addresses to the parishes (LAU2) was made on the web portal for the Danish Parishes: <http://www.sogn.dk/index.php?mod=sogn&func=soegDitSogn> (last checked 24.02.2010).

Agricultural areas in protected and valuable sites

This index is calculated as the share of the agricultural area under protection

For this indicator the calculations from the EU landscape indicator were downscaled to Parish level (LAU2). It was assessed that this would give a fair picture of the link between agricultural area and nature protection in Denmark.

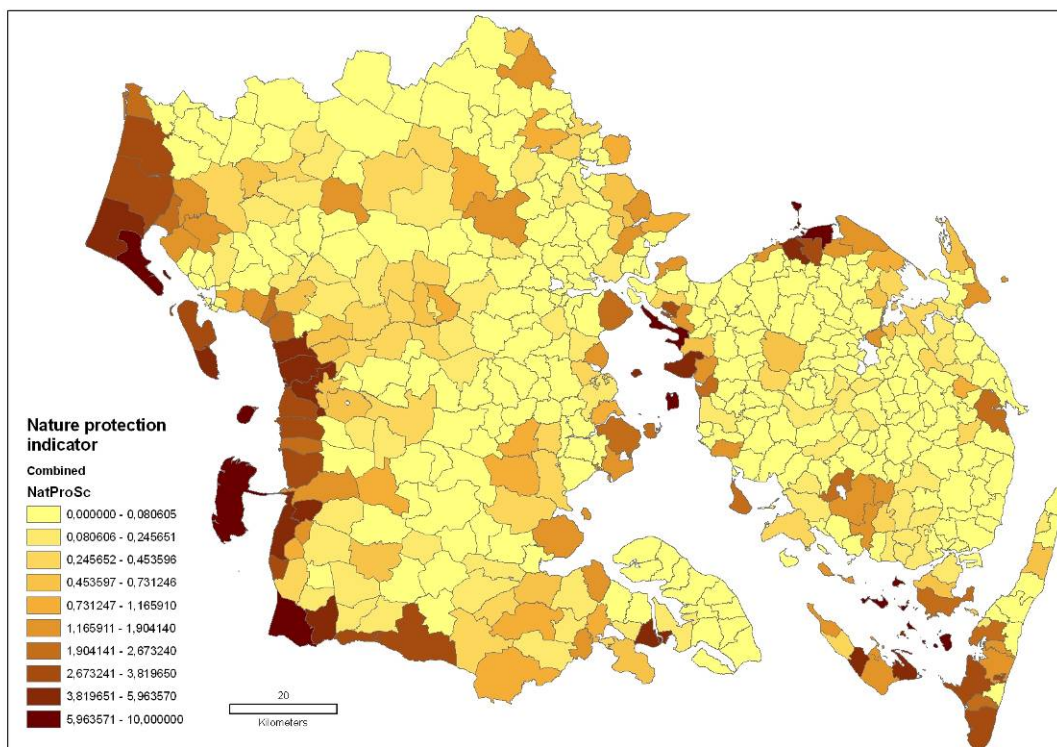


Figure 28: Index on agricultural areas in protected and valuable sites for the case study region Southern Denmark

Range of the indicator: 0-100 % of agricultural area under nature protection.

Data sources:

Agricultural area: The GIS-layer based on CORINE and also used in the EU landscape indicator

Nature protection: The GIS-layer based on Natura 2000 sites, European nationally designated areas, World Heritage Unesco sites related to agricultural landscape, and category V - World Protected Areas, also used in the EU landscape indicator.

Combined indicator for landscape social appreciation

For the combined indicator for landscape appreciation the regionally scaled values (0-10) for the landscape products, the farm tourism and the nature protection indicator were added.

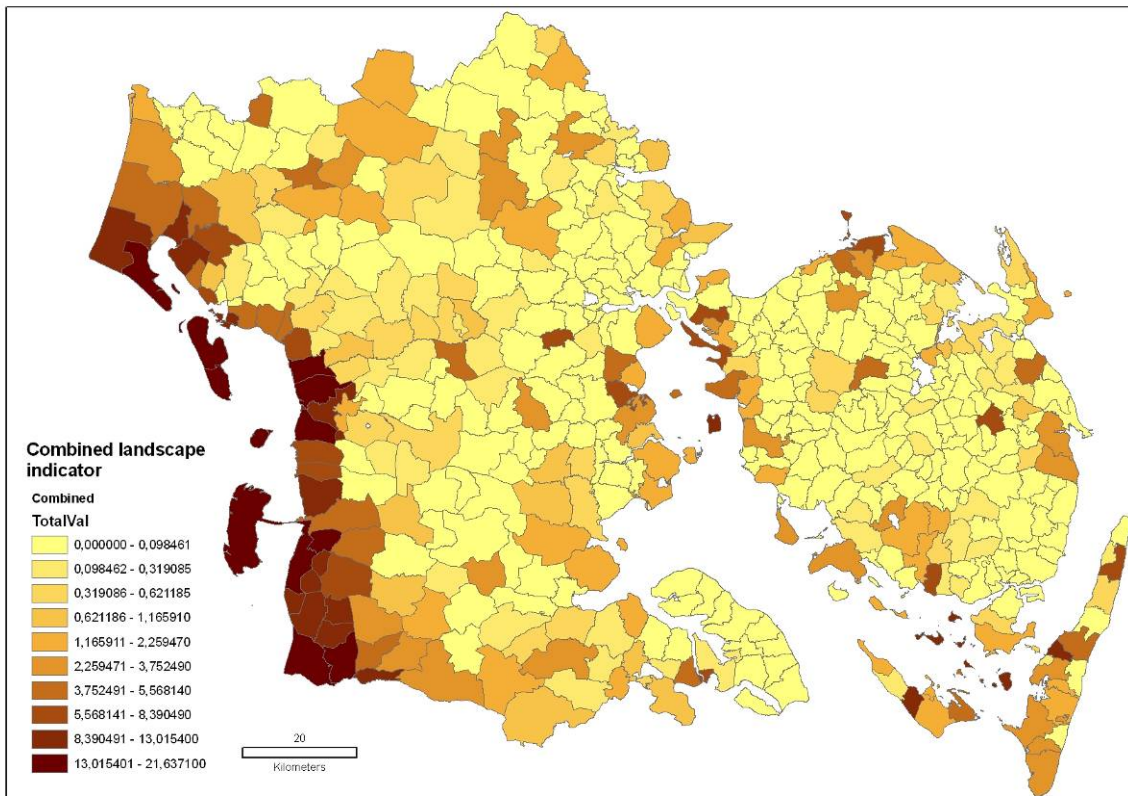


Figure 29: Combined indicator for landscape social appreciation based on alternative data sources for the case study region Southern Denmark.

Range of the indicator: 0 – 21.63 on the scale 0 – 30.

Other tested alternative data sources

Camping sites

Data on the location of camping sites including number of tent/caravan places is available in Denmark. However, the location cannot be linked to agricultural land as the major (almost only) driver behind the location of the sites is the nearness to the coast.

Agricultural area

LPIS data was compared to the delineation of the agricultural area based on the CORINE approach from the EU wide study. Although the LPIS data is more precise it did not change the overall picture and did not lead to new insights.

Nature protection area

In Denmark all permanent grassland > 0,25 ha are protected by the Nature Protection Act. These areas are available in GIS though a recent report concluded that the registration is not fully reliable. It was evaluated this layer gives more insight on the link between farmland and nature values, but that this is below the landscape level.

Designated landscape areas in regional planning

Not tested yet.

5.2.2 West-Midland (United Kingdom)

A critical element of the development of the landscape indicator is to determine whether alternative (so-called ‘complementary’) variables provide additional information about public preference for and appreciation of landscape. Within a physically and culturally diverse region (the county of Shropshire in the West Midlands, for example, contains all of the major eras on the geological stratigraphical table), it is important to explore whether additional variables mapped at a finer spatial resolution, add a new and important dimension to the mapping. The data were extracted from OS (Ordnance

Survey) small scale vector Strategi data for a selection of variables, that are presented in the next chapters.

Certified products

The following Figures show two examples of landscapes producing PDO/PGI products that are clearly identifiable with those landscapes. No other information was found to enrich data from the EU PDO/PGI database.



Figure 30: a West Midlands landscape typical of those producing certified food products, in this case cheeses such as Dovedale, Buxton and Staffordshire. © Copyright Peter Barr and licensed for reuse under this Creative Commons Licence



Figure 31: West Midlands landscape typical of those producing certified food products, in this case Herefordshire or Worcester cider and perry. © Copyright Philip Pankhurst and licensed for reuse under this Creative Commons Licence

Listed Barns

From the many thousands of Listed Buildings in the West Midlands, those with 'Barn' in the title in the OS database were extracted and mapped. This reflects the agricultural links of the building, although in many cases listed barns are today either disused or converted to dwellings. The predominant western distribution reflects the association with livestock farming in the west of the region, at least historically. Many of these, especially in north Herefordshire/south Shropshire are built from timber and are valued historically.



Figure 32: West Midlands landscape showing a listed vernacular barn. © Copyright Patrick Mackie and licensed for reuse under this Creative Commons Licence

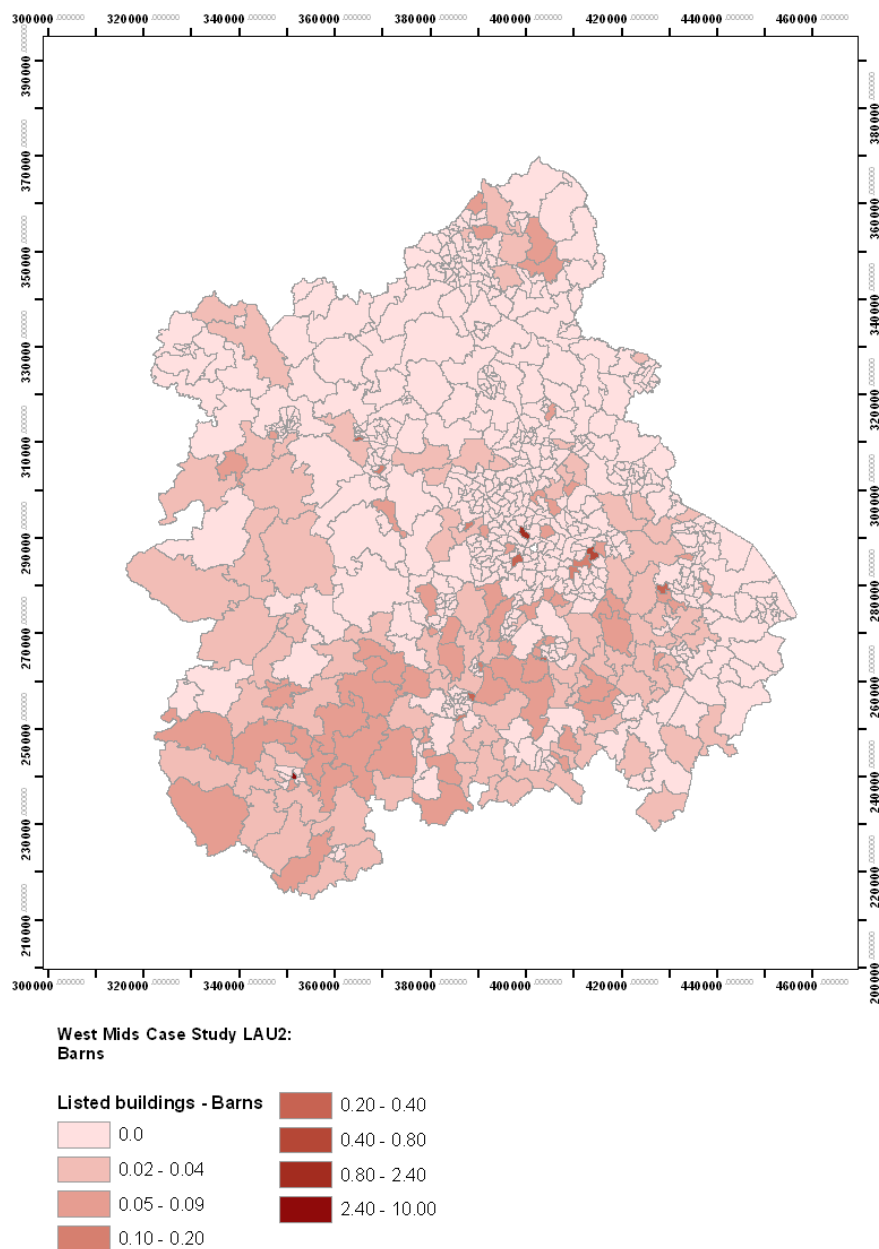


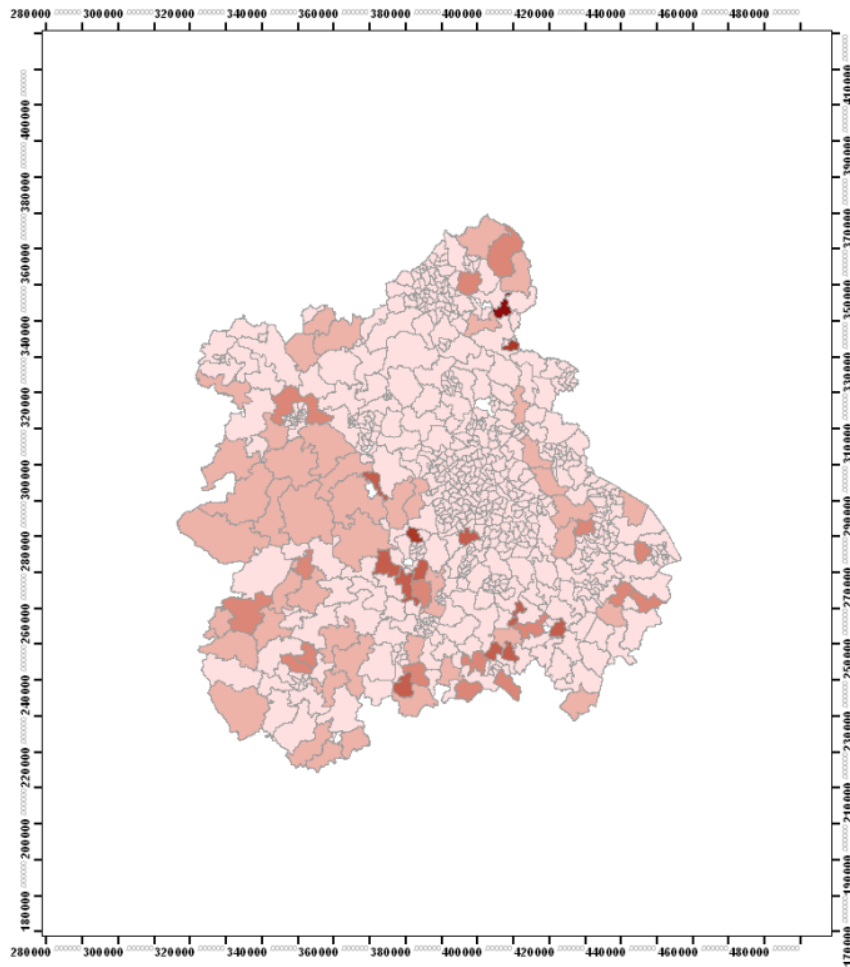
Figure 33: Index on landscape related certified products based on alternative data sources (listed barns) for the case study region West Midlands

Tourism in rural areas

Camping & Caravan Sites

Camping & Caravan sites are a potentially useful indication of the extent of tourist visits to an area, thus expressing one dimension of landscape preference. Campsites that were within urban areas (as defined by 1:250 000 scale OS Strategi data¹) were masked out. The figure (normalised by UAA and rescaled from 0 – 10), reveals patterns reflecting strong visitor preference for parts of S. Warwickshire (Cotswolds), Wyre Forest & the Severn Valley, Cannock Chase in the north and, to a lesser extent the rural, rolling countryside of traditional, mixed farming with orchards in the SW of the region surrounding the county town of Hereford.

¹ <http://edina.ac.uk/digimap/description/products/strategi.shtml>



West Mids Case Study LAU2:
Camp & Caravan Sites

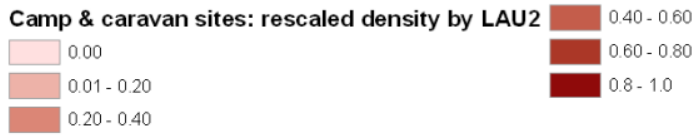


Figure 34: Index on tourism in rural areas based on alternative data sources (camp and caravan sites) for the case study region West Midlands

Picnic Sites

By contrast, Local Authority (LA) picnic sites show a more diffuse pattern, reflecting other factors such as local preferences for, for example, beauty spots, country parks, forest parks etc.

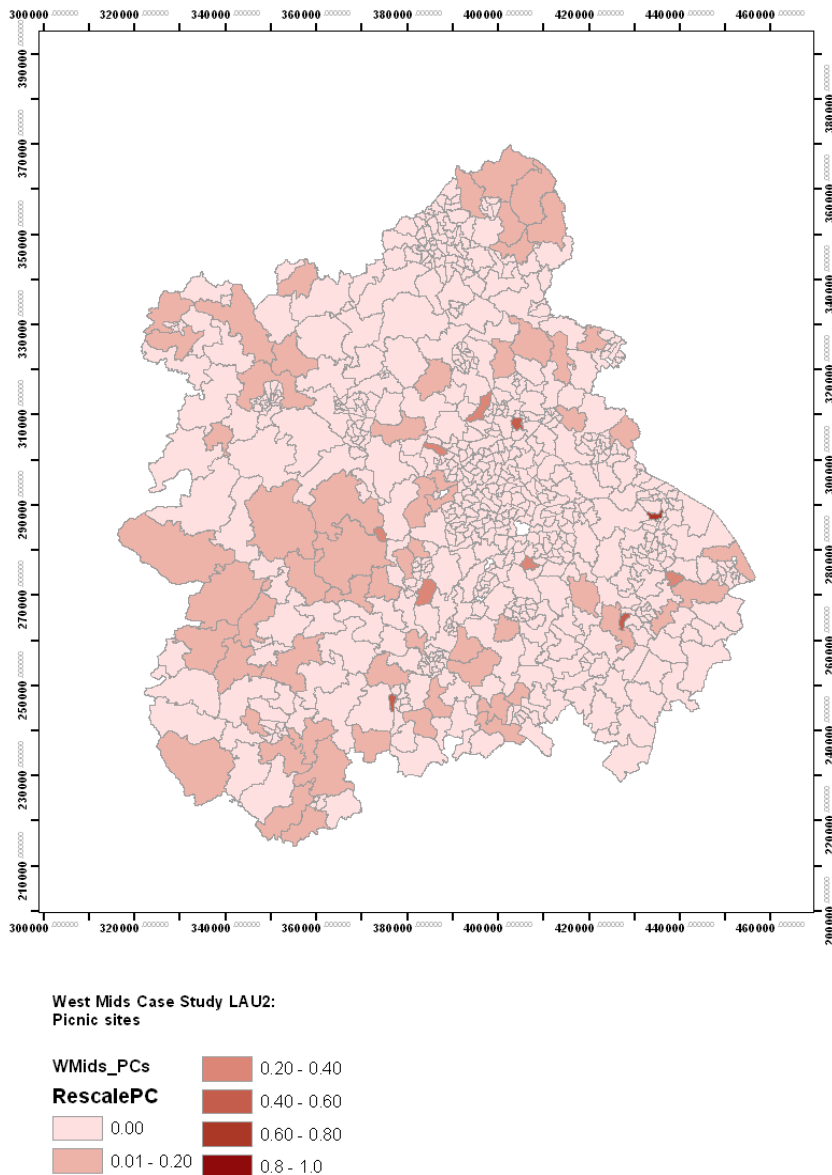


Figure 35: Index on tourism in rural areas based on alternative data sources (picnic sites) for the case study region West Midlands

Agricultural areas in protected and valuable sites

Viewpoints & Information Centres

Viewpoints are strongly determined by topographic highs; Information Centres are linked to urban centres, both an indication of visitor preference. Note for example, the presence of relatively high values in the conurbation of the West Midlands. Viewpoints have, in fact, the same drawback as camping sites, they may be targeted at a different landscape type, or at all landscapes and not particularly the agricultural landscape.

Areas of Outstanding Natural Beauty & National Parks

Designations relating directly to 'landscape appreciation' (as opposed to protection of species and habitats) are captured by designation of, in a UK context, Areas of Outstanding Natural Beauty (AONBs) and National Parks, mapped below. Additional information, usually available at county level, are designations such as Areas of Great Landscape Value. To some extent these have been

superseded by landscape character mapping and their continued use in planning varies between counties at the regional level.

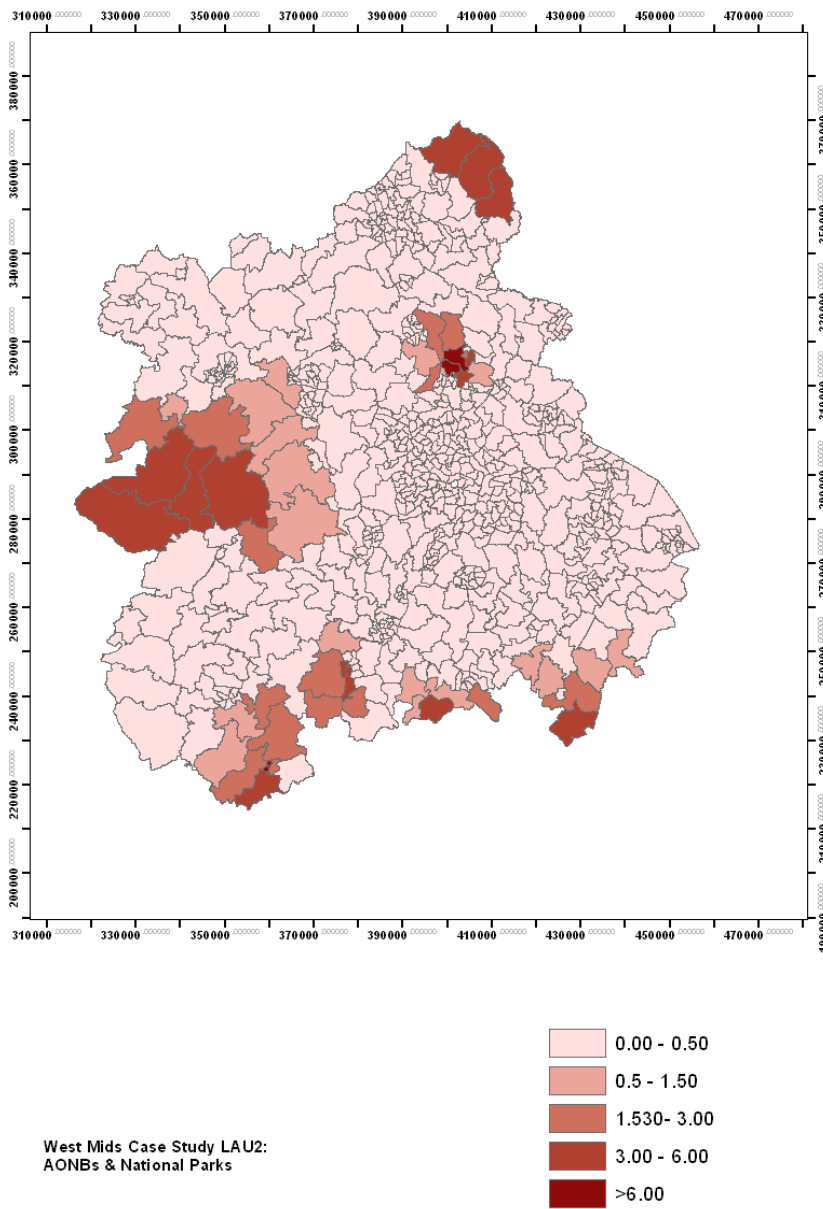


Figure 36: Index on agricultural areas in protected and valuable sites based on alternative data sources (Areas of Outstanding Beauty and National Parks) for case study region West Midlands

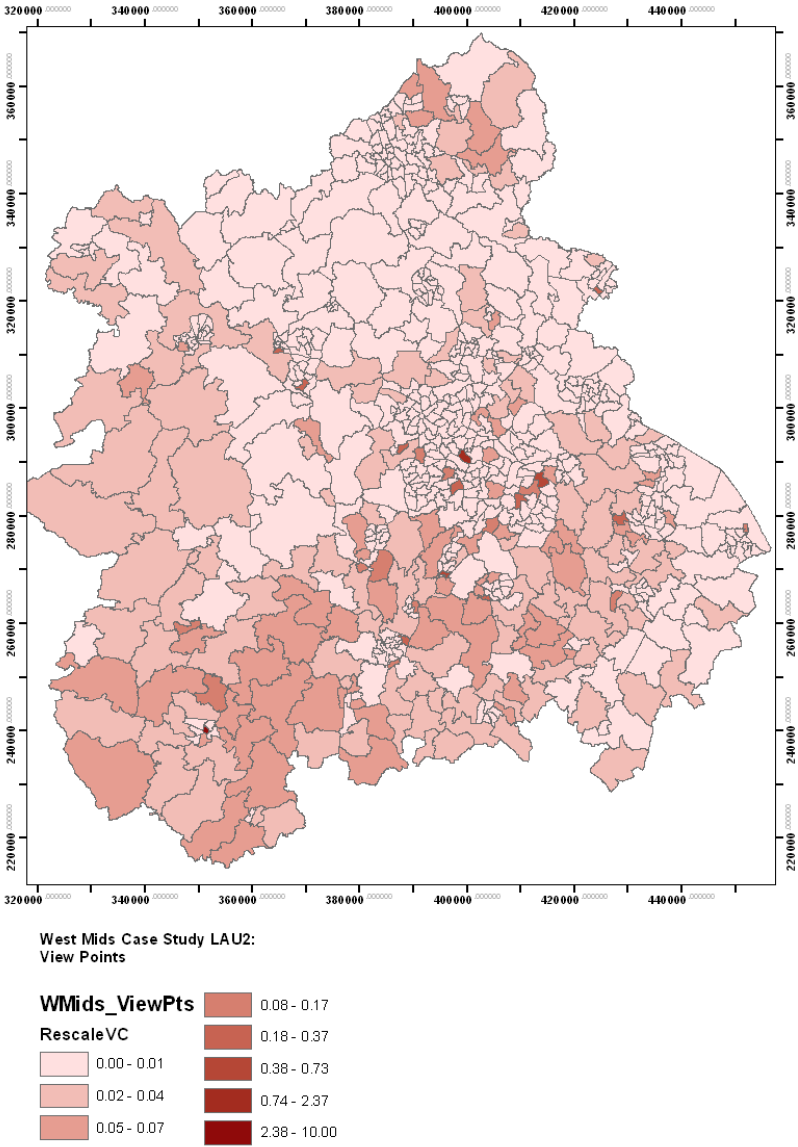


Figure 37: Index on agricultural areas in protected and valuable sites based on alternative data sources (view points) for case study region West Midlands

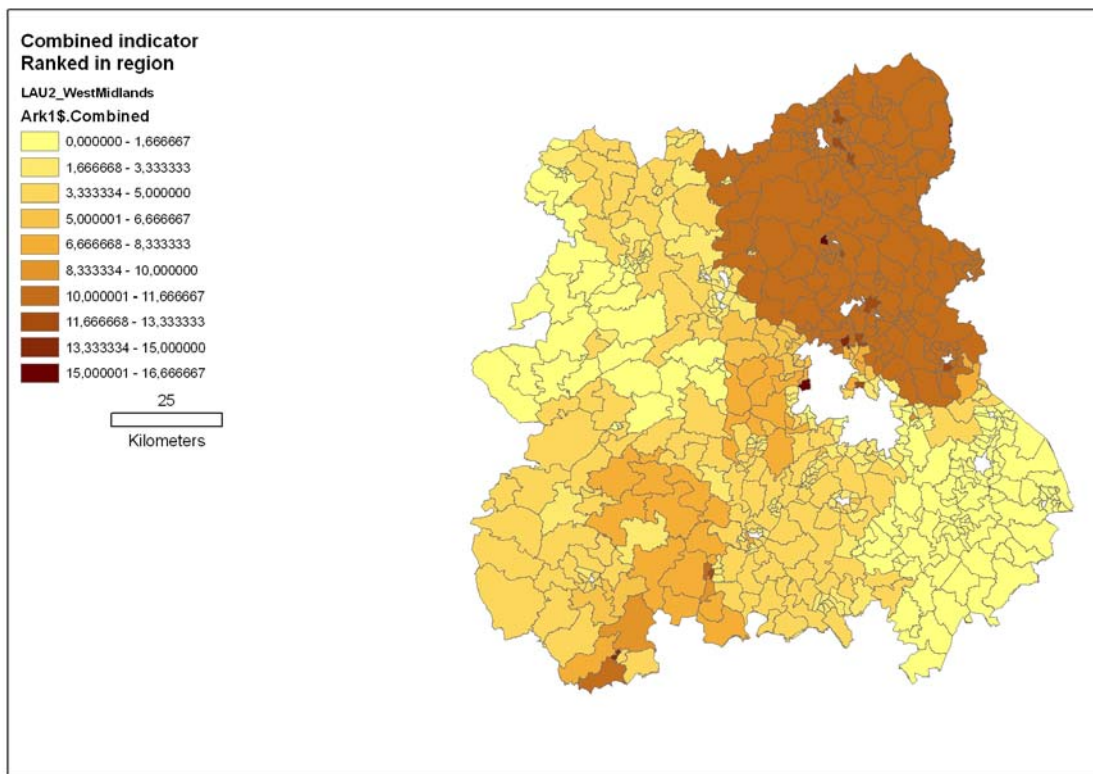


Figure 38: Societal appreciation indicator of the agricultural landscape composite indicator based on the downscaled procedure for the EU wide indicator (see Part 1) for case study region West Midlands

This and similar types of information are available nationally for all part of the UK and for many other member states from national maps, often in digital form.

The mapping reveals some consistent patterns and, in particular, reveals variation that is consistent with the scale of differences in the physical/cultural landscape.

Figure 38 shows the result obtained in Part 1, it has to be underlined that maps in Figures 37 and 38 cannot be directly compared, since the latter complements the first one.

5.2.3 Groene Woud/Noord-Brabant (The Netherlands)

Quality products

Within the province Noord-Brabant, there is little information available about the production of quality products related to landscape. The best available alternative is information about the number of farms with side-line activities concerning the production of agricultural products, like the production of dairy products etc. For The Netherlands, there is a national database called GIAB (Data files and Information about Agricultural Businesses) (www.giab.nl), that contains data at farm level which are not free for publication. For this reason only the normalized values are discussed. The end result is a regional normalization (between 0 - 10) of the percentage of agricultural businesses with registered sideline activities concerning the production of agricultural products, within the LAU2 regions.

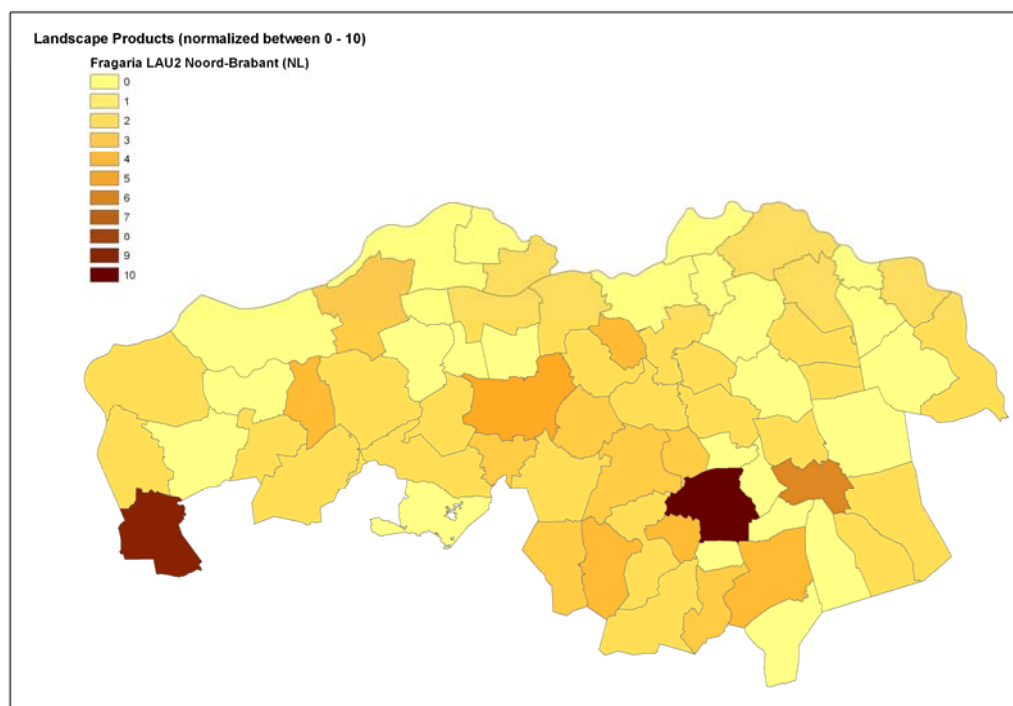


Figure 39: Index on landscape related high quality product based on alternative data sources (farms with sideline activities concerning production of dairy products etc.) for the case study region Groene Woud (Brabant)

Figure 39 shows a concentration of sideline activities in the Eindhoven and Woensdrecht region, the latter in close proximity to the Belgium city of Antwerp. Though these areas appear almost as outliers in comparison with the remaining communities, we think that this represents the geo-economic reality of the Province and should not be treated as a statistical abnormality.

Using GIAB-information of sideline activities concerning the production of agricultural products has one disadvantage. The index tends to be higher in areas with a lot of urban area. So perhaps this indicator is more suitable to indicate the variation in demand for agricultural products, instead of its impact on rural landscape.

Tourism in rural areas

Again for rural tourism, alternative information can be obtained from the GIAB-database (see paragraph Alternative/complementary indicators for Number of Quality Products). This database shows on farm-level the farms that have registered tourist activities and accommodations. Since this data has publication restrictions, it is not possible to mention anything about absolute numbers and only the normalized values are discussed. The end result is a regional normalization (between 0 - 10) of the percentage of agricultural businesses with registered sideline activities concerning tourist activities, within the LAU2 regions.

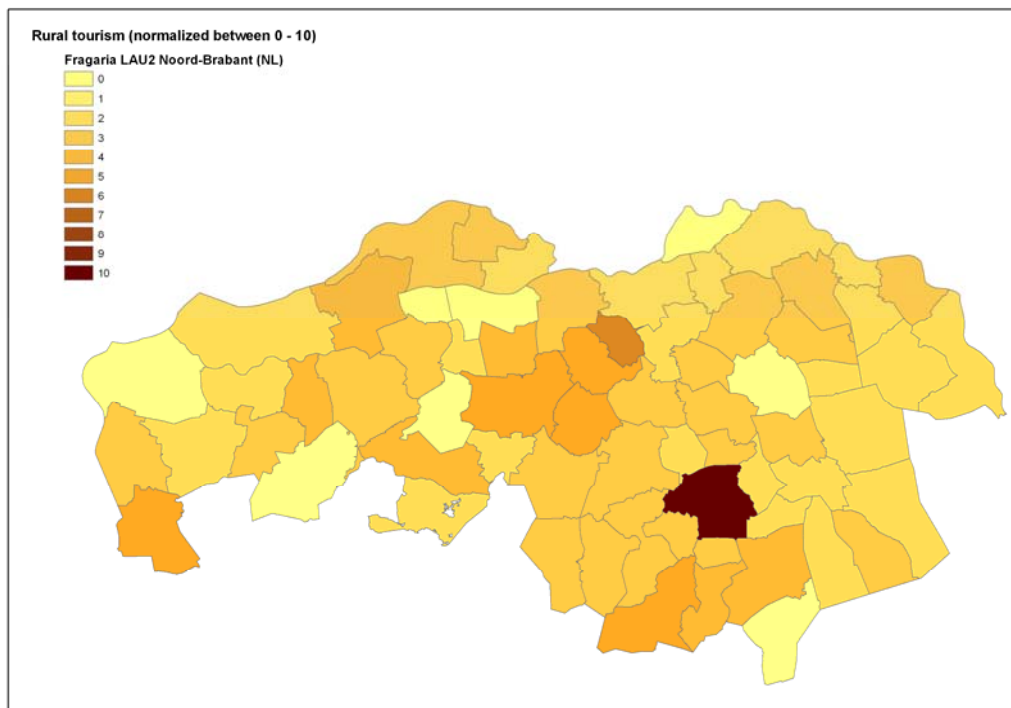


Figure 40: Index on tourism in rural areas based on alternative data sources (farms with sideline activities concerning touristic activities) for the case study region Groene Woud (Brabant)

Comparing the results of the rural tourism index based on European data and national data, it can be concluded that the normalized results on European data are much more heterogeneous. However, since the index is normalized it is difficult to tell whether there is an absolute difference in the rural tourism among the two datasets. Looking in more detail at the index based on national data, one can state that there is one single LAU2-region with an outlying value, which causes a homogeneous appearance of the remaining regions. Nevertheless this outlying region concerns the biggest city in the region, called Eindhoven, and in one might expect tourism to concentrate.

Additional Indicator: Appreciated Agricultural Landscapes

There is a current recompilation of recreational preferences for landscapes through the special website www.daarmoetikzijn.nl (www.myplacetobe). The results are very promising and have the potential to be used in the future for a more detailed mapping of recreational services after linking the landscapes preferences to recreational ecosystem services (Goossen & Perez-Soba, 2011). The website gives the internet-users the opportunity to compile their own preferred 'imaginary' landscapes. With the use of geo-referenced data the internet-user landscape preferences are compared with real landscapes. The result is a unique personalized map with a person's own appreciation of the Dutch landscapes. All preferences and personalized maps are saved in a database². From 2006 on, almost 250.000 Dutch users visited the website. The outcome from the first five years (2006-2010) of the website is used to map the average landscape preferences of the Dutch citizens (Goossen and Perez-Soba 2011), as shown in Figure 41.

² Alterra is now developing an European version of the website www.myplacetobe.eu

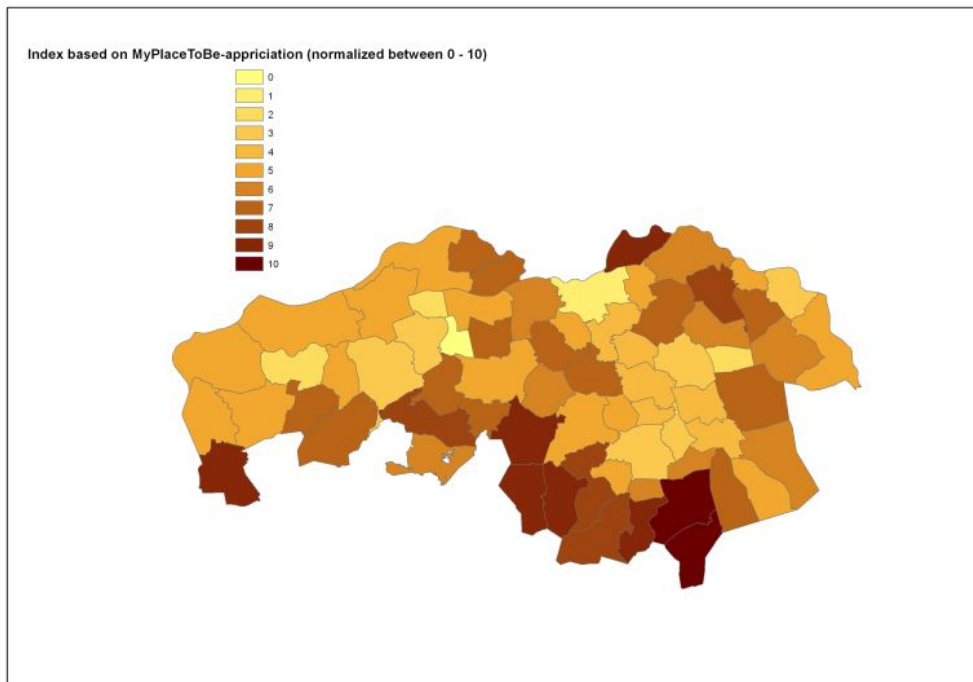


Figure 41: Index on social appreciation of the rural-agrarian landscapes based on recreational preferences as detected by the interactive website 'MyPlaceToBe' (Goosen 2011)

Figure 42 shows a possible application of the MyPlaceToBe-data for the Province of North-Brabant at the level of LAU2. The original selection of agricultural land use raster data deriving from the Dutch land use dataset LGN has been combined with the results of nationwide analysis of MyPlaceToBe data (Figure 41) and was later aggregated at the LAU level (Figure 44) to allow comparisons within the indicator assessment of this study. Although this indicator has been listed here as a national 'additional indicator', it should be noted that there is also an initiative to build a European-wide version of this national webpage which potentially allows to build up a European-wide preference dataset as the basis for a European appreciation index.

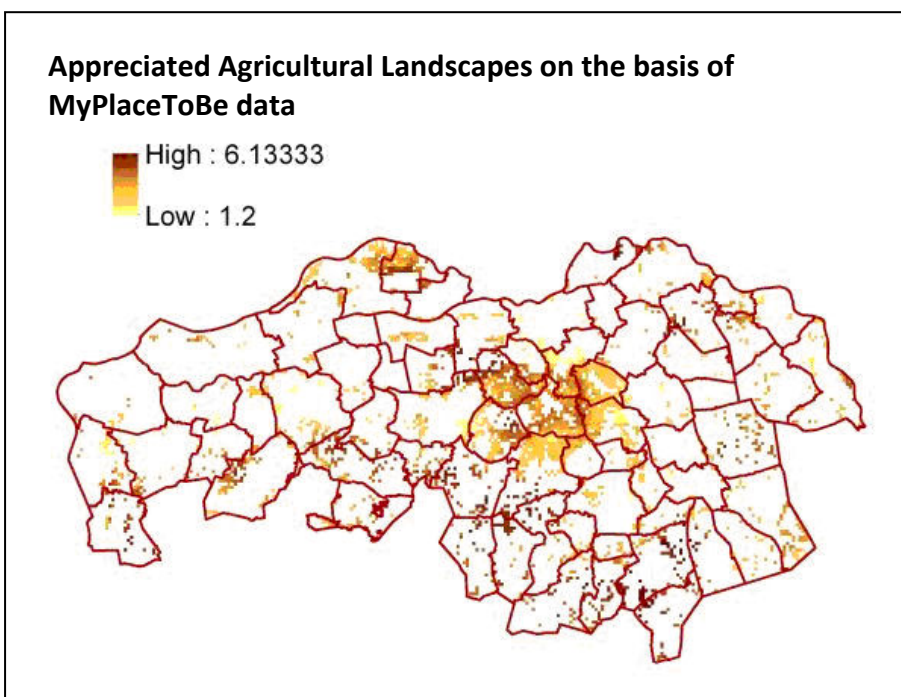


Figure 42: Original raster data based on LGN behind the aggregation of 'MyPlaceToBe' displayed in Figure 41 (Goosen 2011)

Agricultural areas in protected and valuable sites

Protected areas considered for the Province of North-Brabant include:

1. UNESCO areas within The Netherlands (version of August 2008)
2. National parks 2007
3. National landscapes 2010
4. Planned EHS 2010 (Main Ecological Network)
5. Natura2000 protection status in 2008

This information is overlaid with the agrarian land cover derived from the Dutch National land-cover map (LGN5). The result is a regional normalization (between 0 and 10) of the percentage of agrarian surface located within the combined protected areas related to the total agrarian surface.

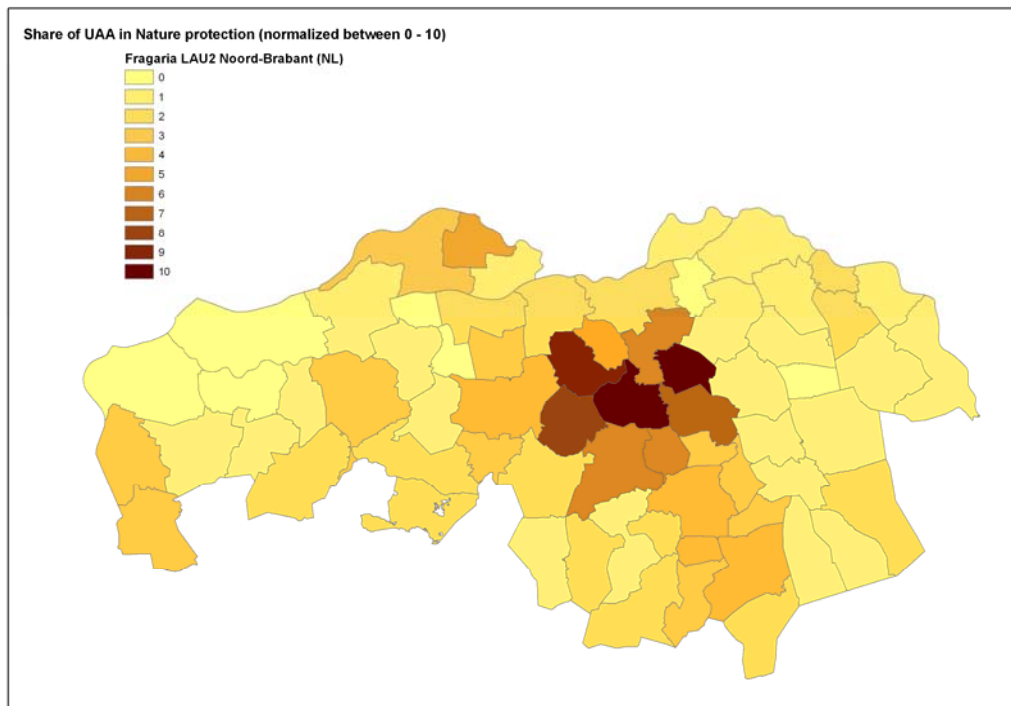


Figure 43: Index on agricultural areas in protected and valuable site based on alternative data sources (including protected sites on national level) for the case study region Groene Woud (Brabant)

“Het Groene Woud” is located in the centre of Noord-Brabant, and its location is clearly visible on the map with a high index. This area falls under the restriction of National landscapes and is so large that it covers multiple LAU2-regions. The result is that percentage of agrarian surface located within protected areas goes up to 100 %. Such extreme values have as disadvantage that the remaining LAU2-regions look more homogeneous; this can also be observed when comparing the index, based on European data with the results of the national data.

The differing index of the European and national approach is in this case not related to a difference in the applied land cover data. As the agricultural surface derived from LGN5 corresponds nicely with the surface derived from CORINE 2006, with a standard deviation of 5.7%. If the differences are not caused by land cover data, the deviation must then be due to a difference in definition of protected areas.

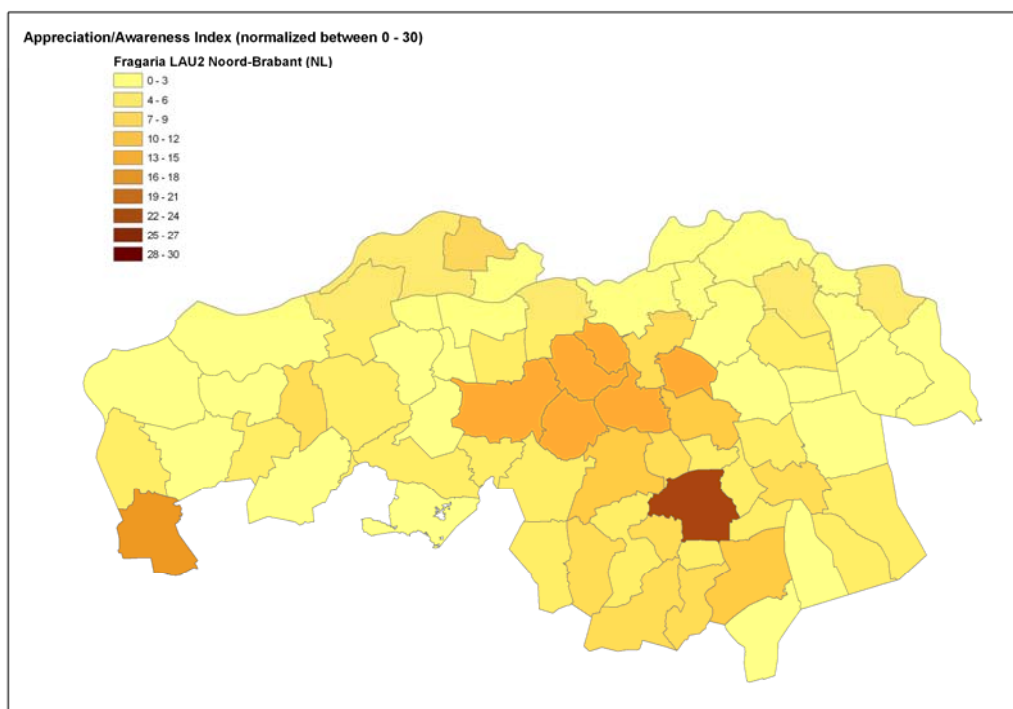


Figure 44: Combined indicator for landscape appreciation for the case study region Groene Woud (Noord Brabant)

Combined indicator for landscape appreciation

The societal appreciation of the rural landscape index is the sum of the latter three indices and has a scale ranging from 0 to 30. Looking at the result, the city of Eindhoven and the area around “Het Groene Woud” score very high according to the appreciation index. This is mainly caused by the share of agriculture inside protected areas and rural tourism. Landscape products on the other hand, seem to have a less dominant role in Noord-Brabant.

5.2.4 Tuscany (Italy)

Quality products

Here following the available data bases for alternative/complementary indicator to number of quality products are introduced. For each one of these data bases, after a short description, the reasons for considering or not considering them as suitable alternative/complementary indicators are explained.

Traditional Products

By following the Law Decree n° 350 of the 8th of September 1999 of the Ministry of Agriculture and Forestry policies (MIPAF), in Tuscany since 1999 an extensive census of traditional products has been carried out by the Agenzia Regionale per lo Sviluppo dell’Innovazione del settore Agricolo-forestale (ARSIA – Regional Agency for the Development of Innovation in the Agro-forestry Sector). Traditional products are defined as those products whose methods of production, conservation and seasoning have been consolidated in times, and carried out in the territory homogeneously and following traditional rules for at least a past period of 25 years. According to this census (http://germoplasma.arsia.toscana.it/pn_prodtrad/), in Tuscany, in 2009 there were 465 traditional products. For each traditional product there is a description of the territory of production (e.g. type of habitat for pastures of lambs), methods of production, risks of ending production, etc. This

description can be used to identify those products linked to the landscapes from those that are not. Traditional products are geo-referenced at province levels (LAU1).

Given that the analysis is carried out at LAU2 level this indicator cannot be considered a suitable complementary indicator to the number of certified products.

Local germoplasms

Germoplasms of breeds and varieties are geo-referenced at the level of provinces (LAU1) levels (http://germoplasma.arsia.toscana.it/pn_germo/).

For each animal or plant germoplasm there are, amongst other, information on place of origin and the territory of diffusion, methods of production, risks of extinction, etc. This description can be used to identify products linked to landscape.

Given that the analysis is carried out at LAU2 level this indicator cannot be considered a suitable complementary indicator to the number of quality products.

Custodian farmers

A third database contains information on farmers who are officially recognised and rewarded by agri-environmental measures for conserving varieties at risk of extinction. Their farms are geo-referenced at LAU2 level http://germoplasma.arsia.toscana.it/pn_germo/.

The rationale behind the use of this indicator is that the existence of registered farmers cultivating old varieties of plants, fruit trees, and vegetables within the territory of a municipality can be assumed to be a proxy for traditional management of the whole farm and therefore testifying an appreciation of this type of agricultural landscape. The presence of custodian farmers managing their farms in traditional ways, in some cases, may have an impact on the appreciation of agricultural landscapes. This can be the case, for instance, when small traditional vineyards are somehow mitigating the very large extension of vineyards for the production of PDO wines which are impacting on the appreciation of landscape, especially in winter times when wines are without foliage.

Despite the low number of custodian farmers registered at the moment, this indicator, could be seen as having a strong potentiality in the future to become a complementary indicator to the number of quality products, particularly if a larger number of farmers who maintain and manage their farms in traditional ways was registered and geo-referenced.

Two maps show stewardship farmers at LAU2 level. The first (Figure 45) shows the number of stewardship farmers referred to UAA at LAU2 level. The second (Figure 46) shows just the number of stewardship farmers at LAU2 level.

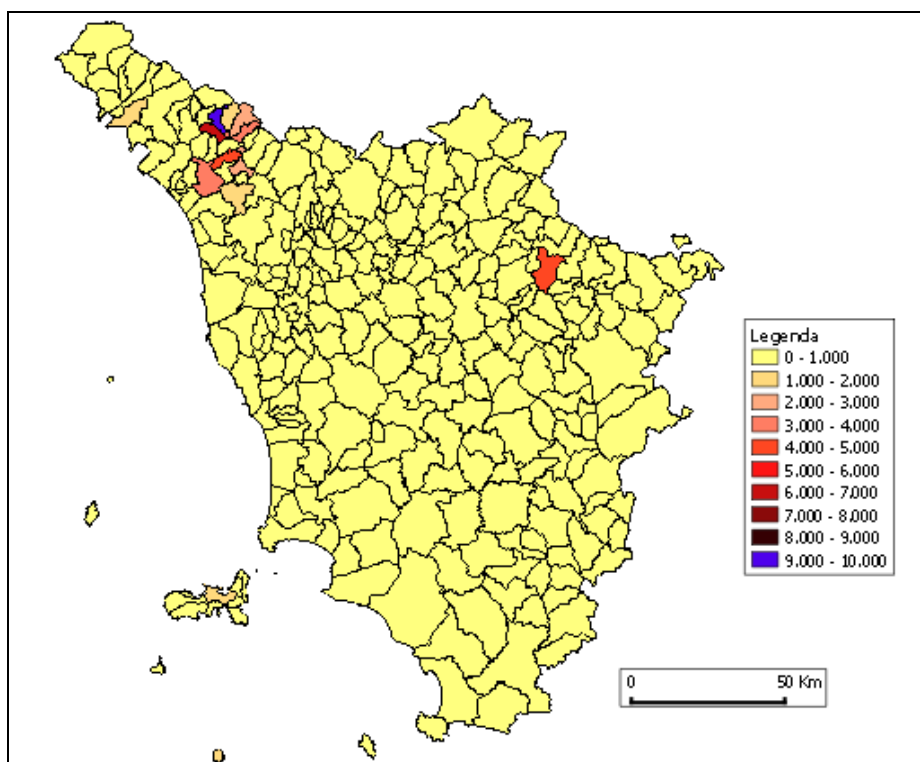


Figure 45: Number of Stewardship Farmers per UAA of LAU2 units in the case study region Tuscany

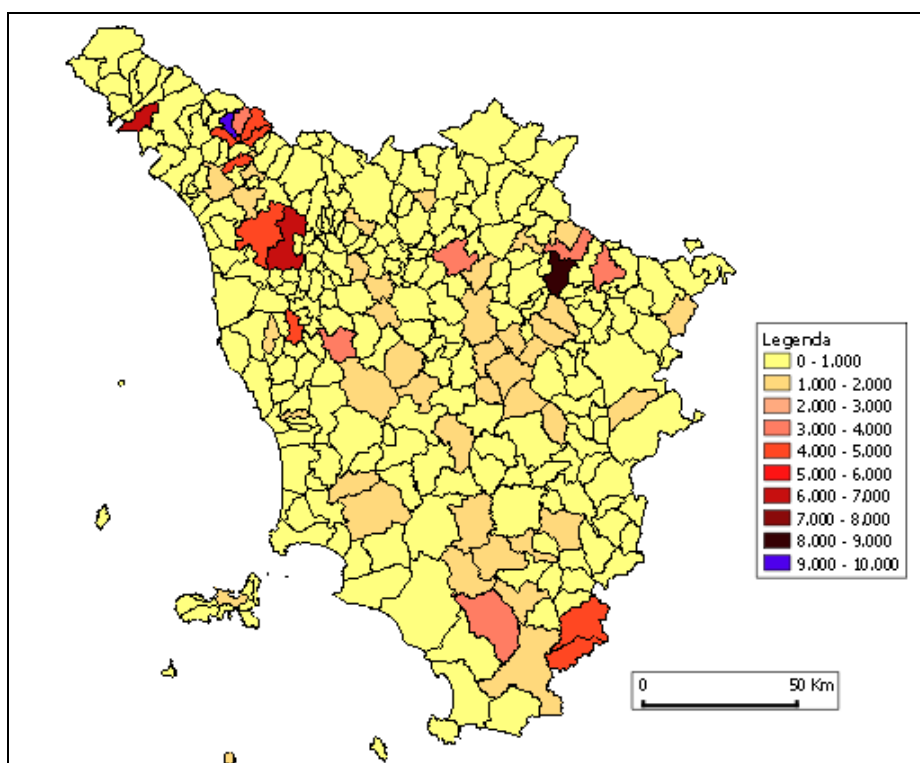


Figure 46: Number of Stewardship Farmers at LAU2 level

UAA for PDO wines

Data bases are available for PDO wines. Information includes square meters of cultivated UAA for their production and quantity of production at LAU2 level. http://www.artea.toscana.it/sezioni/servizi/misure.asp?dove=testi/ocm/vitivinicolo/albi_elenchi/albi_elenchi.htm

This indicator can be a valid alternative to the number of PDO wines. When it is possible to obtain also the UAA for other PDO and PGI products linked to landscape, the resulting indicator will be a suitable, and more precise, alternative for the indicator based on the number of certified products. A map of the UAA for PDO wines is shown below (see Figure 47).

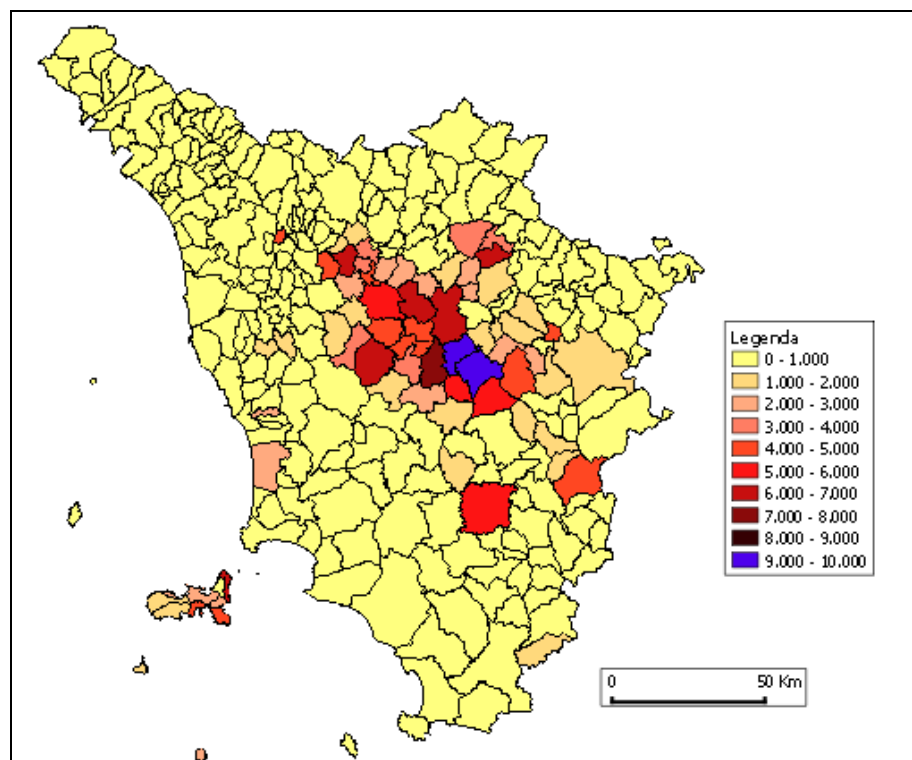


Figure 47: UAA for PDO wines at LAU2 level

Tourism in rural areas

Databases on tourism at province (LAU1) and municipality (LAU2) levels are available at the official web site of the Tuscany Region <http://ius.regione.toscana.it/cif/stat/index-turismo.shtml>

The indicator number of tourists refers to the overall presence of tourists at LAU1 or LAU2 levels, not distinguishing between those visiting the countryside or urban areas.

The indicator number of beds refers to all the tourists hosting structures (e.g. hotels, campsites, second homes, B&B, agro-tourism farms, etc.) at LAU 1 or LAU2 levels, not distinguishing between those in urban areas or in rural areas.

These indicators may have a meaning as proxies measuring tourism attracted by agricultural/rural landscape only if municipalities are *a priori* classified in rural or urban areas.

Therefore both the indicators number of tourists and number of beds are not considered suitable alternative/complementary indicators to the indicator number of farms with gainful tourist activities.

Wine and taste roads

Wine and taste roads are routes crossing territories particularly suitable to the production of wine and typical products. These routes are characterised also by landscape, cultural, historical and natural features. Wine and taste roads are networks of private and public actors promoting local history, culture, products by offering a package of local private (e.g. wine) and public goods (e.g. landscape) for recreational and tourism activities. A publication of the Tuscany Region (2007), *Toscana: Itinerari del vino e del gusto*, is available with information on each one of the 24 roads and municipalities interested (see Figure 48). From this information is possible to identify the municipalities crossed by each of the wine and taste roads.



Figure 48: Wine and taste roads in Tuscany (Toscana Promozione, Agenzia di Promozione Economica della Toscana, Itinerari del vino e del gusto, Regione Toscana, 2007)

This indicator can be considered a suitable complementary indicator for rural tourism.

Horse Trails

Horse trails are routes crossing some municipalities and provinces of Tuscany. These routes are organised following old gravel roads, beautiful natural and rural landscapes and historical and cultural monuments and villages. Tuscany Region has published “Ippovie Toscane” (www.turismo.intoscana.it), a publication with description of the horse routes of Tuscany (see Figure 49).



Figure 49: Horse trails in Tuscany (Tuscany Region web site: http://www.turismo.intoscana.it/intoscana2/export/TurismoRT/sito-TurismoRT/Tema/turismoequestre.html_2133648958.html)

This indicator can be considered a suitable complementary indicator for rural tourism

Other Countryside Itineraries

The description of 417 thematic itineraries in the Tuscan countryside is available at the web site: <http://www.turismo.intoscana.it/intoscana2/opencms/TurismoRT/sito-TurismoRT/MenuServizio/RicercaElementiDiInteresse/index.html?tagcanale=Campagna&categoria=/Contenuti/Itinerari&sezione=ITINERARI&asset=Articolo>

From the description of countryside itineraries it is possible to select those directly linked to the agricultural/rural landscape (e.g. bike routes, trekking routes, wine and taste roads, museums of rural/agricultural life and work, horse trails, etc.) and exclude those regarding more general cultural, artistic, old towns and villages destinations, and trekking routes in forests or mountains. In order to avoid double counting also wine and taste roads and horse trails have been excluded from selected itineraries. Those selected have then included in a data base defined as “other countryside itineraries”. Finally, by following the description of each itinerary selected, the municipalities crossed have been identified so to have the availability of the information at LAU2 level.

This indicator can be considered a suitable complementary indicator for rural tourism.

Conclusions on alternative/complementary indicators for rural tourism

Amongst the indicators identified only “wine and taste roads”, “horse trails” and “other countryside itineraries” are suitable complementary indicators to the number of farms with gainful tourism activities. However given their common “complementary character” and the fact that many municipalities are crossed by just one touristic route above, it is reasonable to aggregate these indicators in one single index identified as “multiple countryside itineraries linked to landscape”.

Three maps of the indicator “Countryside itineraries linked to landscape” are shown. The first map (see Figure 50) shows the number of countryside itineraries referred to the UAA for each municipality (LAU2). Unfortunately, because of the presence of municipalities with very tiny UAA, the standardisation to UAA makes problematic the visualisation of other municipalities with countryside itineraries and larger UAA. To overcome this problem, a second map (see Figure 51) is produced, considering the number of countryside itineraries referred only to UAA greater than 100 ha at LAU2 level. The indicator is considered equal to 0 for the 9 municipalities (out of a total of 287) with less than 100 ha of UAA. However, also this arrangement makes the visualization of this indicator at LAU2 level problematic. This is due to cases of relatively small number of itineraries related to large extension of UAA. So, finally, also a map (see Figure 52) showing just the number of countryside itineraries linked to landscape not referred to UAA is produced.

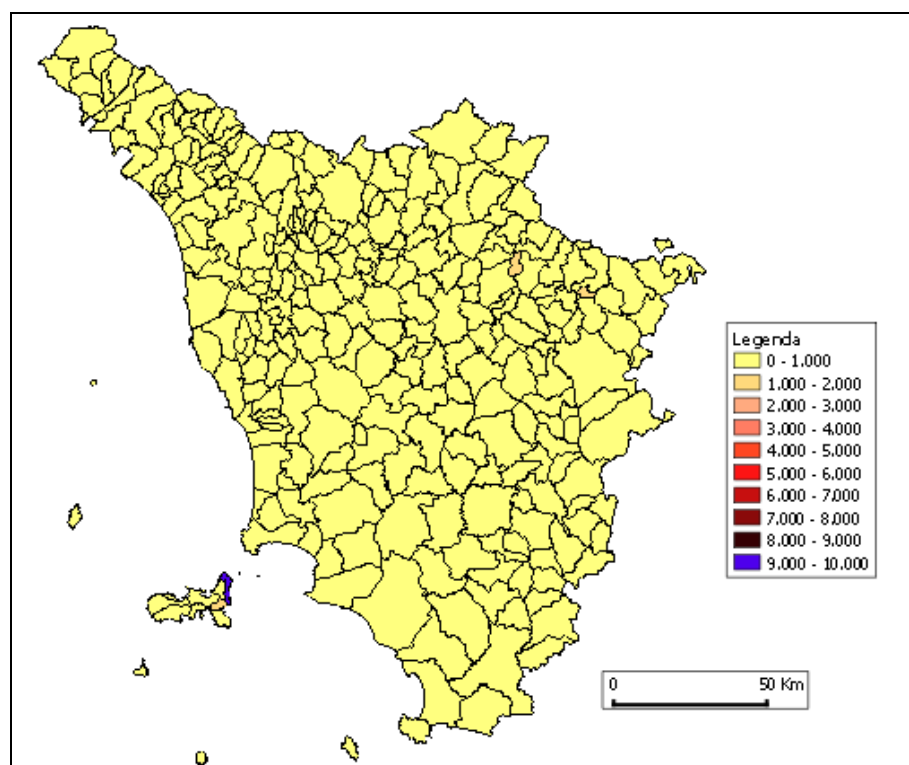


Figure 50: Number of Multiple Countryside Itineraries per UAA at LAU2 level

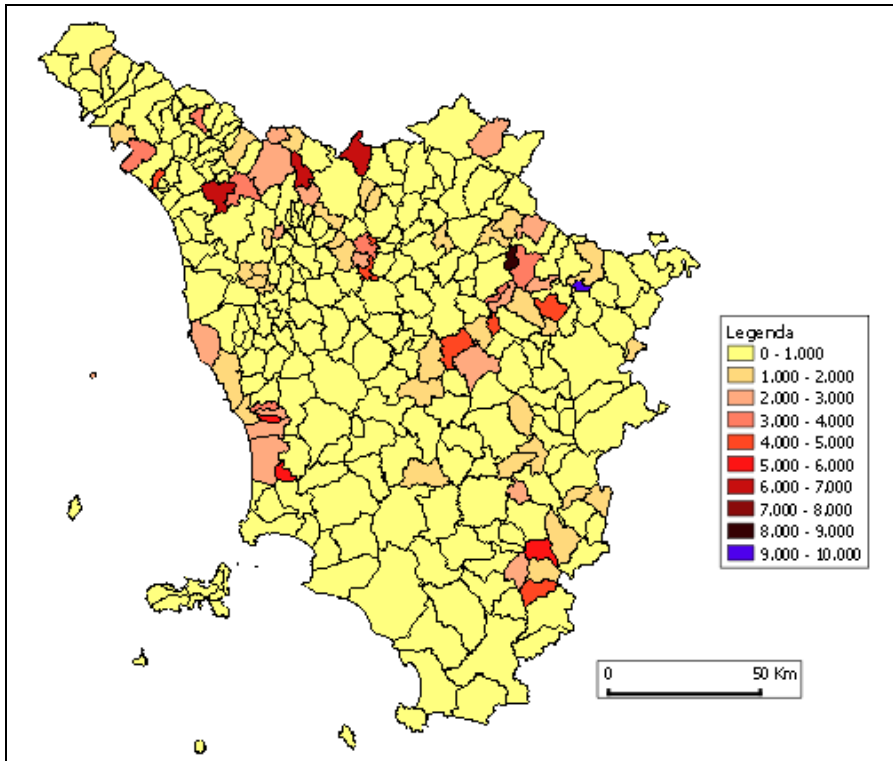


Figure 51: Number of Multiple Countryside Itineraries per UAA at LAU2 level (UAA>100ha; value of the indicator = 0 for UAA < 100ha)

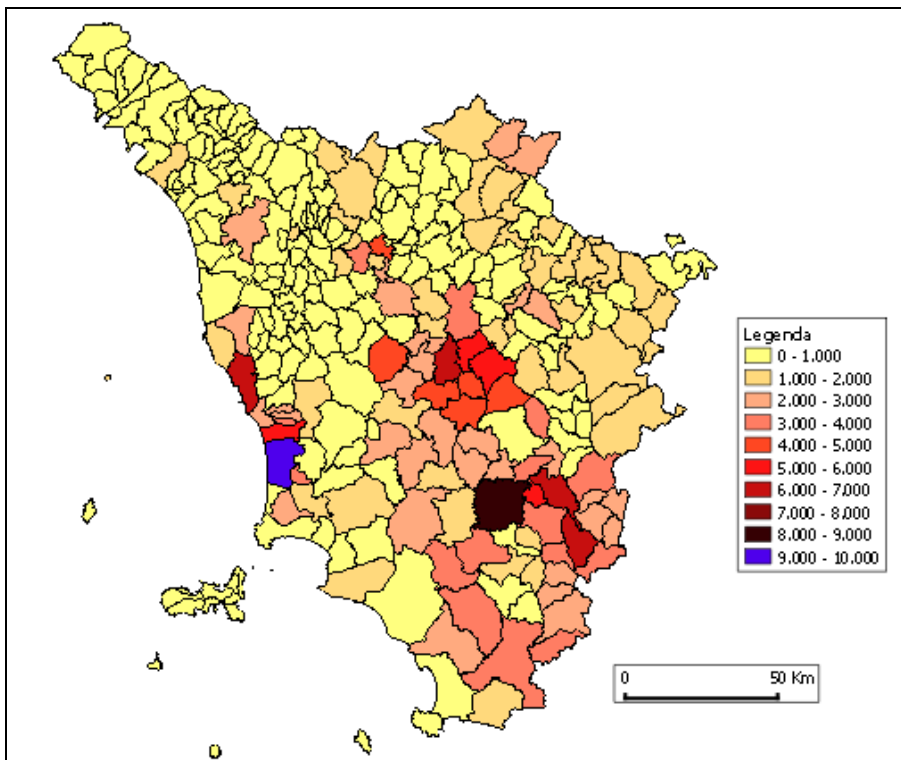


Figure 52: Number of Multiple Countryside Itineraries at LAU2

Agricultural areas in protected and valuable sites

Here following the available data bases for alternative/complementary indicator for protected areas are introduced. For each one of these data bases, after a short description, the reasons for considering or not considering them as suitable alternative/complementary indicators are explained.

Local protected areas and Natura 2000 sites

In 2009, according to the ninth official update of regional protected areas of Tuscany, the surface of protected areas amounted to 226,902 ha covering 9.87% of the regional territory. Data on municipalities interested by protected areas are available. The protected areas system of the Tuscany Region accounts for:

- 3 National Parks;
- 3 Regional Parks;
- 3 Provincial Parks;
- 28 State Natural Reserves;
- 42 Provincial Natural Reserves;
- 52 Areas of Local Natural Protection Interest

Natura 2000 areas cover (excluding juxtaposition between different typologies) 312.241 ha around 12% of total regional territory. The system of protected areas and Natura 2000 sites coincide only for around 43%. Agricultural land uses represent around 15.07% of Natura 2000 sites (Regione Toscana, suppl. Boll. Uff.le n°48 del 28.11.07).

A data bank on Natura 2000 at municipality level (LAU2) is available at the regional environmental computerised system of Tuscany web site. <http://web.rete.toscana.it/sgr/webgis/consulta/viewer.jsp>

However to obtain data on UAA in local protected areas or Natura 2000 areas at LAU2 level is not possible within the timeframe of the present study.

Therefore within this study this indicator is not considered as a suitable complementary indicator for protected areas.

Protected landscapes (vincolo paesaggistico)

The areas identified and geo-referenced in this data base are those protected under the law decree D.Lgs. n.490 of 29 October 1999 “*Testo unico delle disposizioni legislative in materia di beni culturali e ambientali*”, and later by the law decree D.Lgs n.42 of 22 January 2004 “*Codice dei beni culturali e del paesaggio*”. A data base at LAU2 level is available at the following web site: <http://www.lammacres.rete.toscana.it/sitbc/tema.asp?typ=3&pr=FI>

In the same web site there are links to access geo-referenced maps of protected at LAU1 level (provinces) showing also LAU2 levels (municipalities) (see Figure 53 below).

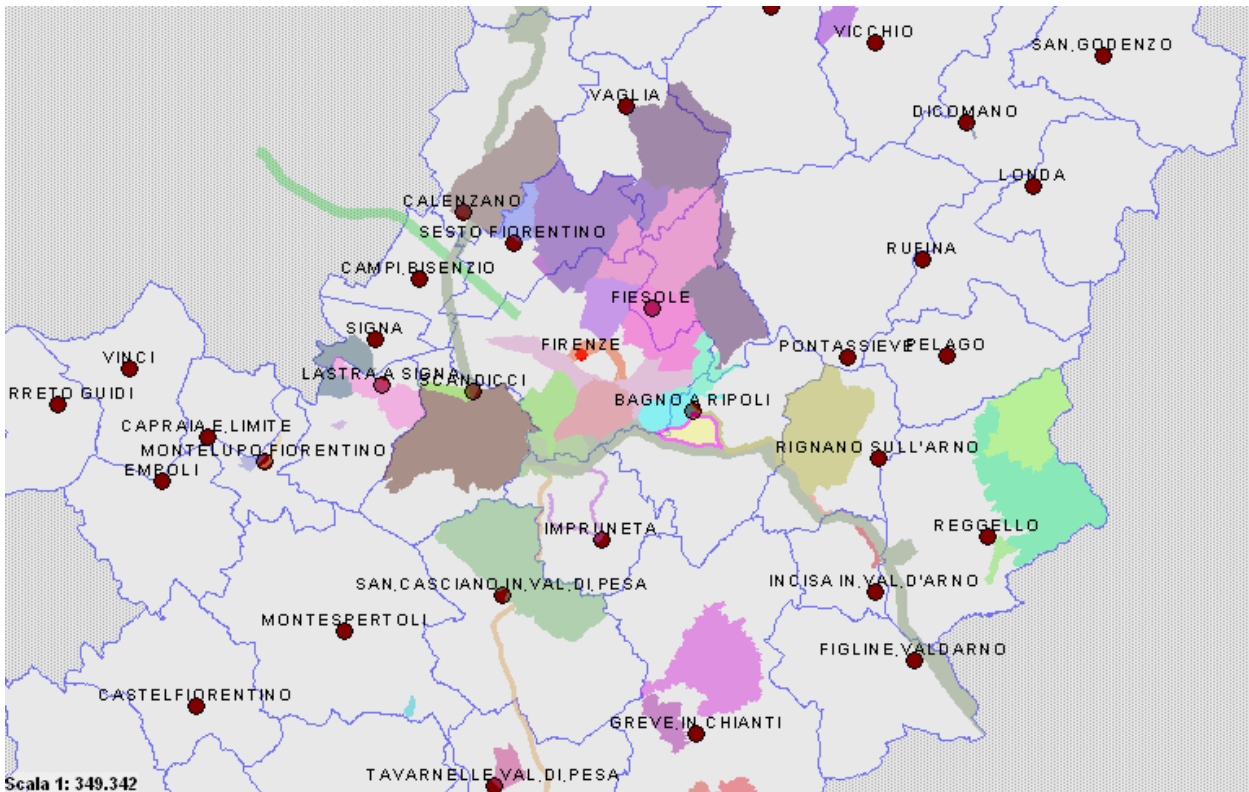


Figure 53: Protected landscapes in the municipalities surrounding Florence
 (Source: [http://sit.lammacres.rete.toscana.it/scripts/sisterims.dll?Run?svr=MAPSRV&Func=open&map=%22vincolo%20PAESAGGISTICO%20provincia%20di%20FIRENZE%22&html&QQQ&%22\[identificativo%20univoco%20regionale\]=9048172%22](http://sit.lammacres.rete.toscana.it/scripts/sisterims.dll?Run?svr=MAPSRV&Func=open&map=%22vincolo%20PAESAGGISTICO%20provincia%20di%20FIRENZE%22&html&QQQ&%22[identificativo%20univoco%20regionale]=9048172%22))

Unfortunately, despite the obvious existence of information on extension of each protected landscapes at LAU2 level, this information is not available at the web site.

However descriptions of protected landscapes and reasons for their protection are available at municipality level (LAU2). These descriptions can be used to identify those protected landscapes which are directly or indirectly linked to rural/agricultural landscapes from those that instead have more an urban character (e.g. meadows outside the medieval defensive walls of an historical town, trees running alongside a road, etc.) and therefore of no interest for this study.

For the reasons mentioned above, the indicator “protected landscape” in this study is measured by number of protected landscapes linked to rural/agricultural landscape.

This indicator can be considered an alternative/complementary indicator for protected areas.

In case this indicator is used as complementary indicator to “UAA in Protected areas” attention should be given to problems of double counting in case of agricultural areas that are registered contemporarily as “protected landscape” and as “UAA within protected areas”.

Figure 54 shows the number of protected landscapes referred to UAA. In this map, because of the presence of protected landscape also in municipalities with very tiny extension of UAA, the standardisation to UAA creates problems for the visualisation of the presence of protected landscape in municipalities with greater extension of UAA. To overcome this problem, a second map (see Figure 55) is produced, considering the number of protected landscapes referred only to UAA greater than 100 ha at LAU2 level. The indicator is considered equal to 0 for the 9 municipalities (out of a total of 287) with less than 100 ha of UAA. Finally also a map of just the number of protected landscapes per municipalities (LAU2 level) is shown (see Figure 56).

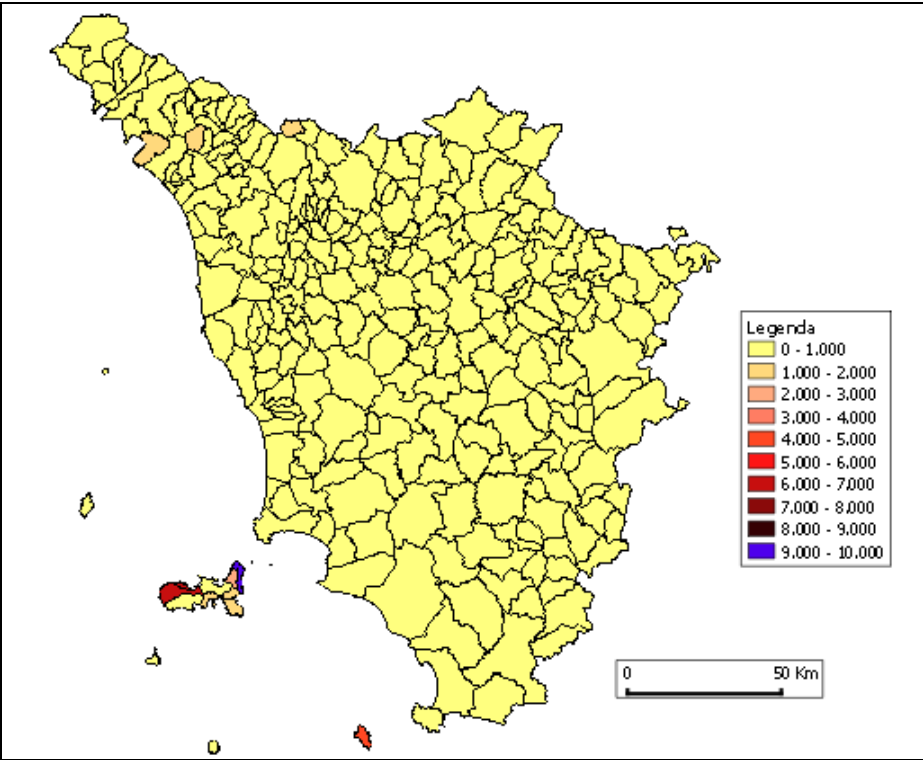


Figure 54: Number of Protected Landscapes per UAA at LAU2 level

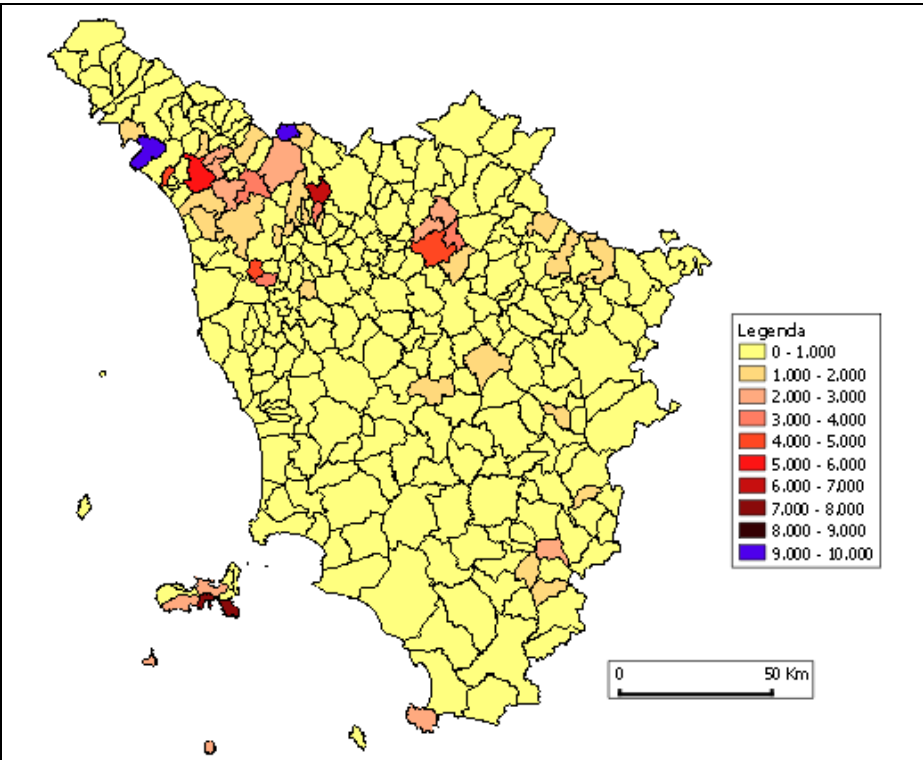


Figure 55: Number of Protected Landscapes per UAA at LAU2 level

(UAA > 100ha; value of the indicator = 0 for UAA < 100ha)

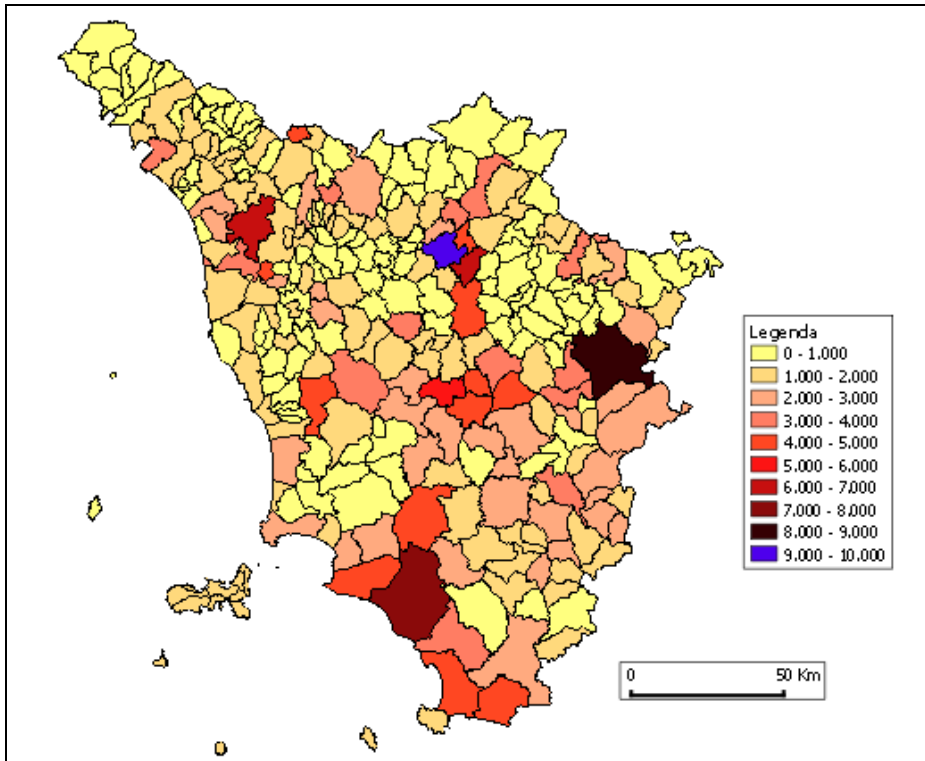


Figure 56: Number of Protected Landscapes at LAU2

Moreover, the following options have been taken into consideration:

Camping sites are generally located near the costs of Tuscany and used by people having holidays at seaside. However data are available at LAU 2 level.

Agri-environmental measures: data are available at LAU1 level. Obtaining these at LAU2 level is much more difficult.

Combined indicator for landscape appreciation

From the sections above it results that the complementary indicators selected for the Tuscany case study are:

Quality Products: Stewardship Farmers measured by numbers per LAU2; UAA for PDO Wines normalised by total UAA per LAU2;

Rural Tourism: Multiple Countryside Itineraries (i.e. Wine and taste roads, Horse trails, other countryside itineraries) measured by number per LAU2;

Protected Areas: Protected Landscapes measured by number per LAU2;

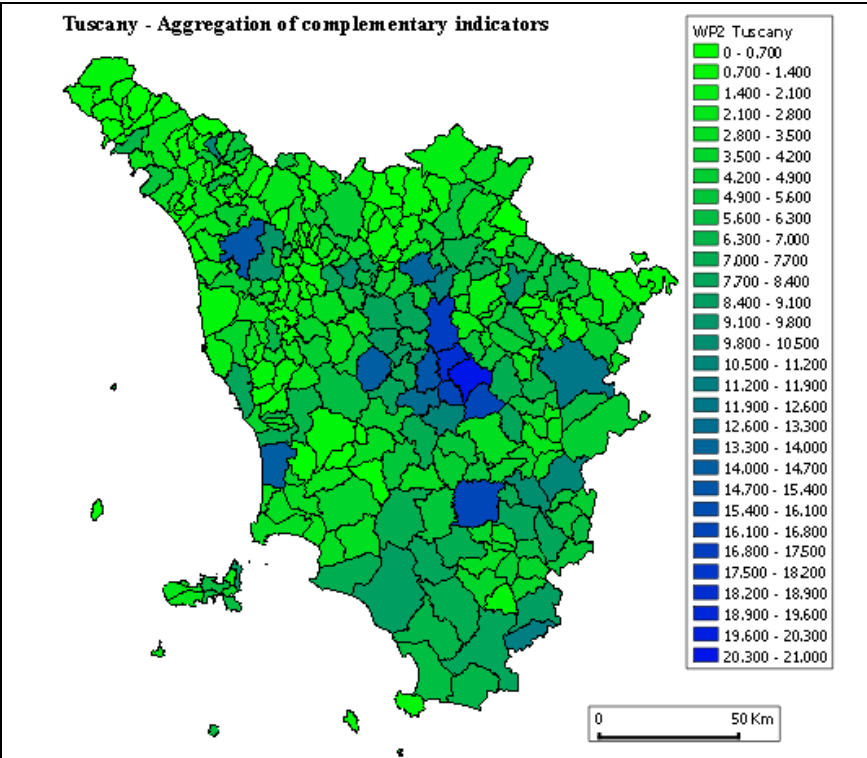


Figure 57: Tuscany “Social appreciation” of rural landscape measured by aggregation of selected alternative/complementary indicators

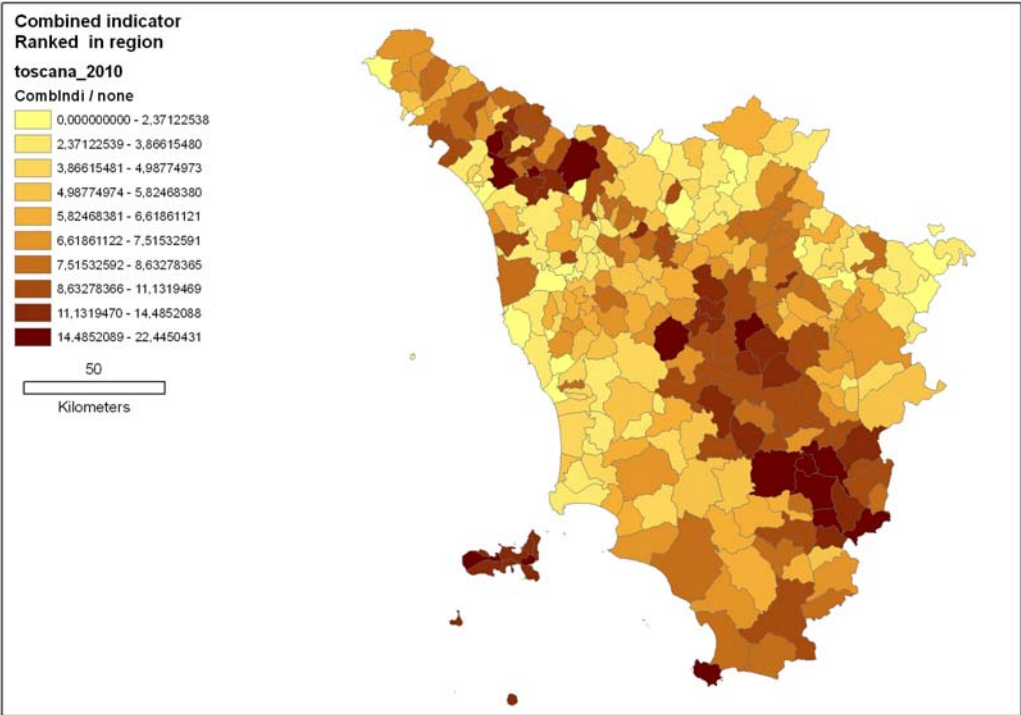


Figure 58: Tuscany “Social appreciation” composite indicator following the EU landscape indicator protocol (see Part 1)

5.2.5 Alentejo (Portugal)



Certified products

Certified forest products would qualify as supporting information for the landscape indicator for Portugal. Though the FSC -Forest Stewardship Council (<http://www.fscportugal.org/introducao/introducao.htm>) and PEFC schemes (<http://www.pefc.org/about-pefc/membership/national-members/14-Portugal>) provide databases of such products, it is not possible to relate identified products to the Alentejo area from the current databases. It is known that there are certified products such as cork (please see FSC table attached) but the certification bodies do not have available data regarding those products. Consequently, certified products from forests cannot be included as complementary index.

In Alentejo there is a high number of certified products (44) and their production zones are not mutually exclusive. Therefore an attempt was made to define an index taking the spatial overlap of production areas into consideration. Such index is combining surface and number of certified products by multiplying the production surface (land cover area providing the certified product) by a factor given by the number of products per landscape/total products.

The procedure is shown in Tables 5 and 6. In Table 5, the number of certified products related to each land cover class was counted. Then, the number of products was divided by the total number of certified products in Alentejo, which is 44, in order to have the ratio of certified products by providing land cover class.

Table 5: Number of certified Products by provider Land cover classes

Designation	Agricultural system linked to the PDO	CORINE class involved in the production system
Presunto de Barrancos	montado	244
Carne da Charneca (bovinos)	montado+pastagem	244;231;321
Carne de Porco Alentejano	montado	244
Azeitonas de Conserva de Elvas e Campo Maior	olival	223
Azeite do Alentejo Interior	olival	223
Presunto do Alentejo ; Paleta do Alentejo	montado	244
Queijo de Nisa	pastagem	244;241;242;243;223;321;231
Azeite de Moura	olival	223
Carne Mertolenga (bovinos)	pastagem+montado	244;231;321
Castanha Marvão-Portalegre	soutos	311
Cereja de São Julião-Portalegre	pomar/cereja	222
Queijo de Évora	pastagem	244;241;242;243;223;321;231
Mel do Alentejo		222;223;231;241;242;243;244;321;322;323;324
Queijo Serpa	pastagem+montado	244;241;242;243;223;321;231
Ameixa d'Elvas	pomar/ameixa	222
Carnalentejana (bovinos)	pastagem+montado	244;231;321
Azeites do Norte Alentejano	olival	223
Chouriço Mouro de Portalegre	montado	244
Cacholeira Branca de Portalegre	montado	244
Painho de Portalegre	montado	244
Lombo Enguitado de Portalegre	montado	244
Lombo Branco de Portalegre	montado	244
Linguiça de Portalegre	montado	244
Morcela de Assar de Portalegre	montado	244
Morcela de Cozer de Portalegre	montado	244
Farinheira de Portalegre	montado	244
Chouriço de Portalegre	montado	244
Borrego do Baixo Alentejo	pastagem+montado	244;241;242;243;223;321;231
Queijo mestiço de Tolosa (ovelha+cabra)	pastagem+veg natural	244;241;242;243;223;321;231;322;323;332;333
Borrego do Nordeste Alentejano	pastagem+montado	244;241;242;243;223;321;231
Paia de Toucinho de Estremoz e Borba	montado	244
Farinheira de Estremoz e Borba	montado	244
Chouriço de Carne de Estremoz e Borba	montado	244
Paia de Lombo de Estremoz e Borba	montado	244
Morcela de Estremoz e Borba	montado	244
Chouriço grosso de Estremoz e Borba	montado	244
Paia de Estremoz e Borba	montado	244
Linguiça do Baixo Alentejo ; Chouriço de carne do Baixo Alentejo	montado	244
Paio de Beja	montado	244
Presunto de Camp Maior e Elvas ; Paleta de Campo Maior e Elvas	montado	244
Presunto de Santana da Serra ; Paleta de Santana da Serra	montado	244
Borrego de Montemor-o-Novo	pastagem+montado	244;241;242;243;223;321;231
Maçã de Portalegre	pomar/maça	222
Vinha	Vinha	221

Table 6 shows as an example the calculation procedure for class 244, which corresponds to Montado landscape.

Table 6: Calculation procedure for certified products/land cover class

CLC	PRODUCTS	NUMBER OF PRODUCTS	NP/TP
244	Presunto de Barrancos	35	0,795455
	Carne da Charneca (bovinos)		
	Carne de Porco Alentejano		
	Presunto do Alentejo; Paleta do Alentejo		
	Queijo de Nisa		
	Carne Mortolenga (bovinos)		
	Queijo de Évora		
	Mel do Alentejo		
	Queijo de Serpa		
	Carne Alentejana (bovinos)		
	Chouriço Mouro de Portalegre		
	Cacholeira Branca de Portalegre		
	Painho de Portalegre		
	Lombo Enguitado de Portalegre		
	Lombo Branco de Portalegre		
	Linguiça de Portalegre		
	Morcela de Assar de Portalegre		
	Morcela de Cozer de Portalegre		
	Farinheira de Portalegre		
	Chouriço de Portalegre		
	Borrego do Baixo Alentejo		
	Queijo mestiço de Tolosa (ovelha+cabra)		
	Borrego do Nordeste Alentejano		
	Paia de Toucinho de Estremoz e Borba		
	Farinheira de Estremoz e Borba		
	Chouriço de Carne de Estremoz e Borba		
	Paia de Lombo de Estremoz e Borba		
	Morcela de Estremoz e Borba		
	Chouriço grosso de Estremoz e Borba		
	Paia de Estremoz e Borba		
	Linguiça do Baixo Alentejo; Chouriço de carne do Baixo Alentejo		
	Paio de Beja		
	Presunto de Campo Maior e Elvas; Paleta de Campo Maior e Elvas		
	Presunto de Santana da Serra; Paleta de Santana da Serra		
	Borrego de Montemor-o-Novo		

The Montado is the agro-silvo-pastoral system characteristic of southern Portugal, and the dominant land-cover in the region of Alentejo. The Montado results from the progressive transformation of the original macquis, leading to a land-use system based on the diversity and complementarity of production. It is characterised by the combination of an open tree cover of cork oak (*Quercus suber*) and holm oak (*Quercus rotundifolia*) in various densities, with a rotation at the soil level, of cultures, grazing and fallow (Pinto Correia, 1993). This agro-forestry system has a characteristic fuzzy landscape pattern which is kept through extensive grazing (livestock of pigs, cows and sheep in low densities). Different trends of extensification, and even abandonment along with intensification (mainly for intensive olive oil production) have been occurring.

In a subsequent step the value of the ratio was multiplied by the area of the corresponding land cover class. For example the municipality of Alandroal has 16734,93 ha of Montado (Class 244) and

this area was multiplied by the value of the ratio for montado (0,795455) as calculated above ($16734,93 \times 0,795455 = 13387,94$). The underlying motivation for such a procedure is to give more value to the land cover classes which are able to provide a higher number of certified products.

Table 7: Modified index for Class 244 (Montado)

#	Municipality	244	Val
1	Alandroal	16734,93	13387,94
2	Alcácer do Sal	19164,37	15331,50
3	Aljustrel	6025,07	4820,06
4	Almodôvar	22173,99	17739,19
5	Alter do Chão	10986,56	8789,25
6	Alvito	8378,80	6703,04
7	Arraiolos	33854,22	27083,38
8	Arronches	12060,90	9648,72
9	Avis	15779,27	12623,42
10	Barrancos	7391,47	5913,18

This procedure was applied to all land cover classes providing certified products in the different municipalities. The following step was to normalize such value. In order to do so the total agricultural and forestry area in each municipality was used, that has associated certified products. After the normalization, the rescaling procedure with the Min-Max method was applied. Table 8 shows the calculation procedure.

Table 8: Normalisation and rescaling of the value

#	Municipality	Total.Val	AAF_CP	Normalização	Rescale
1	Alandroal	15889,96	41394,74	0,383864191	5,811279897
2	Alcácer do Sal	17470,28	71167,77	0,245480167	3,28545558
3	Aljustrel	5989,00	15516,84	0,385967855	5,84967656
4	Almodôvar	20039,70	66028,51	0,303500645	4,344461734
5	Alter do Chão	10046,44	25331,51	0,396598524	6,043710544
6	Alvito	7614,10	14400,86	0,528725295	8,45532571
7	Arraiolos	28239,68	46041,37	0,613354396	10
8	Arronches	10569,87	19358,99	0,545992975	8,7705003

The map below shows the result of this approach. It is acknowledged that larger municipalities are “favoured” (the larger the municipality, the higher the surface of land cover classes related to certified products), but it is a drawback of this index that needs to be acknowledged.

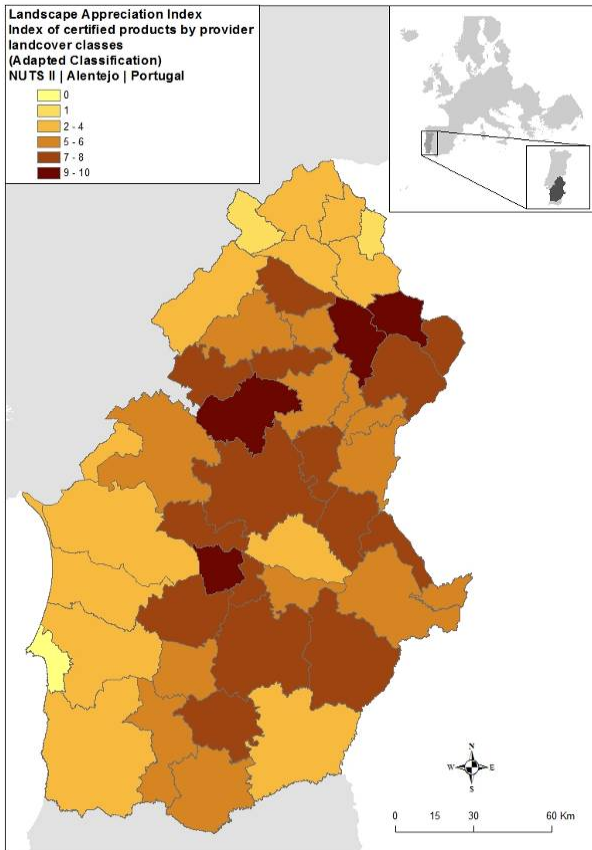


Figure 59: Landscape social appreciation index for certified products for the case study region Alentejo

Tourism in rural areas

Number of trails by Municipality

The Portuguese Federation of Camping and Mountaineering (FCMP) (<http://www.fcmpportugal.com/PresentationLayer/homepage.aspx>) provides data on the number and the kilometres of hiking trails in each municipality (already certified as well as in the process of being certified in the short term). The reported number of kilometres corresponds to the total length of the path and therefore it was not possible to calculate the length of the path that crosses exclusively agricultural areas. For this reason the derived index is related to the total length of paths per municipality and normalised by the area of the municipality. Table 9 shows this calculation step.

Table 9: Summing up of km that cross agricultural area and normalisation by total area of municipality

IC	Concelho	Area.Municipality	N_P_KM	NT_KM/Area.Municipality	Rescale
1	Alandroal	54266,85	72,30	0,138876	2,81
2	Alcácer do Sal	149997,12	95,40	0,068217	1,38
3	Aljustrel	45829,48	37,40	0,083636	1,69

According to the results in Table 9 map in Figure 60 was built.

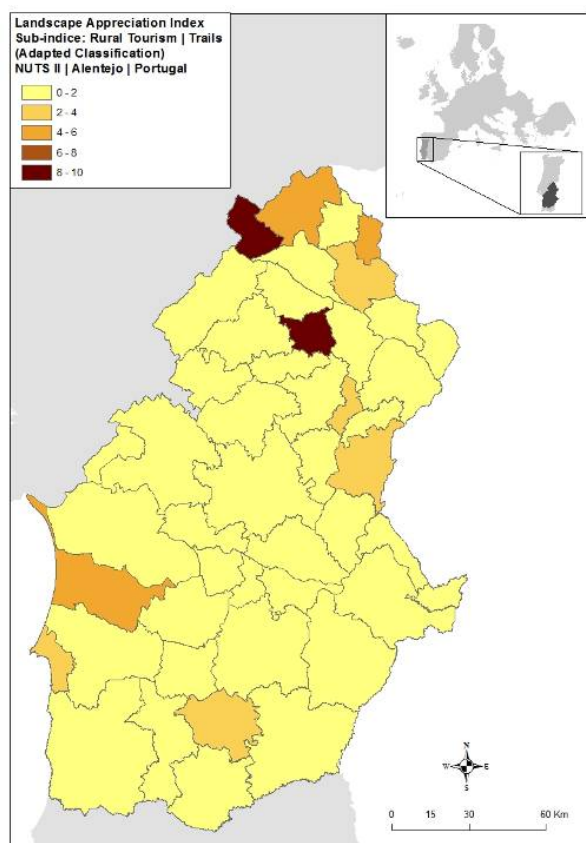


Figure 60: Landscape Appreciation Indicator Rural Tourism

Tourist Hunting Zones

A stakeholder consultation process was carried out in the Alentejo region to understand which landscape components and uses of the landscape are valued by societal groups.

The inclusion of the number of hunting reserves was suggested by stakeholders because hunting is a very important activity that relates to the rural landscape and it is an important touristic asset. In order to gather data on hunting reserves a search in the website of the national forestry organization AFN (<http://www.afn.min-agricultura.pt/portal>) was made. This search allowed the collection of the area (ha) of hunting reserves managed for tourism in the Alentejo region at the municipality scale. After gathering the hunting area (in ha) under management for tourism this value was normalized by the agriculture and forestry area.

Table 10: Calculation procedure for Tourist Hunting Zones

IC	Concelho	Area.Municipality	AAF	ÁreaHZ(ha)	Type	Number_HuntingZones	AreaHZ/AAF	Rescale
1	Alandroal	54266,85	52060,74	13226,39	Touristic	18	0,254056905	3,115218
2	Alcácer do Sal	149997,12	139847,95	71560,0537	Touristic	60	0,511698978	7,248319
3	Aljustrel	45829,48	44717,72	13141,5	Touristic	10	0,293876788	3,75401
4	Almodôvar	77787,56	77420,86	14794,25	Touristic	14	0,191088681	2,10508
5	Alter do Chão	36200,98	35776,54	2709	Touristic	4	0,075720013	0,254333

Finally, the rescaling equation was again used in order to rank the municipalities according to the hunting area managed for tourism. The map below shows such a distribution.

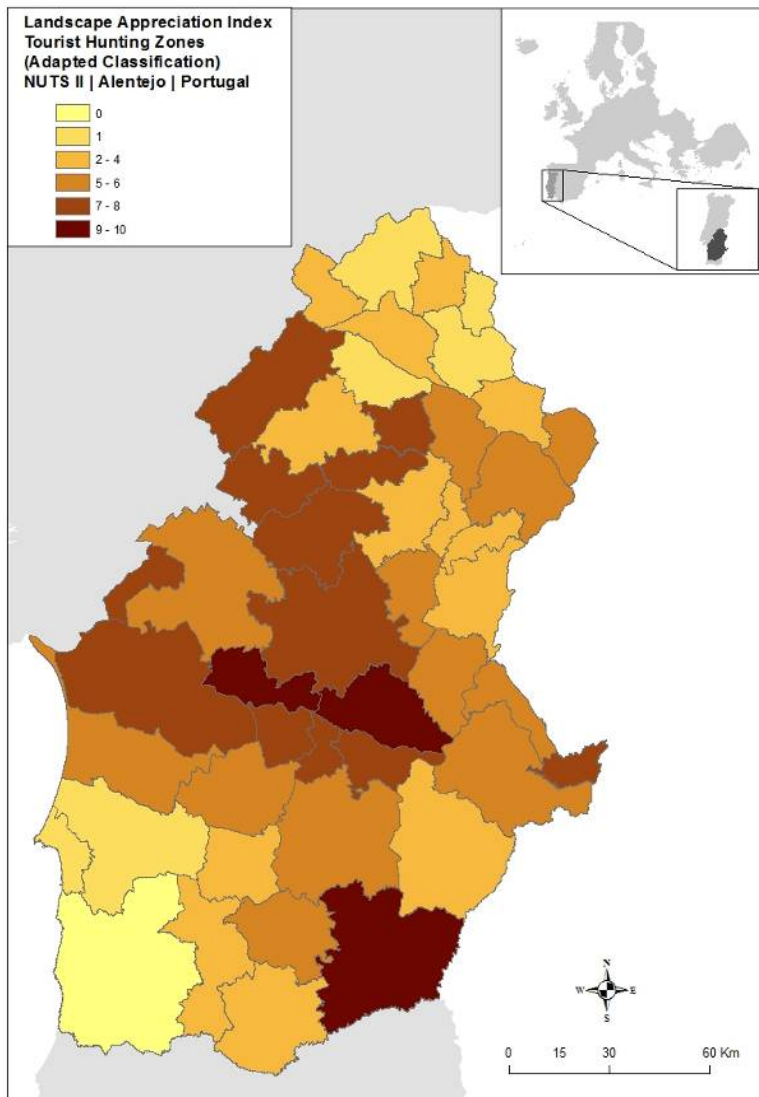


Figure 61: Landscape Appreciation Index Tourist Hunting Zones

Additional Indicator: Landscape Diversity (4th Dimension)

Landscape diversity is of utmost importance in the Alentejo context, as the landscape in this region tends to be quite homogeneous where large areas of the landscape matrix are composed by the Montado. The Montado, in fact, though integrating a high diversity within the system, results in a homogeneous landscape with slight variations in tree and undergrowth shrub densities. Diversity is introduced by a small scale mosaic of other types of land cover. When this variation occurs, the level of appreciation by a broader set of different groups of users is certainly higher. This was identified by empirical work applied to the region. In fact, previous work on research projects such as MURAL (Pinto-Correia et al. 2011) and ROSA (in progress) in Alentejo showed that the more diverse is the landscape composition the more likely it is to suit a broader set of user groups. As such, the landscape diversity dimension was included in the development of the index in the Alentejo case study.

In order to identify the index to be used, different types of landscape metrics were explored. The aim was to assess both composition and configuration issues using a set of metrics from a spatial analysis software such as FRAGSTAT (McGarigal et al. 2002).

The selected set of metrics used was based on existing literature e.g. Botequilha Leitão and Ahern (2002), McGarigal et al. (2002). Caution was taken in order to include a parsimony set of meaningful and useful metrics. The set of metrics computed included : Patch Richness Density (PRD), Percentage

of landscape (PLAND), Interspersion and juxtaposition index (IJI), Shannon Diversity Index (SHDI) , Largest patch index (LPI) and Shannon Diversity Index (see Table 11).

Table 11: Set of metrics for calculating landscape diversity

Metrics	Description
<i>PLAND Percentage of landscape</i>	Quantifies the proportional abundance of each patch type in the landscape. It varies between $0 < \text{PLAND} \leq 100$. PLAND approaches 0 when the corresponding patch type (class) becomes increasingly rare in the landscape. PLAND = 100 when the entire landscape consists of a single patch type
<i>PRD Patch Richness Density</i>	Standardizes richness to a per area basis that facilitates comparison among landscapes. The unit is number per 100 hectares.
<i>IJI Interspersion and juxtaposition index</i>	Is based on patch adjacencies. As such, it assesses the interspersion or intermixing of patch types
<i>LPI Largest patch index</i>	Quantifies the percentage of total landscape area comprised by the largest patch. As such, it is a simple measure of dominance. $0 < \text{LPI} \leq 100$. LPI approaches 0 when the largest patch in the landscape is increasingly small. LPI = 100 when the entire landscape consists of a single patch; that is, when the largest patch comprises 100% of the landscape.
<i>SHDI Shannon Diversity Index</i>	Is a well known diversity index. $\text{SHDI} \geq 0$, without limit. SHDI = 0 when the landscape contains only 1 patch (i.e., no diversity). SHDI increases as the number of different patch types (i.e., patch richness, PR) increases and/or the proportional distribution of area among patch types becomes more equitable.

The empirical knowledge from the area allowed a selection of two indices: Shannon Diversity and Interspersion and Juxtaposition.

In order to further explore the diversity component other calculation procedures were undertaken. The goal was to develop an indicator of diversity addressing both a) composition and b) configuration issues.

The adopted procedure is as follows:

- 1 The number of sub-classes within agriculture and forestry (CORINE classes 2 and 3) were initially calculated.
- 2 Then, a matrix (see Table 12) was built with both the number of classes (X axis) and the maximum PLAND of the most representative class within the municipality (Y axis). The underlying assumptions for this classification are based on literature review, which states that the higher the proportion occupied by one class cumulatively with low number of classes, the more such class is dominating the landscape (Botequilha Leitao and Ahern, 2002), and this is said to be less preferred by the public in general (Appleton, 1998; Carvalho-Ribeiro and Lovett, 2011) as well as from some specific user groups (Pinto-Correia et al., 2010; Surova and Pinto-Correia, 2008).

Table 12: Diversity/Composition matrix

Percentage of Landscape If a land cover dominates –high PLAND the more homogeneous is the landscape)	1-6 67<PLAND<100 Assign value of 1	7-12 67<PLAND<100 Assign value of 4	13-18 67<PLAND<100 Assign value of 7
	1-6 34<PLAND<66 Assign value of 2	7-12 34<PLAND<66 Assign value of 5	13-18 34<PLAND<66 Assign value of 8
	1-6 0<PLAND<33 Assign value of 3	7-12 0<PLAND<33 Assign value of 6	13-18 0<PLAND<33 Assign value of 9
Number of subclasses (the higher the number the more diverse)			

- 3 The number of classes per municipality (calculated in point 1 above) has been corrected in order to “control” for the size of the municipality in relation to the number of classes it contains (larger municipalities contain more classes) using the rescaling equation used in other steps. With the rescaled indicator smaller municipalities are the ones scoring higher values.
- 4 In order to build the Diversity/Composition dimension the matrix approach described at point 2 was applied, this time using in the Y axis the Largest Patch Index (LPI- measure of dominance) and on the X axis the Patch Richness Density (PRD- a measure of diversity).
- 5 The matrix approach was also used to build the Diversity/Configuration dimension. The metrics used were the Shannon Diversity Index (in the X axis) and the Interspersion and Juxtaposition Index –IJI- (in the Y axis). The IJI values used were the ones for the class that had the highest PLAND. By doing so it was intended to assess the way in which the most predominant land cover class was intermixed with the other land covers in order to fulfill the demands of different groups of users. Although the Montado is the dominant system, its composition and structure varies for example in relation to tree density, shrub coverage and composition.
- 6 The resulting Diversity-Composition and Diversity-Configuration maps were summed up in an integrated indicator of landscape diversity.

Figure 62 shows the resulting map.

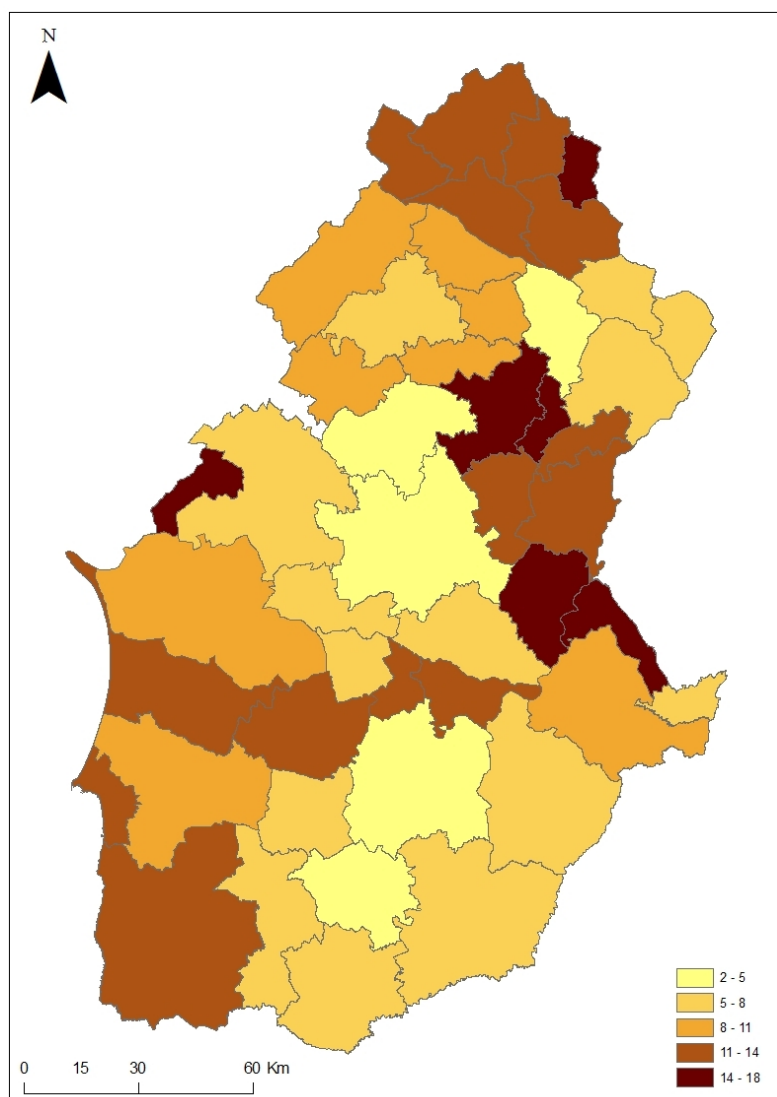


Figure 62: Additional indicator 'Landscape Diversity' (sum of diversity-composition and diversity-configuration maps)

Agricultural areas in protected and valuable sites

Complex Patterns

Throughout the stakeholder consultation process the stakeholders referred to the importance of the 'complex cultivation patterns' (= class 242 CORINE) in the Alentejo Region, because it brings diversity to an agro-forestry system where Montado clearly dominates.

This sub-index was calculated by dividing the area of Corine class 242 by the agricultural and forestry area of the municipalities. These values were afterwards rescaled following the procedures already described. Table 13 illustrates such a calculation procedure and Figure 63 illustrates the results at the LAU2 level aggregation.

Table 13: Calculation for Complex Patterns

IC	Concelho	AAF	CL242	CL242/AAF	Rescale
1	Alandroal	52060,74	2864,39	0,055020131	4,267695
2	Alcácer do Sal	139847,95	1282,73	0,009172342	0,47893
3	Aljustrel	44717,72	709,13	0,015857917	1,031412
4	Almodôvar	77420,86	478,08	0,006175089	0,231243
5	Alter do Chão	35776,54	243,62	0,006809533	0,283672

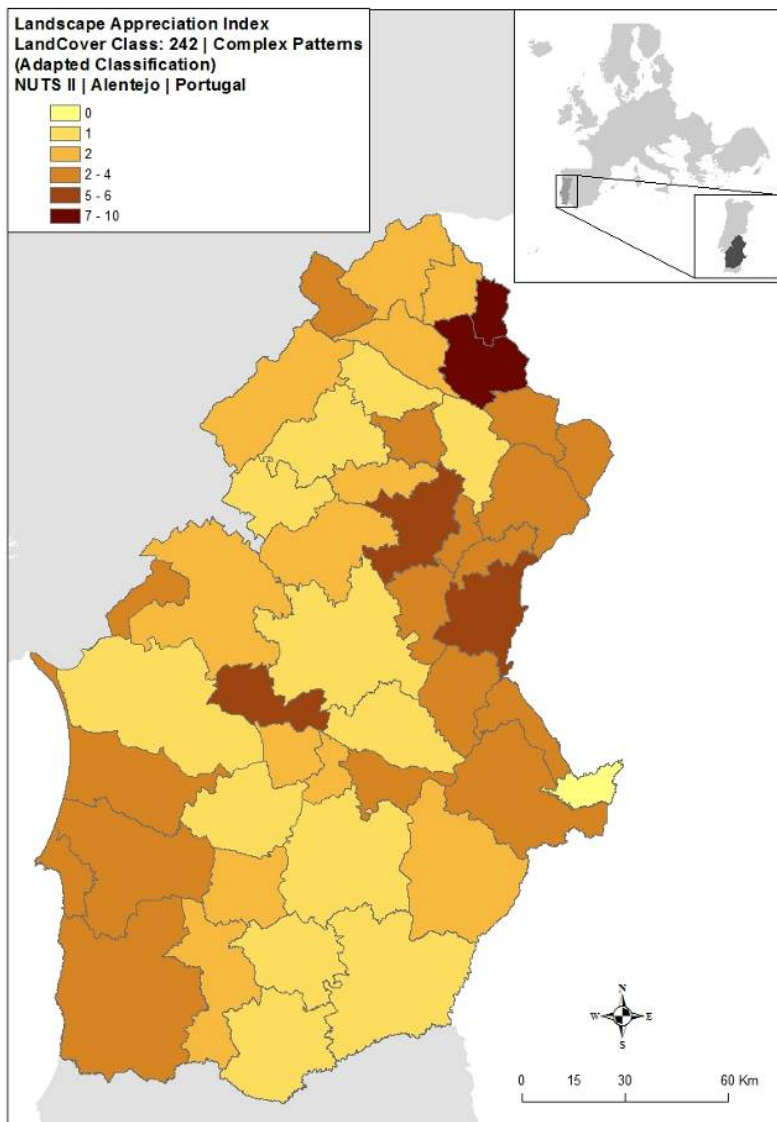


Figure 63: Landscape Appreciation Indicator Complex Pattern

Combined indicator for landscape appreciation

Summarizing, for mapping landscape diversity two distinct approaches were undertaken: the first comprised the sum of the Shannon Diversity index with the Interspersion and Juxtaposition index; the second approach consisted in creating a diversity configuration and diversity composition (through the use of a matrix approach) that were afterwards summed. Results of the first approach were used as the final landscape diversity indicator. The sum of the Shannon Diversity index with the Interspersion and Juxtaposition index was chosen instead of the matrix approach because it was more perceptible as well as of more easy understanding. Furthermore, the FRAGSTAT metrics directly used are of widespread use in the literature therefore, it was decided not further complicate the calculation procedures if it not introduced a clear and meaningful advantage. The final map summing up the 4 indices for the adapted classification is presented below (see Figure 64)

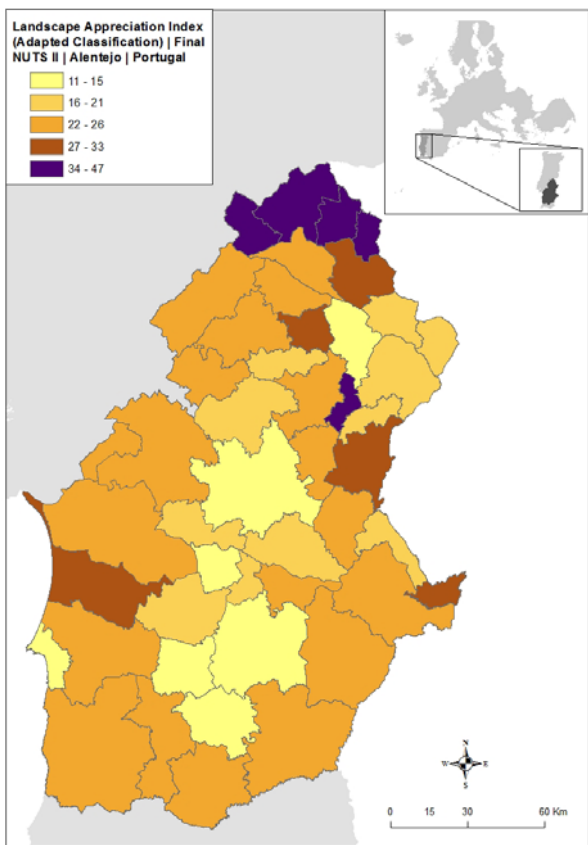


Figure 64: Final Map on Landscape Appreciation Indicator Landscape Diversity

Comparison between all assessments

A final comparison between the results of all three assessments (see Figure 66), shows that the adaptation of the indicator assessment to the regional LAU2 scale increases clearly the evidence for the presence of highly appreciated landscapes. This is the case for the comparison between the European and the regional adapted 3 indices assessment, as well as for the latter with the version containing the additional indicator on landscape diversity.

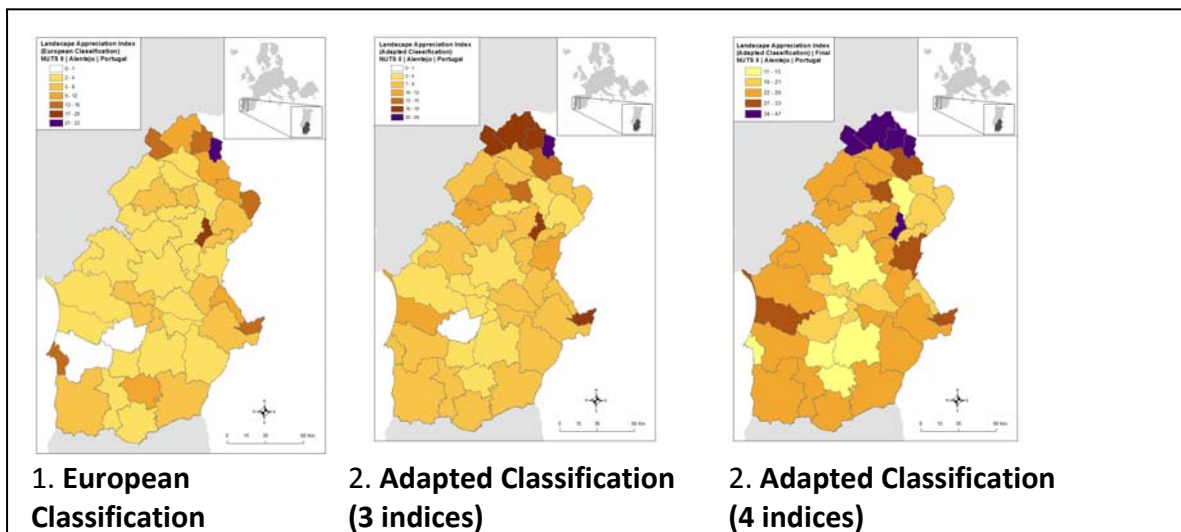


Figure 65: Comparison between the European, adapted and adapted + additional indicator assessment)

5.3 Conclusion on alternative / complementary indicators

European dimension

When critically reviewing the component of the EU wide landscape state and diversity indicator on the 'societal appreciation of the rural landscape', it rapidly becomes clear that alternative options for the indices 'agricultural areas in protected areas' and 'certified products' are relatively limited. The 'protected area' dataset could be somewhat completed but this is not considered to lead to substantial differences compared to the currently used data. Additional data on 'high quality products', on the other hand, could not successfully be tracked down and expectations to succeed with this in the near future are small.

For the index 'tourism in rural areas', however, one alternative may be combining data on camping beds (source: Eurostat) and camping sites (source: TomTom). This would introduce a -demand-based component rather than supply-based (like the presence of on-farm activities associated with recreational services). The shortcoming of such an approach is that there is no necessary connection between camping as a leisure activity with regard to the appreciation of the surrounding rural landscapes.

Another possible European data source that has been analysed is the FADN data on farm tourism. As a 'stand-alone' dataset, the data does not seem to contribute too much in comparison to the to FSS declarations for "Tourism as other gainful activity". However, it can be integrated for a combined assessment.

Overall, the study does not show that there may be a "4th dimension" missing in the definition of the EU wide landscape indicator. Data that can substantially improve the indicator (i.e. hiking and horse trails, barns, areas of outstanding natural beauty) can be referred to one of the existing three dimensions (protection – tourism – quality products). In Alentejo landscape diversity is pointed out as potential new component, but it is already the object of a main component of the overall landscape state and diversity indicator, therefore already accounted for, even if in a separate component.

Finally, in order to access the full degree of societal landscape appreciation for rural landscapes – but also to detect the contrary, the lack of awareness of certain landscapes - direct stakeholder consultations among a wide range of social groups would need to be performed.

Regional dimension

The input on the regional dimension of complementary and additional indicators for the 'societal appreciation of rural landscapes' has been rich and varied. In the following paragraphs the results per sub-indicator and for variables representing additional dimensions are briefly reviewed.

Certified Products

Taking a European perspective, research carried out in this study confirms that North-European countries struggle much more with the sub-indicator on certified products than Southern ones. In both the Netherlands and United Kingdom, the search for regional data sets was not very successful, mirroring the picture at the European level. Though several candidate indicators had been put forward in the early implementation phase, none of them was ultimately carried forward. Instead, the Netherlands developed an approach on the basis of the national agricultural statistical database (GIAB) which allowed the identification of farms where 'food processing activities' are reported. However, it must be admitted that the link with social appreciation of landscapes is rather difficult to establish.

On the other hand, the Danish indicator on ‘Steers and lambs from the Wadden Sea region’ must be considered as having a very strong link to the highly appreciated salt marsh landscapes in Southern Denmark. This is mainly through the detection of grazing rules in the salt marshes and the certain share of the winter fodder. This new indicator fills a fundamental gap in the current assessment scheme where no certified product is available. It also sheds a light on the adequacy of the certified product approach. To quote a stakeholder from the North-Brabant interview: “Instead one should use ‘regional products’.

In terms of the methodology that is being applied, the work undertaken in Alentejo (Portugal) provided the deepest insights. This showed that taking into account certain land cover classes per administrative region, favoured automatically those municipalities which are larger and thus have larger areas of land cover which are potentially providing certified goods. In general, the certified product approach works here and in Italy much better and it shows that the assessment can be made more sophisticated. Also Tuscany came to the conclusion that the link with UUA produces better results than pure numbers per LAU2.

Tourism in rural areas

As indicated earlier, the sub-indicator ‘rural tourism’ must be considered as the most promising component of the overall indicator. This is simply because of the obvious direct link between outdoor recreation and landscape quality, but also because of the much larger range of data options.

The use of national data representing members (farms) of the Danish National Association for Agri-Tourism has shown to be useful. Though successfully applied, the result shows a rather fragmented wide distribution raising questions regarding its adequacy. Furthermore, doubts remain on information provided by data on camping sites, since the link with appreciated landscapes is not straightforward. This should also be kept in mind when further developing a European approach (see above).

Regarding the approach in using the total areas of a municipality when normalising the length of cycling trails crossing agricultural landscapes, the Alentejo region admitted its methodological drawback (see above). The indicator of hunting reserves (in ha) managed for tourism led to totally different results than the other methodologies (much larger extent of high scoring areas) and points at the need to develop a sound conceptual approach when working with different indicator subjects. The same accounts for the assessment addressing ‘complex patterns’ on the basis of CORINE land cover data.

Also the Tuscany region experienced methodological problems when applying their ‘thematic itineraries’ for the countryside. In order to arrive at sound results, it was necessary to consider only UUA greater than 100 ha at LAU2 level, or count the number of itineraries without normalisation. Though possibly only a methodological detail, the example shows that meaningful results do require regional insights and expert input.

The example of the British Midlands shows that there is a lot of valuable national data available that addresses rural tourism. However, the direct link with the agricultural land use is not entirely clear. Here GIAB appears to produce reliable, alternative results.

Agricultural areas in protected and valuable sites

In general this sub-indicator turns out to be rather useful. The analysis of data availability in case study regions shows that EU wide data can be complemented (i.e. in The Netherlands with the addition of ‘national landscapes’ and in UK with the inclusion of ‘AONBs’) and region-specific approaches effectively lead to improvements of the European results. The lesson learned is to

involve national experts for screening and approving the national data sets used in the European assessment.

Proposals for additional / complementary indicators

Stakeholder feedback in the Alentejo region had pointed at the need to assess landscape diversity as an important criterion for landscape appreciation. This led to the development of a rather thorough research and assessment of the most suitable index. The novelty of the approach requires some further validation, but certainly points at the need to also use relevant quantitative assessment techniques, but to do so in combination with qualitative methods as well.

In order to address true dimensions of societal appreciation, a mainly stakeholder-driven approach is the interactive landscape preference tool ‘My Place to be’ (www.myplacetobe.eu <<https://webmail.wur.nl/Project%20Proposals/MyPlaceToBe/www.myplacetobe.eu>>) developed by Goossen et al. (2009). By directly involving visitors and tourists in a computer-based query on their landscape preferences (offering a multiple-choice menu of geo-data to make use of), this approach would allow the building of the evidence base for the type of landscape preferences that dominate the user’s (visitor’s) awareness of a desirable landscape. However, according to Tress and Tress (2001), an integrative landscape approach requires the need to take local landscape knowledge into account – *“what locals think and feel about their landscape and how much they are still engaged with it”*.

However, it should be kept in mind that results for ‘My-place-to-be’ are ultimately representing desired area profiles constructed by the geo-statistical data rather than expressions of local/regional knowledge of existing landscapes.

6 Part 3 - Validation of the EU landscape societal appreciation indicator

6.1 Comparison of outcome of Part 1 and Part 2

6.1.1 Objectives

In the first part of this study the three sub-components were mapped at LAU2 level for each Case Study region. The primary purpose of this was to re-base these indicators at a level that would allow a direct comparison of their efficacy against alternative, locally sourced indicators that would be available at LAU2 level. However, a second key objective of the mapping of the existing societal appreciation of landscape indicator (and its three components) at LAU2 level was to define its true meaning and assess its conceptual limits as well as assessing the spatial scale at which it should be most appropriately used. The rationale here is that the distinctions between the two levels of mapping in terms of ‘message’ can be used to frame the message of the NUTS2 indicator. This would be done as a precursor to thinking about how the indicator might be improved, by addressing such issues as whether the analysed components are sufficient to address the issue of landscape appreciation at the EU level, and identify whether any dimensions are being neglected.

These over-arching objectives were addressed by a set of key questions:

- What do the existing individual sub-components actually represent/measure at different scales (and what are the linkages between scales)?
- What are the critical constraints related to using existing variables in the ‘social appreciation of the rural-agrarian landscape’ indicator at different scales of analysis, i.e. at NUTS2 level and finer spatial scales.
- What components are missing from the indicator?
- What complementary sub-components are available (i.e. alternatives to those currently proposed) and what dimensions do they add?

6.1.2 Methodology

The methodology involved the mapping of the societal appreciation indicator at both NUTS2 and LAU2 level (or LAU1 level if LAU2 level is not obtainable) to facilitate comparison of the message of the indicator when presented at different scales. The mapping was undertaken under Part 1. The questions were addressed at the case study and EU level through the expert judgment by the authors of this report, supplemented by stakeholder consultation in each case study region. A total of 19 stakeholders have provided their views, distributed over the case study regions as shown in Table 14. There are no records available for Denmark, and not all questions were addressed in the Portugal case study.

Table 14: Number of stakeholders responding to the consultation in each case study region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
Number of stakeholders providing data		4	2	4	9	19

For this purpose a detailed consultation document was produced as a means to elicit appropriate judgments from a panel of stakeholders in each case study region. A copy of this stakeholder consultation document is presented (for the UK example) at Annex 2. A minimum of two

stakeholders were recruited in each case study region from specific groups with expertise, and an interest, in the future management of landscapes, for example, local authority planners, national park officers, wildlife and conservation officers, rural tourism officers etc. Stakeholders were provided with an introduction to the indicator, including its design and purpose, together with a series of maps for their case study region representing the composite indicator and its three sub-components. To draw out and direct their opinions stakeholders were then asked a series of questions, each tailored to explore a particular issue.

In the section that follows the results of the stakeholder consultation are presented, where each section head reflects a particular issue that was explored in the consultation. The section is structured as follows. First, each section presents the stakeholder views on issue being explored, then methodological issues that might affect outcomes are addressed, and finally conclusions are drawn based on both the views of stakeholders and the expert judgments of the project teams. As this is a multi-country analysis, the results for each case study region are listed in summary form, then these are compared and contrasted to arrive at general conclusions. A number of questions are sometimes asked in connection with the same issue, each exploring different aspects of that issue.

6.1.3 Results

What does the composite indicator actually measure?

What terminology would you use to describe what the indicator represents – currently it is described as capturing social ‘appreciation’ of the rural-agrarian landscape?

Stakeholders were asked to identify a term that best described what the indicator was attempting to measure – their selections are presented in Table 15 below. There is very little consensus on the term chosen, suggesting that there is sufficient ambiguity in the specification of the indicator to allow end-users to impart their own definition, in spite of the fact that the indicator already has an ‘official’ label, i.e. ‘appreciation’. The selections imply that stakeholders generally fall into two classes: the positivists (green rows in Table 15) and the neutrals (purple rows in **Error! Reference source not found.**15). ‘Positivists’ assume that the indicator does, or should, reflect the extent of positive value judgements (about landscapes) in the mind of society (some are obviously also thinking in terms the positive attributes of the landscape itself), while the ‘neutrals’ seek to strip the indicator of value judgements and capture the extent to which society is aware of the existence and attributes of landscape, regardless of whether these attributes are perceived to be good or bad.

Table 15: frequency of nomination of terms to describe what the indicator is capturing

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
Appreciation		1	2			3
Valuation		1				1
Appeal / potential appeal	1			1		2
Cognisance / awareness		2				2
Connection with	1	2				3
Perception				1		1
Familiarity						
Understanding		1				1

More general comments and observations were made by stakeholders on what the composite indicator represents, in addition to the selection of nomenclature. It was noted that some of the sub-

components that make up the indicator more strongly indicate a valuation or measure of appeal than others, these being protected areas and tourism, while certified products implied little if any consumer valuation of the landscapes producing the products. It was commented that a general societal perspective may not actually exist at all, in that only a subset of the population will have any kind of self-perception of a particular landscape. If this is the case then whatever term is chosen to label the indicator, the indicator can only ever reflect the perceptions of parts of society, i.e. those parts of society that both have overt perceptions of landscape. However, all indicators would be limited to this extent, so the measure of the success of the indicator must be the extent it captures extant landscape awareness and preference.

Is the NUTS2 mapping of the indicator an adequate representation of the extent to which society ‘appreciates’ the rural-agrarian landscape of your region?

This question is understood in two different ways by stakeholders. First, whether the absolute level of appreciation conveyed by the composite indicator accords with their own perception of it, and second, whether the relative distribution of appreciation within their region looks reasonable. This second question is relevant in cases where case study areas contain multiple NUTS2 regions (see Annex 1), for example the West Midlands region case study contains three NUTS2 regions (some case study areas constitute only a single NUTS2 region).

Table 16: Frequency indicating that indicator does, or does not adequately represent societal appreciation of landscape in each region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
‘Yes’, adequate			1			1
‘No’ inadequate		4	1	4		9
Out of a maximum of:		4	2	4		10

The results clearly show that the majority of stakeholders do not think that the composite indicator adequately reflects the ‘real’ level of societal appreciation in their region. Stakeholders believed that appreciation *in toto* is under-represented in Tuscany, while stakeholders in the Netherlands were more inclined to think that the absolute level of appreciation reflected for their case study was adequate, but that critical variation within the region was not reflected; this view was also expressed in the UK. This notion that the indicator was acceptable if data were being expressed at the EU level for EU-level policy analysis, but not at more local scales recurs throughout the consultation and is revisited below. It was also suggested that societal appreciation of landscapes itself takes place at finer scales than NUTS2, with most indicators associated with landscape and the environment, such as National Parks, being expressed somewhere between NUTS3 and LAU1.

Is the composite indicator conveying a clear message?

Stakeholders were universally of the view that the composite indicator did not convey a clear message (see Table 17). Stakeholders do not always give reasons from this judgment, but where they did these are presented in Table 18 below. Drawing on this list, together with statements made when addressing other questions, a number of conclusions can be drawn. The concept of ‘societal

appreciation’ is somewhat unfamiliar to stakeholders and as such is ill-defined. As a consequence stakeholders attempt to create their own meaning based on the component variables from which the composite indicator is constructed. It is when they attempt to do this that problems occur. The main problem appears to be that the sub-components themselves are disparate in nature and an aggregation of them results in an unfathomable construct. This is reflected in some of the phrases that stakeholders use to describe the aggregation outcome, words such as ‘meaning is lost’ and ‘not intuitive’. Obviously stakeholders understand the concept of societal appreciation at some abstract level, but there is obviously a ‘lack of fit’ when trying to define this in terms of these sub-components. In some cases stakeholders are judging the clarity of the indicator by its performance, i.e. they see appreciation values for their case study area which do not fit with their expectation and they draw the conclusion that the composite indicator does not measure appreciation as they understand the concept.

Table 17: Frequency indicating that the indicator does, or does not present a clear message

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
‘Yes’, Clear message						
‘No’ unclear		4	2	4		10
Out of a maximum of:		4	2	4		10

Table 18: Frequency indicating reasons that the indicator message is not clear

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
Inadequate data		1				
Trying to do too many things		1				
Message incomplete (issues missed)		1		1		
The reason for the indicator values is unexplained				1		
Results counterintuitive			2			
Methodology for construction of indicator ambiguous			1			
Sub-components too different to allow coherent composite			1			
Territorial units used for mapping unrelated to landscape divisions		1				

Effect of measurement scale on the performance of the composite indicator

This question attempts to explore one of the most challenging notions in the study, that the nature of the indicator might change with the resolution at which it is expressed. It is apparent from the stakeholder responses that the great majority either did not understand the question, or could not formulate a response. As a consequence, most answered a different question, related to issues surrounding the performance of the composite indicator at different levels of resolution. Most were agreed that when presented at NUTS2 much critical detail in the indicator was lost, but of course, this need not affect the nature of the indicator, only its accuracy and potential usefulness. However, the point was made that at NUTS2, the broad geo-political units used in the mapping bear no relationship with landscape units, but at higher resolutions the performance in this regard improves, i.e. the divisions between units begin to reflect real landscape distinctions. At this regards the abstract meaning of the indicator should be underlined, when calculated at NUTS2. At that scale reference to real landscape boundaries are not necessary.

It was noted that the nature of the indicator might change, but not because of the resolution at which it is presented, but rather because of the perceptions of the end user and their requirements. The ‘message’ of the indicator is a matter of the perceptions of the end-user as much as the intentions of the creator.

Table 19: Frequency indicating that the nature of what the indicator is measuring changes with the scale at which it is mapped

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
‘Yes’, resolution affects nature of what it being measured		2	2	2		6
‘No’ resolution does not affect nature of what is being measured		1				1
Out of a maximum of:		3	2	4		9

At what resolution is the existing composite indicator most meaningful?

Table 20: Frequency indicating the level at which the existing composite indicator is most meaningful

	Syddanmark (DK)	West Midlands (UK)	Groene Woud (NL)	Tuscany (IT)	Alentejo (PT)	Total
NUTS2			1			
NUTS3			1			
LAU1 (equivalent to former NUTS4)		1				
LAU2 (equivalent to former NUTS5)		1		4		

Note: stakeholders were permitted to indicate more than one level.

The stakeholders were divided on the issue of the resolution at which the results of the indicator were most meaningful and there were marked differences between case study areas. The perception of the meaningfulness of the indicator would appear to be affected to some extent by the number LAU2 units within the case study area and the degree of variation across the case study. In The UK and Tuscany there are a very large number of LAU2 units within the area as well as significant variation across them. Stakeholders from these study areas tend to report that the indicator is meaningful at higher levels of resolution. In the Netherlands the number of LAU2 units in study area is relatively small and stakeholders perceive the indicator as meaningful at lower levels of resolution, such as NUTS1 and 2.

Effect of measurement scale on the performance of each of the indices

How are the three indices individually affected by the scale of mapping?

Stakeholders were asked to make judgements about the impact of changing the scale of mapping on the performance of the three sub-components, to build a picture of the relative susceptibility of each to loss of value as resolution declines.

Table 21: Frequency reporting that sub-components are being undervalued, or misrepresented by presentation of data at NUTS2

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Total
Protected areas		3	2	3		7
Certified products		1	N.A.	3		
Farm tourism		3		3		6

There is consistent support from the stakeholders for the notion that presenting the sub-components at NUTS2 leads to sometimes critical loss of resolution. This can mean that key variations in the values of the sub-components are not expressed. The problem with this is that the key landscapes, i.e. landscapes that might have regional or even national importance, are no longer visible and therefore may consequently be subject to inappropriate policy decisions. For example, spatially small landscapes of high nature conservation value, extreme beauty, or great cultural importance would be invisible using the NUTS2 indicator, as would landscapes with high concentration hotspots of certified products. It was also pointed out that most definable landscapes are smaller in extent than NUTS2 and therefore expressing them at NUTS2 conflated multiple, potentially diverse landscapes.

Some stakeholders, however, had less problem with the scale at which the sub-components were presented than the nature of the indicator itself. In these cases, stakeholder viewed the indicators as being misleading at all scales.

The aim of the indicator, though, is not to support the planning process, therefore the spatial dimension is of relative importance.

What scale of mapping is most appropriate for each of the sub-components?

There are two separate issues here (i) the meaningfulness of the sub-components when mapped at different scales and (ii) the reliability of the data used in the measures at different scales.

(i) Meaningfulness

The majority of stakeholders felt that the sub-components were more meaningful when presented at high resolution. This may in part be explained by the fact that the majority of stakeholders had a national or regional focus in their work and therefore would view indicators of this type from the point of view of their usefulness to local policy makers. The exception to this rule seems to be in the case of the protected areas sub-index, which some stakeholders viewed as being most meaningful at NUTS2 level. The reasons for this are uncertain, but it might be that the perceived deficiencies of the sub-indicator are less apparent at lower levels of resolution.

Table 22: Scale at which sub-components are perceived to be most meaningful in each case study region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)
Protected areas		NUTS3, LAU2, LAU2, LAU2	LAU1, LAU2	LAU2, LAU2, NUTS2, NUTS2	
Certified products		LAU1, LAU1, LAU2, LAU2	N.A.	LAU2, LAU2, LAU2, LAU2	
Farm tourism		LAU1, LAU1, LAU1, LAU2	LUA1, LAU2	LAU2, LAU2, LAU2	

It might also be worth commenting that even at the LAU2 level, the meaningfulness of the data may be poor, where, for example, point features measured by one of the sub-components are servicing landscapes in other LAU2 units. For example, people staying at accommodation on a single farm in one specific LAU2 may be ‘appreciating’ the landscape in adjacent LAU2 areas. This is also an issue for many of the potential complementary indicators discussed below (campsites, picnic areas, farm shops etc.). One would perhaps not expect every LAU2 to have these point features, even in the areas with the highest level of appreciation, and so the distribution of them might be idiosyncratic.

(ii) Reliability

There is much variation of opinion on the subject of the reliability of the sub-components at different scales. This question is impacted by perceptions of the accuracy and quality of the data at different resolution. So, for example, if there are questions about the spatial accuracy of data at high levels of resolution, these problems are perceived to be less severe the greater the levels of aggregation.

Spatial accuracy is not likely to be much of an issue where the datasets contributing to the indicator are geo-referenced points and boundaries. There is however an issue with reliability where the data are derived from census of survey databases. In general there is acceptance that the sub-components are reliable at a greater diversity of resolutions than they are considered meaningful.

Table 23: Most frequently nominated scale at which sub-components are perceived to be most reliable in each case study region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)
Protected areas		NUTS3, ALL, LAU2, LAU2, NUTS3	LAU2, LAU2	LAU2, NUTS2, NUTS2	
Certified products		LAU1, NUTS2, NUTS3, LAU1, LAU2, NUTS3	N.A.	LAU1, NUTS2, NUTS2	
Farm tourism		LAU1, NUTS2, NUTS3, LAU1, LAU2, LAU2, NUTS3	NUT3, LAU2	LAU1, LAU2, NUTS2	

The validity of the indices in each of the case study regions

The relevance of the measure in capturing societal ‘appreciation’ in each case study region

Stakeholders were asked to consider the relevance of each of the sub-components to the notion of societal appreciation of landscape in the context of their case study region. These judgements will of course vary according to individual perceptions of the same landscape, but they will also vary between case study regions. For example, in one region the market for certified products linked to specific landscapes and farming systems might be undeveloped and therefore this particular measure, while theoretically an important indicator, will have no practical value for that area, as would seem to be the case for the Groene Wald case study area. Stakeholders were asked to assess the relevance of each of the sub-components using a 5-point rating scale, where 5 is very important and 1 is very unimportant. Table 24 below presents the average ranks supplied by stakeholders in each case study region, together with the component individual ranks in parentheses. The individual ranks provide some indication of the degree of disagreement (and perhaps uncertainty) between stakeholders in the same case study area.

Table 24: Average rank of the relevance of each sub-indicator as a measure of societal appreciation in each case study region (with component scores in parentheses)

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Average rank over all regions
Protected areas		4.3 (4, 5, 4, 4)	3 (4, 2)	2.5 (1, 4, 1, 4)	3.7 (5,5,3,3,2,5,3,4,3)	3.4
Certified products		2.5 (2, 5, 1, 2)	N.A.	4.3 (4, 4, 4, 5)	3.7 (4,5,4,5,5,4,2,2,2)	3.5
Farm tourism		2.7 (1, 4, 2, 4)	3.5 (3, 4)	3.5 (1, 4, 4, 5)	3.4 (3,5,2,3,4,5,3,3,3)	3.3

As Table 24 shows, there is considerable variation among individual stakeholders in their ratings of the relevance of each of the sub-components, even within case study areas, with stakeholders in Tuscany rating the protected areas sub-index as high as four and as low as one. Averaging over all case study areas, the more relevant sub-index (but only by a small margin) would appear to be certified products, with protected areas second. With respect of certified products, there may be an effect due to the type of product. Some products tend to have very small defined areas (e.g. wines, although there are exceptions), whilst others tend to have large defined areas (e.g. cheeses).

The comprehensiveness of the sub-components in capturing all relevant cases in each case study region

Table 25: Average rank of the comprehensiveness (i.e. captures all relevant cases) of each sub-indicator in each case study region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Average rank over all regions
Protected areas		3.7 (3, 4, 4, 4)	3.5 (4, 3)	1.3 (2, 1, 1)	3.8 (5,2,5,4,4,3,4)	3.1
Certified products		1.3 (2, 1, 1, 1)	N.A.	3 (3, 3, 3)	3.4 (3,4,5,3,4,2,3)	2.6
Farm tourism		2.0 (1, 1, 2, 4)	3 (3, 3)	1.3 (2, 1, 1)	2.6 (2,2,3,2,4,4,3,1)	2.2

In terms of the comprehensiveness of the sub-components, i.e. the extent to which they are perceived to capture all cases in each case study area, all of the sub-components are rated fairly low, particularly farm tourism. The ratings of individual stakeholders show more consistency in the case of this measure.

The meaningfulness of the sub-components as a reflection of societal appreciation of landscape in each case study region

In terms of meaningfulness of each of the sub-components, stakeholders rated certified products far and away the best, with lower ratings given to the other two sub-components. There appears to be a fair degree of consistency in the ratings given for this measure across individual stakeholders. What this outcome means is moot, but it perhaps means that the certified products indicator is more explicable, transparent, and more directly related to the issue of societal appreciation than the others.

Table 26: Average rank of the meaningfulness of each of the sub-components as a reflection of societal appreciation of landscape in each case study region

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Average rank over all regions
Protected areas		3.5 (2, 4, 4, 4)	2 (2, 2)	1.7 (1, 2, 1, 1)	3.9 (5,5,4,3,4,3,4,4,3)	2.8
Certified products		2.5 (5, 1, 3, 1)	N.A.	3.3 (4, 2, 3, 4)	3.9 (5,4,4,4,5,5,3,2,3)	3.2
Farm tourism		2.5 (1, 3, 2, 4)	3 (3, 3)	2.3 (2, 2, 1, 4)	3.5 (4,4,3,2,5,5,4,3,2)	2.8

The limitations of the three sub-components

Some of the perceived deficiencies that stakeholders report are specific to their particular case study regions, while others are generalisable to all. In the tables that follow relevant observations are reported on a case study basis with some more general conclusions following. The general conclusions include inputs from the Alentejo stakeholder consultation.

(i) Protected areas

Table 27: Stakeholder views on the limitations of the protected areas sub-index

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)
Protected areas		<p>Local conservation activity and small protected areas not captured.</p> <p>Use of administrative units for mapping conflicts with distribution of this indicator, which is linked to landscape boundaries – problem increases with reduced resolution.</p>	<p>Appreciated landscapes do not end with the boundary of the protected area.</p> <p>Right balance not achieved at LAU2 level – too much emphasis in natural features of landscape to the exclusion of more productive and managed landscapes.</p>	<p>Due to the low presence of agricultural areas in protected designations, cultivated and semi-natural areas, which can be highly valued, are under-represented by this indicator.</p> <p>The focus on naturalistic measures of protection (natural landscape) is limiting, there should also be recognition of the man-made and cultural environment.</p>

The general view is apparent here that the focus of the sub-indicator is too tight, since the reason for protecting an area is very often linked to its ecological value and this concerns mostly natural (or semi-natural) landscapes. Society also appreciates managed landscapes, sometimes more so than unmanaged land and wilderness, and appreciation of these managed landscapes needs to be accounted for³. The EU wide indicator includes UNESCO sites, but managed landscapes with high value to society are often the subject of local conservation and activities and designations and indicators of these activities/designations are available.

(ii) Certified products

Table 28: Stakeholder views on the limitations of the certified products sub-index

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)
Certified products		<p>There are many more certified products present in the region than are captured by the sub-indicator i.e. small producers or those who have not got around to registering their products yet.</p> <p>Does consumption of a product imply any real appreciation / awareness on the part of the consumer of the landscape that produced it?</p> <p>Specific geographical locations of producers are not used in the indicator, only the 'region' in which production occurs.</p> <p>Too much weight given to wines, a product not characteristic of the WM landscapes.</p> <p>Significant additional data required for sub-component to be meaningful.</p>	<p>Products should not be limited to those that are certified, it should include regional products also – assuming that a meaningful and mutually agreed set of criteria for inclusion can be developed.</p>	<p>There should be some recognition of local and regional products, perhaps using, as an indicator the number and popularity of public festivals promoting typical agricultural products.</p> <p>Agricultural areas rich in forestry have fewer certified products and are therefore under-represented when there is no normalization over UAA.</p> <p>High concentrations of certified products may indicate over-exploitation of delicate landscapes.</p>

³ Subject to there being some kind of designation that can be captured.

There is a shared view that the single farm-based measure of tourist activity used in the current indicator fails to capture much and perhaps even the majority of rural tourism, which might make use of non-farm accommodation sites and facilities, but still be motivated, at least in part, by landscape appreciation. There is also recognition that the farm-based measure might also be capturing tourist activity that is based on the man-made environment, such as nearby cities, large country houses and gardens and cultural centres, which are not related to agricultural landscapes and may not be directly subject to policy instruments such as the CAP. Though these concerns correctly address limitations of this sub-index, the main reason why FSS data on farms declaring tourism as other gainful activity is considered an appropriate indicator is because the landscape indicator monitors expressly the impact of the CAP on the environment, therefore in this case the link between farmer (as direct recipient of CAP measures) and user/landscape is rather straightforward. Additionally, the CAP also impacts directly on the incidence of provision of on-farm tourism and recreation activity, through its impacts on farm income and the supply of grants for diversification activity.

(iii) Farm tourism activity

Table 29: Stakeholder views on the limitations of the farm tourism sub-index

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)
Farm tourism activity		Only a very small proportion of farmers adopt this and this in no way reflects the scale of rural-based tourism. People using agricultural landscapes for tourism or recreation might not stay on a working farm, and conversely, people staying on working farms might not be engaged in activities relating to surrounding landscapes.	Limiting the tourism measure to a single farm-based measure does not capture other rural-based activities such as rural restaurants, small hotels etc.	Farm tourism in Italy is linked to drivers different from agriculture (or not only agriculture). Farm tourism close to cities or cultural centres, or close to beautiful areas, are more popular than other places. Level of farm tourism dependent on availability of suitable farm buildings, which favours small-scale traditional, owner-occupied farms.

There is a shared view that the single farm-based measure of tourist activity used in the current indicator fails to capture much and perhaps even the majority of rural tourism, which might make use of non-farm accommodation sites and facilities, but still be motivated, at least in part, by landscape appreciation. There is also recognition that the farm-based measure might also be capturing tourist activity that is based on the man-made environment, such as nearby cities, large country houses and gardens and cultural centres, which are not related to agricultural landscapes and may not be directly subject to policy instruments such as the CAP. Though these concerns correctly address limitations of this sub-index, the main reason why FSS data on farms declaring tourism as other gainful activity is considered an appropriate indicator is because the landscape indicator monitors expressly the impact of the CAP on the environment, therefore in this case the link between farmer (as direct recipient of CAP measures) and user/landscape is rather straightforward. Additionally, the CAP also impacts directly on the incidence of provision of on-farm tourism and recreation activity, through its impacts on farm income and the supply of grants for diversification activity.

The relative importance of sub-components

Stakeholders were asked to decide on the relative importance of each of the three sub-components in measuring societal appreciation of landscapes. Stakeholders were asked to consider this question

in two ways: (i) assuming that perfect data were available for the construction of the indicator; and (ii) based on the indicator as it is currently constructed.

The first of these judgements seeks to capture the fullest potential merit of each measure. In this sense the judgement captures the perception of stakeholders on the centrality of each of the ‘messages’ underlying the three sub-components to the theoretical concept of societal appreciation of landscapes.

The second judgement recognises that whatever level of importance might be attached to individual sub-components in an ideal world, their measurement in the real world is subject to a number of limitations that erode their ‘message’, and therefore their value in reflecting societal appreciation of landscapes. These limitations reflect both the way in which each ‘message’ is measured, i.e. the variable (choice of phenomenon) and metric used and the quality of the data collected for each variable. The second judgement therefore takes the value judgement at (i) and adjusts it to account for the limitations imposed by current imperfect measurement.

Under both assumptions stakeholders were asked to weight each of the sub-components in terms of their importance, using a 10-point ranking, where 10 is most important and 1 least important)?

(i) The ‘true’ potential value of sub-components

Table 30: Average weight ascribed to each of the sub-components by stakeholders in each case study area, assuming perfect measurement (with individual component ratings in parentheses)

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Average over all case study areas
Protected areas		8.5 (9, 10, 8, 7)	8 (8, 8)	4.3 (10, 1, 2)	6 (10,6,0,4,5,7,8,8)	6.7
Certified products		5.5 (7, 3, 6, 6)	5 (5, 5)	7.7 (9, 7, 7)	5.8 (10,5,3,9,8,4,4,3)	6.0
Farm tourism		6.7 (7, 8, 4, 8)	7 (7, 7)	6.3 (6, 5, 8)	7.3 (9,6,0,9,10,9,9,6)	6.8

(ii) The value of the sub-components under current approaches to measurement

Table 31: Average weight ascribed to each of the sub-components by stakeholders in each case study area, based on current approaches to measurement

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)	Average over all case study areas
Protected areas		8 (9, 10, 8, 5)	7 (7, 7)	4 (3, 10, 1, 2)	7.6 (10,7,6,4,10,7,9,8)	6.7
Certified products		4.0 (7, 3, 1, 5)	3 (3, 3)	7.5 (10, 6, 7, 7)	6 (9,6,4,7,10,4,7,1)	5.1
Farm tourism		3 (3, 5, 2, 2)	4 (4, 4)	5 (1, 6, 5, 8)	6.6 (9,5,5,7,9,7,4)	4.6

The ratings given to the sub-components under the assumption that the data are collected in as methodologically sound a manner as possible are obviously higher than the ratings given for the sub-components collected by under current methodologies. The judgement of stakeholders therefore is of one of concern about the quality of the existing data, arising out of weaknesses inherent in the indicator. The fact of an improvement in the ratings under the assumption of perfect data capture implies that the performance of the sub-components can be improved. However, the ratings given under the assumption of perfect data capture are not perfect in themselves, implying that the stakeholders do not feel that the underlying phenomena that are being measured adequately capture societal appreciation, as expressed through these three dimensions. For example, the indicator reflecting landscape appreciation might be improved, to capture actual levels of appreciation more fully, by the addition of other local protection designations, but even this might still not fully reflect the potential of this indicator to fully capture societal appreciation where there might be appreciation of production-based landscapes which would have no conservation designation under any system of designation, but which might still be viewed as attractive and offer recreation and tourism potential and be accessible to urban populations.

It is apparent that some of the sub-components are perceived as performing better than others, with the protected areas sub-indicator most highly regarded and the farm tourism sub-indicator seen as performing very poorly in its current form, but with room for improvement (i.e. this is viewed as potentially the best). There is also considerable variation in perception of value for the sub-components over the case study areas, with the landscape protection indicator, for example, seen as having low value in Tuscany, but being very highly regarded elsewhere.

It is also apparent that the weights given to each of the sub-components are not equal, a fact that runs counter to the assumption of equal weight in the construction of the composite indicator.

Complementary indicators

In the second part of this study, a list of alternative, or complementary, indicators in each case study area were identified, that might be used alongside the existing three sub-components to improve the performance of the composite indicator. These indicators were identified on the basis that they either might contribute a different but complementary aspect of the ‘message’ of societal appreciation of landscape, or they overlap with the ‘message’ of the existing sub-components, while capturing that common message more meaningfully, or accurately. In Part 2, these judgements were taken solely by the authors of this report. In Part 3, these choices were subject to review by the expert stakeholders in each case study region. In reviewing the complementary indicators stakeholders were asked which, if any, they would include in the composite indicator, alongside the existing sub-components, as a means to improving the performance of the composite indicator (i.e. making it more meaningful and accurate). Stakeholders were also asked to suggest their own complementary indicators if they knew of any that they considered would perform better than those selected by the project team.

In Tables 32-35 a complete list of the complementary indicators identified by stakeholders in each case study region is given, with these clustered by theme, together with the frequency with which each was nominated by case study.

Table 32: Complementary indicators identified by stakeholders in each case study region as having potential to improve the performance of the composite indicator – PROTECTED AREAS

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)

Agri-environment and cross-compliance measures related to wildlife				1	
Protection of cultural heritage				1	
Fauna reproductive areas				1	
SSSIs		1			
AONBs		1			

Table 33: Complementary indicators identified by stakeholders in each case study region as having potential to improve the performance of the composite indicator – CERTIFIED PRODUCTS

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)
UAA of DOP wines				1	
Development of local food market				1	
Festivals/exhibitions for local/traditional foods				2	
Distribution of farm shops and farmers' markets		2			

Table 34: Complementary indicators identified by stakeholders in each case study region as having potential to improve the performance of the composite indicator – FARM TOURISM

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)
Scarborough Tourism Economic Activity Model (STEAM)		1			
Agri-environment measures related to tourism				1	
Wine and Taste roads				1	
Bridleways / trails				1	1
Multiple countryside itineraries (other rural tourist facilities, such as campsites, picnic sites etc)		1		2	

Table 35: Complementary indicators identified by stakeholders in each case study region as having potential to improve the performance of the composite indicator – OTHER

	Syddanmark (DK)	West Midlands (UK)	Groene Wald (NL)	Tuscany (IT)	Alentejo (PT)
National Geographic Geodiversity data		1			
Numbers of farmers in Stewardship schemes				1	
Density of cultural heritage				1	
Mapping of farms offering educational access, or other open public access		1			
Complex patterns					1
Hunting					1

6.2 Critical analysis of the constraints related to using existing and alternative variables in the Landscape Appreciation Indicator

6.2.1 Objectives

As part of the work on Part 2, a number of complementary indicators, from nationally available datasets, was identified that might be used to supplement, or even replace, the existing sub-components in the composite societal appreciation indicator. Use of these complementary indicators would be on the basis that they addressed limitations in the existing indicators, or improved the completeness of the 'holistic message' that is societal appreciation. One of the primary objectives of Part 3 therefore was the conduct of a critical analysis of constraints on the use of the alternative indicators (plus the existing sub-components). Before this could be done however, it was necessary to:

1. decide on the nature and number of the constraints that impacted on these indicators;
2. identify evaluation criteria by which the impact of the constraints on each putative indicator could be assessed.

It was recognised that some of these constraints will be critical in deciding the suitability of variables for use in the 'appreciation' indicator and some will perhaps be of only minor importance. It was therefore necessary, as a final step in this process, to attach weights to each constraint reflecting its importance in determining the suitability of each indicator.

In the next section, a series of constraints are identified for use in this critical evaluation. The nature and significance of each constraint is discussed, with a view to deciding how critical each is in determining the suitability of indicators for use in the composite societal appreciation indicator. As elaborated below, constraints were classified into two types: (i) technical/methodological; and (ii) qualitative (i.e. relating to content).

6.2.2 Identification of constraints

Technical/methodological constraints

Is the variable replicated over all EU regions?

Variables for which data are already collected in a majority of Member States have a far better chance of becoming EU-wide indicators than those that are either currently present in only a few Member States, or variables that are not currently collected anywhere. This increased likelihood of use is due primarily to the more limited additional effort required to roll out the variable to the whole of the EU, but also to the fact that, due to historical use, the utility of the variables has already been proved in a range of landscape contexts. Used in this context 'utility' is taken to reflect a combination of the meaningfulness of the variable, its ease of use in practical terms, and the cost of acquiring it.

Is the variable available to Eurostat?

Variables have the greatest chance of use in the landscape appreciation indicator if they are already submitted by Member States to Eurostat.

Does the current variable have a long shelf life?

This constraint reflects the possibility of rapid rates of change in some variables i.e. there is rapid real-world change. Variables that reflect physical, economic or cultural states that change rapidly are unsuitable for use as indicators, as they would likely be outdated by the time of publication of the

indicator. Conversely, if the values of a variable are subject to only very slow change, this variable may also not be suitable for use as an indicator, as it is unlikely to be diagnostic of policy impacts.

Modernity – is the variable up-to-date?

Some variables are not collected annually, for example population censuses. Use of such variables in the landscape appreciation indicator requires that, in the intervals between data collection, the values remain sufficiently representative of current state to be of relevance.

Is the variable based on a Census?

Variables derived from a census will be more reliable and have greater accuracy than survey-based variables. Survey-based variables should only be used if they contain critical data that cannot be obtained through census.

Is the variable publicly available?

Publicly available data will have no associated copyright or cost issues that have to be addressed. Use of privately collected or commercial data should not be excluded, but the use of such will require strong justification (including justification of costs).

Is the variable available at a spatial resolution of NUTS2 or higher?

This criterion reflects the resolution of variables available from all potential suppliers, not just Eurostat, i.e. Eurostat may not hold a variable at all, or only have it available at national level, but it may be available at NUTS2 or higher resolutions from other (national) agencies.

Is the variable calculation methodology likely to change over time?

This constraint would be of relevance for variables where plans are already in train to re-develop the variable, or its method of calculation, or where a variable is under review, or even where some aspect of a variable is contested by end-users.

Is the variable's calculation methodology consistent over regions?

Where variables are collected by member state agencies that are not for delivery to EU agencies, the methodology of their calculation and content may vary, even where there is commonality of subject matter.

Qualitative constraints

Content

The potential indicator must be consistent with the objectives of the overall 'societal appreciation of landscape' indicator.

Equity

The indicator must treat all regions fairly, i.e. indicators should be excluded that disadvantage some regions and countries for commercial or technical reasons (i.e. reasons that have nothing to do with societal appreciation of landscapes)?

At the point of scoring the potential complementary indicators on the basis of this evaluation criterion it was apparent that the concept reflected in the criterion was not easy to understand and that in many cases equity was being conflated with the issue of the relevance of the indicator in each region. For this reason, at the point of analysis of the critical evaluation scores, this evaluation criterion was dropped and therefore does not appear in the data presented in the results section that follows.

Descriptive power

This constraint encompasses the degree of focus of the variable, which has two dimensions:

- Apparency - i.e. is the variable easy to understand?
- Clarity – is it easy to see exactly what the variable is measuring?

Duplication

This constraint has two dimensions:

- Are there alternative variables available that measure the same or similar things?
- Do any of the alternative variables better reflect the dimension of interest?

Interaction

This constraint has two dimensions:

- Do any of the variables interact to cause unforeseen effects?
- Are variables consistent with other official indicators?

6.2.3 The evaluation methodology

To achieve the critical evaluation in a methodical, transparent and replicable way a scoring and weighting approach has been used. A schematic for the evaluation process is presented in Figure . A list of evaluation criteria, based on the constraints identified above, was created and presented to other teams for comment and amendment. Once a final set of criteria was agreed, these went forward to the evaluation using the methodology described below.

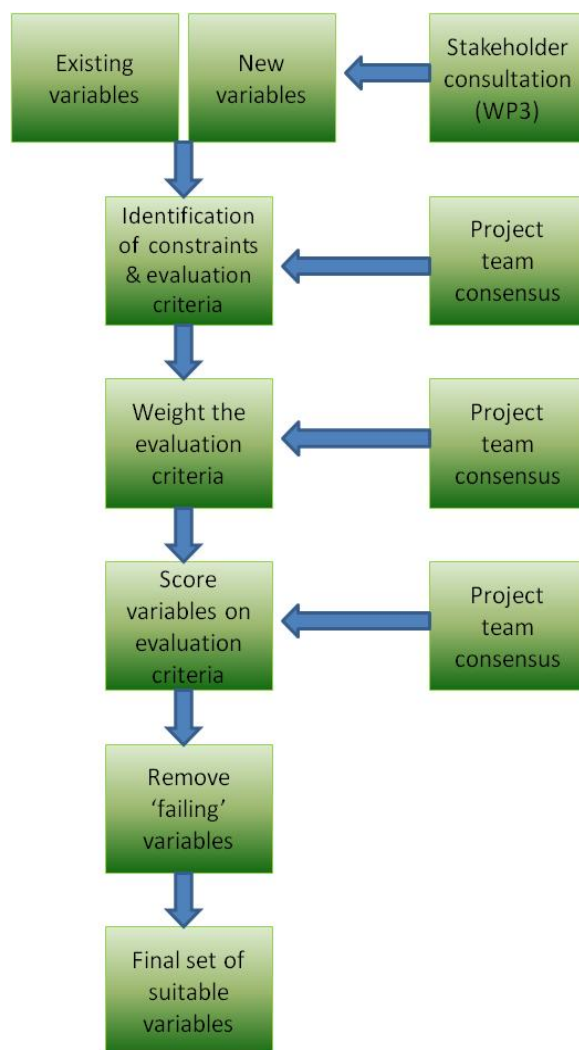


Figure 66: A schematic for the critical evaluation process

1. Weights were attached to each evaluation criteria, where these reflect the relative importance of each constraint in determining the suitability of individual variables for use in the appreciation indicator..
2. Variables were scored against each constraint, using a 5-point scale.
3. The weighted scores for the evaluation criteria were summed, to yield a weighted aggregate score for each variable over all constraints. This was done for methodological and content criteria separately.
4. Aggregate threshold scores for the methodological and content criteria were then determined, and variables dropped from further consideration, due to cumulative weakness, if they fell below these values.
5. Evaluation criteria (reflecting key constraints) were identified which are so critical to the successful use of a variable that failure to achieve particular states on these criteria would render the variable useless, i.e. these constraints are 'deal-breakers'. Any evaluation criterion that carries a weight of 5 was deemed to fall into this category. Any variable that fell below a particular threshold (or failed to achieve a particular binary state) on any one of these variables was dropped. For example, if a variable scored zero on 'availability' because it is not present in any EU countries, it would be dropped, regardless of how well it scored on other evaluation criteria.
6. The methodological and content scores were summed
7. A constraint profile of each variable was then constructed.

Steps 1 through 3 were undertaken by the case study teams separately, then the results were analysed centrally for steps 4 through 7.

6.2.4 Results

A full set of appraisal tables, i.e. for each case study area, are presented at Appendix 2 and Appendix 3, while summary statistics arising from the evaluation are presented in the sections following. Appendix 4 contains a guide to the coding of each evaluation criterion.

How do the existing sub-components of the composite indicator perform?

The three existing sub-components of the composite indicator have also been subject to the critical evaluation. This was done for two reasons, first to evaluate their performance, identifying strengths and weaknesses and second to record a benchmark against which the complementary indicators can be compared.

Table 36: Performance scores of the landscape indicators

	Syddanmark (DK)	West Midlands (UK)	Groene Woud (NL)	Tuscany (IT)	Alentejo (PT)	Average	Max possible score
Protected areas (Aggregate score)		230	185	205	215	209	250
Aggregate technological criteria score		145	145	145	130	141	145
Aggregate qualitative criteria score		85	40	60	85	68	105
Certified products (Aggregate score)		140	84	216	200	160	250
Aggregate technological criteria score		105	54	145	115	105	145
Aggregate qualitative criteria score		35	30	71	85	55	105
Farm tourism activity (Aggregate score)		220	140	230	190	195	250
Aggregate technological criteria score		130	50	145	105	108	145
Aggregate qualitative criteria score		90	90	85	85	88	105

Cumulatively poor performing indicators

Indicators have to perform at a minimum level on key individual evaluation criteria (constraints), but also have to have a minimum level of overall performance. In assessing the overall performance of the potential complementary indicators, the performance of the three existing sub-components has been used to set thresholds for rejection. In this case, a very simple set of threshold scores have been set, i.e. those putative complementary indicators have to score at least equal to the average score of existing sub-components on both the measures of (i) aggregate technological criteria and (ii) aggregate qualitative criteria score.

As there are three sets of scores, for the three existing sub-components, each of the potential complementary criteria need to be identified with one of these three (based on the theme that they cover) and then the threshold scores for that existing sub-indicator apply. Where putative complementary indicators are so radically different in nature that they cannot be identified with any of the three sub-components, the threshold scores for the weakest (lowest scoring) of the sub-components applies. The rationale for using the performance of the existing sub-components as thresholds is that any putative complementary indicator that it is proposed should be used to either supplement the existing sub-components, or replace one of them, has to perform equally as well as those currently in place. On the basis of the above, the putative complementary criteria in Table 37 below go forward to the next round of evaluation.

Table 37: Putative complementary indicators that have aggregate performance scores high enough to continue to the second round of evaluation

	Aggregate technological criteria score	Aggregate qualitative criteria score	Total aggregate score
Alentejo			
None			
Tuscany			
Number of stewardship farmers of local products at LAU2 level	114	60	174
Groene Woud			
None			
West Midlands			
Percentage of farms with tourism as a gainful activity	130	90	220
PDO/PGI product UAA per total UAA	105	90	210

The 'deal-breakers'

There are certain evaluation criteria, reflecting key constraints and requirements, that are so crucial, that the putative complementary indicators must perform to a high level on these in order to make their use in an adapted composite indicator feasible – these are the 'deal breakers'. Any evaluation criterion with a weight of 5 is considered to be a 'deal breaker'. Putative complementary indicators must score 5 on all of these 'deal breakers' to be considered feasible contributors to the composite indicator. Table 38 below shows those putative indicators from Table 37 that meet this second key requirement.

Table 38: Putative complementary indicators from Table 37 that pass the 'deal-breaker' test

	Aggregate technological criteria score	Aggregate qualitative criteria score	Total aggregate score
Alentejo			
None			
Tuscany			
None			
Groene Wald			
None			
West Midlands			
Percentage of farms with tourism as a gainful activity	130	90	220

It is apparent from Table 38 above that only the West Midlands case study provides any putative complementary variables that pass all tests. There is potential in this approach to identify complementary variables of two types, first, variations on the three existing sub-components (the variants), and second, novel indicators. The 'variants' are more likely to pass the evaluation criteria tests because they possess the same basic qualities as the existing sub-components, but include refinements that lead to better performance on the evaluation criteria than the originals. In this

case, the single complementary indicator that has passed the critical evaluation is of the former type, i.e. it is a 'variant' of an existing sub-indicator; and in fact it is very close methodologically to the original, and scores identically to the existing sub-indicator in the critical evaluation, suggesting that it offers no significant improvement in functionality.

Local indicators that could be rolled out to other Member States

One of the objectives of this study is to identify indicators that might have potential to improve the composite indicator that are not yet available at EU level, or available in each member state. These novel indicators, which would be based on national datasets, would perform well in individual case studies and the nominating team would believe that they could be rolled out to other States quickly and cheaply. In the critical evaluation to this point such indicators would not be identifiable, as they had failed on the basis of one of the 'deal-breaker' evaluation criteria, i.e. the requirement that 'the variable be replicated over all EU regions'. As a last step in the critical evaluation process therefore, variables that scored highly but failed on 'deal breakers' are reviewed to identify any that failed solely on the issue of the availability of the data in other regions. The review reveals that both of the putative indicators from Table 37 lost at the deal-breaker stage fall into this category and should therefore be reinstated on the basis that if the variable can be rolled out to other regions easily, they would make suitable additions to the existing sub-components on the basis of their critical evaluation performance.

6.3 Discussion and conclusions

6.3.1 The meaning of the indicator

The concept of 'societal appreciation' is somewhat unfamiliar to stakeholders and as such their understanding of it is ill-defined. In practice, the meaning of the composite indicator is not fixed even if the intention of the designers is that it be so. Meaning is, to some extent, determined by the interpretation of the end user. The interpretation placed on the indicator by the end user may be influenced by their perceptions and level of understanding of the issues involved, but may also be influenced by the requirements that they place on the indicator, i.e. the job that they want the indicator to do. As a consequence, stakeholders go beyond, or even by-pass, the explanation of the indicator provided by its creators, and create a broader set of 'messages' for the indicator than was intended. One area where this is particularly the case is on the issue of value judgement. Compounded by the fact that the term 'appreciation' is ambiguous, a large proportion of stakeholders see the indicator as conveying both the sense of awareness of an issue and a valuation of worth. This problem is compounded by the fact that the three sub-components are also perceived to convey a value judgement to some extent, with the protected areas indicator conveying a value judgement strongly and certified products only weakly. It is also noted that the ease with which users of the composite indicator can abstract its true (intended) meaning decreases at higher resolutions because at this level the identification of the indicator outputs with individual landscapes and therefore association with value judgements becomes irresistible.

6.3.2 Clarity of message

As a consequence of the meaning of the composite indicator being unfamiliar and, in practice, ill-defined stakeholders attempt to create their own meaning based on the component variables from which the composite indicator is constructed. However, the perception is that the various dimensions of the composite indicator conflict with one another and make the final indicator difficult to conceptualise, i.e. coherence and meaning is lost. As a consequence of end-users 'bottom-up' approach to definition, while there is some certainty with respect of what dimensions of landscape are being 'appreciated', it is uncertain whether stakeholders perceive the aggregate indicator's intended message.

6.3.3 Scale of presentation

The consensus view is that the use of a limited set of 'standardised' measures, presented at NUTS2, does not allow for the capture of local context and variation and, in particular, local prioritisations of issues. The indicator appears to stakeholders to be designed for use by EU-policy makers, providing generalisations over regions and there is recognition that at NUTS2, the indicator would serve a useful purpose on this basis. All scales of presentation have value depending on the requirements of the end user and this strongly suggests that the indicator needs to be made available at a variety of scales, not just NUTS2, so that a wider range of end-users can select the scale appropriate for their requirements, i.e. the dimensions of landscape units that the public comprehend/utilise/identify with. This of course accepts the possibility that the information value (meaningfulness) of certain indicators can break down at too high a resolution, especially where the mapped units are smaller than the landscape units they cover (i.e. individual units cover only fragments of a landscape).

6.3.4 Reasonableness of the composite indicator outputs

As discussed above, the NUTS2 composite indicator does not seem to stakeholders to be the right scale to address analysis below the regional level. However, this is largely a scale of presentation issue. It has to be noted that when stakeholders expressed dissatisfaction with the reasonableness of

one of the sub-components of the composite indicator, they tended then to also lose confidence in the whole.

6.3.5 Methodological issues

It is argued by stakeholders that normalising the sub-components by the UAA in regions can produce misleading results. For example, in an LUA2 unit with a very small UAA, even a modest number of PDO/PGI products will lead to a high apparent rate of certified products when raised to the LAU2 level. To overcome this problem it is suggested that the denominator either be the LAU2 area itself, i.e. do not normalise by UAA at all, or, if the UAA approach must be maintained, LAU2 units with very small UAAs should be excluded. Standardisation by UAA area makes most sense at low resolutions like NUTS2, but when the spatial unit used for the indicator is smaller than the designated area for the product it breaks down. The problem then is that the most appropriate scale will vary between countries. LAU1/2 might work for wines or, in any case, for products for which designated areas are small, but not for dairy products. An additional issue highlighted by some is that current indicators are denominated on an administrative, rather than a landscape unit framework. This means that appreciation scores at LAU2 level may be confounded by the presence within the administrative unit of a varied combination of landscape types. In the UK, for example, most political/administrative units in rural areas are based on historic parish (or equivalent) units, which traditionally incorporated, by design, a variety of different landscape types (i.e. an open core of good arable land, with some poorer grazing land and an area of wooded land for a fuel supply).

6.3.6 The relative importance of the sub-components

Each of the sub-components has different levels of relative importance and these differences in relative importance are not being recognised by the current approach to the aggregation of sub-components into the composite indicator. These weights might be consistent across all regions, or might be specific to the local conditions of each region. A corollary to this issue is that if additional sub-components are added (and many stakeholders argue that issues are being missed), all weights will have to be re-estimated in creating a new composite indicator.

6.3.7 The performance of the three sub-components of the composite indicator

The results of the critical evaluation exercise showed that the current sub-components of the composite indicator were more efficacious than any other indicator that could be identified either by stakeholders or the researchers. This remained true even when considering, without prejudice, indicators that are only available at national and regional level. Additionally, the critical evaluation exercise did not reveal any other dimensions of societal 'appreciation' of landscape beyond those represented by the three existing sub-components.

6.3.8 Use of complementary indicators

The critical evaluation of complementary indicators reviewed a number of candidates identified in Part 2 to either replace the existing sub-components of the composite indicator, or supplement them (i.e. make good some deficiency in the representation of the three dimensions of societal 'appreciation'). These complementary variables were classified into two types: (i) independent alternatives to existing sub-components; and (ii) variants of existing sub-components (i.e. using the same data source as existing sub-components, but adjusting the method of calculation). Type (i) complementary indicators can both replace the existing sub-components, or supplement them, while type (ii) can only replace existing sub-components. Very few of the nominated complementary indicators passed the critical evaluation, i.e. the great majority were deemed to be inferior to the existing sub-components. Of those that did perform as well, all were of type (ii). There were three

variables of this type, representing variants of the existing farm tourism and certified products activities. This focus on methodological variants to the existing sub-components resonates with exploration of the issue undertaken in Part 1 and in comments made by stakeholders. The issue most highlighted in this regard is the deleterious effect of the UAA normalisation when applied to the farm tourism and certified products sub-components when mapped at levels below NUTS2.

6.3.9 Alternative dimensions of societal appreciation

Neither the analysis carried out in Part 2 nor the stakeholder consultation identified dimensions of societal appreciation of landscape that had been missed, i.e. ways of capturing societal appreciation of landscape that were not already covered by the three existing sub-components of the composite indicator. Consideration of this issue by the authors' team yielded only one potential candidate, that of the representation of landscapes in the media. Landscapes are presented in the media in cultural, historical and current affairs contexts in books (both fiction and non-fiction), magazines, newspapers, films, television and radio programmes, plus increasingly in web formats. There is no arguing with the fact that the presentation of landscapes in any of these media forms can significantly enhance levels of societal awareness. Indeed, it could be argued that this dimension is more influential as a vector of societal awareness than any other; however the problem lies in measuring this impact. While a wealth of media-related statistics are currently collected in all member states, no data collected specifically on the representation of landscapes is known of. Additionally, because of the multiplicity of media outlets of various kinds and degrees of formality, it would seem unlikely that data of this kind could be easily and cost-effectively collected in the near-term. For these reasons, this dimension of societal appreciation of landscapes will have to remain, for the moment, unexplored.

6.4 Advise on possible improvements of the EU landscape social perception indicator in terms of data collection and elements to be included ('complementary' indicators)

1. The name given to the indicator carries with it some ambiguity. The term 'appreciation', is thought by some to mean simply awareness, i.e. it carries no value judgement. However, others understand the term to be in essence a value judgement, i.e. a level of approval of landscape due to its inherent qualities. As the indicator is designed not to be a value judgement, it is suggested that an alternative name such as 'awareness' would be more appropriate.
2. For the certified products and tourism sub-components the use of the UAA as a denominator in estimating occurrence rates is distorting at scales below NUTS2, adds little value at NUTS2 and above, and is confusing at all scales. It is suggested that the use of UAA as a denominator for these sub-components be dropped. For the current tourism indicator it would be better to use the number of farms as the denominator, i.e. the sub-indicator would then be the percentage of farms that derive income from tourism/recreation activities in each LAU2 unit, rather than the percentage per UAA. However, for the protected area sub-index the indicator does make sense as a percentage of UAA. Over all Member States the trend is for declining UAA sizes, so the problems associated with small UAA in LAU2 and LAU1 units will increase.
3. The landscape protection indicator does not capture productive landscapes that might be highly appreciated by society, particularly where there are high levels of access. The addition of more national landscape designations to the sub-index should be considered. However, some care would have to be exercised here, as some national landscape designations are already included in the

indicator as ‘Category V(5) designations’. It should also be pointed out that some of this type of ‘appreciation’ will be captured by the indicator component reflecting rural tourism.

4. The three sub-components are not considered to have equal weight in reflecting societal appreciation of landscape. Some sub-components are considered more important than others, either because they address a message that is important, or because they are more efficient, transparent and accurate measures, or both. An estimation of weights for each of the sub-components should be considered, based on a broad assessment of their relative efficacy. A possibility is also to consider allowing these weights to vary from region to region reflecting local priorities and conditions.

5. Recommendation (4) touches on another issue, that different regions might appreciate landscapes in different ways. Societies with a strong food culture might be largely aware of landscapes through identification with the food products that derive from them, while societies with a less developed food culture, such as the UK, might apprehend landscapes more through historical narrative, or tourism. A uniform weighting of the sub-components of the composite indicator might therefore be inappropriate, failing to capture strong regional identities in appreciation. However, the problem with abandoning a uniform pan-EU methodology, is that it potentially weakens the value of the indicator as a tool for regional comparison. This would not be a great problem however, if the primary purpose of the indicator was the monitoring of change over time, rather than inter-regional comparison at fixed points in time.

6. One size does not fit all. The NUTS2 indicator is recognised as being a useful tool for policy makers who have an EU-wide focus, but the indicator is of little use to those operating below that level. It is suggested that the indicator be produced at a range of scales, so that different stakeholders can find a scale that is suitable for them.

7. Societal appreciation is a nebulous and largely unfamiliar concept, even to stakeholders with experience of the tourism sector and environmental protection etc. Until this concept becomes established, end-users will seek to understand the message of the indicator in terms of what it is measuring on the ground. At this level however, the composite indicator makes little sense. Greater effort therefore needs to be made to explain what the notion of societal appreciation is, as a concept, and a good first step would be to clearly define that it measures awareness or perception of landscape and not its value and select a definitive name to reflect this.

8. The farm tourism sub-index is not highly regarded. Though its importance is clear from a conceptual point of view, this sub-indicator needs to be supplemented with other variables which reflect rural tourism, such as numbers of rural restaurants, non-farm small-scale accommodation, public access provision etc. Unfortunately, few complementary variables have been identified that might be candidates for this. Care must be taken in selecting these complementary indicators, in that they must be related to agricultural landscapes and thereby subject to change through the agricultural and environmental management that is the purview of the CAP. In this sense the use of variables provided by the agricultural statistics (FADN and FSS) fully reflect this link.

9. Some consideration should be given to the possibility of validating the coverage of the FSS data on farm recreation and tourism activity by comparison with raised FADN data on the same farm-based activities. While the FADN data are based on a survey in each member state, the expression of the farm-based recreation and tourism activities in the national FADN surveys is done with much greater clarity than is the case with the FSS, thereby reducing the risk of respondents misunderstanding the instruction to register the presence of this type of activity.

10. If it is considered desirable to supplement the existing landscape protection sub-component with local landscape designations, it will be necessary to identify, in a systematic way, those

landscape designations that are eligible in each region. For this purpose a new EU landscape protection classification, like the existing Category V IUCN designation, should be constructed.

11. Consideration might be given to expressing the indicators using broad landscape units, instead of administrative units, such as those that have already been mapped for England and Wales at the regional (1:250,000) scale. The feasibility of such an approach would of course be dependent on an appropriate landscape typology and mapping system being available at the EU level (e.g. Mùcher et al., 2006; Mùcher et al., 2010). Such a framework could also be used to assess and map the other two Landscape indicators, i.e. physical structure and degree of naturalness.

12. The ultimate aim of the indicator is not to build a landscape map, at least not in traditional terms. When calculated at NUTS2 level, the indicator holds an abstract meaning and at that scale reference to real landscape boundaries is not necessary. Downscaling below LAU2 complicates the understanding of such level of abstraction since stakeholders clearly try to compare the outcome of the indicator with their mental landscape map. A further degree of complexity is also given by the fact that often the link between extensive agriculture and appreciated landscape is taken for granted, but this is not always the case. Society may value landscapes that are not necessarily hosting extensive practices (e.g. wine regions). In this sense the indicator does not provide a direct link to extensively managed landscapes.

REFERENCES

- Appleton, J. (1998). Living in the landscape: Toward an aesthetic of environment. *British Journal of Aesthetics*, 38(1):104-105.
- Botequilha Leitao A. and J. Ahern (2002). Applying landscape ecological concepts and metrics in sustainable landscape planning. *Landscape and Urban Planning*, 59(2):65-93.
- Carvalho-Ribeiro S. M. and A. Lovett (2011). Is an attractive forest well managed? Correlating public preferences for forests across rural/urban gradients. *Forest Policy and Economics*, 13:46-54.
- EEA (2005). Agriculture and environment in the EU-15: the IRENA indicator report. The European Environment Agency, Copenhagen, Denmark, 128 pp.
- EEA (2005). The European Environment – State and Outlook 2005. The European Environment Agency, Copenhagen, Denmark, 584 pp.
- Goossen M., Meeuwssen H., Franke J. and M. Kuyper (2009). My ideal tourism destination: Personalized destination recommendation system combining individual preferences and GIS data. *Journal of Information Technology and Tourism*. 11, 1:17-30.
- Goossen M. and M.Perez-Soba (2011). Mapping recreation services at national scale: the case of the Netherlands. In: PEER Report: A spatial assessment of ecosystem services in Europe: Methods, case studies and policy analysis - phase 1 (J.Maes et al. EDS). Available at http://www.peer.eu/fileadmin/user_upload/publications/PEER_report_3_phase_I.pdf
- Goossen, M., Schuiling, R. and M.Danes (2011). Mapping the Agricultural Appreciation Indicator. GIS analysis in support of FRAGARIA. Internal document.
- Helming K., Sieber S., Wiggering H., Wascher D.M., Tabbush P., Dilly O. and H.Bach (2007). Sustainability Impact Assessment of Multifunctional Land Use. In: Starret et. al. 2007. Environmental Science and Technology 2006 (2). Proceedings from the Second International Conference on Environmental Science and Technology, held August 19-22, 2006 in Houston, Texas, USA; American Science Press , pp. 495-500.
- Helming K., Diehl K., Bach H., Dilly O., König B., Kuhlman T., Perez-Soba M., Sieber S., Tabbush P., Tscherning K., Wascher D.M. and H. Wiggering (2011). Ex ante impact assessment of policies affecting land use, Part A: analytical framework. *Ecology and Society*. 16(1): 27. [online] URL: <http://www.ecologyandsociety.org/vol16/iss1/art27/>
- Konkoly Gyuró É. And S.Jombach (2007). Revised fact sheet of the indicator „Continuity of appreciated landscape heritage” Impact issue SOC 11 Landscape Identity. Contribution to the deliverable report 2.3.1 of the SENSOR project, 14 pp.
- McGarigal K., Cushman S. A., Neel M. C. and E. Ene (2002). FRAGSTATS: Spatial pattern analysis program for categorical maps, Computer software program produced by the authors at the University of Massachusetts, Amherst., available at www.umass.edu/landeco/research/fragstats/fragstats.htm

- Mücher C.A., Wascher D.M., Klijn J.A., Koomen A.J.M and R.H.G. Jongman (2006). A new European Landscape Map as an integrative framework for landscape character assessment. R.G.H. Bunce and R.H.G. Jongman (Eds) *Landscape Ecology in the Mediterranean: inside and outside approaches*. Proceedings of the European IALE Conference 29 March – 2 April 2005 Faro, Portugal. IALE Publication Series 3, pp. 233- 243.
- Mücher C.A., Klijn J.A., Wascher D.W. and J.H.J. Schaminée (2010). A new European Landscape Classification (LANMAP) – a transparent, flexible and user-oriented methodology to distinguish landscape. *Ecological Indicators*, 10:87-103.
- Oliveira R. and M. Dneboská (2008). From the Landscape Perception until Public Participation. How long is the way? University of Evora, 14 pp. Internal document.
- Paracchini M.L., Pinto Correia T., Ramos I.L. and C. Capitani (2010). Indicators to assess rural landscape valuation: how and what is measured at different levels of governance. Proceeding of the conference “Living Landscape – The European Landscape Convention in research perspective”, Florence 18-19 October 2010, Bandecchi&Vivaldi Editori.
- Paracchini M.L. and C. Capitani (2011). Implementation of a EU wide indicator for the rural-agrarian landscape - In support of COM(2006)508 “Development of agri-environmental indicators for monitoring the integration of environmental concerns into the Common Agricultural Policy”. EUR 25114 EN. Publications Office of the European Union. 88 pp.
- Pedroli B., van Doorn A., de Blust G., Paracchini M.L., Wascher D.M. and F. Bunce (2007). Europe’s living Landscapes. Essays exploring our identity in the countryside. KNNV Publishing (The Netherlands) in cooperation with Landscape Europe, Alterra, The Netherlands. 432 pp.
- Pinto Correia T. (1993). Threatened Landscape in Alentejo, Portugal: the Montado and other Agro-Silvo-Pastoral Systems. *Landscape and Urban Planning*, 24:43-48.
- Pinto-Correia T., Barroso F., Menezes H. and D. Surova (2011). The fuzziness of Montado landscapes: progresses in assessing user preferences through photo based surveys. *Agroforestry Systems* 82:209-224.
- Stanners, D. & P. Bourdeau (Eds.) (1995). Europe’s Environment – The Dobriř Assessment. A Report of the European Environment Agency, Copenhagen, Denmark, 680 pp.
- Surova D. and T.Pinto-Correia (2008). Landscape preferences in the cork oak Montado region of Alentejo, southern Portugal: Searching for valuable landscape characteristics for different user groups, *Landscape Research* 33(3):311-330.
- Tress B. and G. Tress (2001). Capitalising on Multiplicity: a Trans-disciplinary Systems Approach to Landscape Research. *Landscape and Urban Planning* 57: 143-157.
- Van Eupen M. (2010). Assessment of OpenStreetMap themes ‘leisure’, ‘lodging’ and ‘tourism’ for the East-part of the Dutch province ‘North-Brabant’. Contribution to Fragaria. Internal document.
- Wascher D.M., Schuiling R., Hazendonck N. and B. Looise (2008). Map of European Leisurescapes - A Geographic Image of Tourist Values, Trends and Potentials in European Landscapes. In:

Hazendonk N., Hendriks M. and H. Venema (eds.) 2008. Greetings from Europe. Landscape and Leisure. 010 Publishers, Rotterdam.

Wascher D.M. (ed.) (2005). European Landscape Character Areas – Typologies, Cartography and Indicators for the Assessment of Sustainable Landscapes. Final Project Report as deliverable from the EU's Accompanying Measure project European Landscape Character Assessment Initiative (ELCAI), funded under the 5th Framework Programme on Energy, Environment and Sustainable Development (4.2.2), Alterra Report No. 1254, 150 pp.

APPENDICES

Appendix 1 The method used in the Pre-study

The final version of the indicator is presented in Paracchini and Capitani (2011).

Landscape products

Food/wine

Food:

Dataset: DOOR database

<http://ec.europa.eu/agriculture/quality/door/list.html;jsessionid=MbCjKzDVhKD1S4GvYhJT6Ff52Ts9gGsCfX5qPVyWsM05RCsQQHjT!169409807>

The index is calculated as the number of PDO/PGI products normalized by UAA (I_{norm}). PDO/PGI products linked to landscape were selected according to the following criteria:

1. The product itself creates a specific landscape (i.e.: examples vineyards, olive groves, etc.)
2. The production area is characterized by a particular landscape (i.e.: montados, bocages, alpine meadows, maquis, etc.)
3. The production is explicitly related to the preservation of the landscape's characteristics.
4. The production is the result of a traditional management of rural landscape.

The index is then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method, using the equation

$$(1) \quad I_{rescaled} = ((I_{norm} - I_{min}) / (I_{max} - I_{min})) * 10$$

where

$I_{rescaled}$ is the value of the rescaled indicator

I_{norm} is the value of the indicator standardised on the UAA

I_{min} is the lowest value of the population of I_{norm} indicators calculated at NUTS2 level

I_{max} is the highest value of the population of I_{norm} indicators calculated at NUTS2 level

Wine:

Dataset: Inventory of quality wines produced in specified regions,

<http://ec.europa.eu/agriculture/markets/wine/prod/inventaire.pdf>

The index is calculated as the surface under cultivation of quality wines produced in specified regions (VQPRD), normalized by total UAA (I_{norm}).

The index is then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method, using equation (1)

Food/Wine mixed index

The number of wines under VQPRD scheme is calculated from E-Bacchus database for each country

<http://ec.europa.eu/agriculture/markets/wine/e-bacchus/index.cfm?event=searchPEccgis&language=EN>

Therefore at country level:

food weight = (N° PDO-PGI products)/(N° PDO-PGI products + N° VQPRD wines)

wine weight = (N° VQPRD wines)/(N° PDO-PGI products + N° VQPRD wines)

Then, after standardization, the label and wine indices are summed up using the weights.

$I_{\text{weighted}} = (I_{\text{food}}_{\text{rescaled}} \times \text{food weight}) + (I_{\text{wine}}_{\text{rescaled}} \times \text{wine weight})$ ⁴

The index obtained is then reclassified to 0-10 range

Rural Tourism

Dataset: FSS statistics (2003-2005)

The index is calculated as the N° of holdings having Tourism as “other gainful activity”, normalized by UAA.

The index is then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method, using equation (1)

Protected sites

Datasets:

- Natura 2000
- World Heritage List of UNESCO (selected cultural landscape)
- the European inventory of nationally designated areas,
- World Database of Protected Area (category: V)

Agricultural area is estimated by CLC2000, considering all the agricultural areas in class 2 of CLC first level classification plus the class Natural grasslands (class 3.2.1)

The index is calculated as the proportion of agricultural area included in protected sites in a reference unit, out of the total agriculture surface in the reference unit.

NB: Both surfaces are calculated from CLC. In this case, then, the normalization is done with CLC not with UAA

Index = (agriculture surface in protected sites in a reference unit)/ (total agriculture surface in the reference unit)

The index is then rescaled to a range from 0 to 10 with the Minimum-Maximum standardization method, using equation (1)

⁴ This does not apply to the final indicator presented in Appendix V

Table 39: Regions addressed in the present study

Name		Type of agricultural tradition and rural landscape	Number of LAU2 polygons
Syddanmark	DK	Intensively used agricultural landscape	22 municipalities (LAU1), 200 parishes (LAU2)
West Midlands	UK	Diversity of landscape is reflected in a diversity of farming types, including lowland grazing, arable in the east, including horticulture. In the north intensive dairy farming is common and the upland fringes are LFA.	171 MSOAs (lying between LAU1 and LAU2)
Groene Wood (province Brabant)	NL	Intensively used agricultural landscapes with high recreation and landscape values	26 municipalities (LAU1)
Tuscany	IT	Very diversified agricultural landscape with a great diversity of traditional food and beverages	10 Provinces (LAU1) and 287 municipalities (LAU2)
Alentejo	PT	Generally very low density of population, and concentrated settlement. Extensively used agricultural and silvo-pastoral landscape, maintained mainly through extensive grazing systems. These are combined with relatively smaller areas of small scale olive groves, mostly around small towns. There are also recently areas of intensive agriculture, with irrigation.	46 municipalities (LAU1)

Appendix 2 Stakeholder briefing document (UK version)

1. Background

Acknowledging that EU policies, particularly the Common Agricultural Policy (CAP), have a major impact on landscapes and the environment, the European Commission has recognised the need for better monitoring of the evolution of agricultural production systems and land use patterns at regional level and associated effects on the environment. In pursuit of this goal (i.e. ongoing assessment of the impact of policy decisions) it has issued a number of Communications requiring the construction of a framework of agri-environmental indicators “for monitoring the integration of environmental concerns into the CAP” (COM(2006)508). Using available and easily accessible agri-environmental information (i.e. data already available in EU datasets), a framework has subsequently been constructed containing 28 indicators, capturing:

1. driving forces
2. responses
3. the state of agriculture and the environment
4. pressures and benefits

For a full list of these indicators, see Appendix A, or COM(2006) 508 final⁵. This framework of indicators not yet operational, but once it is it will be used to identify shortcomings in current policy measures and the need for new policy initiatives and, where appropriate, improvement in the targeting and tailoring of the measures to local conditions.

A review of the set of draft indicators by the European Commission has pointed out that Indicator 28, which is defined as ‘Landscape state and diversity’ is “in need of substantial improvements in order to become fully operational”. To this end the European Commission’s Joint Research Centre (JRC), who constructed the original indicator, have commissioned a consortium of European research centres to evaluate some elements of this indicator and make recommendations for possible improvements. This stakeholder consultation exercise forms part of this JRC-funded project.

2. What is the ‘landscape state and diversity’ indicator?

The landscape state and diversity indicator is meant to give information on overall changes occurring at a landscape scale, driven by the CAP. Changes will be identified through monitoring activities based on the set of indicators listed in Appendix A.

The focus of Indicator 28 is the rural-agrarian landscape, understood as: (i) the soil surfaces where the agricultural activities (e.g. cultivations, grazing etc.) take place; (ii) the areas of natural/semi-natural vegetation functional to agricultural management (e.g. hedges, field margins, ditches etc.); and (iii) rural buildings and structural elements (e.g. dry walls, terraces etc.) (see Paracchini and Calvo Iglesias, 2007)⁶.

Landscape in general, and the rural-agrarian landscape in particular, is a complex entity and difficult to represent on the basis of indicators, since it is composed of a mosaic of spatial units (i.e. fields, urban, forest), characterised by the interrelation of different components such as: natural conditions,

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0508:FIN:EN:PDF>

⁶ Paracchini, M-L. and Calvo Iglesias, M. (2007) Landscape analysis for the definition of High Nature Value Farmland - the example of Italy. European Commission, Joint Research Centre, Publications Repository. <http://publications.jrc.ec.europa.eu/repository/handle/111111111/255>

farming traditions, farming systems, cultural heritage, and the people who manage the landscape (the farmers).

Due to the complexity outlined above, the Landscape State and Diversity indicator (Indicator 28) has been structured to capture rural-agrarian landscape state and diversity through three components, each representing a relevant individual dimension of landscape:

Landscape physical structure, characterised as land cover and its spatial organisation resulting from land management (organisation of different land cover types, plot size, fragmentation, diversity etc.)

The influence exerted by society on the agrarian landscape with their agricultural activities, and the way such influence is organised (farm practices, farming systems, biomass production etc.)

The social perception of the landscape, i.e. how society perceives, reads and assesses landscape quality; how society plans, manages, and uses the landscape for productive or non productive purposes.

Because this indicator must be operationalised in the near term, a main constraint is that the components listed above must be calculated on the basis of currently available data, or using information that can be made available in the short term, at the EU level, based on a harmonised methodology.

The present study (and this consultation exercise) focuses on the third component above, i.e. the social appreciation of the rural-agrarian landscape.

It is important to point out that the indicator of social appreciation of the rural-agrarian landscape is reflected at the EU-wide scale (and at regional level) and does not take into account the preferences of individuals. As everything is scaled up, including the level of governance, the main actors involved are society, market(s) and government(s). Therefore indicator reflects the way society as a whole interacts with landscape.

The components of the rural-agrarian landscape appreciation indicator cover complementary themes that describe the way society interacts with the rural-agrarian landscape. These three ways are:

- society protects valuable landscapes that are considered as a common resource
- it uses and enjoys the natural capital providing a recreational service
- it consumes the products of the landscape and provides a market for such products, which is sufficiently steady to guarantee the subsistence of the market itself, of the community providing the product and therefore, indirectly, of the associated landscape

3. The 'social appreciation of landscape' indicator / dimension

The JRC constructed this indicator using a linear combination of three indices (referencing the three points above), relating to:

1. Agricultural areas in protected and valuable sites
2. Tourism in rural areas
3. Quality products, including food and spirits under the Protected Denomination of Origin (PDO) and Protected Geographic Indication (PGI) schemes, and wines under the Vin de Qualité Produit dans des Régions Déterminées (VQPRD) scheme

3.1 *Agricultural areas in protected and valuable sites*

This index measures the share of agricultural land that is protected (under different regulations/protocols), such as Natura 2000 sites, World Heritage UNESCO sites linked to agricultural landscape, European nationally designated areas, and category V - World Protected Areas. Data on designations were derived from multiple datasets. The index was calculated as the percentage of the

agricultural land area included in protected and valuable sites in each NUTS2⁷ unit (county or group of counties). Agricultural areas were defined as Utilizable Agricultural Area (UAA) using CLC2000 (Corine Land Cover 2000), taking into account all agricultural land cover classes, including the class 'Natural grassland'.

3.2 *Tourism in rural areas*

This index is a proxy for tourism, specifically in agricultural areas. Because data on tourism in rural areas are fragmentary throughout the EU, a single data source has been used, i.e. the EU FSS (Farm Structure Survey), which in turn is derived from Member State submissions of national data, in the case of the UK, the Defra June Survey of Agriculture. The index is therefore restricted to tourist activity on farms, rather than all rural tourism.

The index is based on the number of holdings declaring that they have "Tourism as other gainful activity". The data refer to all activities related to tourism, i.e. accommodation services, showing the holding to tourists or other groups, sport and recreation activities etc. where either land, buildings or other resources of the holding are used.

3.3 *High quality products*

This index is a measure of the appreciation of local/traditional products, where these require traditional landscape management, which is directly related to the maintenance of traditional agricultural landscapes. The index for Quality food and wine was calculated from two different datasets:

1. Protected Denomination of Origin (PGO) and Protected Geographic Indication (PGI) products linked to landscape state and diversity - these were selected from the EC database of products certified according to the EU labelling scheme⁸ database. A subset of products was selected based on the following criteria:
 - the product itself creates a specific landscape (e.g. vineyards, olive groves, etc.)
 - the production area is characterized by a particular landscape (e.g. montados, bocages, alpine meadows, maquis, etc.)
 - the production is explicitly related to the preservation of a landscape's characteristics
 - the production is the result of a traditional management of rural landscape.
2. Data on quality wines.⁹

The final index represents the relative contribution of PDO/PGI products and VQPRD wines to the total number of certified products in a region.

4. **Combining the indices into a single composite index**

By a series of technical steps the three indices were rescaled in a 0-10 range and added together (with equal weighting), to create the final composite indicator, which has a range score of 0 to 30 (for more details, see Appendix B. All of the sub-indicators and the final indicator were mapped at the NUTS2 level as shown in Figure 68 below. Just to reiterate, the final indicator does not represent appreciation by individuals, as they would express it, i.e. in terms of appreciation of the aesthetic quality of landscape. The final indicator represents the interaction of 'society' with landscape, as can

⁷ Nomenclature of Territorial Units for Statistics (NUTS) is a hierarchical system for dividing up the economic territory of the EU, where NUTS 1 equates to Government Office Regions, NUTS2 (county or group of counties) etc.

⁸ EC, DG Agriculture, <http://ec.europa.eu/agriculture/quality/door/>

⁹ <http://ec.europa.eu/agriculture/markets/wine/prod/inventaire.pdf>

be measured by the actions that society takes such as protecting it, visiting it, and buying it's products, without reference, necessarily, to landscape beauty.

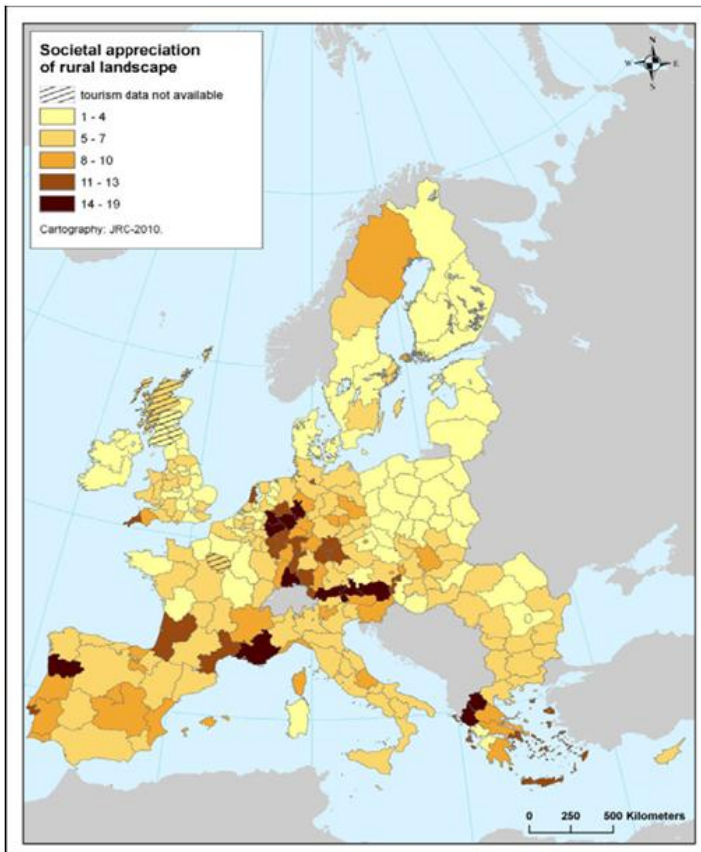


Figure 67: Map of composite societal appreciation of rural landscape indicator for EU25.

5. The scope of this project

The overarching objective of this study is to assess the conceptual limits of the 'social appreciation of the rural-agrarian landscape' indicator, calculated at the EU level, and how it could be improved.

In practice, the final indicator of social appreciation of the rural landscape will be built following the protocol of composite indicators. One of the key characteristics of such indicators is that they are calculated out of a basket of indicators which together describe the dimensions or structure of the phenomena being measured (such as, for example, competitiveness, gender balance, innovation etc.).

The key question in this case is: are the analysed dimensions sufficient to address the issue of landscape appreciation at the EU level? Are there dimensions being neglected and if there are, what are they?

This over-arching objective will be addressed by a set of key questions:

1. What do the existing individual sub-indicators actually represent/measure at different scales (and what are the linkages between scales)?
2. What are the critical constraints related to using existing variables in the 'social appreciation of the rural-agrarian landscape' indicator at different scales of analysis, i.e. at NUTS2 level and finer spatial scales.
3. What complementary sub-indicators are available (i.e. alternatives to those currently proposed)?

4. What do the complementary sub-indicators measure at different scales (and what are the linkages between scales)?
5. What are the critical constraints related to using complementary variables in the ‘social perception of landscape’ indicator at different scales of analysis, i.e. at NUTS2 level and below.

6. The stakeholder consultation

Stakeholders are being invited to make a contribution to a number of the key questions. Consultation will take place with two groups: (i) Eurostat stakeholders e.g. those responsible for the FSS and FADN datasets and others; and (ii) Consultation with key stakeholders in a number of case study regions within the EU, the West Midlands GOR being one.

6.1 What would we like you to do?

We would like you to give your views on the existing ‘societal appreciation of the rural-agrarian landscape’ indicator. We will facilitate this by asking a series of questions, which we would like you to answer, based on the briefing material presented above and on the material provided below, especially the maps, that has been generated by the project so far.

6.2 The questions

A holistic measure of what?

(i) What terminology would you use to describe what the indicator represents – currently it is described as capturing social ‘appreciation’ of the rural-agrarian landscape? Some alternative terms might be: awareness, understanding, valuation, appeal, familiarity, cognisance, ‘connection with’.

(ii) Is the NUTS2 mapping of the indicator an adequate representation of the extent to which society ‘appreciates’ the rural-agrarian landscape of your region?

(iii) Is the composite indicator conveying a clear message?

Resolution

(iv) Comparing the composite indicator mapped at the NUTS 2 (NUTS2 equates to county/groups of counties) and LAU2 (electoral ward) level (see Figure 69 below), do you think that the nature of what the indicator is measuring changes with the resolution at which it is mapped, i.e. the move from NUTS 2 to LAU2? If so, how does it change?

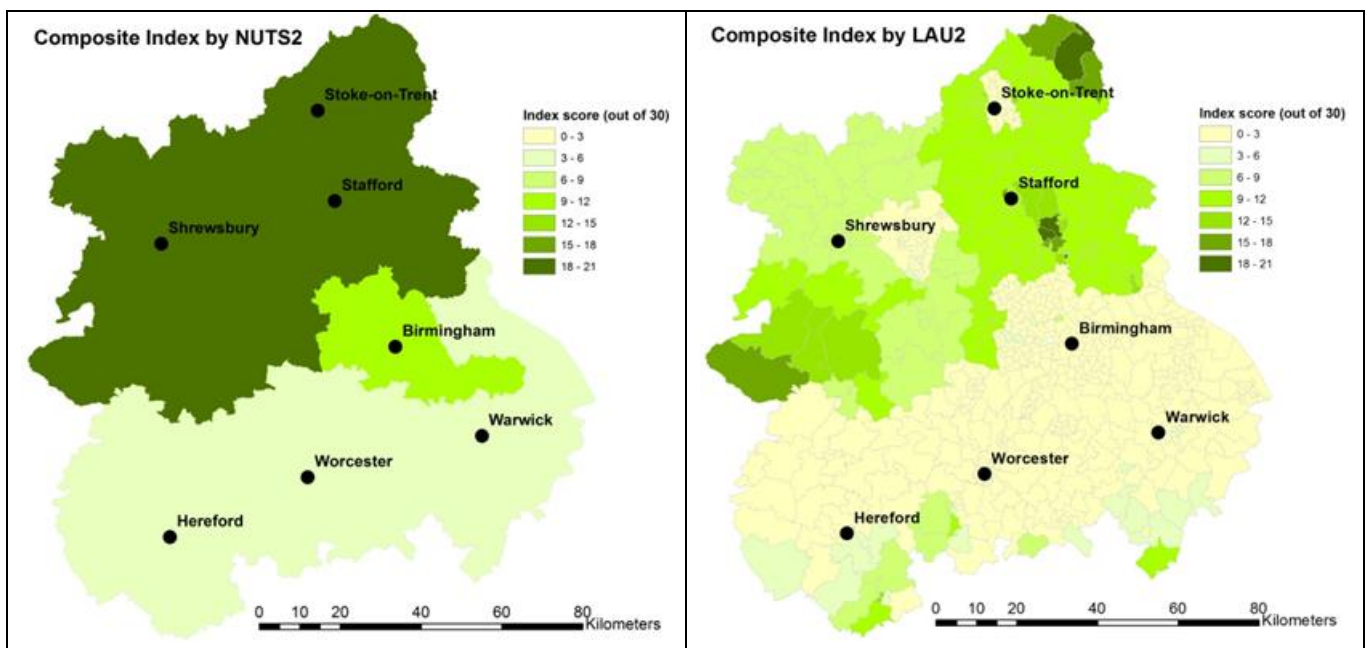


Figure 68: Composite societal appreciation indicator for WM region based at NUTS2 and LAU2

(v) At what resolution is the existing composite indicator most meaningful? (Please tick)

NUTS2 (Counties/groups of Counties)	NUTS3 (Counties/ groups of Unitary Authorities)	LAU1 (Districts/Unitary Authorities) (equivalent to former NUTS4)	LAU2 (Electoral Wards) (equivalent to former NUTS5)

(vi) How critical is the loss of resolution at the NUTS 2 level? Which elements of the composite indicators are being undervalued, or misrepresented, by presenting the indicator values at NUTS2 level and why?

(a) Protected areas (see Figure 69 below)

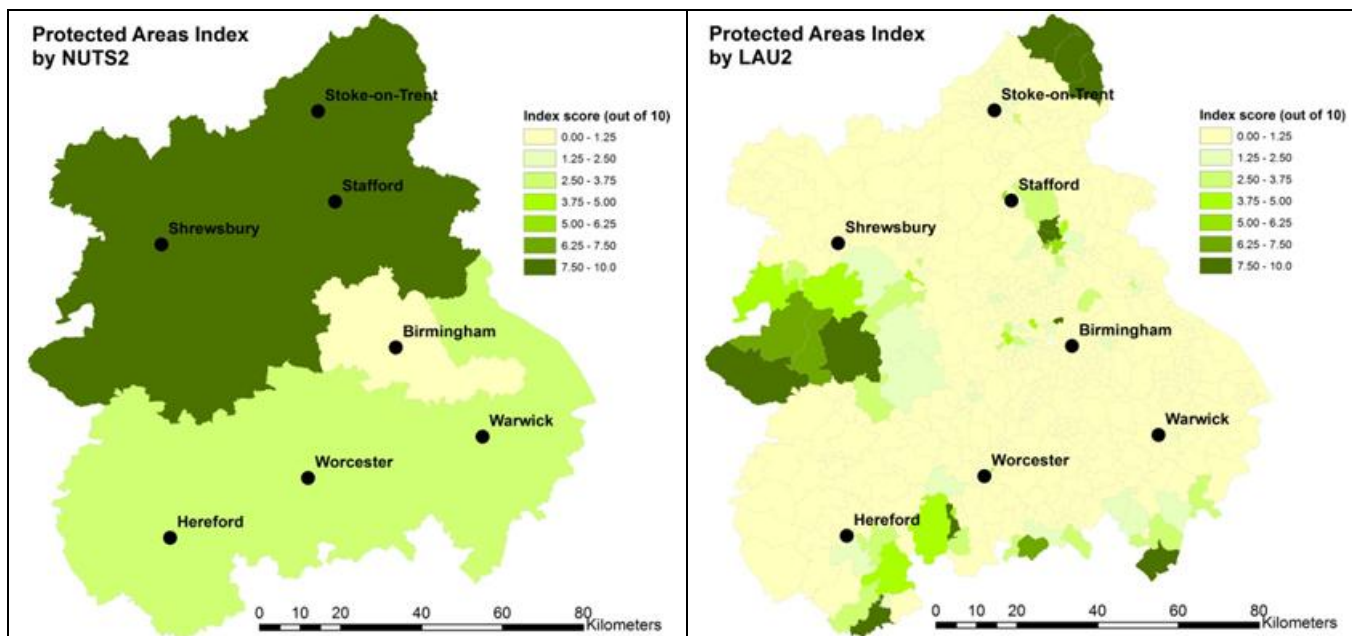


Figure 69: Protected areas sub-indicator for WM region based at NUTS2 and LAU2

(b) Certified products (see Figure 70 below)

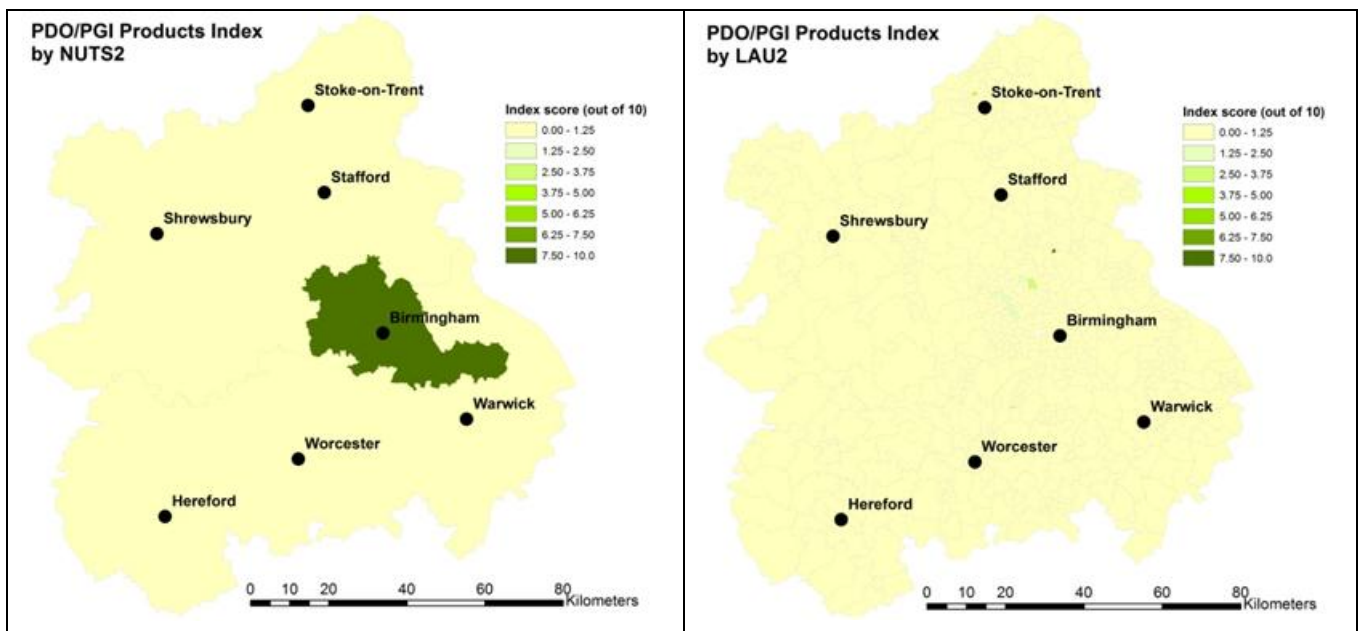


Figure 70: Certified products sub-indicator for WM region based at NUTS2 and LAU2

(c) Farm tourism activity

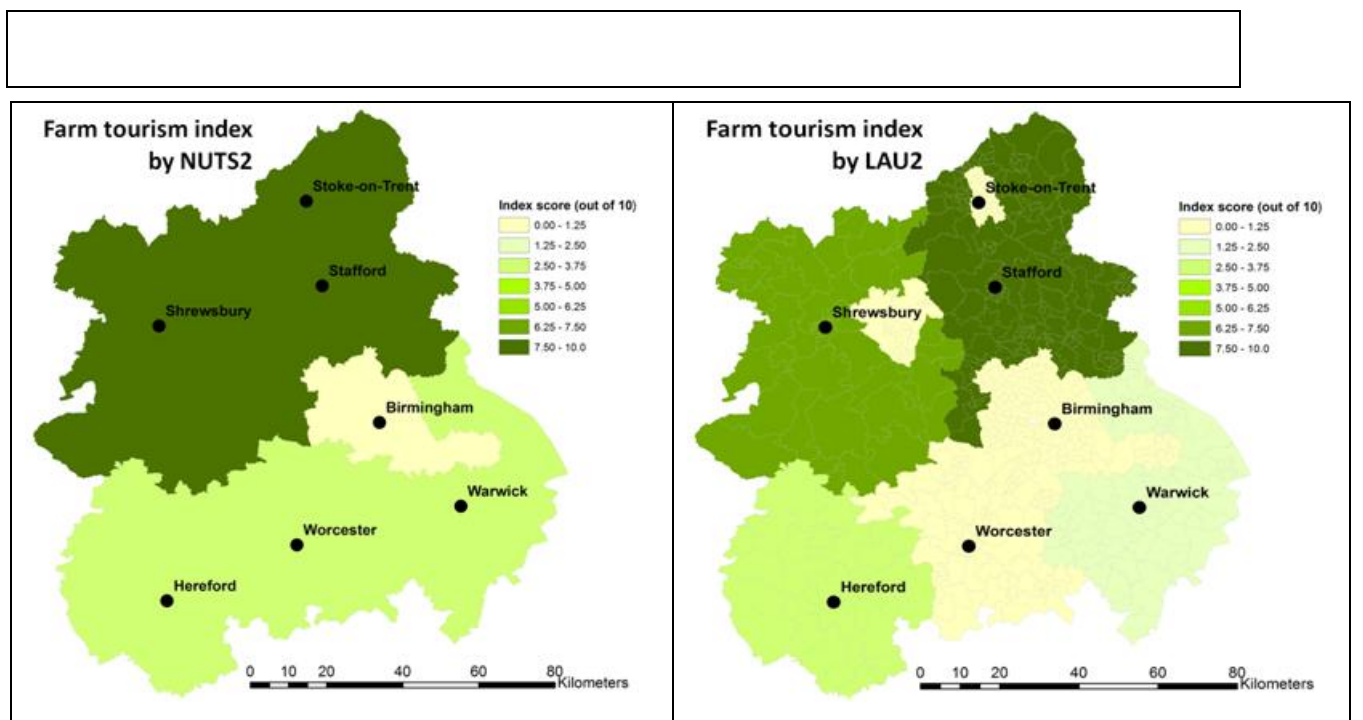


Figure 71: Farm tourism sub-indicator for WM region based at NUTS2 and LAU2

The sub-indices

(vii) Looking at the maps provided above, how would you rank the statements below about the three sub-indices, as mapped, where 5 = completely agree and 0 =completely disagree:

	Protected areas	Certified products	Farm tourism activity
This measure is relevant to my region			
The data for this measure is reliable in my region			
This measure captures all relevant cases in my region			
This measure is meaningful in terms of societal appreciation in my region			

(viii) At which level of mapping are each of the sub-indices most meaningful and representative?

	Protected areas	Certified products	Farm tourism activity
NUTS2 (Counties/groups of Counties)			
NUTS3 (Counties/ groups of Unitary Authorities)			
LAU1 (Districts/Unitary Authorities)			
LAU2 (Electoral Wards)			

(ix) At which level of mapping are the data for each of the sub-indices reliable? (please tick all that apply)

	Protected areas	Certified products	Farm tourism activity
NUTS2 (Counties/groups of Counties)			
NUTS3 (Counties/ groups of Unitary Authorities)			
LAU1 (Districts/Unitary Authorities)			
LAU2 (Electoral Wards)			

(x) What are the limitations of each of the three current sub-indices?

(a) Protected areas

(b) Certified products

(c) Farm tourism activity

The whole composite indicator

Alternative sub-indices

(xi) Looking at the list of complementary indicators we have identified for your region (see table below), have we missed anything? Can you think of other alternatives?

West Midland GOR (UK)	
Quality Products	Farm shops / farmers markets (various local/regional datasets)
Rural Tourism	Ordnance Survey 'Strategy' dataset for: location of tourist facilities (e.g. campsites, picnic areas etc); Location of national trails / long-distance paths. STEAM (Scarborough Tourism Economic Activity Monitor) an economic model owned and operated by Global Tourism Solutions (GTS), which aims to quantify the local impact of the visitor economy.
Protected areas	National designated areas or landscape protection (Areas of Outstanding Natural Beauty, National Parks, Heritage Coasts); Local designated areas for landscape (Special Landscape Areas; Areas of Great Landscape Value, etc); National designated areas for biodiversity/geodiversity (SSSIs, National Nature Reserves); Local designated biodiversity areas (County Wildlife Sites/Sites of Important for Nature Conservation, Local Nature Reserves, etc.)
Other	Scheduled Ancient Monuments; Listed Buildings (Grade I and II).

(xii) Which of the alternative sub-indicators do you think should be included with existing sub-indicators?

Your suggestions:	
Quality Products	
Rural Tourism	
Protected areas	
Other	

Appendix 3 Critical evaluation tables for each case study area

West Midlands, UK.

	Technical and methodological evaluation criteria																			
Variable	Is the variable replicated over all EU regions?	Is the variable available to Eurostat?	Does the current variable have a long shelf life?	Modernity – is the variable up-to-date?	Is the variable based on a Census?	Is the variable publicly available?	Is the variable available at a spatial resolution of NUTS2 or better?	Is the variable's construction methodology likely to change over time?	Is the variable's construction methodology consistent over regions?	Aggregate technological criteria score	Is the variable consistent with objectives of the overall indicator?	Does the variable disadvantage some regions for non-landscape-related reasons (Equity)?	Descriptive power – is the variable tightly focussed (i.e. not trying to capture too many issues)?	Is the variable easy to understand (Apparency)?	Is it easy to see what the variable is measuring (Transparency)?	Do any (useable) alternative variables better reflect the dimension of interest?	Is the variable subject to interactions that cause unforeseen effects?	Is the variable consistent with other official indicators?	Aggregate qualitative criteria score	Aggregate evaluation score
Protected Areas																				
UAA in protected area per UAA area	5	5	5	5	0	5	5	5	5	130	5	0	5	5	5	0	0	5	60	190
UAA in locally designated protected landscapes	3	0	5	5	0	5	5	5	0	95	5	0	5	5	5	0	5	5	65	160
Listed farm buildings per UAA	1	0	5	5	0	5	5	5	0	85	5	0	5	5	5	5	5	5	90	175
Farm Tourism																				
Number of farms with tourism per UAA	5	5	5	5	5	0	5	5	5	130	5	0	5	5	5	5	5	5	90	220

Percentage of farms with tourism	5	5	5	5	5	0	5	5	5	130	5	0	5	5	5	5	5	5	90	220
Number of campsites per UAA	3	0	3	5	0	5	5	5	0	89	5	3	5	5	5	5	5	5	99	188
Number of picnic areas per UAA	3	0	3	5	0	5	5	5	0	89	5	3	5	5	5	0	5	5	74	163
Length of national trails per UAA	3	0	5	5	0	5	5	5	5	105	5	0	5	5	5	5	5	5	90	195
Quality Products																				
Number of PDO/PGI products per UAA	3	0	5	5	0	5	5	5	5	105	5	5	5	0	0	0	0	0	50	165
UAA designated for PDO/PGI per total UAA	3	0	5	5	0	5	5	5	5	105	5	5	5	5	5	5	5	5	105	210
Weights (evaluation criteria) (scale 1-5)	5	3	3	3	3	3	5	2	2		5	3	2	2	2	5	1	1		

Alentejo, Portugal

Variable	Technical and methodological evaluation criteria									Qualitative evaluation criteria										
	Is the variable replicated over all EU regions?	Is the variable available to Eurostat?	Does the current variable have a long shelf life?	Modernity – is the variable up-to-date?	Is the variable based on a Census?	Is the variable publicly available?	Is the variable available at a spatial resolution of NUTS2 or better?	Is the variable's construction methodology likely to change over time?	Is the variable's construction methodology consistent over regions?	Aggregate technological criteria score	Is the variable consistent with objectives of the overall indicator?	Does the variable disadvantage some regions for non-landscape-related reasons (Equity)?	Descriptive power – is the variable tightly focussed (i.e. not trying to capture too many issues)?	Is the variable easy to understand (Apparency)?	Is it easy to see what the variable is measuring (Transparency)?	Do any (useable) alternative variables better reflect the dimension of interest?	Is the variable subject to interactions that cause unforeseen effects?	Is the variable consistent with other official indicators?	Aggregate qualitative criteria score	Aggregate evaluation score
Agriculture in Protected Areas ¹	5	5	5	5	0	0	5	5	5	115	5	0	5	5	5	0	0	5	60	175
Farm Tourism ¹	5	0	5	5	0	0	5	0	5	90	5	3	5	5	5	0	0	5	69	159
Label / Wine ¹	5	0	5	5	0	5	5	5	5	115	5	0	5	5	5	0	0	5	60	175
Number of certified Products by provider Land cover classes	5	0	3	5	0	0	5	5	5	94	5	0	5	5	0	0	0	5	50	144
Trails (Km)	3	0	0	5	0	0	5	5	5	55	5	5	5	5	5	0	0	5	75	125
Tourist Hunting Zones	3	0	5	5	0	5	5	5	5	105	5	3	5	5	5	0	0	5	69	174
Complex Patterns	5	0	5	5	0	5	5	5	5	115	5	0	5	5	5	0	0	5	60	175
Weights (evaluation criteria) (scale 1-5)	5	3	3	3	3	3	5	2	2		5	3	2	2	2	5	1	1		

Adapted classification

Groene Woud, Netherlands

	Technical and methodological evaluation criteria																			
Variable	Is the variable replicated over all EU regions?	Is the variable available to Eurostat?	Does the current variable have a long shelf life?	Modernity – is the variable up-to-date?	Is the variable based on a Census?	Is the variable publicly available?	Is the variable available at a spatial resolution of NUTS2 or better?	Is the variable's construction methodology likely to change over time?	Is the variable's construction methodology consistent over regions?	Aggregate technological criteria score	Is the variable consistent with objectives of the overall indicator?	Does the variable disadvantage some regions for non-landscape-related reasons (Equity)?	Descriptive power – is the variable tightly focussed (i.e. not trying to capture too many issues)?	Is the variable easy to understand (Apparency)?	Is it easy to see what the variable is measuring (Transparency)?	Do any (useable) alternative variables better reflect the dimension of interest?	Is the variable subject to interactions that cause unforeseen effects?	Is the variable consistent with other official indicators?	Aggregate qualitative criteria score	Aggregate evaluation score
WP1: Agriculture in Protected Areas	5	5	5	5	0	5	5	5	5	130	0	5	0	0	5	0	0	5	30	160
WP1: Certified food at farm level	1	0	3	0	5	5	5	0	0	69	0	5	0	0	0	0	5	0	20	89
WP1: Tourist activities at farm level	3	5	3	0	5	0	5	0	0	64	5	5	5	5	5	0	5	5	80	144
WP2: % agri-lu /total-lu in protected areas	5	5	0	5	0	5	5	5	5	115	0	5	0	0	5	0	0	5	30	160
Weights (scale 1-5)	5	3	3	3	3	3	5	2	2		5	3	2	2	2	5	1	1		

Tuscany, Italy

	Technical and methodological evaluation criteria																				
Variable	Is the variable replicated over all EU regions?	Is the variable available to Eurostat?	Does the current variable have a long shelf life?	Modernity – is the variable up-to-date?	Is the variable based on a Census?	Is the variable publicly available?	Is the variable available at a spatial resolution of NUTS2 or better?	Is the variable's construction methodology likely to change over time?	Is the variable's construction methodology consistent over regions?	Aggregate technological criteria score	Is the variable consistent with objectives of the overall indicator?	Does the variable disadvantage some regions for non-landscape-related reasons (Equity)?	Descriptive power – is the variable tightly focussed (i.e. not trying to capture too many issues)?	Is the variable easy to understand (Apparency)?	Is it easy to see what the variable is measuring (Transparency)?	Do any (useable) alternative variables better reflect the dimension of interest?	Is the variable subject to interactions that cause unforeseen effects?	Is the variable consistent with other official indicators?	Aggregate qualitative criteria score	Aggregate evaluation score	
Quality Products																					
Number of PDOs and PGIs products referred to total UAA at LAU2 level	5	5	5	5	5	5	5	5	5	145	5	3	5	5	5	0	0	5	80	225	
UAA for PDO wines referred to total UAA at LAU2 level	5	5	5	5	5	5	5	5	5	145	5	3	5	5	5	0	0	5	59	204	
UAA of PDOs and PGIs referred to total UAA at LAU2 level	1(?)	0	5	5	5	5	5	5	5	110	5	3	5	5	5	5	0	5	94	204	
Number of Stewardship Farmers of local products at LAU2 level	3	0	3	5	5	5	5	5	5	114	5	5	5	5	5	0	0	5	75	189	
Use of local biological products (i.e. short	0(?)	0	0	0	0	0	0	5(?)	5	10	0	5	0	5	0	0	0	0	25	35	

commercial chains) in refectories such as in schools, places of work, etc.																					
Relationships between short commercial chains of local biological products and big distribution channels (% of sold products)	0(?)	0	0	0	0	0	0	5(?)	5	10	0	5	0	5	0	0	0	0	25	35	
Rural Tourism																					
Number of agri-tourism farms referred to UAA at LAU2 level	5	5	5	5	5	5	5	5	5	145	5	0	5	5	5	5	0	5	85	230	
Number of agri-tourism farms per LAU2 level (i.e. not referred to total UAA)	5	5	5	5	5	5	5	5	5	145	5	5	5	5	5	5	5	5	105	250	
Number of Multiple Countryside Itineraries	5	0	5	5	5	5	5	5	5	130	5	5	5	5	5	0	5	5	80	210	
Number of festivals of local cultural traditions per LAU2	5	0	5	5	5	5	5	5	5	130	5	5	5	5	5	0	5	5	80	210	
Number of markets/exhibitions of traditional products per LAU2	5	0	3	5	5	5	5	5	5	109	5	5	5	5	5	0	0	5	75	184	
Protected areas																					
UAA within protected areas referred to Ha of protected areas at LAU2 level	5	5	5	5	5	5	5	5	5	145	5	0	5	5	5	0	0	5	60	205	
Number (or extension) of Protected landscapes in rural areas (e.g. rural landscape cultural heritage) at LAU2 level (if	5	0	5	5	5	5	5	5	5	130	5	5	5	5	5	5	5	5	105	235	

extension then referred to total UAA)																					
Density of cultural/heritage elements and areas of archaeological interest referred to total UAA at LAU2 level	5	0	5	5	5	5	5	5	5	130	5	5	5	5	5	5	5	5	115	245	
Number of agri-environmental measures and cross compliance BCAA (es: retain terraces) related to landscape at LAU2 level	5	0	3	5	5	5	5	5	5	130	5	5	5	5	5	0	0	5	75	195	
Number of agri-environmental measures and cross compliance BCAA (es: retain terraces) related to wildlife at LAU2 level	5	0	3	5	5	5	5	5	5	124	5	3	5	5	5	0	0	5	73	197	
UAA of "Istituti faunistici di ripopolamento a divieto di caccia" (fauna reproductive areas) which generally are in agricultural areas	3(?)	0	3	5	5	5	5	5	5	114	5	3	5	5	0	0	0	5	59	173	
Weights (evaluation criteria) (scale 1-5)	5	3	3	3	3	3	5	2	2		5	3	2	2	2	5	1	1			

Appendix 4 The scoring of variables for each evaluation criteria

Evaluation criteria	Scoring scheme
Methodological criteria	
Is the variable present in all EU regions?	Score as: 5 if present in all EU states, 3 if present in a majority, 1 if present in a minority, and zero if present in none.
Is the variable available to Eurostat?	Score as 5 if yes; zero if no.
Does the current variable have a long shelf life?	Score as 5 if long; 3 if medium; zero if short.
Modernity – is the variable up-to-date?	Score as 5 if yes; zero if no.
Is the variable based on a Census?	Score as 5 if yes; zero if no;
Is the variable publicly available?	Score as 5 if yes; zero if no;
Is the variable available at a spatial resolution of NUTS2 or better?	Score as 5 if yes; zero if no;
Is the variable's construction methodology likely to change over time?	Score as 0 if yes; 5 if no;
Is the variable's construction methodology consistent over regions?	Score as 5 if yes; zero if no;
Qualitative criteria	
Is the variable consistent with objectives of the overall indicator?	Score as 5 if yes; zero if no;
Does the variable disadvantage some regions for non-landscape-related reasons (Equity)?	Score as 0 if no; 3 if to limited extent; 5 of yes.
Descriptive power – is the variable tightly focussed (i.e. not trying to capture too many issues)?	Score as 5 if yes; zero if no;
Is the variable easy to understand (Apparency)?	Score as 5 if yes; zero if no;
Is it easy to see what the variable is measuring (Transparency)?	Score as 5 if yes; zero if no;
Do any (useable) alternative variables better reflect the dimension of interest?	Score as 0 if yes; 5 if no;
Is the variable subject to interactions that cause unforeseen effects?	Score as 0 if yes; 5 if no;
Is the variable consistent with other official indicators?	Score as 5 if yes; zero if no;

Appendix 5 The final indicator of societal awareness of the rural-agrarian landscape

The component of societal awareness of the rural-agrarian landscape has been modified in the final landscape state and diversity indicator according to the findings presented in this study. These concern the use of FADN data on revenues from tourism activities, and the equal weighting of the food and wine components in the certified products index. The final indicator is presented in Figure 72, and described in detail in Paracchini and Capitani, 2011.

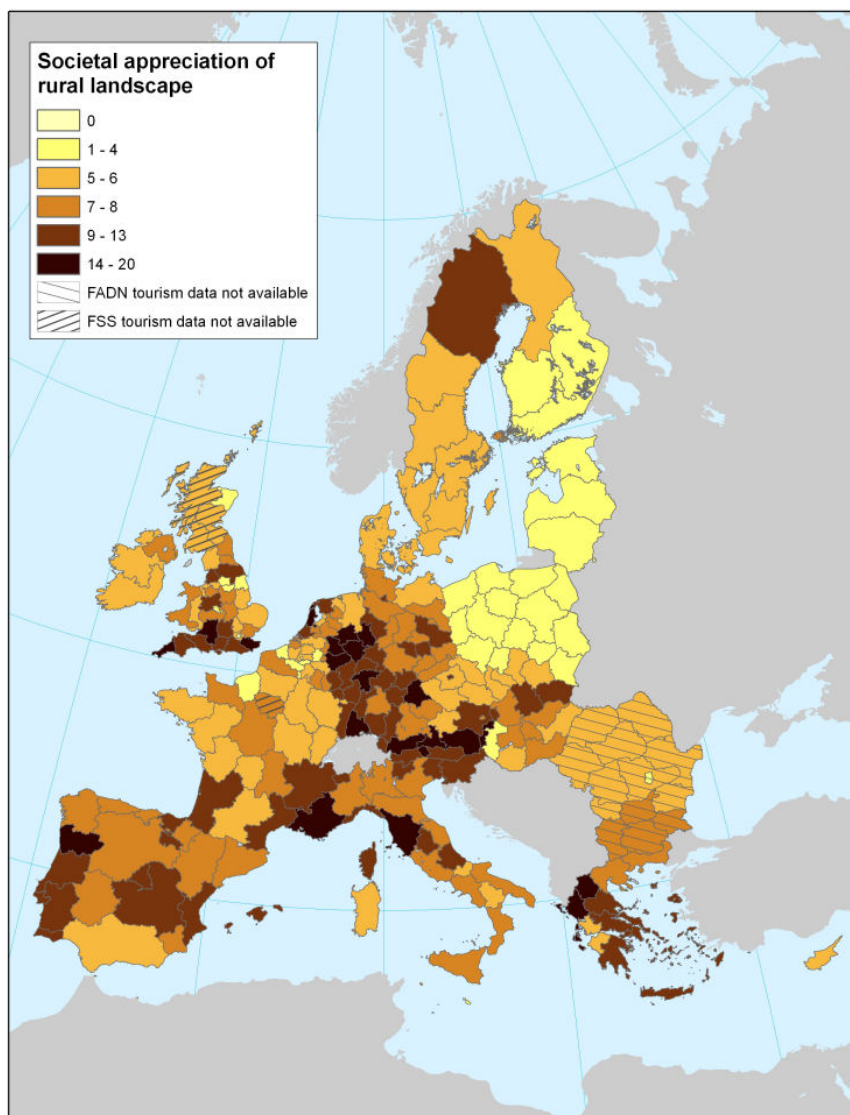


Figure 72: The final indicator of societal awareness of the rural-agrarian landscape according to Paracchini and Capitani, 2011

European Commission

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Abstract

The work presented in this report is part of the effort to define the landscape state and diversity indicator in the frame of COM (2006) 508 "Development of agri-environmental indicators for monitoring the integration of environmental concerns into the common agricultural policy". The Communication classifies the indicators according to their level of development, which, for the landscape indicator is "in need of substantial improvements in order to become fully operational". For this reason a full re-definition of the indicator has been carried out, following the initial proposal presented in the frame of the IRENA operation ("Indicator Reporting on the Integration of Environmental Concerns into Agricultural Policy"). The new proposal for the landscape state and diversity indicator is structured in three components: the first concerns the degree of naturalness, the second landscape structure, the third the societal appreciation of the rural landscape. While the first two components rely on a strong bulk of existing literature, the development of the methodology has made evident the need for further analysis of the third component, which is based on a newly proposed top-down approach. This report presents an in-depth analysis of such component of the indicator, and the effort to include a social dimension in large scale landscape assessment.

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