Article

Understanding the Role of Nature in Urban-Rural Linkages: Identifying the Potential Role of Rural Nature-Based Attractive Clusters That Serve Human Well-Being

Mario Cozzi [1,*], Carmelina Prete [1], Mauro Viccaro [1], Frans Sijtsma [2], Paolo Veneri [3] and Severino Romano [1]

[1] School of Agricultural, Forestry, Food and Environmental Sciences, University of Basilicata, Viale dell' Ateneo Lucano n. 10, 85100 Potenza, Italy
[2] Department of Economic Geography, Faculty of Spatial Sciences, Landleven 1, 9747 AD Groningen, The Netherlands
[3] Department of Social Sciences, Gran Sasso Science Institute, Via Crispi 7, 67100 L'Aquila, Italy
* Correspondence: mario.cozzi@unibas.it

Abstract: Rural areas provide unique amenities for recreational purposes which are highly appreciated by urban inhabitants. This generates an important but often hidden relationship between the urban and the rural. The aim of our study is first to provide empirical evidence for this linkage and then to identify for Italy, at the municipal level, those rural areas which actually function as nature-based attractive clusters. We used the data coming from a participatory webGIS survey that asked 1632 Italian respondents to mark attractive nature related places locally, regionally, nationally and world-wide to explain quantitatively and qualitatively the relationship between urban and rural. From the survey, indicators were developed to rank the nature-based attractive clusters. Our results pointed out a major (almost double) flow from urban to rural for natural amenities, which increased with the spatial level at which attractive nature areas were marked. This analysis allowed for the identification rural clusters of Italian municipalities that form nodal points for nature-based urban well-being; shedding light on an often neglected urban-rural relationship. The method is applicable in other countries and may stimulate better planning and management strategies for improving rural areas, taking an urban-rural perspective.

Keywords: urban-rural linkage; nature; cultural ecosystem services; wellbeing; participatory GIS; attractive clusters

1. Introduction

Urban and rural areas are interconnected places [1–3]. With the increase in complexity of the macro-economic context in which rural areas are located, rural territory, from an almost exclusively agricultural space, has become a place of interaction of an increasingly diversified economic and social fabric.

Several authors have identified the challenges stemming from the spatio-temporal variability of the rurality concept itself [3–5]. Woods [3] writes:

'The theoretical innovation of conceptualizing the rural as a hybrid or networked space has been accompanied by renewed interest in the empirical investigation of the spatial settings in which rural and urban identities are most entangled (. . .)'.

According to a report of the OECD [6], a large set of links connect urban to rural areas. In order to rationalize urban-rural connections, five main categories have been identified, which help to identify the different factors of interaction: demographic linkages, economic transactions and innovation activity, delivery of public services, exchange in amenities and environmental goods and multi-level governance interactions.

In particular, the greatest empirical attention is given to assessing the flows from rural to urban, mainly in the workplace, shopping and commerce, education and training [6–8].

The urban dominance in understanding the urban-rural is also reflected in different classifications in the field of territorial development policies. Both on the international level [7] and the national level within National Inner Areas Strategy [9], these classifications are based on the identification of urban centres where people, jobs and services are concentrated. They act as gravity bases for the surrounding territories classified on the basis of socio-demographic profile or degree of remoteness. More specifically, Functional Urban Areas (FUAs), identified by the OECD and the European Commission, are of relevance because of their international comparability and increased popularity [7,10]. From a simple urban-rural dichotomy perspective, FUAs encompass the space covered by 'rural' -to-'urban' relationships, identified through the commuting flows to the urban centre.

Rural areas also provide amenities for recreational purposes and symbolic values (often public goods) different from urban ones, which both urban and rural dwellers demand; they can be highly valued as factors to increase wellbeing also via the potential for tourism [6].

Different studies have shown the positive relationship between natural areas and human well-being [11–14], highlighting the repair effect of natural landscape with respect to urban environment [15] and emphasizing preferences of people for natural landscapes as recovery for mental fatigue [16,17]. In this context, rural areas have been linked to various aspects of well-being [18]: wild experiences can be physically active [19,20], be a vacation, a challenge [21], or they can be lived as collective experience, which provides social bonds and support [22], feelings of protection [17], experiences of equality and community [23].

In this context, knowledge focuses on the density of attractive resources, rather than the real dimension of the services offered by rural areas. In fact, it often results in a distance between potential and strategic actions moved by economic agents. Therefore, the aim of our study is (1) to empirically provide evidence for urban-rural linkage concerning nature-based wellbeing and (2) to identify, at the spatial level, rural areas which actually function as nature-based attractive clusters. It could represent an important tool to improve understanding the role of these areas.

To achieve the objectives described, the proposed work is divided into a methodological section, which defines the data collection of the greenmapper survey, and the approach used to determine the nature-based attractive clusters within the study area. Finally, the results obtained are reported and discussed.

2. Materials and Method

2.1. Study Area

The empirical analysis focuses on Italy. The highly anthropized Italian soil has various characteristics from volcanic, to endolagunar and calcareous (Figure 1a), while the hilly areas are predominant compared to the mountainous and flat areas (Figure 1b). The average altitude of the territory is around 337 m a.s.l. There are 871 protected natural areas in Italy for a total of about 31,000 km^2 of land area (equal to 10.5% of the Italian surface) and about 28,000 km^2 of sea surface according to the data of MEPTS (Ministry of the Environment and the Protection of the Territory and Sea (MEPTS), https://www.minambiente.it/sites/default/files/archivio/normativa/dm_27_04_2010.pdf accessed on 15 July 2022). Italy is the country that holds the record for the largest number of UNESCO' s natural and cultural heritage in the world, with 55 assets on the list in 2019. With a surface area of 301.338 km^2 and population density of 200 inhabitants per km^2, Italy is divided into five so called 'groups of regions' (NUTS I) and twenty administrative regions (NUTS II) (Figure 1c). Within the NUTS II regions, Eurostat since 2011 classifies municipalities (LAU, Local Administrative Units) according to three degrees of urbanization (high, medium and low) using the DEGree of URBAnisation (DEGURBA), a new tool based on population density and the number of inhabitants assessed within regular grids with cells of one square kilometre. In 2021, in Italy it appears that 64% of the municipalities fall into the low urbanization class, mainly rural area, where 17.1% of the population is located on 60.8% of the area. Highly urbanized municipalities, which represent only 3.2% of the national total

number of municipalities and only 6.2% of the territorial area, hold 35.3% of the Italian population. In the remaining 33% of the medium-sized municipalities of urbanization, on a territorial extension of 32.99%, 47.7% of the total population is concentrated (Figure 1d).
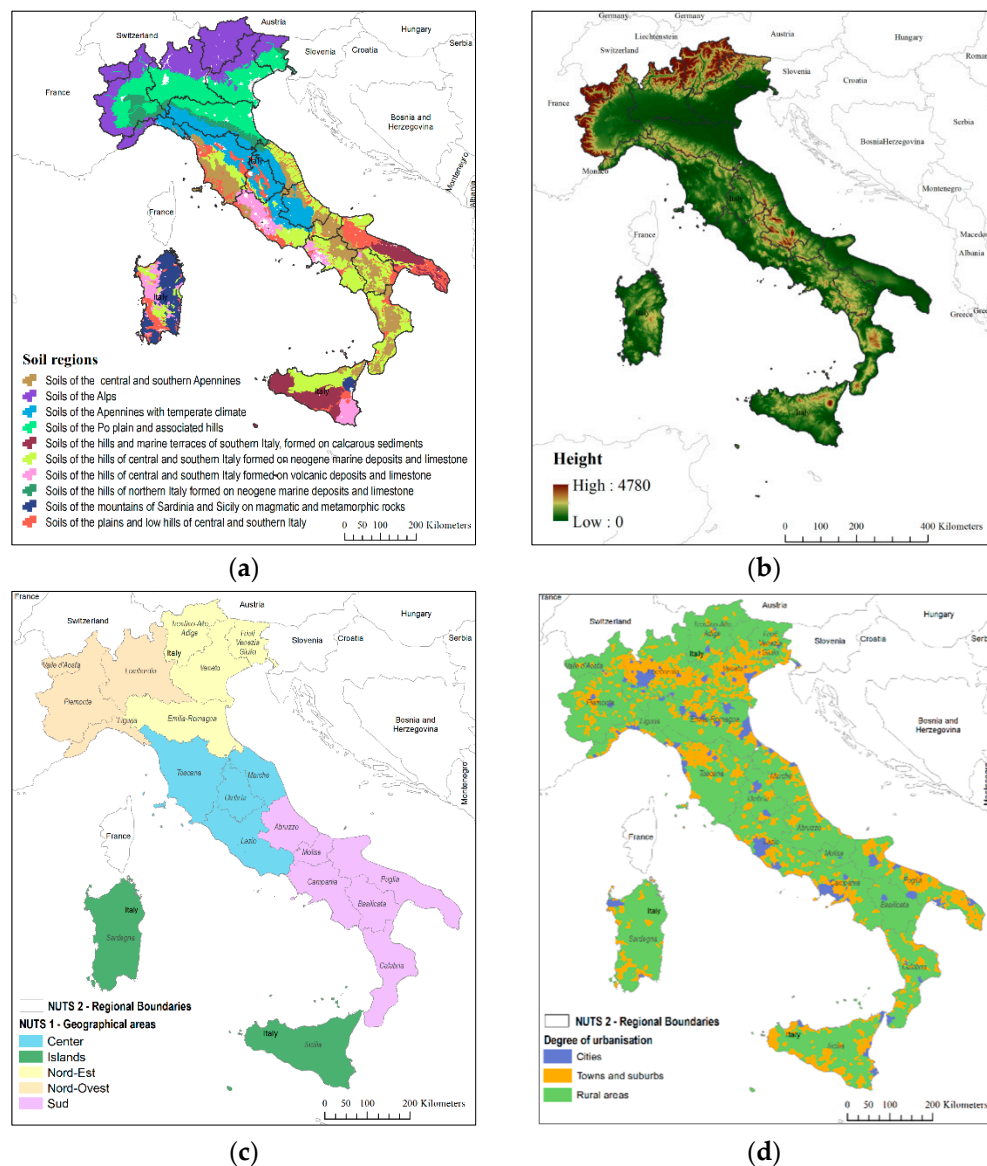

Figure 1. (**a**) Study area with soil regions, (**b**) height, (**c**) regional boundaries (NUTS II), and (**d**) degree of urbanisation.

2.2. Data Collection: Greenmapper Survey

To identify areas with nature attractiveness we turned to the field of (online) place value mapping or soft GIS [24–26]. The "attractive" capacity of nature was evaluated using the survey conducted through greenmapper platform (www.greenmapper.org accessed on 5 March 2022), a participatory webGIS survey [27]. This is an innovative, value mapping, soft GIS approach that overcomes the use of GIS indicators for the endowment of natural areas (measured especially in terms of surface), since it is based on subjective judgments of the nature attractiveness. Thus, it allowed us to obtain both quantitative and qualitative information on the appreciation of highly valued natural amenities and to derive empirical evidence of urban-rural interconnection. Then, the collected data were parametrized for ranking and clustering of rural municipalities to identify the nature-based attractive clusters.

In particular, in our study we emphasize the utility of greenmapper for spatial planning and development programmes. The greenmapper tool has already been applied in other countries, including the Netherlands, Germany, Denmark, Switzerland, South Korea, Brazil. Among the different uses of the tool, it has supported the systematic assessment of non-monetary values in landscape impact evaluations, the assessment of property pricing effects of attractive nature [28], measures of well-being [29], and ecosystem services assessment [30]. The mapping of values is a spatially explicit multi-scale procedure, in which respondents mark the natural places (using a XY-point location marker) they find most attractive on a digital map. In particular, the starting point is the address where people live, marked by a red flag. respondents who fill in the online questionnaire are free to mark their favourite natural places, marking the point on the map.

Four spatial levels are identified on which to mark an attractive, valuable or important nature-related place:

- level I—"Neighbourhood": a circle with a radius of 2 km from home;
- level II—"Living area": a circle with a radius of 20 km from home;
- level III—"Country": the whole nation;
- level IV—"Worldwide": the world.

For all these four places, the same set of questions is asked. Respondents assign a score from 1 to 10 to the quality of the place, they indicate the visiting frequency (daily, weekly, monthly, few times per year, yearly, rarely, or never) and the favourite activities to be selected among 39 activities (indicated by icons), grouped into 9 categories (See Table A1). Respondents can mark 4 attractive nature places (one mark for level): Neighbourhood, Living Area, Country, Worldwide.

Finally, respondents answer an open question why they find the marked place attractive. The advantage is to obtain information that is not known a priori, giving the interviewee the possibility to respond in detail, adding unique information and clarifications. These aspects are significant in place-based (the place-based approach advances the involvement of local communities, using their knowledge, collaborating with all local actors and promoting inter-institutional cooperation) decisions, so it is crucial to try to grasp them.

The dataset collected among the members of an online panel (Demetra opinions— www.opinioni.net January 2018, accessed on 21 January 2018) includes 1632 respondents (Figure 2). The sample was aimed to be representative, considering demographic profile (age, gender and geographical area) of the Italian population, (see Tables A2 and A3). The data of an online survey are related to the 'Internet population' only, and thus exclude people who do not use the internet. In 2021, 90% of Italian households had access to internet (https://www.statista.com/statistics/377722/household-internet-access-in-italy/, accessed on 12 July 2022).

2.3. Nature-Based Attractive Clusters

Our analysis focuses on the nature-based attractive capacity of rural areas to generate well-being for urban and rural dwellers. For this purpose, we believe that the most appropriate unit of analysis is the municipal level. Besides we have developed five indicators to quantify the attractive capacity:

- the number of markers that fall in each municipality;
- the visit frequency of the marked places, since it allows us to discriminate the direct and indirect value linked to the preferences and if and how much the visit frequency and the preference rate are related. The visit frequency is divided into 7 classes; each class has been assigned a progressive number value: daily = "1", weekly = "2", monthly = "3", few times a year = "4", year = "5", rarely = "6", never = "7";
- the preference rate gives a measure of the satisfaction degree of places; it is expressed on a scale from 1 to 10 (1 as extremely unattractive and 10 as perfect);
- the diversification of activities ranges between 1 and 39. It indirectly gives a measure of the offer of attraction in the different territories;

- the diversification of cultural services gives a measure of Cultural Ecosystem Services (CES) categories linked to the most attractive natural areas. We have coded the expressions of the open section on the basis of the categories proposed by the international classification systems (they include the Millennium Ecosystem Assessment, the Economics of Ecosystems and Biodiversity and the Common International Classification of Ecosystem Services). Table 1 shows the 9 ecosystem services components marked by an acronym, a description and an example of a typical answer for that category.
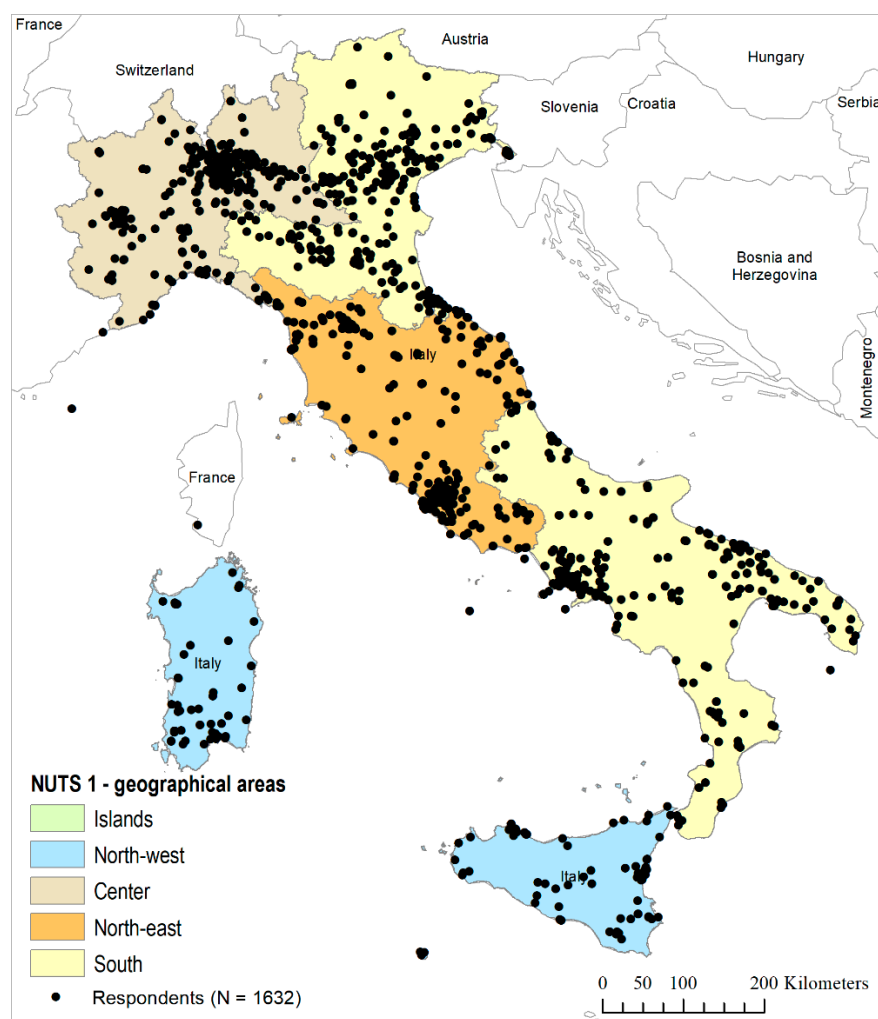

Figure 2. Respondents' locations by geographical area (NUTS 1). The collected data were analysed, both in quantitative and qualitative terms, to highlight the relationship between urban and rural areas, or rather areas with different degrees of urbanization (see Section 2.1), as regards nature-based well-being.

The identified indicators were normalized with respect to the variation field (min-max) and aggregated to obtain a single measure ranging from 0 to 1. On the basis of the value assumed by each municipality, we obtained a ranking of municipalities, where 0 means an inability for nature-based attractiveness and 1 the maximum capability.

Finally, the presence of local spatial association was tested within the analysed data, for clustering geographically the hotspots, by applying the Getis-Ord Gi* statistic [31]. The Getis-Ord Gi* statistic is a tool of local spatial autocorrelation analysis, used in several contexts, such as cluster regions in the transportation equipment industry [32], forest fire management [33] active school travel (i.e., walking) clusters [34], industrial clusters [35], road accidents analysis [36,37].

The expression characterizing the Getis-Ord Gi* is as follows:

$$G_i^* = \frac{\sum_{j=1}^{n} w_{i,j}\, x_j - \overline{X} \sum_{j=1}^{n} w_{i,j}}{S \sqrt{\frac{\left[n \sum_{j=1}^{n} w_{i,j}^2 - \left(\sum_{j=1}^{n} w_{i,j}\right)^2 \right]}{n-1}}}$$

where x_j is value attributed to feature j, $w_{i,j}$ is spatial weight between features *i* and *j*, n is equal to the total number of features and: $\overline{X} = \frac{\sum_{j=1}^{n} x_j}{n}$, $S = \sqrt{\frac{\sum_{j=1}^{n} x_j^2}{n} - \left(\overline{X}\right)^2}$.

More specifically, it identifies those nature-based attractive clusters with values higher in magnitude than one might expect to find by random chance; thus, it is possible to calculate the degree of similarity with respect to other nearby observations, counting - at the same time - the statistical significance. A common practice is to group those units with Gi* greater than 1 into clusters [38,39].

Table 1. Categories of Cultural Ecosystem Services (CES).

Services	Acronym	Description	Expressions
1. Mental and spiritual refreshment services	MS	Sites of spirituality, religious or other relax forms	E.g., "Makes me relax", "relax", "free oneself with the mind from the city chaos", "tranquillity", "peace", "serenity".
2. Physical refreshment service	PS	Sites which favour regeneration in pure air, away from noise, making movement	E.g., "Green lung of the city", " … far from the noise", "clean air", "Making movement", "There are the spas important for health".
3. Knowledge and educational value	KE	Sites which favour knowledge of animal and plant species	E.g., "I am pleased to discover different species of animals", "the diversity and abundance of species that make them", "A municipal park that still preserves rare trees such as the cedar of Lebanon".
4. Connection with nature	N	Sites that simply influence an emotional feeling with nature	E.g., "nature", "green", "I like trees and flowers".
5. Aesthetic value	A	Sites of particular beauty	E.g., "Beautiful", "beautiful landscape", "panorama", "breath-taking landscape", "breath-taking panorama".
6. Social relations	SR	Sites of meeting points with friends	E.g., "there are courses for my age", "children can play", "social life", "sociability", "company".
7. Sense of place	SP	Sites which feed a sense of authentic attachment and identity	E.g., "It makes me feel at home", "I grew up".
8. Cultural heritage	CH	Sites relevant to local history and culture	E.g., "a journey in the art", "place of historical interest", "very representative of the area".
9. Recreation and ecotourism	RE	Sites used for recreational activities (walks, walks with dogs, horseback riding, swimming, gathering wild food, sport fishing, hunting, etc.)	E.g., "equipped to play sports", "It is an ideal place to do outdoor activities, such as cycling, running or walking, being in contact with nature while remaining close to the town"

Source: https://ageconsearch.umn.edu/record/300919?ln=en accessed on 1 September 2022.

3. Results

3.1. Quantitative and Qualitative Analysis

In the quantitative analysis, the collected data were analysed to highlight the role of rural areas within the urban-rural context. For the identification of the linkage between urban and rural areas, or rather areas with different degrees of urbanization, as regards the nature-based well-being, we analysed the survey of 1632 respondents. They placed 3715 markers on the national territory, decreasing in the number from level I ("Neighbourhood") to IV ("Worldwide"), since not all users completed the survey.

The results show for the "Neighbourhood" level (places within 2 km from home) the natural amenities, mainly parks and gardens, which fall within one' s own municipality are obviously chosen (>90% of dwellers' markers). For later levels, cities and suburbs dwellers behaved similarly with respect to the choice of the most attractive natural places. More precisely, for the "Living area" level (places within 20 km from home) the flow from cities and suburbs to the outside is major (respectively, 46% and 49% of markers), differently

the flow from rural areas to the outside is less (35% of rural areas dwellers' markers). For "Country" level, the flow outside its municipal boundaries is mainly oriented towards rural areas, with a percentage of 36% both from cities and suburbs dwellers. Furthermore, a substantial percentage of markers (percentage that increases as the level increases) are placed in the sea, which indicates the strong influence of this biophysical factor on the choice of favourite natural places, as shown also in other studies [15,27,40] (see Table A4). Figure 3 shows schematically the total linkages between urban (cities and towns and suburbs) and rural. The thickness of the connecting lines shows the strength of the relationship, and the arrows show the direction and the percentage refers to the number of answers given (shown in round brackets). The figure highlights (1) the presence of a flow related to natural amenities in both directions urban and rural, and (2) an asymmetrical flow, with a major flow from urban ("Cities" and "Towns and suburbs") to rural ("Rural areas").
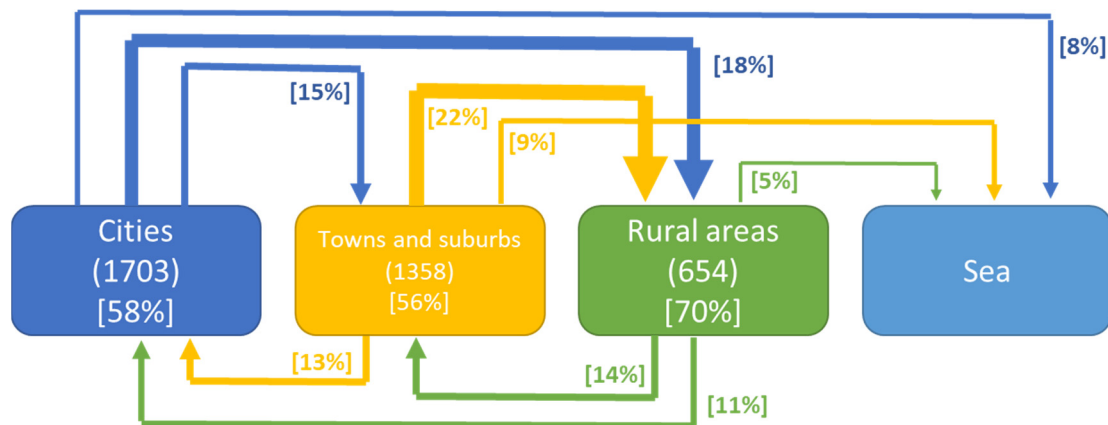

Figure 3. Flows among "Cities", "Towns and suburbs" and "Rural areas".

From a qualitative point of view, everyday recreational behaviours within "Cities" are mainly oriented towards walking or running (24%), relaxing and playing (mainly picnic/BBQ) (21%). Moving from "Cities" to "Rural areas", these activities decrease in favour of various activities related to the wildlife observation, and more generally, to the nature observation (17%), mountain (4%) or winter sports (4%); within the "other sports" category, the photo shooting prevails, although in "Rural areas", preferences for activities such as fishing, hunting and mushroom picking, are more significant (13%, see Figure 4).
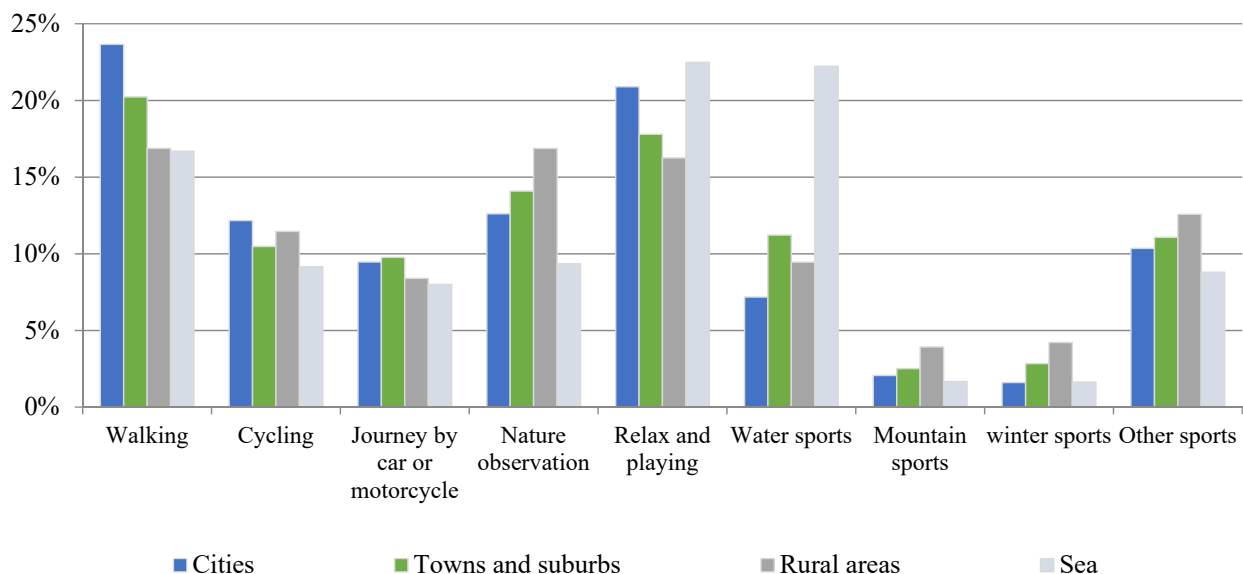

Figure 4. Favourite activities categories within cities, towns and suburbs, rural areas and the sea.

The preference rate for a recreation area outside the city is less tied to a direct use of the resource, which indicates that certain recreation areas had a symbolic option or existence value besides their use value. Indeed, the preference rate is less than 6 on a scale from 1 to 10 for unvisited places within "Cities" and around 6 within "Towns and suburbs"; while the preference rate remains around 8 within "Rural areas" and 9 within "Sea", despite a direct use (see Figure 5). Consequently, it is more appropriate to value the overall qualities of cultural ecosystem services and not only the use-related recreational component.
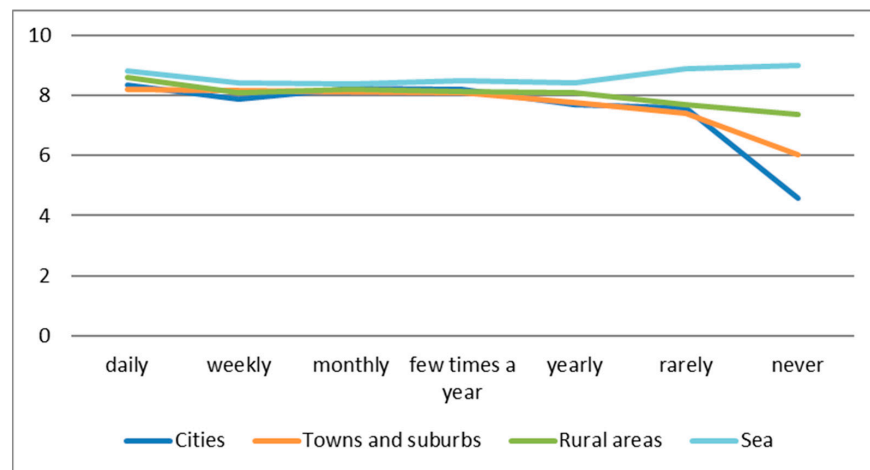

Figure 5. Relationship between visiting frequency and preference rate within cities, towns and suburbs, rural areas and sea.

Figure 6 depicts the CES categories affecting human well-being and the division among urban and rural. We identified the aesthetic value as the most relevant wellness component, which increased from "Cities" (19%) to "Rural areas" (25%) and "Sea" (33%). The connection with nature increased from "Cities" (14%) to "Rural areas" (20%); while the recreation and ecotourism, mainly linked to outdoor activities for weekend family fun, and the mental refreshment services, slightly prevail within "Towns and suburbs" (both 18%), the knowledge and educational value slightly prevail within "Rural areas" (4%). Aspects related to the possibility of regenerating oneself physically enjoying clean air, the possibility of having social relationships and sense of place, slightly prevail within "Cities" (respectively, with 8%, 4% and 7%); enriching one' s cultural linked to the presence of historical and artistic element are more significant within "Cities" (16%).
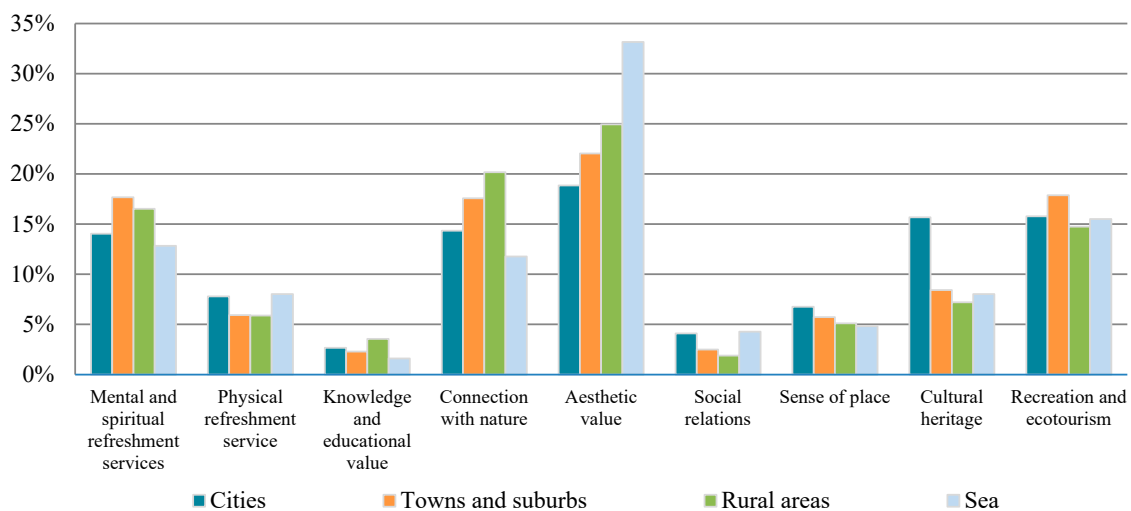
Figure 6. Distribution of CES categories within cities, towns and suburbs, rural areas and sea.

3.2. Nature-Based Attractive Clusters within Rural Areas

3.2.1. Frequency Distribution of Indicators

On average, a frequency of one marker for each municipality was detected, even if some municipalities were found in which a higher number of markers were positioned (maximum 8 markers per each municipality for "Neighbourhood" and "Country" levels) (see Figure 7a).
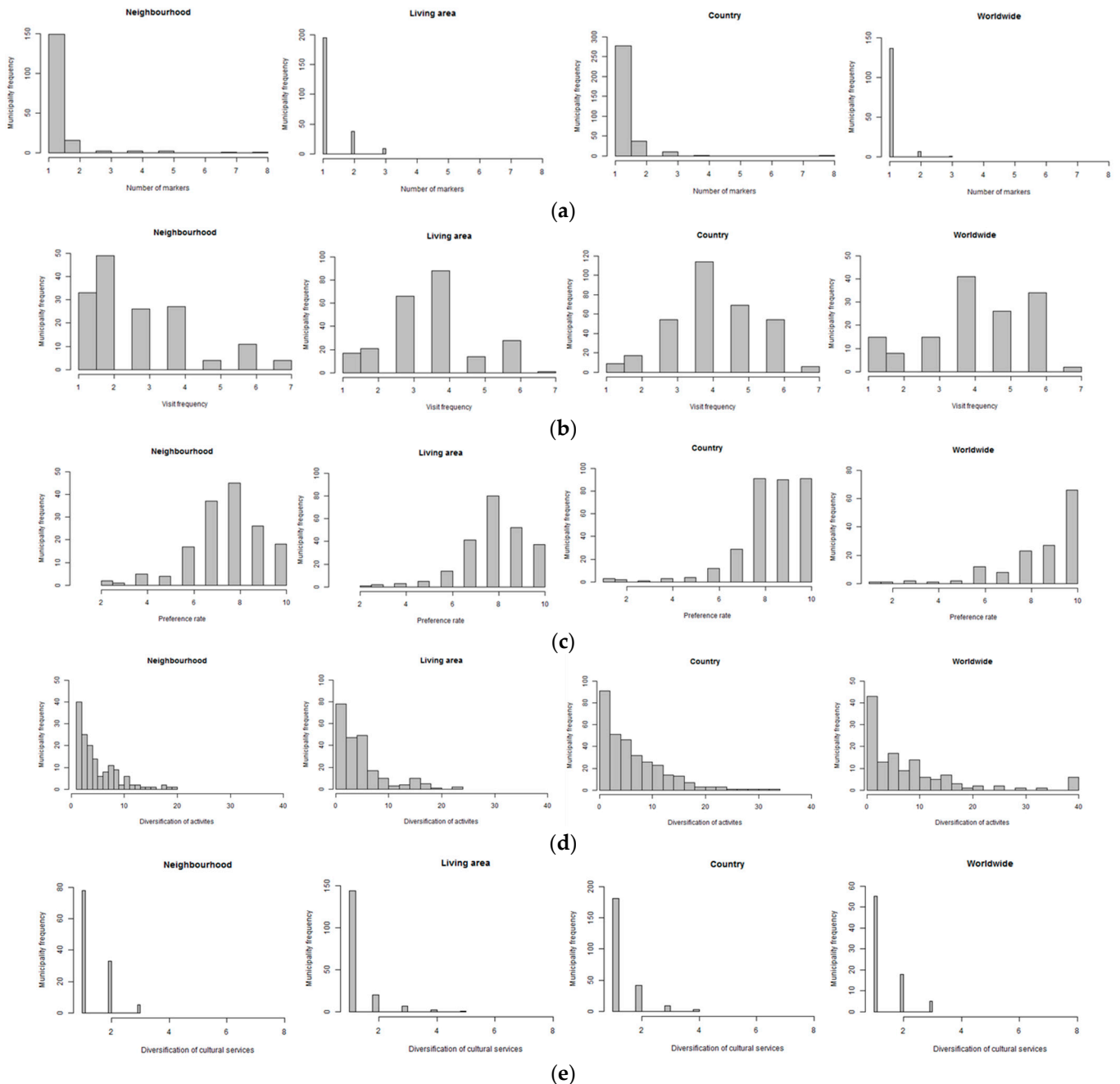
Figure 7. (**a**) Municipality frequency of number of markers from level I to IV within rural areas; (**b**) Municipality frequency of visit frequency from level I to IV within rural areas; (**c**) Municipality frequency of preference rate from level I to IV within rural areas; (**d**) Municipality frequency of diversification of activities from level I to IV within rural areas; (**e**) Municipality frequency of diversification of cultural services from level I to IV within rural areas.

The visit frequency ranges, for "Neighbourhood" level, mainly from daily to few times a year with the prevalence of weekly visit frequency; it tends to decrease for "Living area" level with the prevalence of few times a year frequency, as well as in the last two levels, it spreads especially towards an annual or rare visit frequency (see Figure 7b).

The preference rate tends to have a greater value as the level increases, with an average value of 8 for the first ("Neighbourhood") and second ("Living area") level, between 8 and 10 for the third ("Country") level and a prevalence of 10 for the last ("Worldwide") level (see Figure 7c).

The diversification of activities has a prevalence of one activity for "Neighbourhood" level (maximum 20 activities), at least five activities are mainly carried out for "Living area" (maximum 23 activities) and "Country" (maximum 34 activities) levels; several cases with a maximum number of activities are recorded for the "Worldwide" levels (see Figure 7d).

The diversification of cultural services ranges between 1 and 9, even on average, from the first level to the last spatial level, one or two cultural services prevail for each municipality (see Figure 7e).

3.2.2. Spatial Distribution of Nature-Based Attractive Municipalities and Clusters

The application of the methodology, as reported in Section 2.3, has led to the identification of nature-based attractive municipalities. We found 173 rural municipalities (3.2% of Italian rural municipalities) with an attractive index in a range 0.1–0.7 for the "Neighbourhood" level, 242 rural municipalities (4.5% of Italian rural municipalities) with an attractive index in a range 0.1–0.8 for the "Living area" level, 328 rural municipalities (6.1% of Italian rural municipalities) with an attractive index in a range 0.1–0.66 for the "Country" level, and finally 144 rural municipalities (2.7% of Italian rural municipalities) with an attractive index in a range 0.1–0.8 for the "Worldwide" level (Table 2).

Starting from the attractiveness indices, the presence of clustered municipalities (Gi* greater than 1) for each level was detected (see Table 2). There was a total of 672 municipalities for the "Neighbourhood", 727 municipalities for the "Living area", 688 municipalities for the "Country" level and finally 673 municipalities for the "Worldwide" level generate cluster (respectively, Figure 7a, Figure 7b, Figure 7c, Figure 7d).

Diversified situations are found in the Italian regions (NUTS II) (see Table 2; see Figure 8). In the North of Italy, the attractive municipalities were 5% on average (of the total of northern rural municipalities).

Table 2. Percentage of municipalities which form nature-based attractive clusters within rural areas per regions.

| Italian Regions	N. Rural Municipalities	Nature-Based Attractive Index								Nature-Based Attractive Clusters							
		Neighbourhood (Range 0.1–0.70)		Living Area (Range 0.1–0.78)		Country (Range 0.1–0.66)		Worldwide (Range 0.1–0.80)		Neighbourhood (Gi* >1, p < 0.1)		Living Area (Gi* >1, p < 0.1)		Country (Gi* >1, p < 0.1)		Worldwide (Gi* >1, p < 0.1)	
		N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%	N. Munici-palities	%
Piemonte	957	13	1.4%	23	2.4%	21	2.2%	3	0.3%	62	6.5%	74	7.7%	42	4.4%	19	2.0%
Valle D' Aosta	64	0	0	2	3.1%	12	18.8%	2	3.1%	1	1.6%	8	12.5%	26	40.6%	9	14.1%
Lombardia	666	13	20.3%	20	3.0%	22	3.3%	11	1.7%	70	10.5%	63	9.5%	61	9.2%	53	8.0%
Trentino-Alto Adige	244	5	0.8%	11	4.5%	32	13.1%	8	3.3%	24	9.8%	36	14.8%	81	33.2%	48	19.7%
Veneto	288	15	6.1%	23	8.0%	22	7.6%	3	1.0%	40	13.9%	65	22.6%	40	13.9%	25	8.7%
Friuli Venezia Giulia	153	3	1.0%	6	3.9%	5	3.3%	2	1.3%	14	9.2%	23	15.0%	16	10.5%	8	5.2%
Liguria	151	4	2.6%	7	4.6%	9	6.0%	2	1.3%	16	10.6%	26	17.2%	23	15.2%	7	4.6%
Emilia-Romagna	234	14	9.3%	24	10.3%	15	6.4%	12	5.1%	49	20.9%	52	22.2%	26	11.1%	49	20.9%
Toscana	177	6	2.6%	15	8.5%	24	13.6%	9	5.1%	28	15.8%	40	22.6%	45	25.4%	43	24.3%
Umbria	80	5	2.8%	6	7.5%	12	15.0%	10	12.5%	23	28.8%	25	31.3%	24	30.0%	36	45.0%
Marche	177	8	10.0%	5	2.8%	7	4.0%	5	2.8%	37	20.9%	21	11.9%	20	11.3%	35	19.8%
Lazio	300	19	10.7%	28	9.3%	31	10.3%	18	6.0%	68	22.7%	56	18.7%	60	20.0%	90	30.0%
Abruzzo	273	4	1.3%	6	2.2%	11	4.0%	8	2.9%	12	4.4%	29	10.6%	14	5.1%	43	15.8%
Molise	131	3	1.1%	5	3.8%	5	3.8%	1	0.8%	17	13.0%	18	13.7%	12	9.2%	11	8.4%
Campania	294	8	6.1%	5	1.7%	15	5.1%	2	0.7%	26	8.8%	23	7.8%	28	9.5%	10	3.4%
Puglia	115	14	4.8%	11	9.6%	15	13.0%	5	4.3%	37	32.2%	30	26.1%	25	21.7%	17	14.8%
Basilicata	127	6	5.2%	4	3.1%	8	6.3%	3	2.4%	26	20.5%	12	9.4%	24	18.9%	16	12.6%
Calabria	334	4	3.1%	8	2.4%	16	4.8%	3	0.9%	17	5.1%	35	10.5%	32	9.6%	17	5.1%
Sicilia	243	14	4.2%	19	7.8%	24	9.9%	18	7.4%	35	14.4%	47	19.3%	45	18.5%	57	23.5%
Sardegna	337	15	6.2%	14	4.2%	22	6.5%	19	5.6%	70	20.8%	44	13.1%	44	13.1%	80	23.7%
Total	5,345	173	3.2%	242	4.5%	328	6.1%	144	2.7%	672	12.6%	727	13.5%	688	12.9%	673	12.6%
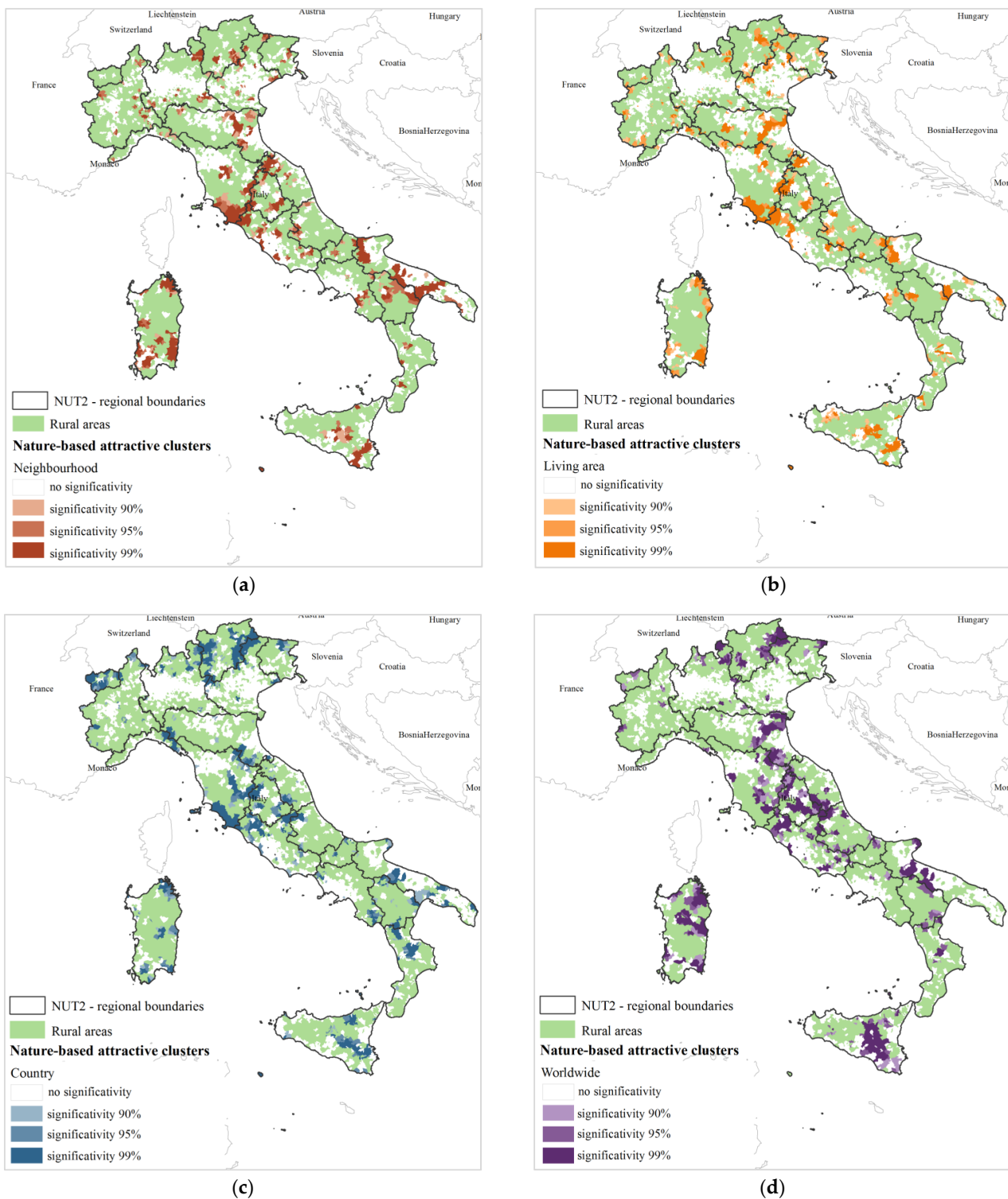
Figure 8. (**a**) Nature-based attractive clusters for "Neighbourhood" level, (**b**) the "Living area" level, (**c**) "Country" level and (**d**) "Worldwide" level within rural areas.

In the Centre of Italy, we found a higher percentage of attractive municipalities (on average 8% of central rural municipalities). In the South of Italy, the country level prevails with a percentage of attractive municipalities between 4% and 13% (respect to regional rural municipalities). As for the two islands (Sicily and Sardinia), it is possible to highlight several common attractions that make up clusters; for "Worldwide" level they tend to affect large portions of the regional territory.

4. Discussion

The results empirically highlight the flow between urban and rural as regards natural amenities. Moreover, our results point out a major (almost double) flow from urban to rural, which increases with the spatial level. Indeed, with a continued increase in urbanization and a higher share of people living in high-density settlements, nature has become a scarcer and less accessible, thus increasing its appreciation, even well beyond city and town limits [27,41]. In particular, [27] suggest that a deeper understanding of use and appreciation of different types of green space will shed light on their role in the well-being of urban and rural dwellers. The results of their study indicate that people view landscapes differently in terms of quality of their experience and that most people have a "portfolio of places" for different needs and moods. As confirmed in other studies [42], everyday recreational behaviours within cities are mainly oriented towards walking or running, relaxing and playing. In this context, the accessibility is specifically mentioned, mainly for neighbourhood level (5.4% of markers), as a choice factor, through statements such as "Near where I live", "A place to find contact with nature while being very close to home", "Green area a few steps from home", "Near the house and easy to reach on foot or by bike", "Very large green area, very panoramic and easily accessible", "Calm, quiet, accessible without a car".

Moving from cities to rural areas, these activities decrease in favour of various activities related to the wildlife observation, and more nature observation in general. Moreover, our results, similarly to what is highlighted by [43], reveal the preference rate for natural amenities outside the city is less tied to a direct use of the resource, which indicates that certain favourites areas have a symbolic option or existence value besides their use value.

Therefore, within rural areas we identified priority hotspots for society to protect and valorise because of their global importance to human well-being.

More specifically, we found an overlap among levels below 30% (about 4% for all levels, see Figure 9a); this supports the importance of distinguishing the choice of favourite places by level (mainly a local/regional level and a wider level of national or supranational interest), as it implies the emergence of areas with different management values and therefore to calibrate the actions and funds to be concentrated on the different attractive cluster categories. In this context, clustering allows us to consider those municipalities that could benefit from proximity to highly attractive municipalities, as they might invest in natural amenities to (re)-enter a nature-based cluster.
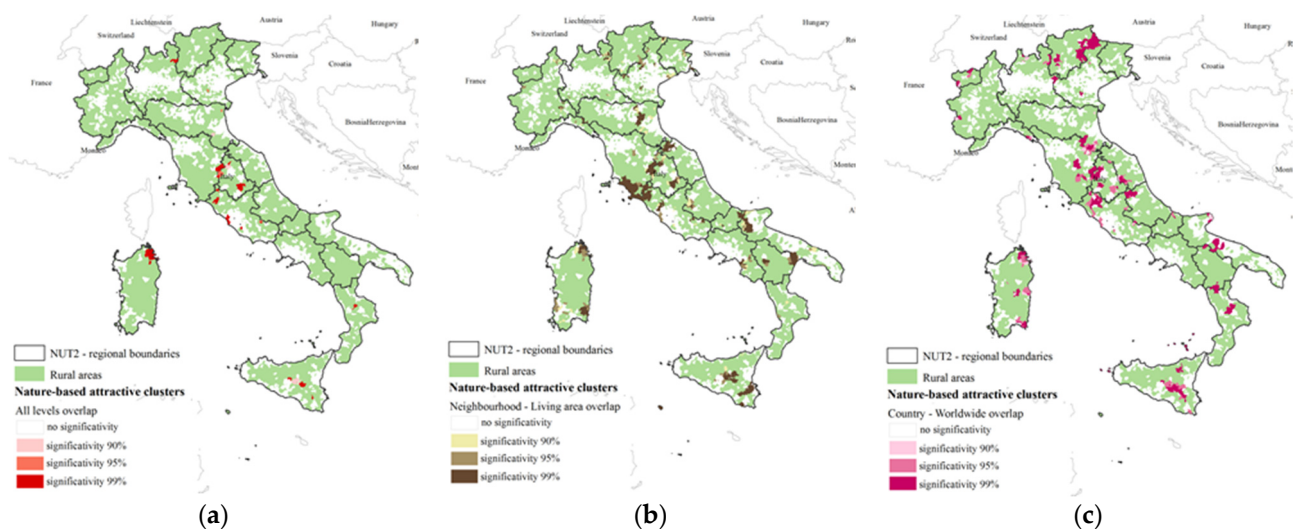

Figure 9. (**a**) All levels overlap, (**b**) "Neighbourhood"–"Living area" level overlap, (**c**) "Country"–"Worldwide" level overlap.

We found a higher overlap between the first two levels (about 39%) (see Figure 9b) and between the last two levels (about 30%) (see Figure 9c).

In general, for the first two levels our study documents that people find various cultural values in their daily environment and not only in landscapes of exceptional biodiversity. Our analysis also suggests that the concept of naturalness for respondents differs from an ecological definition. Dwellers have chosen natural places with varying degrees of human influence when taking into account the naturalness and human influence. Therefore, the perceived naturalness of entire landscapes does not seem to depend directly on the intensity of land use; it can rather be assumed that a landscape that is "green" and without disturbing views of infrastructures and buildings is perceived as natural by most people. Indeed, it is also possible to identify specific expressions related to the rural environment such as: "It is also interesting for the vineyards on the hills", "They are places where there is everything, hill, vineyards, woods and small rivers, hiking on horseback immerses you in nature", "The fields", etc.

Moreover, the management, the provision of service facilities and built-up features are particularly important for the first two levels, namely the presence of seating, fountains, area for dogs, playgrounds for children, places for recreation, etc. Indeed, the quality of these areas is not automatically protected. Particular attention should be given to rural areas close to city, since disorganized development of the settlements (urban sprawl) may easily alter the urban-rural balance on the territory [44], with perhaps little economic or social benefits to the local community and to the detriment of the (non-sprawling) urban population [45].

For the last two levels, identifying potential nature-based attractive clusters, we have made more explicit the territorial framework for regional and national spatial and economic policies oriented to the rural development for recreational and tourist purposes. Recreation and natural tourism (ecotourism) are increasingly important activities with many economic and environmental implications [46–48]. As society changes, the demands and trends for recreational and naturalistic tourism are continuously changing and evolving. This poses many challenges for planners and managers of recreational areas and service providers. A key reason for studying patterns of recreation and tourism is the economic significance of this industry. According to World Travel &Tourism Council (https://wttc.org/Portals/0/Documents/Reports/2021/Global%20 Economic%20Impact%20and%20Trends%202021.pdf?ver=2021-07-01-114957-177, accessed on 17 July 2022), before the pandemic, Travel & Tourism (including its direct, indirect and induced impacts) accounted for 1 in 4 of all new jobs created across the world, 10.3% of all jobs (333 million), and 10.3% of global GDP (US\$9.6 trillion). International visitor spending amounted to US\$1.8 trillion in 2019 (6.8% of total global exports). Growth will come mainly from nature-based tourism [49]. The World Tourism Organization estimates that ecotourism represents 2–4% of the entire world tourism market and has an annual growth potential of around 20%. Therefore, the high economic value associated with it could have considerable potential to generate resources that could in theory be reinvested in the conservation and enhancement of natural areas. A recent study [50] highlights that for every dollar governments invest in protected areas and support for nature-based tourism, the economic rate of return is at least six-times the original investment. Of course, economic impacts (on GDP) are only one way of measuring the importance of recreation. As we highlighted in the analysis, natural places are critical contributors to several aspects of human well-being. In this sense, the most interesting aspect of our results lies in the possibility to identify nature-based attractive clusters, and therefore to discriminate those areas that may represent "nodal points" on which to identify tools and territorial policies for the enhancement of natural resources and rural territories. Indeed, zoning should not be considered a tedious or useless exercise, but instead an indispensable activity in order to correctly identify the territories and implement correct policies on them that are consistent with their specific cities [45,51,52].

The results may have major implications for the management of recreation and touristic destinations. Current destinations should be aware of the way they are nature-based attractive municipalities. This awareness may be the basis for neighbouring destinations to strategically initiate collaboration agreements, integrate their tourism policies and even create new tourism destination brands, which can be more meaningful for visitors and satisfying for the travel patterns they want.

Using these results, this study can draw some policy implications for regional or interregional economy and social changes in rural tourism areas. Policymakers may focus more on the spatial relationship of a community's natural amenities. For example, the nature-based attractive clusters can be used as the core areas of rural tourism networks. At the same time, the regions wherein these amenities are more widely dispersed can develop network strategies among neighbouring communities.

5. Conclusions

In our study, a place-based approach is recommended as an integrated approach towards balanced regional development [53]. With regards to more specifically the organization of the geographical space, Ref [54] explained that not only large cities but also territories characterized by the presence of a variety of medium and small cities and rural areas have all the potential to make a significant contribution to overall economic growth. In this light, it is not strictly necessary to focus on large urban areas for the development of the regions, but rather to know how to adequately exploit the assets of regional systems of different sizes and densities.

Based on this assumption, we provided empirical evidence of an asymmetrical flow related to natural amenities between urban and rural, with a flow almost double from urban to rural. Rural areas, indeed, provide amenities for recreational purposes and symbolic values different from urban ones, highly appreciated by urban and rural inhabitants. However, not all rural areas really have this function, and it is essential to study the specific attractive potentiality of different rural areas.

The identification of nature-based attractive clusters represents a useful methodology in a process of "integrated planning". The co-operation (partnership) among rural municipalities is often justified by the low density and low size of the administrative units, which often do not have economic and financial autonomy able to improve their services offer. Thus, for the identified clusters the co-operation can play a major role in satisfying the need to achieve economies of scale for the provision of services, to diversify the economy and to improve the capacity of administration. In addition, the co-ordination between rural areas, where these resources are located, and cities, which host strategic functions and competences, can help rural communities retain the benefits of the exploitation of resources [6].

Despite the fact that the survey is not specifically designed to account for differences between urban and rural areas, the analysis allows us to obtain the number of markers in each area and therefore a measure of natural places preference in one's own area or outside, giving interesting results. Finally, as has been shown, the model shows very well the spatial clusters on which to set development and balancing policies between cities and rural territories. A potential limit is represented by the spatial distribution of the marks, as it could lead to an over or underestimation of the values. An increase in the sample of markers would, certainly, allow for further insights and developments on the matter.

Further research may also focus on the incidence analysis of the objective factors (biophysical features, environmental appearance, land use changes, cultural features, built features, management functions) on the subjective judgments. Once drivers and trends are understood, policymakers, planners and managers can understand likely changes in behaviour and demand that may affect the choice of specific areas and the actions necessary to improve the offer of cultural ecosystem services.

Appendix A

Table A1. Activities grouped into 9 categories.

Walking	Cycling	Journey by Car or Motorcycle	Nature Observation	Relax and Playing
Running	Cycling	Journey by car	Animal observation	Cafè/terrace
Walking	Drive/cycle	Journey by motorbike	Bird-watching	Picnic/BBQ
Walking the dog	Mountain biking		Nature observation	Playing
	Road racing		Plants observation	Sunbathing

Watersports	Mountain sports	Winter sports	Other sports	
Canoeing	Hiking	Crosscountry skiing	Sport fishing	
Golf surfin	Mountaineering	Ice skating	Geocaching	
Kitesurfing		Powerboating	Horseback riding	
Rafting		Skiing	Rollerskating	
Sailing		Sledding	Hunting	
Scuba diving			Meditation	
Swimming			Mushroom picking	
			Photo shooting	

Table A2. Respondent's demographic profiles by age and gender compared to Italian population.

Age	Italian Sample (n. Respondents)		Italian Sample (% of Respondents)		Italian Population (n.)		Italian Population (%)	
	male	female	male	female	male	female	male	female
18–30	166	187	21.0%	22.2%	3,536,272	3,338,048	19.5%	18.2%
31–45	286	290	36.2%	34.4%	6,042,858	6,032,116	33.3%	32.8%
46–55	184	206	23.3%	24,5%	4,794,119	4,933,107	26.4%	26.8%
56–65	154	159	19.5%	18.9%	3,794,554	4,069,703	20.9%	22.2%
Total	790	842	100.0%	100,00%	18,167,803	18,372,974	100,00%	100,00%

Table A3. Respondent's demographic profiles by geographical area compared to Italian average.

Geographical Area (NUTS 1)	Italian Sample (n. Respondents)	Italian Sample (% of Respondents)	Italian Population (n.)	Italian Population (%)
North-west	408	26.2%	16,095,306	26.6%
North-east	320	19.0%	11,640,852	19.6%
Center	369	19.8%	12,050,054	19.9%
South	353	23.7%	14,022,596	23.2%
Islands	182	11.3%	6,675,165	11.0%
Total	1632	100.0%	60,483,973	100.0%

Table A4. Linkages between urban and rural related to attractive natural amenities.

	Neighbourhood Level Attractive Nature		Living Area Level Attractive Nature		Country Level Attractive Nature		Worldwide Level Attractive Nature		Total	
Cities to cities	535	94%	278	54%	160	33%	18	14%	991	58%
Cities to towns and suburbs	16	3%	132	25%	95	20%	14	11%	257	15%
Cities to rural areas	3	1%	67	13%	174	36%	62	49%	306	18%
Cities to sea	17	3%	42	8%	58	12%	32	25%	149	9%
Subtotal	571	100%	519	100%	487	100%	126	100%	1703	100%
Towns and suburbs to cities	10	2%	68	17%	86	23%	13	10%	177	13%
Towns and suburbs to towns and suburbs	427	93%	201	51%	107	29%	24	19%	759	56%
Towns and suburbs to rural areas	13	3%	105	26%	134	36%	53	42%	305	22%
Towns and suburbs to sea	9	2%	24	6%	48	13%	36	29%	117	9%
Subtotal	459	100%	398	100%	375	100%	126	100%	1358	100%
Rural areas to cities	0	0%	23	12%	44	25%	5	7%	72	11%
Rural areas to towns and suburbs	14	6%	43	22%	25	14%	8	12%	90	14%
Rural areas to rural areas	203	93%	126	65%	90	52%	37	55%	456	70%
Rural areas to sea	2	1%	2	1%	15	9%	17	25%	36	5%
Subtotal	219	100%	194	100%	174	100%	67	100%	654	100%
Total	1249		1111		1036		319		3715	

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