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Perceived contributions of multifunctional landscapes to human well-being: Evidence from 13 European sites

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Abstract

1. Multifunctional landscapes provide critical benefits and are essential for human well-being. The relationship between multifunctional landscapes and well-being has mostly been studied using ecosystem services as a linkage. However, there is a challenge of concretizing what human well-being exactly is and how it can be measured, particularly in relation to ecosystem services, landscape values and related discussions.
2. In this paper, we measure self-reported well-being through applying an inductive free-listing approach to the exploration of the relationships between landscape multifunctionality and human well-being across 13 rural and peri-urban sites in Europe.
3. We developed a face-to-face online survey (n = 2,301 respondents) integrating subjective perceptions of well-being (free-listing method) with mapping perceived ecosystem service benefits (Public Participation GIS, PPGIS approach).
4. Applying content analysis and diverse statistical methods, we explore the links between well-being (i.e. perceived well-being items such as tranquillity, social relations and health) and social-ecological properties (i.e. respondents' sociocultural characteristics and perception of ecosystem service benefits).
5. We identify 40 different well-being items highlighting prominently landscape values. The items form five distinct clusters: access to services; tranquillity and social capital; health and nature; cultural landscapes; and place attachment. Each

cluster is related to specific study sites and explained by certain social-ecological properties.
6. Results of our inductive approach further specify pre-defined conceptualizations on well-being and their connections to the natural environment. Results suggest that the well-being contributions of multifunctional landscapes are connected to therapeutic well-being effects, which are largely neglected in the ecosystem services literature.
7. Our results further point to the context-specific character of linkages between landscapes and human well-being. The clusters highlight that landscape-supported well-being is related to multiple interlinked items that can inform collective visions of well-being in the future.
8. For landscape planning and management, we highlight the need for place-specific analysis and consideration of perceptions of local people to identify the contributions to their well-being.
9. Future research would benefit from considering the experiential qualities of value and well-being as they relate to direct experiences with the landscape and wider psychological needs, specifically over time.

KEYWORDS
ecosystem services, free listing, human well-being, landscape planning, multifunctional landscapes, PPGIS, quality of life, self-reported well-being

1 | INTRODUCTION

In many rural landscapes of Europe, the capacity to provide multiple ecosystem services simultaneously has decreased over the last decades as a result of land use intensification and abandonment (García-Llorente et al., 2012; Jongman, 2002; Stoate et al., 2009). Ongoing pressures towards land use intensification and homogenization with the aim of maximizing single ecosystem services (mainly food or material production) often occurs at the cost of other services such as clean water provision and biodiversity, or the loss of local knowledge, identity and places of particular value (IPBES, 2018). Identifying and harnessing opportunities for enhanced landscape multifunctionality, understood as the ability of the landscape to provide multiple functions and uses (Renting et al., 2009), provides ways of managing trade-offs and synergies between ecosystem services (Galler, von Haaren, & Albert, 2015; Mastrangelo et al., 2014; Torralba, Fagerholm, Hartel, Moreno, & Plieninger, 2018). Multifunctionality has gained increasing interest in science and policy, as reflected in a high number of scientific publications (e.g. Renting et al., 2009) and in the uptake of multifunctionality in key policy documents such as the European Landscape Convention (Council of Europe, 2000), greening efforts in the context of the European Union (EU) Common Agricultural Policy for 2015–2020 (European Commission, 2014) and the European Commission's Nature-Based Solutions approach (European Commision, 2015).

Multifunctional landscapes provide critical benefits such as support of climate regulation, ecosystem services and community resilience, which are essential for human well-being (Meerow & Newell, 2017; Wilson, 2010). For example, Branca et al. (2013) associated multifunctionality with climate change mitigation and poverty alleviation in Brazil; Goldstein et al. (2012) elicited how, in participatory rural development processes, increasing multifunctionality is beneficial to climate change mitigation, food security and diversification of rural economic opportunities. European studies show that multifunctional landscapes are perceived as hotspots of ecosystem services supply that provide multiple benefits and values to the well-being of different user groups (Fagerholm et al., 2019; García-Llorente et al., 2012; Garcia-Martin et al., 2017; Plieninger, Dijks, Oteros-Rozas, & Bieling, 2013).

Research across a wide spectrum of disciplines has empirically explored the linkages between nature or ecosystems and human well-being with the conclusion that nature generally makes people happier and healthier (both physically and mentally; see e.g. Annerstedt & Währborg, 2011; Hartig, Mitchell, de Vries, & Frumkin, 2014; Russell et al., 2013; van den Bosch & Ode Sang, 2017; Wendelboe-Nelson, Kelly, Kennedy, & Cherrie, 2019; White et al., 2019). Recently, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Regional Assessment for Europe and Central Asia revealed the dynamic relationships between nature's contributions to people, biodiversity and ecosystems, and their relevance for human well-being (respectively quality of life in their terminology;

Martín-López et al., 2018). In this context, there is growing recognition of the linkages between nature's contributions to people, the diversity of values for nature and well-being. This includes issues of cultural identity, equity and power relations, while at the same time moving from a purely instrumental idea of 'services' and 'benefits' to also embracing relational and intrinsic values (Chan, Gould, & Pascual, 2018; Díaz et al., 2015; Pascual et al., 2017). Further ideas on how people relate to and derive contributions for their well-being from their natural environment include, for instance, the literature on landscape values, which embraces a diversity of social values, covering intrinsic and relational ones (García-Llorente et al., 2012; Stephenson, 2008; Termorshuizen & Opdam, 2009; van Riper et al., 2017). A recent special feature also proposed a widening of the theoretical base of social values for sustainability (Raymond, Kenter, van Riper, Rawluk, & Kendal, 2019).

The relationship between multifunctional landscapes and human well-being has mostly been studied using ecosystem services as a linkage. However, many of the perceived contributions of landscapes to human well-being cannot be easily associated with this concept, but rather need to consider a broader set of attributes of how people value nature for their personal well-being (as demonstrated by Bieling, Plieninger, Pirker, and Vogl (2014) in a study across four European landscapes). Fagerholm et al. (2016) found that the contribution of a landscape to perceived well-being is related to values based on interactions among people and the landscape (i.e. relational values). Large knowledge gaps still remain in relation to the intangible connections between people and ecosystems on well-being across cultures and biophysical contexts (Russell et al., 2013). Furthermore, the relationship between landscape multifunctionality and self-reported (subjective and perceived) well-being by different people deserves attention and has not been studied across Europe so far.

Human well-being is, not surprisingly, one of the most central themes of human thinking and action. Numerous people in disciplines such as philosophy, literature, psychology, medicine, economics and politics have explored the dimensions and conditions of what makes life a good one. This reaches from classical thinking such as Aristotle and his concept of *eudaimonia* (happiness; Heintzelman, 2018) to modern ideas that put the development of human capabilities at the centre (Nussbaum & Sen, 1993). This diversity comes with the challenge of concretizing what human well-being exactly is and how it can be measured (Dodge, Daly, Huyton, & Sanders, 2012), particularly in relation to ecosystem services, landscape values and related discussions. Commonly, well-being is understood and measured in terms of either objectively identifiable variables (e.g. income, gross domestic product [GDP]) or by placing emphasis on the more subjective and context-specific perceptions and expectations of people (e.g. life satisfaction; Rapley,). Yet, much of the existing work on well-being compares objective indicators of health in urban spaces (e.g. Sandifer, Sutton-Grier, & Ward, 2015). The past decades have, however, witnessed a growth in subjective well-being research acknowledging that people's own evaluations of their lives and well-being, commonly measured through self-report rating scales, are important to consider (Diener, Oishi, & Tay, 2018). The World Health Organization emphasizes the subjective elements of human well-being (quality of life in their terminology) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQOL Group, 1998, p. 555). The World Happiness Report (Helliwell, Layard, & Sachs, 2018) provides examples of how different elements of subjective well-being can be integrated into landscape and urban planning, particularly with reference to migration within and between countries. The nature-based solutions agenda in the EU calls for the integration of subjective elements of human well-being in multifunctional landscape management (Raymond et al., 2017). Furthermore, the environmental management literature increasingly encourages moving beyond GDP towards measuring the various objective (e.g. material wealth or physical health) and also subjective (e.g. quality of social relationships or feelings of happiness) components of well-being (Rogers et al., 2012, p. 61): "Well-being is multidimensional and context-specific, and must be approached in a way that preserves cultural diversity and societal autonomy while meeting universal human needs."

In this paper, our interest is to measure self-reported well-being through applying an inductive free-listing approach to the exploration of the relationships between landscape multifunctionality and human well-being. With this approach, we take a post-humanistic standpoint to well-being that acknowledges the well-being stems from the interactions between humans and non-humans (Andrews, 2018). We explore the links between well-being (i.e. perceived well-being items such as tranquillity, social relations, living in a small community and health) and social-ecological properties across 13 case study sites in Europe. More specifically, our objectives are:

1. to identify the items of subjective well-being as elicited by residents
2. to detect how well-being items expressed subjectively are grouped in clusters and which of these clusters are relevant in each study site
3. to examine how the sociocultural characteristics of respondents and their perception of ecosystem services explain the human well-being clusters across the study sites. We compare well-being to socio-demographics, respondent's relation to the area, ownership and use of land, and perceived ecosystem service benefits.

2 | MATERIALS AND METHODS

To study the perceived contributions of multifunctional landscapes to human well-being, we developed an online survey, integrating subjective and context-specific perceptions of well-being (free

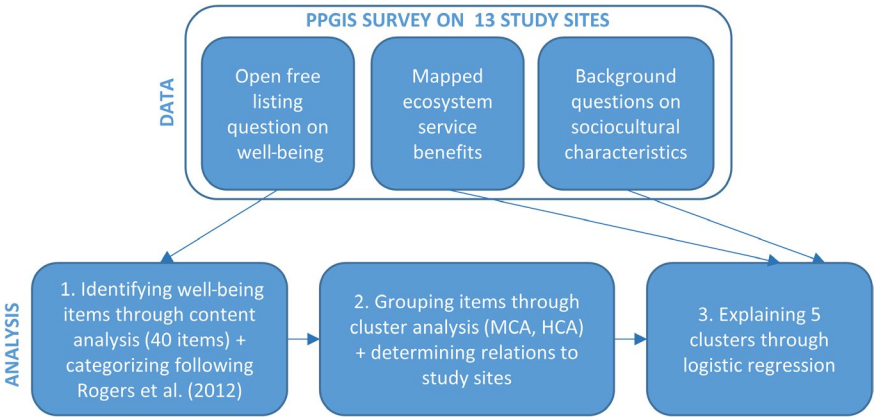

FIGURE 1 Workflow of data collection and analysis. HCA, hierarchical cluster analysis; MCA, multiple correspondence analysis

listing) with perceived ecosystem service benefits (mapping). We analysed the data through content analysis and statistical methods. The workflow of data collection and analysis is presented in Figure 1. More detailed analysis of the spatial patterns of the mapped ecosystem service benefits are reported in Fagerholm et al. (2019).

2.1 | Study sites

The research was performed in 13 rural landscapes in 10 European countries that were selected from a larger number of candidate sites in a multi-step procedure (see Moreno et al., 2017). These study sites were chosen in a way that they include important types of multifunctional landscapes and span a gradient of land uses and biogeographical settings (Figure 2; Table S1): Montaña Oriental Lucense, Spain (SP-MO); Canton de Loudeac, France (FR-CL); The Brecks, England, UK (UK-BR); Linköping, Sweden (SE-LI); Franches Montagnes, Switzerland (CH-FM); Schwarzbubenland, Switzerland (CH-SB); Hochkirch-Weißenberg, Germany (DE-HW); Saxon region, Romania (RO-SA); Llanos de Trujillo, Spain (SP-LT); Serena Campiña, Spain (SP-SC); Kassandra, Greece (GR-KA); Montemor-o-Novo, Portugal (PT-MN); and Zala, Hungary (HU-ZA). The sites are predominantly agricultural landscapes and form consistent social-ecological units (i.e. local areas that share similar biophysical and socio-economic properties, Martín-López et al., 2017). They are multifunctional as they host mosaics of different land covers, thus allowing for multiple uses and functions. For example, Llanos de Trujillo is characterized by dry grasslands, wood pastures (dehesas), shrublands and extensive cereal crops. Livestock breeding (sheep, cattle, Iberian black pigs) is of economic importance, but culture and nature tourism is growing. The Brecks is an open-farming landscape, with small towns and villages and free-draining sandy soils that are not only used for intensive agriculture, but also for outdoor pig production, vegetable production and plantation conifer forestry. Zala is a hilly area and partly included in a national park. The Balaton lake is a crucial part of the landscape and mainly appreciated as holiday region.

Following the FARO typology of rurality (that combines indicators of population density, average income and accessibility in terms of travel time to cities, van Eupen et al., 2012), some sites are 'deep rural' (e.g. the Romanian and Spanish sites), while others are classified as 'rural' (e.g. the German site) and 'peri-urban' (e.g. the Swedish site). The study sites differ in size between 50 and 1,640 km^2, host a population density between 3 and 185 inhabitants per km^2 and show enormous differences in wealth levels (gross domestic product/capita: 4,600–61,200 €, unemployment rate: 2.7%–27.5%). Between 0% and 84% of each site belong to protected area networks. The sites are located in the Mediterranean, Atlantic, Continental, Boreal and Pannonian biogeographical regions of Europe.

2.2 | Survey data collection and survey contents

We developed a face-to-face online Public Participation GIS (PPGIS) survey (Maptionnaire platform) that included map-based, open and structured survey questions (Figure 1). The survey was operated on tablets and laptops (see for instance a translated version of the survey from Serena Campiña (SP-SC) at: https://app.maptionnaire.com/fi/869) and filled in with the help of facilitators. Facilitators were native speakers of local languages provided with a manual and trained over 2–3 days onsite by two of the authors (N.F., M.T.) to ensure the consistency across the 13 study sites. The survey was translated into all locally relevant languages. Data collection was tested in Llanos de Trujillo (SP-LT) and Schwarzbubenland (CH-SB) in May-August 2015 (Fagerholm et al., 2016). At the other study areas, data collection was carried out in February-September 2016. Due to the lack of internet coverage, we performed the surveys using paper questionnaires and maps in RO-SA and manually inserted the data to the survey platform.

In participant requirement, the aim and purpose of the survey were clearly explained highlighting the objectives of the research, the use of results and those individual responses would remain anonymous and confidential. Participation was on voluntary basis. Participants could also withdraw in the middle of the survey if they preferred so. The University of Copenhagen human research

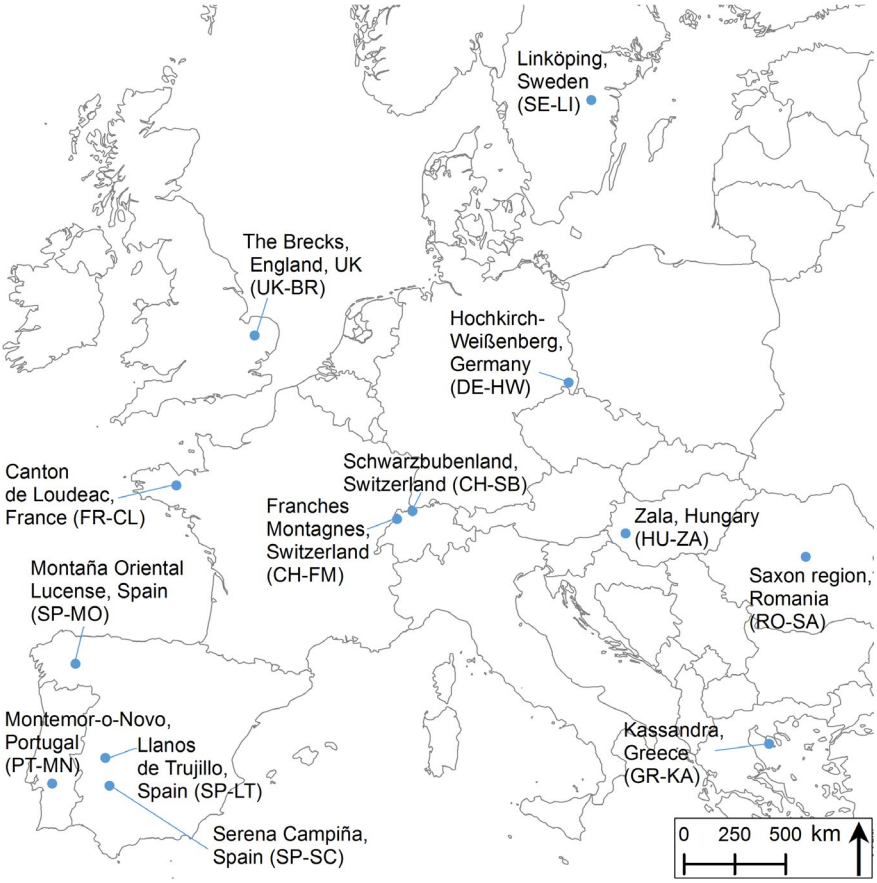

FIGURE 2 Location of the 13 study areas across 10 European countries

ethics committee did not require full ethics application to be submitted because this study was deemed low risk, that is that all participants in the study were above 15 years and prior and informed consent would be obtained.

In the survey introduction, the facilitators stressed the focus on the informant's personal relationship to nature and landscapes in the area. The survey started by mapping the respondent's home location and then subsequently perceived ecosystem service benefits as point locations (related survey question: 'Do you find some particular place or area special in this landscape?'). Respondents could map an unlimited number of places or choose also not to map a specific ecosystem service benefit. The background map was a Bing satellite image overlaid with Open Street Map objects. A minimum zoom level of 1:25 000 was enforced to ensure spatial scale coherence in mapping. One mapped point denoted a single place or area. Our point mapping method, commonly applied in PPGIS (Brown & Fagerholm, 2015), focused on identifying sites where people perceived a specific ES benefit while it did not account for the size of the area mapped. Starting from existing classifications (Haines-Young & Potschin, 2013; Millennium Ecosystem Assessment, 2005), we developed a locally relevant typology covering 10 different ecosystem service benefits that focus on the sociocultural dimension of landscapes, including for example outdoor recreation, social interaction, aesthetic value, and habitat and biodiversity (Table S2). The mapping, identifying particular sites for ecosystem service benefits, addressed both subjective perceptions and uses of the landscape that emerge from the interaction with the landscape (Setten, Stenseke, & Moen, 2012) and from the relationships among the people and between people and the landscape (Pascual et al., 2017). It captures a subset of individual anthropocentric self-regarding values, particularly values assigned by a person to the landscape (assigned values; Chan, Satterfield, & Goldstein, 2012; Kenter et al., 2015; see also more elaboration on the type of mapped values in Fagerholm et al., 2019).

The mapping part of the survey was followed by an open free-listing question on well-being (cf. Bieling et al., 2014): 'How does this area and the opportunities it offers contribute to your well-being? Please write briefly and describe here anything that comes to your mind (e.g. list shortly the three most important things)'. Free listing is a method from cognitive psychology shown to be applicable in landscape studies (Bieling et al., 2014; Wartmann & Purves, 2018). Our free-listing question emphasized self-reported well-being and subjective context-specific perceptions and expectations of people (Rapley,). As this question was open-ended, the responses referred to the importance of the area to people's well-being and, thus, applies an integrated, holistic approach to values in landscapes (Stephenson, 2008). In the free-listing approach, the subjective perceptions were strictly not place-based as the mapped ecosystem service benefits and could also cover other types of values such as transcendental values (e.g. health, freedom and happiness) (Raymond & Kenter, 2016).

The final survey questions addressed respondent's socio-demographical characteristics and relationship to the study area, which may have a significant influence on ecosystem service benefit and well-being perceptions (Brown & Reed, 2009; Palomo, Martín-López, Potschin, Haines-Young, & Montes, 2013; Van Riper & Kyle, 2014).

2.3 | Respondents and sampling approach

Our survey covered full- or part-time (e.g. seasonal residents) local residents who were recruited face-to-face through purposive stratified sampling based on the following three stratification criteria: (a) municipality; (b) gender; and; (c) age (young: 15–29 years, middle-aged: 30–59 years, seniors: ≥60 years). The first criterion was based on the geographical balance of respondents within each study area, while the other two were in proportion to local census data (except for RO-SA where local census statistics were unavailable). Respondents were approached in key public locations such as market places, cafés, streets, schools and health care centres (concurrent with Bieling et al., 2014; Scolozzi, Schirpke, Detassis, Abdullah, & Gretter, 2014). A crowdsourced sample (allowing any interested person to fill in the survey) through distributing a URL link was additionally included in CH-SB. The sampled population represents the population of the study sites with <3.7% difference per age/gender group with the exception of elderly women (−6.8% compared to sample, see comparison of the facilitated vs. online approach applied in CH-SB in Fagerholm et al., 2019).

In total, 2,301 respondents were surveyed in the 13 study sites. They mapped 28,787 locations for perceived ecosystem service benefits and 95.8% responded to the question on well-being (see details of respondent profile in the Supporting Information).

2.4 | Content analysis of well-being responses

The open responses to the well-being question were translated from local languages to English by the facilitator team at each respective site. For inductive content analysis, a consistent protocol was developed. Firstly, we explored the data to identify the most typical items. After this, we extracted randomly 50 responses which were coded in a data table (Excel) by six of the authors (N.F., B.M.L., M.G.M., M.T., A.S.O. and E.O.R.) to discuss the possible responses under each item. In this process, we merged items and added some new to the initially developed ones. To appreciate the qualitative nature of the data, we agreed that a response could be classified under several items (e.g. the response 'We know each other' under 'Feeling home/Place attachment' and 'Interaction with family, friends and community'). We also acknowledged that conceptual variations exist in the subjective well-being across cultures (Diener, Oishi, et al., 2018). For example, in some cultures such as in the Mediterranean region in our data, the item silence/tranquillity/peacefulness/relaxation seems to relate to social aspects (e.g. relaxed community life) in addition to psychological restoration. We also ensured that interpretation of responses was done in their context (e.g. the response 'comfort' could be interpreted differently depending on the context expressed in the text string, sometimes indicating feeling home and other times relaxation; see examples in Table S3). After this process, the responses of each study site were coded by one researcher familiar with the landscape context. The final content analysis resulted in 40 items of well-being (see Table S3).

Next, to understand what kind of well-being categories the items address, they were classified under the following eight objective and subjective well-being components presented by Rogers et al. (2012) that cover human physical, emotional and social needs: Material living standards; Health; Physical and economic security; Stable ecosystems; Education; Work and leisure; Agency and political voice; and Social relationships. Allocation of items was not in all cases straightforward but we followed the content of the responses, as elaborated in Table S3. Hence, sense of place is, for example, under Social relationships as responses mostly related to social interactions and often mentioned together with family and growing up. Also, freedom and accessibility to landscape were placed under Agency and political voice because they refer to the right to each individual to define their own choices. An item 'broadly defined quality of life' was added as a distinct category for those aspects not fitting under any of the eight well-being components.

2.5 | Statistical analysis

In contrast to the grouping of well-being items according to a predefined typology, we wanted to identify the type of clusters that could be formulated from the inductively identified well-being items through statistical analysis. We calculated the percentage of respondents highlighting each of the 40 well-being items extracted from the free-listing question and then conducted a multiple correspondence analysis (MCA) and a hierarchical cluster analysis (HCA) to identify the clusters. First, we performed a MCA to avoid correlation between the items of well-being and to explore the relationships between the responses on well-being items. MCA was conducted with those items that were mentioned by more than 1% of respondents (i.e. 36 items). To decide the number of factors to retain, we used the scree test to identify those that proportionally explain more variance than the rest, leading to an exponential increase of the accumulated variance.

Second, we performed a HCA with the well-being item scores represented by those MCA factors with the highest explained variance. We used the Ward's linkage method and Euclidean distance as agglomerative techniques to conduct the HCA. The resulting clusters identified the groups of well-being items provided by our study sites. The clusters were created statistically through a process of automatic truncation that is based on the entropy difference between the neighbouring clustering results (Liang, Zhao, Li, Cao, & Dang, 2012). Third, to determine which well-being clusters were relevant in each study site, we performed Chi-square contingency tables, followed by the Fisher's exact test.

Finally, we used stepwise forward multivariate logistic regression to examine which social-ecological properties underpin the perception of well-being related to European multifunctional landscapes. Social-ecological properties were understood as sociocultural characteristics of respondents and their perception of ecosystem service benefits. For sociocultural characteristics, we used the variables of gender, age, level of education, field of work in agriculture, landownership, self-estimated knowledge of the area and length of residency in the area (Table S4). The variables of the perception of ecosystem service benefits were the number of mapped places for each of the 10 ecosystem service benefits (Table S2). Dependent variables were the clusters of well-being found through the HCA. We coded the dependent variables as '1' if the respondent had described a well-being item that belonged to a particular well-being cluster (i.e. HCA cluster) and as '0' if the respondent did not. We selected the final logit regression models by using $p = .1$ as criteria for inclusion and exclusion of independent variables. For identifying the statistically significant variables, we used $p < .1$ because in environmental management the cut-off of $p \leq .1$ is considered more responsible than $p < .05$ (Field, Tyre, Jonzén, Rhodes, & Possingham, 2004). Previous research on ecosystem services has also considered $p \leq .1$ as cut-off for statistical analysis (e.g. Higuera, Martín-López, & Sánchez-Jabba, 2013; Martín-López, Montes, & Benayas, 2007).

3 | RESULTS

3.1 | Items of subjective well-being

The 40 well-being items identified from the free-listing question mostly relate to tranquillity (17.0% of identified items, 50.3% of respondents mentioning; Figure 3). Landscapes create the opportunities for interaction among family, friends and the community, which was overall the second most mentioned well-being item (11.3% of identified items, 33.5% of respondents). Nature, landscape sceneries and fresh air were also among the most prominently mentioned items (4.5%–6.1% of identified items, 13.2%–18.1% of respondents). Well-being was considerably linked to the items of sense of place and living in a small community (4.5%–3.9% of identified items, 13.3%–11.5% respondents mentioning). The most rarely perceived items include learning from nature, hunting/fishing and religious activities (0.2%–0.3% of identified items, mentioned by less than 1.0% of respondents).

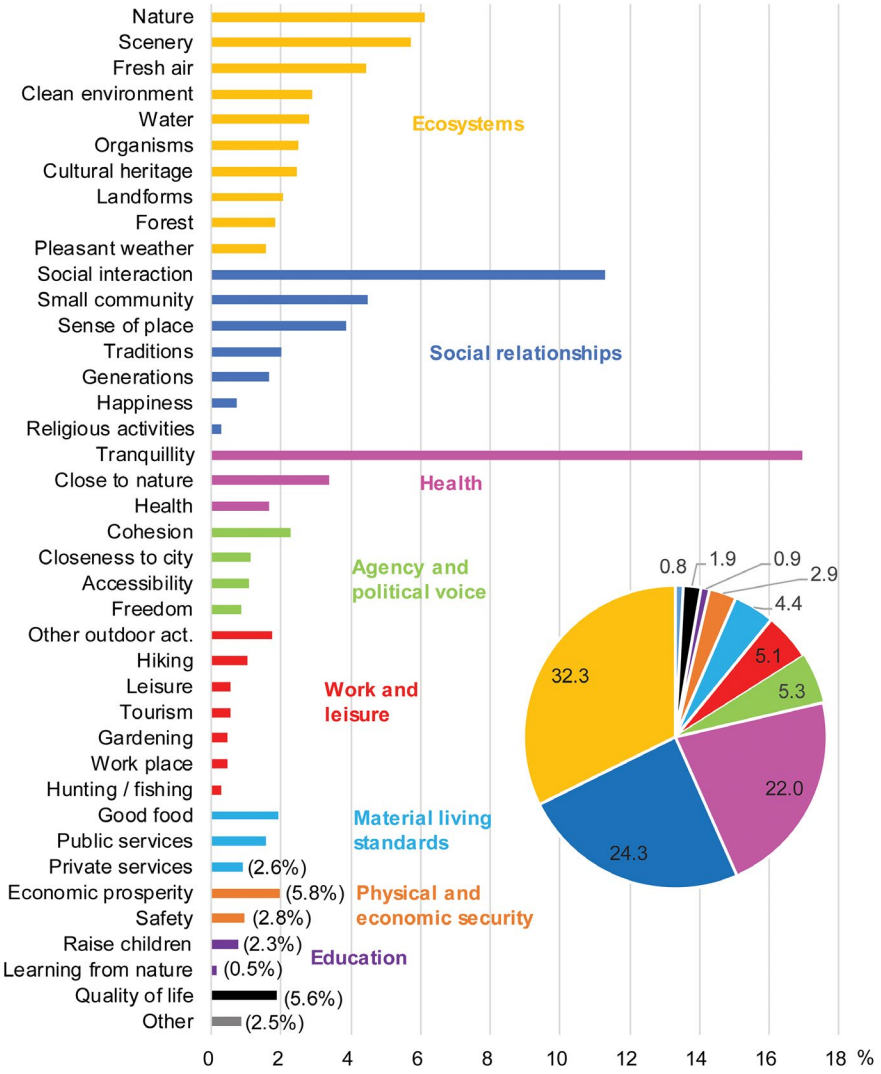

FIGURE 3 Relative proportions of 40 well-being items across 13 study sites categorized under the well-being components following Rogers et al. (2012). The proportions are calculated from the total of all the 6,537 coded responses. Proportions in brackets denote the percentage of respondents who mentioned the item. Original category Stable ecosystems has been renamed by the authors as Ecosystems due to the inherently dynamic character of all ecosystems

TABLE 1 Factor loadings for the well-being items in the first five axes (F1-5) derived from the multiple correspondence analysis (MCA). Values in bold correspond to the coordinates of each well-being item that is significant in each axis at $\alpha = 0.05$

Well-being items	F1	F2	F3	F4	F5
Safety	**−4.19**	−4.33	1.13	1.25	4.67
Quality of life	−3.85	0.21	−0.90	0.80	**5.02**
Economic prosperity	**−2.86**	−0.74	2.13	1.14	−1.22
Health	−2.53	−0.21	−6.97	3.88	**−8.14**
Generations	−2.50	6.41	**11.71**	−0.11	−7.78
Social interaction	**−2.09**	−0.54	1.69	0.08	0.71
Tranquillity	**−1.86**	−0.25	−1.69	0.65	0.69
Cohesion	−1.62	−1.11	0.37	**4.12**	−0.37
Work place	−1.55	−1.62	1.64	4.24	**−8.21**
Sense of place	−1.00	4.52	**7.95**	−0.80	−4.79
Freedom	−0.99	0.15	−1.71	2.53	**−5.85**
Clean environment	−0.61	−0.34	**−5.31**	2.05	−5.66
Happiness	−0.59	−0.92	−1.27	3.75	**−4.88**
Fresh air	−0.40	1.08	**−3.43**	−3.44	0.99
Raise children	0.21	−5.96	0.74	0.10	**−9.00**
Good food	0.63	1.27	**−4.18**	2.45	1.02
Small community	0.66	**−4.80**	1.15	2.23	−0.77
Nature	1.26	−0.14	**−2.24**	−0.28	−0.24
Close to nature	1.72	−3.20	−2.11	−2.34	**−5.54**
Public services	2.45	**−12.56**	5.50	−2.76	3.49
Scenery	**2.70**	2.30	−0.26	−1.21	1.08
Pleasant weather	**2.82**	1.17	−2.05	−2.03	1.20
Accessibility	3.25	−8.46	−0.50	−1.30	**−11.99**
Other outdoor act.	3.32	**−5.83**	−1.13	0.37	−5.04
Hiking	3.40	−2.59	−3.67	−0.66	**−5.71**
Closeness to city	3.58	**−9.48**	3.13	−0.26	−2.40
Organisms	**4.04**	2.44	−3.79	3.10	−0.39
Private services	4.12	**−14.61**	7.10	−1.81	8.94
Gardening	**5.06**	−4.21	4.64	−3.51	1.33
Water	**6.45**	2.65	−1.28	−7.08	1.36
Traditions	6.81	1.47	2.03	**13.06**	2.58
Cultural heritage	6.90	1.54	1.72	**10.74**	2.44
Landforms	**8.81**	2.70	0.61	−5.66	1.41
Forest	**9.43**	1.54	−0.47	−0.12	−3.38
Eigenvalue	5.61	5.01	4.82	4.04	3.96
Inertia explained (%)	24.53	14.72	12.13	4.18	3.61
Inertia accumulated (%)	24.53	39.25	51.38	55.56	59.18

The well-being items mostly relate to the three components of Ecosystems (32.3% of all identified items), Social relationships (24.3%) and Health (22.0%) (Figure 3). The majority, 10 different items, fall under the component Ecosystems. Tranquillity, the most prominent item, was located under Health component. Well-being components of Education, Physical and economic security and Material living standards played a less common role (0.9%–4.4% of identified items). Broadly defined quality of life, not falling under any of the eight well-being components, represented 1.9% of identified items mentioned by 2.5% of respondents.

3.2 | Clusters of well-being

Each factor of the MCA represented a different pattern of relations between well-being items that tend to associate positively or negatively with each other. The first five factors of the MCA absorbed 59.18% of the variance and presented an inertia of 3.61 (Table 1). The first factor (F1) absorbed 24.53% of the variance and revealed various groups of associations. The positive side grouped well-being items like forest, water, landforms, traditions and gardening. On contrary, safety, tranquillity and social interaction grouped together in the negative scores.

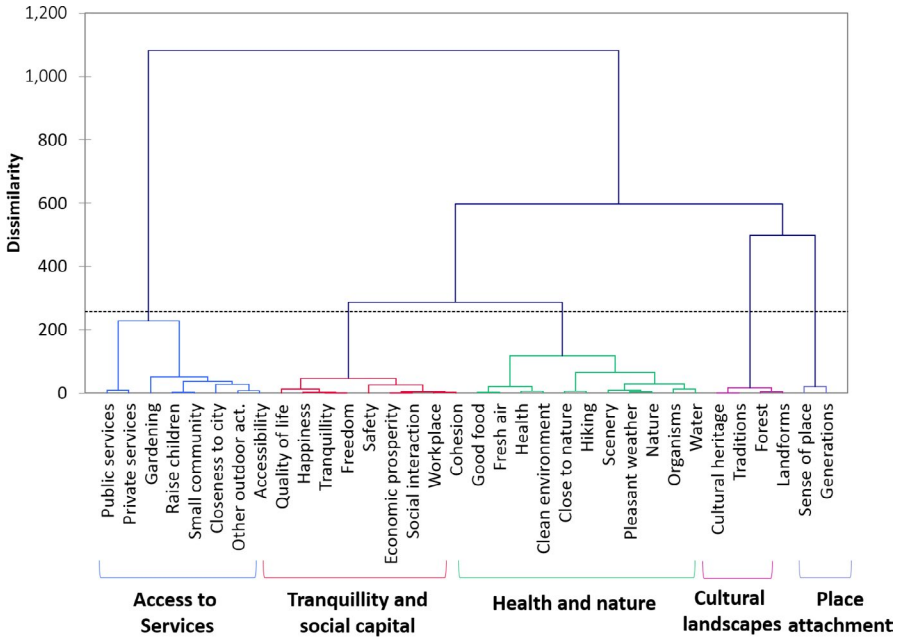

FIGURE 4 Dendrogram of clusters of well-being associated with European multifunctional landscapes and identified through hierarchical cluster analysis

The second factor (F2) absorbed 14.72% of the variance and indicated linkages between generations and sense of place in the positive scores. This group was negatively associated with public services, private services, closeness to the city and accessibility that grouped together in the negative side of the axis. The third factor (F3) retained 12.13% of the variance and distinguished between sense of place, generations and private services in the positive side and clean environment, food and fresh air in the negative. Compared to the first three axes, the last two (F4 and F5) absorbed little variance. F4 associated traditions with cultural heritage; while F5 opposed accessibility, closeness to the city, raise children, work place and health in the positive side; to private services and safety in the negative.

Using the scores of the well-being items represented by the first three factors of the MCA, which explained more than 10% of the variance each, we identified five well-defined clusters (Figure 4). These encompass the groups of well-being items perceived by the residents of the selected European multifunctional landscapes. Cluster 1 (at the left side of the dendrogram) represented a notion of well-being that includes *Access to services* (both public and private), closeness to cities and accessibility to green spaces where residents can practice recreational activities. Cluster 2 covered the conception of well-being associated with *Tranquillity and social capital* aspects, such as social relationships, social cohesion, safety or freedom of choice. This cluster also comprised the item of happiness and the broad notion of quality of life. Cluster 3 named *Health and nature* comprised items strongly connected with health, such as clean environment, fresh air, quality of food, and physical and psychological experiences that benefit health (e.g. hiking or landscape scenery), as well as nature's elements, such as species and organisms, water and the broad notion of nature. Cluster 4 represented *Cultural landscapes* that contribute to respondents' well-being through their cultural heritage and options for experiencing traditions. This cluster also encompassed the items of forests and landforms because they are often the settings where cultural traditions and events take place. Finally, cluster 5 (the right side of dendrogram) characterized *Place attachment*, covering the items of sense of place and the importance of past generations.

According to the Chi-square and Fisher's exact tests, these well-being clusters were not evenly distributed across study sites. The cluster of *Access to services* was positively associated with the Swiss study sites (CH-FM, CH-SB) and Linköping (SE-LI; $\chi^2 = 279.8$; $df = 12$; $p < .0001$). Contrastingly, the cluster of *Tranquillity and social capital* was represented by the three Spanish study sites (ES-LT, ES-MO, ES-SC), the Saxon region (RO-SA) and Montemor-o-Novo (PT-MN; $\chi^2 = 354.7$; $df = 12$; $p < .0001$). *Health and nature* was positively associated with Schwarzbubenland (CH-SB) and Montaña Oriental Lucense (ES-MO), as well as Kassandra (GR-KA; $\chi^2 = 180.6$; $df = 12$; $p < .0001$). While the well-being clusters of *Cultural landscapes* and *Place attachment* were predominant in Zala (HU-ZA), they were distinctively associated with other study sites. *Cultural landscapes* were mostly associated with Kassandra (GR-KA), Franches Montagnes (CH-FM) and Canton de Loudeac (FR-CL; $\chi^2 = 228.2$; $df = 12$; $p < .0001$) and *Place attachment* was also represented in Montemor-o-Novo (PT-MN; $\chi^2 = 48.7$; $df = 12$; $p < .0001$).

3.3 | Sociocultural characteristics and perceived ecosystem service benefits that underpin well-being clusters

The results of the logit regression models illustrate how the five subjective well-being clusters were explained by certain sociocultural characteristics of respondents and their perception of ecosystem service benefits (Table 2).

The probability that respondents stated the contribution of the study area for their well-being in terms of *Access to services* was

TABLE 2 Model parameters of the five logit regressions with the clusters of well-being as dependent variables and socio-demographical characteristics and perceived ecosystem service benefits of respondents as explanatory variables. Only the statistically significant variables ($p < .1$) are presented for each cluster of well-being. C.I. refers to its 95% confidence. AIC: Akaike information criterion

Variables	Coefficient	Standard deviation	*z*	*p*-value	95% C.I.	
(a) Access to services						
Constant	−1.885	0.231	66.720	<.0001	−2.338	−1.433
Length of residency	−0.125	0.041	9.240	.002	−0.206	−0.045
Children	0.157	0.049	10.388	.001	0.062	0.253
Education	0.206	0.087	5.597	.018	0.035	0.376
Work in agriculture	−0.312	0.171	3.324	.068	−0.647	0.023
Food farm	−0.223	0.119	3.541	.060	−0.456	0.009
Harvested products	−0.201	0.103	3.802	.051	−0.403	0.001
Outdoor recreation	0.696	0.118	34.735	<.0001	0.465	0.928
Aesthetic values	0.368	0.145	6.470	.011	0.085	0.652
Habitat and biodiversity	0.397	0.131	9.223	.002	0.141	0.654
Environmental capacities	−0.336	0.129	6.819	.009	−0.588	−0.084
N = 2,244						
Log-Likelihood = 2,370.09						
AIC = 2,392.09						
Percent of correct predictions = 75.80						
(b) Tranquillity and social capital						
Intercept	1.452	0.265	30.080	<.0001	0.933	1.971
Knowledge	−0.292	0.053	30.566	<.0001	−0.395	−0.188
Education	−0.343	0.083	16.883	<.0001	−0.507	−0.179
Work in agriculture	0.430	0.157	7.537	.006	0.123	0.738
Harvested products	0.484	0.100	23.394	<.0001	0.288	0.681
Outdoor recreation	0.228	0.110	4.282	.039	0.012	0.443
Culture and heritage	0.285	0.113	6.395	.011	0.064	0.506
Habitat and biodiversity	0.300	0.124	5.911	.015	0.058	0.543
Gender—Male	−0.189	0.098	3.718	.054	−0.380	0.003
N = 2,244						
Log-Likelihood = 2,570.790						
AIC = 2,588.790						
Percent of correct predictions = 71.79						
(c) Health and nature						
Intercept	−1.445	0.231	39.247	<.0001	−1.897	−0.993
Landownership (yes)	0.289	0.096	9.012	.003	0.100	0.477
Education	0.189	0.078	5.835	.016	0.036	0.343
Work in agriculture (yes)	0.253	0.136	3.453	.063	−0.014	0.520
Farm products	0.461	0.109	17.839	<.0001	0.247	0.675
Harvested products	0.150	0.090	2.807	.094	−0.025	0.325
Outdoor recreation	0.216	0.101	4.552	.033	0.018	0.415
Aesthetic values	0.383	0.127	9.123	.003	0.134	0.631
Inspirational values	0.224	0.117	3.626	.057	−0.007	0.454
N = 2,244						
Log-Likelihood = 2,922.932						
AIC = 2,940.932						
Percent of correct predictions = 62.57						

(Continues)

TABLE 2 (Continued)

Variables	Coefficient	Standard deviation	*z*	*p*-value	95% C.I.	
(d) Cultural landscapes						
Intercept	−1.910	0.579	10.887	.001	−3.044	−0.775
Age	−0.400	0.137	8.499	.004	−0.668	−0.131
Knowledge	0.174	0.062	7.756	.005	0.051	0.296
Landownership (yes)	0.416	0.126	10.934	.001	0.169	0.662
Education	0.271	0.101	7.203	.007	0.073	0.468
Aesthetic values	0.332	0.159	4.353	.037	0.020	0.644
Culture and heritage	−0.292	0.132	4.942	.026	−0.550	−0.035
Inspirational values	0.556	0.157	12.547	.000	0.248	0.863
Environmental capacities	0.262	0.143	3.361	.067	−0.018	0.542
N = 2,244						
Log-Likelihood = 2022.406						
AIC = 2040.406						
Percent of correct predictions = 82.17						
(e) Place attachment						
Intercept	−6.461	0.768	70.841	<.0001	−7.965	−4.956
Age	0.632	0.182	12.110	.001	0.276	0.988
Length of residency	0.138	0.068	4.105	.043	0.005	0.272
Knowledge	0.293	0.079	13.792	.000	0.138	0.448
Education	0.247	0.117	4.483	.034	0.018	0.476
Work in agriculture (yes)	0.481	0.171	7.884	.005	0.145	0.816
Farm products	−0.357	0.157	5.131	.024	−0.665	−0.048
Social interaction	0.302	0.161	3.531	.060	−0.013	0.616
Inspirational values	0.405	0.179	5.133	.023	0.055	0.755
N = 2,244						
Log-Likelihood = 1591.42						
AIC = 1609.42						
Percent of correct predictions = 87.78						

negatively influenced by the time living in the area and whether the respondent worked in agriculture, and positively determined by having children and high level of education (Table 2a). In terms of ecosystem service benefits, the perception of outdoor recreation, aesthetic values, and habitat and biodiversity positively influenced the probability of respondents to consider *Access to services* as a well-being cluster, whereas provisioning services and environmental capacities influenced negatively.

Respondents were more likely to mention well-being items belonging to the *Tranquillity and social capital* cluster when they were women and/or worked in agriculture, while holding good self-estimated knowledge of the area and/or higher education level was negatively related with this cluster (Table 2b). The likelihood to mention well-being items under the *Tranquillity and social capital* cluster was positively influenced with the perception of particular ecosystem service benefits, that is, harvest of wild products in nature, outdoor recreation, culture and heritage, and habitat and biodiversity.

It was more probable for respondents to mention well-being items under the *Health and nature* well-being cluster if they owned land, worked in agriculture and/or were highly educated (Table 2c). The perception of this cluster was positively related to certain ecosystem service benefits, that is food products from farms, freely harvested wild products in nature, outdoor recreation, aesthetic and inspirational values.

The probability of respondents mentioning well-being items under *Cultural landscapes* was positively influenced by owning land, holding local knowledge and/or high educational level, while age was negatively related (Table 2d). As of ecosystem service benefits, the perception of aesthetic values, inspirational values, and environmental capacities was positively related to respondents mentioning *Cultural landscapes* as contributing to their well-being. However, the ecosystem service benefit of culture and heritage was negatively related to this cluster.

Finally, the probability of perceiving well-being items under the *Place attachment* cluster was positively influenced by age, the

number of years living in the area, having local knowledge, the level of education and working in agriculture (Table 2e). The perception of ecosystem service benefits that was positively related to the probability to identify *Place attachment* as contributing to well-being included social interaction and inspirational values, while the identification of farm products was negatively related to this cluster.

4 | DISCUSSION

4.1 | Free-listing approach to self-reported well-being

In this study, we placed emphasis on people's self-reported well-being and applied an inductive free-listing approach to explore how multifunctional landscapes contribute to people's subjectively perceived well-being. Such open free-listing approach, going beyond pre-defined typologies of well-being (such as Rogers et al., 2012; Smith, Case, Smith, Harwell, & Summers, 2013), has rarely been used in previous landscape research (as an exception see Bieling et al., 2014). However, there are studies in other contexts that try to understand well-being through free listing and related methods such as word association or open-ended questions with very broad prompts, for example with regard to food (Ares, De Saldamando, Giménez, & Deliza, 2014), refugee camps (Horn, 2009), labour migration (Meyer, Robinson, Chhim, & Bass, 2014) or older age groups (Douma, Steverink, Hutter, Meijering, & Bowers, 2017). A novel aspect of our study is also to contextualize the perceived well-being with perceived ecosystem service benefits identified through PPGIS.

Our results support former findings on conceptualizing well-being and quality of life, highlighting essential aspects that range from the basic needs in life to health, security, social relationships, heritage, identity, equity and justice (IPBES, 2018; Millennium Ecosystem Assessment, 2005). Also, the well-being items emerging from the responses to our survey comply with Stephenson's (2008) concept of forms, practices and relationships being constitutive for values ascribed to landscapes. When looking at how they fit to ecosystem service categorization, one-fourth, that is 10 items, do not essentially match with ecosystem service benefits that we mapped (namely small community, generations, happiness, cohesion, closeness to city, public and private services, economic prosperity, safety and raising children). Then again, the well-being items could well be associated with all the subjective and objective well-being components identified by Rogers et al. (2012), covering the physical, emotional and social needs of humans. The clusters of well-being items that we identified, however, reveal prominently the interlinked character of the perceived well-being items not expressed in pre-defined typologies. Such interlinkedness has been similarly highlighted by Russell et al. (2013) in their conceptualization of the four different ways in which humans interact with nature. These are based on embodied cognition theory and include knowing about an ecosystem, perceiving remote interactions with ecosystem components, interacting with ecosystem components or people, and living within an ecosystem. Similarly, Klain, Satterfield, and Chan (2014) highlight the interconnected and interdependent qualities of ecosystem services, values and benefits when narrated by people.

The inductive approach allowed us also to specify existing conceptualizations on human well-being and their connections to the natural environment. In this regard, our results suggest that the well-being contributions of multifunctional landscapes are connected to therapeutic well-being effects (Gesler, 1993), which are largely neglected in the ecosystem services literature. Our identified well-being items follow the model of therapeutic landscape experiences connected to deeply emotional, embodied connections with nature (Bell, Phoenix, Lovell, & Wheeler, 2015). Indeed, the identified well-being items particularly highlight the relational values (Chan et al., 2016; van Riper et al., 2017) among people as well as between people and the landscape.

4.2 | Self-reported well-being items in multifunctional landscapes

Multifunctional landscapes are characterized by various functions and values in space and time (Haines-Young & Potschin, 2004). The benefits that people obtain from them depend on the needs, choices and values at individual scale and are often related to particular places or landscape features (Bryce et al., 2016; Garcia-Martin et al., 2017). These place-based benefits connect to a wide heterogeneity of well-being contributions, concretely expressed by the 40 different items emerging in our empirical study across the 13 landscapes. Our translation of the survey responses to English may have had some effect in the content analysis (Wartmann & Purves, 2018). However, translation was done by local facilitators familiar with the context and coding by authors familiar with the landscape in question. Hence, we do not expect misinterpretation.

Enjoyment of tranquillity (50% of respondents mentioning) and the role of landscapes in facilitating social interactions (34% of respondents mentioning) were by far the most frequently mentioned well-being items (cf. Figure 3). Research on subjective well-being suggest that cross-national studies might reflect differences in national mood, that is the differences in personality (see e.g. Helliwell, 2006). Our study reflects this in terms of the item tranquillity. Already in the content analysis phase, we acknowledged the conceptual variation in this item including also the social aspect in the Mediterranean countries (see Section 2.4). Overall, our results are in line with Max-Neef's (1992) 'Matrix of Human Needs' that considers social relationships and overall social capital as outstanding and transversal features of happiness, well-being and quality of life (cf. Costanza et al., 2007). In fact, seminal work by Fowler and Christakis (2008) demonstrated that people's happiness is generally a collective phenomenon and depends on the happiness of others with whom they are connected. It also supports

well-being theory in positive psychology, which proposes positive relationships as an important predictor for well-being in addition to positive emotion, engagement, having meaning or purpose in the world and accomplishment (Diener, Oishi, et al., 2018; Diener, Seligman, Choi, & Oishi, 2018; Seligman, 2012). Evidence also shows that social connections including the sense of belonging to a larger community (Helliwell & Putnam, 2004; Portela, Neira, & Salinas-Jiménez,) and connections with nature (Howell, Passmore, & Buro, 2013; Mayer & Frantz, 2004; Nisbet, Zelenski, & Murphy, 2011) are positive correlates of well-being and interlinked to each other. Hence, social capital does not only have powerful effects on people's well-being (Fowler & Christakis, 2008) but is at the core of sustainability as a whole (Fowler & Christakis, 2008; Rogers et al., 2012).

Our results further point to the context-specific character of linkages between landscapes and human well-being, which is to some extent due to the significant role of the different biophysical landscape features in these areas (see also Bieling et al., 2014). In our study, the role of some landscape elements for well-being has been particularly emphasized. For example, the relevance of the sea, lakes, rivers and other forms of waterbodies was mentioned by 8% the respondents (c.f. Figure 3) although our study sites are mainly land-based. In Greece, the study site being a peninsula and the only site directly close to water, the importance of the sea and water is overwhelming (the item mentioned by 48% of respondents). This confirms the significance of water as an enjoyed landscape element (García-Llorente et al., 2012; Newell, 1997; Plieninger et al., 2013) with multiple psychological and social benefits (Bell, Graham, Jarvis, & White, 2017).

4.3 | Distinct clusters of well-being and the role of people and the local landscape

The relations of the individual well-being items revealed opposing trends. For example, those respondents who mentioned well-being items associated with nature and cultural traditions did not highlight items related to social interaction and safety (cf. Table 1). Likewise, those respondents that emphasized public and private services and closeness to a larger city did not mention sense of place, the importance of former generations and long-time residence in the area. These different notions of well-being were further highlighted by the identification of five distinct well-being clusters: *Access to services*; *Tranquillity and social capital*; *Health and nature*; *Cultural landscapes*; and *Place attachment* (cf. Figure 4). These clusters show varying importance across our study sites and alternatively stress the material aspects of living, cultural or biophysical landscape, or sociocultural aspects.

The clusters of *Access to services* and *Tranquillity and social capital* are influenced by the geographical location, rurality versus peri-urbanity divide and socio-economic context across Europe (Table S1; Moreno et al., 2017). The *Access to services* cluster has a distinct peri-urban profile linked with the study sites perceived as small communities close to larger cities in Sweden and Switzerland. All the sites have relatively high wealth levels (high GDP), low unemployment rates and high population densities (cf. Table S1). The peri-urban profile is in line with the overall phenomenon of families moving out from the hectic, dense and expensive cities to the surrounding more natural environments to increase well-being (Fertner, 2013; Mitchell, 2004).

On the contrary, the Mediterranean sites in Spain and Portugal as well as the Romanian site are the ones related to the *Tranquillity and social capital* cluster. These sites are rather rural with low wealth (low GDP) and education levels, high unemployment rates (except Saxon region [RO-SA]), high proportions of people working in agriculture and low population densities (cf. Table S1). It seems these landscapes support people's well-being in heterogeneous ways (cf. Figure 4) and through benefits across all ecosystem service categories (cf. Table 2b). The core of it lies, however, in the experienced tranquillity and the networks of social relations—two aspects that in Southern countries take place frequently in outdoor settings, while they are more typically located indoors in Northern countries. Furthermore, the result is supported by the strong role of family social relations in the everyday life in the Mediterranean region compared to other regions (Ganjour & Widmer, 2016). This cluster is also often found among women (who generally tend to report higher levels of well-being (Portela et al.,) and people with self-reported low knowledge of their local landscape (cf. Table 2b).

The cluster of *Health and nature* is linked to specific types of multifunctional landscapes in Switzerland (CH-SB), Spain (SP-MO) and Greece. These landscapes are related to agroforestry with tree crops (CH-SB: fruit tree orchards, especially cherry finely grained with forest islets, SP-MO: chestnut groves forming a mosaic with arable lands and forests, GR-KA: olive trees combined with arable crops) having centuries-long traditions. The characteristics of respondents linked to this cluster (owning land, working in agriculture, high education, cf. Table 2c) might contribute to their high awareness of the historical traditions and land use systems. Also, their perception of ecosystem service benefits (cf. Table 2c) is likely related to the landscape and food products that agroforestry offers and to spending time in nature to enjoy these benefits. Klain et al. (2014) similarly observed that food-related practices in landscape promote bundling of ecosystem services, benefits and values among coastal communities in Canada.

The cluster *Cultural landscapes* is related to the new generation of farmers with emphasis on young people, high level of education, owning land and knowing the area well, particularly at the Hungarian, French, Swiss (CH-FM) and Greek study sites. These landscapes contribute to people's well-being by providing both cultural (i.e. cultural heritage attributes and traditions) and biophysical landscape values (i.e. presence of forests and landforms; cf. Figure 4), reflected also in their perception of ecosystem service benefits (cf. Table 2d).

Finally, the well-being cluster of *Place attachment*, highlighting the items of sense of place and generations (cf. Figure 4), has a profile of elderly people, people having long residency in the area,

having high levels of education and mostly working in agriculture. Bieling et al. (2014) found similar patterns in their free-listing study where farmers expressed place attachment to have higher importance for well-being compared to visitors and residents. This cluster is distinctively related to the deeply rural Hungarian and Portuguese sites dominated by oak woodlands and oak pastures where the landscape contributes to residents' well-being mostly through social relationships and relational values.

Out of the sociocultural characteristics, the variables of level of education (through all five clusters) and field of work in agriculture (through four clusters) turned out to be the most common variables explaining perceived well-being across the study sites. Gender did not show high significance, although hypothesized as an interesting variable (cf. Russell et al., 2013). The sociocultural characteristics did not include for example land tenure, accessibility in the landscape or personal/family wealth level, which could be integrated to further analysis. For perceived ecosystem service benefits, there was no clear pattern but provisioning and some of the cultural services (outdoor recreation, aesthetics and inspiration) were common explaining variables through three clusters.

We considered well-being with respect to values and the perceived qualities of landscapes. However, a range of other ways in which values relate to well-being have not been considered here. Future research would therefore benefit from considering the experiential qualities of value and well-being in a wider theoretical context that includes direct experience with the setting (landscape) and wider psychological needs (Raymond & Raymond, 2019). People's perceptions of well-being may also change over time (Pearce, Cherrie, Shortt, Deary, & Ward Thompson, 2018) and it would be valuable to study the changes in perceived well-being at different stages in life or the effect of landscape change to well-being in future studies.

4.4 | Implications for planning and management

Developing a common baseline and shared understanding of well-being is one key challenge for intervention programs aimed at improving life satisfaction among individuals and groups. Our study advances knowledge provided by recent global assessments (e.g. IPBES, 2018) through a bottom–up approach that gives attention to the subjective and contextual contributions of the landscape to people's well-being (such as tranquillity). It complements the contributions identified from top–down assessments that might not be as relevant in the daily life of the people in these European landscapes (such as food and water security). Hence, place-based approaches and community-involvement have an important role in subjective measurement of and management for well-being. Recent scenario assessments reveal an urgent need to link top–down global modelling and scenario assessment approaches with more bottom–up and place-based assessments of values and well-being in relation to biodiversity and ecosystems (Kok et al., 2017; Raudsepp-Hearne et al.,). The methods presented here could help with such top–down and bottom–up integration.

Eggermont et al. (2015) advocate for 'innovative planning of agricultural landscapes', broadening the ecosystem service framework to include human well-being as a core principle of sustainable and resilient landscapes. Hence, for operational landscape management, it is important to not only measure ecosystem services in multifunctional landscapes but also to explicitly address the link from landscapes to human well-being (Rieb et al., 2017; Sangha, Le Brocque, Costanza, & Cadet-James, 2015). In light of our results, this stresses the need for landscape management to nurture a diversity of well-being items, including access to services, tranquillity and social capital, health, cultural landscapes and place attachment, catering for different needs and interests. These should be brought into the particular policies for land management such as the EU Common Agricultural Policy (European Commission, 2014) and the Nature-Based Solutions approach (European Commision, 2015).

At local landscape level, interaction with family, friends and community, the second most mentioned well-being item by our respondents, has much potential for landscape management. Overall, social capital has substantial effect on human well-being and people directly value engagement with others (Helliwell & Putnam, 2004; Portela et al.,). This could be harnessed, for example, to the development of multiuse public green spaces, supporting linking generations, or meshing voluntary and professional workers in more effective ways for multifunctional landscape management. Such initiatives would also support inclusion of relational values in landscape management. Promoting positive links between people and nature may also motivate pro-environmental behaviour change (Nisbet et al., 2011) which is among the much needed transformations to achieve sustainable societies (Sachs et al., 2019).

5 | CONCLUSIONS

Our study resulted in a rich set of well-being items, creating in-depth insight into the diverse ways that people in different parts of Europe express the importance of multifunctional landscapes for their well-being. The identified clusters of well-being highlight that landscape-supported well-being is related to multiple interlinked items that can inform the definition of collective visions of well-being in future research. Hence, it thereby advances the many existing typologies identifying separate well-being components or dimensions. The results have relevance for landscape planning and management providing empirical evidence of the need for place-specific analyses and careful consideration of preferences and needs of local people in order to help identifying and implementing sustainable futures in multifunctional landscapes, and beyond.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHORS' CONTRIBUTIONS

All the authors contributed to conceptual design, interpretation of results, writing or revising text, approved the submission and agreed on accountability. N.F., M.T., E.O.-R. and T.P. contributed to survey design and data acquisition. B.M.-L., N.F., E.O.-R. and M.T. contributed to data analysis.

DATA AVAILABILITY STATEMENT

The anonymous survey data that support the findings of this study have been deposited in IDA research data storage service: http://urn.fi/urn:nbn:fi:att:2fc777d5-e7f0-4efd-9560-5bfd292fed73.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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