UNIVERSITÀ DEGLI STUDI DI PADOVA
Dipartimento Territorio e Sistemi Agro-forestali
Department of Land, Environment, Agriculture and Forestry

Corso di laurea magistrale/Second Cycle Degree (MSc) in Forest Science

Financing nature conservation through ecotourism: Exploring the introduction of parking fees in Cansiglio forest

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Index

List of figures

List of tables

Abbreviations and acronyms

BT	Benefit Transfer
CICES	Common International Classification of Ecosystem Services
CVM	Contingent Valuation Method
DCE	Discrete Choice Experiment
ES	Ecosystem Services
HP	Hedonic Price
MA	Millennium Ecosystem Assessment
PES	Payment for Ecosystem Services
RPM	Revealed Preference Methods
SPM	Stated Preference Methods
TCM	Travel Cost Method
TEEB	The Economics of Ecosystem and Biodiversity
TEV	Total Economic Value
WTP	Willingness to Pay

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Abstract

The growing demand for nature-based recreation, especially after COVID-19, highlights how people are motivated to visit natural areas, such as forests. The Cansiglio Forest (Veneto region, Northern Italy) is interested by an intense tourist flow during the high season (summer and autumn), which is impacting the area with cars parked in inadequate places (by the side of the road), and air and noise pollution. With an increased demand for cultural and regulating ecosystem services (ES), there are also increased costs for the managers of the natural areas, who need further funding. If visitors are willing to pay (WTP) for the provision of such ES, the managers can use these resources to reinvest them in the area by managing congestion and improving the ES and activities related to it. In this light, the managers of Cansiglio forest (Veneto Agricoltura) are considering charging a parking fee as a way to enable this payment. To tailor parking fees to visitors' willingness to pay to support the maintenance of ES, the latter can be estimated via non-market valuation techniques, such as Discrete Choice Experiments (DCE). DCE is a survey-based tool that allows estimating the WTP values for goods and services and elicits which site characteristics (such as ES) (attributes) are determinants of people's preferences. The present study proposes a framework to elicit visitors' WTP value for the ES provided by Cansiglio Forest, including a review of the attributes most commonly used in similar studies, examples of parking fees being charged in natural areas, and motivational theories which help accounting for how socio-psychological aspects can affect WTP values. More specifically, the push and pull framework is proposed as the backbone for the future survey, using the Recreation Experience Preference Scale (REP) as a tool for investigating the push factors (motivations) and the DCE as the tool for pull factors (site characteristics). A list of attributes and a list of motivations are suggested as inputs for further discussions among the stakeholders of Cansiglio, representing the first step of the future survey. Additional aspects related to how parking fees are being charged in other natural areas are exposed. The results of this thesis represent a starting point for determining the value of ES provided by Cansiglio Forest, as a tool to define an appropriate parking fee and also for discussions around potential policies in Italy aiming at supporting the maintenance of natural areas.

Prefazione

La crescente domanda di attività ricreative basate sulla natura, soprattutto dopo il COVID-19, evidenzia come le persone siano motivate a visitare aree naturali, come le foreste. La Foresta del Cansiglio (Regione del Veneto, Nord Italia) è interessata da un intenso flusso turistico principalmente durante l'estate e l'autunno, che sta impattando l'area con auto parcheggiate in luoghi inadeguati (a lato della strada), e l'inquinamento atmosferico e acustico. Con una maggiore domanda di servizi ecosistemici culturali e di regolazione (SE), aumentano anche i costi per i gestori delle aree naturali, che necessitano di ulteriori finanziamenti. Se i visitatori sono disposti a pagare per la fornitura di tali SE, i gestori potranno reinvestire queste risorse nell'area per gestire la congestione e migliorare i SE e le attività ad essa correlate. I gestori della Foresta del Cansiglio (Veneto Agricoltura) stanno valutando di addebitare una tariffa di parcheggio per richiedere questo pagamento. Per adattare le tariffe di parcheggio alla disponibilità dei visitatori a pagare per supportare la manutenzione di SE, quest'ultima può essere stimata tramite gli esperimenti di scelta (dall'inglese DCE). DCE è uno strumento basato su sondaggi che permette di stimare la disponibilità a pagare per beni e servizi e a chiarire quali caratteristiche dell'area (attributi) determinano le preferenze delle persone. Il presente studio, propone un framework per ricavare il valore della disponibilità dei visitatori di pagare per i SE forniti dalla Foresta del Cansiglio, inclusa una revisione degli attributi più comunemente utilizzati in studi simili, esempi di tariffe di parcheggio addebitate in aree naturali e teorie motivazionali che aiutano a spiegare come gli aspetti socio-psicologici possono influenzare i valori della disponibilità di pagare. In particolare, il framework *push and pull* si propone come struttura portante per la futura indagine, utilizzando la *Recreation Experience Preference Scale* (REP) come strumento per indagare i fattori di spinta (motivazioni) e il DCE come strumento per i fattori di attrazione (caratteristiche dell'area). Un elenco di attributi e un elenco di motivazioni vengono suggeriti come input per ulteriori discussioni tra gli stakeholder del Cansiglio, rappresentando il primo passo della futura indagine. Vengono esposti ulteriori aspetti relativi al modo in cui le tariffe di parcheggio vengono addebitate in altre aree naturali. I risultati di questa tesi rappresentano un punto di partenza per determinare il valore dei SE forniti dalla Foresta del Cansiglio, come strumento per definire una tariffa di parcheggio adeguata e anche per discussioni su potenziali politiche in Italia volte a sostenere la manutenzione delle aree naturali.

1. Introduction

Recreation in natural areas, or nature-based tourism, has become a popular activity, with increasing demand over the past years, especially in industrialized countries (Juutinen et al., 2011; Steven et al., 2017; Xu et al., 2020; Franceschinis et al., 2022). In the United States of America, for example, the number of people visiting national parks in the country moved from 285.9 million in 2000 to 327.5 million in 2019, an increase of around 15% in the two decades. After that period, however, the number decreased to 297.1 million in 2021 (NPS, 2022a). According to the National Park Service (NPS, 2021), this decrease in the number of visitors is related to temporary park closures and restrictions in response to the COVID-19 pandemic. The global crisis caused by the virus, on the other hand, made it evident and even increased the importance and need of spending time outdoors and reducing stress levels, and, as a consequence, in some regions, the visitation to natural areas increased considerably, especially those near urban centers where access was possible (Grima et al., 2020; da Schio et al., 2021).

Reconnecting with nature, enjoying the landscape, hiking, climbing, doing picnics, increasing knowledge of the territory, learning historical aspects of the region, and observing wildlife are some of the many nature-based activities found in forest areas (Manfredo et al., 1996; Haines-Young & Potschin, 2018). These are known as cultural services, which are just one of the ecosystem services (ES) provided by forests. According to the Millenium Ecosystem Assessment (MA), the ES can be divided into supporting services (nutrient cycling, soil formation), provision services (food, water, wood, fiber, fuel), regulating services (climate regulation, water purification, disease regulation), and cultural services (aesthetic, spiritual, educational, recreational) (MA, 2005). The increased importance people place on these ES underlines the fact that the value of forests goes beyond the timber price, especially in the context of climate change (TEEB, 2010).

A large number of visitors in natural areas, however, can potentially cause some negative consequences, such as a reduction in the visitor's satisfaction, damage to flora and fauna, impact on conservation projects, conflicts with the local community through competition for local services, increase litter and pollution, impact local infrastructure, reduce the efficiency of tourism services, and increase operating costs for the local manager of the natural area (World Tourism Organization, 2004; Kohlhardt et al., 2018; Thiene et al., 2019; Ferguson et al., 2022). For this reason, the idea of implementing entrance or parking fees became popular in some places (WTO, 2004), such as the USA, where the first fee was implemented in 1908 in Mount Rainier National Park to support the management of the area (Solop et al., 2003).

The creation of entrance and parking fees is a tool for congestion management and an increase in revenues for the local management body, among other applications (Chase et al., 1998; Wilson & Tisdell, 2003; Herath & Kennedy, 2004). If the manager invests these payments into the forest, so that the ES are maintained or improved, this could be interpreted as a type of Payment for Ecosystem Services (PES) as defined by Wunder (2015). In addition, studies point out that the level of acceptance for paying an entrance or parking fee from visitors and potential visitors of a natural area increases when it is known that the money will be destined for the maintenance and improvement of the park itself, and not just to the landowner's own pockets (Tisdell & Wilson, 2003; Phillip & Macmillan, 2006).

Even though there is an increasing trend in demand for ES, their economic valuation remains challenging (United Nations, 2014). The recreation services provided by forests can be characterized as public goods because they are non-rival and non-excludable (European Commission, 2019), so often there is not a well-defined market for them (Weiss et al., 2011). This is especially true in Northern Europe, where traditionally all areas, public or private, are considered to be of free access to everyone (Hanley et al., 2002). As we move south in Europe, however, there has been some discussion as to whether fees should be implemented: France considered it as a "completely taboo" suggestion for the country, however, from 2020 the discussions around implementing entrance fees to visit French national parks have been happening, as a way to deal with the reduced funding issues (Connection France, 2020). In Italy, parking fees combined with shuttle service are charged in some natural areas as a way of managing congestion issues and keeping the entrance free to everyone who wishes to visit those areas (Il Dolomiti, 2022). If the recreational use of a forest is indeed a public good, the marginal cost of an additional user would be zero and there would not be motives for creating a fee for visitors (Epsey, 2005). As previously mentioned, however, congestion and ecological damages might increase with the number of visitors, which ends up increasing operating costs, implying, according to Epsey (2005, p.6), a "positive marginal cost of an additional user".

Because of these conflicting characteristics, there is not yet a market with well-defined prices for recreation services and other ES in forests. Aiming to evaluate these non-market values, valuation techniques known as revealed and stated preference approaches were developed, involving tools such as the travel cost method (TCM), contingent valuation (CVM), and discrete choice experiment (DCE), among others (UN, 2014).

Choice experiments have become a popular tool in the valuation of ES in recent decades, since it has some advantages when compared to other approaches, such as CVM and TCM (Adamowicz et al., 1998; Hanley et al., 1998). This valuation approach, coupled with theories to investigate tourists' motivations might help managers of protected areas, who are facing a major challenge in

balancing conservation goals and tourism business demand when managing natural areas (Juutinen et al., 2011; Franceschinis et al., 2022).

Studies using the DCE approach show that recreational infrastructure (such as picnic areas, dedicated trails, and toilets) and the chance to spot wildlife are among the main attributes that visitors and potential visitors find in visiting a natural area. When assessing individuals' WTP for a natural area, however, other attributes should be considered, so that not only tourism but also nature conservation is taken into consideration, reflecting the value people place on nature and the ES provided by it (Cerda et al., 2018a).

When placing a value on the conservation of a natural area, not only the site characteristics (attributes) of the area that attracts a person to visit it are taken into consideration, known as pull factors, but also the push factors, which refer to the psychological aspects of individuals, who take into account their motivations, values and environmental beliefs when considering the intention to perform a certain behavior, such as visiting a natural area and WTP a premium price for it (Dann, 1977; Crompton, 1979; Azjen, 1985; Stern et al., 1999). A lot of research was carried out to assess the push factors, with the development of frameworks and models to assess eco-tourists motivations and behavior. Still, much less has been done to use these psycho-social models to assess their predictive power to explain WTP (López-Mosquera & Sánchez, 2012).

In Italy, more specifically in the Italian Pre Alps, due to its landscape beauty, its historical aspects, and its proximity to the plain area, where there is a high concentration of people, there is a huge potential for recreation services provided by the forest (Thiene & Scarpa, 2008; Veneto Agricoltura, 2020a). As stated by its management body during a meeting in January 2022, the Cansiglio forest, located in the pre-Alps, receives many visitors every year, especially during peak seasons, which is impacting the area due to crowding, resulting in traffic congestion, cars parked in inadequate places (by the side of the road), air and noise pollution.

Considering the increasing demand for nature-based recreation, coupled with the demand for areas with fresh temperatures due to climate change, there is a high possibility of further intensification in the number of tourists in the European Alps (Probstl-Haider et al., 2021). Therefore, managers of natural areas must develop strategies to deal with environmental impacts and potential conflicts among diverse visitor groups with different preferences (Schirpke et al., 2021).

Based on this issue, Veneto Agricoltura - the managers of the Cansiglio Forest – are considering the introduction of a parking fee as an instrument for managing car congestion and collecting funds for improving the provision of ES in the forest. As such, it is crucial to define a framework to measure people's preferences for those ES and estimate their WTP values for their maintenance

and enhancement. Furthermore, from the managerial perspective, research on existing parking fees in other protected areas in Italy and other countries could be useful to understand how much they are being charged and how they are being collected (via an app, parking meter, paid at the info point, etc.), thus supporting the management body on their decision of how to implement the parking fee in the study area.

A study named BIOΔ4 was published in 2020 using Cansiglio as one of the study areas to create a set of indicators to measure biodiversity and identify PES schemes in forest areas. One of the results of this study was precisely the suggestion of implementing a parking fee in Cansiglio to support the costs related to monitoring activities of cars parked in inadequate areas. BIOΔ4 project's conclusions refer to the need for a future evaluation of how much to charge for the ES. One of the possibilities suggested was measuring WTP through stated preference methods and benchmarking of parking fees charged in natural areas (Veneto Agricoltura, 2020a).

This thesis is thus aligned with the previous project carried out in the study area (BIOΔ4) and, on a broader scale, with the objectives of the Italian Forest Strategy published in February 2022, which states recreational services in forests as one of the actions for improving the efficiency in the use of forest resources for sustainable development of the country, and states the presence of ad hoc scientific studies as one of the indicators to reach that objective (MIPAAF, 2022). This study is also aligned with goals 11 (Sustainable cities and communities) and 15 (Life on land) of the Sustainable Development Goals (SDG) of the United Nations, specifically the targets "Strengthen efforts to protect and safeguard the world's cultural and natural heritage", and "Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems" (UNDP, 2022).

1.1 Problem statement

Based on the need to address the congestion issue in Cansiglio in addition to the need for funding management and monitoring activities related to it, the present study aims to propose inputs for a future survey aiming to determine the value of a potential parking fee tailored on the willingness to pay of visitors and potential visitors for the maintenance and enhancement of ecosystem services provided by the Cansiglio forest. Such information will be a crucial tool to generate additional income to manage congestion and for maintaining and improving those benefits derived from the ecosystem.

1.2 Objectives and research questions

The study mainly aims at providing inputs for designing a future survey focusing on estimating the economic value of the ES provided by the Cansiglio Forest. Such information would be used to tailor a parking fee to visitors' WTP to

maintain and enhance those ES. Based on this general objective, the following research questions are proposed:

1. How is the eco-tourists' WTP for ES addressed in existing literature?
2. What are the examples of parking fees in natural areas worldwide?
3. Which are the most common theories used to investigate eco-tourists motivations and behavior?

Based on the above, the specific objectives are:

1. Determine which site characteristics and/or activities have been used in the recreational literature that should be considered on a potential DCE in Cansiglio;
2. Explore the current practices of existing parking fees in natural areas worldwide to provide inputs for the Cansiglio site;
3. Determine which motivational theory should be considered to address tourists' motivations towards paying for the ES in Cansiglio.

1.3 Structure of the thesis

This thesis is divided into seven parts: The theoretical background is established in chapter 2, aiming to define key concepts and explain the assumptions that guided the thesis, starting from the most acknowledged definitions of ES, which ES are usually involved in recreation in natural areas and the opportunities and threats that arise from the relationship of nature conservation and nature-based tourism with a special focus on the use of fees as tools to manage tourist flow and reflect WTP for ES, followed by the actual valuation techniques used to capture eco-tourists WTP to improve those ES.

The methodology used to reach the objectives of the research is presented in chapter 3, first with a description of the study area, then moving to data collection and analysis. The results are then presented in chapter 4, which is divided into two sections: The first section shows the valuation approaches found in the literature dealing with ES and congestion management, then moves specifically to the most common attributes used in DCE found, followed by a suggestion of attributes that should be considered in the future survey to be carried out in Cansiglio, including the parking fee. This section ends with the actual examples of parking fees in natural areas around the globe, focusing on Italy. The second and last section of this chapter adds to the future survey by compiling the main motivational theories found in the ecotourism literature and suggesting the selection of one theory, namely "push and pull", to incorporate socio-psychological aspects into the survey.

Chapter 5 presents the discussions related to theoretical, managerial, and policy implications of the results found in the previous chapter, as well as the limitations found throughout the thesis development and suggestions for future research. The conclusions drawn from the results and discussion are presented in chapter 6. Finally, the last part of this document is composed of a list of the references used in the research.

2. Theoretical background

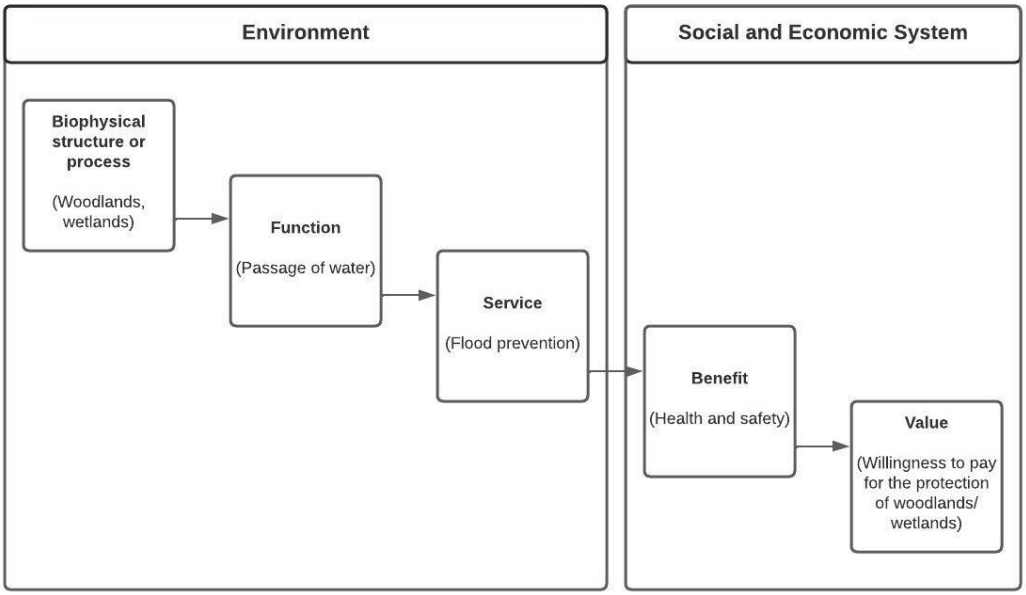
This chapter presents the theoretical framework on which the thesis is based. The first section details the evolution of the concept of ecosystem services and the importance of considering them in decision-making processes, with a focus on regulating and cultural ES in Europe. The relationship between those ES and nature-based tourism is explored in the second section with some examples of opportunities and issues deriving from this relation, ending with a special focus on the use of entrance and parking fees as tools to manage tourist flow and reflect WTP for ES. Finally, the third section deals with the economic valuation techniques used to evaluate the WTP for ES, with a focus on the discrete choice experiment method and the possible contribution of motivational theories.

2.1 Ecosystem services definition

Ecosystem services are defined as the benefits people receive from ecosystems, such as supporting services (nutrient cycling, soil formation), provision services (food, water, wood, fiber, fuel), regulating services (climate regulation, water purification, pollination, disease regulation), and cultural services (aesthetic, spiritual, educational, recreational). This wildly acknowledged definition of ES was stated by the Millennium Ecosystem Assessment (MA) in 2005, a result of the work of more than 1,360 experts who collaborated to create a state-of-the-art assessment of the conditions of the ES worldwide, due to the growing concern on the consequences of anthropic changes in the ecosystem (MA, 2005).

These benefits people obtain from ecosystems, or in other words, the relationship between people and nature can be interpreted as a result of the so-called “cascade effect” (Figure 1), which starts from the biophysical structure or process, such as woodlands, wetlands or other habitats that have a function of, for example, slowing the passage of water, which in turn can prevent flooding, something that humans find useful. This can be interpreted as a service provided by the ecosystem and if people perceive the benefits of this service, they can give value to it, monetary or not (Haines-Young & Potschin, 2010).

Figure 1: The cascade model



Source: Adapted from Haines-Young & Potschin (2010)

Considering the logic behind the cascade effect and the increasing levels of biodiversity loss, the changes in the provision of ES can be connected to impacts on the wellbeing and the economy and based on this issue, the initiative called The Economics of Ecosystem and Biodiversity (TEEB) was created in 2007 to mainstream the values of ES (TEEB, 2010). TEEB has developed many reports calling attention to the need for valuation that consider the economic importance of ES in decision-making processes, since “nature is often invisible in the economic choices we make” (Sukhdev et al., 2014 p.4).

In 2012, a group of 94 States combined forces to discuss science and policy relationships when dealing with sustainable use of biodiversity and ES, creating the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The IPBES is thus an intergovernmental body composed of representatives of each member state, which now has 140 members, plus experts from around the globe who have as goal the assessment of specific themes and methodologies related to biodiversity and ES, identify tools to support policies, and build capacity and knowledge for sustainable development (Díaz et al., 2015; http://www.ipbes.net).

With the recognition of the growing importance of ES to human well-being in the light of the increasing number of different definitions of ES found in the literature, the standardization of definitions of each ES was considered necessary, to facilitate the development of environmental-economic accounting methods and comparisons (Haines-Young & Potschin, 2018). As a response, the Common International Classification of Ecosystem Services (CICES) was created by the European Environment Agency (EEA) in 2013 and revised in

2017 (CICES, 2022). This classification involves five hierarchical levels which get increasingly more specific: (i) section, (ii) division, (iii) group, (iv) class, and (v) class type. Table 1 shows the definition of each ES present in the first broader level of CICES classification (section), which is connected to some of the categories mentioned in the MA of 2005.

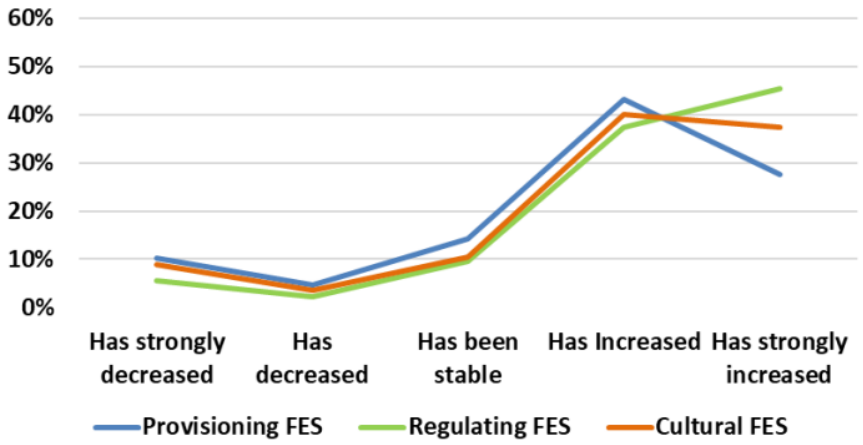
Table 1: Definition of ES sections

Sections in CICES V5.1	Definitions
Provisioning	All nutritional, non-nutritional material, and energetic outputs from living systems as well as abiotic outputs (including water)
Regulating and maintenance	All the ways in which living organisms can mediate or moderate the ambient environment that affects human health, safety, or comfort, together with abiotic equivalents
Cultural	All the non-material outputs of ecosystems (biotic and abiotic) that affect the physical and mental states of people

Source: Haines-Young & Potschin (2018)

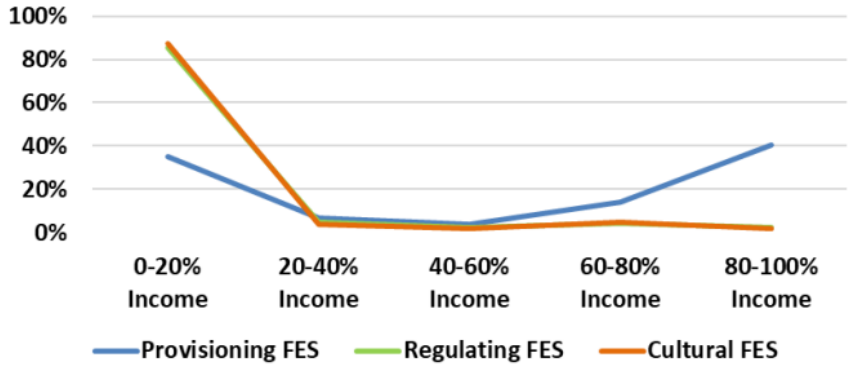
In Europe, studies evidence that there is a gap between the supply and demand of cultural and regulating forest ES. From the demand side, the regulating and cultural forest ES were regarded as most important, while provisioning services were evaluated as considerably less important, according to the 10,391 respondents of a survey carried out in 33 European countries (Roitsch et al., 2022, cited by Winkel et al., 2022). Similar results were observed by Torralba et al. (2020), who surveyed 1,186 forest owners and managers in Europe. Results show that ES demand from society has strongly increased, especially the regulating and cultural ones (Figure 2). From the supply side, however, for 80% of the respondents, a great part of the forest owners' and managers' income is from provisioning ES (mostly wood) and less than 20% of their income is represented by regulating and cultural ES (Figure 3) (Torralba et al., 2020).

Figure 2: Demand for forest ES from society, as perceived by forest owners and managers in Europe



Source: Torralba et al. (2020)

Figure 3: Relative income from forest ES of forest owners and managers in Europe



Source: Torralba et al. (2020)

To address this mismatch between the demand for cultural and regulating services from society and limited income from these ES for forest owners and managers, policy integration and creation of incentives for ES in Europe is suggested, considering that, even though there are forest and bioeconomy strategies in Europe that acknowledge ES, there is still a lack of concrete incentives to manage forests for recreation and tourism, for example (Winkel et al., 2022). In Italy, the National Forest Strategy mentions the growing importance of ES. As one of its actions, there is the promotion of cultural ES of forests, to be measured by three indicators: (i) the number of events in the forest for different purposes by type (culture, tourism and recreation, sports), (ii) allocation of public financial resources, and (iii) presence of ad hoc scientific studies and investigations (MIPAAF, 2022).

2.2 Ecosystem services and nature-based tourism

The cultural services mentioned in section 2.1 (all the non-material outputs of ecosystems that affect the physical and mental states of people) involve the characteristics of the environment that enable activities involving health, aesthetics, education, entertainment, symbolic, and spiritual interactions, such as sports (i.e. hiking, climbing), watching wildlife, research, relaxing and enjoying the beauty of nature, learning about history, connecting spiritually, making films, and writing books (Haines-Young & Potschin, 2018). Those are some of the benefits people seek when visiting natural areas and other natural environments. This visit to a natural area is known as ecotourism or nature-based tourism (Ceballos-Lascuráin, 1987, as cited in Stewart & Sekartjakrarini, 1994). According to Donohoe and Needham (2006), six principles should be considered in ecotourism: (i) nature-based, or in other words, activities that occur primarily in nature, places with less human interference; (ii) preservation/conservation, related to the awareness of ecosystem requirements, the maintenance, and improvement of ecosystems; (iii) environmental education, to encourage interaction with nature and increase

awareness and understanding of natural and cultural heritage; (iv) sustainability, related to the integration of conservation, satisfaction of human needs and economic development; (v) distribution of benefits, guaranteeing equitable access to resources, and consider traditional knowledge for local management; (vi) ethics/responsibility, taking into consideration the potential impacts on the natural areas as a consequence of travel, and consider ecological aspects in decision-making.

It could be said that there is a paradox between nature-based tourism and nature conservation: on the one hand, when surrounded by nature and engaging in environmental education activities, the visitor's awareness towards nature conservation increases, on the other hand, the visit to natural areas result in impacts on the environment, for example through the creation of tracks and trails, trampling of vegetation, soil erosion, pollution (waste disposal and carbon emissions), and disturbance of wildlife (noise and walking in breeding areas) (Jacobson & Lopez, 1994; Steven et al., 2011; Venohr et al., 2018; Wolf et al., 2019). It is thus necessary to manage tourist flow and activities so that ecotourism is an ally to nature conservation instead of a threat. Those impacts on the environment and the consequent need for tourist management were noted by the International Union for Conservation of Nature (IUCN) (Leung et al., 2018). Some alternatives to deal with crowding issues have been proposed by IUCN in its report called "Tourism and visitor management in protected areas", such as the restriction of access to certain areas, and the creation of user fees (entrance fees) (Leung et al., 2018). These management responses, however, mean extra expenditures for the managers of the natural areas, who often face funding issues, and need to find further resources (WTO, 2004). This gap can potentially be filled with tourism revenue (Huwyler et al., 2014; Thiene et al., 2019). An increased number of tourists could raise revenues for a touristic area but, as seen, could also potentially impact nature. However, a balance between the number of visitors and nature conservation can still provide funding for managing a natural area and generate conservation benefits, as was studied by Bednar-Friedl et al. (2012) in the Austrian Alps.

If the environmental awareness of visitors leads them to be willing to spend money for reducing crowdedness in natural areas, managers can collect funding to sustain the maintenance and improvement of the area. This could be done, for example, via the introduction of a fee (WTO, 2004; Von Haefen & Lupi, 2022). In Europe, individuals like to engage in nature-based tourism and they see the forests as a destination for this kind of activity (Ranacher et al., 2017); however, at the same time, studies highlight how visitors to forests and other natural areas tend to prefer less crowded situations, so congestion in natural areas can not only have environmental impacts but in some cases also decrease visitors' satisfaction (Usyal et al., 2012; Leung et al., 2018).

A decreasing visitor satisfaction could be reflected in monetary terms: visitors are often found to be WTP to avoid crowded situations, also in the light of an improvement in the conservation of biodiversity. For instance, Crespo-Cebada et al. (2020) found in their survey of visitors of a natural park in Spain that they are WTP for an entrance fee if there are higher biodiversity levels and lower numbers of visitors in the study area. Thiene et al. (2017) found in their research involving visitors of a park in the Italian Alps that they are WTP more for an entrance fee if they encounter fewer people on the hiking trails. Jeanloz et al. (2016) found that for a national park in Belgium, among other attributes of the park, stakeholders think it is very important to consider an increase in biodiversity refuge when investigating visitors' WTP for an entrance fee in the area. Similar preferences were found in countries outside of Europe as well: Kohlhardt et al. (2018) found in Canada that visitors are WTP more for an entrance fee to have fewer people at viewpoint areas of the natural park; and León et al. (2015) found that in Colombia, visitors of a national park are WTP for an entrance fee if there are fewer tourists per month visiting the area as a way to protect local biodiversity and improve tourism experience.

Parking and entrance fees in natural areas are used for various reasons: by increasing revenues, there could be less dependency on government funds, allowing the improvement of park management activities, visitor facilities, protecting the environment from overcrowding, and achieving other social purposes, such as environmental education (Chase et al., 1998; Wilson & Tisdell, 2003; Herath & Kennedy, 2004). Focusing on the overcrowding issue, parking/entrance fees can be used as a tool for reducing intense car congestion in natural areas. For instance, the US Park Service proposed an increase in the entrance fee during peak season in selected parks in the US (NPS, 2017). Similarly, in Scotland, the implementation of a car park fee is justified as means to manage the elevated number of recreation visitors in the Loch Muick area (Phillip & Macmillan, 2006). Hanley et al. (2002) found a 31% reduction in the number of trips if a £5/day car-parking fee was introduced in Scotland. Kohlhardt et al. (2018) found that the number of visitors to Garibaldi Park (Canada) would reduce by 50% if even small entrance fees were charged.

In addition to the reduction of touristic flows to a specific area, another outcome of charging parking fees is to move flows from one site to another (typically from an overcrowded site to another with no congestion). For example, Steiner & Bristow (2000) found that about 17% of the visitors in the Yorkshire Dales National Park (United Kingdom) would go elsewhere if they had to pay. Von Haefen and Lupi (2022) found that if there was no WTP for a US$9.65 gate fee to avoid doubling of congestion in their study area (Gulf Coast sandy beaches in Mississippi, Alabama, and Florida), it would result in a 22.4% reduction in trips and a 6.9% increase in trips to other coastal areas in the region, but if there was

a WTP for a gate fee instead, the revenues of the study area would increase and the visitors would have an increase in welfare.

Some studies, however, found that there can be a certain level of inelasticity in demand for certain natural areas, meaning that the number of visitors might not reduce significantly with the implementation of a parking/entrance fee (Herath, 2000). Witt (2019) estimated that an increase of 26% in the entrance fee in Mexico resulted in just a 5% decrease in visitation. Weitowitz et al. (2019) point out some limitations of charging parking fees in reducing visitor pressure in natural areas, such as when no alternative transportation mode exists and when the visitors' willingness to visit that specific site given their motivations and the site attributes is high. The authors, however, mention that despite these limitations that might arise in some areas depending on the context, the use of such fees still presents the advantage of generating additional revenue for the management of the area.

Parking and entrance fees could be a potential tool for managing congestion in some protected areas; however, as stated by Van Zyl et al. (2019) - and emerged during the discussions with Veneto Agricoltura – the information for fee setting is limited, and management authorities often find difficulties when trying to set a price. Van Zyl et al. (2019) carried out a benchmark of national parks entrance fees by country: The authors mention the difficulty of the lack of studies revealing benchmarks on the matter and that it could be a powerful tool for assisting the managers of protected areas when deciding the value of potential fees.

One possible explanation for this lack of data could be the characteristic of the recreation activities in forests, considered a public good (EC, 2019). Market-based approaches for ES are proposed as a solution for increasing the supply of cultural ES, however, the fact that many of those ES have public goods characteristics, keeps them from being easily marketed (Weiss et al., 2011). This is especially true in Northern Europe, where all natural areas, public or private, are traditionally considered of free access to everyone (Hanley et al., 2002). Finland openly states that no entrance fee is charged in the National parks (Metsähallitus, 2022). The same situation is observed in Sweden (Sveriges Nationalparker, 2022). As we move south in Europe, however, there has been some discussion as to whether fees should be implemented: France considered it as a "completely taboo" suggestion for the country, however, from 2020, the discussions around implementing entrance fees to visit French national parks have been happening, as a way to deal with the reduced funding issues (Connection France, 2020).

In other countries, such as the USA, entrance fees are a long stand tradition, and it is possible to easily find the fees of each national park on the National Park Service website (https://www.nps.gov/aboutus/entrance-fee-prices.htm). In

fact, the first entrance fee in a natural area in the country was established in 1908 at the Mount Rainier National Park (Solop & Hagen, 2003). In Costa Rica, Chile, South Korea, and Australia entrance fees to national parks are also easily found online, on the webpage of the national parks management bodies (SINAC, n.d.; CONAF, 2021; KNPS, 2022; NSW, 2022).

Another aspect to be considered is the relationship between acceptance and transparency. Studies reveal that if the visitors know that their payment is being destined for conservation activities and improvement of facilities inside the natural park, their acceptance of the user-pay principle and even their WTP increases (Wilson & Tisdell, 2003; Phillip & Macmillan, 2006; Nyaupane et al., 2009).

The goal of establishing a parking fee instead of an entrance fee in Cansiglio avoids the issue of public access to the natural area, which as will be seen in section 3.1, is accessible to everyone. Visitors would still be free to enter the area and the parking fee would be related to the maintenance and improvement of ES in Cansiglio. Based on this aspect, natural areas charging parking fees were searched to characterize the state of the art of this strategy, with the aim of supporting Veneto Agricoltura in their decision to potentially create a parking fee in Cansiglio.

2.3 Valuation of ecosystem services

As seen in the previous sections, given the demand for ES, the threats of anthropic activities pose to its maintenance, and the limited income of these ES for forest owners and managers, market-based incentives have been discussed as a solution (Winkel et al., 2022). Marked-based instruments for ES are an attempt to correct market failure, since some of them have public goods characteristics, meaning that exclusion is not possible (Alpizar et al., 2001).

One of the challenges for the implementation of such instruments is related to determining how much the payment would be in monetary terms since there is not a well-defined market for such environmental services (regulating and cultural services) as we can find for commodities such as timber and food (provision services) (Costanza et al., 2011). Since there is not a well-defined market for those ES, some tools have been developed to capture their value, known as non-market valuation techniques (Smith, 1993).

Non-market techniques can be classified into Revealed Preference Methods (RPM) and Stated Preference Methods (SPM), depending on how the information for defining the value is collected: The RPM consists of observations of actual transactions in the market that are related to the environmental good or service, whereas the SPM directly asks respondents their preferences and how much they are WTP for them (Alpizar et al., 2001). For RPM, two main approaches are found: (i) travel cost method (TCM), which

consists of using the costs related to the trip to a natural area to evaluate the recreational benefits derived from it; and (ii) hedonic pricing method (HP), which involves the observation of a related market to determine the value of an environmental good, usually the real estate market (Le Goffe, 2000; Hanley et al., 2002). Finally, for the SPM, two approaches are used: (i) contingent valuation (CVM), a method that estimates economic values by creating a hypothetical scenario and asking survey respondents to state their WTP to get that good or service; and (ii) choice experiment (DCE), which also consists of a survey-based methodology, but involving multiple hypothetical scenarios with different bundles of goods described based on their attributes (site characteristics) at varying levels, and the respondent has to make choices between them, depending on his/her preferences related to the level of each attribute (Bateman et al., 2002). There is also the benefit transfer, a method that consists of using a function from a previous study and calibrating it with data from the policy site to measure welfare (Loomis, 1992; Masiero et al., 2018).

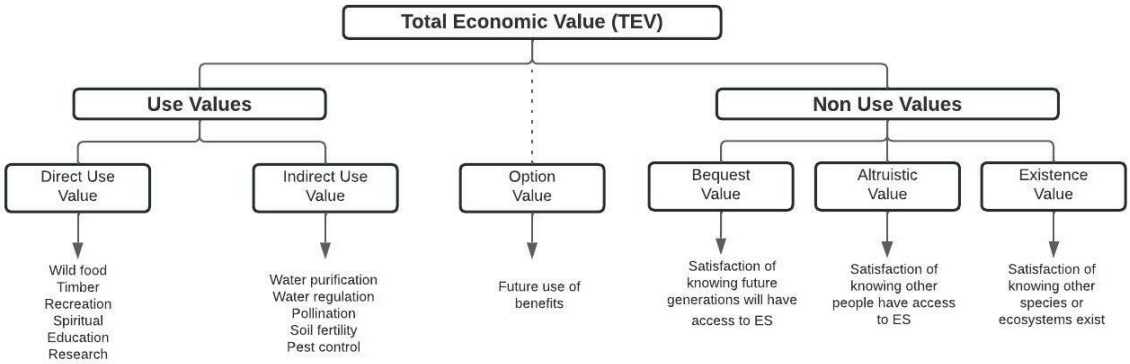
The main difference between those two methods is that RPM is restricted to measuring just the use value, since it depends on real transactions, while by using the SPM it is possible to detect the total economic value (TEV) (Christie et al., 2012) (Table 2). The TEV Framework is a common approach for determining the value of environmental goods and services (Pascual et al. 2010). It states that two different components constitute the value of a good or service: (i) use value and (ii) non-use value (Figure 4). The use value refers to the benefits derived either from direct use-values, which refer to goods or services directly used by an individual such as provisioning or cultural services (e.g. timber extraction, enjoying the landscape), or indirect use-values, related to regulating services (e.g. water purification). As for the non-use values, there is no physical involvement with the resource, and it involves the bequest value, which is the value of keeping the good/service so that future generations can use it; the altruist value, which is similar to the bequest value but concerns people from the current generation (intergeneration equity); and existence value, which is to know that the resource exists even if it will never be seen (i.e. polar bear, big trees). Within the TEV framework, there is another value referring to the possibility of safeguarding an asset for the option of using it at a future date, known as option value, which has been an object of discussion of whether it should be part of TEV or not (Pearce & Moran, 1994; Pascual et al., 2010).

Table 2: Types of values captured by each economic valuation method

Type of value	Valuation methods				
	Revealed Preferences		Stated Preferences		
	Travel cost	Hedonic price	Contingent valuation	Choice experiment	Benefit transfer
Elicits use value	x	x	x	x	x
Elicits non-use value			x	x	x

Source: Adapted from Christie et al. (2012)

Figure 4: Total economic value framework



Source: Adapted from Pearce & Moran (1994) and Pascual et al. (2010)

As will be seen in this study, non-market valuation approaches, especially the SPM have been used in the literature to value environmental resources, and from all the valuation methods exposed above, DCE has become a popular tool in the valuation of ES in recreational areas in the recent decades (Thiene et al., 2019; Mariel et al., 2021). There are some possible reasons for the relatively recent popularity of DCE for evaluating the environment since it has some advantages when compared to other approaches: It avoids co-linearity between attributes and allows to measure non-use values; in addition to valuing the environmental asset as a whole, the DCE allows the valuation of individual attributes of the environmental assets, this is important since, in policies and management plans, decisions are concerned with changing attribute levels, rather than losing or gaining the environmental good as a whole; DCE allows benefit transfer since the environmental good can be divided into measurable attributes that can be economically estimated; it avoids the “yea-saying” found in CVM since respondents are presented with multiple alternatives (choice sets) including the status quo one from which the respondent has to choose, instead of “all or nothing” choice (Adamowicz et al., 1998; Hanley et al., 1998).

2.3.1 Discrete choice experiment

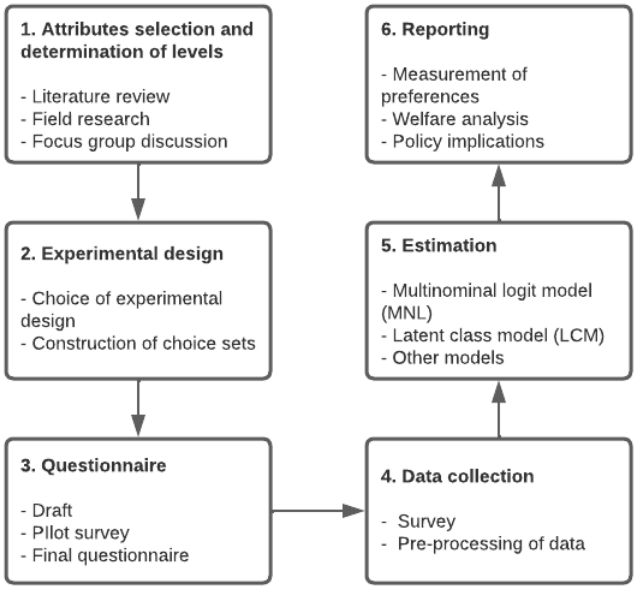
The DCE is one of the methods belonging to the SPM family and is rooted in Lancaster's characteristics approach (1966), which states that instead of the good itself, the utility (benefits) that people obtain from a given good comes from its different characteristics (attributes). For example, a meal, which could be considered a single good, possesses various characteristics such as nutritional and aesthetic, and different meals will present different proportions of these characteristics (levels) (Lancaster, 1966).

When applied to environmental resources, this approach allows estimating the value that people attach to changes in environmental conditions, i.e. number of protected species, quality of the water bodies, vegetation cover, forest degradation level, and the possibility of recreational activities (see Castillo-Eguskitza et al., 2019; Kim et al., 2021; Nijhum et al., 2021). This is measured through a survey where respondents are given groups of hypothetical scenarios where the attributes' levels change, known as choice sets. The respondent is asked to choose one option, the one which produces the highest utility for him/her, among which there is the status quo, which refers to the current situation, or no change (Adamowicz et al., 1998; Bateman et al., 2002).

The DCE allows not only to identify respondents' preferences, or in other words which attributes and their levels are chosen, but also the marginal value of change of each of those attributes, in other words, how much the respondents are WTP for the change in the level of each attribute. This is possible due to the trade-offs respondents make while choosing among the choice sets (Adamowicz et al., 1998). The calculation of the economic value is possible because one of the attributes includes a cost to the respondents (i.e. user fee, tax, donations). The choice sets as well as the calculation of WTP are a result of statistical processes which will not be explored in detail in this thesis, considering this study represents only the first step of the DCE (Figure 5).

To measure the respondents' WTP for the change in the environmental resource, a sequence of carefully designed actions is necessary, starting from the selection of attributes and their levels (step 1), which is based on literature reviews, group discussions, interviews, and experts' opinions (Coast and Horrocks, 2007). The attributes should be those which reflect the respondents' preferences for environmental change and that are impacted by a policy, or a management plan. The levels of each attribute must reflect at least the current situation of the attribute, known as *status quo,* and a minimum and maximum level each attribute can get, in addition to one attribute representing the monetary cost (Hoyos, 2010).

Figure 5: Steps in a choice experiment



Source: Adapted from Hoyos (2010) and Mariel et al. (2021)

DCE allows the investigation of preferences heterogeneity of stakeholders and WTP for environmental resources, and due to these characteristics, DCE has been an important tool to support decision-making, by helping managers of public resources in elaborating policies and management plans that are aligned with public opinion and thus can potentially have more acceptance and effectiveness (Shapansky et al., 2002; Liski et al., 2019). Given all the characteristics of DCE, this method was chosen for the future survey to be developed in Cansiglio.

Despite presenting some advantages when compared to other methods, it should be noted that since DCE is part of SPM, it also has some similar drawbacks to the CVM, since assessing stated preference is not assessing actual behavior (Makumbirofa & Saayman, 2022). Some of the issues regarding specifically DCE is the size of the experimental design since as seen, the combination of all attributes and their levels results in too many choices for the respondent and there is debate on how many is too many; another issue is that the sum of attributes might not reflect the value of the environmental good or service, since there is a difference between how people perceive the environment and how the environment works (Hanley et al., 1998).

2.3.2 Motivational theories

Cultural ecosystem services are a result of interactions between the biophysical aspects of a place and the psychological aspects of the visitor, thus not only the site characteristics are important factors in evaluating a natural area (attributes in the DCE) but also the visitors' or potential visitors' characteristics, values, and

motivations should be considered (Kumar & Kumar, 2008; Zoderer et al., 2016). Understanding the tourists' motivations allows to group them into segments with shared needs, which supports managers of natural areas to plan their strategies according to the different needs of each segment, thus improving the protection of natural areas and yielding visitors' satisfaction, increasing willingness to pay, calibrating crowding, and also reducing conflicts between users (Manfredo et al., 1996; Stern, 1999; Thiene et al., 2017; Carrascosa-López et al., 2021; Carvache-Franco et al., 2021).

The definition of motivation in the literature refers to the psychological needs that influence a person's behavior (Dann, 1979; Pearce & Caltabiano, 1983; Yoon & Usyal, 2005) and when applied to tourism, this motivation refers to the psychological needs that influence a person to travel (Meng et al., 2008). Investigating why people travel and what they want to enjoy is highly complex since it deals with cognitive processes and sometimes the individuals cannot express their motives, making research on this topic very challenging (Dann, 1981; Yoon & Uysal, 2005).

Many theories have been developed through time to identify the motivational factors that affect individuals' decision to travel to a natural area and engage in certain activities. However, as López-Mosquera and Sánchez (2012) observed, just a few studies investigated the influence of those psycho-social motives on WTP related to the conservation of a natural area. The psycho-social motives considered in their study included general environmental attitude, perceived support from family and peers, and perceived ability to take an active part in the conservation and enhancement of environmental quality.

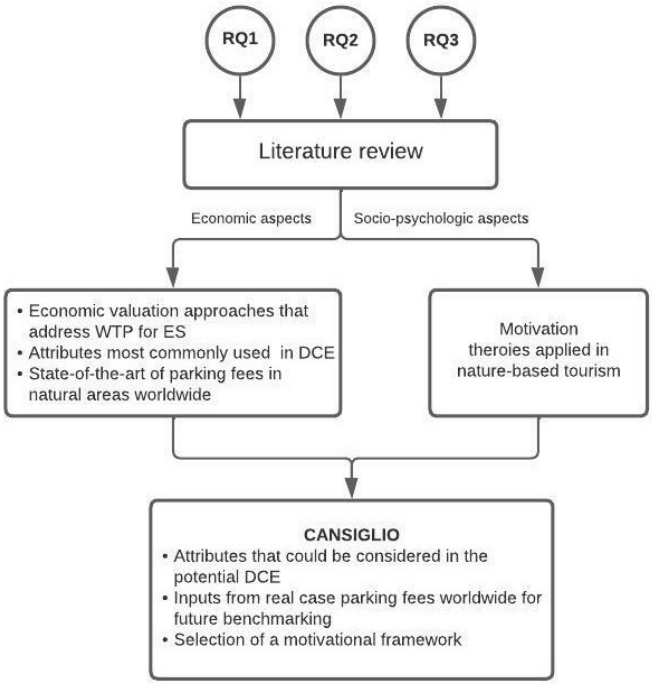
For example, Swait et al. (2020) found that motivations, or goal-pursuit, influence individuals' choices, making individuals less distance-sensitive, which means that visitors of natural areas are willing to travel longer distances which results in higher costs to reach an area that meets their motivations. Thiene et al. (2017) also found that motivations, such as relaxing, spending time with family, contact with nature, and improving skills and knowledge of the territory, play an important role on the site selection process. Finally, Morey and Thiene (2017), by surveying over 4 thousand mountain bikers from various countries, found that personality traits and the presence of a companion interact with site characteristics and can influence the choice of the final destination.

Considering that motivations influence whether an individual will engage in nature-based tourism and consequently their WTP to protect a natural area, not only preference for site attributes (DCE) should be explored in a future evaluation of a fee in Cansiglio but also motivational theories. This is to help understand the different groups of visitors' motivations and their influence on WTP for the potential parking fee.

3. Research methodology

Based on the exposed above and to answer the research questions, secondary sources of information and primary data have to be collected. The study employs a literature review following the guidelines from Snyder (2019), illustrated in Figure 6 and detailed in items 3.2 and 3.3.

Figure 6: Research approach



RQ = Research question

Source: Own elaboration (2022)

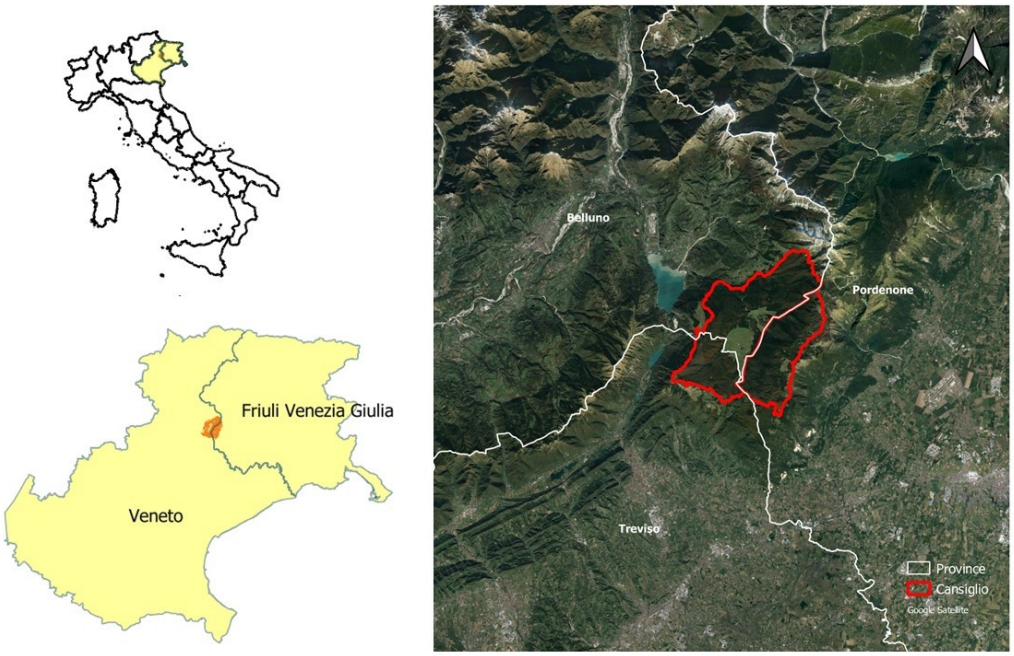
3.1 Study area

The target area of this study is named *Foresta del Cansiglio*, or Cansiglio forest, located in North-eastern Italy, in the regions of Friuli Venezia Giulia and Veneto. The forest covers three provinces: Belluno, Treviso, and Pordenone, as illustrated in Figure 7.

Veneto and Friuli Venezia Giulia, two regions in Northern Italy, where the pre-Alps and Alps are located, have been visited by mountaineers from all over Europe ever since 1800 (Tempesta et al., 2002), an indication of the historical importance of this area for ecotourism. The Italian pre-Alps represent one of the closest nature destinations for people living in the plain area, which is home to many urban centers (Thiene & Scarpa, 2009). The plain area known as *Pianura Padana* is located in Northern Italy and, according to the National Institute of

Statistics (ISTAT, 2020), is home to 32% of the country's population, which was composed of 60.5 million people in 2017. It is also the one area concentrating a great part of the country's economic activities as well as having the most polluted air (ISTAT, 2020).

Figure 7: Location of Cansiglio forest



Source: Own elaboration based on data from *Geoportale Nazionale*

The hypotheses regarding the etymology of the name Cansiglio are numerous, from the word "*campus silius*" or "*campus silens*", which means "flat and silent place", to the word "*concilium*", indicating a consortium of woods and pastures belonging to several communities (Uliana, 2020). Cansiglio forest is indeed located on a plateau at around 1,000 meters above sea level and covers approximately 5,000 hectares, 87% of which are covered with forest, composed of beech woods (Fagus sylvatica), fir-beech woods, and, on smaller surfaces, spruce woods. The remaining 13% is covered by meadows, pastures, and herbaceous plants (Veneto Agricoltura, 2020a), as illustrated in Figure 8, which are used by farmers mainly for milk and cheese production.

Figure 8: Landscape of Cansiglio in different seasons

Source: The author (2022)

Due to its location and characteristics, the Cansiglio forest is the destination of many tourists which can lead to overcrowding situations during summertime, autumn, and weekends. This is resulting in consequences for the residents and the local environment since many visitors park their cars where they should not, resulting in logistical difficulties in the area, such as blocking access to other properties and streets, noise, and air pollution (Veneto Agricoltura, personal communication, 2022). The disturbance of the local environment resulting from recreation activities is also mentioned as one vulnerability in the Natura 2000 form of Cansiglio (Regione del Veneto, 2003).

There is not a monitoring system of vehicular flow in Cansiglio, but it is estimated that approximately 2,000 vehicles are present in a day during peak season (Veneto Agricoltura, personal communication, 2022).

3.1.1 Historical aspects of Cansiglio

Cansiglio forest plays an important role in the history of Italy. Most of the information found in this section refers to the books of Spada (1995): "*Il gran bosco da remi del Cansiglio nei provvedimenti della Repubblica di Venezia*" and Lazzarini (2006): *La trasformazione di un bosco: Il Cansiglio, Venezia e i nuovi usi del legno (secoli XVIII-XIX)*", given the richness in detail provided by the authors.

The relationship between Cansiglio and men dates back to prehistoric times, during the Paleolithic (12,000 years ago), when hunters, which were part of the species *Homus alpinus*, were recorded as the first human visitors in the forest, mainly due to the connection with the plain area. Later on, in the second century

BC, there are records of the presence of the roman empire in the area who is believed to have used the wood from Cansiglio (Spada, 1995).

Some centuries later, the importance of this forest for humans became even more prominent, when during the 16th century, the Republic of Venice (*Serenissima Reppublica di Venezia*) destined the beech forest located in Cansiglio for the production of oar for the Republic's arsenal. The beech forest in Cansiglio was considered the best raw material for oar production (Spada, 1995; Lazzarini, 2006). At this moment, the indiscriminate cutting of Cansiglio forest was prohibited and specific management activities aiming at reforestation and the selection of areas to be harvested were developed, marking it one of the first forest management systems in the history of Italy (Spada, 1995).

At the end of the XVIII century, a group of people known as *Cimbri,* of german origins, arrived in Cansiglio to work with the beech wood. They were commissioned by the Republic of Venice to cut beech wood for the Venetian Arsenal, but they were known and still are for their abilities as artisans, who produced a variety of wooden objects, such as round-shaped boxes used in pharmacies and frames for cheese. With time, the cimbri population increased in the area and they marked the history of Cansiglio, not only for their activities and culture but because they represent the beginning of a stable settlement within the boundaries of the state forest (Lazzarini, 2006). All this information regarding the history of Cansiglio, from the first humans, the republic of Venice, and the *Cimbri* can be found in detail at the Museum of Mankind in Cansiglio (*Museo Regionale dell'Uomo in Cansiglio "Anna Vieceli"*), where documents and objects are displayed.

In 1871, following the annexation of Veneto to the Kingdom of Italy in 1866, Cansiglio became "*Foresta demaniale inalienabile*", which means an inalienable State forest of the Italian State (Lazzarini, 2006). After that, in 1965, the part located within the Friulian territory was transferred to the heritage of the Friuli Venezia Giulia Region (Cansiglio.it, 2020).

Due to its location and panorama, Cansiglio was also a site of the cold war, serving as a base for North Atlantic Treaty Organization (NATO) air force, to protect from hypothetical attacks from the east. A bunker that used to be equipped with American missiles, was abandoned in 1979 and recently converted by Veneto Agricoltura into a center for environmental education, now known as the hangar of peace (Veneto Agricoltura, 2018; Rosato, 2018).

Regarding the current governance of the part of Cansiglio forest inside the Veneto region, also known as *Foresta Demaniale Regionale del Cansiglio*, the body responsible for the maintenance of the infrastructure, forest management, and the one that can impose access restrictions to the public is Veneto Agricoltura, which is the regional body responsible for public forests in Veneto.

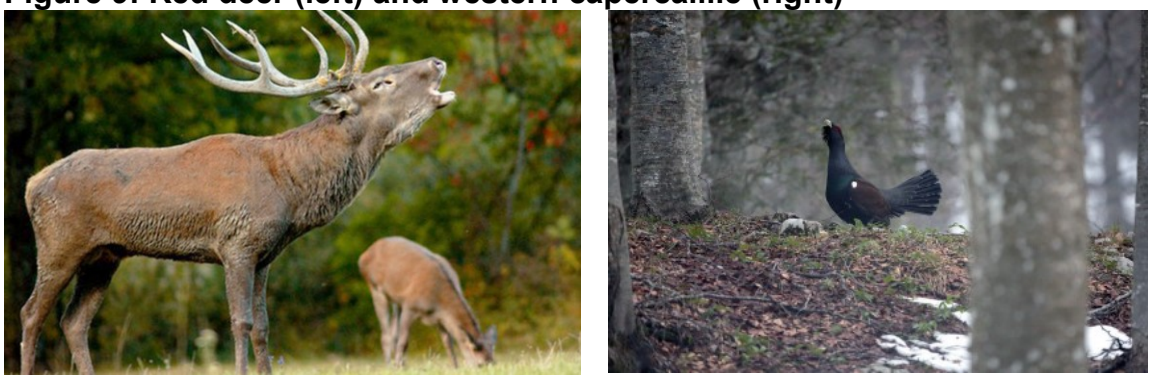
It is worth mentioning that since it is a public forest, the right to access is guaranteed to the public, except for some specific exceptions (i.e. safety issues). The right of alienation, on the other hand, does not apply to Veneto Agricoltura, since the forest is an unavailable asset by law. Finally, the body responsible for law enforcement in the region is the Carabinieri (Veneto Agricoltura, 2020a).

As stated by Veneto Agricoltura during a field visit on May 4th, 2022, the forest is still used for wood production under sustainable forest management, serving as a source of wood for packaging (silver fir) and flooring (beech). The wood is sold stumpage to local small and medium-sized companies, to support the local businesses which then can use the historical aspects of Cansiglio to add value to their products. On top of provision services, Cansiglio is also known for providing other ES, with a highlight on the regulating and cultural ones. The vegetation aspects, with close-to-nature management and presence of wildlife (especially the roar of the deer during autumn), hiking trails, a botanical garden, museum, picnic areas, restaurants, and camping sites attract a wide range of visitors to the area, especially during weekends at summertime and autumn.

3.1.2 Biodiversity in Cansiglio

Cansiglio forest is both a Special Protection Area (SPA) and a Site of Community Importance (SCI), under the Birds and Habitat Directives, respectively. This means the area is part of the Natura 2000 network since the vegetation provides an important habitat for a range of wildlife, including the red deer (*Cervus elaphus*) and western capercaillie (*Tetrao urogallus*) (Figure 9), this last one being under risk of extinction (Veneto Agricoltura, 2020b). Being part of Natura 2000 means that some actions are taken to keep biodiversity and sustainable development, which in the case of the capercaillie is to adjust the periods in which tree harvesting is carried out in the Cansiglio forest to be compatible with the bird's breeding and rearing activities (Veneto Agricoltura, 2020b).

Figure 9: Red deer (left) and western capercaillie (right)



Source: Veneto Agricoltura (2012); Veneto Agricoltura (2020)

Even though the presence of red deer is appreciated by visitors, who go to Cansiglio during autumn especially to listen to their roar, the elevated number of individuals in the area was impacting the regeneration of the vegetation, damaging the natural habitat of other species, and impacting silvicultural activities. Since Cansiglio is a protected area, hunting activities are not allowed, so the deer population has increased considerably over the years (Caudullo et al., 2003). This caused several discussions and conflicts between stakeholders since there was a plan (in 2011-2013) to reduce the deer population through hunting which was approved by the region of Veneto but that in the end was blocked by the president of the region due to protests of environmentalists (Meletti, 2021). Recently, however, nature has solved this issue with the presence of wolves, the natural predator of deer (Figure 10). The presence of wolves in Cansiglio from 2015 was celebrated not only because of the deer situation, but because wolf individuals have been missing in the region for centuries, so this return is a positive sign in terms of environmental quality (Veneto Agricoltura, 2017b; Veneto Agricoltura, 2019; Meletti, 2021; Mezzavilla et al., 2022).

Figure 10: Presence of wolfs in Cansiglio

Source: Il Gazzettino (2021)

The importance and representativeness of Cansiglio's biodiversity are further confirmed by the fact that it was the first forest in Italy to have a PEFC certification of ecosystem services, which means that it can be verified by a third-party body for voluntary actions aimed at the protection of biodiversity and recreational functions (Dini, 2021).

The guidelines for obtaining the PEFC certification for ES were based on a set of 12 measurable and replicable indicators created based on the project BioΔ4 mentioned in chapter 1, which used Cansiglio as one of the study areas. The indicators are related to various aspects of the forest that contribute to

biodiversity, including forest structure, species composition, presence of deadwood, and disturbance of biodiversity (Table 3). Each indicator is then given scores from 0 to 5, according to thresholds specified for each indicator (Veneto Agricoltura, 2020a).

Table 3: Biodiversity indicators

	Indicator	Details
1	Articulation of forest structure	Count of the n. of layers in which the vegetation is divided vertically
2	Species of conservation interest	Count of the n. of protected/rare fauna and flora species
3	N. of species that make up the tree and shrub layers	Count of the n. of tree and shrub species
4	Snag	Count of the n. and distribution of standing deadwood (snag)
5	Deadwood on the ground	Count of the n. and distribution of deadwood on the ground
6	N. of large trees	Count of the n. and variety of large trees
7	Dendromicrohabitat	Count of the n. and variety of dendromicrohabitat on living trees
8	Breeding zone of species of conservation interest	Verification of presence and counting of dens, rendez-vous, singing arenas, brood breeding areas, nests and/or holes of woodpeckers, of qualified fauna species
9	Presence of clear areas	Measurement of the incidence of herbaceous clearings or low shrubs that contribute to the articulation of the horizontal structure of the vegetation
10	Morphology and water-related habitats	Verification of the presence and estimation of the variety of wet or rocky habitats that contribute to the joint geomorphology of the forest site
11	Protected areas or subject to specific regulation	Areas under specific regulation for environmental protection purposes
12	Disturbance of biodiversity	Verification of the presence of anthropic conditions or activities that can limit (directly or indirectly) the biodiversity: (1) regeneration loss due to browsing, (2) presence of forest plantations with exotic species, (3) relevance of other disturbance/damages related to anthropogegnic presence (infrastructure, tourism)

Source: Veneto Agricoltura (2020a)

3.1.3 Recreational and educational activities in Cansiglio

As mentioned in item 3.1.1, Cansiglio is the destination of many visitors due to its biodiversity and history, and also because it provides a variety of recreational activities. In addition to the biodiversity indicators presented in the previous section, the BioΔ4 project explored cultural services found in Cansiglio that

could be used for a PES project, categorizing each one of them according to the CICES classification (Table 4).

Table 4: Cultural ecosystem services in Cansiglio

Division	Group	Class	ES
Direct, in-situ and outdoor interactions with living systems that depend on presence in the environmental setting	Physical and experiential interactions with natural environment	Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	Hiking, mountain biking
		Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	Bird-watching, deer watching, forest bathing, forest therapy, yoga in the forest
	Intellectual and representative interactions with natural environment	Characteristics of living systems that enable education and training	Environmental education
		Characteristics of living systems that are resonant in terms of culture or heritage	Historical and cultural value of the forest
Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental setting	Spiritual, symbolic and other interactions with natural environment	Elements of living systems that have symbolic meaning	Symbolic value of some elements of the forest (i.e. big trees)
		Elements of living systems used for entertainment or representation	Photography, video

Source: Veneto Agricoltura (2020a)

According to the information provided by Veneto Agricoltura, there is a variety of activities one visitor can engage in while visiting Cansiglio such as visiting the museum, botanical garden, hiking, biking, deer watching, forest bathing, visits to archaeological sites, in addition to specific events released every year during summer. Those activities are usually developed from April to October and the peak is during the weekends (Veneto Agricoltura, personal communication, 2022).

Veneto Agricoltura is also planning new activities, such as the use of electric bikes for archeotourism activities, and continue promoting forest bathing activities and deer watching (Veneto Agricoltura, personal communication, 2022).

3.2 Data collection

A literature review was carried out to answer the research questions. To do so, the data collection was divided into three different moments: first, a research of the main methods used in the literature to evaluate eco-tourists' WTP for ES, and from this first research, a selection of the main attributes used in DCEs was made, followed by a search of parking fees charged in natural areas worldwide. Finally, research on the most common approaches used to investigate eco-tourists' motivations and behavior was carried out as a final step of the data collection. The source for these data was protected area management authorities' websites and scientific publications on online databases (Scopus and Google Scholar).

For analyzing the evaluation approaches and then the attributes of DCE, a qualitative systematic literature review was performed during June and July 2022, by following the sequence presented in section 3.3 and using the following specific search strings:

1. "parking" AND "choice experiment" OR "willingness two pay" AND "protected area*" OR "natural area*" OR "natural park*";
2. "congestion" OR "crowd*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
3. "recreation" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
4. "cultural service*" OR "cultural ecosystem* service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
5. "education* service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
6. "biodiversity" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
7. "forest*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*";
8. "close-to-nature" AND "choice experiment" OR "willingness to pay";
9. "ecosystem service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"; and
10. "heritage*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*".

The qualitative systematic literature review was chosen since it is used to "identify all empirical evidence that fits the pre-specified inclusion criteria to answer a particular research question or hypothesis" (Snyder, 2019 p.334). Given the relevance of Scopus in terms of being frequently used as a consolidated reference for literature reviews in published papers (see Fischer et al., 2017; Macke & Genari, 2019; Mengist et al., 2020; Ulker-Demirel & Ciftci, 2020), and for including important peer-reviewed journals in the scientific community, the selection of published articles was focused on this platform.

After that, still considering the economic part of the research, the existing parking fees in natural areas worldwide were searched in order to provide some indications of the state-of-art of this type of fee and to serve as a reference for future benchmarking. This phase consisted of three moments: First, an online search was carried out, to gather parking fees available on grey literature (natural areas' websites, national park management bodies' websites, and travel blogs) from January to March 2022, then emails were sent to the management bodies of those areas where there is a parking fee in place, to investigate how the fees were calculated if any specific valuation approach was used. This step lasted until June 2022, after which, at Italy-level, a third phase was carried out, which lasted until September 2022, involving phone calls to those managers who didn't respond to the emails previously sent.

The data coverage for the sate of the art of parking fees worldwide was not exhaustive given the available list of national parking fees, scattered data, and the large number of natural parks worldwide. To ensure that the main tourist sites and flagship areas were included and to guarantee a minimum level of comparability between countries, the national park level was prioritized. Countries and national parks where parking is free of charge were not considered in the research.

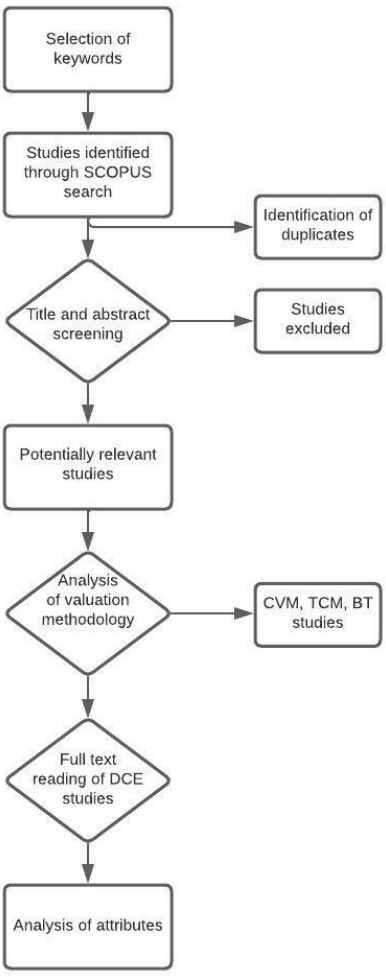
At the Italy level, an exhaustive online search was conducted from January to April 2022 as an attempt to cover all natural areas with parking fees in place. The managers of each area were contacted either by phone or email to understand how the fees were calculated and the expected outcomes.

Finally, for the research on the most common approaches used to understand tourists' motivations and behavior, traditional literature was carried out, from April to June 2022. This type of literature review is used for describing literature in a simpler, non-systematic way and was preferred since the goal was not to cover all existing theories but to have an overview of the evolution of the main theories cited in the literature and serve as a way to synthesize literature and enable the creation of a theoretical framework (Snyder, 2019).

3.3 Data analysis

The general criteria for selecting the papers during the literature review was that only documents published in scientific journals and in English language were considered. For the qualitative systematic review specifically, only those publications with a clear valuation methodology were considered. The analysis involved the following aspects of each paper: The evaluation method (i.e. choice experiment, contingent valuation, travel cost), study area (country level), survey mode (online, by post, or face-to-face), and payment vehicle (i.e. parking fee, entrance fee, tax, and others), thus providing an overview of how tourists' WTP for ES is addressed in the existing literature. If the valuation approach of the selected article was a DCE, a further analysis was carried out, which aimed to understand which attributes were used and how they were measured (levels), following the sequence illustrated in Figure 11. This served as input for defining potential attributes to be considered in the future DCE to be developed in Cansiglio.

Figure 11: Steps of the literature review of evaluation approaches



Source: Own elaboration (2022)

As for the data on the existing parking fees in natural areas worldwide, the first analysis involved the identification of the number of fees that were found, the location of the natural area where the fee is charged (region-wise for those located in Italy and country-wise for those out of Italy), their price, and how they are charged (parking meter, app, personnel).

This data that serves as input for future benchmarking was separated into parking fees found at Italy-level and then for the other countries. This was done to allow a calculation of a fair average to be used as a reference by the management body of Cansiglio, considering that other countries have different realities, for example, in terms of currency, recreational demand, environmental impact, and purchase power.

The results found for other countries were converted to Euro and used as a general reference to have a global view of how popular parking fees are outside of Italy and to understand the most common payment methods used.

The motivational literature review was analyzed following a historical timeline, from the first theory most cited in the literature to the most recent one. The concept of each theory, which factors are considered, and examples of its application in ES evaluation were analyzed. After going through the theories, the one considered to fit the most the needs of the study case of Cansiglio was selected, to support the creation of a specific framework for evaluating a potential parking fee in the study area.

4. Results

In this chapter, the results of the literature review are presented. The outcome of the literature review is divided into two sections, the first dealing with the approaches most commonly used in the economic valuation of natural resources, and site characteristics (attributes) used in DCE involving natural areas, congestion, ecotourism, and or ES. This section ends with the characterization of the state-of-the-art of parking fees charged worldwide, with a focus on Italy.

Considering that not only the site characteristics play an important role in one's decision to visit a specific natural area and pay for its ES, but also the individual's motivations might influence it, the second section of this chapter deals with the most popular theories for studying individual's psychological aspects in ecotourism motivation and behavior, to support a future survey in Cansiglio.

Based on the information found in those two sections and the needs of Veneto Agricoltura for the Cansiglio study case, at the end of each section, specific motivation theory and site attributes are proposed as inputs for a future survey in the study area. It is important to highlight that those results are a first step of the evaluation process and serve as input to be further discussed with stakeholders of Cansiglio.

A participative approach to define the parking fee is necessary since it impacts various actors, such as Veneto Agricoltura who is responsible for the management of the area; the administration of municipalities where Cansiglio is located as well as the *carabinieri,* responsible for the law enforcement (i.e. fine for those visitors who enter the forest with their vehicles); the municipalities (*comuni*) in which the forest is located that are responsible for the road traffic and parking management; the local owners of restaurants, B&B, farmers, and touristic guides who profit from visitors in Cansiglio and contribute in the provision of activities in the area; and the visitors (Veneto Agricoltura, 2020a).

4.1 Valuation approaches involving natural areas

As seen in Chapter 2, different methods enable the valuation of non-market values. The DCE specifically has been used as a tool for evaluating the total economic value of environmental resources while considering public preferences. This tool not only allows one to determine the value of a resource, but supports managers to prioritize their actions by showing which attributes of the site people are willing to pay more to maintain, enhance, or decrease (Mariel et al., 2021).

Given the above-exposed, a review of the literature was carried out to find which are the most used methods for evaluating ES and congestion in natural areas, with special attention to the attributes most commonly used in DCE specifically, thus supporting the definition of the attributes that could be used in a future survey to capture respondents' WTP for ES in Cansiglio, the first step of the DCE according to the scheme presented in Figure 5 (section 2.3.1).

The literature search revealed 360 published papers, of which 254 were selected since they provided information on valuation involving respondents' WTP for specific attributes of a natural area, following the guidelines established in sections 3.2 and 3.3. After removing the duplicates, which refer to the same publication found in the Scopus platform using different keywords, the final number of selected papers was 159 (Table 5).

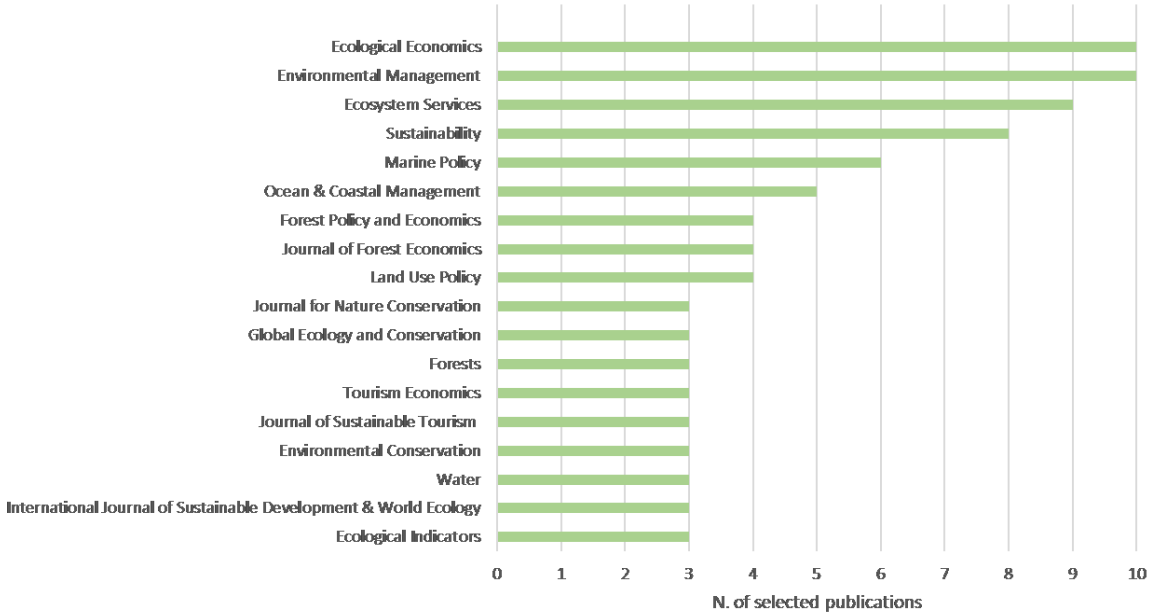
Table 5: Selected publications from the systematic literature review, by keyword

#	Keywords	Results	Selected
1	"parking" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	5	3
2	"congestion" OR "crowd*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	13	11
3	"recreation" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	60	45
4	"cultural service*" OR "cultural ecosystem* service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	9	6
5	"education* service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	1	1
6	"biodiversity" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	100	74
7	"forest*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	72	46
8	"close-to-nature" AND "choice experiment" OR "willingness to pay"	3	2
9	"ecosystem service*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	85	58
10	"heritage*" AND "choice experiment" OR "willingness to pay" AND "protected area*" OR "natural area*" OR "natural park*"	12	8
	Total	**360**	**254**
	Without duplicates		**159**

Source: Own elaboration (2022)

Of the 159 selected publications distributed within 83 journals, 55% were published in 18 journals, those being well-known in the scientific community dealing with ES (Figure 12).

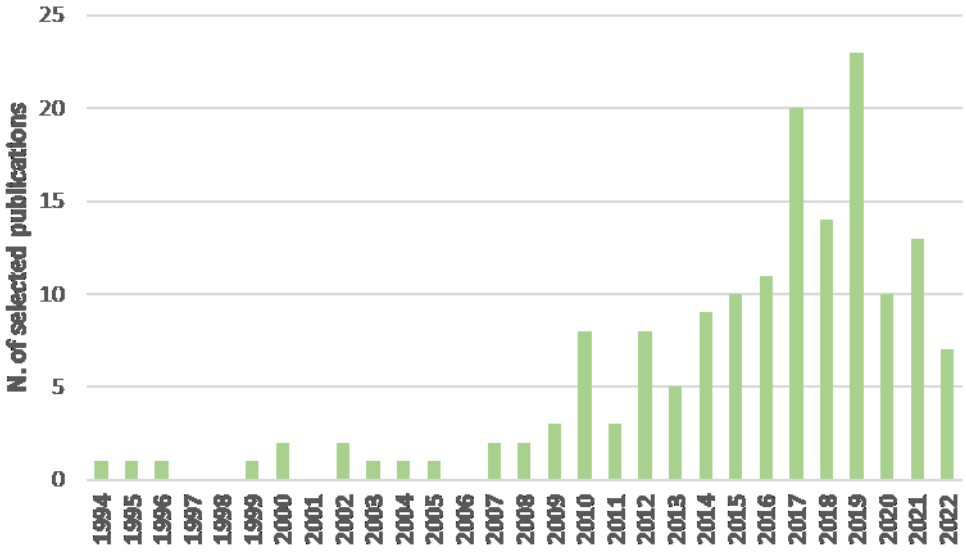
Figure 12: Distribution of selected publications by journal



Source: Own elaboration (2022)

As for the year of publication of the selected papers, it is observed an increase in recent years, mostly from 2017, with some oscillations, some potentially justified by the COVID-19 pandemic, since most of the surveys are carried out face-to-face (Figures 13 and 14). The number of papers published in 2022 refers to the period between January and July.

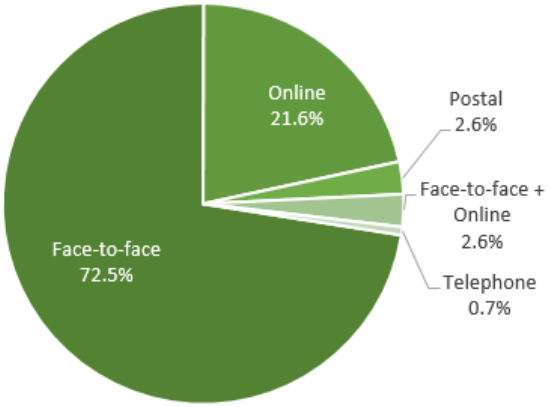
Figure 13: Distribution of selected publications by year of publication



Source: Own elaboration (2022)

Regarding the survey mode, it was considered face-to-face surveys those in which the questionnaire was applied in presence, whether being on the study area or not, using paper, computer, or other tools, whereas the online mode refers to the questionnaires that were applied exclusively online, without the physical presence of the interviewer. As seen, some publications made use of more than one mode, combining online and face-to-face, for example. There were also publications that used other modes such as postal and telephone, the last one being relatively older, published in 1996 (Figure 14).

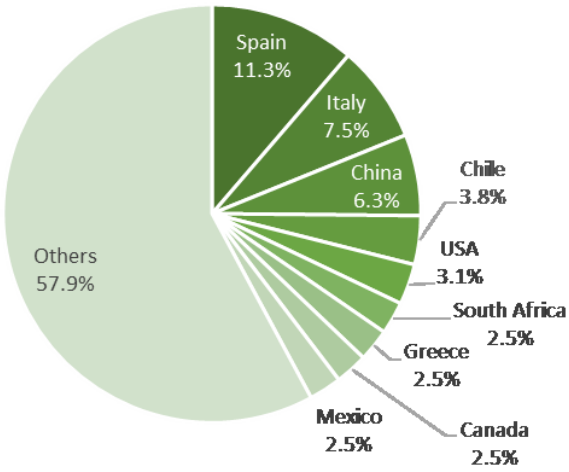
Figure 14: Distribution of selected publications by survey mode



Source: Own elaboration (2022)

As for the location of the study area of the selected papers, almost half of the publications were located in 9 countries, with a higher concentration in Spain (18 publications), Italy (12 publications), and China (10 publications) (Figure 15).

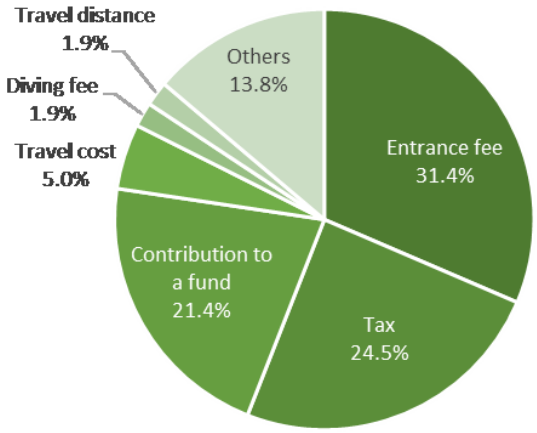
Figure 15: Distribution of selected papers by country



Source: Own elaboration (2022)

The most common payment vehicle used in the selected publications was the entrance fee (50 publications), which means that the visitor would have to start paying to access the study area or pay more for the cases where there was already an entrance fee in place, followed by tax (39 publications), which refers to the increase in existing local taxes for the residents of the study area, and contribution to a fund (34 publications) when the respondent was asked his/her WTP for supporting a fund created specifically for the study area (Figure 16). Others include extra charges for accommodation, additional fees, parking fees, water bills, and safari costs. Only one publication made use of parking fees, which will be discussed in detail later on in section 4.1.1.

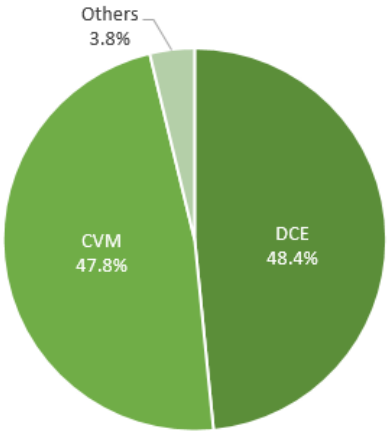
Figure 16: Most common payment vehicles found in the selected publications



Source: Own elaboration (2022)

Finally, regarding the valuation methods found in the literature, as seen in the search strings in Table 5, the keyword “choice experiment” was explicitly used considering that the aim was to understand which are the most common attributes used in publications dealing with evaluating WTP for natural areas. By adding the keyword “willingness to pay”, however, it was possible to capture other methods commonly used in the literature. Figure 17 shows that after DCE, the CVM is also frequently used (others refer to TCM and BT).

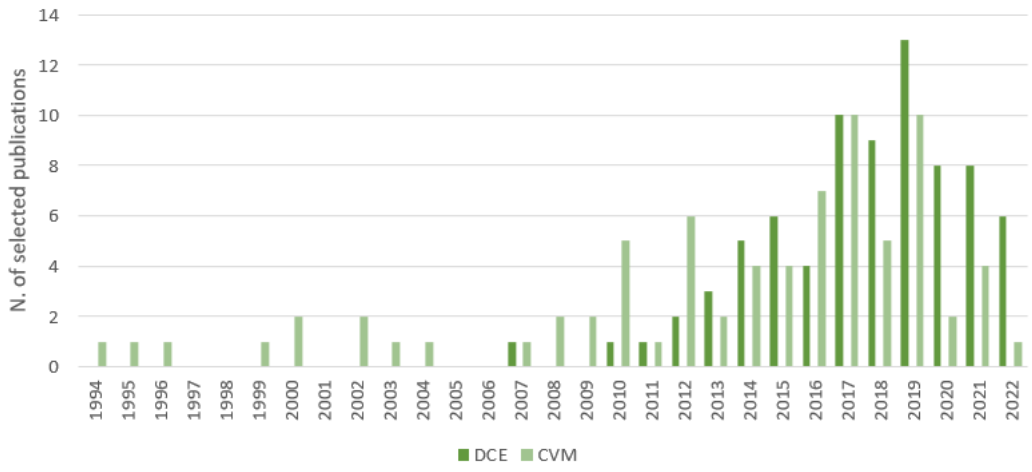
Figure 17: Most common evaluation methods found in the selected publications



Source: Own elaboration (2022)

It is not possible to affirm that DCE is more popular than CVM in this study since the keyword selection was purposely biased towards DCE, however, as mentioned in section 2.3.1, DCE has become increasingly popular over time, and this can be noticed if the distribution of selected papers by year illustrated in Figure 13 is classified by CVM and DCE (Figure 18).

Figure 18: Distribution of selected publications by year by methods (CVM and DCE)

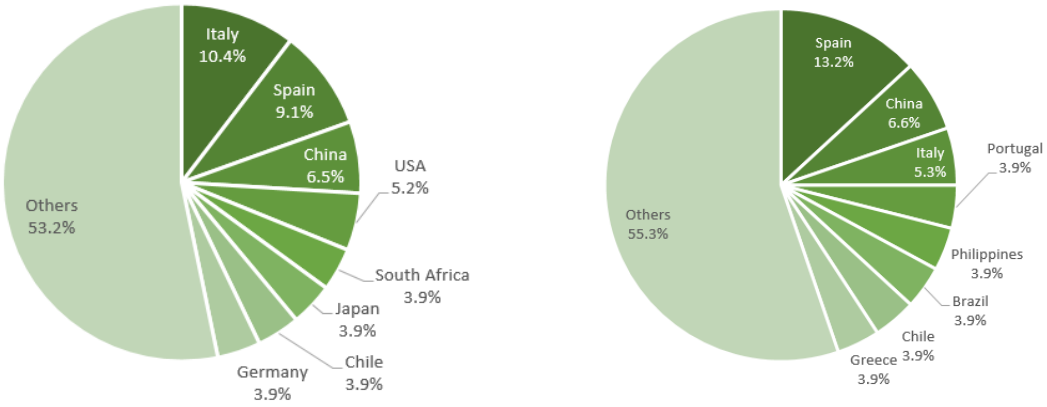


Source: Own elaboration (2022)

When separated by valuation method, DCE or CVM, it was noted that the distribution of selected papers by country and by payment vehicle is different: Spain is the most popular country when focusing on publications that used CVM, however when analyzing publications that used DCE instead, Spain moves to second place and Italy is in the first place (Figure 19). The most preferred payment vehicle in the selected publications that used DCE was tax,

followed by entrance fee, whereas for CVM the entrance fee was the most preferred, followed by a contribution to funds (Figure 20).

Figure 19: Distribution of selected papers by country by methods: DCE (left) and CVM (right)



Source: Own elaboration (2022)

Figure 20: Distribution of selected papers by payment vehicle by methods: DCE (left) and CVM (right)

Source: Own elaboration (2022)

4.1.1 Attributes used in choice experiments in natural areas

After this general characterization of the publications found in the literature review, and considering only the publications that used DCE as valuation approach, 358 attributes from 77 publications were found in total, excluding the payment vehicle which is present in every publication as one attribute and that will be further explored in this section. Even though the total number of attributes seems large, over 63% of those attributes could be classified into 8 main groups of similar aspects (Table 6).

Table 6: Groups of main attributes found in the selected papers using DCE as valuation method

Classification	Quantity	%
Recreation	88	25%
Biodiversity	58	16%
Congestion	21	6%
Forest structure and management	13	4%
Water-related ES	14	4%
Jobs and local business development	10	3%
Cultural aspects/ historical and natural heritage	8	2%
CO2 sequestration and air quality	8	2%
Litter	6	2%
Others	132	37%
Total	**358**	

Source: Own elaboration (2022)

The three first groups of attributes, recreation, biodiversity, and congestion, not only represented the largest amount of attributes mentioned in the selected publications, but they also showed to be preferred by respondents. Just as an example of these results, in the survey carried out by Crespo-Cebada et al. (2020 p.1) “The main results show that tourists had a high preference and willingness to pay for higher biodiversity levels and lower numbers of visitors, whereas the other attributes were less relevant.”; and for Otaghvar et al. (2022 p.19553) “The results showed that maintaining and improving the status of animal species and tourism conditions among respondents has a higher priority than the other attributes.”

The first group of attributes, representing 25% of the total number found in the literature review, is related to recreation. This aspect was approached in a variety of ways, for example, through recreational infrastructure in quantitative terms, such as the presence and quantity of picnic areas, benches, toilets, dedicated trails (hiking, biking, climbing, skiing), length and width of the trails, areas for wildlife watching, trashcans, exercise station, resting places, camping spots, hotels, and restaurants (García-Llorente et al., 2012; Tyrväinen et al., 2014; Oviedo & Yoo, 2016; Thiene et al., 2017; Cerda et al., 2018a; Cerda et al., 2018b; Masiero et al., 2018; Tekalign et al., 2018; Pienaar et al., 2019; Thiene et al., 2019; Jang-Hwan et al., 2020; Arnberger et al., 2021; Estifanos et al., 2021; Franceschinis et al., 2022; Sacher et al., 2022). These authors measured the levels of the attributes in quantity, for example, the trail length measured in terms of time that visitors spend on it (1,2, or 3 hours); or the number of wildlife-watching spots (2, 5, 7, or 10 sites) (see Jang-Hwan et al., 2020; Masiero et al., 2018); and also through the simple presence or absence of a given attribute, for example, presence or absence of signs and trails (see Estifanos et al., 2021).

The recreation aspect was also tackled in terms of the quality of infrastructure, which means the quality of hiking and camping sites, or the trail surface (Hoyos et al., 2012; Cerda et al., 2018a; Kohlhardt et al., 2018; Pienaar et al., 2019; Arnberger et al., 2021; Sacher et al., 2022). In this case, the levels were not measured in quantity, but for example, if the respondent preferred the trails covered with asphalt, gravel, or natural soil (see Arnberger et al., 2021). Another group of attributes categorized as recreation was related to the information aspects, or in other words, improving information point facilities, creating new ones, opening hours of those info centers, presence of guides, interpretive sign boards, flyers, and video presentations (Arnberger et al., 2018; Paltriguera et al., 2018; Tekalign et al., 2018; Thiene et al., 2019; Crespo-Cebada et al., 2020).

The second most used group of attributes is related to biodiversity. This was treated by using attributes related to habitat availability, habitat suitability for specific species, presence of wildlife, and restriction of access to protect the biodiversity. For attributes involving habitat availability, the levels were related to the area (in km² or % of coverage), or more generically in terms of low, medium, or high availability for endangered species (Jobstvogt et al., 2014; Jeanloz et al., 2016; Kang et al., 2019; Obeng et al., 2021; Sacher et al., 2022).

As it concerns wildlife, the levels of this attribute changed among the different studies, mainly due to the aim of the research and the context of the study area (if focusing on one specific species, or more generally speaking of all biodiversity). For example, Cerda et al. (2018a) focused on different groups of animals and plants at individual levels (reptiles, birds, insects, rodents, nothofagus species, sclerophyllous species, and herbaceous plant species), and they used dummies for each one to understand which group the respondents are WTP more, not using the number of species but instead approaching the conservation of wildlife through in-depth research possibilities. Jeanloz et al. (2016) used two attributes for biodiversity in their research, one focusing on the chances of spotting red deer (0, 1, or 2 out of 50 walks), and another for biodiversity in general, using as a proxy the % of the increase in surface occupied by vegetation as it would be used as a refuge for wildlife (0, 10 or 20% increase).

The restriction of access was another interesting attribute used for dealing with biodiversity, which had as goal mainly preventing disturbance of the local fauna. The levels were, for example, the restriction of access by specific vehicles (car/boat), or no access at all (during weekends, or n. of days per year, only on designated trails) (Paltriguera et al., 2018; Estifanos et al., 2021; Tyllianakis, 2022).

Some attributes which were considered in the group of “forest structure and management” in Table 6, but they also impact biodiversity specifically in forest

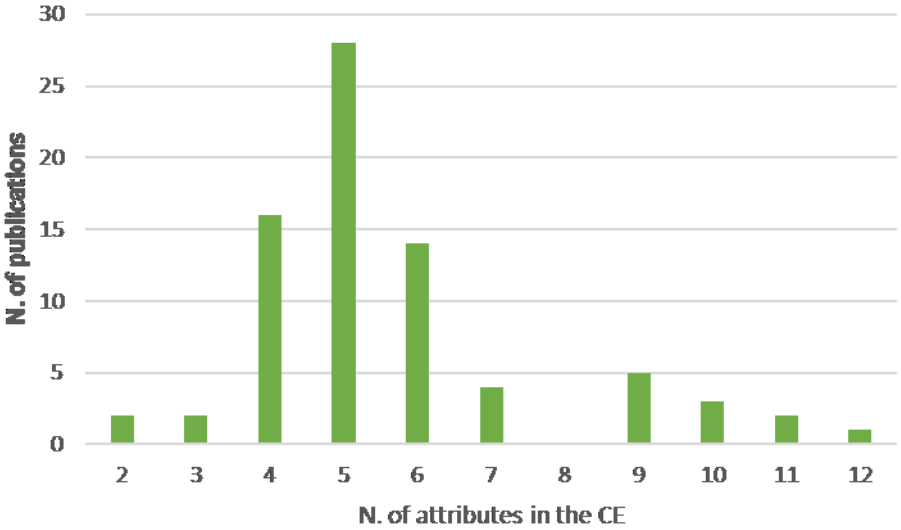
areas are part of the so-called “closer-to-nature management”, which is a form of sustainable management that considers the natural components, structures and processes of the forest, aiming the improvement of habitat while producing timber, such as the maintenance of deadwood, use of native tree species, promotion of natural regeneration, partial harvests and stand structural heterogeneity (Larsen et al., 2022). In their choice experiment carried out in Germany, Sacher et al. (2022) explored the trade-off between the presence of more natural forest structures, such as the presence of deadwood, and recreation in forest areas in Germany. To do so, they considered attributes dealing with deadwood (amount, decomposition grade, and structure), tree species composition, age structure of the forest, habitat availability, recreation facilities, and quality of the forest path. Their findings show that the amount of deadwood does not affect respondents’ site selection, while infrastructure facilities or good paths/accessibility were more important. The respondents also showed preferences for improving habitats for rare and endangered species in forests, which is proof that biodiversity is significant to them, so there shouldn’t be conflicts between recreationists and the increased presence of deadwood in the study area (Sacher et al., 2022).

Another attribute commonly mentioned in the selected literature was congestion, also called crowding, and the number of visitors. Some of the selected publications deal specifically with the issue of congestion in natural areas and/or the conciliation between tourism development and nature conservation, such as Thiene et al. (2019) in Italy, Cerda et al. (2018a) in Chile, López-del-Pino & Grisolía (2018) in the Canary Islands, Kohlhardt et al. (2018) in Canada, and León et al. (2015) in Colombia. The results from the selected publications point out that overcrowding has a negative impact on the utility of visitors and that conservation and visitor preferences can converge. The congestion in these studies was approached by the experience of visitors inside the area, in terms of number of encounters while hiking, number of people at the beach, number of people at viewpoints (per 100 meters), number of tourists per month in the study areas.

Obeng et al. (2021) on the other hand, considered the number of tourists in a study area (% of the increase in the number of tourists within 5 years) as a positive aspect, which could bring benefits to the local community through services provision. The study had a different goal considering that the respondents of the survey were not visitors, but the local community, which highlights one potential conflict that could raise in Cansiglio, related to the relationship between congestion control measures and other stakeholders’ opinions, who see a higher number of tourists as a positive aspect, such as restaurant owners, touristic guides.

Considering the payment vehicle as an attribute in the publications, it was noted that 75% of the publications used between 4 to 6 attributes in their DCE, but some used up to 12 attributes (Figure 21). According to Mariel et al. (2021), some studies point out that increasing the number of attributes in a DCE does not negatively affect response efficiency, however, those studies considered multiple attributes dealing with the same content (i.e. splitting the attribute "biodiversity" into two attributes "biodiversity in forests" and "biodiversity in other parts of the landscape") and thus it is not clear if the inclusion of multiple attributes introducing new characteristics (increasing the amount of information a respondent would have to process) would negatively affect response efficiency.

Figure 21: Quantity of attributes used in the DCE of the selected publications



Source: Own elaboration (2022)

Still considering the payment vehicle attribute specifically, as seen in Figure 20, the most common one used in DCE is the tax, followed by entrance fee and contribution to a fund. The tax-related attribute refers to the increase of an existing tax to support the actions for the improvement of ES. The value was expressed in terms of, for example, an increase in annual tax for the next 5 or 10 years, this being property tax, regional tax, or tax per household (Masiero et al., 2018; Kim et al., 2021; Ankamah-Yeboah et al., 2022). The entrance fee involved the creation of a new one to access the natural area or the increase of an existing entrance fee (i.e., Franceschinis et al., 2022; Cerda et al., 2018a). The contribution to a fund is related to the donation specifically for the conservation of the natural area under study during a specific interval of years, or a contribution made during each visit to the area, or even an annual contribution to a fund created specifically for the natural area (i.e. Hoyos et al., 2012; Dobson et al., 2020; Lee et al., 2019).

Only one publication using parking fees specifically was found in the present literature review, which had as goal understanding tourists' preference between two transportation modalities in a natural area in Spain: car and bus (González et al., 2019). The cost for using the shuttle service (bus) was composed of a parking fee at the entrance of the park, where the bus stop would be located (the bus ride was free), a cheaper option than the parking fee within the park, for those who prefer using the car instead of the bus. The other attributes included waiting time to find a parking space (this being zero for those who choose the shuttle service) and waiting time to start the visit, related to the time required to wait for the shuttle service (this being zero for those who choose using the car), in addition to CO2 emissions from each modality. The idea was to establish a parking fee at the entrance of the park that is attractive enough to encourage visitors to use the shuttle service and to establish a parking fee inside the park that is enough to discourage visitors from using their cars. The results of this study indicated that visitors would be willing to pay nearly 11€ to reduce the time spent finding a parking space and 9€ for reducing the waiting time to start the visit (González et al., 2019).

4.1.2 Attributes suggested for the future survey in Cansiglio

Attributes can be quantitative (i.e., number of people encountered on the trail or number of species found in an area), and qualitative (i.e. quality of the soil in the camping area, trail surface), and they are chosen based on literature reviews, group discussions, interviews, and experts opinions (Coast and Horrocks, 2007). It is difficult to include all of the important attributes in a DCE, but it is important to consider the most important ones to the majority of the respondents so that they are willing to make trade-offs among them (Kløjgaard et al., 2012).

As seen in Table 6, some attributes were frequently mentioned in the literature, such as the ones related to recreation infrastructure, biodiversity aspects, and congestion (or crowdedness). Considering the results presented so far, the ES already explored by the project BioΔ4 (items 3.1.2 and 3.1.3), and the observations made on-site on May 4th, 2022, Table 7 contains possible attributes to be considered as inputs during discussions with stakeholders, bearing in mind that after researching potential attributes to be considered in a DCE, the selection of those to be used in the final survey should be made through a qualitative selection process involving focus groups and interviews (Jeanloz et al., 2016).

Table 7: Potential attributes to be considered in a DCE survey in Cansiglio

Attribute	Description	Section*	Division*	Group*	Class*	Source
Picnic areas	Cansiglio already has areas with picnic tables. The DCE could explore the preference of respondents for changing their quantity	Cultural	Direct, in-situ and outdoor interactions with living systems that depend on the presence in the environmental setting	Physical and experiential interactions with the natural environment	Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	DeShazo et al. (2015), Thiene et al. (2017), Cerda et al. (2018a), Tekalign et al. (2018), Thiene et al. (2019), Franceschinis et al. (2022), Sacher et al. (2022)
Camping area	Cansiglio already has a dedicated area for campers to park. The DCE could explore the preference of respondents for changing their quantity					Cerda et al. (2018a), Tekalign et al. (2018)
Trail surface	Explore the preference for changing the composition of the surface of the trail in Cansiglio (i.e., gravel, natural soil)					Hoyos et al. (2012), Cerda et al. (2018a), Kohlhardt et al. (2018), Pienaar et al. (2019), Arnberger et al. (2021), Sacher et al. (2022)
Wildlife watching spot	Currently, there is not a permanent spot for observing wildlife (birds, deer). The DCE could explore the preference of respondents for creating such a structure					BioΔ4, Thiene et al. (2017), Masiero et al. (2018), Tekalign et al. (2018), Tempesta & Vecchiato (2018), Franceschinis et al. (2022)

Attribute	Description	Section*	Division*	Group*	Class*	Source
Likelihood of spotting wildlife with guided tours	Allowing only guided tours during the red deer roar period and exploring the respondents' preferences for the number of guided tours per week					DeShazo et al. (2015), Jeanloz et al. (2016), Kubo & Shoji (2016)
Forest bathing	Explore the preference for the number of forest bathing activities per week or per month, and distribution through seasons					BioΔ4
Big trees	This attribute could be approached in two ways: Just in terms of knowing that this symbolic element of the area will be kept, or by the possibility of creating dedicated trails passing by some big trees		Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental setting	Spiritual, symbolic and other interactions with the natural environment	Elements of living systems that have symbolic meaning	BioΔ4
Thematic trails - Archaeology	Developing dedicated trails with information boards passing by archaeological findings in Cansiglio		Direct, in-situ and outdoor interactions with living systems that	Intellectual and representative interactions with the	Characteristics of living systems that are resonant in terms of culture	Author’s suggestion based on field observations

Attribute	Description	Section*	Division*	Group*	Class*	Source
Thematic trails - Arsenal of Venice	Development of a cultural itinerary with information boards involving the history of the use of the forest by the Republic of Venice		depend on presence in the environmental setting	natural environment	or heritage	BioΔ4
Open hours of the museum	Capture the preference for a change in the open hours of the museum					Author's suggestion based on field observations
Open hours of giradino botanico alpino	Capture the preference for a change in the open hours of the giardino botanico		Direct, in-situ and outdoor interactions with living systems that depend on presence in the environmental setting	Intellectual and representative interactions with the natural environment	Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge	Author's suggestion based on field observations
Information material available at the information center	Creation of flyers and brochures with natural and cultural aspects of Cansiglio		Direct, in-situ and outdoor interactions with living systems that depend on presence in	Intellectual and representative interactions with the natural environment	Characteristics of living systems that enable education and training	DeShazo et al. (2015), Kubo & Shoji (2016), Paltriguera et al. (2018), Tekalign et al. (2018)

Attribute	Description	Section*	Division*	Group*	Class*	Source
Open hours of the information center	Possible timetables of the information center		the environmental setting			BioΔ4, Arnberger et al. (2018), Paltriguera et al. (2018), Tekalign et al. (2018), Thiene et al. (2019), Crespo-Cebada et al. (2020)
Video presentation in the hangar	Creation and projection of videos that could be presented in the hangar during the high season (i.e. importance of wolf population, close-to-nature forest management)					Author's suggestion based on field observations
Number of wolves	Given the importance of the return of this species to Cansiglio, explore the respondents' preferences for the presence of more individuals		Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental	Other biotic characteristics that have a non-use value	Characteristics or features of living systems that have an existence value	Cerda et al. (2018b), Dobson et al. (2020), Estifanos et al. (2021)

Attribute	Description	Section*	Division*	Group*	Class*	Source
			setting			
Species of conservation interest	Biodiversity in general terms, capture the respondents' preference for changing levels of the number of protected species as a whole group					BioΔ4, Jobstvogt et al. (2014), Jeanloz et al. (2016), Kang et al. (2019), Obeng et al. (2021), Sacher et al. (2022)
Forest structure	Explore respondents' preference for the articulation of forest structure, in terms of vertical layers	Regulation & Maintenance (Biotic)	Regulation of physical, chemical, biological conditions	Lifecycle maintenance, habitat and gene pool protection	Maintaining nursery populations and habitats (Including gene pool protection)	BioΔ4, Sacher et al. (2022)
Deadwood	Explore respondents‘ preference for the presence of deadwood on the ground, in terms of quantity					BioΔ4, Sacher et al. (2022)
Snag	Explore respondents‘ preference for the presence of snags, in terms of quantity					BioΔ4, Sacher et al. (2022)
Restriction of access	Restriction of access to some areas during autumn (i.e. during the deer roar period)					Paltriguera et al. (2018), Estifanos et al. (2021), Tyllianakis (2022)

Attribute	Description	Section*	Division*	Group*	Class*	Source
Congestion on the trails	N. of people to be encountered during hiking activities, to measure preferences for different levels of crowdedness	-	-	-	-	DeShazo et al. (2015), Rodrigues et al. (2015), Kainzinger et al. (2017), Kohlhardt et al. (2018), Thiene et al. (2017), Arnberger et al. (2018), Kang et al. (2019), Thiene et al. (2019), Crespo-Cebada et al. (2020), Lee et al. (2019), Arnberger et al. (2021), Lara-Pulido et al. (2021), Franceschinis et al. (2022), Makumbirofa & Saayman (2022)
Congestion in the parking lot	Time (in minutes) to find a parking spot. This would be an interesting attribute if a limitation on the number of cars was to be imposed (i.e. previously booking the parking spot online)	-	-	-	-	Kainzinger et al. (2017); González et al. (2019)
Parking fee	Monetary attribute expressed in EUR/day	-	-	-	-	González et al. (2019), BioΔ4

*CICES classification

Source: Own elaboration (2022)

The presence of big trees in Cansiglio, as noted by the BioΔ4 project, could be an interesting attribute, that even though it was not detected in the publications that used DCE, it was mentioned in a selected publication that used CVM as a valuation method. Asciuto et al. (2015) evaluated the existence value of monumental trees in a park located in the Italian region of Sicily by using CVM and found out that residents were willing to pay €13.45 for the monumental trees along the trail.

Another interesting aspect to take into consideration is that charismatic species, such as the red deer, can be the main attraction for ecotourists who visit natural areas, but focusing on this interest leads to under-appreciation of other biodiversity and cultural values present in these areas (Hausmann et al., 2016; Dobson et al., 2020). Based on this observation, other attributes such as the big trees and all the other options from Table 7 should be considered in a future selection of attributes for the DCE survey, thus allowing to explore the tourists' preference for alternative attributes that include biodiversity and cultural aspects. These preferences might also change depending on the visitors' motivations, as will be explored in section 4.2.

4.1.3 Parking fees in natural areas

Considering that just one publication used parking fees as payment vehicle of their DCE and the need to understand the state-of-the-art of parking fees being charged in natural areas, an additional step was carried out to find real examples of those fees and potentially understand how they are being charged and how they were calculated, serving as input for future benchmarking.

The research for ongoing parking fees in natural areas, specifically in Italy, resulted in 17 items, with fees ranging from € 2 to 35 per car per day, with an average of € 9.60 and a median of € 7. The most frequent cost of parking fees found in the Italian natural areas was € 5, found in three different natural areas located in the regions of Valle d'Aosta and Piemonte (Table 8).

Table 8: Parking fees in natural areas – State of the art in Italy

Natural Area	Region	Fee (€/car/day)	Payment method	Observations	Source
Parco Regionale della Maremma	Toscana	2.00	Parking meter	-	Phone call on 04/04/2022 with the director Enrico Giunta
Parco Naturale Marguareis	Piemonte	3.50	-	2.5 €/day for motorbikes. Local residents don't pay.	areeprotettealpimaritime.it

Natural Area	Region	Fee (€/car/day)	Payment method	Observations	Source
Parco Naturale Alpi Marittime	Piemonte	3.50	Personnel	2 €/day for motorbikes. Local residents don't pay. Payment only from June 13th to September 13th (the area is closed during winter)	areeprotettealpimaritime.it
Riserva di Torre Guaceto	Puglia	4.00	Online	2 €/day for motorbikes. It is fordidden to enter the area with vehicles. A shuttle service and bike rental are offered from the parking lot to the entrance of the area	riservaditorreguaceto.it
Parco Naturale Adamello Brenta	Trentino-Alto Adige	4-10	Online and personnel	There are various parking lots with different costs. There is a subscription system which allows to pay less if 5 tickets are bought previoulsy	pnab.it
Parchi delle Alpi Cozie	Piemonte	5.00	Personnel at info center	During summer season. 3 €/day for motorbikes	parchialpicozie.it
Parco delle Vallere	Piemonte	5.00	-	Payment only during spring and summer	parcopopiemontese.it
Parco Nazionale Gran Paradiso	Valle d'Aosta	5.00	Personnel	-	pngp.it
Parco Naturale Puez Odle	Trentino Alto-Adige	6.00	Personnel	-	infodiviaggio.it
Parco Naturale Paneveggio	Trentino Alto-Adige	7.00	-	Payment only during summer period	parcopan.org
Val Visdende	Veneto	8.00	Parking meter	Payment only during summer period	Toscani (2022)
Val di Mello	Lombardia	10.00	Parking meter	Managed by the municipality	valtellina.it

Natural Area	Region	Fee (€/car/day)	Payment method	Observations	Source
Parco del Monviso (Pian del Re)	Piemonte	10.00	-	5 €/day for motorbikes. Payment only during summer	parcomonviso.eu
Parco della Sterpaia (Val di Cornia)	Toscana	10.50-18	Parking meter or app	-	parchivaldicornia.it
Parco Nazionale Cinque Terre	Liguria	15-35	-	There are 5 parking lots with different fees, managed by different municipalities	lecinqueterre.org
Parco Naturale Fanes-Senes-Braies	Trentino-Alto Adige	18.00	Online	-	pragsparking.com
Parco Naturale Tre Cime	Trentino-Alto Adige	30.00	Personnel	20 €/day for motorbikes	auronzomisurina.it
Average		**9.60**			

Source: Own elaboration (2022)

The highest parking fees in Italy were related to areas hosting tourist hotspots, such as Cinque Terre (*Parco Nazionale Cinque Terre*), a unique area characterized by the presence of colorful houses at a wine production area on steep terraces by the seaside; Lago di Braies (*Parco Naturale Fanes-Senes-Braies*), a mountain lake with clear water and unique landscape; and Tre Cime di Lavaredo (*Parco Naturale Tre Cime*), a postcard of the Dolomites in the Alps. Only three managers from Italian natural areas provided further information on how the fee was defined.

The director of *Parco Regionale della Maremma*, where a fee of € 2 is charged for parking, stated at a phone call on April 4th, 2022 that no specific methodology was used for determining the price, but that it represents twice the original parking fee value, which was of € 1 and existed before the creation of the park. By duplicating the fee, the goal of the park management body was to encourage visitors to use other more sustainable modes of transportation, including bicycle and bus. The management body invested in the creation of a 9 km cycle lane and, together with the municipality, is using half of the income from the parking fee, which totaled € 80,000/year in 2021, to invest in the implementation of a larger number of public transportation connecting the park to the urban center. The other half of the income is destined for the maintenance of the natural area.

The technical staff of the environmental office of Parco Naturale Adamello Brenta also answered, by email on April 14th, 2022, that no replicable methodology was used when defining the parking fee, but that it consists of a

balance among several aspects related to their internal costs, such as maintenance of the natural area, visitor center service, management of vehicular traffic and sustainable mobility, implementation of new trails, and information material. Regarding specifically the congestion issue, the management body monitors the vehicular flow and blocks car access to specific areas of the park at specific times, directing the vehicular flow to other paid parking lots held by the management body and providing a shuttle service to reach the park. In 2021, 106,533 tickets were bought in the various parking lots of the park, which vary in price from 4 to 10 €/car/day and also per vehicle type (motorcycles, car, van, bus pay different prices) (PNAB, 2021).

A similar congestion management option was recently implemented in a specific area of the *Parco naturale Fanes-Senes-Braies,* the Braies lake, where from July 11th to September 10th, 2022 (high season) visitors who arrive at the park by car can only access the area by previously booking online and paying the parking fee. When the parking lot is fully booked (800 spots), visitors can only get to the park by foot, bicycle, or shuttle bus, which leaves from a bus stop 5.5 km away from the lake every 30 minutes and costs € 10. The system is controlled using cameras and a bar which only opens after the recognition of the plates that were informed at the moment of the booking. The aim is to have no more than 5,500 tourists per day at the lake area during summer (Piccoli, 2022).

At *Parco Naturale Alpi Marittime*, there is an agreement between the management body and the cooperative Montagne del Mare, which is responsible for running the parking lots and the museum (*Museo Uomini e Lupi*) at the area. According to a phone call carried out on September, 30th, 2022 with the staff of the cooperative, the parking fee takes into consideration costs related to the maintenance of the structure, such as paying the staff, cleaning supplies, energy, and water but according to the cooperative it is also a tool for sustainable development of the territory since a more organized parking arrangement avoids accidents on the mountain roads in addition to generating jobs for the local population.

The staff of *Parchi delle Alpi Cozie* answered by email on April 5th, 2022, however no details on how the fee is calculated were given. Numbers on tourist flow and income from the parking fee are found at the website of the natural area: In 2020 € 12,322 were collected from parking fees and the total number of visitors for the year was 35,606 people (Ente di gestione delle aree protette delle Alpi Cozie, 2020).

Finally, it was detected that there have been some protests regarding the recent increase in the parking fee charged in *Val Visdende*, which went from 5 to 8 €/car/day in the summer season of 2022. Visitors complained about the increase in the fee, which would make their trips more expensive coupled with the increase in the price of the gas, but residents and the management body

stated that this is necessary for the management of the area, which suffered from the Vaia storm in 2018 and with congestion caused by visitors during the summer period (Toscani, 2022).

At the international level, 20 car park fees were found (Table 9). Given the large number of natural areas worldwide and the challenges in finding specific information on parking fees for each one of them, the actual number of car park fees is potentially larger than the one reported in this thesis.

The National Parks in South Korea have both entrance and parking fees and they don't change values throughout the country (KNPS, 2022). In Poland, even though the fees are different among parks, the country has a law stating that the income coming from the operation of parking spaces in national parks must be invested into the development of the park for tourism and recreation (Article 8h of the Law of 16. 04. 2022). The technical team of Slowinski National Park stated by email on May 20th, 2022 that the price of the parking fee was defined based on years of observation of parking ticket prices charged in the surrounding areas.

Table 9: Parking fees in natural areas – International examples

Park	Location	Original Fee	Currency	Converted Fee (EUR)*	Payment method	Source
Ojcowski National Park	Poland	5-8	PLN	1.09-1.74	Parking meter	ojcowskiparknarodowy.pl
Natural areas in Lancashire county	England	1.00	GBP	1.18	-	lancashire.gov.uk
All National Parks in South Korea	South Korea	2000.00	KRW	1.48	-	english.knps.or.kr
Wielkopolska National Park	Poland	7.00	PLN	1.52	Parking meter or app	wielkopolskipn.pl
Slowinski National Park	Poland	8.00	PLN	1.74	-	slowinskipn.pl
Bavarian Forest	Germany	2-5	EUR	2-5	-	baumwipfelpfade.de
Cairngorms National Park	Scotland	2.00	GBP	2.36	-	nature.scot
Natural areas in Kent county	England	2-3.50	GBP	2.36-4.13	App, online, or by phone	kentwildlifetrust.org.uk
Natural areas in Clark county	USA	3.00	USD	2.65	Personnel or app	clark.wa.gov

Park	Location	Original Fee	Currency	Converted Fee (EUR)*	Payment method	Source
Sydney Harbour National Park	Australia	5-20	AUD	3.22-12.86	Pay and display machines that accept cards and coins	nationalparks.nsw.gov.au
Volcan Poas National Park	Costa Rica	2000.00	CRC	3.40**	Online	sinac.go.cr
Volcan Irazu National Park	Costa Rica	2000.00	CRC	3.40**	-	sinac.go.cr
Bieszczady National Park	Poland	20.00	PLN	4.34	-	bdpn.pl
Oregon State Parks	USA	5.00	USD	4.41	Personnel or parking meter	stateparks.oregon.gov
Virginia State Parks	USA	5-10	USD	4.41-8.82	Personnel or online	dcr.virginia.gov
Tatra National Park	Poland	25.00	PLN	5.43	Online	tpn.pl
Iguaçu National Park	Brazil	37.00	BRL	6.24	Online	cataratasdoiguacu.com.br
Stolowe Mountains National Park	Poland	30.00	PLN	6.51	-	pngs.com.pl
Berchtesgaden	Germany	8.00	EUR	8.00	App	koenigssee.de
Stone Mountain Park	USA	20.00	USD	17.64	Online	stonemountainpark.com
Average				**4.66**		

*Exchange rate for the period jun/2021-jun/2022 from the European Central Bank (ecb.europa.eu)

**ECB does not provide CRC-EUR exchange rate, thus another source was consulted for this currency (reuters.com)

Source: Own elaboration (2022)

A great part of the National parks in Costa Rica has an entrance fee; however, only two of them charge a parking fee (Table 8). According to the administrative staff of the national system of protected areas (SINAC), who answered by email on June 7th, 2022, the price charged for the parking fee doesn't consider

environmental aspects, just costs related to wages, gas, cleaning supplies, and permits.

As to the other countries from Table 9, in Australia, as is the case in Costa Rica, most parks charge an entrance fee but from the information available, only one park charges a parking fee. The same is observed in the USA: At the national level, a complete list of entrance fees to each national park is found and, after paying the fee at the entrance of the park, parking spots can be found, without any extra charge for parking (https://www.nps.gov/aboutus/entrance-fee-prices.htm). At the state level, however, some parking fees in natural areas were found. Finally, in Brazil, the Iguaçu National Park charges both entrance and parking fees and this is mostly due to the popularity of the area, visited by tourists from around the globe. There, the parking fee can be purchased together with the entrance fee at the park's website (ICMBIO, 2021).

As to the payment methods, five natural areas, one in Italy (*Parco della Sterpaia*), one in Poland (Wielkopolska National Park), one in Germany (*Berchtesgaden*), areas in Kent County (England), and Clark County (USA) use specific apps to charge the parking fee, named *Phonzie,* moBILET, *Parkster, Ringo,* and *Flowbird* respectively. Those are apps used exclusively for parking but they are not exclusive to those natural areas, they are actually used at national level, or in the case of *Parkster*, at the international level: in Germany, Sweden, and Austria. In all those three parks, the app is an option, but the visitor can also choose to use the parking meter or pay to the personnel at the parking area. In *Parco della Sterpaia* , after purchasing the parking ticket in the app, the visitor is asked to print the ticket and put it in the car (parchivaldicornia.it).

Other parks have on their website the possibility of booking a spot and paying online using a credit card. That is the case for example of *Parco Naturale Adamello Brenta* (Italy) and Iguaçu National Park (Brazil) (mobilitypnab.it; cataratasdoiguacu.com.br). The other two payment methods, and the most common ones, are through parking meters or directly with the personnel present at the parking space or information center.

Many parks highlight that the local population who visit the area do not pay the parking/entrance fee or pay less, some charge differently if the visitor comes from other countries. In Italy, residents of the municipalities covered by *Parco Naturale Adamello Brenta* either pay half of the parking fee or don't pay anything, depending on which parking lot (PNAB, 2021). In *Parco Naturale Alpi Marittime* and *Parco Naturale Marguareis* local population does not pay any fee. In Brazil, the parking fee of Iguaçu Nation Park changes according to the visitor, being lower for people who live in the municipalities nearby the protected area and the same situation is also true for the entrance fee, with international visitors paying the highest fee (ICMBIO, 2021).

4.2 Motivation theories for ecotourism

As seen in section 2.3.2, in addition to the site attributes, an individual's motivations also impact economic valuation. To examine the factors that influence tourists' motivations and behavior, some frameworks were developed.

The literature review highlighted nine motivational theories, summarized in table 10. The application of each theory to ecotourism is detailed in the following paragraphs.

Table 10: Motivational theories used in ecotourism

Theory	Description	Source
Push & Pull Theory	An individual is pushed to travel to one place based on internal psychological factors and pulled by attributes of the destination	Dann, 1977
Theory of Reasoned Action (TRA)	Attitudes and subjective norms influence an individual's intention of performing a certain behavior	Azjen and Fishbein (1980)
Materialism	Post-materialistic approach states that people who had economic insecurity tend to have materialistic values and those who had economic security and affluence tend to present higher-order values, such as environmental concerns	Inglehart (1981)
Iso Ahola's Motivation Theory	An individual travel either to escape or seek something, from a personal and/or interpersonal perspective	Iso Ahola (1982)
Theory of Planned Behaviour (TPB)	An evolution of TRA, including a third component (perceived behavioral control) that influences an individual's intention to perform a behavior	Azjen (1985)
Travel Career Ladder (TCL)	Travel motivation can be described by hierarchical levels of needs, from more basic to higher level ones depending on the travel career (experience) of the individual	Pearce (1988)
Value Belief Norm Theory (VBN)	Values influence behavior by means of pro-environmental beliefs and personal norms	Stern et al. (1999)
Travel Career Patten (TCP)	An evolution of TCL, states that instead of a hierarchy, there is a multi-level dynamic structure of motivations of a tourist	Pearce and Lee (2005)
Interactional theory	There is an interactive exchange between the tourist and the touristic environment and those interactions impact three outcomes: (i) knowledge, (ii) attitudes toward management, and (iii) environmental behavior	Powell et al. (2009)

Source: Own elaboration (2022)

The push and pull theory is a common approach to studying travel motivations (Klenosky, 2002; Phau et al., 2013; Chen & Chen, 2015; Chan et al., 2018; Aquino et al., 2019; Fraiz et al., 2020) and states that an individual is pushed to travel based on internal psychological factors, such as the need for discovering new things or escaping everyday life, and pulled by attributes of the destination such as sunshine or recreation facilities (Dann, 1977; Crompton, 1979; Uysal & Jurowski, 1994). This approach is related to two decisions: first, whether to go (push factors), and then where to go (pull factors); the former is internal, related to the individual's motivations and the latter is external, varying according to the country or location of the park since each area has its particular attributes (Slabbert & Viviers, 2012; Phau et al., 2013).

Crompton (1979) in his study on motivations for pleasure vacation identified seven push factors: escape from the perceived mundane environment, exploration and evaluation of self, relaxation, prestige, regression, enhancement of kinship relations, and facilitation of social interaction. The importance of push factors or in other words motivation might change with sociodemographic aspects. For example, Kim et al. (2003), while investigating the influence of push and pull factors at Korean national parks, found four push factors (family togetherness and study, appreciating natural resources and health, escaping from everyday routine, adventure and building friendship) and three pull factors (key tourist resources, information, and convenience of facilities, accessibility, and transportation) and they had significant differences among different age groups, occupation, gender, and income. Motivation for visiting natural areas can also change with nationality and the difference between domestic and international tourists (Prayag & Ryan, 2011; Mody, 2014). Correlations are also found between push and pull factors, satisfaction, and place attachment (Yoon & Usyal, 2005; Kil et al., 2021).

Analyzing push and pull factors can help identify potential conflicts in the recreational use of an area. Schirpke et al. (2021) while analyzing the motivation of tourists in mountain lakes of the European Alps found out that the visitors could be separated into two groups: nature-oriented and leisure-oriented, the first group is comprised of people who visit those areas to observe nature and go hiking and prefer remote areas with no tourist facilities, whereas the second group is formed by people who prefer lakes of easy access and recreational activities such as reading, listening to music or having a picnic. Considering these two groups have basically opposite preferences, the park manager can develop different strategies to reduce potential conflicts and environmental impacts (Schirpke et al., 2021).

Klenosky (2002) also provided an important discussion related to the push-pull motivational framework by using the means-end theory. Like many other studies on push and pull factors (Jeong, 2014; Xu & Chan 2016; Lee et al., 2017;

Mutanga et al., 2017; Pestana et al., 2020), Klenosky's study confirmed that pull and push attributes are correlated, but stressed the need for further investigation on how this relation happens. The means-end theory used by Klenosky (2002) to develop the push and pull framework is one approach for investigating ecotourism motivation. López-Mosquera & Sánchez (2011) also used this approach to reveal the benefits people get from visiting a peri-urban green area in Spain, these being sport and recreational activities, improvement of physical and mental well-being, and enjoyment of landscape beauty. By using a laddering procedure, the researchers can connect the tangible attributes of a product (or destination), such as nice beaches, to the benefits the visitors derive from it, e.g. getting sun and looking healthier, and ultimately the values, such as improving self-esteem, so that the attributes are just the means from which consumers (or visitors) get their benefits (Gutman, 1982; Klenosky, 2002).

After the push and pull framework was stated by Dann in 1977 and researched by Crompton in 1979, Iso Ahola (1982) further developed travel motivation and suggested that people travel either to escape or seek something. His theory consists of four quadrants of motivations that are not mutually excludable, which means that an individual might decide to travel based on more than one motivation at a time: (i) personal escape, which relates to the need of getting away from everyday life and the stress that comes with it; (ii) interpersonal escape, or in other words, avoiding the usual relationships with co-workers and/or family members and friends; (iii) personal seeking, consisting on obtaining intrinsic rewards such as learning about other cultures or relaxation; and (iv) interpersonal seeking, looking for improving the relationship with people they already know (family, friends) or even meeting new people with similar interests. Examples of application of this theory can be easily found in the literature, for example, Wolfe & Hsu (2004) and Snepenger et al. (2006) found that ecotourists' motivations are correlated to Iso-Ahola's four dimensions, the first focused on how those four motivational forces vary among different groups (Non-Caucasians and Caucasians) and Snepenger et al. (2006) found that no significant correlation between Iso-Ahola's motivations and the number of recent domestic and international vacations made by a tourist, implying that these motives act independently of travel experience.

Building on the push and pull framework, Yoon and Uysal (2005) stated that these two factors influence travel satisfaction, which in turn influences destination loyalty. Satisfaction is related to the expectations of the visitor and to the comparison, the visitor makes with other destinations: If the experience (performance) meets the visitors' expectations and is better than alternative destinations, then the visitor is satisfied (Oliver, 1980; Yoon & Uysal, 2005). According to the authors, travel satisfaction is an important factor for managers of natural areas since, when satisfied with their experience, visitors tend to

recommend the area to potential visitors and this type of information, known as word-of-mouth, is one of the most common references people look for when interested in traveling, so efforts should be done to make the site characteristics and activities (pull factors) competitive. In addition to recommending the destination to other people, travel satisfaction influences the decision to return to the area on future trips, known as consumer loyalty, which is also influenced by the emotional attachment, related to tourists' motivations, or in other words, the push factors (Backman & Crompton, 1991; Yoon & Uysal, 2005). In their DCE carried out in a natural area in China, Kang et al. (2019) found that tourists with a higher level of satisfaction were willing to pay more for attributes improvements in the shape of an entrance fee than those with less satisfaction.

Some years after the proposal of the push and pull framework, in 1980 Azjen and Fishbein proposed the theory of reasoned action (TRA), which was developed into the theory of planned behavior (TBP) in 1985. According to TBP, intentions are linked to a person's attempt to perform a behavior, and it is determined by internal and external factors, such as (i) attitude toward the behavior, which refers to the individual's positive or negative evaluation of performing a certain behavior, their beliefs, if it has more positive or negative outcomes; (ii) subjective norm, referring to the perception of external social pressure to perform or not a certain behavior; and (iii) perceived behavioral control, which refers to the consideration of non-volitional factors, meaning the effort an individual has to make to be able to control personal and external factors (e.g. hiking ability, time, and money availability). Those determinants have different weights for each person and each intention being analyzed. In other words, according to the TBP, people intend to perform a behavior if they think they can do it if they think the advantages outweigh the disadvantages, and if they believe others think they should perform it (Azjen, 1985; Azjen, 1991).

Specifically dealing with how to measure attitudes towards environmental behavior in surveys, one of the factors considered in the TPB, the NEP scale (New Ecological Paradigm) was created to address the environmentalist view, the social awareness that human actions have extensive impacts on the biosphere (Dunlap et al., 2000). The NEP is probably the most widely used psychological measure in the literature on environmentalism (Stern, 1999; Lee & Jan, 2018) and consists of a set of 15 items regarding beliefs about the biosphere and the impacts of human activity on it, related to topics such as ecological limits, the balance of nature, human domination, and ecological catastrophe (Dunlap et al., 2000).

Stern et al. (1999) in their value-belief-norm theory (VBN) integrates the NEP, the value theory (Schwartz, 1992), and the norm-activation theory (Schwartz, 1977). The VBN postulates that a person's predisposition to provide support for

a movement or in other words the attitudes towards the environment depends on a sequence of factors: (i) a person's values (altruistic values, egoistic values, and biospheric values), (ii) the belief that valued objects are threatened (i.e. non-human species), (iii) awareness of consequences to those non-human species, (iv) acceptance of responsibility for the undesirable consequences, and (v) the conviction that their actions can help restore those values.

Lee & Jan (2018) applied the TBP and VBN to visitors of natural areas in China and confirmed that environmental attitude, subjective norms, and perceived behavioral control are predictive variables for ecotourism behavioral intention in nature-based tourism contexts. López-Mosquera & Sánchez (2012) also used both theories to assess WTP for a suburban park in Spain and found that TPB has a greater influence on WTP. Kenter et al. (2016) used those two theories to understand their influence on visitors' WTP for ES of UK marine protected areas. Their findings suggest that individuals with stronger altruistic and biospheric values had a tendency for higher WTP whereas egoistic values negatively influenced WTP (Kenter et al., 2016). Hultman et al. (2015) applied the TPB to test the influence of ecotourism attitudes on WTP for ecotourism. Their results indicate that attitudes both cognitively and affectively influence the final decision and that they positively influence the WTP, which means that respondents who have environmental attitudes are willing to pay a premium price for ecotourism.

When dealing with values, another aspect that could affect motivations and attitudes toward the environment is materialism (Kilbourne & Pickett, 2008; Hurst et al., 2013; Hultman et al., 2015). Post-materialistic approach states that people who had economic insecurity tend to have materialistic values and those who had economic security and affluence tend to present higher-order values, such as environmental concerns (Inglehart, 1981). Materialistic visitors, therefore, are less concerned about natural resources as long they have other benefits from them, based on their financial value, status, and other appearance-related reasons (Hultman et al., 2015). On the other hand, post-materialistic visitors have different attitudes toward the environment, valuing its existence (Banerjee & McKeage, 1994; Hurst et al., 2013). Hultman et al. (2015) found in their survey that materialism had a negative relationship with pro-environmental behavior indeed, specifically on the tourist's WTP for ecotourism.

Another behavioral theory for nature-based tourism is later proposed by Pearce and Lee (2005), based on Maslow's hierarchy of needs (Maslow, 1943), who stated that people have a pattern of motivations based on their life stage and previous travel experience, meaning that people who traveled more in the past and that are older tend to have different motivations when compared to young and less experienced travelers. The travel career pattern (TCP) is a

development of the called travel career ladder (TCL) (Pearce, 1988) and emphasizes that it is a multi-level dynamic structure of motivations rather than a hierarchical one as previously stated in the TCL. The TCP framework comprises 14 factors, three of which are considered core motives, viewed as very important for travelers regardless of their travel experiences and life stages: novelty-seeking, escaping/relaxing, and relationship-building. The other motives consist of autonomy, nature, self-development (host-site involvement), stimulation, self-development (personal development), relationship (security), self-actualization, isolation, nostalgia, romance, and recognition. The authors also suggested that seeking cultural experiences is one of the key motivations, no matter the career level, but that this motive becomes more important as people accumulate travel experiences.

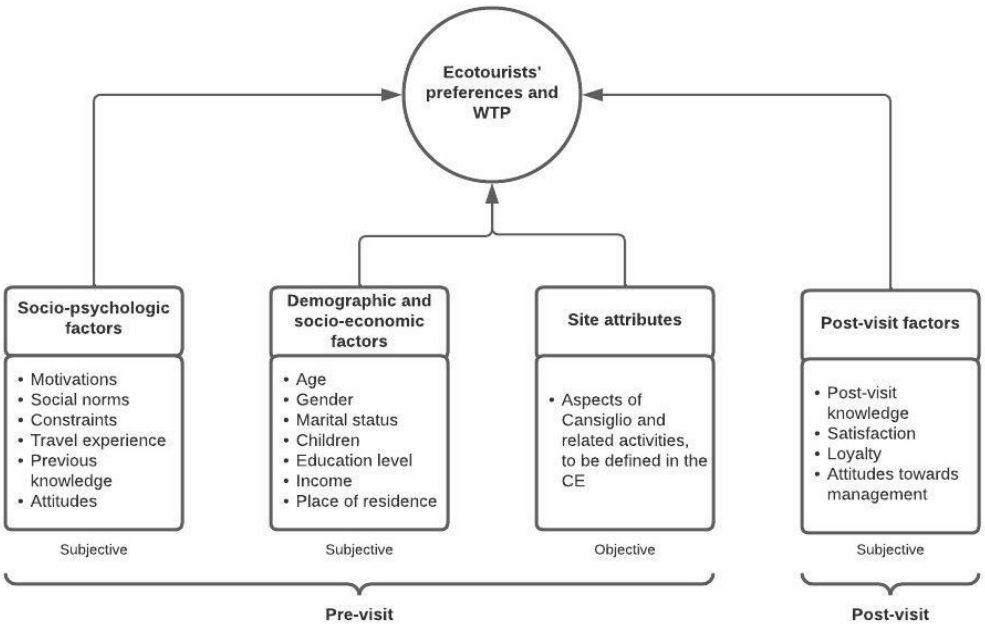
Finally, Powell et al. (2009) suggested that there is an interactive exchange between the tourist and the touristic environment and that those interactions impact three outcomes: (i) knowledge, (ii) attitudes toward management, and (iii) environmental behavior. Among the factors that influence the three outcomes, we can find tourists' motivation, socio-demographic aspects (age, gender, education, income), previous experience in ecotourism, management activities (e.g. visitation quotas, guide certifications), and site characteristics (attributes, tours availability and quality, guides experience). By testing the interactional theory on tourists of the Grand Canyon National Park in the USA, the authors found out that the tourists' knowledge of the park's natural aspects increased after visiting it as well as the perceived increase of knowledge, with 83% of the respondents stating that they feel like they learned a great deal. The environmental behavior and intentions also increased (14%) and the respondents were more aware of the park management activities, with a decrease in 8% of the answer "no opinion" to the questions regarding the attitudes towards management after the visit (Powell et al., 2009). Other studies confirmed that knowledge post-visit increased if compared to knowledge pre-visit, such as Hughes and Morrison-Saunders (2002) who found out, based on the number of correct answers of a quiz, that respondents' knowledge increased from 57% pre-visit to 71% post-visit to a natural area in Australia; and Hughes et al. (2011) found that visitors who receive additional information post-visit are more likely to report changes in their conservation knowledge, their attitudes towards protecting wildlife and the natural environment, and the frequency of picking up litter.

Specifically in Italy, Mason (2016), Thiene et al. (2017), and Swait et al. (2020) carried out an analysis of visitors of natural areas in the Northeast region of the country, including motivational factors. Their findings reflect how motivational factors affect behavior, such as site selection, destination loyalty, and WTP. Mason (2016) studied the motivation of tourists in the Friuli Dolomiti Alps Natural Park and their relation with destination loyalty. Their results revealed

four activity-related motivations: (i) nature, (ii) risk, (iii) contemplation, and (iii) socialization and that nature was the only motivational factor for their targeted population (adventure tourists) to revisit the study area, thus providing the park manager with valuable information to prioritize efforts on developing nature-themed activities in the area. Thiene et al. (2017) confirmed that visitors' motivations (relax, spend time with family, acquire and/or improve skills, knowledge of the territory, and contact with nature) and personal constraints (walking disability, health problems, small kids, lack of training, lack of technical skills, constraints due to other people, lack of free time, lack of money) influence the activities they intend to get involved and the selection of specific sites inside the Dolomiti Bellunesi National Park (DBNP). Swait et al. (2020), focusing on the same study area (DBNP) revealed that distance-decay is mitigated by goals, which means that individuals are willing to travel longer distances to find an area that fulfills their goals, thus willing to pay more for their trip to achieve their goals.

Initially, when analyzing environmental behavior, researchers focused their attention on sociodemographic factors only, such as age, gender, income, and marital status, however as seen in this section, recent literature shows that other psychological factors are more influential in predicting behaviors, such as attitudes, beliefs, and values (López-Mosquera & Sánchez, 2012). Even though there are several approaches to travel motivation and behavior, with different factors that could influence the individual's intentions, they all have one aspect in common: visitors go through a cognitive process involving their motivations when deciding whether to travel or not. Figure 22 illustrates the factors found in those theories and the potential interaction between them and WTP.

Figure 22: Factors considered in motivational theories for assessing eco tourists' behaviors



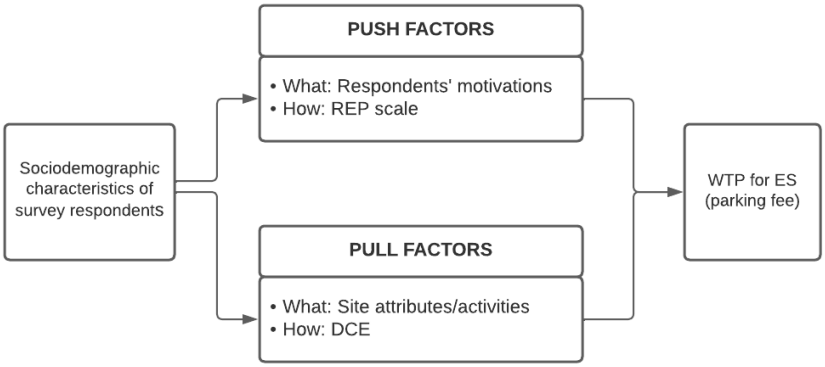
Source: Own elaboration (2022)

Since not all of the factors from the mentioned theories can be considered in a single survey (because this would result in a long and repetitive questionnaire) and considering that there is not a widely agreed-on theoretical or conceptual framework to analyze tourists' motivations and behavior (World Tourism Organization, 1999, cited by Pearce and Lee, 2005), it is suggested that just one theory should be selected to capture the motivation of visitors and potential visitors of Cansiglio.

4.2.1 Motivational theory suggested for the future survey in Cansiglio

The proposed theory for assessing survey respondents in the study area is the push and pull theory (Dann, 1979). The flexibility and popularity of the theory in addition to the fact that it combines both psychological aspects (push factors) and physical aspects (pull factors) make it an interesting option. It is proposed that those two factors could be explored through well-known approaches such as the "Recreation Experience Preference" (REP) for the push factors and DCE for the pull factors (Figure 23). This is aligned with Mehmetoglu (2011, p.169) observation: "future research could elaborate some other techniques for the examination of push and pull framework." To the best of my knowledge, no other study combined those two approaches (REP + DCE) to access WTP for ES using a parking fee as a payment vehicle.

Figure 23: Proposed framework for assessing WTP for ES in Cansiglio



Source: Own elaboration (2022)

As previously mentioned, one important difficulty in studying motivation is the respondents' lack of awareness of their travel motives, so they cannot easily put into words their motivations without further support (Dann, 1981; Pearce & Lee, 2005). To overcome this issue, a structured questionnaire is suggested, which provides the respondents with a list of potential motivations and asks them to rate each option (based on what motivates them to travel to a green area based on a scale, for example from "not important at all" to "very important"). This is indeed the most popular approach found in the travel motive literature (see Kim

et al., 2003; Prayag and Ryan, 2011; Phau et al., 2013; Jeong et al., 2014; Aquino et al., 2019; Carvache-Franco et al., 2020). In 1996, Manfredo and colleagues developed a scale called “Recreation Experience Preference” (REP) with 108 items grouped in 19 dimensions to measure tourists’ motivations based on their goal states. The REP is commonly used in the motivational research of recreationists (Manfredo et al., 1996; Anderson & Fulton, 2008; Budruk & Stanis, 2013; Fix et al., 2013; Le Corre et al., 2021).

Considering the above-mentioned issue coupled with the importance of understanding people’s motivations presented in this section, a list of the most common motivations found in ecotourism literature and that could be applied to the Cansiglio study case was developed (Table 11).

Table 11: Motivation items selected for the Cansiglio study case

Motivation	Source
To find solitude	Manfredo & Driver (1996); Jeong et al. (2018); Kil et al. (2021)
To get away from other people	Manfredo & Driver (1996); Jeong et al. (2018); Pearce & Lee (2005); Kil et al. (2021)
To avoid interpersonal stress and pressure	Pearce & Lee (2005); Xu & Chan (2016); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To get away from crowds	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To experience the tranquility	Manfredo & Driver (1996); Jeong et al. (2018); Pearce & Lee (2005)
So my mind could move at a slower pace	Manfredo & Driver (1996); Jeong et al. (2018); Kil et al. (2021)
To work on my personal/spiritual values	Manfredo & Driver (1996); Pearce & Lee (2005)
Help keep me in shape	Manfredo & Driver (1996); Xu & Chan (2016); Jeong et al. (2018)
Improve my physical health	Kim et al. (2003); Phau et al. (2013); Xu & Chan (2016); Jeong et al. (2018); Kil et al. (2021)
I could do something creative such as photography	Manfredo & Driver (1996); Jeong et al. (2018)
I thought it would be a challenge	Jeong et al. (2018)
To be in a natural setting	Manfredo & Driver (1996); Pearce & Lee (2005); Mason et al. (2016); Jeong et al. (2018); Carvache-Franco et al. (2021)
To observe the scenic beauty	Manfredo & Driver (1996); Pearce & Lee (2005); Mason et al. (2016); Xu & Chan (2016); Jeong et al. (2018); Kil et al. (2021); Cajiao et al. (2022)
To enjoy nature	Manfredo & Driver (1996); Kim et al. (2003); Phau et al. (2013); Mason et al. (2016); Thiene et al. (2017); Jeong et al. (2018); Swait et al. (2020); Carvache-Franco et al. (2021); Kil et al. (2021)
To learn more about nature	Phau et al. (2013); Mason et al. (2016); Jeong et al. (2018); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021); Kil et al. (2021)

Motivation	Source
To observe wildlife	Kim et al. (2003); Carvache-Franco et al. (2021); Cajiao et al. (2022)
To find adventure	Kim et al. (2003); Pearce & Lee (2005); Jeong et al. (2018); Cajiao et al. (2022)
To enjoy time with my companion	Manfredo & Driver (1996); Pearce & Lee (2005); Phau et al. (2013)
To enjoy time with friends	Manfredo & Driver (1996); Pearce & Lee (2005); Phau et al. (2013); Mason et al. (2016); Xu & Chan (2016); Kil et al. (2021); Cajiao et al. (2022)
To enjoy time with family	Manfredo & Driver (1996); Kim et al. (2003); Pearce & Lee (2005); Mason et al. (2016); Xu & Chan (2016); Thiene et al. (2017); Swait et al. (2020); Kil et al. (2021); Cajiao et al. (2022)
To be with others who enjoy the same	Manfredo & Driver (1996); Pearce & Lee (2005); Phau et al. (2013); Mason et al. (2016); Xu & Chan (2016); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To get away from everyday life/routine	Kim et al. (2003); Pearce & Lee (2005); Phau et al. (2013); Mason et al. (2016); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To get away from everyday stress/pressure	Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To relax, take a rest	Manfredo & Driver (1996); Kim et al. (2003); Pearce & Lee (2005); Phau et al. (2013); Mason et al. (2016); Xu & Chan (2016); Thiene et al. (2017); Swait et al. (2020)
To avoid hot weather	Kim et al. (2003); Phau et al. (2013)
To appreciate cultural resources	Kim et al. (2003); Pearce & Lee (2005); Phau et al. (2013)
To have fun	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021); Cajiao et al. (2022)
To experience something different	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016)
To be independent	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To learn/experience new things	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To develop my knowledge of the area	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016); Thiene et al. (2017); Swait et al. (2020)
To explore the unknown	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021); Kil et al. (2021)
To develp my personal interests	Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To use/develop my skills and competences	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016); Thiene et al. (2017); Jeong et al. (2018); Swait et al. (2020); Kil et al. (2021)

Motivation	Source
To gain a new perspective on life	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To gain a sense of accomplishment	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016)
To think about the good times I had in the past	Manfredo & Driver (1996); Pearce & Lee (2005); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)
To have others know that I have been there	Manfredo & Driver (1996); Pearce & Lee (2005); Xu & Chan (2016)
To make good impression on others	Manfredo & Driver (1996)
To meet new people	Manfredo & Driver (1996); Xu & Chan (2016); Carvache-Franco et al. (2021); Carrascosa-López et al. (2021)

Source: Own elaboration (2022)

5. Discussion

In this chapter, the theoretical implications of the findings of this study will be discussed first. Then, the implications for the management and policies are presented. The last section identifies the limitations that existed in this study and the recommendations for further research are also offered.

5.1 Theoretical implications

The literature review results confirmed that SPM, specially DCE, has become popular in environmental resources valuation worldwide and supported the definition of attributes that should be discussed in a future DCE to be carried out in Cansiglio. The combination of attributes related to cultural services (recreation, health, heritage, and symbolic meaning), regulating services (improving biodiversity through close-to-nature management), and the ones related to congestion (both in terms of dedicated parking spaces and crowdedness in trails) can be to deal with the nature-based tourism x nature conservation paradox in Cansiglio. The use of a parking fee as the cost attribute as proposed by Veneto Agricoltura is a way of avoiding the issue that would raise if an entrance fee was selected instead because Cansiglio is open to public access. The parking fee would still allow the collection of funds for congestion management, connecting it to the maintenance and improvement of ES in the study area.

During the systematic literature review, only one publication using parking fees as a payment vehicle of the DCE was found, however, it focused on the analysis of alternative transportation mode (shuttle bus), and the attributes were related to the time respondents preferred waiting (to start the visit, to find a parking spot) and CO_2 emissions from each transportation mode (González et al., 2019). This makes the selected approach for Cansiglio innovative since it considers forest ES as attributes to be evaluated while considering parking fee as the monetary attribute.

The second objective of this thesis was to capture the state-of-the-art of parking fees currently charged in natural areas. It was observed that parking fees are being charged in different natural areas around the world and that many of them are not so far from Cansiglio, located in Italian natural areas. From the information collected during the thesis, it was possible to observe that none of the existing parking fees were calculated through non-market valuation techniques, but still considered environmental aspects related to disbursements such as personnel, maintenance of the area (information center, parking lot, trails), and management of alternative transportation (shuttle bus, cycling routes). This makes the evaluation approach designed for Cansiglo pioneering in Italy, by considering the individuals' willingness to pay through a DCE with ES

provided by Cansiglio as attributes, in addition to considering motivational aspects.

To the best of my knowledge, the use of DCE within the push and pull framework for determining preferences and WTP for ES through a parking fee is a novel approach, since just a few studies have examined the potential influence of psycho-social motives on WTP related to environmental aspects by using other motivation theories, and that future investigations between those aspects are asked for (López-Mosquera & Sánchez, 2012). There is a vast volume of literature on ecotourism motivation and behavior spanning over 40 years and the framework proposed in this thesis is congruent with key elements found in the literature. It is not a new framework but a reframing of key elements found in the literature, considering that no widely agreed-on theoretical or conceptual framework has emerged and that literature suggests further examination of the push and pull framework (Pearce & Lee, 2005; Mehmetoglu, 2011).

5.2 Managerial implications

The findings of the study raise some managerial implications regarding the survey design and the future implementation of the parking fee in the study area.

The suggestion of the push and pull framework for the survey to be carried out in Cansiglio is an effort to support Veneto Agricoltura in obtaining not only the WTP for the ES through a parking fee but also to help direct efforts to obtain a greater knowledge of respondents' motivations since they might influence the acceptance of different levels of the fee. This approach also helps to understand which kind of visitors visit the area based on which motivations drive them to visit Cansiglio in terms of motives and how those motivations are potentially connected to the site attributes. This could result in different groups of tourists with different needs and preferences and thus potentially different WTP values for the parking fee. Ultimately, this approach supports management choices contributing to both improving recreational experiences and supporting the sustainable use of natural areas.

The analysis of the current state of parking fees served as input to understand how they are being charged, thus supporting the management body of Cansiglio by providing it with options on how to implement the potential parking fee in the area (for example, by using apps and previous online booking systems, as some Italian natural areas currently do). From this analysis, it was also important to see how transparency with visitors is important, to reduce conflicts with stakeholders such as the one reported in *Val Visdende*.

5.3 Policy implications

This study represents the first step to a valuable contribution to future policies related to nature-based tourism in public areas. As seen in this thesis, there are countries with a long stand tradition of charging fees such as the USA. In Europe, Poland included parking fees in the national law, establishing that the income from the parking fee in national parks should be destined for the development of the park for tourism and recreation.

Considering the growing demand for nature-based tourism, especially after COVID-19, this finding could serve as a starting point for discussions around the possibility of creating a similar regulation in Italy, aiming to support the natural areas in providing cultural and regulating ES, which is aligned with the National Forest Strategy. The use of DCE to support the determination of the value of ES through a parking fee is a tool that considers public preferences to support the sustainable development of natural areas in the country, once it takes into consideration respondents' preferences among the choice sets.

5.4 Limitations and suggestions for future research

This research was carried out in light of the available literature. The systematic literature review was based on publications available on the Scopus platform, that even though is commonly used in similar methodologies and considered a reference in the scientific world, it might not reflect all publications available for one search string.

As previously discussed, none of the existing parking fees in Italy was calculated using SPM, however, this affirmation is limited to the few answers obtained on how the existing fees were calculated.

During the development of this thesis, one opportunity for future research was found. The natural areas that currently charge parking fee monitors the number of cars to manage the tourist flow and also keep track of the income from the fee. Currently, there is no constant monitoring of the number of tourists or cars in Cansiglio, thus it would be interesting to implement one for three main reasons: (i) to provide empirical data to reveal which is the period with higher intensity of visitation, (ii) to support the estimation of potential income that could be generated from the parking fee once the price is defined; and (iii) to monitor the potential impacts of the implementation of the parking fee in the number of visitors. This is aligned with the observation of Beunen et al. (2006), who mention that not much literature exists on the effects of parking policy measures on the number of cars.

6. Conclusions

This research aimed to synthesize the main characteristics of the evaluation of eco-tourists' WTP for ES in literature, the current practices of existing parking fees in natural areas, and the most popular motivational theories applied to ecotourism.

This information was considered necessary given the current mismatch between the supply and demand of ES, the impacts of congestion in natural areas, and the need for generating additional income for managers and other stakeholders of natural areas who must address those issues.

By presenting an overview of the main attributes used in DCE that dealt with aspects of ES and congestion management in natural areas, the state-of-the-art of parking fees being currently charged in natural areas, and the most common theories addressing eco-tourists motivations, it was possible to define a framework that can be used specifically for the Cansiglio study case, in terms of site attributes, motivation items, and how they can be framed, in addition to possible ways of charging the parking fee.

The results represent the first step of a future survey to be developed in Cansiglio with the aim of capturing the WTP for ES in the area through a parking fee, serving as inputs to be further discussed among stakeholders in Cansiglio, to determine the price of the referred fee to enable congestion management and increase the provision of ES.

This thesis also contributes to the literature on nature-based recreation by proposing options for using consolidated theories such as DCE and REP scale within the push and pull framework, as an innovative approach to determine WTP values for ES and understanding objective and subjective factors that might influence this such values.

From a policy perspective, the results represent a starting point for discussions around the possibility of creating a regulation in Italy that aims to support the natural areas in providing cultural and regulating ES by considering public preferences.

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Annex 1 – Attributes found in the literature review

Author	Journal	Country or continent	Method	Survey mode	Payment vehicle	Attr_1	Attr_2	Attr_3	Attr_4	Attr_5	Attr_6	Attr_7	Attr_8	Attr_9	Attr_10	Attr_11
Ankamah-Yeboah et al. (2022)	Journal of Environmental Economics and Policy	Norway and Scotland	CE	Online	Tax	Fish stock	Litter	Area	Jobs	-	-	-	-	-	-	-
Franceschinis et al. (2022)	Sustainability	Italy	CE	Online	Entrance fee	Access	Bivouacs	Congestion	Picnic areas	Wildlife spots	Via ferrata	Climbing routes	Mountain biking trails	Thematic trails	Water spots for horses	-
Makumbirofa & Saayman (2022)	Journal of Coastal Research	Italy	CE	Face-to-face	Diving fee	Visibility underwater	Congestion	Quantity and size of groups	Biodiversity	-	-	-	-	-	-	-
Otaghvar et al. (2022)	Environmental Science and Pollution Research	Iran	CE	Face-to-face	-	Biodiversity	Recreation infrastructure	Landscape	Educational and research facilities	-	-	-	-	-	-	-
Sacher et al. (2022)	Forest Policy and Economics	Germany	CE	Online	Travel distance	Tree species composition	Age of the forest	Habitat	Deadwood amount	Deadwood decomposition grade	Deadwood sructure	Recreation infrastructure	Quality of forest path			
Tyllianakis (2022)	Journal for Nature Conservation	Malta	CE	Face-to-face	Entrance fee	Fish catches	Biodiversity	CO2 sequestration	Restriction of access							
Yang et al. (2022)	Global Ecology and Conservation	China	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Arnberger et al. (2021)	Water	Austria	CE	Face-to-face	-	Landscape	Water bodies	Landscape background	Trail vegetation	Trail surface	Trail width	Congestion	Activity types	Dog walking	Recreational infrastructure	Accessibility
Estifanos et al. (2021)	Tourism Economics	Ethiopia	CE	Face-to-face	Entrance fee	Protected area coverage	Wolf population	Touristic infrastructure	Restriction of access	-	-	-	-	-	-	-
Kim et al. (2021)	Land	Korea	CE	Online	Tax	Forest degradation level	Biodiversity	Accessibility	Tourism infrastructure	-	-	-	-	-	-	-
Lara-Pulido et al. (2021)	Sustainability	Mexico	CE	Face-to-face	Entrance fee	Biodiversity	Visibility underwater	Congestion	-	-	-	-	-	-	-	-
Louda et al. (2021)	Forests	Czech Republic	CE	Face-to-face	Travel cost	Meadows	Clearence cairns	Mountain streams	-	-	-	-	-	-	-	-
Nijhum et al. (2021)	Land Use Policy	Canada	CE	Online	Tax	Neighborhood development	Green corridor	Wetlands	Recreational infrastructure	-	-	-	-	-	-	-
Obeng et al. (2021)	Global Ecology and Conservation	Ghana	CE	Face-to-face	Tax	Biodiversity	Water quality	Hunting access	Ecotourism	-	-	-	-	-	-	-

Author	Journal	Country or continent	Method	Survey mode	Payment vehicle	Attr_1	Attr_2	Attr_3	Attr_4	Attr_5	Attr_6	Attr_7	Attr_8	Attr_9	Attr_10	Attr_11
Pakalniete et al. (2021)	Sustainability	Latvia	CE	Face-to-face and online	Contribution to a fund	State of ES of macro-algae groves	State of ES of mussel population	Negative impact on economic activities	-	-	-	-	-	-	-	-
Saha & Mukul (2021)	Small-scale Forestry	Bangladesh	TC	Face-to-face	Travel cost	-	-	-	-	-	-	-	-	-	-	-
Thuy et al.(2021)	Journal of Marine and Island Cultures	Vietnam	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Truong (2021)	Biodiversitas	Vietnam	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Ureta et al. (2021)	DLSU Business & Economics Review	Philippines	CV	Face-to-face	Water bill	-	-	-	-	-	-	-	-	-	-	-
Zydron et al. (2021)	Sustainability	Poland	CV	-	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Aseres & Sira (2020)	Heliyon	Ethiopia	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Crespo-Cebada et al. (2020)	Forests	Spain	CE	Face-to-face	Entrance fee	Biodiversity	Congestion	Information boards	Resting places	-	-	-	-	-	-	-
Dobson et al. (2020)	Oryx	South Africa	CE	Online	Contribution to a fund	Threatened bird species	Charismatic mammals	Protected area status	Existing conservation funding	-	-	-	-	-	-	-
Dumax et al. (2020)	Water Economics and Policy	France	CE	Face-to-face	Increase in water bill	Flood protection	Biodiversity	Water quality	Restriction of access	-	-	-	-	-	-	-
Jang-Hwan et al. (2020)	Forest Science and Technology	South Korea	CE	Online	Tax	Food provision	Water flow regulation	Noise reduction	Climate regulation and air quality	Prevention of landslides	Trails	-	-	-	-	-
Lee et al. (2020)	Water	China	CE	Face-to-face	Contribution to a fund	Congestion	Education	Control mechanism	Transportation mode	Surveillance	-	-	-	-	-	-
Mamat et al. (2020)	Earth and Environmental Science	Malaysia	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Melo-Guerrero et al. (2020)	Chapingo	Mexico	CE	Face-to-face	Entrance fee	Biodiversity	Recreation infrastructure	Forest health	Accessibility	-	-	-	-	-	-	-
Ribet & Brander (2020)	Journal of Outdoor Recreation and Tourism	Hong Kong	CE	Face-to-face	Surcharge on trail race ticket	Biodiversity	Drinking water	Trail conditions	Green race auditing	-	-	-	-	-	-	-

Author	Journal	Country or continent	Method	Survey mode	Payment vehicle	Attr_1	Attr_2	Attr_3	Attr_4	Attr_5	Attr_6	Attr_7	Attr_8	Attr_9	Attr_10	Attr_11
Rousseau & Fuertes (2020)	Ocean & Coastal Management	The Netherlands	CE	Online	Contribution to a fund	Biodiversity	Visibility underwater	Weather	Water temperature	Presence of shipwreck	Diving facilities	Presence of restaurants	Difficulty of dive	-	-	-
Alcon et al. (2019)	Journal for Nature Conservation	Spain	CE	Face-to-face	Tax	Biodiversity	Business activities development	Historical herritage	-	-	-	-	-	-	-	-
Armstrong et al. (2019)	Conservation Biology	Norway and Ireland	CE	Face-to-face and online	Tax	Area	Attraction of protection for the industry	Habitat	-	-	-	-	-	-	-	-
Ardiansyah et al. (2019)	AACL Bioflux	Indonesia	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Bravo-Vargas et al. (2019)	Environmental Management	Chile	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Enseñat-Soberanis et al. (2019)	Journal of Ecotourism	Mexico	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
González et al. (2019)	Journal of Transport Geography	Spain	CE	Face-to-face	Parking fee	Waiting time to start the visit	Waiting time to find a parking space	CO2 emissions	-	-	-	-	-	-	-	-
Jurado-Rivas & Sánchez-Rivero (2019)	Sustainability	Spain	CV	Face-to-face	Additional travel costs	-	-	-	-	-	-	-	-	-	-	-
Kang et al. (2019)	Tourism Economics	China	CE	Face-to-face	Entrance fee	Congestion	Vegetation cover	Touristic infrastructure	Litter	Distance	-	-	-	-	-	-
Kim et al. (2019)	Environmental Science and Pollution Research	South Korea	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
Lee et al. (2019)	Sustainability	China	CE	Face-to-face	Contribution to a fund	Vegetation cover	Biodiversity	Protected area size	Water quality	Congestion	-	-	-	-	-	-
Lee et al. (2019)	Sustainability	China	CE	Face-to-face	Tax	Farming method	Biodiversity	Land use	Ecotourism mode	-	-	-	-	-	-	-
Lindberg et al. (2019)	Social Indicators Research	USA	CE	Online	Tax	Marine protected area	Forest protected area	Jobs	-	-	-	-	-	-	-	-
Molina et al. (2019)	Science of the Total Environment	Spain	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Oh et al. (2019)	Forests	Korea	CV	Online	Tax	-	-	-	-	-	-	-	-	-	-	-
Pienaar et al. (2019)	Ecological Economics	USA	CE	Online	Tax	Habitat type	Recreation infrastructure	Flood protection	-	-	-	-	-	-	-	-

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Rocchi et al. (2019)	Land Use Policy	Italy	CE	Face-to-face	Tax	Access to the gift of nature	Biodiversity	Recreation	Water regulation	Climate regulation	-	-	-	-	-	-
Sardana (2019)	Ecological Economics	India	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Scheufele & Bennett (2019)	Environment and Development Economics	Lao	CE	Face-to-face	Entrance fee	Biodiversity	Poaching	Accessibility	Benefitting households	-	-	-	-	-	-	-
Sardianou & Leonti (2019)	Earth and Environmental Science	Greece	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Sever & Verbic (2019)	Journal of Environmental Psychology	Croatia	CE	Face-to-face	-	Congestion	Road traffic	Educational signage	Landscape	Trail condition	-	-	-	-	-	-
Shah et al. (2019)	PLOS ONE	Japan	CE	Online	Contribution to a fund	Leisure Fish Catch	Biodiversity	Shoreline and Coastal Conditions	-	-	-	-	-	-	-	-
Thiene et al. (2019)	European Review of Agricultural Economics	Italy	CE	Face-to-face	Entrance fee	Bivouacs	Information centres	Vehicular access	Congestion	Picnic sites	Reintroduction of griffon vulture	Information centres	Thematic itineraries	Trails for mountain bike	-	-
Vasquez-Lavín et al. (2019)	Resource and Energy Economics	Chile	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Arnberger et al. (2018)	Land Use Policy	Germany	CE	Face-to-face	-	Presence of windmills	Presence of powerlines	Trails	Benches	Educational signage	Forest conditions	Congestion	User groups	Trail signs	-	-
Castillo-Eguskitza et al. (2018)	Ecological Indicators	Spain	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Cerda et al. (2018)	Biodiversity and Conservation	Chile	CE	Face-to-face	Entrance fee	Biodiversity	Provision of water	Soil quality in camping and walking trail areas	Recreation infrastructure	-	-	-	-	-	-	-
Forleo et al. (2018)	International Journal of Sustainable Development & World Ecology	Italy	CV	Online	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Lopes & Villasante (2018)	Marine Policy	Brazil	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
López-del-Pino & Grisolía (2018)	Tourism Economics	Canary Islands	CE	Online	Entrance fee	Toilets	Congestion	-	-	-	-	-	-	-	-	-

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Masiero et al. (2018)	Ecosystem Services	Italy	CE	Online	Tax	Slope stability	Flora conservation	Wildlife watching spots	Recreational infrastructure	Landscape	Water quality	CO2 sequestration	Biodiversity	-	-	-
Paltriguera et al. (2018)	Ecological Economics	England	CE	Face-to-face	Donation	Information	Restriction of access	Biodiversity	Website	-	-	-	-	-	-	-
Platania & Rizzo (2018)	Ecological Indicators	Italy	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Tan et al. (2018)	Global Ecology and Conservation	China	CE	Face-to-face	Contribution to a fund	Area	Biodiversity	Water quality	-	-	-	-	-	-	-	-
Tekalign et al. (2018)	Sustainability	Ethiopia	CE	Face-to-face	Entrance fee	Tour guiding	Horse riding	Handcraft and souvenir	Photography service	Accommodation	Recreational infrastructure	Nature viewpoints	Information	Benefit-sharing	-	-
Tempesta & Vecchiato (2018)	Resources	Italy	CE	Online	Tax	Maintenance of pastures and meadows in mountain areas	Trail conditions	Wildlife watching spots	-	-	-	-	-	-	-	-
Tonin (2018)	Ecosystem Services	Italy	CV	Online	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Valasiuk et al. (2018)	Restoration Ecology	Sweden and Norway	CE	Online	Tax	Passive protection area	-	-	-	-	-	-	-	-	-	-
Akinyemi & Mushunje (2017)	International Journal of Applied Business and Economic Research	South Africa	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Baral et al. (2017)	Journal of Sustainable Tourism	Nepal	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Cerda et al. (2017)	Environmental Conservation	Chile	CE	Face-to-face	Contribution to a fund	Mammals species	Soil protection	Other animals and plants	Touristic infrastructure	-	-	-	-	-	-	-
Chen et al. (2017)	Journal of Coastal Conservation	China	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Dagiliūtė et al. (2017)	Environmental Processes	Lithuania	CV	Online	-	-	-	-	-	-	-	-	-	-	-	-
Ferreira et al. (2017)	Ecological Indicators	Portugal	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
Fujino (2017)	Journal of Forest Economics	Japan	CE	Online	Contribution to a fund	Protected forest cover	Farmland	Wetland cover	Natural parks cover	N. of endangered species	-	-	-	-	-	-

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Getzner et al. (2017)	Water	Croatia	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Kainzinger et al. (2017)	Journal on Protected Mountain Areas Research and Management	Austria	CE	Face-to-face	Entrance fee	Congestion	Waiting time for boat launch	Waiting time for parking	River difficulty	Trip length	-	-	-	-	-	-
Kohlhardt et al. (2017)	Journal of Environmental Planning and Management	Canada	CE	Online	Entrance fee	Congestion	Trail conditions	Viewpoint conditions	Distance	Landscape	-	-	-	-	-	-
Lal et al. (2017)	Tourism Management	Rwanda	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Mueller et al. (2017)	Land Use Policy	USA	CE	Online	Tax	Water	Scenic beauty	Biodiversity	Accessibility	Cultural value	-	-	-	-	-	-
Resende et al. (2017)	Brazilian Journal of Biology	Brasil	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Roberts et al. (2017)	Journal of Sustainable Tourism	Peru	CV	Face-to-face	Additional fee	-	-	-	-	-	-	-	-	-	-	-
Steven et al. (2017)	Conservation Biology	Australia and UK	CE	Face-to-face	Entrance fee	Threatened species	Biodiversity	Endemic species	-	-	-	-	-	-	-	-
Thiene et al. (2017)	Journal of Environmental Economics and Management	Italy	CE	Online	Entrance fee	Bivouacs	Vehicular access	Congestion	Picnic sites	Wildlife watching spots	Thematic itineraries	Trails for mountain bike	Via Ferratas	Climbing routes along cliffs and crags	-	-
Torquati et al. (2017)	Landscape Online	Italy	CE	Face-to-face	Extra charge in accomodation	Hospitality quality	Presence of pool	Located in a Natura 2000 site	Located in a traditional rural landscape	Distance from historical village	-	-	-	-	-	-
Torres-Miralles et al. (2017)	Ecosystem Services	Spain	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
Valasiuk et al. (2017)	Journal of Forest Economics	Poland and Belarus	CE	Face-to-face	Tax	Passive protection area	-	-	-	-	-	-	-	-	-	-
Xuan et al. (2017)	Ocean & Coastal Management	Vietnam	CE	Face-to-face	Travel cost	Coral cover	Litter	Job loss	-	-	-	-	-	-	-	-
Brouwer et al. (2016)	Marine Policy	The Netherlands	CV	Face-to-face and	Tax	-	-	-	-	-	-	-	-	-	-	-

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				online												
Hausmann et al. (2016)	Animal Conservation	South Africa	CE	Face-to-face	Travel cost	Habitat type	Touristic activities	Accessibility	-	-	-	-	-	-	-	-
Jeanloz et al. (2016)	Ecosystem Services	Belgium	CE	Face-to-face	Entrance fee	Biodiversity	Chance to observe red deer	Environmental education	Air purification	-	-	-	-	-	-	-
Kenter et al. (2016)	Ecosystem Services	UK	CV	Online	Travel distance	-	-	-	-	-	-	-	-	-	-	-
Kirkbride-Smith et al. (2016)	PeerJ	Barbados	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Kubo & Shoji (2016)	Journal of Outdoor Recreation and Tourism	Japan	CE	Online	Tour fee	Tour destination	Group size	Information	Likelihood to spot wildlife	-	-	-	-	-	-	-
Molina et al. (2016)	Environmental Science & Policy	Spain	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Oviedo & Yoo (2016)	Environmental and Resource Economics	Spain	CE	Face-to-face	Tax	Forest composition	Reforestation technique	Vegetation cover	Recreation area	Jobs	-	-	-	-	-	-
Rojas-Nazar et al. (2016)	Marine Policy	New Zealand	CV	Online	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Trujillo et al. (2016)	Marine Policy	Colombia	CV	Face-to-face	Diving fee	-	-	-	-	-	-	-	-	-	-	-
Ureta et al. (2016)	Journal of Environmental Science and Management	Philippines	CV	-	Tax	-	-	-	-	-	-	-	-	-	-	-
Asciuto et al. (2015)	Journal of Forest Science	Italy	CV	Postal	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Castaño-Isaza et al. (2015)	Ecosystem Services	Colombia	CV	Face-to-face	-	-	-	-	-	-	-	-	-	-	-	-
Christie et al. (2015)	Ecosystem Services	Caribbean	CE	Face-to-face	Tax	Biodiversity	Species for fishing	Coastal protection	Water quality	Recreation	Diving/snorkelling recreation	-	-	-	-	-
Chhun et al. (2015)	Marine Resource Economics	New Zealand	CE	Online	Tax	Biodiversity	Cultural management	Recreation fishing restrictions	Commercial fishing restrictions	-	-	-	-	-	-	-
DeShazo et al. (2015)	Journal of Tropical Forest Science	Malaysia	CE	Face-to-face	Entrance fee	Drinking water	Likelihood of seeing wildlife	Access to a stream or small waterfall	Litter	Information	Picnic areas	Trails	Congestion	-	-	-

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Grazhdani (2015)	Environmental Management	Albania	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
León et al. (2015)	Ecological Economics	Colombia	CE	Face-to-face	Entrance fee	Coral reef restoration	Mangrove restoration	Dry forest restoration	Coastal and sandy ecosystems	Number of tourists	Income level of the local population	-	-	-	-	-
Polizzi et al. (2015)	Ecosystem Services	Finland	CV	Online	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Rodrigues et al. (2015)	Environmental and Resources Economics	Spain	CE	Face-to-face	Diving fee	Congestion	Landscape	Presence of Jellyfish species	Habitat quality	-	-	-	-	-	-	-
Segerstedt & Grote (2015)	Environmental Management	Germany	CE	Face-to-face	Carbon offset prices	Biodiversity	Greenhouse gases	Water resourses	Poverty reduction	UN cooperation partners	-	-	-	-	-	-
Baral & Dhungana (2014)	Forest Policy and Economics	Nepal	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Bernabéu & Samos (2014)	International Journal of Environmental Research	Spain	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Börger et al. (2014)	Ecological Economics	UK	CE	Online	Tax	Biodiversity	Protected species	Invasive species	-	-	-	-	-	-	-	-
De Valck et al. (2014)	Landscape and Urban Planning	Belgium	CE	Face-to-face	Tax	Biodiversity	Habitat conversion	Reduction in coniferous forest	Accessibility	-	-	-	-	-	-	-
Grazhdani (2014)	Journal of Food, Agriculture & Environment	Albania	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Jobstvogt et al. (2014)	Ecosystem Services	UK	CE	Online	Travel distance	Landscape	Underwater objects	Biodiversity	Accessibility	Restrictions of activities	Area	-	-	-	-	-
Kolahi et al. (2014)	International Journal of Environmental Research	Iran	CV	Online	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Tyrväinen et al. (2014)	Forest Policy and Economics	Finland	CE	Face-to-face	Extra charge in accomodation	Trail quantity	Landscape	Biodiversity	Carbon sequestration	-	-	-	-	-	-	-
Vincent et al. (2014)	PNAS	Malaysia	CE	Face-to-face	Contribution to a fund	Area logged	Area poached	Jobs	-	-	-	-	-	-	-	-

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Cerda et al. (2013)	Journal for Nature Conservation	Chile	CE	Face-to-face	Entrance fee	Biodiversity	Drinking water	Existence of endemic orchids	Existence of an endemic amphibian	-	-	-	-	-	-	-
Diedrich et al. (2013)	Ocean & Coastal Management	Spain	CV	Face-to-face	-	-	-	-	-	-	-	-	-	-	-	-
Gelcich et al. (2013)	AMBIO	Chile	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Jobstvogt et al. (2013)	Ecological Economics	Scotland	CE	Face-to-face	Tax	New medicinal products	Protected species	-	-	-	-	-	-	-	-	-
Minin et al. (2013)	Animal Conservation	South Africa	CE	Face-to-face	Extra charge in safari costs	Lion	Leopard	Cheetah	African wild dog	Black rhino	White rhino	Elephant	Buffalo	-	-	-
Antoušková (2012)	Agris on-line Papers in Economics and Informatics	Czech Republic	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Chen & Jim (2012)	International Journal of Sustainable Development & World Ecology	China	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
García-Llorente et al. (2012)	Journal of Arid Environments	Spain	CE	Face-to-face	Tax	Traditional agriculture	Ecotourism	Wind farms	Protected area	Habitat quality	-	-	-	-	-	-
Hoyos et al. (2012)	Journal of Forest Economics	Spain	CE	Face-to-face	Contribution to a fund	Native forest	Biodiversity	Recreation infrastructure	Exotic tree plantations	Vineyards	-	-	-	-	-	-
Jones et al. (2012)	International Journal of Sustainable Development & World Ecology	Greece	CV	-	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Kafyri et al. (2012)	Environmental Management	Greece	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
Wang & Jia (2012)	Ocean & Coastal Management	China	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Wilson et al. (2012)	Forestry	Canada	CV	Postal	Tax	-	-	-	-	-	-	-	-	-	-	-
Barry et al. (2011)	Marine Policy	Ireland	TC	Face-to-face	Travel cost	-	-	-	-	-	-	-	-	-	-	-

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Emmanouilides et al. (2011)	Conference Paper - HAICTA 2011	Greece	CE	Face-to-face	Tax	Reduction of saline soils	Decrease in use of nitrates and phosphates	Biodiversity	Jobs	-	-	-	-	-	-	-
Garcia-Llorente et al. (2011)	Environmental Management	Spain	CV	Face-to-face and online	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Adams et al. (2010)	Lake and Reservoir Management	USA	CE	Online	Entrance fee	Infrastructure	Plant biodiversity	Animal biodiversity	Presence of invasive species	-	-	-	-	-	-	-
Badola et al. (2010)	Environmentalist	India	TC	Face-to-face	Travel cost	-	-	-	-	-	-	-	-	-	-	-
Chen & Jim (2010)	Environmental Management	China	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Ezebilo (2010)	Forest Ecology and Management	Nigeria	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
González et al. (2010)	Forest Systems	Spain	BT	-	-	-	-	-	-	-	-	-	-	-	-	-
Ransom & Mangi (2010)	Environmental Management	Kenya	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Oliveira et al. (2010)	Journal of Sustainable Tourism	Portugal	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Wilson et al. (2010)	Forest Policy and Economics	Canada	CV	Postal	Tax	-	-	-	-	-	-	-	-	-	-	-
Barr & Mourato (2009)	Ocean & Coastal Management	Mexico	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Reid-Grant & Bhat (2009)	Marine Policy	Jamaica	TC	Face-to-face	Travel cost	-	-	-	-	-	-	-	-	-	-	-
Santiago & Loomis (2009)	Journal of Environmental Planning and Management	Puerto Rico	CV	Face-to-face	Travel cost	-	-	-	-	-	-	-	-	-	-	-
Adams et al. (2008)	Ecological Economics	Brazil	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-

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Huhtala & Pouta (2008)	Journal of Forest Economics	Finland	CV	Online	Tax and entrance fee	-	-	-	-	-	-	-	-	-	-	-
Martín-López et al. (2007)	Environmental Conservation	Spain	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Strange et al. (2007)	Environmental Management	Denmark	CE	-	Tax	Area	Species preservation	Accessibility	Recreation infrastructur e	-	-	-	-	-	-	-
Velarde et al. (2005)	Ecological Economics	Africa	BT	-	-	-	-	-	-	-	-	-	-	-	-	-
Tongson & Dygico (2004)	Coastal Management	Philippines	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Horton et al. (2003)	Environmental Conservation	Brazil	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Hall et al. (2002)	Natural Resource Modeling	USA	CV	Face-to-face	Tax	-	-	-	-	-	-	-	-	-	-	-
Nunes (2002)	European Journal of Operational Research	Portugal	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Maharana et al. (2000)	GeoJournal	India	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
Scarpa et al. (2000)	Ecological Economics	Ireland	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-
White & Lovett (1999)	Environmental Management	England	CV	Postal	Tax	-	-	-	-	-	-	-	-	-	-	-
León (1996)	Environmental Management	Spain	CV	Telephone	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Echeverría et al. (1995)	Ecological Economics	Costa Rica	CV	Face-to-face	Contribution to a fund	-	-	-	-	-	-	-	-	-	-	-
Moran (1994)	Biodiversity and Conservation	Kenya	CV	Face-to-face	Entrance fee	-	-	-	-	-	-	-	-	-	-	-

Attr = Attribute