Electric Mobility in a Nature Reserve in Portugal - Virtues, Conflicts and Tourism

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Abstract

The central theme of the paper is to contribute to the discussion on the relevance of sustainable electric mobility as a beneficial element for tourism activities developed in protected areas. The topic is not recent, but the development of electromobility has increased interest and research, with a strong focus on urban areas, but also more and more on natural areas.

The aim is to determine if there is a potential field of electric mobility intervention, with benefit for tourism activities, in protected areas. For this, we called upon the literature review and comparison with the case of a nature reserve located in Portugal. On the one hand, the investigation procedure focused on the analysis of the virtues and conflicts identified in the literature, along with the contextualization of sustainable mobility in natural areas. On the other hand, we tried to understand how these virtues and conflicts fit the case study, the Serra da Malcata Nature Reserve, in Portugal, as part of the development of an INTERREG project.

It can be concluded, although no more substantial project indicators are available, that there is a possibility of overcoming existing conflicts, seeking to maximize the virtues and that it may have an impact not only on tourism activities but on the socioeconomic territory itself.

Keywords: Electric mobility, tourism, natural areas, sustainability

1. Introduction

One of the characteristics of modern society is the necessity and dependence of mobility. Society is already adapted to travel a bit around the world and the goods can come from long distance. The last 200 years of evolution in modes and transport systems have led to unprecedented global interaction and, in many cases, an increase in personal freedom. This increasing mobility carries several costs: air pollution, use of materials, road safety and congestion and climate change are some aspects to consider when one reflects about the future of mobility (Mozos-Blanco, Pozo-Menéndez, Arce-Ruiz, & Baucells-Aletà, 2018; Scott, Hopkins, & Stephenson, 2014). Some authors report that technology can solve some of the problems, but that new business models are needed (Nieuwenhuis, Vergragt, & Wells, 2017).

Few cultural aspects of the modern era reflect the dilemma of sustainability as well as the issue of mobility (Nieuwenhuis, Vergragt, & Wells, 2017; Nikolaeva, Adey, Cresswell, Lee, Nóvoa, & Temenos, 2019). It has been almost three decades since the concept of 'sustainable mobility' appeared in the 'EU Green Paper on the Impact of Transport on the Environment' (EC, 1992) and which constituted the European Union's response to the 'Our Common Future' United Nations' report (WCED, 1987) published a few years earlier. That European report focused on the complex relationship between the positive effects and negative socio-environmental impacts derived from the transport sector and the difficulty of reconciling, in a comfortable way, to society, transport and sustainable development - business as usual became unacceptable (Holden, Gilpin, & Banister, 2019). More recently, the United

Nations published the '2030 Agenda for Sustainable Development' (UN, 2015) where the issue of mobility does not appear clearly in terms of concrete actions and concerns (Holden, Gilpin, & Banister, 2019), meaning that there is some negligence regarding this aspect, possibly due to the current interdisciplinary nature of the theme. Although, in most developed countries, population growth tends to stagnate, people's mobility is increasing (Van Audenhove, Korniichuk, Dauby & Pourbaix, 2014; Yeh, Mishra, Fulton, Kyle, McCollum, Miller, Cazzola & Teter, 2017), which reinforces the strangeness of that absence, but also shows some political and institutional inertia (Cohen, Higham, Gössling, Peeters, & Eijgelaar, 2016).

The mobility of the future is based on some changes that are taking place: new vehicles, change in ownership and in the way we use vehicles, mobile technologies that equip and empower individuals, and other aspects (Lyons, 2016). The approach to sustainable mobility requires actions to reduce the number and duration of travel, encourage the way of displacement (modal shift) and increase efficiency in the transport system (Banister, 2008). If sustainable mobility has been more profusely addressed by research when the field of study is the urban environment, with the scarcity of green corridors and with the modern problems and negative externalities arising from urbanity, it becomes attractive the travel to natural spaces with the purpose of recreational and leisure practices and the enjoyment of very different conditions from the origin.

In natural areas, particularly in protected areas, it is essential to encourage a pro-environmental behavior, a task that is not simple. For many people, leisure and hedonistic behavior is understood as a right and a dimension of life in which consumers are less willing to make concessions for environmental reasons, even if in their everyday life assume a different behavior (Stanford, 2014). It is documented that allegations of concern for the environment do not always result in behaviors that demonstrate this concern (Carrigan & Attalla, 2001; Sharpley, 2001; Font & Mihalic, 2002; Doane, 2005; Weeden, 2005).

Throughout the so-called developed world, the traditional relationships between home, work, leisure and the environment are changing. These geographies and sociologies of mobility, namely the intensification of travel, mainly by automobile, led to new risks for the preservation of the environment. It is therefore a fundamental challenge for countries to implement transport and mobility solutions that can meet the need for greater accessibility and, at the same time, reduce the impact on the environment. This is especially true for tourist sites, where the high number of visitors (which is likely to grow in the coming years) causes different social, economic and ecological impacts. There is a growing interest in making the sites more sustainable with a focus on promoting slow mobility, by fostering their walkability (Laker, 2017; Wang & Wen, 2017) or encouraging the use of sustainable means of transport (Timothy & Boyd, 2015). The benefits associated with slow mobility are essentially intangible: environmental benefits (less congestion, pollution and noise and improvement in quality of life) and cultural (better promotion of natural and cultural heritage) (Maltese, Mariotti, Oppio, & Boscacci, 2017).

In this context of sustainable mobility, in natural areas, it is possible to consider the use of electromobility. This situation can increase the potential number of tourists, from active visitors to other groups with different types of accessibility difficulties. The central theme of the article is to contribute to the discussion that increases the relevance of sustainable electric mobility as a beneficial element for the touristic activities developed in protected areas. The theme is not recent, but the development of electromobility has been an issue of research interest, focusing on natural areas. For the construction of the paper, the literature review and the comparison with the case of a natural reserve located in Portugal were used. The investigation procedure focused on the analysis of the virtues and conflicts identified in the literature, alongside the contextualization of sustainable mobility in natural areas. On the other hand, we sought to understand how these virtues and conflicts are suited to the case study, the Serra da Malcata Nature Reserve in Portugal, in the context of the development of an INTERREG project.

In the first section of the article, the articulation between the natural areas, the appropriation of these spaces by the tourist practices and activities and the use of sustainable mobility as a new dimension that can create value for the business actors and to the community is addressed. The second section is a reflection on the virtues and conflicts of that appropriation and about this use. Subsequently, given the elements collected in the literature, the implementation of the Moveletur project is presented attending the specific case of the Serra da Malcata Nature Reserve. Next, an analysis of the results already achieved with the implementation of the project is carried out and a comparison is made with the virtues and conflicts previously mentioned. Finally, the conclusions are presented.

2. Natural areas, tourism and sustainable mobility

Tourism is now an important sector/industry/set of economic activities around the world and different types of actors are paying close attention to its development and growth. New and different types of tourism activities based on experiences are being outlined constantly.

In the Portuguese case, although it is one the important productive, employment and income sector, it is still mainly focused on three major regions: Algarve, a traditional summer holiday destination; Lisbon, capital of the country and cultural destination; and the island of Madeira, known for its phenomenal landscapes. When checking the number of nights spent in hotel establishments, and according to the National Statistics Bureau[1] (2017 data), 69% of the total number of stays were concentrated in these three regions; In addition, in the same year, and according to the same source, 90% of revenues in hotel establishments were located in coastal areas.

Tourism is therefore generating asymmetries in contemporary Portugal, although inland municipalities (low density regions) are attempting to combat these problems. One of the windows of opportunity that arises in these regions is its well-preserved authenticity and the traditions that remain over time and that, in a world where tourists are thirsty for real experiences, are truly important advantages (Kastenhölz, 2010; Eurico, & Oliveira, 2015). Several authors have stressed the importance of linking the uniqueness of territorial resources and the differentiation of the touristic supply in order to produce quality in services and activities (Kozak, 1999; Buhalis, 1999; Hassan, 2000; Page & Dowling, 2002). In addition, these areas of low density have a poorly intervened nature that can also be used for leisure and visitors' enjoyment.

The Portuguese Tourism Strategy 2027 (Turismo de Portugal, 2017) aspires to place Portugal as a world leader tourist destination and, as regards this paper, outlines efforts to be a sustainable, cohesive, innovative and competitive destination. Thus, the development of tourism in Portugal is focused on the conservation and appreciation of the cultural and natural heritage, promoting positive impacts on the community. To achieve these objectives, the strategy is based on the country's most distinctive assets and emerging international trends, namely: in the first case, climate, light, history, culture, identity, sea, nature and water; In the second, well-being and quality of life (Turismo de Portugal, 2017).

Nature is, in this sense, an important asset that can be used to strengthen macroeconomic variables in low-density regions through tourist activities (Salvatore, Chiodo & Fantini, 2018; Gonzalez, Roman, & Ortuzar, 2019). These areas have a vast and rich natural heritage, based on unique flora and fauna formed by native species. An important part of the Portuguese territory is protected by different forms of classification (Natura2000 network, World Heritage List, United Nations Geoparks' Program, national protection systems, for example), making Portugal an ambitious country in terms of nature and landscape protection. The use of nature by tourism coincides with the welfare concerns for which the general population, and tourists, is attentive. At the same time, it provides an economic opportunity for entrepreneurs to develop tourist activities using natural resources (Martín, Gallego, & Delgado, 2018).

Nature tourism is not a term normally used by tourists. It is not understood, by visitors, to be used as a synonym of tourist practice - hardly anyone talks about spending vacations or traveling because of nature. But it is a value term for the tourism sector in the context of the needs, experiences and activities of visitors (Cetin, Zeren, Sevik, Cakir & Akpinar, 2018) and for the promotion of development in the regions (Gutiérrez & Lopéz, 2017). Nature tourism requires the existence of natural/protected areas and these areas show an interesting development of tourist activities, both linked to the preservation and protection of natural heritage, as well as taking advantage of the growth of tourist flows (McKercher, 2003; Martín, Gallego, & Delgado, 2018). The strength of tourism in protected areas is of such magnitude that Ballart Hernández (2005) states that it can be a ray of hope for the development of countries, based on the argument that important natural (and cultural) attributes, if duly promoted, can lead to an important source of income for local communities.

Protected areas are raw nature tourism assets, conserving resources and heritage that can be valued and marketed (Martín, Gallego, & Delgado, 2018). Its transformation into tourism products requires some public and private investments in accessibility, signage and information, access and control doors, museums and interpretation centers, event facilities, tours and development of Itineraries, among others.

[1] In the case of Lisbon, the metropolitan area was considered.

The importance of protected areas for tourism activities stress the need for an appropriate site management model, in order to control the pressure on nature and wildlife throughout the world (Charters & Saxon, 2007). The European Charter for Sustainable Tourism, developed under the auspices of the European Commission and the Europarc Federation, emphasizes the need for an alignment of environmental, cultural and social aspects with economic development (Europarc Federation, 1995). Fadigas (2007) mentions that protected areas are not only natural, biological and landscape preservation habitats instruments; they are also tools for the qualification of spaces and economic and social territorial promotion. This is a fundamental condition for living and inhabited spaces and the preservation of nature becomes one other tool for community development and evolution, always attending its protection and safeguard. A protected area aims to promote the sustainable growth of territories, based on balanced economic development and social cohesion, looking at natural resources as growth factors.

Starting from this general perception, the way to undertake can be oriented towards the creation of "environmental districts" (under the broader concept of marshallian industrial districts) (Rocca, 2010; Chiabai, Paskaleva & Lombardi, 2013), where economic, social and environmental issues can be managed on the basis of participative involvement and inclusive processes. These processes should involve local and/or regional actors and require coexistence between economic activities (i.e. tourism services) and protected resources, promoting new and possibly innovative approaches (Diem-Trinh & Hall, 2014) – like slow and sustainable mobility.

Mobility in natural areas aims to meet various needs, such as: tourist travel; work travel; emergency and rescue; residents' journeys (Lambas & Ricci, 2014). The first examples of the regulation of flows in internal road networks in natural parks with a focus on sustainable elements emerged in Spain in 1995 (Lambas & Ricci, 2014). The concern of the managers of the National Park of La Caldera de Taburiente and the National Park of Teide was the environmental capacity of the road system by limiting traffic to protect the more sensitive environmental elements and introducing mitigation technologies for physical (noise) and chemical (pollution) factors. In the United Kingdom, the intervention was carried out in order to remove the traffic from the most sensitive areas, opting for the creation of pathways that favored biking and walking and the introduction of natural barriers (Lambas & Ricci, 2014; Stanford, 2014). The different approaches are described as soft management incentives (carrots) and hard management disincentives (sticks) (Cullinane, 1997; Steiner & Bristow, 2000).

Slow mobility is defined as the journey based on the destination, on foot or by bike (Dubois & Ceron, 2006). Walking and biking are low-cost travel forms that can (potentially) replace a substantial amount of motorized trips. This motorized transport displacement for active travel modes can increase trip confidence and reduce pollutant emissions. In addition, smooth mobility has several health and welfare benefits that should not be neglected and can also help the local economy with the development of tourist activities. Slow mobility in tourist itineraries and routes (with options) has been gaining many supporters in the context of the tourist phenomenon, both on the demand side and on the supply side and even in institutional structures. These itineraries involve differentiated scales, extensions and themes (Timothy & Boyd, 2015; MacLeod, 2017). They vary from several individual/municipal initiatives in rural and/or nature areas to supra-regional projects, such as the Historical Villages Route (Portugal), RAVeL (Belgium), the National Network of bicycle lanes (United Kingdom) or the Cammino dei Monaci (Italy). They have become particularly important for the efforts of territorial cohesion, regional marketing and community awareness about the transition to more sustainable mobility (Lumsdon, 2000; Maltese, Mariotti, Oppio, & Boscacci, 2017).

It is possible to go further and, instead of fully replacing the motorization for travel, consider the use of electromobility. This situation can increase the potential number of tourists, from active visitors to other groups with different types of accessibility difficulties. Tourism can constitute a way of development, especially in low-density regions, due to its multiplier effect (spill-over effect and job creation) (Directorate-General for Regional and Urban Policy, 2016), and based on the exploitation of territorial resources (Romão & Neuts, 2017).

Based on the analysis of different examples across Europe (e.g.: "Fahrtziel Natur", Germany; "klima:aktiv mobil", Austria; "Stream - Sustainable Mobility for Tourism and Recreation", European Commission; "Alpmobil", Switzerland; "Alpine Pearls", six different alpine countries; "A corporate identity and a tourist map for a cycling corridor by using old railway tracks in West Flanders", Belgium; "Identifying and planning green routes", Lithuania; "Developing Boat & Bike and Bike & Ride systems", Portugal; among others) it is possible to conclude: the demand for slow mobility has increased over the

last few years; bicycles and electric vehicles are vital and open to a larger target group; there is a high willingness to pay for transport and quality gastronomy (Maltese, Mariotti, Oppio, & Boscacci, 2017); users value a well-developed infrastructure and cyclable itineraries, with good signaling; itineraries with alternatives and good description of places to stop, options for sightseeing and cultural experiences along the itinerary and places to eat and/or sleep are greatly appreciated.

After all, the affirmation of a new culture of mobility based on the sustainable forms of mobility is still to be achieved more effectively. The regulation that encourages alternative forms of displacement to minimize negative impacts has proved difficult to operationalize (Rocca, 2015).

3. Virtues and conflicts of rurality and sustainable tourism mobility

One of the most common ways to perpetuate the most positive aspects of rurality has occurred due to the development of tourism and leisure activities. Tourism, in this type of territories, has been assumed as a platform of fundamental importance for the staging of places. However, while tourism can be a leverage of development in these areas, it can also hold perverse effects that matter to take into consideration (Williams & Ponsford, 2009; Grec, 2017; Romão & Neuts, 2017).

With regard to the tourist supply of public goods, there is a set of experiences that are specifically provided to tourists: the contemplation of the historical monumental heritage; the occurrence of traditional festivals; the traditions embodied in music, dance and folk figures; the availability of natural resources and the use of the essential resources for the exercise of tourism activities.

But tourism can also lead to negative impacts on the territory. The development of tourism can increase the flow of people to a place in such a way that this flow, by itself, alters the living conditions of local species, inhibiting mating, feeding, processes of natural selection, among others. On the other hand, extractive activities by the population can be increased unsustainably to produce souvenirs for tourists (e.g. plant species). In general, natural resources can be misused when there is no adequate planning and an understanding that the increased consumption of resources, for immediate purposes, is not sustainable in the long term.

The entire movement and stay of tourists generate a consumption of resources and energy normally greater than what would be consumed without the journey, starting with the displacement itself. There are other negative aspects, such as the banalization of folk art, once the search for local art products can generate changes in the original artistic culture. Tourism tends to encourage the production of reproductions, the tourists want to find, buy, take something local as a souvenir.

As stated by Grünewald (2003:148), "The tourist does not want to see what they call *tourees*, that is, an actor who modifies his behavior to profit according to this perception that it is attractive to the tourist". The culture can gain a commercial aspect, being destined to the avid consumer by acquiring a symbolic copy of the site (Lage & Milone, 2001).

In view of the above, it is observed the duality of the tourist phenomenon, and it can be inferred that the quality of the impacts of the activity on the local population on tourism destinations depends more on the society that deploys it, or receives it, that of tourism itself, in its condition of providing the sites with losses or contributions to their local identity consolidation and affirmation process (Pires, 2004).

In this sense, tourism should not promote a type of consumption that causes negative impacts in the environment with the risk of destroying its development bases. Thus, it is up to the receiving community the responsibility of seeking to establish, democratically and collectively, the bases in which the tourism activity should be sustained in its territory (Hennig & Künzl, 2011).

In many destinations, spaces that could be used for the exploitation of various economic activities (such as agriculture or mining) are destined exclusively for the practice of tourist activities, causing a dependence of the destination in relation to that sector.

One of the most significant effects is the divorce between the qualities to be incorporated in marketable tourism products and services, offered to tourists and visitors, and the historical, social and economic contexts, which may result in the loss of local authenticity (Figueiredo, 2003) and the imponderability of authenticity (Grünewald, 2009) or, on the contrary, in forcing a false 'authenticity', a staged place or territory (such as the *tourees*, already referred to above).

Another of the negative effects refers to the uncaring of the local productive characteristics, assuming a direction of perception of the rural as a spectacle, scenery, landscape, by tourists and visitors

(Figueiredo, 2003). It also refers to the question of the occurrence of various conflicts because, as Larrére (1990) refers, there is not a single type of demand, consumption or even representation about rural areas. Also, the hierarchical character of the demand, consumptions and representations can lead to the subordination of rural populations in relation to external interests, whether they are starred by the state or both by tourists and visitors (Figueiredo, 2003), constituting an important risk factor to be mentioned.

In relation to natural heritage, protected areas include the idea of safeguarding different types of resources for a more rational use, in favor of a higher collective interest (Lambas & Ricci, 2014). This safeguard will allow resources to be enjoyed by future generations for conservation, education and scientific purposes. In Portugal, the National Network of Protected Areas (RNAP) and the Natura2000 network (RN2000) seek to protect natural resources, the preservation of the environment, regarding mischaracterization of the landscape, and the protection of the local communities' traditions.

However, it is widely argued the efficiency related to the use of those areas. Protected areas need to merge their purposes with public accessibility and the socio-economic development of the regions (Lambas & Ricci, 2014). Once these territories can be considered tourist assets, and one should safeguard the principles of sustainable development, leaving to future generations the enjoyment of those areas, the social costs could be undermined through legislation and/or directives aimed at considering legal mechanisms of social control in order to make local communities a right of ownership over the natural resources contemplated in RNAP and RN2000[2].

The expectation for tourist profit in a space-commodity reinforces conflicts, but not without producing resistances. These conflicts give rise to the need to defend local actors in order to maintain the specificities of the local and regional history of places, valuing them not to be swept away by global interests.

Sustainable mobility poses a challenge for society in general, and especially for tourism activities. It is relevant when referred to travelling in natural areas for various reasons. It is a challenge and due to that has implied that it is not yet completely widespread in terms of operation, whether on the supply side or on the demand side, as intended to sustain in the previous section.

The analysis of the way tourism is affected by the various elements that have been referred previously does not end in models, nor in words. One of the most important changes, and still far from being included in the analysis, has to do with the metamorphisms that occur at the level of society, in terms of the constant alteration of habits and mentalities, consumer values and preferences, in terms of the planned development formats, where the political-institutional decision-makers have a decisive role, and in economic terms, as the range of production of goods and services hold a lot of possibilities.

The interrelated impacts of tourism production system and the existing conflicts vary from local scale to global scale (Jamal, 2004). The 'guilt' of tourism in the battle of global sustainability is not an object of research, despite its tendency to create positive and negative impacts on natural and cultural sustainability (Jamal, 2004). "Conflicts occur when user groups compete for similar resources and other users may diminish the enjoyment of recreation, or other activities" (Zeppel, 2010:95, based on Eagles, McCool, & Haynes, 2002). An extensive investigation carried out in 1998 in Canada (Parks Canada Agency, 2000) concluded that ecological integrity in national parks was in jeopardy, showing signs of "severe ecological stresses" (Parks Canada Agency, 2000: 1-8).

Visitors to rural areas normally use cars: in the UK, 90% of visits to natural parks are carried out using a private car; in Italy, 85% of visitors arrive at the tourist destination using a motor vehicle (Stanford, 2014). Several examples of mobility planning are referred to by Lambas & Ricci (2014): Pembrokeshire National Park, Yorkshire Dales National Park, North Yorkshire and Cleveland Heritage Coast (United Kingdom), Adamello Brenta National Park (Italy), and the aforementioned National Parks Caldera de Taburiente and Teide (Spain). However, it has been difficult to alter the behavior related to the use of a motorized displacement solution (Coulter, Clegg, Lyons, Chatterton, & Musselwhite, 2007).

In natural areas where tourism is important, automobiles can be regarded as a threat for the resources on which tourism depends: visual pollution, noise pollution, aural and mechanical disturbances, pollution (global and local effects), road congestion, problems with parking, erosion of routes and itineraries closest to the parking hubs (Lambas & Ricci, 2014; Stanford, 2014; Grec, 2017;

2 This would entail, in any case, a process of education/training of the local community(ies) for a perfect understanding of this legislation/directives.

González, Román, & Ortúzar, 2019). The whole of these impacts produces effects on the level of the lithosphere, hydrosphere, biosphere; but mainly in the natural landscape, which can be threatened in its natural and anthropic components, as well as in the heritage legacy by the presence of infrastructures (car parks and roads).

Despite the more restrictive European and international rules relating to combustion engines, the different impacts can affect the distinctive qualities of natural areas and harms the experiences of tourists and day-trippers (González, Román, & Ortúzar, 2019), as well as impacts the local community. This reality led to the concern with the planning and implementation of alternatives to classic motorized mobility in natural areas. More sustainable transport systems (buses, trains, bicycles, among others) allow to reduce the externalities associated with the car use (González, Román, & Ortuzar, 2019).

It is relevant the conclusion transmitted by González, Román, & Ortuzar (2019), which state that natural areas visitors ae concerned about the reduction of the environmental impact of their visit (in terms of CO2 emissions).

Outdoor activities will continue to be practiced in, or near, natural areas (Türk, Jakob, Krämer, & Roth, 2004). Encouraging the use of more sustainable means of travel and the implementation of dissuasive measures for the use of private vehicles are strategies that could be applied, without a very strong need for investment. The management of roads and routes must be different in natural areas, to encourage a safe and efficient visit and also to increase the recreational experience (González, Román, & Ortúzar, 2019).

The quality of the service, the management of the measures adopted, and the conditions experienced by visitors are the main explanatory factors for the use of more sustainable means (González, Román, & Ortuzar, 2019). The objective is to ensure the conservation and quality of the visit (Coppes & Braunisch, 2013), one and the other essential for the continuous increase of visitors.

The mitigation and compensation of the different impacts produced by the car circulation can be built under various possibilities (Lambas & Ricci, 2014):

- Passive infrastructures: green barriers that absorb and filter unwanted particles; constructive elements that reduce noise;
- Active operations: traffic control (flow, schedules, access restrictions, use of vehicles without emissions).

It is urgent to develop strategies, different from traditional top-down strategies, to solve conflicts, such as collaborative strategies, which seek consensus (common ground), or learning collaborative approaches (Jamal, 2004). These approaches are mechanisms to focus on community problems and conflicts related to natural resources, considering multi-stakeholder collaboration. It is also important to provide locals with the feeling of involvement and ownership of protected areas so that they become responsible for taking care of and controlling natural property values in a sustainable way - local people must feel included (Grec, 2017; Gutiérrez & Lopéz, 2017).

Destination planning faces several, and possibly divergent, interests and values: they balance between ecological needs, the political-economic aspects related to taxes and income and the needs of tourists and visitors; they also vary between environmental, economic and community interests (Jamal, 2004).

In this sense, there is a need to implement actions that limit the impact and find funding options for the protection/conservation of natural areas and to create awareness about environmental issues (Grec, 2017).

Regarding the possibilities that can be put into action to control the use of motorized means of travel using combustion engines, these can be: closure of internal roads, improvement of the routes for bicycles (or similar vehicles), routes hierarchization, speed control (Stanford, 2014; González, Román, & Ortúzar, 2019). Some solutions involve alternatives that can generate income: increased access prices, user-paying policies, private sector involvement (Jamal, 2004; González, Román, & Ortuzar, 2019).

With this context in mind, a practical case is approached in the next section to observe actions developed attending the particularities mentioned in the literature.

4. Case study - Moveletur project in the Serra da Malcata Nature Reserve

The rural world is going through significant changes and must search original and innovative development vectors, new development formats and new activities that bring together different

stakeholders. The Moveletur project - Sustainable Tourism and Electric Mobility in Natural Areas is committed to encouraging innovation in emerging sectors of the rural economy, since the emergence of leisure activities in natural spaces provide the ideal setting for new forms of territorial use, with economic and social impact. The challenge arises from knowing how to integrate this new use with traditional uses in a way that generates wealth without compromising values or resources. It is also perceived that recreational activities have more significance and socio-economic impact on the territory each day. The project involves 7 partners, from Portugal and Spain, with a budget of almost 1 million euros and its execution began in May 2017.

The project focuses on protected natural areas as areas with economic potential. All the protected natural areas that are part of the project belong to the ecological network Natura2000, whose aim is the long-term conservation of the most threatened species and habitats in Europe, helping to prevent threats to biodiversity (Evans, 2012; Sundseth & Creed, 2008). The main activities envisaged are presented in Figure 1.

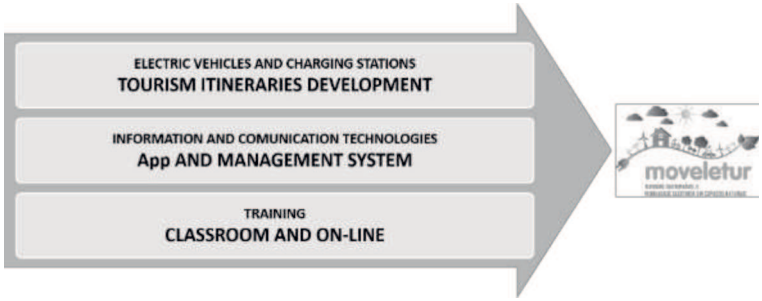

Figure 1 - Main activities of the Moveletur project

The project addresses the development of sustainable tourism through the creation of green itineraries that link natural and cultural values through an electric mobility network (Banister, 2008). This project offers opportunities for the binding and sustainable integration of protected cross-border territories. Thus, it allows the knowledge and dissemination of attractive sites existing in natural spaces in Portugal and Spain, involving a proposal of green itineraries, creation of visitor centers and development of sustainable tourism activities. Through this project, numerous heritage resources, as well as traditional architectural elements, can be reactivated as potential tourist resources.

Moveletur also seeks to help professionals and workers to achieve new skills and jobs related to the management of electric mobility. Entrepreneurship will be encouraged through training activities related to management and maintenance services of electrical mobility equipment. They will also contribute to climate change adaptation and risk prevention and management as a source of ecological job creation. The emerging economic activity of electric mobility will be promoted as part of a transition to a low-carbon economy (green economy).

The cross-border intervention territory forms an extensive region to invigorate, characterized by:

- Scarce settlement. In the Spanish protected areas, the population density is 17 inhabitants/km2 (97 inhabitants/km2 at national level), in the Portuguese protected areas, is 12 hab/km2 (118 inhabitants/km2).
- Depopulation. Since the 60's there has been a repeatedly negative evolution in the number of inhabitants, because young people are moving to cities in the search for jobs.
- Grey revolution. The municipalities integrated in the Spanish protected areas have an ageing rate of 29% (16% at national level); In the municipalities of the Portuguese protected areas, aging rates are almost twice the national average. The consequences of this immense migration to more attractive areas have been, and still are, penalizing these regions, not only by population decline, but also by population ageing and by decreasing birth rates.
- High significance of agricultural activity compared to the services sector. However, it is a sector with difficulty in cooperation and scale gains.
- The activity rates are lower than the national average. In the case of municipalities in the border region, they are 37.1% and 28.4%, respectively in Spain and Portugal, compared to 55.6% and 48.4% at national level.

It is an extensive territory, characterized by development difficulties, with different ways of looking at natural and cultural resources, but which need to improve its value, by means of tourism

activities, for example. Cross-border cooperation within the framework of the project enables the identification of new opportunities for socio-economic development and the integration of spaces on both sides of the border. The project partners manage equipment (electric vehicles and charging stations) for public use, located in natural areas, in terms of maintenance and information to visitors, which facilitates communication with potential users of electric vehicles and the management of charging sites. The implementation of green itineraries requires dialogue and coordination with hospitality entrepreneurs or other tourist services located in natural areas in both countries, through which the use of electric vehicles will be managed.

In Portugal, protected areas show an interesting increase in the number of visitors but are far from the full potential use of these areas, as shown in Figure 2. In 2018, about 550.000 people visited Portuguese protected natural areas.

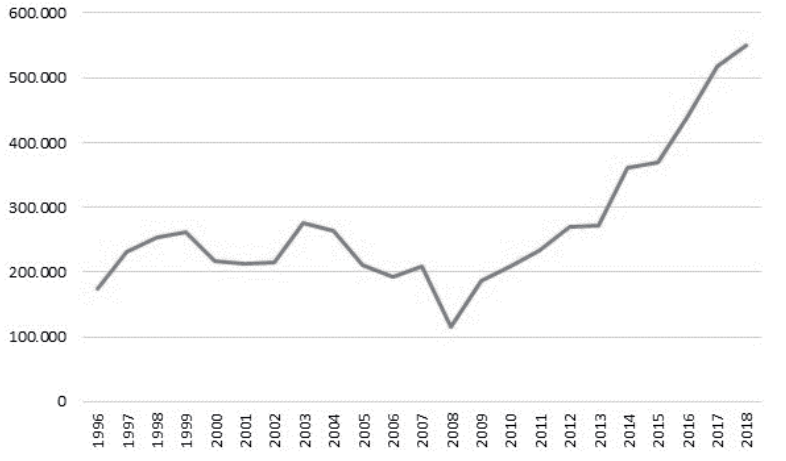

Figure 2 - Number of visitors of protected areas in Portugal (1996-2018)

Source: Institute for the Conservation of Nature and Forests

The project aims to respond to the challenge of combining tourist and leisure activities with local traditions and endogenous resources to help boost the economic potential linked to natural protected areas. By promoting electric mobility, the project will also contribute to achieving the European climate change targets.

The work carried out so far has identified several good practices related to the valorization of natural and cultural resources (mainly in the European Union) using electric vehicles on tourist itineraries. Among them are (FPNCyL, 2017): La Metropoli Verde, Spain; Werfenweng, Austria; Gorensjka, Slovenia; Krka National Park, Croatia; Regional Natural Park of Luberon, France; Sintra, Portugal; the National Parks Initiative, USA. These are projects that do not have a reported research component, they are mainly applied projects with which the project partners have been learning.

From these good practices, it is possible to sustain that efforts to encourage electric mobility in natural areas are still disappointing, even if they are part of the political agenda. However, this situation is not at all unexpected due to the morphology of the land, accessibility problems, to the fact that these are areas with low number of residents and visitors, or due to problems arising from the installation of infrastructures in protected areas, among other particularities. It is also possible to state that it is not normal (at least for now) that public funding programs related to electric mobility cover institutions or environmental organizations. Generally, public funding is used in the hope that the demonstration effect will take place in the community and encourage people to adopt electric mobility.

Created in 1981, the Serra da Malcata Nature Reserve (RNSM) involves the municipalities of Penamacor and Sabugal, in the central area of Portugal, near the Spanish border (cf. Figure 3). Covers an area of 16.348 ha with altitudes ranging from 425m to 1078m. This nature reserve includes a set of rock formations extending from northeast to southwest, separated by watercourses that form along the shale soils. The RNSM is situated between the Coa river to the north and the Bazágueda river to the south.

Figure 3 - Location of the Serra da Malcata Nature Reserve

In this protected area, the relics of Mediterranean wood are mostly remarkable. The reserve was classified as a biogenetic reserve by the European Council in 1987. Shrubs are the main botanical species in the northern mountainous region that is characterized by a cold humid climate. The South area is very eroded because it has been exploited by industry in recent decades, with large plantations of resinous trees. Its main symbol is the Iberian lynx, one of the most threatened mammals in Europe. RNSM is also famous for unusual bird species, such as the griffon, the black vulture and the black stork.

The development of the project considers the link between the most important natural and cultural elements, the accessibility for different types of electric vehicles and the location of the charging stations, with the support of an application and a management system. The territory is already subject of intervention in relation to itineraries of slow mobility (walking and cycling), enabling that, instead of creating new itineraries, it was decided to consider the existing routes and work from there (also considering the purpose of safeguarding the natural resources).

Although planned to include a set of charging stations for bicycles and automobiles, close to public services or hospitality units, it was decided to use only car charging stations. The reason for this change is that the current bike charging systems are (almost) plug & play and the distances within the RNSM are accessible to the current autonomy of electric bicycles. In this sense, the intervention was oriented towards the connectivity between the natural areas of the project.

The main objectives of the project are interconnected with the objectives of other projects that are being developed throughout the territory related to slow mobility, which was one of the main concerns to keep the project running after its execution.

5. Results analysis and discussion

Moveletur partners have an important history and operational culture in networks of cross-border cooperation (International Network of Natural Parks, Natura2000 network, Biosphere Reserve network) and are aware of the common problems, common objectives and opportunity detection.

The frontier territories are also spaces of opportunity, endowed with a valuable natural and cultural heritage, in which cross-border initiatives take place, spaces of accessibility and territorial articulation (road and railway network), areas of economic cooperation, with a history of success in cross-border cooperation programs (notably INTERREG).

The project is included in two areas of cooperation, Castilla y León - North of Portugal and Castilla y León – Center of Portugal. It proposes integrated and coordinated action in the existing natural spaces in both areas of cooperation. This action in natural areas presupposes an important added value for the territory and, specifically, for the two areas of cooperation involved. At the same time, it proposes the design of a joint network of itineraries and electrical mobility equipment, as well as the development of joint activities, such as an Electric Tour. These activities will help to improve the image of a natural tourism destination based on environmental sustainability, sustainable mobility and low-carbon economy.

In this sense, the main challenges that are sought to overcome are:

- Improving the competitiveness of territories by developing new economic activities based on sustainable tourism and electric mobility;
- Training and education of students and workers in new jobs linked to a low-carbon economy,

through training actions considered in the project regarding the management and maintenance of electric mobility;
- Efficiency and valorization of natural resources, making natural areas protected one of the main reasons for tourists to choose their next destination;
- Strengthen the rural areas that form most of the natural frontier areas, bringing them new technologies and innovations, based on electrical mobility, proving their viability in these territories and not only in large urban areas.

The main challenges identified include the creation of work methodologies that contribute to the development of a concept of cross-border natural spaces, the appreciation of the natural, cultural and landscape richness, the development of nature tourism, the creation of new employment opportunities and the use of technologies for the management and enhancement of natural spaces.

These challenges structure a set of opportunities that can increase the importance of having Moveletur (or similar projects) researching and acting in natural spaces. It is well known that natural spaces have great potential (specifically in frontier areas) to develop activities and tourism services of nature/sustainable tourism, since the tourist destinations that safeguard their cultural and/or natural heritage have been noted as tourist attractors and who have tourism of better infrastructural quality - the natural elements are valued in the market and can increase the economic capacity of the territories (McKercher, 2003; Saner, Yiu, & Filadoro, 2015; Boley & Green, 2016).

To overcome these challenges 101 electric vehicles were acquired (6 automobiles, 81 bicycles, 8 scooters, 3 tricycles and 3 quadricycles), 29 charging stations were purchased (17 fixed and 12 mobile), 31 tourist itineraries were created (13 for automobile and 18 for bicycle), a system of electric vehicles management was developed, a smartphone application was developed and two training actions were carried out, one online and one in classroom.

The project team conducted multiple proximity sessions to disseminate the project by the surrounding community, to bring electric mobility to the rural and natural environment and to encourage its use through loan/sharing of vehicles. These actions allowed the perception and obtaining important data to verify the acceptance of this model in natural areas.

From the work already developed, and considering the feedback obtained from the different typologies of activities developed during the implementation period, it is possible to mention the low environmental impact that electric mobility produces. The possibilities that this dimension provides are essentially positive in the extent of activity/professional functions and complementarity of tourist activities.

In terms of the specific use in natural areas, visitors have revealed a fully satisfactory experience, as it allows this experience to be done with little noise and without direct pollution, as well as entrepreneurs considered that the existence of this activity can complement their tourist supply.

In the natural areas, the existence of conflicts similar to those revealed in the literature was not verified, but this is not a validated conclusion, once the project is running and the data obtained needs to be analyzed.

Finally, we emphasize the issue that proved to be a source of problems. Despite the more than 1600 loans made, with the occurrence of 4 incidents, there is a risk management problem. New forms of displacement, such as electric mobility, require new models of insurance coverage; the existence of multi-users, the specificities of the electrical components, sometimes the difficulties of accessibility and communication in natural areas make the contracting of insurance a complex aspect. For safety reasons, the itineraries were sought to minimize the risk of travel.

The Portuguese and Spanish partners need to develop all activities together to achieve successful connectivity through the provision of truly cross-border tourist itineraries, which provide electric mobility of natural spaces of both countries.

6. Conclusions

Tourism activities can contribute to territorial development, but they are not harmless (Prats, 2005). They can bring undesirable impacts and risks to the territories that should be considered. Some of them are: the compatibility of tourism with the load capacity of local ecosystems, implying an adaptation between development and market needs with the preservation of natural resources; modernization of local traditional economic sectors; strategic planning of local development; integrated

and participatory management of local tourism development, involving social actors and local population (Buckley, 2012).

Regarding the project's implementation, there have been no evident conflicts in relation to the use of electric mobility for tourism purposes, proving the virtues that are reported in the literature. This can occur because they are areas focused on alternative tourism, where the search for visitors is still limited; it can, however, be a way of encouraging planning in view of the demand-based development in a sustainable logic.

To avoid conflicts, the project seek that tourism activities could be inclusive in relation to local development and local economic structure; in turn, the local structure should allow the renewal of the traditional sectors and the emergence of new activities, if they do not substantially change the characteristics of the natural areas.

To achieve this goal, new technologies offer the possibility of developing new tourism services which, on the other hand, can contribute to new economic activities and jobs. At the 1st World Conference on Smart Destinations (February 2017), UNWTO stressed how smart destinations are key to sustainable development and according to Boes, Buhalis & Inversini (2016), smart tourism highlights the potential role of digital technologies in the development of collaborative processes between service providers at destination (coopetition) or destinations and experiences co-creation, based on available resources, knowledge and Information in each area. The objectives set out in the Moveletur project may be important as an initial step towards raising awareness about the theme and, as it is an intervention project, for the community perception of the capital gains that sustainable tourism practices can provide.

Finally, tourism can play a strategic role in promoting new forms of fruition and use of rural territories and natural areas that can be more sustainable for the environmental system.

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