The role of a national park in classifying mountain tourism destinations: An exploratory study of the Italian Western Alps

J. Mt. Sci. () (): e-mail: jms@imde.ac.cn http://jms.imde.ac.cn
https://doi.org/10.1007/s11629---

Duglio S., Letey M. (2019). The role of a national park in classifying mountain tourism destinations: An exploratory study of the Italian Western Alps. *Journal of Mountain Science* 16(7), 1675-1690

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Abstract: Together with the main aim of preserving nature, national parks are also expected to play an important role for the local communities, driving economic activities toward the lens of sustainable development. This contribution aims to present an exploratory study on the relationship between the presence of a protected mountain area, the Grand Paradiso National Park (GPNP), in the North West of the Italian Alps, and the classification of tourism destinations, according to Weaver's model of destination management. Starting from the model, the authors provide a quantitative analysis using a set of variables and indicators to comprehensively assess the differing patterns assumed by the municipalities within the borders of the GPNP and those that are not. The provisional results illustrate that the municipalities within the border of a protected area are more likely to be grouped alongside the sustainable mountain destinations. Meanwhile, research outcomes confirm that a protected area does not necessarily contrast the tourism industry but instead may boost local development by driving it within the borders of the sustainable development, switching from the area's only preservation function to a flywheel for the local communities.

Keywords: Mountain tourism; Sustainable tourism management; National park; Municipalities; Alps

Introduction

A common definition considers a tourism destination to be "a geographical region, political jurisdiction, or major attraction, which seeks to provide visitors with a range of satisfying to memorable visitation experiences" (Bornhorst et al. 2010). This description is inclusive of both geographical areas (for example, the Alps or the Pyrenees) and a single attraction, with the common point of being able to provide a unique or significant experience to tourists (Bornhorst et al. 2010).

When considering the mountain context, several authors define a mountain tourism destination as a geographical, economic and social unit specifically designed for tourists in terms of mountain infrastructures (Flagestad and Hope 2001; Kuščer et al. 2017). In relation to what these areas offer for tourists, however, not only do mountains widely differ depending on factors such as climate, geomorphology and vegetation (Richins et al. 2016), but also in terms of human activities able to cope with differing tourist needs: nature, relaxation sports, leisure, culture, health and wellness.

Consequently, together with the "classical" mountain tourism destination, ski resorts, it is possible to identify other kinds of attractions able to offer a unique experience to tourists, i.e. the opportunity to come into contact with nature and environmental heritage: protected areas. They represent, in fact, the most suitable way to preserve the environment and, in the meantime, to valorise natural heritage by driving tourist experiences. A protected area is considered to be: "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008). Within the cited definition exist several types of protected areas such as National or Regional Parks, which are regulated by national or regional legislation, as well as areas that follow recognisable special programmes or conventions, including the World Heritage Convention concerning the protection of the World's Cultural and Natural Heritage (Dudley 2008).

Independent of protected areas is an ongoing international debate on the role that they should have on the local context and, together with their first goal, environmental protection; as such, a number of authors have begun to pay attention to

how they may become a method of territorial development, especially in making mountain tourism more sustainable (Nepal 2000; Dumitras et al. 2017). In fact, over the years protected areas, and in particular parks, have assumed a different role than their initial one of the exclusive protection and preservation of the environment: achieving objectives such as the economic development of a territorial area in a sustainable manner (Dixon and Sherman 1991; Naughton-Treves et al. 2005).

Within this general framework, this paper aims at contributing to the debate, and presents an exploratory study carried out in the first Italian national park ever established, the "Grand Paradiso" National Park (GPNP) on the border of two Italian Mountain Regions, Piedmont and Aosta Valley, in the North-West of the Italian Alps. In particular, the study's main objective is to evaluate the role of the park in driving sustainability in mountain tourism destinations. To achieve this goal, we decided to map the GNPG municipalities in accordance with Weaver's model of destination management (Weaver 2000; Weaver 2012) and, in doing so, propose a quantitative approach of the Weaver model. The model is based on a set of indicators, thanks to which 214 mountain municipalities in the two aforementioned Italian Regions were analysed, to assess whether there are significant differences among the municipalities within the borders of the GPNP.

Therefore, the paper is organised as follows.

Section 2 provides the conceptual framework, which is concentrated on tourism and protected areas, with a focus on destination management.

Section 3 focuses its attention on the methodological approach adopted in the study, the research hypothesis and data collection, whilst Section 4 presents and discusses the main results derived from the adopted methodology.

Finally, Section 5 is devoted to concluding the study, and presents the advantages and the limitations of the study and indicates future avenues of research.

Conceptual framework

As is widely known, the concept of sustainable development was introduced at the beginning of the 1970s (United Nations Conference on Human Environment, 1972) and resumed in the so-called Brundtland Report (1987) entitled "Our Common Future" as development that allows new generations to satisfy their needs as their forefathers did. Later, Agenda 21 and the Fifth Environmental Action Plan of the European Union suggested concrete governances aimed at implementing sustainability. At the end of the 1990s, the environmental conservation approach was replaced by the new concept of environmental sustainability, the improvement of socio-economic strategies and the planning of territorial involvement in the development process of local populations (Regis, 2005). Since the mid-90s, during which the Charter of Lanzarote formally extended the concept of sustainable development to the tourism sector (Duglio and Beltramo 2014), several studies have paid attention to the role of tourism activities in preserving and threatening the environment (UNWTO 2005; CIPRA 2011; Torres-Delgado and Saarinen 2014; Kuščer et al. 2017).

The European Charter for sustainable tourism (2000), then, tries to define the concept as a tourism-related development that can meet the demands of both tourists and host communities whilst preserving and improving the opportunity for future development. Later, the UNWTO (2005) enriched the concept and defined sustainable tourism as "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities". The main objectives of sustainable tourism include, therefore, the implementation of management practices that reduce negative impacts and maximise the positive implications at the social, economic, ecological and cultural level (Eagles et al. 2002; Blanco-Cerradelo et al. 2018).

As highlighted by Lee and Chang (2008), tourism is an activity that effects the local environment in a multitude of ways and, to lead to positive results in the long term, must follow a sustainable development approach. In the last 20 years, therefore, many studies have tackled tourism sustainability from different points of view (Qian et al. 2018). In particular, some authors have focused their attention on modelling and measuring sustainability in the tourism sector (Mihalic 2000; Siegrist 2004; Weaver 2000), in addition to developing different tools (Schianetz and Kavanagh

2008), largely using devoted indicators. These tools take into account both qualitative and quantitative indicators (Miller 2001; Choi and Sirakaya 2006; Lew et al. 2016; Iliopoulou-Georgudaki et al. 2016), composite indicators (Blancas et al. 2015; Pérez et al. 2013), as well as models that integrate different indicators among them (Sirakaya et al. 2001; Ness et al. 2007; Kristjánsdóttir et al. 2018).

International organisations, and in particular the World Tourism Organisation (WTO) and the European Commission, have also developed practical indicator systems to observe, manage and evaluate sustainability in tourism: the WTO recommendations and the European Tourism Indicator System were applied in different studies to test their difficulties and challenges (Blancas et al. 2010; Tudorache et al. 2017).

If all these experiences and efforts underline the importance of measuring sustainability in tourism development practises, as Torres-Delgado and Saarinen (2014) point out, this is especially true in particular conditions.

As already expressed, mountain areas are one of the major natural tourism attractions. Their sustainable development has become a very important issue (Fuchs et al. 2002) and, in reason for their peculiar characteristics, they are subject to specific studies (Kuščer et al. 2017). In recent years, many scholars have studied "monitoring" systems of sustainable development in mountain tourism destinations (Fuchs et al. 2002; Stankova 2014; Jurigova and Lencsesova 2015; Paunović and Jovanović 2017). These studies underline, in particular, how sustainability in mountain tourism is closely connected to the destination competitiveness.

In developing their offers, mountain destinations have frequently adopted different environmental management practices. It is the case, for instance, of small hotels, widespread in mountain areas, which adopt different sustainable strategies to reach competitiveness (Buffa et al. 2018).

Furthermore, it is important to highlight that many mountain areas are protected by national or local governments, thanks to the presence of national or regional parks, natural reserves and important natural sites (Paunović and Jovanović 2017).

In this general context, hence, a devoted avenue of research takes into account the tourism sector in protected areas to effectively evaluate the advantages and disadvantages of this economic sector both on the environment and the local communities (Buckley 2003).

Sustainable tourism destinations in protected areas

The first studies on protected areas are dedicated to their main role: the preservation of wildlife and, more generally, the environment (Ceballos-Lascurain 1996). Tourism, however, is the main objective in protected areas, particularly from an economic point of view (Dixon and Sherman 1991). As such, since the later 1990s, largely thanks to the aforementioned new trends in the field of tourism and hospitality, different studies concerning tourism in protected areas started to be carried out by academics as well as public administrations. Nepal (2000) analysed the role of tourism in protected areas, in particular the impact of tourism in the Himalayas, studying the development of tourism on the local economy. In his results, the author notes how the negative aspects of tourism can be reduced by maximising the positive effects. He highlights how tourism, in particular environmentally friendly tourism, can generate development, particularly in mountain areas, but it must be subjected to strategies and regulations (Nepal 2002).

Subsequently, other authors have appeared to agree with these results, emphasising the importance of planning and managing tourism development in protected areas (Dudley 2008; Eagles et al. 2002; Plummer and Fennell 2009; Weaver 2005). Siegrist (2004) contributed to the debate, reporting virtuous examples of tourism management in the Alps and underlying the role of protected areas in promoting tourism and, consequently, boosting local development.

Hammer and Siegrist (2008), furthermore, analysed the success factors in nature-based tourism. In particular, they pointed out that in areas already considered to be marginal, protection becomes an important development factor because of its attractive role. On the other hand, however, the study underlines the importance of local policies in preserving nature and supporting the

development of tourism. If managed by host communities, in fact, tourism can lead the economic development of local populations, even in the so-called marginal mountain areas where the local economy is mainly based on agriculture and pastoralism (Butzmann and Job 2017; Dinica 2018; Siegrist and Bonnelame 2017; Weaver and Lawton 2017).

Otherwise, and in contrast with the available literature, Pröbstl-Haider and Haider (2014) do not consider parks to be destination attractions. The authors point out that only tourists interested in nature take into consideration protected areas when choosing destinations.

Even in recent years, the literature focuses on sustainable tourism in protected areas, including World Heritage sites (Della Lucia and Franch 2017; López and Pardo 2018). The authors highlight how protected areas may play an important role in attracting tourism, though not always sustainable.

To evaluate the sustainability of tourist destinations, a model of destination management was proposed by Weaver in 2000 (Weaver 2000; Weaver 2012). According to this model, tourist destinations can be categorised into four main areas in light of the relationships between two "forces": the level of tourism intensity and the level of regulation that can be associated with the tourism scale. Thanks to this model, it is possible to identify the Circumstantial Alternative Tourism destinations (CAT), the Deliberate Alternative Tourism destinations (DAT), the Sustainable Mass Tourism destinations (SMT) and the Unsustainable Mass Tourism destinations (UMT). Both DAT and SMT destinations are characterised by high levels of regulation; by contrast, CAT and UMT destinations have low levels of regulation. Moreover, SMT and UMT are high tourism intensity destinations, whilst DAT and CAT are low tourism intensity ones. More specifically, according to Weaver, a CAT destination is represented by locations that are within the "exploration" stage (according to Butler 1980), while a DAT destination appears when regulations are present. As far as mass destinations are concerned, a UMT destination occurs when tourism is developed without any kind of strict regulations causing the destination to exceed its carrying capacity, whereas an SMT is able to maintain its limits.

To address the aforementioned research goal, evaluating the role of the national park in driving sustainability in mountain tourism destinations, a quantitative approach of the Weaver model of destination management is applied to an exploratory case study, located in the North-West of the Italian Alps and represented by the "Gran Paradiso" National Park (GPNP). **To our knowledge, this study represents a first attempt to provide a quantitative approach of the Weaver model taking into account the role of a national park in classifying mountain tourism destinations.**

Research hypothesis

The quantitative application of the Weaver model means that the research hypotheses contained in Table 1 must be verified.

Table 1 Research hypotheses

Due to the regulatory role expressed by a national park, as already reported by (Nepal 2000), one may expect that the municipalities within its border are much more likely to be inserted into Weaver's SMT or DAT categories (Weaver 2000; Weaver 2012) (Hypothesis 1 – H1). It may be more likely, consequently, that municipalities outside of a national park are more likely to be classified as CAT or UMT patterns (H2). Furthermore, the ski industry strongly contributes to the tourism development of mountain areas, with some advantages and disadvantages taking into account the economic and environmental implications of ski resort activities and processes (Steiger and Mayer 2008). H3 and H4 analyse whether the presence of a park may have driven the development of winter tourism activities in a more sustainable way.

1 Methodology and data collection

1.1 The area of investigation

The choice of the GPNP for carrying out the analysis is due to the particular location of this area: the park is trans-regional and contains 13 municipalities in five different alpine valleys, three

in the Aosta Valley Region (Cogne, Valsavarenche and Rhêmes Valley) and two in the Piedmont Region (Orco and Soana Valleys). With a surface of 710.4 km², the GPNP's area is wholly situated within mountain habitat, with an altitude between 1,000 m and 4,061 m a.s.l. (the Gran Paradiso Peak). The municipalities invested in the presence of the GPNP number approximately 8,700 individuals (a density of 12.3 in/km2). Second, the GPNP being the first national park ever instituted in Italy, with a King's decree dating 1922 (Regio Decreto, 1922), it is expected to have driven the economic development of the territory within its borders from the very beginning due to the high levels of regulation compared to the adjacent mountain valleys.

Furthermore, the Piedmont and Aosta Valley municipalities of the park, despite their territorial continuum, are characterised by economic, social and cultural specificities. At government level, moreover, there is an important difference, essentially due to the different kinds of government frameworks defined by the Italian Constitution (Special Constitutional law 26 February 1948, n. 4- Aosta Valley Special Statute). The Aosta Valley Autonomous Region has legislative power in different subjects, including tourism and landscape protection; these differences may have created some disparities in the economic development of the local communities. In fact, in the Aosta Valley no mountain municipality can be considered marginal in terms of economic and social indicators, while the same is not possible for the Piedmont Region where 222 mountain municipalities are classified as marginal areas (45.3% of the total Piedmont mountains municipalities), 111 of which have a high marginality index (Crescimanno et al. 2008).

Starting with the main characteristic of the GPNP, the parameter used for selecting the municipalities is essentially related to the official regional borders in which the GPNP's municipalities are located: the Metropolitan Area (ex-Province) of Torino and the Aosta Province Areas. The area of investigation, therefore, concerns each of the municipalities located in the two counties, which can be defined as "mountain" destinations. To define the in-mountain-context municipalities selected by the analysis, the selected criterion is the membership of the municipality itself at the institution of the "Unioni montane di comuni" (Mountain Municipalities Unions), which was established in 2012 after a national reform of the Italian public bodies (Regional Law 14 March 2014, n. 3 –Mountain Law). Two hundred municipalities meet this criterion: 141 are located in the Metropolitan Area (ex-Province) of Torino and 73 are in the Aosta Valley Province. Among the 13 municipalities with part of their territory located within the GPNP borders, six are in the Piedmont Region (Ceresole Reale, Locana, Noasca, Ribordone, Ronco Canavese and Valprato Soana) and seven are in the Aosta Valley Region (Aymavilles, Cogne, Introd, Rhêmes-Saint-Georges, Rhêmes-Notre-Dame, Villeneuve and Valsavarenche), as shown in Figure 1.

Figure 1 The area of investigation

Figure 1 displays the subject of the analysis, the Piedmont and Aosta Valleys Regions, with all the mountain municipalities involved in the metropolitan area of Torino (n = 141) and the Aosta Valley (n = 73) in dark grey, with a focus - in black - of the districts invested in the presence of the GPNP (n = 13).

1.2 Methods and data

Figure 2 resumes the methodological approach that has been adopted in the study.

Figure 2 Research phases and research methodology

Phase 1 was devoted to the identification of the Metropolitan Area of Torino and Aosta Valley municipalities. The two areas count 390 municipalities (316 for Torino – T - and 74 in Aosta Valley - A). Starting from all the municipalities, as afore reported, the attention has been focused on those that are in mountain areas (selected criterion is the membership of at the Mountain Municipalities Unions). Thus, 141 municipalities for the Metropolitan Area of Torino and 73 for Aosta Valley were selected in order to carried out the analysis.

Together with the definition of the area of investigation, in Phase 1 we focus our attention on the identification of the variables and indicators in

order to propose a quantification approach to the Weaver model (Weaver 2000; Weaver 2012). The model, which categorises tourist destinations in four main types, is based on the relationship between the levels of tourism intensity and regulation; consequently, variables and indicators are distributed within them.

According to previous studies carried out in the Italian Alps (Della Lucia and Franch 2017), the set of indicators concerning tourist intensity and regulation is selected by relating their significance with the characteristics of the data, its accessibility, precision, robustness, reproducibility, and, finally, consistence with the subject (Ceron and Dubois 2003; Hardi et al. 1997; Mccool and Stankey 2004). These are the main reasons why, among many possible indicators proposed - or used - in previous studies and identified in Phase 1 (more specifically 41 indicators, as reported in Table 2) many indicators have been eliminated from the present work.

Table 2 Indicators in the literature review

Initially, (Phase 2) a total of 10 variables were taken into consideration in the investigation: three for the tourist intensity and seven for the regulation. For each variable, one or more ad hoc indicators have been considered and, in particular, 8 indicators for the tourist intensity and 10 indicators for the regulation asset.

Table 3 First step variables and indicators

Table 3 details variables and indicators, how they are measured (column "formula") as well as the data sources. For the data collection, we have relied on data provided by official sources and, in particular, the Italian National Institute of Statistics (ISTAT), the Piedmont and Aosta Valley Regional Observatories and UrbanIndex.it, project promoted by the Italian Presidency of the Council of Ministers, containing a set of statistical indicators for different areas. As far as the "Tourism certification rate" indicator is concerned, data sources take into account the official databases of all the tourism labels available in these areas: Q label GPNP dababase, Aosta Valley VIVA database, Q Italian Hospitality database, Saveurs Aosta Valley database and Chamber of Commerce of Torino "Maestri del Gusto" database. All the data were collected between the months of June and July 2018 and refer to 2017, the last available year.

Starting with the set of variables and indicators contained in Table 3, a limited number were selected for use in the statistical technique of the principal component analysis (PCA). **This technique has been shown to be a suitable tool to categorise the municipalities within the Weaver model (Della Lucia and Franch 2017).**

To define the most appropriate variables and indicators, both Pearson and Spearman correlations have been calculated for all the initial variables (Phase 3). **The decision to use both the two correlation coefficients has to be seen in the intention to have a better vision of the robustness of the selected indicators.** Thanks to the results provided by the Pearson and Spearman correlations (Table 4), alongside the constraints associated with the need to combine the availability of data with the significance criteria, five variables (for seven indicators) are reported to perform the PCA statistical analysis, as shown in Table 5.

Table 4 Pearson and Spearman correlation coefficients

Table 5 Variables and indicators used in the PCA statistical analysis

The results derived from the Pearson and Spearman correlations provide a set of indicators that confirms some indicators used in previous analysis and, in particular, the "% of protected areas" and the "Second home concentration" (Della Lucia and Franch 2017).

To explain, the "Touristic rate", the "Tourist density rate" and the "Composite accommodation function rate" are significantly correlated with each other (both Pearson and Spearman correlations are significant for $p \leq 0.01$). The "% protected surface" indicator, which is connected to the research question, is significantly correlated with the "Tourism certification rate" and the "Environmental certification rate" indicators (both Pearson and Spearman correlations are significant

for p≤0.01). Furthermore, when considering rural or alpine environment tourism, second homes can play an important role both in terms of level of tourist presence and contribution to the sustainable development of the area (Müller 2002; Hoogendoorn and Visser 2004; Gallent 2014; Sonderegger and Bätzing 2015; Miletić et al. 2018).

As far as the Pearson and Spearman correlations are concerned, among the "Second homes" variables (see Table 4), the "Second homes concentration" indicator is significantly correlated with "Touristic rate" and "Composite accommodation function rate" indicators (both Pearson and Spearman correlations are significant for p≤0.01). According to the Pearson test, furthermore, second homes are also significantly correlated with the "Tourist density rate" indicator (p≤0.01).

In the meantime, the "Second homes concentration" indicator is significantly correlated with the "% protected surface" and the "Tourism certification rate", both at the 0.01 level (Pearson) and, respectively, the 0.01 – for "% of protected areas" - and 0.05 – for "Tourism certification rate"- levels (Spearman). This is the reason why the "Second homes concentration" indicator, despite not having a high level of correlation with the "Environmental certification rate", has been included in the analysis.

2 Results and discussion

The PCA analysis is performed using SPSS Statistics software version 25.0. Because the selected variables have different measure units, they have been standardised before performing the analysis **calculating the Z-Score**. The PCA highlights two principal components, the first being attributable to the tourist intensity, while the second represents the regulation. These two components explain 61.32% of the variability (Table 6).

Table 6 PCA - Two components matrix

According to Table 6, the "Touristic rate", "Composite accommodation function rate" and "Tourist density rate" indicators are associated with the Tourism intensity component. Conversely, "% of protected surface", "Tourism certification rate", "Second home concentration" and "Environmental certification rate" correspond to the Regulation. In this component, furthermore, it is interesting to observe that the presence of second homes tends to correspond to areas with up-to-date regulation. This is in relation to how the second home indicator was calculated: in fact, second homes are considered by the model to be potential tourism.

Figure 3 displays how the aforementioned indicators are positioned in accordance with the two components of the Weaver model, intensity and regulation, dividing the plot into 4 quadrants representing the 4 main states of the model: I CAT, II DAT, III SMT and IV UMT.

Figure 3 Rotated components - Positioning of the variables according to the Weaver model

Figure 4 illustrates the results for the PCA analysis performed for the mountain municipalities of the Metropolitan Area of Torino (ex-Province, n = 141) and the Aosta Valley Region (n = 73). The symbol ▲ is associated with the municipalities of the area of investigation, with part of their territories within the border of the GPNP.

Figure 4 PCA analysis – Positioning of the Aosta Valley and Metropolitan Area of Torino municipalities according to the Weaver model

As shown in Figure 4, it is possible to note a concentration of the municipalities of the two mountain areas (Torino and Aosta Valley) within the low intensity tourism destinations and, in particular, in the Circumstantial Alternative Tourism destinations (CAT). They are normally small size municipalities in terms of both population and tourism activities.

Nevertheless, 21 out of 214 municipalities (8.8%) can be considered as Unsustainable Mass Tourism destinations (UMT). In the Metropolitan Area of Torino, they are mostly represented by municipalities that, on the one hand, are medium size towns, well connected with the major centre of Torino (i.e. Avigliana, Lanzo Torinese, Sangano, Susa) or, on the other hand, have become major tourism destinations for ski-related activities, like Oulx, Sestriere and Claviere. As far as the Aosta

Valley Region is concerned, the UMT destinations are generally concentrated in the region valley floor where economic activities have been developed (for instance, Saint-Christophe, Saint Vincent, Pre-Saint-Didier and Bard).

By contrast, Figure 4 also shows that, when focusing our attention on the Sustainable Mass Tourism destination (SMT), 28 municipalities can be associated with this specific cluster (13.1%). They are mainly concentrated near the axis intersection, which means that they are either on the border between being sustainable or unsustainable (as some important mountain ski resorts of both the two Regions: Bardonecchia, Sauze d'Oulx, Courmayeur, Ayas and Valtournenche) or on the limit between being mass or niche destinations (Usseglio, Fenestrelle, Villeneuve, Pollein, Valgrisenche). Notably, with reference to the specific GPNP case study, in particular, all the municipalities involved are situated on the top of the matrix, showing high levels of regulation. In fact, among the first 10 municipalities with the highest regulation, eight are encompassed in the GPNP area. This is particularly due to the role of the "% of protected surface" indicator combines with the "Tourism certification rate" ones. A more in-depth analysis of this area, however, proves that the municipalities in the Aosta Valley are more likely to be inserted in the SMT destinations cluster, while the municipalities included in the Metropolitan Area of Torino appear to be DAT destinations. In particular, starting for the top of the Regulation variable axis the model reports Ceresole Reale (Torino, T), Valsavarenche (Aosta Valley, A), Ribordone (T), Valprato Soana (T), Noasca (T), Cogne (A), Rhêmes-Notre-Dame (A) and Ronco Canavese (T).

The performed PCA analysis, therefore, support the Hypothesis 1, the municipalities within the border of a mountain national park are more likely to be SMT or DAT destinations. In doing so, our results confirm previous studies (Della Lucia and Franch 2017) that, even if not focused on national parks, show how areas that are concerned on the environment, even by following recognisable special programmes as the World Heritage Convention, are more likely to have municipalities in the SMT or DAT quadrants. By contrast, the same study also reports that the municipalities out of the WHS perimeter are more likely to be CAT or UMT (Della Lucia and Franch 2017).

When referring the analysis carried out within the GPNP protected area, in particular, Table 7 reports the municipalities involved in the study and with a focus on the "% of protected surface" indicator.

Table 7 Municipalities and protected surface

If, on the one hand, the indicator explains the position of the GPNP municipalities on the highest quadrants of the Weaver model on destination management ("% of protected surface" and "Tourism certification rate" indicators), on the other hand the same is not able to explain why some of them are situated in the II quadrant (DAT) and others in the III one (SMT).

Effectively, as reported in Figure 3, the "Touristic rate", "Composite accommodation function rate" and "Tourist density rate" indicators are the most suitable to determine whether a GPNP destination may be a mass (even if sustainable) or a niche one. Being the GPNP municipalities similar as far as the territorial constraints are concerned, the different positioning in terms of tourism intensity (number of accommodation and beds) may be connected with having adopted different tourism strategies.

Therefore, we decided to analyse if the development of winter tourism based on the ski industry may be able to determine the position of the municipalities towards a mass tourism destination and, second, if the presence of the GPNP may have been able to "contain" this possible growth (H3 and H4).

Table 8 contains the municipalities invested in the presence of the GPNP that, in the meantime, have developed alpine ski related facilities for winter tourism.

Table 8 GPNP Municipalities and winter tourism facilities

As shown in Table 8, the presence of winter tourism facilities devoted to the ski industry has not necessarily driven the municipalities towards a

mass tourism destination and, when they do arise, PCA outcomes indicate that they are sustainable destinations (Figure 4). The main reasons why the areas are placed in the DAT or SMT patterns are related to two main factors. First, as already highlighted, the different policies implemented on both sides of the park, due to different regional systems of regulation and public subsidising, may have determined different paths of tourism development in the Aosta Valley and Piedmont Regions. The Aosta Valley has historically counted on mountain tourism as a driver for economic development in the region and, as pointed out by Leonelli and Minguzzi (2013), it is nowadays a leading Italian tourism destination, in particular for the high occupancy of beds, both in the hotel and non-hotel sectors. Furthermore, it is worthwhile to note that the presence of the protected area has not impeded the development of winter tourism facilities, but, by contrast, has guaranteed the preservation of the natural heritage as well as the sustainable development of the territory.

These provisional outputs give interesting indications for local policy makers. Starting from the assumption that the GPNP municipalities are already sustainable, as showed the performed PCA analysis, in order to improve their position in the Regulation axis, local mayors of both the two sides of the GPNP can rely on boosting the implementation of tourism labels and certifications by the local operators.

As far as the Tourism intensity is concerned, being it mainly associated with the numbers of the tourism offer (beds, facilities) for switching from the DAT quadrant (Deliberate Alternative Tourism) to the SMT quadrant (Sustainable Mass Tourism), the local policy makers of the Torino side of the GPNP should enrich, of course, their capabilities to host tourists. In doing so, the performed PCA analysis suggests a feasible strategy: in fact, “Second homes concentration” indicator proves to have effects for both the Tourism intensity and the Regulation components. A possible suggested tourism strategy for the local communities should not count on building new facilities and accommodation, but on revitalising the second homes in order to convert them into tourism offer, supporting, for instance, the adhesion to the Airbnb platform by local owners (Reinhold and Dolnicar 2017; Sthapit and Jiménez-Barreto 2018).

3 Conclusion

The definition of sustainable tourism, and in particular the determination of the sustainability of a tourist destination, has been the subject of many studies, but they have mainly taken qualitative aspects into consideration. Weaver's model has allowed us to evaluate the sustainability of a tourist destination through a quantitative approach.

In this study, attention is paid to the role of a national park, more specifically the first ever established in Italy, the GPNP, in driving sustainability in mountain tourism destinations, proposing the quantitative approach of the Weaver model, a specific research goal not taken into consideration by previous studies. In doing so, we proposed an exploratory study on the municipalities within the GPNP’s borders, based on the consideration that, as highlighted by Dudley (2008) and Hardy et al. (2002), a protected area is itself an indicator of sustainability, and, furthermore, with the double aim of nature conservation as well as the economic development of local communities (Jamal and Stronza 2009).

As far as the research hypotheses are concerned, the provisional analysis shows that:

1. Hypothesis 1 - The municipalities within the border of a mountain national park are more likely to be SMT or DAT destinations, is supported by the analysis.
2. Hypothesis 2 - The municipalities outside of a mountain national park are more likely to be CAT or UMT destinations than SMT or DAT destinations, is supported by the analysis.
3. Hypothesis 3 - The municipalities outside of a mountain national park with a developed ski industry are more likely to be classified as UMT destinations than SMT destinations, is supported by the analysis.
4. Hypothesis 4 - The municipalities within the border of a mountain national park with a developed ski industry are more likely to be classified as DAT destinations than SMT destinations, is not sustained by the performed PCA.

If H1 was expected by the authors, H2, H3 and H4 support the evidence already highlighted by Dinica (2018): tourism in protected areas is an increasing phenomenon and, consequently, the municipalities including a protected area may have greater economic development that needs to be taken under control.

Evidence for H4, in particular, demonstrates how the presence of a protected area does not necessarily oppose the implementation of the tourism industry, more specifically related to the winter season; on the other hand, it can be a useful "tool" for controlling and driving it within the borders of the sustainable development. As observed by Weaver (2001), moreover, there are cases in which sustainability is positively correlated with visitor attendance and a park may facilitate this positive interrelation.

As with all exploratory studies, this analysis presents some strong points and limitations. First, to our knowledge, this study represents the first attempt to assess the role of a national park in driving sustainability in mountain tourism destinations, proposing a quantitative approach of the Weaver model using a set of variables and indicators. Second, the performed PCA analysis gives useful information and important suggestions to the local policy makers for a better understanding of the positioning of their municipalities *per se* as well as in comparison with other local communities, based on a set of comparable indicators. Consequently, the study may be a starting point for helping policy makers in defining alternative tourism development scenarios.

At the meantime, as all the research studies, this analysis contains some limitations. The most important limitation of the paper is related to a better understanding of the second homes phenomenon in terms of tourism intensity. In fact, new trends in the hospitality industry, in particular the Airbnb phenomenon emerging in the accommodation sector (Reinhold and Dolnicar 2017; Sthapit and Jiménez-Barreto 2018), have not been considered in this study. Future avenues or research, therefore, need to take into account second homes reconverted into hospitality in the "Composite accommodation function rate" indicator in order to sharpen the data results.

Second, this study has been carried out in relation to a specific case, represented by a national park. As underlined in the introduction section, however, there are different kinds of protected areas (national or regional parks, as well as more specific areas), regulated by national or regional legislation. Future researches, therefore, can replicate the model in other mountain municipalities included in a different kind of protected area in Aosta Valle and Piedmont Regions or reproduce the same analysis in other Italian or mountain European areas within the border of a National Park. In this way, it can be possible to observe whether the results may be generalised at regional level or whether the outcomes may be widespread in different mountain contexts.

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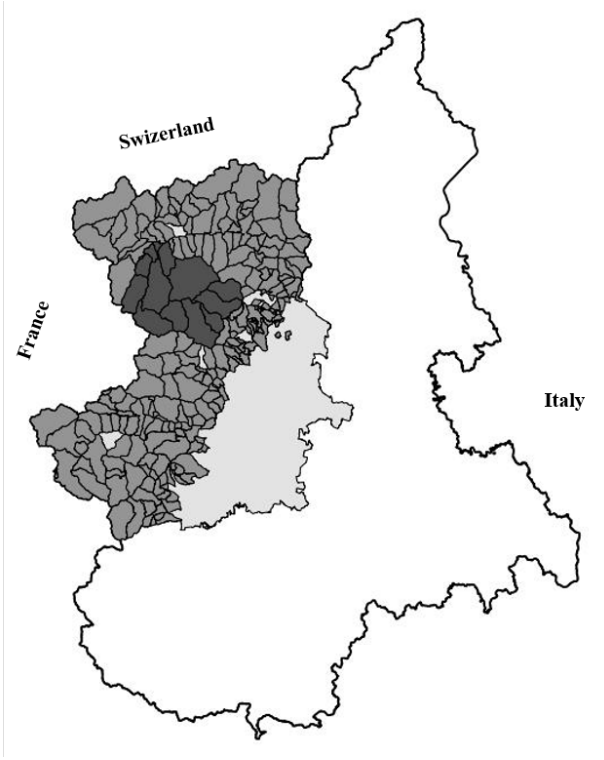

Figure 1 The area of investigation

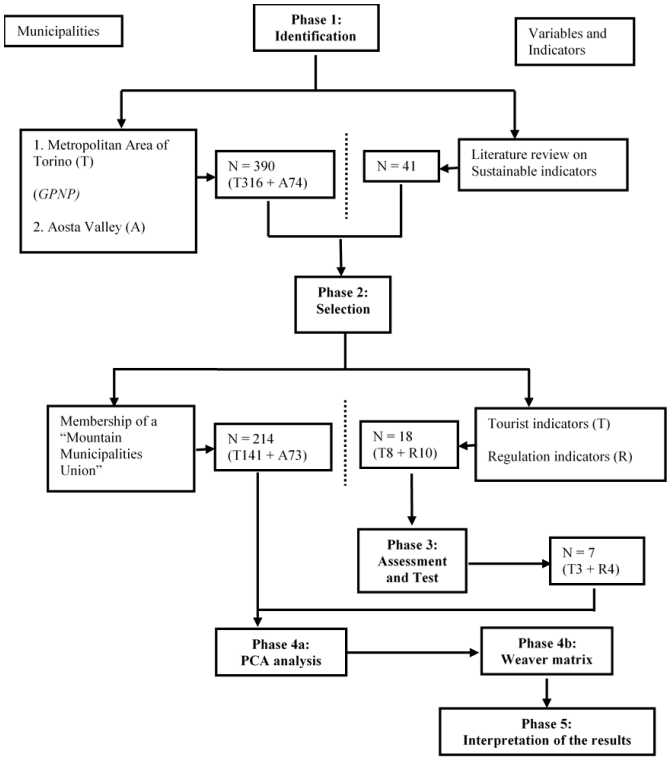

Figure 2 Research phases and research methodology

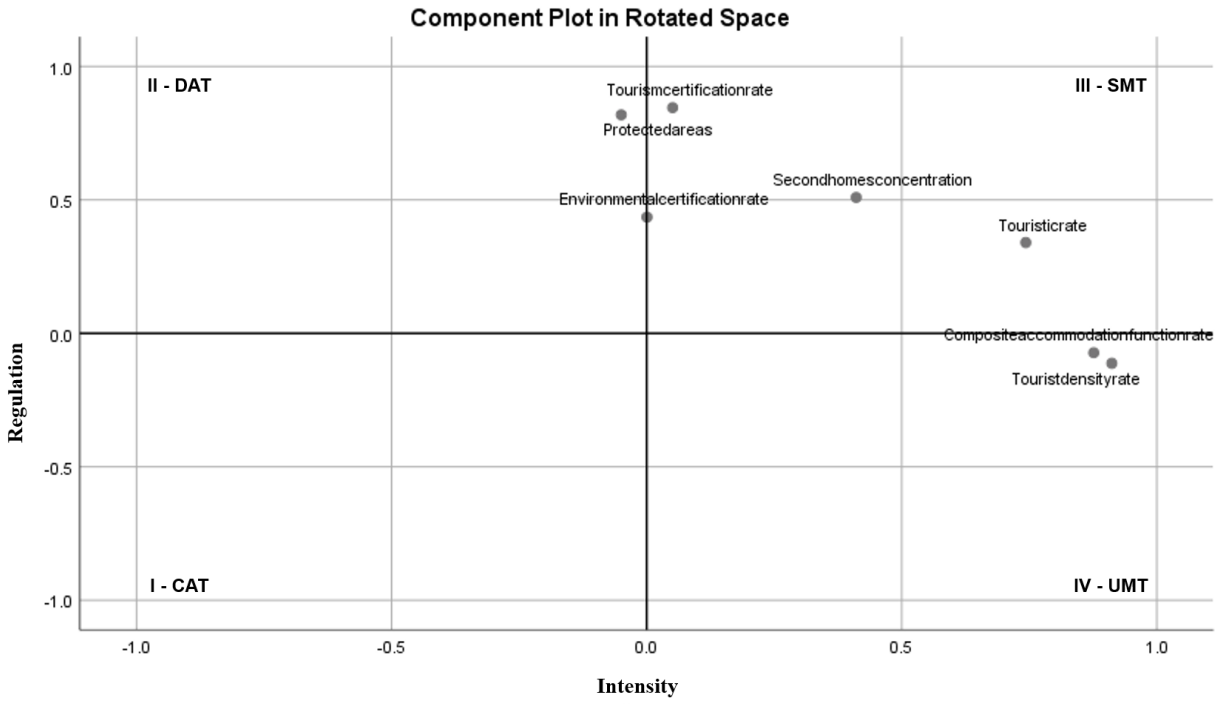

Figure 3 Rotated components - Positioning of the variables according to the Weaver model

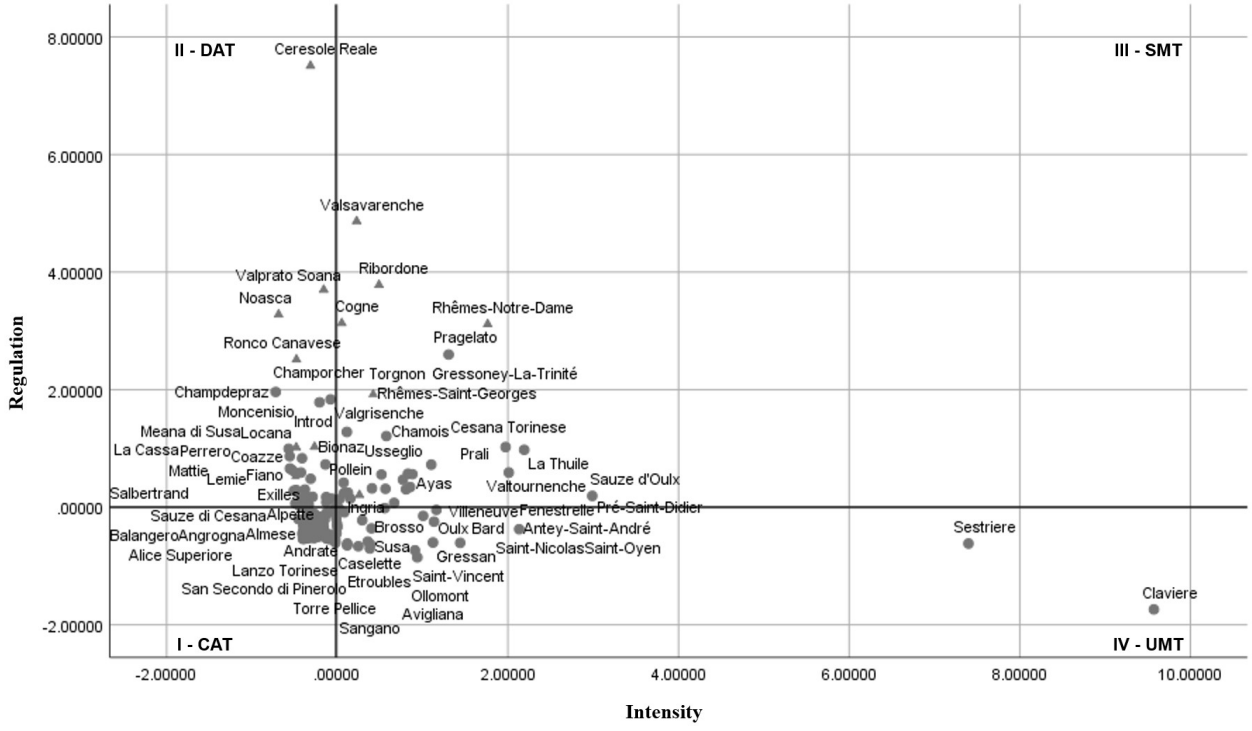

Figure 4 PCA analysis – Positioning of the Aosta Valley and Metropolitan Area of Torino municipalities according to the Weaver model

Table 1 Research hypotheses

H1:	The municipalities within the border of a mountain National Park are more likely to be SMT or DAT destinations.
H2	The municipalities outside of a mountain National Park are more likely to be CAT or UMT destinations than SMT or DAT destinations.
H3	The municipalities outside of a mountain National Park with a developed ski industry are more likely to be classified as UMT destinations than SMT destinations.
H4	The municipalities within the border of a mountain National Park with a developed ski industry are more likely to be classified as DAT destinations than SMT destinations.

Table 2 Indicators in the literature review

Dimensions	Indicators	Literature
Socio-Cultural	Bed occupancy rate; Average length of stay; Touristic rate; Tourist density rate; Digital divide	Blancas et al. 2016; Della Lucia and Franch 2017; ETIS 2016; Tudorache et al. 2017
Economic	Accommodation rate; Accommodation density rate; Composite accommodation function rate; Retailer trade rate; Second homes concentration; Not-in-use building rate; Not-in-use home in residential areas	Blancas et al. 2016; Blancas et al. 2015; Blancas et al. 2018; Chávez-Cortés and Maya 2010; Cucculelli and Goffi 2016; Della Lucia and Franch 2017; Tudorache et al. 2017
Environmental	Protected surface; Tourism certification rate; Environmental certification rate; Separate waste collection; Drinkable water per inhabitant; Fragmentation index urban landscape	Blancas et al. 2016; Blancas et al. 2015, Blancas et al. 2018; Chávez-Cortés and Maya 2010; Choi and Sirakaya 2006; Della Lucia and Franch 2017; Jurigova and Lencsesova 2015; Lee and Hsieh 2016; Tudorache et al. 2017

Table 3 First step variables and indicators

Tourism intensity			
Variables	Indicators	Formula	Source
Tourism	Bed occupancy rate	Presences/beds*days	Regional Observatories
	Average length of stay	Presences/arrivals	Regional Observatories
	Touristic rate	Presences/population*days	Regional Observatories; ISTAT
	Tourist density rate	Presences/km^2	Regional Observatories
	Accommodation rate	Beds/population	Regional Observatories; ISTAT
Accommodation capacity	Accommodation density rate	Beds/km^2	Regional Observatories
	Composite accommodation function rate	Beds/(population*surface) *10,000	Regional Observatories; ISTAT
Trade	Retailer trade rate	Retailers/surface	Urban index
Regulation			
Variables	Indicators	Formula	Source
Protected areas	% of protected surface	(Protected surface/total surface)*100	Regional Observatories
Certifications	Tourism certification rate	Tourism certifications/tourism operators	Regional Observatories; Q label GPNP dababase;

			Aosta Valley VIVA database; Q Italian Hospitality database; Saveurs Aosta Valley database; Chamber of Commerce of Torino "Maestri del Gusto" database
	Environmental certification rate	Environmental certifications ISO 14001 and EMAS/population	EMAS database; ISO database
Separate waste collection	% of separate waste collection	(Separate waste collection/total waste collection)*100	Urban index
Broadband connection	% of digital divide	(Population without Internet connection/total population)*100	Urban index
Water consumption	Drinkable water per inhabitant	m3*year/population	Urban index
Urban Landscape	Fragmentation index urban landscape	Edge Density	Urban index (ISPRA)
Second homes	Second homes concentration	Second homes/population	ISTAT
	Not-in-use building rate	Not-in-use buildings/total buildings	Urban index
	Not-in-use home in residential areas	Not-in-use homes in residential areas/total homes in residential areas	Urban index

Table 4 Pearson and Spearman correlation coefficients

	Pearson						
	Touristic rate	Tourist density rate	Composite accommodation function rate	Protected areas	Environmental certification rate	Second homes concentration	Tourism certification rate
Touristic rate	1.00						
Tourist density rate	.548**	1.00					
Composite accommodation function rate	.453**	.782**	1.00				
Protected areas	.171*	-0.08	-0.02	1.00			
Environmental certification rate	0.09	0.04	0.01	.195**	1.00		
Second homes concentration	.448**	.192**	.212**	.276**	0.04	1.00	
Tourism certification rate	.284**	-0.02	0.03	.572**	.260**	.305**	1.00
	Spearman						
	Touristic rate	Tourist density rate	Composite accommodation function rate	Protected areas	Environmental certification rate	Second homes concentration	Tourism certification rate
Touristic rate	1.00						
Tourist density rate	.900**	1.00					
Composite accommodation function rate	.762**	.650**	1.00				
Protected areas	.160*	0.10	0.08	1.00			
Environmental certification rate	.315**	.351**	.137*	.245**	1.00		

Second homes concentration	.360**	0.07	.515**	.161*	-0.05	1.00	
Tourism certification rate	.382**	.315**	.294**	.280**	.274**	.250**	1.00
**. Correlation is significant at the 0.01 level *. Correlation is significant at the 0.05 level							

Table 5 Variables and indicators used in the PCA statistical analysis

Tourism intensity	
Variables	Indicators
Tourism	Touristic rate
	Tourist density rate
Accommodation capacity	Composite accommodation function rate
Regulation	
Protected areas	% of protected surface
Certifications	Tourism certification rate
	Environmental certification rate
Second homes	Second homes concentration

Table 6 PCA - Two components matrix

Rotated Component Matrix		
	Component	
	Tourism Intensity - 1	Regulation - 2
Tourist density rate	.912	-.112
Composite accommodation function rate	.876	-.073
Touristic rate	.743	.340
Tourism certification rate	.051	.845
Protected areas	-.050	.819
Second homes concentration	.411	.509
Environmental certification rate	.001	.435
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization a. Rotation converged in 3 iterations.		

Table 7 Municipalities and protected surface

Municipality	Region	Inhabitants	PCA Analysis	GPNP protected surface (%)
Aymavilles	Aosta Valley	2,086	DAT	45.44
Ceresole Reale	Piedmont	161	DAT	79.08
Cogne	Aosta Valley	1,396	SMT	64.86
Introd	Aosta Valley	659	DAT	39.85
Locana	Piedmont	1,471	DAT	47.81
Noasca	Piedmont	130	DAT	73.50
Rhêmes-Notre-Dame	Aosta Valley	89	SMT	50.19
Rhêmes-Saint-Georges	Aosta Valley	184	SMT	48.59
Ribordone	Aosta Valley	48	SMT	52.59
Ronco Canavese	Piedmont	310	DAT	70.50
Valprato Soana	Piedmont	104	DAT	68.81
Valsavarenche	Aosta Valley	165	SMT	100.00
Villeneuve	Aosta Valley	1,267	SMT	6.93

Table 8 GPNP Municipalities and winter tourism facilities

Municipality	Region	Number of ski slopes	Total length in km	Min Altitude (m a.s.l.)	Facilities within the GPNP boarders	PCA Analysis
Ceresole Reale	Piedmont	1	1	1,673	Yes	DAT
Locana	Piedmont	3	3	1,411	No	DAT
Valprato Soana	Piedmont	1	0.5	1,500	No	DAT
Cogne	Aosta Valley	8	9	1,534	Yes	SMT
Rhêmes-Notre-Dame	Aosta Valley	7	6	1,696	Yes	SMT
Valsavarenche	Aosta Valley	3	1.7	1,667	Yes	SMT