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Section ARTICLES

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Foundations and relevance of delimiting local tourism destinations

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ABSTRACT: There is an extensive literature on delimiting functional areas for management purposes in the social sciences. Nevertheless, in the field of tourism research there is no established set of criteria for delimiting tourism destinations. However, destinations are considered a main object of analysis and decision-taking for tourism management. This paper discusses the most relevant literature on delimiting functional zones and proposes a methodology for an application in the field of tourism. The research is illustrated with the results on zonification and production of statistical information already obtained by the Canary Islands System of Statistics. The results highlight the relevance of zoning in tourism with the support of the foundations and criteria for delimiting functional areas in the social sciences. Subjectivity is considered to play a crucial role among criteria for delimitation both in tourism and in social sciences in general.

JEL Classification: R12; O32; L83.

Keywords: delimitation; local tourism destinations; functional zones; zoning; tourism micro-destinations.

Fundamentos y relevancia de la delimitación de destinos turísticos locales

RESUMEN: Existe una abundante literatura académica acerca de la delimitación de áreas funcionales con fines de gestión en el ámbito de las ciencias sociales. Sin embargo, en el ámbito de la investigación turística no existen criterios claros para la delimitación de los destinos turísticos. Esto a pesar de que los destinos son considerados un concepto clave como objeto de análisis y para la toma de decisiones en el campo del turismo. Esta investigación se ilustra con los resultados ya alcanzados en la zonificación y producción de información estadística por el Sistema de Estadísticas Turísticas de Canarias. Los resultados ponen de manifiesto la relevancia de la zonificación en el turismo apoyada en los fundamentos y los criterios de la delimitación de áreas funcionales en las ciencias sociales. Los aspectos subjetivos juegan un papel fundamental entre los criterios de delimitación tanto en el turismo como en las ciencias sociales en general.

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Palabras clave: delimitación; destinos turísticos locales; áreas funcionales; zonificación; microdestinos turísticos.

1. Introduction

This paper is the result of a research problem that is becoming increasingly important in the field of tourism. It involves the measurement of tourism at a local scale to achieve better decision making. The importance of the local area in tourism has been highlighted by researchers as Dredge (1999), Lew and Mckercher (2006) or Pearce (1999, 2001), authors who highlight the importance of local destinations as units of analysis in tourism. In fact, Candela and Figini (2012) consider the tourism destination as the most relevant concept in Tourism Economics.

Tourism is an activity with a high spatial concentration of supply. However, this does not give it a distinctive character with respect to other economic activities. In fact, analyses carried out by the World Travel and Tourism Council-WTTC- (2012) show that the concentration of the supply of tourism activities in the United Kingdom is less than in the case of other activities such as the automobile industry or financial services. What is characteristic and unique to tourism is that a significant part of consumption (not production) is carried out in areas with a high concentration of tourism activities, *i. e.,* tourism destinations, where supply and demand converge in the territory.

In this way, in tourism, not only do businesses compete, so do destinations. Consequently, the management of tourism destinations through DMOs (Destination Management Organizations) is one of the determinants of tourism competitiveness (Candela and Figini, 2012). Therefore, in the current context of competition among advanced countries, increasingly based on innovation and knowledge, the role of statistical information is central to making the right decisions at the right time, both for businesses, for governments and for destinations (Sheehan, Vargas-Sánchez, Presenza and Abbate, 2016). It is in this context of relevance of information linked to a territory that this research is framed. This research aims to contribute to the development of methodologies for the identification and delimitation of tourism destinations at a local scale.

Apart from the report of the UNWTO (2004) in which the importance of delimiting tourism destinations is highlighted and certain premises are given for it, there are practically no studies in the field of tourism in which methodologies are proposed and results provided on the identification and delimitation of tourism destinations on a local scale. The causes of this anomalous lack can be diverse. On the one hand, it could be due to the divergence of interests between academic research and decision makers at the local scale. On the other hand, the development of tourism statistics at an international scale has been very conditioned by a macro vision, at the country

level, which has limited the expansion of statistics at sub-national levels. By contrast, the delimitation of functional areas in the social sciences is a field with over four decades of existence. Following the pioneer contribution of Suttles (1972), delimitation of areas has been further developed with contributions by Flowerdew *et al.* (2007), Coulton *et al.* (2001) or Cutchin *et al.* (2011). These delimitation studies have been an important frame of reference for this research.

As mentioned, the aim of this article is to frame the delimitation of tourism destinations in the broader context of social sciences and to contribute to the development of methodologies to identify tourism areas at a local scale for which useful statistical information can be obtained for decision making. These areas are called micro-destinations or local tourism destinations.

Academic literature on tourism highlights the need for public intervention and private coordination as a way of improving the competitiveness and sustainability of destinations (Candela and Figini, 2012). To do this, it is necessary to have abundant and accurate information about destinations over time. However, there is a significant deficit in information on tourism at a local scale. For example, at present there are no official statistics with internationally agreed methodological criteria on the number of tourists, or even day-trippers, who visit major tourism cities of the world such as New York, Shanghai, London or Paris. Indeed, the lack of information is even greater when it comes to analysing the most popular districts within large tourism cities, even though these areas can receive more tourists than many countries in the world. This statistical deficit is linked to a lack of consensual methodologies to measure tourism at a lower scale to the national level.

At the regional level, the development of tourism statistics has been carried out by some countries that have transferred the methodologies designed for the national scale to the regional scale of analysis. However, difficulties arise when the scope of analysis is local. The recent problems of overtourism in cities such as Venice, Barcelona, Amsterdam or San Francisco highlight the importance of incorporating instruments that regulate the tourist flows to avoid congestion problems generated by tourists and situations of social unrest among residents in the destinations (Postma and Schmuecker, 2017). To be able to regulate more efficiently, it is necessary to have better information, both from traditional statistical information and from new sources of information related to tourist tracking, the use of mobile applications, the analysis of card payments, the use of social networks, etc. These new sources of information can be georeferenced and are of great interest for the analysis of tourism at a local scale.

Our research is related with the activities of the International Network on Regional Economics, Mobility and Tourism (INRouTe and UNWTO, 2014) which has been applied by the Canary Islands Institute of Statistics (ISTAC). Part of the methodology presented in the following sections has been applied with practical results since March 2015, at which time ISTAC began to publish detailed statistical information, from the perspective of supply, for infra-municipal geographic units, which have been named tourism spots and tourism entities. This information has been valued very positively by management organizations of destinations in the Canary Islands.

The next section delves more deeply into the background for this research. After this, we explain the methodology for the identification of tourism micro-destinations based on a consensus of experts, the results obtained for the Canary Islands, and some data from the South of Tenerife. In the last section, some conclusions are highlighted.

2. Delimitation of functional areas in social sciences

Insofar as the purpose of this research is to contribute to the necessary methodological development for the delimitation of local tourism destinations, a journey through studies that have addressed a similar theme, although with other purposes, is illustrative. In the scientific literature on tourism, there are not many studies that identify internally homogeneous areas in terms of certain characteristics, but heterogeneous with respect to adjacent areas. However, in some disciplines of social sciences there is a certain tradition of delimitation of functional geographic areas. These studies have been carried out mainly in the fields of sociology, public health, urban planning, regional science, labour market analysis and geography. They have delimited functional areas in cities, in some cases, districts or neighbourhoods for research purposes. These functional areas have been identified in the literature based on nine main criteria. The most repeated is subjectivity and consensus, both of the authorities and of the local population (Coulton *et al.*, 2001; Flowerdew *et al.*, 2007; Sampson, Raudenbush and Earls, 1997; Suttles, 1972). There has also been delimitation using physical and social barriers (Cutchin *et al.*, 2011; Flowerdew *et al.*, 2007; Sampson *et al.*, 1997; Suttles, 1972), pre-established boundaries (Chaskin, 1997; Suttles, 1972) and the homogeneity of the population or characteristics of households (Flowerdew *et al.*, 2007; Riva, Apparicio, Gauvin and Brodeur, 2008; Sampson *et al.*, 1997; Spielman and Logan, 2013). Additionally, land use (Cutchin *et al.*, 2011; Dredge, 1999; Suttles, 1972) the purposes of the research (Chaskin, 1997; Dredge, 1999; Flowerdew *et al.*, 2007) size (Blasco, Guia and Prats, 2014; Clapp and Wang, 2006; Flowerdew *et al.*, 2007) and spatial continuities (Cutchin *et al.*, 2011; Flowerdew *et al.*, 2007; Sampson *et al.*, 1997) have also been used.

In this field of study, it is important to highlight the contribution of Suttles (1972) with his work: *The social construction of communities*. In this research, the author has a multilevel spatial vision of the neighbourhood, arguing that urban households could identify four neighbourhood scales. The smallest is the «block», defined as the area in which children are allowed to play without supervision. The second level is called the «defended neighbourhood», which is a small area that has a corporate identity. The third level is the «community of limited liability», which is a district of local government agencies in which individuals» social participation is selective and voluntary. Finally, the fourth level, the «extended limited liability community» considers an entire sector of a city. The main objective of Suttles' work was to investigate resident local urban communities in order to enter into the process of community differentiation, though this does not always result in well-defined territorial units. Suttles (1972) considered that the main aspects to take into account when defining the boundaries of

neighbourhoods are that some communities already have their borders well defined because the adjacent communities eschew their residents. Boundaries can also be defined by the presence of conveniently arranged physical barriers (railways, highways, parks and industrial estates) that are considered real obstacles to pedestrian traffic; the price gradient in relation to residential land use; and pre-established borders, that is, arbitrary lines delimited on a map for organizational purposes.

In the literature on defining and delimiting neighbourhoods, there are multiple approaches. Deng (2016) identified six categories in which neighbourhood identification and delineation methods can be grouped: perceptual-based methods, which delineate neighbourhoods based on residents' mental maps; physical limits such as geographic features, streets, etc.; inference based methods; methods that use pre-existing zones, such as census blocks, administrative or electoral districts, municipalities, etc.; methods that take into account aggregate limits; and those that use the automated zone design, through the automation of the neighbourhood delimitation process by means of criteria specified by stakeholders. In this research, we agree with Deng (2016) in highlighting the importance in the literature of the methods based mainly on perception, on pre-existing zones and in the design of automated zones, as well as on the combination of several of these. We also consider methods that focus on different attributes of the local population, households, etc., as well as those that focus on the social relationships that occur in a territory.

Regarding the delimitation methods of neighbourhoods based on attributes, it is worth mentioning the contribution of Galster (2001), who defined the neighbourhood as a set of spatial attributes associated with groupings of residences, sometimes together with other land uses. Similarly, Spielman and Logan (2013) conceptualized neighbourhood in terms of space and social composition, defining it as a contiguous territory characterized by a set of social attributes that distinguish it from the surrounding areas. The authors specified that neighbourhood boundaries are defined by changes in a set of attributes between adjacent territories. Unlike the vast majority of contributions on the delimitation of neighborhoods, these authors considered that neighborhoods are not exclusive, that is, one location could be in several neighborhoods at the same time. Spielman and Logan (2013) defined neighbourhoods based on a core and edges, where the central areas belonged unmistakably to a single thematic unit, but the marginal areas were often associated with multiple thematic units.

Many other neighbourhood delimitation studies put the emphasis on social relations. An example of this is the work of Hipp, Faris and Boessen (2012). These authors created neighbourhoods based on the density of social ties and physical distance among adolescents, obtaining networks that show considerable spatial continuity.

Numerous authors highlighted, when identifying neighbourhoods, the importance of mental maps that are created by neighbours, that is, the subjectivity of individuals. In this sense, Chaskin (1997) considered that neighbourhoods are recognizable and definable, but that the delimitation of their boundaries is a negotiated and imperfect process, and often influenced by political considerations. For the author, neighbourhoods are spatial constructions that give rise to spatial units where

residents share certain circumstances. In his work, the author considered that the boundaries of neighbourhoods are drawn by individuals, how they move and relate to their environment, and mental maps that they build from this. The construction of these mental maps is influenced by different aspects, such as the physical elements of the city, roads built (streets, public transport routes, etc.), and physical barriers (walls, viaducts, rivers); and social and functional elements (demography, presence of important institutions, perception of safety or risk, and relative location and functional opportunities). According to the author, the construction of these boundaries depends on the degree of importance that each individual gives to the characteristics that define the neighborhood. Chaskin (1997) identifies four particularly important dimensions: the neighborhood as a spatial unit where multiple activities occur; the neighborhood as a set of social relationships; the neighborhood defined by its relation to one or more activities; and the neighborhood as a symbolic unit with a name and a recognized identity.

Different studies compare the neighbourhoods identified using individuals' subjectivity or mental maps with other areas generated automatically by computer software used in certain methodologies. Haynes, Daras, Reading and Jones (2007) compared 101 areas designed automatically by technicians of Bristol City Hall (England) with those resulting from residents' subjectivity. In 1994, the Planning Department of Bristol City Council divided the city into 101 small areas, which after many consultations were agreed to be the ones that best represented local communities. These areas were the result of adding several census districts, so that they should optimize the homogeneity of social and environmental characteristics, meeting a minimum population threshold. The authors affirmed that although the automated design of zones is apparently objective, in reality, each new delimited zone is the result of the application of a set of criteria specified by the researcher, so, far from defining an optimal set of neighbourhoods, this method offers an infinite number of possibilities. This work concluded that areas generated by means of computer programming can approximate, once the appropriate rules have been identified, to those resulting from the application of local knowledge and consultation.

Another study that identified neighbourhoods automatically was carried out by Clapp and Wang (2006), within the framework of research in real estate markets. In this study, the authors defined neighbourhoods as geographic areas that contained similar populations and real estate markets with a certain degree of homogeneity. They identified the optimal number of neighbourhoods through a hedonic model that used information related to individual home sales transactions and the addresses of these dwellings. The researchers applied Goodman's (1981) submarkets identification criteria to the case of neighbourhood delimitation. These criteria are homogeneity, similarity in some important dimension such as housing and/or demographic characteristics; parsimony, in a given area the least number of possible neighbourhoods is preferred; and contiguity.

Similarly, Cutchin *et al.* (2011) used a theoretically informed combination of qualitative geographic information system (GIS) and field observations to estimate

neighbourhood boundaries in Texas City, using an innovative methodology to address this problem, called the socio-spatial neighbourhood estimation (SNEM) method. They found that the SNEM approach to operationalization could improve neighbourhood-based inferences.

The literature gathers a variety of works that use pre-existing zones for the creation of new neighbourhoods. An example of this is the work of Riva *et al.* (2008), who evaluated the strength of census districts as units of analysis in the field of public health, more specifically in the measurement of the potential of an active life. These areas should be homogeneous with respect to socioeconomic conditions but heterogeneous with respect to other environmental characteristics. Based on the data available at the lowest level of the census area, homogenous zones were designed using three indicators of active life potential, that is, population density, land use mix and accessibility to services. These zones were the result of the grouping of census areas into seven groups or types of environment.

In this context, Coulton *et al.* (2001) identified neighbourhood units based on maps drawn by residents, and compared the results with census definitions of the neighbourhood. This study found that investigations based solely on the neighbourhoods defined by a census may underestimate the effects of neighbourhoods, since the actual conditions affecting residents are not accurately represented within the census boundaries.

The academic literature realizes that the definition and identification of neighbourhoods must take into account multiple factors. In this sense, Milbrath and DeGuzman (2015), who analysed the evolution of the neighbourhood concept from the perspective of public health research, pointed out that to identify neighbourhoods, an integrated approach must be adopted that takes into account geographic characteristics, political influences, interactions and the group identity.

As with this research, in many studies, neighbourhoods are defined for statistical purposes. This is the case of Flowerdew *et al.* (2007), who built a zonal system for the publication of statistics on a neighbourhood scale in Scotland. For the construction of these zones, they used the following criteria: population size, compactness of their form, homogeneity of the population in terms of social and economic variables, and elements of the physical and social environment that can affect the degree of significance of a zone for the local population. The need for human intervention was highlighted given the subjective nature of the areas to be identified. In this work, a consultation process was carried out, where the opinion of the local authorities was taken into account. The consultation consisted of sending a draft of the zones identified to the authorities for comments and suggestions. These authorities proposed specific changes, some important, sometimes suggesting their own areas. Subsequently, changes that did not infringe the principles used were incorporated.

In regional science, the delimitation of functional and administrative areas has also been common. In this sense, Coombes (2014) defines policy boundaries in England at the city-region scale for governance purposes. Other researches approach regionalization problems using spatial optimization techniques. They build regions by combining

small areas that share common characteristics with predefined functional centres that have tight connections among themselves through spatial interaction (Kim, Chun and Kim, 2015; K. Kim, Dean, Kim and Chun, 2016). Dusek (2005) analysed the problem of the unit of equivalent area (MAUP). This problem is related to all the results of the quantitative methods being potentially influenced by the mode of spatial delimitation. His work presents the epistemological background of the problem and gives examples of the negative consequences of ignoring them in the regional macroeconomy.

Cörvers, Hensen and Bongaerts (2009) tests if functional regions in the Netherlands show more labour market coherence between the municipalities included in them than the Dutch administrative regions, and it turns out that regional disparities are not significantly smaller within functional than within administrative regions with respect to income level, housing prices, employment rate, and unemployment rate.

Within the literature on delimitation of functional areas in the labour market it should be highlighted that dedicated to the identification of Travel-to-Work Areas, these areas are defined so that most jobs are filled by residents of that area and most of the resident working population work in the area (Ball, 1980; Casado-Díaz, 2000; Coombes, Green and Openshaw, 1986; Coombes and Openshaw, 1982; Franconi, Ichim and D'Aló, 2017; Martin, Gale, Cockings and Harfoot, 2018; Papps and Newell, 2002; Soares, Figueiredo and Vala, 2017).

Despite the central role played by tourism destinations in tourism analysis and policy, there are few initiatives of zoning in the literature related to tourism. In this sense, it is worth highlighting the contributions of Dredge (1999), who deals with the spatial design of tourism destinations; Vasiliadis and Kobotis (1999), who analyse the grouping of tourist attractions in Macedonia; and Chhetri and Arrowsmith (2008), who identify areas with high recreational potential in Australia.

More generally, Dredge (1999) addressed the spatial design of destinations and tried to improve the conceptualization of the basic elements of destination regions by modelling existing concepts. This work integrated tourism into land use planning. This work was carried out at a local or regional scale, unlike the planning of market-oriented tourism that is usually carried out at a regional or higher scale. Dredge proposed a spatial model for the planning and design of destination regions, and intended it to be applicable to different destinations and scales. This planning and design model is composed of a destination region, source markets, nodes, districts, circulation routes and gateways.

On the other hand, Vasiliadis and Kobotis (1999) applied an analysis of nearest neighbours to analyse the grouping of tourist attractions in Macedonia. They developed a methodology for identifying geographic areas of potential tourism development. This methodology involved the analysis of the distribution of geographic space through an analysis of the nearest neighbour and an analysis of points through functional diagrams that deepened tourism strategies. This involved the combination of tourism products at chosen points with characteristics of visitors' attitudes that constituted a useful and easy way to gather information to facilitate administrative matters. The case study carried out by Vasiliadis y Kobotis (1999) showed how a

careful evaluation of the links between different locations in Prespes identified key places in the development of specific forms of tourism, as well as highlighting the nature of links between access routes, tourism activities and the tourism infrastructures. Therefore, he concluded that the nearest neighbour analysis could serve to give a better understanding of the nature of tourism areas, as well as provide subsequent help in planning a better use of those areas.

Another zoning work in tourism was carried out by Chhetri and Arrowsmith (2008), who identified areas with high recreational potential in Victoria (Australia) using geographic information systems (GIS). They stored geometrical properties within the GIS, including position, size (width, length and perimeter), the shape and structure of the recreational features. The topological properties provided information on continuity, adjacency, connectivity and containment. The GIS allowed the data to be processed for the geostatistical analysis through which several statistical and mathematical operations could be applied, both to spatial data and to data stored in the database.

Finally, Blasco *et al.* (2014) proposed a method to identify alternative tourism areas based on consumption. This method combined geographic information systems with hierarchical clustering techniques, based on space-time distance in the Pyrenees. With the proposed method, larger areas were divided into small local tourism destinations, which might otherwise be difficult to detect. It is argued that these smaller areas have a range of distances within a destination, which, in the context of the development of tourism in mountain regions, are better adapted to the mobility pattern of the hub-and-spoke. The authors used hierarchical cluster analysis to identify tourism areas within a region, following mobility patterns and distances to attractions. This cluster analysis grouped the attractions of the region into zones where the attractions within an area were maximally close to each other and minimally close to the attraction of other areas. In addition, when dealing with spatial data, it is essential to take into account geographical information system (GIS) techniques. Within GIS, there are multiple ways to perform cluster analysis of spatial data. These applications have certain limitations for the purposes of investigation. Therefore, it was decided to carry out a geographical cluster analysis with a statistical package. The results of this analysis were introduced into a GIS to generate a graphic representation of the resulting tourism zones. As a result, the region was restructured into nine new tourism zones. These areas were more uniform and with a higher correlation index between the attractiveness and intensity of the accommodation. They also have different levels of cross-boundary intensity and are very similar to the existing historical regions. The more they differ from the original destinations, the greater their attractiveness, which supported the effectiveness of the new zoning technique.

The analysis of the vast literature related to the identification of functional areas in social sciences, and the scarce precedents in tourism, has contributed great value and knowledge to the design of the methodology and criteria for the identification of tourism micro-destinations or local tourism destinations in this research. This methodology is detailed in the following section.

3. Identification of tourism micro-destinations based on expert consensus supported by criteria

The first step to be carried out for the identification of tourism micro-destinations is to establish a series of criteria by which to group establishments of industries characteristic of tourism, in such a way that the resulting functional areas are internally homogenous. These criteria will be applied based on the consensus of experts in tourism with explicit knowledge about the destination in which they are working.

The criteria proposed in our study have been developed within a joint research between the University of La Laguna and the Canary Islands Institute of Statistics (Hernández-Martín *et al.*, 2016). These criteria are:

1. *Concentration of establishments from tourism characteristic activities*. This criterion will allow us to separate tourism areas from non-tourism areas, that is to say, zones of high tourism concentration from those of low tourism concentration. This criterion can be applied by focusing on one or several characteristic tourism industries. In addition, areas of high concentration of tourism accommodation establishments can be identified or, similarly, the places visited by tourists (restaurants, beaches, parks, etc.), taking into account that tourism accommodation establishments tend to be concentrated around the attractions and other places visited by tourists.

Using tourism accommodation establishments to delimit tourism micro-destinations implies several advantages and some disadvantages. Among its advantages is:

— Most countries and regions collect statistical information on accommodation establishments (overnight stays, average stay, daily rate, etc.), so this information can be quickly linked to the territory, and thus to micro-destinations.
— Accommodation establishments can be geolocated in a simple way, and with this, it is easy to geolocate the statistical information related to each establishment. Not only the information related to establishments (supply information), but also the information that can be obtained at the scale of each tourist (demand information), if upon obtaining this information it is linked to the establishment where the visitor is staying.
— Even if tourists have high mobility, once they are in the destination, accommodation is a good starting point from which to analyse their mobility, since it is the origin and end of their excursions.
— Tourism accommodation establishments are used by the most important segment of tourists, except those who stay in the homes of family and friends.
— Accommodation represents an important part of the expense that tourists make in the destination.
— Tourism accommodation establishments are often close to tourist attractions, restaurants, and other tourism resources. Therefore, when using them to delimit the micro-destinations, the remaining characteristic tourism industries are not ignored.
— The supply of accommodation is stable over time, which contributes to the stability of the boundaries of micro-destinations.

— The characteristics of accommodation establishments (size, categories, seniority, etc.) are closely related to the tourism activities carried out and the consumption patterns of the tourists.

For all the above, this study has opted for regulated accommodation establishments (which in the case of the Canary Islands does not include holiday homes). If there are areas devoted to other tourism services such as restaurants or leisure attractions (for example, golf courses, or theme parks) adjacent to accommodation areas, these have been included within the boundaries of the micro-destination.

The choice of accommodation as a key activity when defining local tourism destinations has some disadvantages. The main problem detected is that it does not take into account day-trippers and cruise passengers, since they do not spend the night in tourism accommodation in the destination.

2. *Homogeneity of tourism supply characteristics*. To divide a tourism area into more than one micro-destination, the criterion of homogeneity of tourism supply characteristics is used. Firms located in a geographical area have similar values, rules and languages, so they form a homogenous social environment (Scott, Baggio and Cooper, 2011). For example, one area may be specialized in family tourism while the other is in sports tourism.

When delimiting tourism micro-destinations, different elements must be taken into account, such as the characteristics of the tourism accommodation supply (category, size, age, construction model, presence of second residences, prices, profitability, degree of occupation, etc.), the distance to the main tourism resources, or the degree of combination with residential uses, among other aspects.

The boundaries of micro-destinations can be established using the characteristics of supply, demand or even a combination of both. In this research, we have chosen to use the characteristics of tourism supply to identify these local tourism destinations, given that they are less changeable over time than those of demand and, in a way, both are correlated. It remains for future research to enrich the results of this study with the use of demand variables in the delimitation.

3. *Stability of boundaries over time.* The boundaries of micro-destinations must be as stable as possible over time. For this reason, we have chosen to use the characteristics of the supply to delimit them, given that the supply changes more slowly than the demand, although they are related.
4. *Dynamism and flexibility*. Although the boundaries of micro-destinations must be stable over time, at the same time, they must be dynamic and flexible in order to cover possible future tourism developments beyond their boundaries. A tourism destination is a dynamic system that changes over time and passes through different phases (Scott *et al.*, 2011). Thus, the design of micro-destinations and the criteria used to do so must be dynamic and flexible enough to account for these changes, and allow the organizations that generate tourism statistics to recalculate, from time to time, published statistical information.

5. *Feasibility and relevance*. The identification of tourism micro-destinations should be a viable process. That is, it must take into account aspects, such as respecting statistical confidentiality and statistical significance of the data available at this level. The delimitation of the mentioned functional areas should be carried out only in the cases in which the tourism information obtained is sufficiently large to compensate for the effort made. Many times, the data obtained at the municipal level are more than sufficient for the realization of certain projects.
6. *Public and private support*. The purpose of the delimitation of tourism micro-destinations is to help the public and private sectors make better decisions in tourism. For this reason, both public and private agents have to be satisfied with the delimitation. If these agents consider that the resulting areas do not approach the reality they perceive, the effort put into their identification will have been in vain. This support can increase if the boundaries of micro-destinations are coherent with urban and territorial planning, and if they are sensitive to social and environmental interests (Coulton *et al.*, 2001, Sampson *et al.*, 1997, Suttles, 1972).

The above criteria must be applied in a sequential process consisting of three phases. First, criterion 1 must be applied: The concentration of establishments from tourism characteristic activities. This criterion will differentiate tourism areas from the non-tourism ones, that is to say, the zones of high density tourism activity from the low ones.

In a second phase, criterion 2 is applied: Homogeneity of tourism supply characteristics. The application of this criterion will identify the boundaries of the micro-destinations. Each of the tourism areas identified by applying the concentration criterion (criterion 1) may contain one or more micro-destinations. In the second case, an area of high tourism concentration will be divided into more than one relevant, viable and differentiated micro-destination.

To conclude, in a third phase, it is checked whether the micro-destinations obtained after applying the concentration and homogeneity criteria meet the requirements imposed by the remaining four criteria: stability; dynamism and flexibility; viability and relevance; and public and private support. If they do not comply, the process will have to be reviewed.

The application of the criteria described in this section has been made through the consensus of experts. This methodology seeks to delimit tourism micro-destinations according to the criteria of experts who know well the tourism destination in which they are working. These experts must rely on the relevance of statistical information that helps them make informed decisions about the boundaries of these new functional areas. This consensus has solid foundations in the prior knowledge of these experts to give rise to new robust functional areas, which have the support of an important part of the tourism sector, and which has been involved in their identification.

Once the micro-destinations are identified and delimited, the next step is to link the statistical information to each of them. For this, it is necessary to previously geolocate the tourism establishments and likewise the statistical information linked to them. In

the case of using tourism accommodation establishments as the central type of tourism activity in this process, the first step will be to develop a *Directory of Tourism Accommodation Establishments*. This directory must contain all the accommodation establishments of the tourism region under study, which must be geolocated. This directory is the basis of a *Tourism Statistics System* consisting of information from surveys conducted on tourism supply and demand. The fact that the directory is geolocated allows the easy geolocation of all the statistical information of this system. Once you have the statistical information linked to each tourism establishment, it is possible to add it to the scale of tourism micro-destinations, and to determine total and average values for each of these functional areas. Therefore, obtaining information at the scale of tourism micro-destinations does not imply generating new surveys and statistical operations, but regrouping the existing information, with the help of the geolocation of the establishments. This allows us to affirm that generating information for tourism micro-destinations is not costly in economic terms, since it uses existing information, links it to the territory and regroups it. This is particularly true in territories that already have well-developed tourism statistics with census operations or with large samples.

3.1. Application of the methodology in the Canary Islands

For the delimitation of local tourism destinations in the Canary Islands, first, previous works that identify the tourism areas of the archipelago were examined. Subsequently, the criteria detailed above have been applied to identify the different micro-destinations within the tourism areas of the Canary Islands.

To continue with the process, the Directory of Tourism Accommodation Establishments of ISTAC was georeferenced. In addition, each accommodation establishment was assigned information related to different statistical operations carried out by ISTAC, that is, information from the Hotel and Apartments Tourism Accommodation Surveys, Tourism Expenditure Survey and others.

Once the geographic information system for the Canary Islands accommodation establishments was created, the criteria designed in the methodology were applied.

Application of criterion 1: Concentration of establishments from tourism characteristic activities. The delimited micro-destinations are areas with a high density of tourism activities that include a wide variety of establishments from tourism characteristic activities. However, in the case of the Canary Islands, more attention has been given to accommodation establishments for the definition of the boundaries of micro-destinations. If an area dedicated to catering or other places of leisure was right next to a lodging area, it will be included within the limits of the micro-destination. The indicative criterion was at least 1,000 tourism beds.

Using the accommodation as the main activity when defining tourism micro-destinations, despite the advantages listed above, has certain limitations. It implies that day-trippers are not taken into account in this process. Fortunately, the number of visitors who do not spend the night, compared to those who do, is very low in

tourism areas of the Canary Islands, so not considering them does not affect the final delimitation of micro-destinations. The situation may be different in those cities with ports where cruise ships dock, with rural and nature tourism, etc.

Application of criterion 2: Homogeneity of tourism supply characteristics. To divide areas of high concentration of tourism establishments into more than one micro-destination, if any, we chose a supply approach, given that the information on the supply is more stable, and is closely related to demand behaviour. For this, characteristics of the tourism supply in general and accommodation in particular have been used.

At this point, the research team, together with ISTAC, developed a proposal for the delimitation of areas that, under the criteria of the group, and the statistical indicators consulted, were homogeneous. In order to determine this homogeneity, special attention has been given to the age, the construction model, the typology and the category of establishments.

This delimitation was also carried out in order to meet criteria 3, 4 and 5, that is, the resulting micro-destinations are:

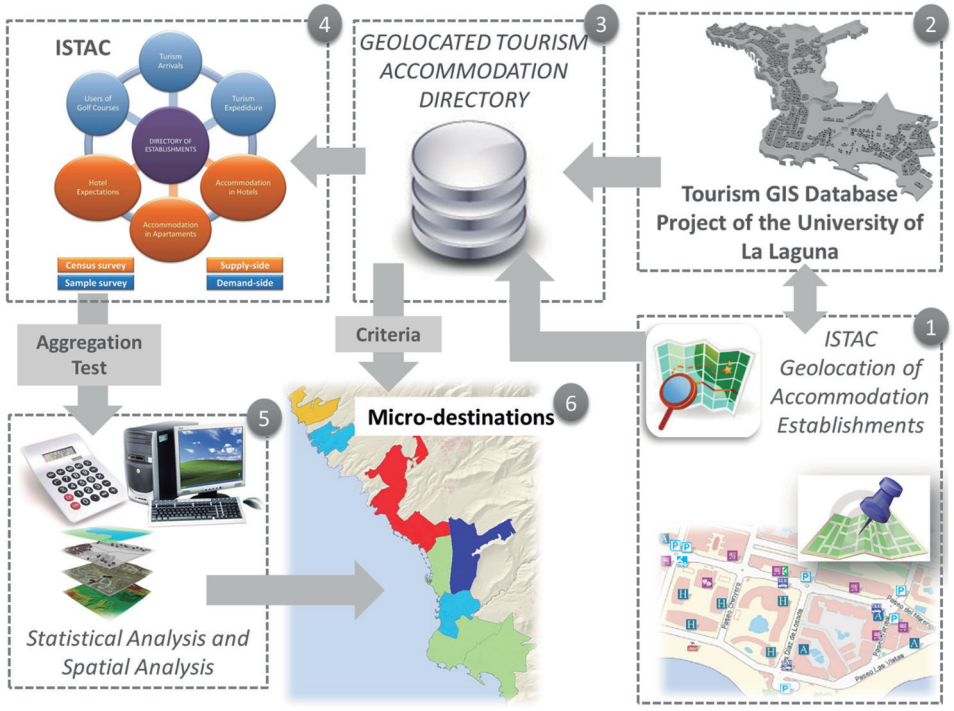
— *Stable*. The established boundaries correspond to the tourism development of the Canary Islands in the last 50 years, and there is no evidence that drastic changes will be produced in these boundaries in the coming decades.
— *Dynamic and flexible*. Despite having established micro-destinations with stable boundaries, they are flexible enough to allow variations in the event of new tourism developments. Recalculating the data in case of variation in the boundaries of the micro-destinations is a simple process.
— *Feasible and relevant*. The number of zones is manageable from the point of view of destination management, while the areas are large enough to respect statistical confidentiality.

Application of criterion 6: Public and private support. The initial proposal for the delimitation of tourism micro-destinations was sent to tourism officials on the islands, belonging to institutions such as *Turismo de Tenerife*, the Gran Canaria Tourism Board, the Lanzarote Data Centre, the Fuerteventura Tourism Board and the Canary Islands Tourism Board (*Promotur*). These officials, in general, were quite in agreement with the first delimitation. In some cases, they made proposals to divide some identified areas into more areas, since they contained different types of accommodation. This was the case, for example, of the tourism areas in San Bartolome de Tirajana or Puerto de la Cruz. In San Bartolomé de Tirajana a micro-destination had initially been identified that encompassed Sonnenland and Campo Internacional. The Tourism Board of Gran Canaria recommended that these two zones had entities and establishments sufficiently differentiated to form two micro-destinations. In Puerto de la Cruz, a single micro-destination had been delimited, which *Turismo de Tenerife* recommended dividing into four, given the heterogeneity of its accommodation offer. On other occasions, tourism officials simply proposed to move a boundary to one side or another, since one micro-destination was not being separated from the other at the most appropriate place. This was the case of Puerto del Carmen (Lanzarote), where they recommended moving a line to avoid dividing the old town.

The literature consulted on the delimitation of functional areas, states that perception, mental maps, local knowledge and consultation with the agents involved are very useful criteria used in the identification of these areas (Chaskin, 1997; Deng, 2016; Haynes *et al.*, 2007; Suttles, 1972). That is why the recommendations of experts from each island were incorporated into the initial proposal, which was enriched with their specific knowledge about their area of action. This step, in addition, allowed those responsible for tourism management on each island to get to know the project and get involved in it, in order to have their support and improve the future usefulness of the identified units.

To conclude, the methodology used for the delimitation of local tourism destinations in the Canary Islands can be summarized by the following scheme (Figure 1).

Figure 1. Methodological Scheme



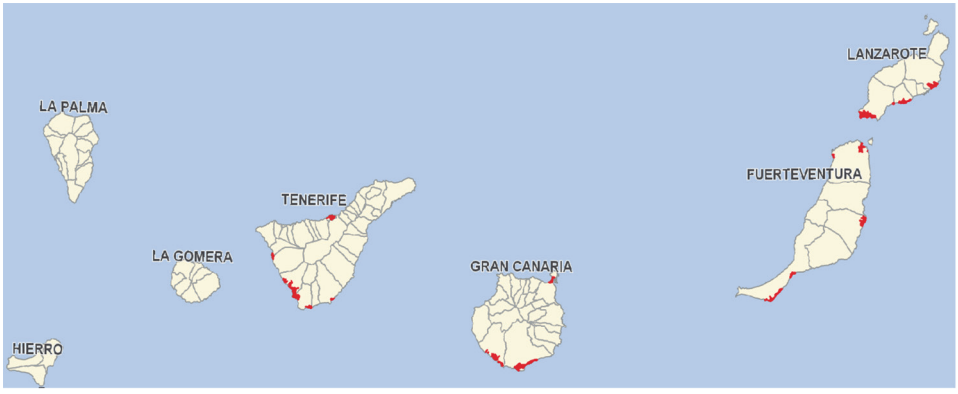
(1) Starting with the Directory of Tourism Accommodation Establishments of ISTAC, which we georeferenced. (2) A Geographical Information System was built to apply the criteria for the identification and delimitation of micro-destinations (3). The information of the Tourism Statistics System of ISTAC is assigned to each establishment (4). The information is added and the appropriate tests are carried out to check for reliability and ensure statistical confidentiality is respected (5). After this process, a large number of statistical indicators are obtained at the scale of tourism micro-destinations.

In step 5 of the methodological scheme (Figure 1), where the information is added at the scale of tourism micro-destinations, the sample sizes of each micro-destination must be taken into account so that the indicators generated at this level are reliable. In the case of supply surveys, given their census nature (they are carried out on all tourism accommodation establishments in the Canary Islands), geolocation allows the use of direct estimators for each micro-destination, without the need to use estimation methods for small areas. However, to provide demand statistics, compiled from a sample, it is necessary to analyse the mean square error of the direct estimators for micro-destinations (Rao and Molina, 2015). This test allows you to decide when to use direct estimators and when to use small area estimators.

4. Results

After the application of the methodology based on the consensus of experts, 47 tourism micro-destinations were identified in the Canary Islands, which are the shaded areas in red that can be seen on the islands' coastlines in Figure 2. For these geographic units, the Canary Islands Statistics Institute (ISTAC) has published, since March 2015, statistical information from the supply side (number of establishments, places, employment and profitability indicators, employment figures and tourism population). This delimitation will also allow, in the future, to offer data from the demand side (profiles of tourists, characteristics of their trips, satisfaction and levels of expenditure), based on the information from the Tourism Expenditure Survey. In La Palma, La Gomera and El Hierro it was not possible to identify these functional units, given that their tourism spots do not reach sufficient numbers to allow data published on this scale to be sufficiently robust and respect statistical confidentiality.

Figure 2. Tourism micro-destinations in the Canary Islands



Source: Canary Islands Institute of Statistics. ISTAC.

These 47 micro-destinations are grouped, in turn, into 16 tourism entities that despite only representing approximately 1.7% of the surface area of the archipelago,

account for around 92% of tourism accommodation places offered and 93% of overnight stays (2016 data). The entities are characterized by spatial continuity except in four cases: Corralejo - El Cotillo, Mogán Turístico, Adeje Turístico and Abona, where spatially separated micro-destinations are grouped.

In the case of the Canary Islands, as explained above, the criteria used for the delimitation of tourism micro-destinations have been applied based on expert consensus based on criteria. The project was presented to town councils, management boards, and other competent bodies on tourism in each island, and a delimitation proposal was sent to them, and they (based on their knowledge, existing indicators and extensive experience in the field) proposed changes that they considered appropriate. This knowledge, supported by indicators, spatial plans of each municipality, and other regulations and tourism plans, led to the identification of the current 47 micro-destinations.

For these 47 micro-destinations, after applying the methodology explained above, tourism information is obtained that is very relevant from the perspective of supply and demand. Below are some indicators by tourism micro-destinations for the case of the municipalities of Adeje and Arona, in the south of Tenerife.

After identifying and delimiting the tourism micro-destinations in the Canary Islands, and adding the information from the Canary Islands Statistics System, developed by ISTAC, a large amount of information is obtained for each of them. As an example of results obtained for each tourism micro-destination, data will be shown for the tourism municipalities of Adeje and Arona, in the south of Tenerife. These municipalities are, together with San Bartolomé de Tirajana in Gran Canaria, the most important in the Canary Islands in terms of tourism. According to the Tourism Accommodation Survey of ISTAC for 2017, both municipalities contained 22% of the accommodation beds in the Canary Islands and generated 23% of the overnight stays in hotels and apartments.

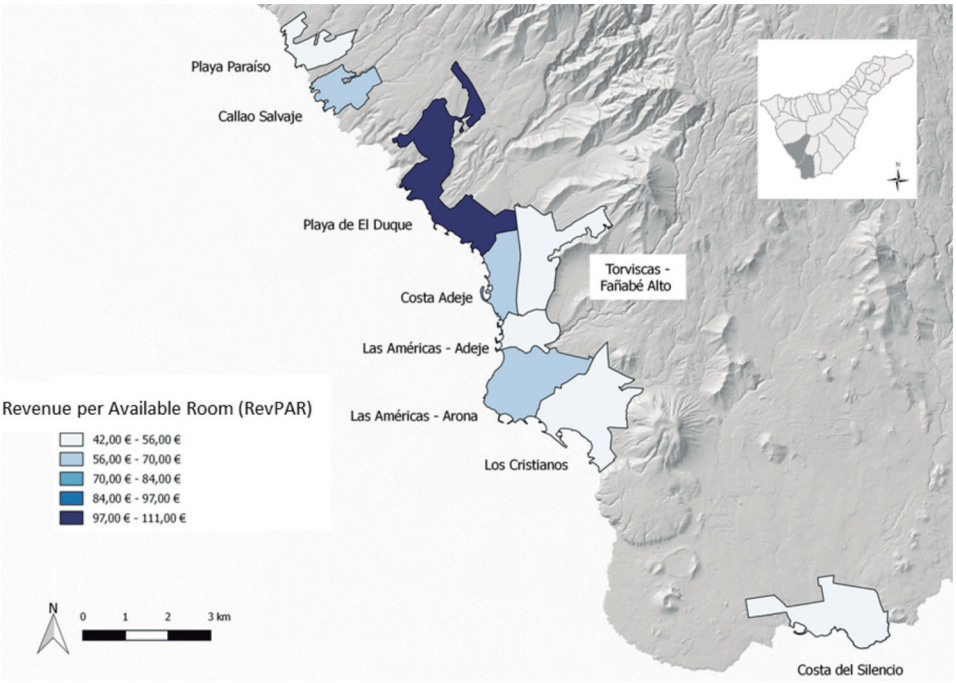
In the municipalities of Adeje and Arona (in the south of Tenerife), nine tourism micro-destinations have been delimited. From left to right these micro-destinations are: *Callao Salvaje, Playa Paraíso, Playa de El Duque, Costa Adeje, Torviscas and Fañabé Alto, Las Americas - Adeje, Las Americas - Arona, Los Cristianos and Costa del Silencio*, as shown in Map 1.

From the application of the methodology designed for this research, ISTAC has published information at the scale of tourism micro-destinations since 2015. Currently, only data obtained from their surveys of tourism accommodation in hotels and tourism apartments are published. Through this publication, annual data from 2009 to 2015 of the following tourism indicators at the level of tourism micro-destinations can be known: number of establishments open, beds offered, overnight stays, travellers, average stay, occupancy rates, average daily rates, income per available room, number of jobs and tourism population. It is expected that information on the demand side (based in tourist surveys) is going to be also released soon.

The statistical data obtained for these nine micro-destinations in the south of Tenerife allow us to affirm that each of the resulting units presents sufficient differential char-

acteristics that justify the production of specific tourism information at this new scale. There are relevant differences regarding the age and type of establishment that each zone contains. For example, it was found that the three oldest micro-destinations - Los Cristianos, Costa del Silencio and Las Américas-Adeje, together with the areas of Torviscas - Fañabé Alto and Callao Salvaje, contain a considerable number of apartments, while the four remaining micro-destinations showed a greater proportion of hotel beds.

Map 1. RevPAR of hotels and apartments according to the tourism micro-destinations of Adeje and Arona. 2015



Source: Tourism accommodation survey. ISTAC.

There is a significant difference between the nine micro-destinations with respect to the presence of homes and second residences within their boundaries. Four of the micro-destinations include a significant number of permanent residents, while the other five have very few residents. The quality of the tourism accommodation, the provision of services and public spaces in the destination are variables that are related to the prices and profitability of each area. In map 1, information on Revenues per Available Room (RevPAR) in hotels and apartments is shown. This information allows us to verify that RevPAR in certain micro-destinations (Playa del Duque) is double that of others (Playa Paraíso or Torviscas-Fañabé Alto).

The relevance of dividing the municipalities of Arona and Adeje into several micro-destinations is revealed when observing the data provided by the ISTAC on

the average daily income (ADR) of the hotels: in Playa del Duque the ADR reaches € 122, while that in Torviscas-Fañabé Alto is € 50. In other words, in Playa del Duque, the ADR reaches more than double the value of the cheapest area within the same municipality. This implies that the value of ADR for the municipality of Adeje (€ 78) is not a good indicator of what is happening in the municipality, due to the high variance of results among the different micro-destinations. Differences are also observed among local tourism destinations in hotel occupancy rates, apartment occupancy rates, the average stay of the tourists, tourism expenditure on each concept (car rental, restaurants, etc.), the presence of children, the number of previous visits, the level of satisfaction with the trip or the use of all-inclusive offers. In addition, the distribution of tourists according to their nationalities does not follow a regular pattern throughout the nine micro-destinations. The United Kingdom is the main country of origin for the south of Tenerife and, when the figures are compared, the proportion of British tourists in some micro-destinations is clearly higher than in others.

5. Conclusions

The academic literature of several research fields shows us that the delimitation of the boundaries of social communities is not a simple process. The criteria used in many papers to establish these boundaries are very diverse, and currently there is no consensus on a universal method. Identifying such community boundaries can arise as a result of general needs, or in response to a set of particular interests, as is the case in this article, the analysis of tourism. The problems faced in trying to establish the destination boundaries at the local scale are very similar to those faced in any other field of research, the main difference being the social dimension. Neighborhoods tend to have clearer, stronger and more stable social relationships than those of tourism micro-destinations, since their residents are stable; however, the experience of neighborhoods has been very useful for the delimitation of destinations. It is worth noting that the criterion of subjectivity of stakeholders has proved to be useful for enriching the results of the delimitation in tourism as very often seen in other cases of functional zoning.

The method proposed in this article to identify the boundaries of tourism micro-destinations contains six criteria that were applied to the Canary Islands. In particular, three of these criteria played a crucial role: the first was the concentration of tourism establishments (to separate the tourism areas from those areas that do not depend largely on tourism); the second, the types and characteristics of the tourism supply (to distinguish one micro-destination from another); and finally, the sixth, public and private support (a criterion that ensures the usefulness of the information obtained for policy purposes). These results can be seen as a contribution to the definition of a standardized international methodology to delimit tourism destinations at a local scale and to provide statistical information for these analytical units. As in most of the literature on functional zoning in social sciences, subjectivity and expert consensus has played a crucial role in the delimitation of areas given that the results of pure statistical methodologies usually failed to provide consistent results.

In the project, accommodation establishments have been used to identify the limits of micro-destinations. There are several advantages of using them as a starting point, which is why they have played such a central role in the methodology developed in this research. In addition to facilitating the geolocation of tourists, they also provide researchers with access to large amounts of statistical information, which is linked and available for accommodation establishments that can also be geolocated. Therefore, the results provide an example of the potential of this methodology, even when only available information is used. The combination of survey information on the demand and supply side would be a future result of this research.

The application of this method in the Canary Islands has been possible given the quality and availability of tourism statistics. It has not involved extra costs since it is based on existing information from the Tourism Accommodation Surveys and the Tourism Expenditure Survey, which has been reorganised with the help of geolocation. In addition, the results can be extended to obtain time series of data for micro-destinations.

The proposed methodology can be applied to any type of region, but it is particularly suitable for places with a high concentration of tourism establishments, as is usually found in coastal destinations for mass tourism. When applying this methodology to other types of tourism regions, the characteristics, objectives and needs of each destination must be taken into account. The particular methodological decisions taken in the case of the Canary Islands (especially the use of accommodation as a cornerstone) may not necessarily coincide with the characteristics of all urban or rural tourism destinations, or those destinations that depend on cruise passengers or day-trippers. In places where accommodation facilities are scattered or may not play a central role in tourism, the method used in this document should be adapted accordingly. In such circumstances, micro-destinations should be delimited according to the concentration of other types of tourism establishments, such as the places most visited by tourists, instead of using accommodation establishments as a starting point, with the support of expert consensus. However, it should be noted that if there is a total lack of concentration of tourism establishments or tourism activity in a specific geographical area, then it makes no sense to try to establish micro-destinations, and therefore it would not make sense to try to use this methodology.

The use of georeferenced information opens up great possibilities in the analysis of local tourism destinations. Both tourism accommodation and the places visited by tourists are very important in the management and planning of tourism, as it provides information on the mobility of tourists. In addition to analysing mobility, possible future extensions of this methodology could involve the expansion of the statistical system by adding geolocation (when available) related to expenditure, environmental indicators, labour statistics, or even real-time data on the consumption of electricity, traffic, public transport, etc. With the aim of improving the decisions taken by destination management organizations and stakeholders, delimitation of reliable and consensued local destinations should play a very relevant role.

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