

**RESEARCH SPIN-OFF //**

**Case study Italy on  
“Inner Areas” post COVID-19 //  
Valchiavenna**

TOURISM:

Carrying Capacity Methodology for Tourism

Final report // July 2022

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## Abbreviations

DMO	Destination management organization
EAFRD	European Agricultural Fund for Rural Development
ERDF	European Regional Development Fund
ESF	European Social Fund
ETIS	European Tourism Indicator System
GDP	Gross Domestic Product
GIs	Geographical Indications
ICH	Intangible Cultural Heritage
IFTS	Istruzione e formazione tecnica superior, “ChefTech for higher technical training”
INTESI	Integrated Territorial Strategies for Services of General Interest
IPR	Intellectual Property Right
LAU	Local Administration Unit
MS	Member State
OSM	Open Street Map
PA	Pilot Action
PDO	Protected Denominations of Origin
PGI	Protected Geographical Indication
POI	Point of Interest
QoL	Quality of life
ROP	Regional Organizational Program
SEI	School of Entrepreneurship & Innovation
SGEI	Services of General Economic Interest
SIG	Services of General Interest
SIC	Siti di Importanza Comunitaria
SME	Small and medium-sized enterprise
SNAI	Strategia nazionale per le aree interne, National Strategy for the Inner Areas
SPA	Special Protection Area
STPS	Società Trasporti Pubblici Sondrio S.p.A
UNWTO	United Nations World Tourism Organization
WHS	World Heritage Site



## Foreword

Targeted analyses are strategic outputs of ESPON. They represent a remarkable tool to connect the territorial research and the need of stakeholder and policy makers to achieve scientific evidence finalised to carry out more effective operative policies.

The targeted analysis ESPON TOURISM, realized under the leading of ÖIR GmbH, sprang out from the ground and fully answers to the need of providing empirical scientific foundations in order to support local decision makers to promote a sustainable tourism in their territories. This foundation would enable the analysis of carrying capacity for tourism based on innovative and available indicators, such as internet and social media data, seasonality, new technologies and big data, and other instruments as high-performance computing (HPC) to be applied to the management of any European tourist destination.

The possibility to develop an additional case study in the framework of TOURISM has been offered to Italy. The objective is to provide an empirical foundation for the tourist destination of Valchiavenna, in Lombardy region, in order to help local policymakers and stakeholders to identify and understand their carrying capacity for tourism based on a range of available indicators, and how to anticipate and successfully face the challenges of future tourism development.

This is a great occasion not only for Italian territories but for many other similar regions in Europe, with similar geographic feature of the Valchiavenna, that is one of the areas laid out in the Italian Strategy for Inner Areas SNAI (Strategia nazionale per le aree interne) 2014-2020 and is characterized by mountain tourism.

SNAI has been designed at national level and devoted specifically to areas with geographic limitations and remoteness with lack of infrastructures, problem of accessibility, services of general interest public, demography etc. The SNAI strategy gathers resources from many ESIF funds to develop integrated operative strategies with a placed based approach and deal with an integrated territorial development.

Many mountain or rural remote regions with a touristic potential respond to this figure. Facing the carrying capacity of tourism is a crucial issue due to the importance of this sector in Italy and in other European regions. This is valid not only for economic aspects but also for social and environmental impact, for the great potential of tourism industry on condition responding to a long-term sustainability.

In the recent years, the COVID19 pandemic had dramatic effects on regions with touristic vocation and regions characterised by remoteness (even if relatively, like the Valchiavenna). They have suffered more than other regions. Nowadays they are going to emerge from the COVID-19 pandemic with great determination and a strong effort to relaunch their economic sectors.

For these regions the objective is to bring out the potential of the inner areas (aree interne), their cultural richness and landscape heritage as well as their territorial legacy which have been challenged and gravely affected by a demographic decline, even more evident after the COVID-19 out-break.

During the pandemic outbreak the sector of tourism has been strongly impacted and is now going to re-emerge. The challenge is now, how to put-up actions to recover through a new form of tourism, able to develop sustainable policies and action plans for the long-term to enhance the local tourist industry, by exploiting their new (or better hidden) territorial potential, focusing on natural and cultural heritage and their territorial specificity.

The effectiveness of a research is measurable mainly by the application of its result. ESPON offers the opportunity to explore new suggestions and address tailored to stakeholders and policy makers, very involved in facing common problems in a proactive way and facilitating the result-oriented approach taking into consideration all different points of view.

Starting from the measurement of the carrying capacity of a territory, it is possible to develop solutions that ensure resilience, sustainability and durability of economic activities such as tourism, look at the territorial heritage as the primary resource of local wealth, in the consciousness that this resource has to be protected and enhanced to ensure a fair and sustainable development.

According to the work done in collaboration with the Comunità Montana Valchiavenna and the local stakeholders, Italy can have an excellent opportunity to offer a chance to other Inner Areas and interact with ESPON.

On the other side, the Valchiavenna local stakeholders had the opportunity to exchange with ESPON experts their needs and difficulties, during constructive discussions that led to useful policy recommendations.

Local stakeholders have been supported in identifying a way to assess tourism trends in their area and find potential solutions to their needs to achieve a strategy for a sustainable development of tourism.

Regione Lombardia, acting as a facilitator to connect the needs of stakeholders with ESPON's experienced researchers, is now wishing to share this result with other European and Italian Inner Areas allowing them to benefit from the research and replicate the method, as well as to exploit this experience improving the application of the method itself.

ESPON TOURISM Case study Italy Valchiavenna shows the importance of the connection of structured relationships between research and practice for cross-fertilisation synergies amongst programmes at trans-scalar and cross-cutting level (from the ESIF to local land use plans...) catalysing them in operative policies and interventions with territorial impact.

As emerged from the case study, a cross-sectoral coordination and a comprehensive approach is needed. It is important to move away from the "traditional" seasonal tourism and "silos" approach in operative policies that no longer respond to the challenges posed by the climate change and other crises, in order to ensure a more balanced and long-lasting life to a valuable land as the Valchiavenna.

Thanks to the whole ESPON colleagues and the ÖIR researchers' team for this promising and fruitful job.

**Luisa Pedrazzini**

Director

Office European Territorial and Environmental Cooperation

Regione Lombardia - DG Environment and Climate

ESPON Monitoring Committee Member Italy

## Prefazione

La pandemia da covid 19 ha sconvolto il mondo e la nostra vita, ha generato lutti, ha lacerato la nostra società ed il modo di percepirla, ha in parte cancellato una generazione ed una categoria di persone, i più deboli. In particolare ha profondamente inciso negativamente sulla nostra socialità.

Uno dei settori più colpiti è quello del turismo che necessariamente fonda le sue basi sullo spostamento (tour) delle persone da un'area ad un'altra.

La Valchiavenna è un territorio che da sempre è stato attraversato da persone, genti, merci e beni di ogni genere che giungevano ed andavano in svariati ambiti, verso differenti direttrici: a nord verso il centro Europa, a sud verso la pianura padana e l'area mediterranea. Territorio il nostro che ha avuto la fortuna di ospitare i primi turisti sulla neve e alle terme di Madesimo già agli inizi del XX secolo.

Ma la gloriosa tradizione turistica e la bellezza del paesaggio non bastano soprattutto in ragione della conseguente diffidenza ingenerata dalla pandemia: la naturale capacità di attrarre ed accogliere va in crisi. Ecco allora che ci si rappresenta l'opportunità dello studio, della ricerca, dell'approccio scientifico del progetto ESPON, programma di cooperazione europea che grazie alla Regione Lombardia si è proposto di analizzare l'impatto della pandemia nell'Area Interna della Valchiavenna in modo tale da fornire basi empiriche e concrete alla nostra valle per costruire adeguate politiche locali per comprendere le capacità attrattive in ragione anche delle tendenze turistiche attuali.

Ringraziamo molto il dott. Bernd Schuh, i suoi collaboratori dell'OIR, Istituto austriaco di studi regionali, la Regione Lombardia con l'arch. Maria Luisa Marchi e l'arch. Luisa Pedrazzini della Direzione Generale Ambiente e Clima di regione Lombardia per aver compiuto questo importante studio scientifico in un momento storico particolare, individuando la Valchiavenna quale territorio lombardo meritevole di una ricerca così approfondita e strutturata. Il nostro compito di amministratori e amministrativi è far conoscere agli operatori turistici lo studio con tutti i suoi approfondimenti. Particolari ringraziamenti sono rivolti: al Consorzio per la promozione turistica della Valchiavenna, al Consorzio turistico di Madesimo con i rispettivi direttori dott. Filippo Pighetti e la dott.ssa Francesca Cervieri, all'Istituto di Ricerche Il Poliedro con la sig.ra Francesca Rossetti, la sig.ra Gabriella Rossi, la sig.ra Laura Fusetti, per il loro prezioso contributo nonché ai vari rappresentanti delle associazioni dei commercianti, degli artigiani, degli albergatori e ristoratori che hanno animato il dibattito nei workshop con importanti interventi e spunti grazie alle loro esperienze professionali.

La Comunità Montana della Valchiavenna crede profondamente nella potenzialità dei progetti e dei programmi europei tanto da aver previsto, nel progetto Aree Interne, la costituzione di un apposito ufficio Europa pensato per dar voce ai bisogni e alle necessità dei valligiani e delle genti di montagna (preoccupati da un intenso spopolamento e colpiti dallo sconvolgimento climatico) abituati a solcare i passi e valichi alpini per scoprire nuovi orizzonti.

### **Davide Trussoni**

Presidente della Comunità Montana della Valchiavenna

## Introduction

The main objective of this project is to provide an empirical foundation for the tourist destination of Valchiavenna so as to help local policymakers and stakeholders identify and understand their carrying capacity for tourism based on a range of available indicators, and how to anticipate and counteract challenges of future tourism development.

The project provides local stakeholders in Valchiavenna the means to assess tourism trends in support of developing policies and action plans for the long-term and sustainable development of the local tourist industry, as the sector has been impacted and is going to emerge from the COVID-19 pandemic.

The effects of tourism on the natural environment and landscapes are a big issue especially on very complex isolated environments with high number of visitors, such as the mountains. A series of anomalies that have been occurring over the years need to be detected and repaired, by doing so it is possible to recognise certain issues and previous mistakes. Such occurrence enables the implementation of solutions to help places, yet to be affected by tourism-guided development, avoid key mistakes of the past and be prepared to react in advance to upcoming radical changes. The objective is accordingly to bring out the potential of the **inner areas** (“*aree interne*”), their richness of cultural and landscape heritage which have been challenged and gravely affected by a demographic decline, even more evident after the COVID-19 out-break.

The project focuses on a participatory stakeholder process with the aim to structure a tourism strategy, which takes into account the specifics of the mountainous region Valchiavenna. The involvement of the regional stakeholders allows for taking into consideration the very specific geographical conditions of the inner area Valchiavenna and aims to identify the potentials in the region. This process is moderated and accompanied by territorial evidence helping thus to shape the decisions within and for the region.

While the project specifically focuses on the needs of the Valchiavenna, several regional and tourism development questions have been taken into consideration:

- Based on the Italian strategy for inner areas – SNAI (*Strategia nazionale per le aree interne*) action plan for the inner area “Valchiavenna”, which concrete actions could be implemented to take a path towards sustainable and resilient tourism in the region?
- How to develop new approaches and how to spread the experiences to other similar situations? How to be innovative in order to develop a sustainable tourism and how to involve local stakeholders?
- Should the inner area “Valchiavenna” focus only on one type of tourism or should they enlarge the offer in order to attract more tourists?
- Which are the obstacles that have to be overcome and how?
- How have touristic places survived and reacted to the COVID-19 impact and with the help of what economic means?
- In the context of policies on territorial resilience, are there any knowledge gaps preventing from delivering a more effective policy response? What is the character of those knowledge gaps? Do they result from difficulty in understanding the territorial development trends and challenges? Or, from lack of access to good practice on how similar places in Europe have dealt with those trends and challenges through the use of projects or policy instruments?
- How to unlock the potential of places in decline, peripheries, places undergoing marginalisation? How to make such geographies more connected and as places that matter?

Based on the findings applicable to the study area (Valchiavenna), possible answers or avenues for reflection for each of these seven questions are provided in section 5.



# 1 Overview of the methodological approach

This research spin-off is relying on the methodological approach as developed in the ESPON Targeted Analysis project TOURISM: Carrying Capacity Methodology for Tourism. In the following, the methodological outline from this project to establish the overall approach, which has been applied in this case in Valchiavenna is presented. Further details on the ESPON Tourism methodology is provided in Annex A.1.

In order to apply and implement the ESPON Tourism methodology, which enables regional stakeholders to understand the development of tourism over time within the existing environmental and socio-economic framework of the region, six different steps needed to be initiated and implemented:

1. **Activation of stakeholders:** the ESPON Tourism methodology called for the active involvement, commitment and ownership of the regional/local stakeholders and destination representatives. This step was important since the group of regional stakeholders needs to be committed to the project in order to make up for the very limited presence of the project team in the region.
2. **Preliminary Desk Research – potential indicators (socio-economic analysis, tourism):** this working step was devoted to the collection of strategic background materials and their analysis (regional strategies, tourism strategies, concepts and background materials on the regions and their embeddedness in territorially relevant programmes and strategies). Please see section 0 for further information.
3. **Workshop I (systemic picture, indicator specification):** in a first stakeholder workshop, the project team elaborated together with the participants from the region a comprehensive understanding of the regional context and the tourism exposure to the region. The identification and activation of the participants was done by the region studied (Comunità Montana della Valchiavenna) with the support of the project team. The broad representation of stakeholders was safeguarded, to the extent possible: Destination Management Organisation (DMO), regional/local decision makers, representatives of economic sectors (crafts, services etc.), tourism industry representatives. The workshop was conducted online. The results consist in a shortlist of regional needs with respect to pathways towards sustainable and resilient tourism.
4. **Data preparation + adaptation of Dashboard** (adding LAU data, computation of carrying capacity, open-streetmap data, calculations according to local needs): the ESPON Tourism methodology lives from the principle of evidence-based decision making and a strong analytical basis. Thus, in this working step, the territorial evidence to analyse the identified regional needs (as collected in Workshop I) is collected and computed in a way to make it useful for decision support. This entails not only the gathering of territorial information from the region, but also from comparable destinations elsewhere in Europe (see section 3.3 for further details on the selected reference regions). The reason for this is the fact that sustainable regional tourism will only be depicted by matching it with territorial context (socio-economic, environmental, social). However, as no absolute threshold or target for “sustainable tourism”/carrying capacity can be set, it will be necessary to find comparative objects (i.e. regions) which may establish a “possibility frontier” of development. Selected regions include other Italian “*aree interne*” but also regions from other EU MS (e.g. Slovenia, Austria). In other words, the ESPON Tourism methodology relies on strong visualisations, which are fed by “big data” sources (e.g. open streetmap data), heat maps with comparisons of the region in question and other comparable EU regions.
5. **Workshop II (presentation of results & discussion with stakeholders, agreement on concrete steps forward):** The closure and highlight of the ESPON Tourism methodology was the second workshop with the region. This workshop was conducted in person and in the region with the same stakeholder participation as workshop I. The results of the indicator analysis and assessment of the carrying capacity were presented by the project team as structuring element to revisit the needs identified. In the second part, the workshop was used to identify potential steps forward within the region toward sustainable and resilient tourism and regional development. These steps were as concrete as possible and were clearly concentrating on the level of decision making within the region. By this, a strong commitment to take these steps is created and a concrete project management is established (i.e. responsibilities, timelines and targets). The sustainability of the workshop results shall therefore be safeguarded.

6. **Reporting & Closure:** In the final step, the project team drafted the final report documenting the results of the ESPON Tourism methodology in the region. Moreover, recommendations and potential dissemination steps as to how the results of this one application case can be used in practice by policymakers in supporting policy development and recommendations for further enhancement and development were compiled (see further section 0).

## 2 Context analysis

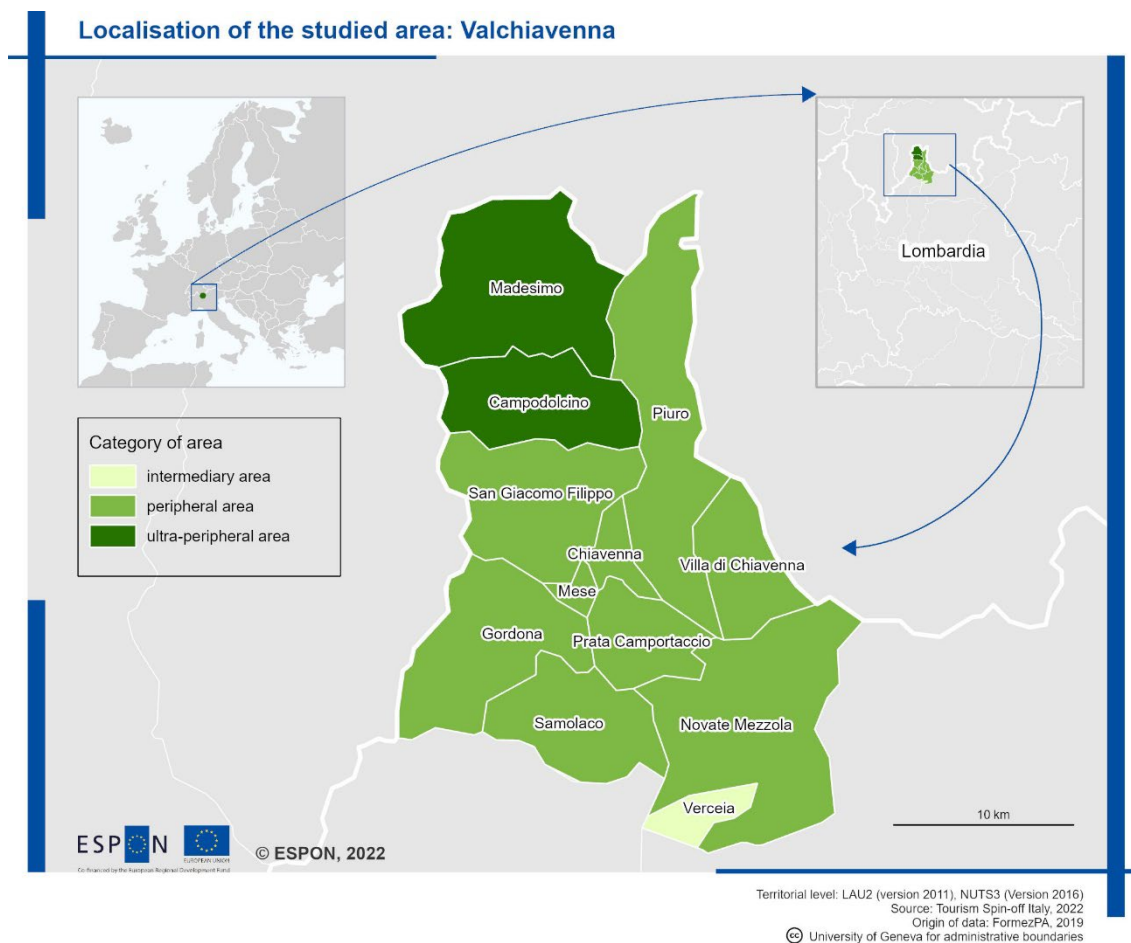
This section sets the frame of the analysis by providing background information on the socio-economic situation, including a specific focus on tourism-related information of the examined area, namely Valchiavenna.

### 2.1 Territorial context in the Inner Areas

#### 2.1.1 Territorial scope of the area

Valchiavenna is situated in the north of Lombardy (Italy) and borders the Swiss canton Graubünden/Grigioni on three sides. Valchiavenna is one of the five administrative districts of the province of Sondrio and includes 12 LAU regions.

**Figure 2.1: Inner Areas in Valchiavenna**



The area comprises two valleys: the Bregaglia valley (on the North-East of the studied area) and the main valley, the Spluga Valley (on the North-West of the studied area). The most populated municipality of the area is the municipality of Chiavenna, situated where both valleys join. Lake Como borders Valchiavenna in the south. Both valleys are important for transboundary traffic and trade as they are leading to the mountain passes of Spluga and Maloja (Eurac, 2017).

The municipality of Chiavenna is considered the center of the area as it is the most populated of the 12 municipalities (7,207 inhabitants for a total of 24,414 in the Valchiavenna (Eurostat, 2021)) and hosts the most Services of General interest. Chiavenna also hosts a station for regional trains and a hospital, several high schools and a laboratory of the University of Milan studying the Alpine environment (Eurac, 2017).

The area disposes of two national roads: the SS36, serving the Spluga valley and only link between Valchiavenna and the rest of the region and the SS37, serving the Bregaglia valley. A regional train, the R11,



builds a link between Chiavenna and Colico on a single-railway track and two bus company an Italian and a Swiss, serve the studied area. Despite the presence of public transport services of the STPS (*Società Trasporti Pubblici Sondrio S.p.A*) in all municipalities, 9% of the population in the north of the area does not have access to public transport within 15 minutes by foot (Eurac, 2017).

The next airport is the airport Bergamo Orio al Serio and it takes 2 hours and a half to reach by car for the farthest north municipality of the studied area, Montespluga. The province's capital city Sondrio can be reached in 2 hours and 50 minutes by car by Montespluga's inhabitants (Eurac, 2017).

Medical services are difficult to reach for the Northern part of the studied area as more than 20 minutes by car are required to reach a doctor. Public transports do not facilitate access to it as for most of the Northern population of the area, more than 30 minutes are needed to reach a doctor. However, some specialisations are poorly covered by the Chiavenna hospital and patients of oncology or cardiology for example, are forced to travel to Gravedona, Sondrio and Lecco to get daily care. The Chiavenna hospital had a maternity ward which was however closed between 2018 and 2022 (La Provincia di Sondrio, 2018 and Asst-val.it). The same accessibility problems can be observed for this population concerning kindergartens and primary schools. (Eurac, 2017).

## 2.1.2 Stakeholder network analysis

### Governing actors

The main public authority in the inner area Valchiavenna is the **Comunità Montana della Valchiavenna** which is defined in the Lombardy regional law n.23 of 16/04/1973 and is part of the province of Sondrio (Comunità Montana della Valchiavenna, 2022a). The Comunità consists of 12 municipalities (Campodolcino, Chiavenna, Gordona, Madesimo, Mese, Novate Mezzola, Piuro, Prata Camportaccio, Samolaco, San Giacomo Filippo, Verceia, Villa di Chiavenna) (Comunità Montana della Valchiavenna, 2022a). The Comunità is the socio-economic and territorial-urban planning body and functions as the coordinating authority for functions and services at the district level. The following services are included: administrative and technical services, cultural services, environmental functions and services, social services (Comunità Montana della Valchiavenna, 2022b). The Comunità provides administrative support for the 12 municipalities.

The **Confartigianato Imprese Sondrio** is located in the city of Sondrio and offers B2B services for SMEs and more particularly artisan businesses (Confartigianato Imprese Sondrio, 2022). There are also commercial representatives (**Commercianti Valchiavenna**) supporting traders and merchants in the region.

### Tourism actors

There are two tourism boards supporting the destinations located in the inner area Valchiavenna:

1. **Consorzio turistico Madesimo** (Madesimo, 2022)
2. **Consorzio turistico Valchiavenna** (Consorzio turistico Valchiavenna, 2022)

The two tourism boards function as destination management organizations (DMOs) and are responsible for marketing and tourism development in the region. They are both active economic entities in the overall governance process of Valchiavenna. Valchiavenna is following an approach of direct involvement of public and private stakeholders at the strategic level.

At the provincial level in **LOMBARDIA** is the official tourism board for the region Lombardy (in LOMBARDIA, 2022). Its primary function is to promote the tourist offer of the Lombardy Region.

### Other actors

The research institute **Il poliedro** is a key stakeholder for regional development related issues in Valchiavenna. The representatives are involved in the processes in Valchiavenna and are important consultants for tourism development.

## 2.1.3 Economic, social and environmental profiles of the area

This section provides an overview of the key challenges related to the economic, social and environmental situation in the area.

### 2.1.3.1 Economic profile of the Inner Areas

According to the "*Strategia d'Area Valchiavenna 2020*", the area had 1 588 active enterprises in 2014 employing around 3,400 persons. The economic fabric of the area is mostly made of small businesses working in industry for most of them (30%) but also trade (20%), agriculture (20%), services (18%) and tourism (12%). The agri-food sector is deemed to be of particular importance for the local economy, as it provides impetus to the agricultural activity and helps preserve the local knowledge on typical production such as cheeses, wines, sausages. A reduction of exports was however noted which is also due to a reduction of the alpine agricultural activity (Comunità Montana della Valchiavenna, 2016).

The strategy also observes a rationalization of the agricultural sector between 2001 and 2011 meaning that the number of agricultural enterprises reduced but the number of utilised agricultural areas increased. The agricultural sector is deemed particularly important for the region as it helps preserve the landscape and provides the tourism and gastronomy sectors with local products. These local products are considered as important tools for the promotion and image of Valchiavenna. The strategy also stresses the need for a multifunctional mountain agriculture meaning an agricultural sector integrating trade and touristic approaches in its work. At that time the area counted 10 agritourism companies (Comunità Montana della Valchiavenna, 2016).

The tourism sector is considered a vital part of Valchiavenna's economy however it is insufficiently developed. The municipalities of Madesimo and Campodolcino attract the most tourists (Eurac, 2017 and Comunità Montana della Valchiavenna, 2016).

The creation of the Inner Area in 2017 however is expected to directly provide funds to economic operators from the area and therefore support the revitalisation of the handcrafts and touristic activities (Comunità Montana della Valchiavenna, 2017).

### 2.1.3.2 Social profile of the Inner Areas

The population of Valchiavenna is mostly located in the valleys and is spread in 76 permanent settlements. However, the region contains several non-permanently inhabited and abandoned settlements remaining from the pastoral tradition of the area (Comunità Montana della Valchiavenna, 2016). The "Valchiavenna Strategy 2020" also points out the important evolution of the number of foreign registrations between 2011 and 2014, as this number quadrupled and reached 869 subject or 4% of the local population at that time (Comunità Montana della Valchiavenna, 2016).

The local population is constituted to 20.82% of inhabitants over 65 years old and 5.3% of children between 0 and 5 years old (Comunità Montana della Valchiavenna, 2016). When considering the local demographic evolution in 2017, the Eurac study expects increasing ageing of the local population with the number of children aged between 0-14 years old decreasing and the number of persons over 65 years old increasing to stabilizing depending on the types of municipalities (Eurac, 2017).

Considering the education level of inhabitants of the areas, in 2011, the northern part of the studied area counted 6.2% of inhabitants with a tertiary degree and 34.4% with a secondary degree. Inhabitants with tertiary or secondary education level were found in the municipalities of Madesimo (44,5%) and Chiavenna (43,1%). The population with the highest percentage of people with compulsory education (62%) lived in San Giacomo Filippo (Eurac, 2017).

In terms of social services, the Mountain Community provides services for disabled people and elderly persons. Social centers (such as family counselling, a retirement home, day centers...) can also be found in Chiavenna (Eurac, 2017).

### 2.1.3.3 Environmental profile of the Inner Areas

Valchiavenna is lodged in a mountainous alpine region of Italy and is characterized by two valleys, the valleys Spluga and Bregaglia. Its landscape is composed of pastures, forest and "*crotti*" (natural ravines with a constant current of cold air, the "*sorèl*") and has a long tradition of alpine agriculture. The area also disposes of several major lakes: Lago di Prestone, Lago di Isola, Lago di Montespluga and two rivers: Liro and Mera.

Several protected areas cover the Valchiavenna environment in the form of Nature Reserves for sites as the "Marmitte dei Giganti", the "Pian di Spagna Oasis" or of Natural Monument such as the "Cascade dell'Acqua Fraggia" or the "Caurga della Rabbiosa". Additionnally, 5 sites were declared sites of communitarian

importance, “*Siti di Importanza Comunitaria*” (SIC): the SIC Val Zerta, SIC Val Bodengo, SIC Piana di Chiavenna, SIC and Special Protection Area (SPA) Val Codera and Valle dei Ratti (Comunità Montana della Valchiavenna, 2016). The area Pian di Spagna-Lago di Mezzola is a RAMSAR zone, it has a European Special Protection Area status and a regional natural reserve character (RAMSAR, n.d.).

These are mostly remote places with limited human impact, and which present a great diversity of habitats and species, due to their altitude (from 200 to 3000 m). These habitats are however at risks, especially the “semi-natural” ones, due to the gradual abandonment of mountain activities which were maintaining the forest at bay. The flat areas of the Valchiavenna valley (the central part of the Piana di Chiavenna SIC and the Pian di Spagna – Lago di Mezzola SIC and SPA) builds one of the largest wetlands in northern Italy, which are of particular importance for a number of bird species (Comunità Montana della Valchiavenna, 2016).

Due to its position at the jointure of two important alpine valleys, the area disposes of hundreds of kilometres of hiking pathways. The most popular one is the 65 km long Via Spluga and traces back 2,000 years of Alpine transit history. This environmentally and historically valuable path also provides information supports along its way elaborated by an Interreg collaboration between Italy and Switzerland (Comunità Montana della Valchiavenna, 2016).

The Valchiavenna also benefits from a cycle path going from Verceia to Chiavenna and joining the Via Spluga and Bregaglia (Comunità Montana della Valchiavenna, 2016).

## 2.2 Tourism activities in the Inner Areas

Lombardy consists of 12 provinces, one of them being Sondrio, an alpine region located between the Alps and Lake Como at the Italian-Swiss border. The service sector, and especially tourism, plays an important role for Sondrio’s economy (Source: World Capital Real Estate Group, 2013). Valchiavenna, which is one out of the four internal areas defined by the Lombardy Region (Source: Interreg Europe, 2019), next to “Alta Valtellina”, “Appennino Lombardo – Oltrepò Pavese”, and “Valli del Lario – Alto Lago di Como”, combines 12 municipalities out of Sondrio’s 78 municipalities, all of them classified as peripheral and outermost areas (Source: Preliminary Investigation Report for the Selection of Internal Areas). But they attract tourist flows in the western Rhaetian Alps (Source: Internal Areas Technical Committee, 2014). With one main valley and more settled urban areas as well as several small valleys, the region shows a highly fragmented picture of 76 occupied areas (census 2011) between Madesimo and Verceia. This leads to a very specific natural and rural image. Areas of that kind recently attracted a lot of interest when it comes to development strategies for inner peripheries to overcome their marginalising effects (ESPON, 2016-2017). The municipality Chiavenna is the center of Valchiavenna and the most populated municipality in the valley. In 2020, Chiavenna had 6 hotels or similar establishments (3\*-hotels: 4, 2\*-hotels: 2) and with 157 bedrooms (3\*-hotels: 138, 2\*-hotels: 19) and 306 bed-places (3\*-hotels: 275, 2\*-hotels: 31) (Source: ISTAT, 2020). In 2012, Valchiavenna had 32,013 visitors, 154.5 beds/1,000 inhabitants, 1,300.8 visitors/1,000 inhabitants, 7 state and non-state cultural sites, and 60.2% paying visitors (Source: Areas Technical Committee, 2014). More recent data, pre-COVID-19 for Sondrio show that in 2019 the total number of tourist arrivals was 950,843, the total number of tourist overnights in 2019 was 3,033,117, and the number of bedplaces was 32,763 in Sondrio. All three indicators steadily increased from 2010 till 2019. Without San Giacomo Filippo and Villa di Chiavenna the number of arrivals of 20,031 was highest in Madesimo in 2010 (Source: EURAC, 2017).

The agricultural past is still visible in the form of architecture (e.g., the “*crotti*”, natural ravines with cold air coming out of the mountains, called “*sorèl*”), agricultural tradition, landscape heritage with mountain pastures, grazing, or “*maggengo*” (haymaking activity in May). A sustainable tourism development strategy was identified for the Mountain Community of Valchiavenna and pursued by rural agglomerations trying to revitalize and recover rural traditions (e.g., Val Codera, Savogno, Dasile, Crana, or Fraciscio). However, there

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<sup>1</sup> The RAMSAR Convention is an international treaty on Wetlands of International Importance Especially as Waterfowl Habitat, signed in 1971 in Ramsar, Iran. It has for mission “the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world” (see: Ramsar 2014: <https://www.ramsar.org/about/the-convention-on-wetlands-and-its-mission> (accessed 18.July 2022))

is a lack of a single direction and shared tourism strategy. Consequently, the Mayors’ Assembly promotes a more efficient and effective organization of the region’s tourism development. Likewise, the Mountain Community of Valchiavenna tries to find a better orientation of tourism marketing efforts. Further contributions are made by the municipal administrations, the Province of Sondrio, Valchiavenna Station University Presidium, Valchiavenna’s Integrated Educational System composed of territorial comprehensive institutes, higher Institutes, kindergarten and cooperatives, Chiavenna Hospital – territorial presidium of the ASST of Valtellina and Alto Lario, the cooperative world and associations (cultural, forestry, agricultural) representing the third sector, MUVIS – Ecomuseo della Valle Spluga, the Forestry Consortium, the Italian Swiss Association of Piuro Excavations, the Amici della Val Codera Association, the local tourism system, hoteliers, restaurants, the sports sector, and representatives of Valchiavenna’s 2020 Youth Group (Source: Territorial Cohesion Agency; Ministry of Education, University and Research; Ministry of Infrastructure and Transport; National Agency for Active Labor Policies Ministry of Agriculture, Food and Forestry Policies; Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017).

### 2.2.1 Regional Development

Six municipalities of Valchiavenna (Bregaglia territory with the municipalities of Piuro and Villa di Chiavenna, Spluga – or so called “San Giacomo” – with the municipalities of San Giacomo Filippo, Campodolcino and Madesimo, and the municipality of Chiavenna) were selected as one of the SGI (Services of General Interest) Alpine test areas to evaluate QoL (quality-of-life), attractiveness and development of the territory. From this list of municipalities, tourism was found to be most important for Madesimo and Campodolcino. Tourism allows services to remain in place, implement new ones due to higher demand, it offers jobs and therefore allows people to remain in the territory using the services (Source: Interreg Alpine Space, European Union, INTESI, 2018). First steps were made in an INTERREG Italy-Switzerland cross-border cooperation (Source: Internal Areas Technical Committee, 2014).

### 2.2.2 Cultural Heritage

Conservation of local knowledge about typical production techniques (e.g., cheese) is seen as the big mission. A best practice example is the Bresaola *L’Originaria*, an air-dried, salted beef aged 2-3 month from traditional cattle breeds raised in the province of Sondrio with a PGI (Protected Geographical Indication) protection and a successful launch on the market. Geographical indications (GIs) such as Protected Denominations of Origins (PDOs) and PGIs are intellectual property rights (IPRs) that safeguard traditional knowledge and prevent intangible culture heritage (Source: Kedge Business School, 2019).

However, in the recent past, the agricultural sector decreased (apart from some municipalities). At the same time, the agricultural area increased signaling rationalization and amalgamation. But small and micro companies (e.g., in Sondrio >60% are individual companies reaching almost 90% in some sectors) see the quality of land and local agriculture products as the strength of the province of Sondrio (Source: World Capital Real Estate Group, 2013). This specific type of the agricultural sector is extremely important for gastronomic tourism offers searching for typical regional products. Both residents and tourists would benefit from an integrated agritourism system promoting local agricultural and forestry products and resources, offering tastings and other diversified types of tourist experiences, activities, and attractions. A focus on local agri-food chains and development of an agro-forestry-pastoral system supporting traditional agricultural activities as well as better land management by new businesses (e.g., young farmers) has been stressed to generate jobs and income. Likewise gastronomic chains, the supply chain of derivatives, the fruit chain, vitiviniculture and horticulture are important to strengthen the spirit of the local identity of this place (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017). Summarized, there is a focus on the importance of valorising alpine food heritage and intangible cultural heritage (ICH) by means of fair prices, collective marketing approaches, legal protection of intellectual property rights, and innovation in a heritage-resonant manner (e.g. *cittaslow and orange flag – a slow food movement with the goal to improve the quality of life*) (Source: Mountain Community Valchiavenna, 2017). Educational and policy guidelines were set to avoid the loss of distinctiveness due to intensified farming going hand in hand with a decline in traditional farming lands and loss of skills, traditions, practices, and values shaping Alpine Food Heritage (Source: Kedge Business School, 2019).

INNOGROW, an INTERREG Europe project, provides funds for the rural economy. Small and medium-sized enterprises (SMEs) with new production technologies, business models and start-ups of sustainable tourism enterprises lead to innovative products (creative and entertainment businesses with the region’s traditional

products) and competitiveness in the agribusiness, tourism and cultural sector, by means of the Lombardy Regional Organizational Program (ROP) (Source: Interreg Europe, 2019).

Studies by the Technical Committee for the Inner Areas in Italy evaluating the spatial distance from major centers to peripheral destinations, that result in different development levels, accessibility to main services, or lack of infrastructures, one of them being Valchiavenna-Valtellina with the neighboring World Heritage Site (WHS) provinces Bolzano, Trento, Brescia and Como, have shown that compared with the southern part of Italy, the northern and central parts of Italy are more open for cultural heritage tourist flows and possible convergences with UNESCO places result in a National Strategy for the Inner Areas (SNAI). Valchiavenna-Valtellina already established tourism strategies of consolidation and diversification of the tourism supply. Valchiavenna-Valtellina has a potential of ~57 million tourist nights per year (Source: Di Matteo & Cavuta, 2019).

### 2.2.3 Ecology

Environmental heritage like Pian di Spagna, Lake Mezzola (the largest wetland in northern Italy), Samolaco, or Val San Giacomo attract tourists with their scenic beauty and are at the same time important for the regional ecological network. This is true for many other protected areas like Marmitte dei Giganti, Riserva Naturale Pian di Spagna, Carga della Rabbiosa, Val Bodengo, or Val Codera (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017), all with limited human impact and ambitions to preserve them in form of a World Heritage Site listed by UNESCO (United Nations Educational, Scientific and Cultural Organization). However, the aim is not only to protect but to develop these areas in a sustainable way.

### 2.2.4 Mobility

Accessibility is limited mainly to private vehicles with the main road SS36 connecting Chiavenna with the rest of the region causing hydrogeological problems (Source: Interreg Alpine Space, European Union, INTESI 2018). The public transport infrastructure is not in line with a sustainable tourism concept (e.g., difficulty of bicycle transportation in buses). Public transport services like the Colico-Chiavenna railway and bus lines of Sondrio's Public Transport Service are a problem as timetables do not meet tourists' expectations, especially in the evenings, and lack coordination among different service providers (Source: Interreg Alpine Space, European Union, INTESI 2018). "On call" public services were thought about and the Local Public Transport Agency, Trenord and SPTS SONDRIO were involved (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017). The improvement of transport services in upper Valtellina (Source: Internal Areas Technical Committee, 2014) and decentralized solutions need to compensate for the poor public transport facilities (Source: Interreg Alpine Space, European Union, INTESI, 2018).

On the other hand, there are plenty of trails that allow one to reach mountain pastures and *refugios* (e.g., Via Spluga is of great environmental and historical value with a long ancient Alpine transit history) that were developed by an INTERREG cooperation between Italy and Switzerland (Source: Italy-Switzerland Cross-Border Cooperation Programme, 2012); or Via Bregaglia (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017). Multilingual signs and organized offers improve their quality (Source: Mountain Community Valchiavenna, 2017). Finally, cycling path along Mera and Merette for both leisure and tourism and supported by local administrations, the district authority, and single central commissioning authorities. Another planned initiative is a single pass for skiing in Valchiavenna and Madesimo and a single ticket for travelling by bus and snowmobile between Montespluga and the Spluga pass, together with Swiss bodies. The Comunità Montana della Valchiavenna, the municipalities of Madesimo, Campodolcino and San Giacomo Filippo, and the Splugen ski lifts are cooperating in a cross-border project to allow Italian tourists to ski on the slopes of Splugen and Swiss tourists on the slopes of Madesimo installing a shuttle service and snowcats (Source: Mountain Community Valchiavenna, 2017).

### 2.2.5 Education

In 2014, 12% of active companies were operating in the tourism industry. For whole Sondrio, the number of enterprises decreased between 2012 till 2020 as follows: 13,675 (2012), 13,470 (2013), 13,416 (2014), 13,306 (2015), 13,314 (2016), 13,266 (2017), 13,202 (2018), 12,964 (2019), and 13,189 (2020). But there is a lack of skills needed for the tourism sector. This resulted in an action list for developing territorial, environmental, agricultural, language, marketing (e.g., the need to development of a social media platform was mentioned; Source: Kosareva, 2019), and commercial planning skills, to promote and enhance the territory from a gastronomic, historical, and cultural point of view, and to offer trainings to qualify new entrepreneurs



connected with natural and cultural resources. Such tourist vocation education offers potential career opportunities in Valchiavenna (Source: Internal Areas Technical Committee, 2014). Participating parties are the Network of Schools in Valchiavenna, the SEI Working Group, the Province of Sondrio, the Professional Institute Crotto Caurga, the Faculty of Geology at the University of Milan, trade associations, and so forth.

One concrete realization in this direction is the IFTS – “ChefTech for higher technical training”, to become food and wine technicians of the typical characteristics of the territory and of artisanal and innovative processes, supported by the Union of Hoteliers, the Union of Artisans, the Union of Merchants and local associations (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017). Another one is offered by the Crotto Caurga Institute, namely courses for technical experts in the creation of menus based on typical food and wine to promote the excellence of the territory (Source: Mountain Community Valchiavenna, 2017).

## 2.2.6 Seasonality and Length of Stay

Tourist flows are concentrated to certain times of the year. The peak is in August with 11,202 arrivals and 34,900 overnights, the lowest number is generated in November with 1,379 arrivals and 2,564 overnights (2014)<sup>2</sup>. On the other hand, there are two seasons, namely a summer and a winter season offering jobs throughout the whole year. The skiing area Valchiavenna has a ski installation capacity of 26,260 people/hour and the territory is highly linked with tourism in the ski areas in Madesimo and Campodolcino (Source: EURAC Research, 2017). With a 4°C warming, Valchiavenna at an altitude between 1,550 and 3,000 meters above sea level would remain naturally snow reliable according to AlpineSpace – Cooperazione Territoriale Europea, IREALP, and climapltour (2009).

The length of stay decreased from 3.7 (2014) to 3.3 (2020), mostly due to an accommodation system that is not adequate for the demand. The same is true for entertainment facilities, events and itineraries being highly limited. Initiatives like events hosted in Madesimo all year round, the improvement of the lake area of Verceia and Novate Mezzola, or events like the “Our place in space” promoted by NASA and ESA should help to spread tourist flows over intermediate seasons (Source: Mountain Community Valchiavenna, 2017).

A new image, namely “family and children friendly” initiatives and offers, are believed to make tourists stay at a place and not to just pass by. Hence, the “Family” project (“Per la Famiglia e i Bambini”) is supported by Consorzi Turistici and Muvis, C.A.I. Valchiavenna, the skiarea, forest and alpine consortia, Consorzio Cranna, Associazione Amici Val Codera and local associations (Source: Ministry of Health; Lombardy region; Mayor of the Municipality of Chiavenna, 2017). Approval of a “Convention Scheme for the implementation of the Valchiavenna Inner Area project” by Region of Lombardy and the implementation of the Inner Area Strategy “Valchiavenna 2020 – from Marginal Area to Tourist Attractor” with a “family-friendly” focus to overcome seasonal tourism by more sustainable forms (Source: EURAC Research, 2017), and investments in Valchiavenna by the European Regional Development Fund (ERDF), the European Social Fund (ESF), and the European Agricultural Fund for Rural Development (EAFRD) for the scope of nature, culture and tourism, and “Valchiavenna in 2030” help the responsible actors (Valchiavenna Mountain Community and the municipalities) to directly develop tourism in the region (Source: Department for Cohesion Policies, 2020). Among several Pilot Action (PA) activities and INTESI (Integrated Territorial Strategies for Services of General Interest), one focuses on overcoming the seasonal tourism logic towards more sustainable forms (Source: Interreg Alpine Space, European Union, INTESI, 2018). For example, in 2017, 26 million Euros of funding to build up a new economic system for Valchiavenna were invested (Source: Mountain Community Valchiavenna, 2017).

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<sup>2</sup> There is no more recent data on the monthly arrivals and overnights available.



## 3 Needs analysis and indicator selection

### 3.1 Workshop 1: Organisation and participants

#### Organisation of the Workshop

The aim of this first workshop was to identify and discuss the needs and problems related to tourism activities in the area, develop a systemic picture of the territorial context of Valchiavenna as well as derive possible indicators capturing the territorial and tourism context. Due to the pandemic context in Europe at this time (the workshop was held on the 5th of May 2022), the workshop was organised online via the application MS Teams. Besides the project team, representatives from ESPON and the Lombardy Region, participants included several representatives from the Comunità Montana della Valchiavenna, a research centre, destination management organisations from Valchiavenna, and local business owners. A second application enabling a direct interaction of the participants with the content was also used, the Conceptboard (see picture below).

The workshop was therefore structured around three key moments:

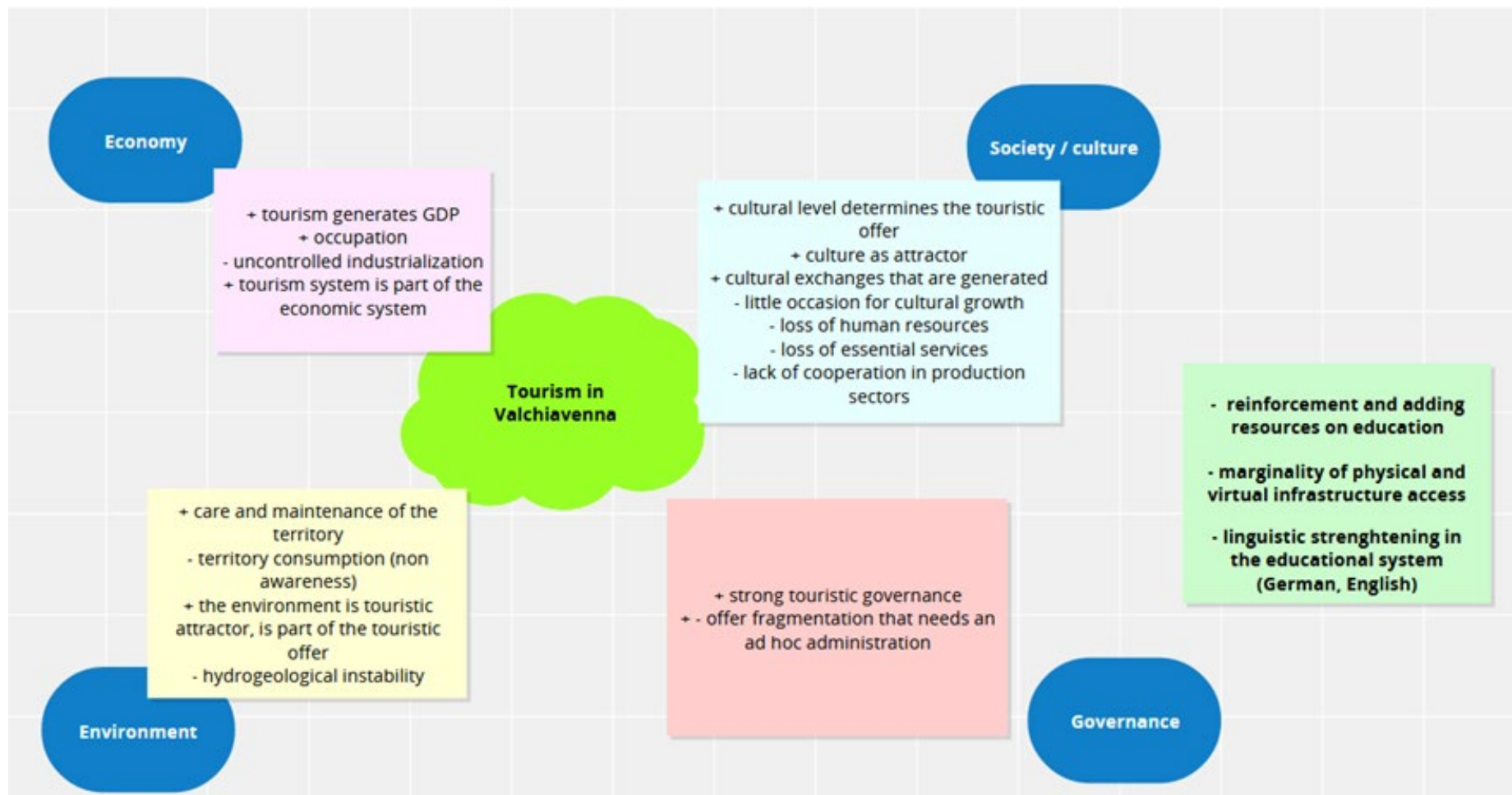
- A presentation round, in which participants were asked what they liked and disliked the most about the Valchiavenna,
- The presentation of the approach to measuring carrying capacity showcasing the methodology in which the workshop is embedded,
- Drawing of a systemic picture of tourism related effects helping to identify the causal loops happening between the territorial context and the tourism activities in Valchiavenna.

Due to time constraints, the pairing of identified causal loops and indicators could only be evoked during the workshop.

The systemic picture approach was drawn as follows. In a first step, the participants were asked to comment the needs, problems and challenges they experimented concerning tourism and organise those around four axes, namely: governance, society & culture, economy and environment. First causal loops were also identified. In a second and final step, guided by the organisation team and based on the contributions written in the first step, needs were formulated.



Figure 3.1: Overview of the systemic picture drawn during the workshop



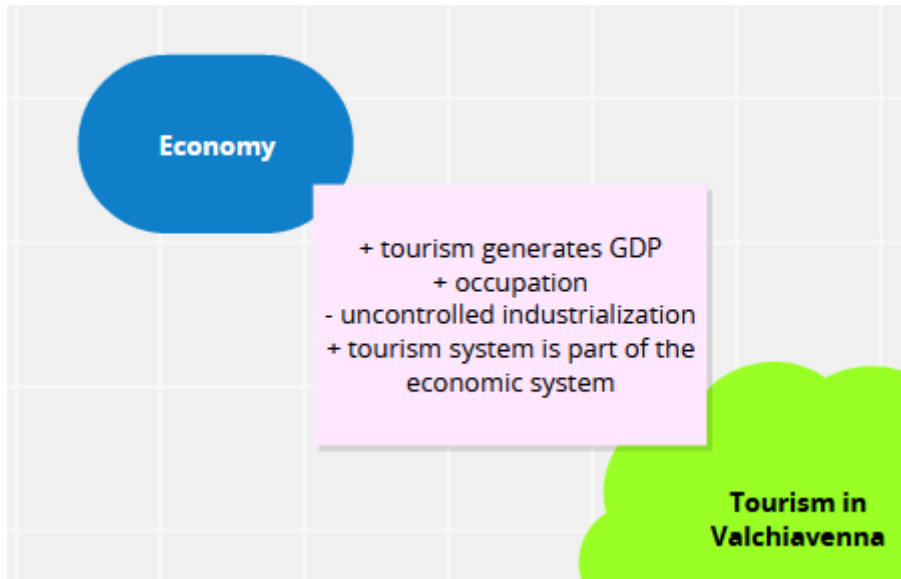
Source: Consortium, 2022

### 3.2 Workshop 1: Outcomes of the needs analysis

The outcomes of the workshop can be presented along the systemic picture's four axes: economy, society and culture, governance, and environment. The main statements and the need stemming out of the four axes will be described in this chapter.

#### Economy

**Figure 3.2: Overview of the contributions on the economic challenges linked to tourism in Valchiavenna**



Source: Consortium, 2022.

The economic issues and challenges faced in Valchiavenna are characterised, according to the workshop participants, by an uncontrolled industrialization (i.e. tourism supply chain). However, tourism influences positively the GDP and employment. Furthermore, participants highlighted that tourism is partly formed by the economic system, which means for example that the agriculture sector, handicraft, etc. are involved in touristic activities as well. In other words, tourism is interdependent and is therefore directly influenced by other economic activities.

## Society and culture

**Figure 3.3: Overview of the contributions on the societal and cultural challenges linked to tourism in Valchiavenna**

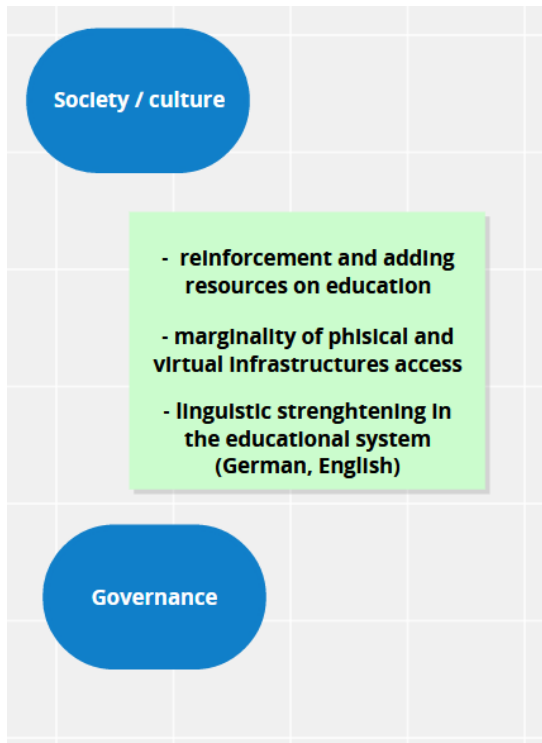


Source: Consortium, 2022.

The pillar of society and culture in the subject territory is being influenced positively by tourism since the local culture attracts visitors and can be seen as a defining element. Then, the level and broadness of touristic offerings is determined by cultural offerings. A further positive influence which derives from tourism is the cultural exchange which takes place in the region thanks to tourism. However, limited occasions for cultural development can slow down the development of the region. Participants also mentioned the loss of human resources and essential services/facilities due to the geographical proximity to Switzerland. A lack of well-paid employment opportunities in the tourism sector requiring higher education leads to migration to higher paying jobs in the closer surrounding. This point is followed by the lack of cooperation between various sectors of production.

Participants added notes between the societal and cultural; and governance related problems and challenges which can be linked to both socio-economic indicators. These can be seen in Figure 3.4.

**Figure 3.4: Overview of the contributions on the governance, societal and cultural challenges linked to tourism in Valchiavenna**

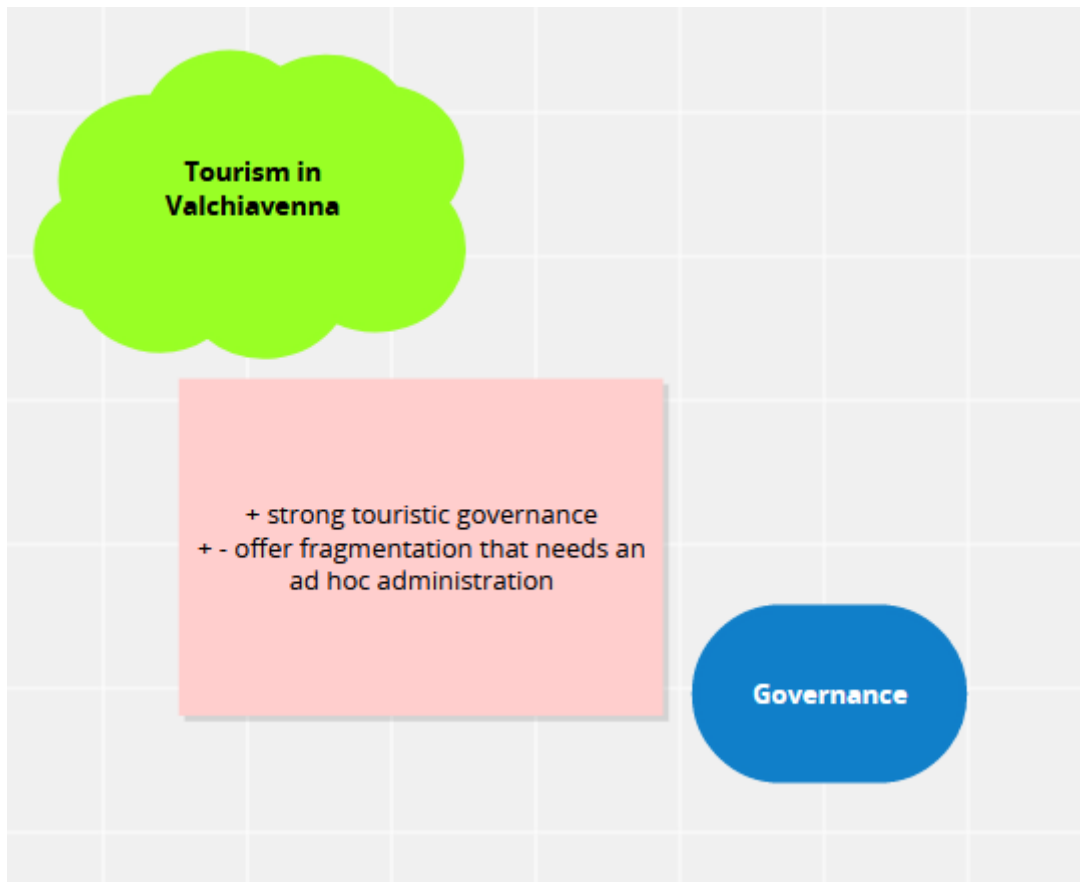


Source: Consortium, 2022.

According to the participants of the workshop, resources should be placed on education and formation. The marginalization of access infrastructure should be improved in both physical and virtual terms. The language potential of the local population should be upgraded, starting in the education system, where especially language skills in German and English should be improved.

## Governance

**Figure 3.5: Overview of the contributions on the governance challenges link to tourism in Valchiavenna**

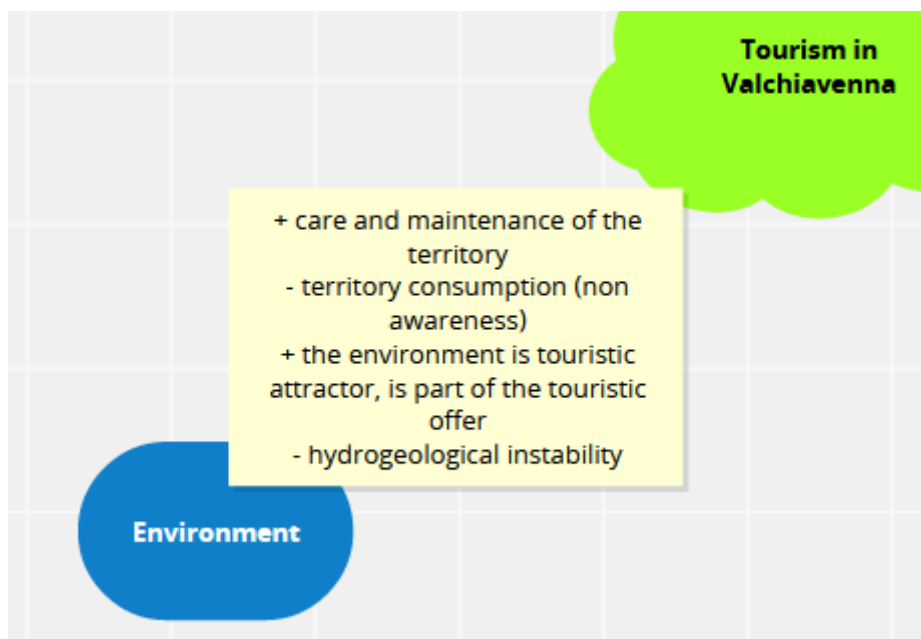


Source: Consortium, 2022.

Regarding challenges in tourism governance, workshop participants mentioned the fragmentation of offerings which are in need of an ad hoc organization. Tourism governance in Valchiavenna has been rated to be strong due to a strong commitment of different stakeholders in the region.

## Environment

**Figure 3.6: Overview of the contributions on the environmental challenges link to tourism in Valchiavenna**



Source: Consortium, 2022.

Tourism positively influences the maintenance of the territory and participants recognized that the environment in general and landscape in particular attracts visitors since it forms part of the tourism offer of the area.

Nevertheless, the territory and its environment are consumed, and hydrogeological disturbances can be noticed which could lead to natural disasters. Therefore, workshop participants identified a strong linkage between tourism and the environment.

In a last step and following up on the identified cause-effect chains of tourism in the regional context, a set of needs of the Valchiavenna region has been identified. These needs are tailored to the territorial context and will be guiding the search for the identification of territorially based information to facilitate the final discussion and identification of solutions and pathways towards sustainable tourism.

## Outcomes

Figure 3.7 provides an overview on the points discussed and the needs identified accordingly.

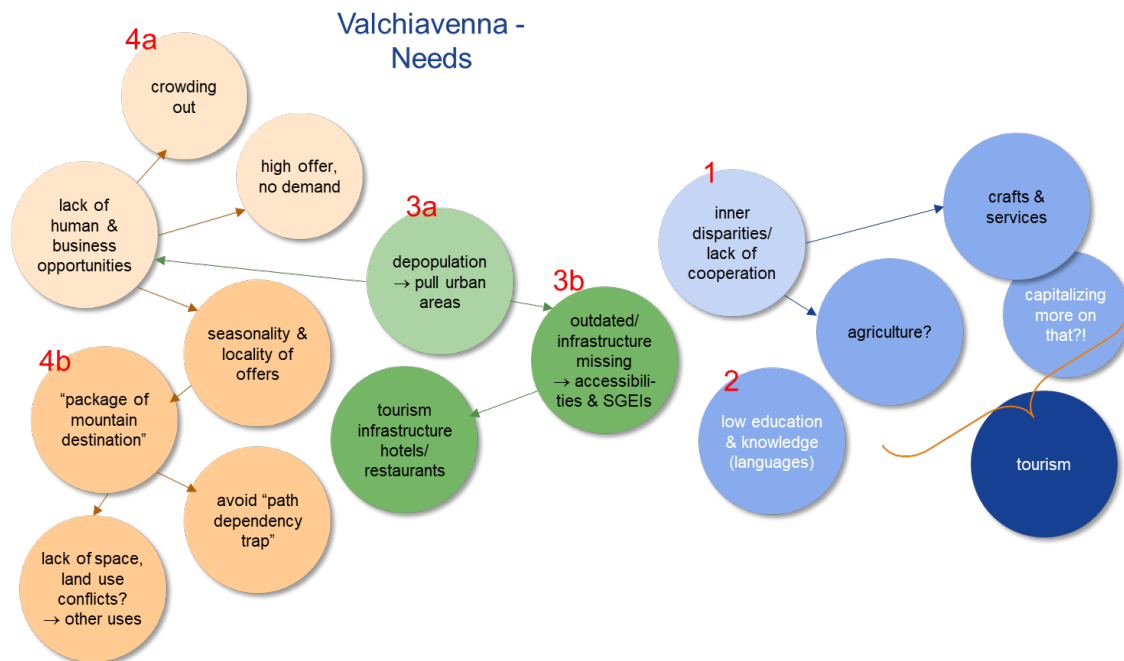
The region is apparently characterized by a territorial heterogeneity which is brought by the Alpine topography with its valley structures and natural barriers. Two tourism poles (the skiing and mountain municipality of Madesimo and the regional center of Chiavenna) show significant differences. These differences lead to an unequal development and to negative externalities due to concentration phenomena. – The dominance of two main tourist seasons (i.e. summer and winter) lead to a underuse of resources and the backlog in investments in the hospitality sector. On the other hand, the fact of the peripheral character of the region prevents Valchiavenna to become prone to the unsustainable path dependency of other mountain destinations. – The intensified mechanization of skiing tourism (carving technology in skiing leading to the need for mechanically heavy preparation of slopes, artificial snow, lack of skiing skills and mass tourism calling for more energy and space intensive accession aids) has not yet fully grasped the region and should be prevented by enlarging not only the seasons over time but also by diversifying the offers for tourists. **(Needs 4a and 4b)**

Depopulation and brain-drain are the most prominent problems identified, which calls therefore for a raise in attractiveness of the region for living and an increase in economic opportunities for citizens. **(Needs 3a and 3b)**

Another need derived from this problem-field is to increase the qualification levels of the population to match the most important economic sectors – i.e. tourism and agricultural related value chains. Innovative and at the same time sustainable solutions will be sought in the future. This means that education and training will have to be provided to secure this know-how. This is extended to the simple capacities of communicating in foreign languages. **(Need 2)**

The specific territorial condition of the Valchiavenna region brings about a phenomenon, which is quite common in mountain areas, which is the concentration and un-even distribution of economic growth and dis-connectivity. The rather obvious and foremost need deriving from this problem is therefore to increase co-operation and exchange and to create win-win situations for the whole region by sharing activities and creating opportunities in a territorially balanced way. **(Need 1).**

**Figure 3.7: Territorial needs identified in Valchiavenna in the interface of tourism and regional conditions**



Source: Consortium, 2022.

**Table 3.1: Identified needs**

Needs identified
<p><b>Need 1: fostering cooperation</b></p> <p>Due to inner-regional disparities and the un-even distribution of tourism attractions, Valchiavenna is lacking co-operation within the region. There is a need to foster cooperation within the region not only locally but also among sectors and value-chains (e.g. tourism and agriculture, crafts and services).</p>
<p><b>Need 2: Improving education</b></p> <p>There is a need for better education and qualification related to tourism and related services – high quality hospitality and sustainable tourism offers as well as language skills.</p>
<p><b>Need 3a: Enlarging the economic potential</b></p> <p>Economic potential has to be enlarged (also but not only related to tourism) in order to counteract brain-drain and depopulation. – Entrepreneurial activities have to be encouraged and fostered.</p>
<p><b>Need 3b: Increasing attractiveness</b></p> <p>To increase the attractiveness of the region to citizens the inner-regional infrastructure (mobility and SGEIs) will have to be improved.</p>

## Needs identified

### Need 4a: Extending tourism seasonality

Seasonality of tourism will have to be extended – the two main seasons of winter and summer will have to be more integrated and additional tourist segments to be attracted. – This will call for other/sustainable tourism infrastructure

### Need 4b: Improving land use planning

The concentration of tourism activities in certain areas within the region leads to unwanted hotspots of land-use conflicts and negative externalities of tourism/temporary dwellers. – There is a need for careful land use planning and mix of land use types.

*Source: Consortium, 2022 – based on workshop 1’s discussions*

As it can be seen from this list, a total number of six needs has been identified and agreed upon during the first workshop.

This list was the guiding principle for our quest for territorial evidence. The aim was to provide information along the needs identified in order to

1. Verify whether this need is corroborated by evidence.
2. Establish comparisons of the Valchiavenna region with other comparable regions to underline this evidence (see section 3.3).
3. Use the information to ensure that the systemic interlinkages become visible and potential leeway of development can be identified.

This was discussed during the second workshop in the region and led to the identification of concrete steps towards meeting the needs and a sustainable tourism path.

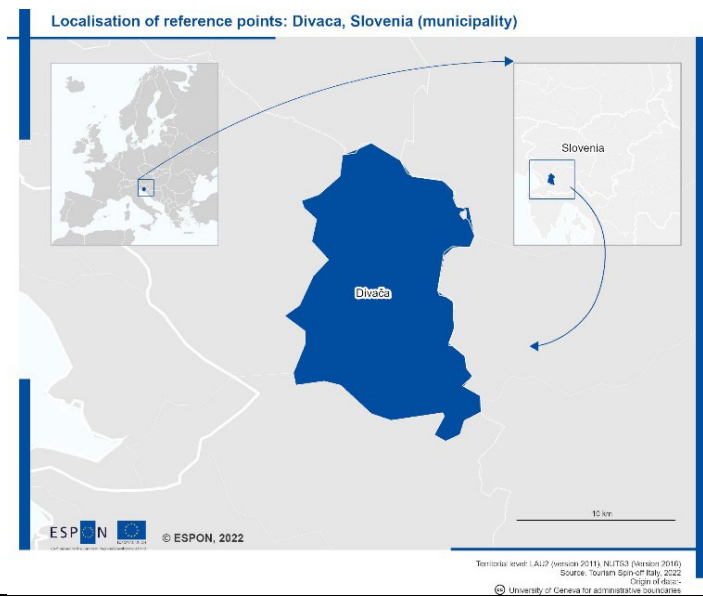
## 3.3 Identification of reference points

Developments and current status of the province Sondrio are benchmarked with below-mentioned three regions, plus all Italian provinces:

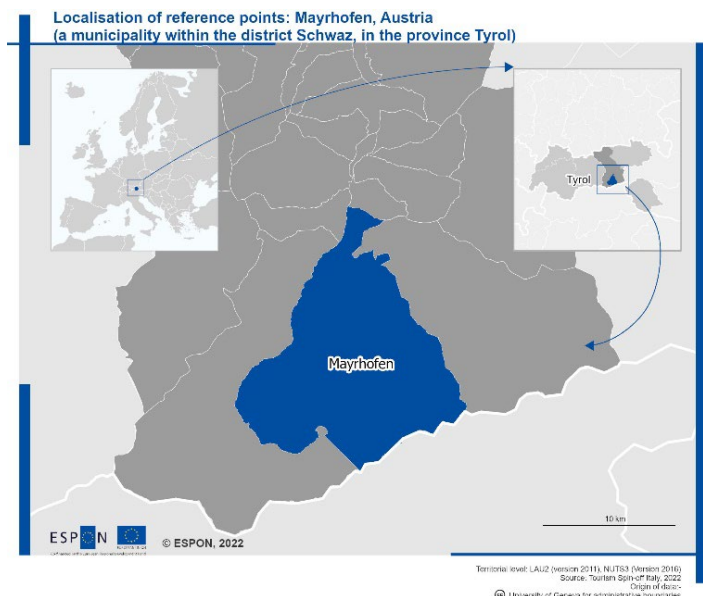


**Figure 3.8: Maps of the reference points**

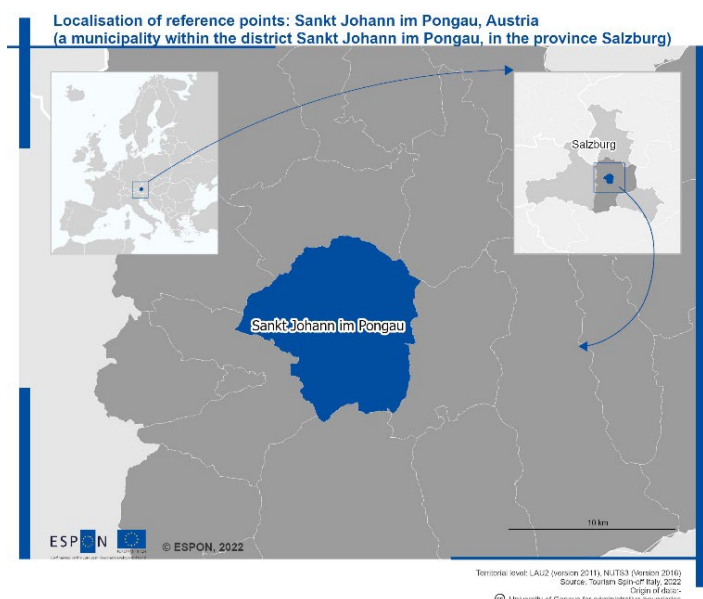
Divaca, Slovenia  
(municipality)



Mayrhofen, Austria  
(a municipality within the district Schwaz, in the province Tyrol)



Sankt Johann im Pongau, Austria  
(a municipality within the district Sankt Johann im Pongau, in the province Salzburg)



Source: Consortium, 2022.

The selection of the Slovenian and Austrian regions is based on similarities (geographic, topographic, socio-economic) identified with the area of Valchiavenna. Both Austrian regions show a similar characteristic with respect to tourism intensity. With Mayrhofen certainly being more confronted with overtourism phenomena in winter season. Still both regions show a comparably similar connectivity (vicinity to centres and higher transport grids like highways). Both regions are not primarily dependent on tourism as main sector, but still it plays a pivotal role in the areas. Both regions are facing the same problem with respect to commuting residents living in the regions and job opportunities to be found in the main regional centres (Inn valley, Salzburg and Bergamo/Milano).

As for Divaca, the similarity shows with the same remoteness and still the connectivity with main transport grids (highway Lubljiana – Trieste). The dependency on natural heritage (karst caves) and the related tourism target group is another similarity. The strong emphasis on culinary specialities and a comparably high density of high-quality cuisine establishments is another significant parallel between the two regions.

The comparison with all other Italian provinces (NUTS2 level) illustrates the position of Sondrio vis-à-vis the other Italian provinces. It provides the relevant number of comparison objects necessary to establish the ESPON Tourism methodology with respect to creating potential development pathways for the tourism exposure and the regional sensitivities.

### 3.4 Selection of indicators and data collection

12 tourism indicators and 9 territorial indicators, 21 in total, were collected from the following institutions: Istituto Nazionale di Statistics (ISTAT), Statistical Office of the Republic of Slovenia (SURS), Statistics Austria, public entities of Sankt Johann im Pongau and Mayrhofen, and EUROSTAT. Own calculations complement the database.

**Table 3.2: Indicators in the database (alphabetical order)**

Tourism Indicators	Time series	Source
<b>Arrivals Domestic</b>	IT: 2014-2020 SI & AT: 2010-2021	Italy: ISTAT (dati.istat.it)
Number of trips to the region by local residents		Slovenia: SURS – Statistical Office of the Republic of Slovenia
<b>Arrivals Foreign</b>	IT: 2014-2020 SI & AT: 2010-2021	Austria: Tourismusverband Mayrhofen-Hippach, Stadtgemeinde St. Johann im Pongau
Number of trips to the region by foreign visitors		
<b>Arrivals Total</b>	IT: 2014-2020 SI & AT: 2010-2021	
Number of trips to the region (local residents + foreign visitors)		
<b>Bedplaces</b>	IT: 2010-2020 SI: 2010-2021 AT: 2012 & 2020	
Number of bedplaces available to tourists		
<b>Length of Stay Domestic</b>	IT: 2014-2020 SI & AT: 2010-2021	
Average length of stay by local residents		
<b>Length of Stay Foreign</b>	IT: 2014-2020 SI & AT: 2010-2021	
Average length of stay by foreign visitors		
<b>Length of Stay Total</b>	IT: 2014-2020 SI & AT: 2010-2021	
Average length of stay (local residents + foreign visitors)		
<b>Overnights Domestic</b>	IT: 2014-2020 SI & AT: 2010-2021	
Number of overnights in the region by local residents		

Tourism Indicators	Time series	Source
<b>Overnights Foreign</b> Number of overnights in the region by foreign visitors	IT: 2014-2020 SI & AT: 2010-2021	
<b>Overnights Total</b> Number of overnights in the region (local residents + foreign visitors)	IT: 2014-2020 SI: 2010-2021 AT: 2010-2020	
<b>Tourism Density</b> Arrivals total/Surface area	IT: 2014-2020 SI: 2010-2021 AT: 2010-2020	
<b>Tourism Intensity</b> Arrivals total/Population	IT: 2014-2020 SI: 2010-2021 AT: 2010-2020	

Source: Consortium, 2022.

Territorial Indicators	Time series	Source
<b>Employment</b> Persons in employment by region of employment	IT: 2012-2020 SI: 2010-2021 AT: 2011 & 2019	Italy: ISTAT (dati.istat.it) Slovenia: SURS – Statistical Office of the Republic of Slovenia Austria: Tourismusverband Mayrhofen-Hippach, Stadtgemeinde St. Johann im Pongau
<b>Employment Rate</b> % of labour force within the working age population	IT & SI: 2010-2021 AT: 2011 & 2019	
<b>Enterprises</b> Number of enterprises	IT: 2012-2020 SI: 2010-2020 AT: 2019	
<b>Population</b> Number of residents	IT, SI & AT: 2010-2021	
<b>Population Density</b> Population/Surface area	IT, SI & AT: 2010-2021	
<b>Self-Employment</b> Number of self-employed people	IT: 2012-2017 SI: 2010-2021 AT: 2011 & 2019	
<b>Surface Area</b> Square kilometre surface covered by the region's borders	IT, SI & AT: 2010-2021	
<b>Tertiary Students</b> Number of tertiary students	IT: 2015-2017 SI: 2010-2021 AT: 2011 & 2019	
<b>Upper Secondary School</b> Number of upper secondary school pupils	IT: 2010-2019 SI: 2010-2020 AT: 2011 & 2019	

Source: Consortium, 2022.

### 3.5 Methodology

The dashboard (<http://dashboards.modul.ac.at/italy/>) offers several interactive visualization possibilities that were used to produce the figures of the three sections below.

First, carrying capacity benchmarking is offered using grids with two axes (x-axis: a tourism performance indicator, y-axis: a territorial context indicator) and the option to select any benchmarking region contained in the database together with Sondrio. Quartile benchmarks derived from all regions in the database can be added to the plot as well. Furthermore, the timely development is plotted for both regions. Another plot using the same two axes plots all regions of the database as separate dots whereby the comparative regions and Sondrio are highlighted in different colours. Clicking through the plots allows one to get an insight into the timely development as well. These two figure options allow one to benchmark Sondrio with one and/or several other regions in different ways.

Second, for the purpose of measuring tourist flow and tourism prediction, an automatic forecasting procedure for the next three years is provided as well as quartile benchmarks over time. Spatial insights are served by geographical maps benchmarking Sondrio with all other Italian provinces. Browsing through the years shows long-term trends over time.

Third, for a more detailed view on the data, variable descriptions, raw data inspection, descriptive statistics are implemented in the dashboard as well. Raw data inspection can also be done via interactive geographical maps.

Fourth, big data insights are offered in the form of OpenStreetMap data visualizations to get a feeling of the touristic hotspots over whole Italy. GoogleTrends shows the spatial distribution and timely development of worldwide search queries of different terms. The selection of region-specific terms give insight into regional as well as timely differences.

Fifth, through the upload/analyse text feature, insight into the uploaded text in terms of sentiment, emotions and topics can be revealed.

More detailed descriptions on the different types of visualizations and features are explained in a user manual (see annex A.2).

### 3.6 Tourist flow estimation

The tourist flow estimation can be based on a variety of tourism indicators in the database.<sup>3</sup>

As one can see in Figure 3.9 below, the total number of tourist arrivals increased from 2014 until 2019, followed by a significant drop down in 2020, most likely due to the COVID-19 pandemic. The same is true for the total number of overnights.

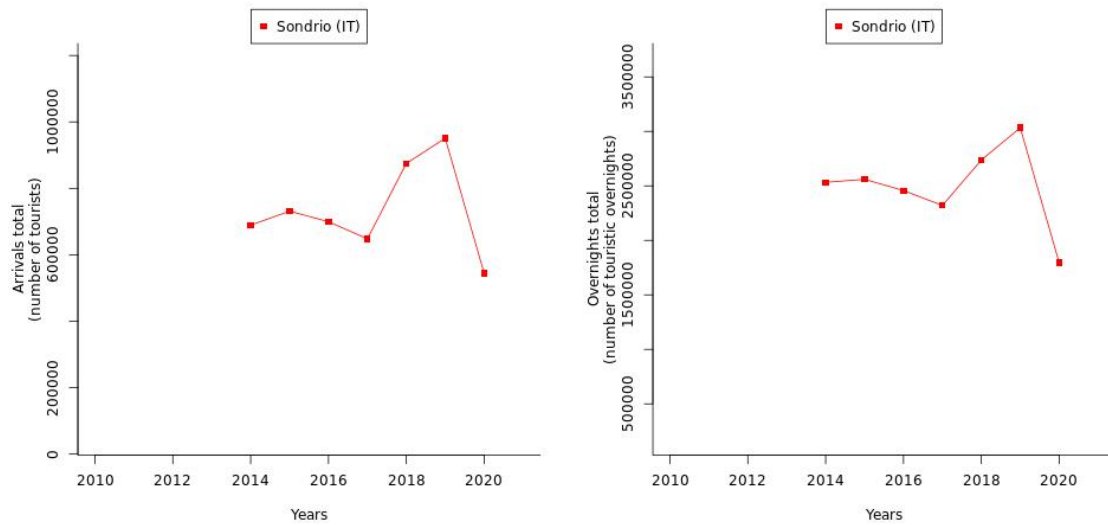
The total length of stay of all tourists together (domestic and foreign) decreased over time, starting at 3.67 days on average in the year 2014, ending up at 3.30 in 2020 (Figure 3.10). The general trend of all other regions contained in the database is showcased by the 25%, 50% and 75% quartiles.

The 25%, 50%, and 75% quartiles are determined (out of all regions for which data is available for the respective year in the database) and these values are displayed over the years. Quartiles are determined by ranking all regions according to the selected indicator and determining the threshold that separates the 25% of those regions scoring lowest on the selected indicator from the rest, the 50% threshold that cuts the ranked indicator in the middle and in this way splits all regions half-half (the so-called median), and the 75% threshold separating the highest scoring 25% from the rest.

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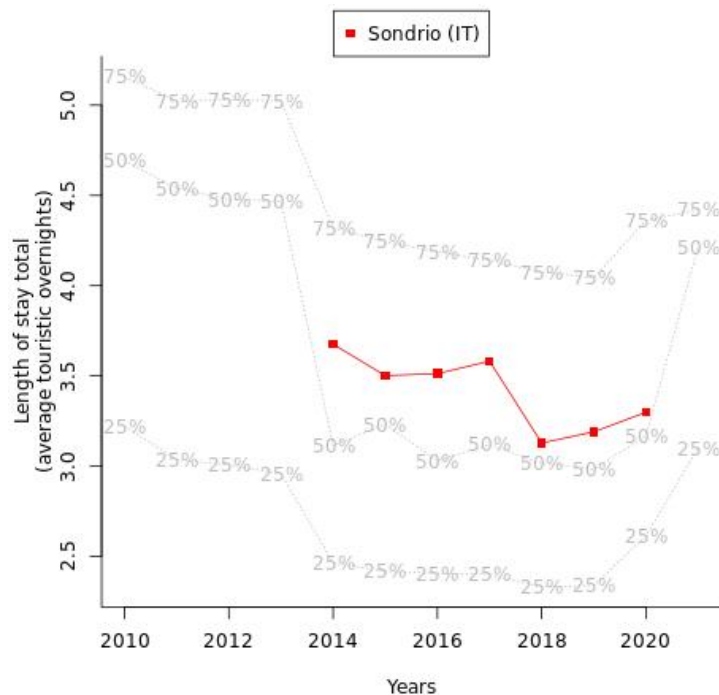
<sup>3</sup> The scale of the y-axis may differ between plots for two regions, so one should take that into account in interpretations.

**Figure 3.9: Arrivals and Overnights Time Series**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database (alphabetical order)).

**Figure 3.10: Length of Stay Time Series**

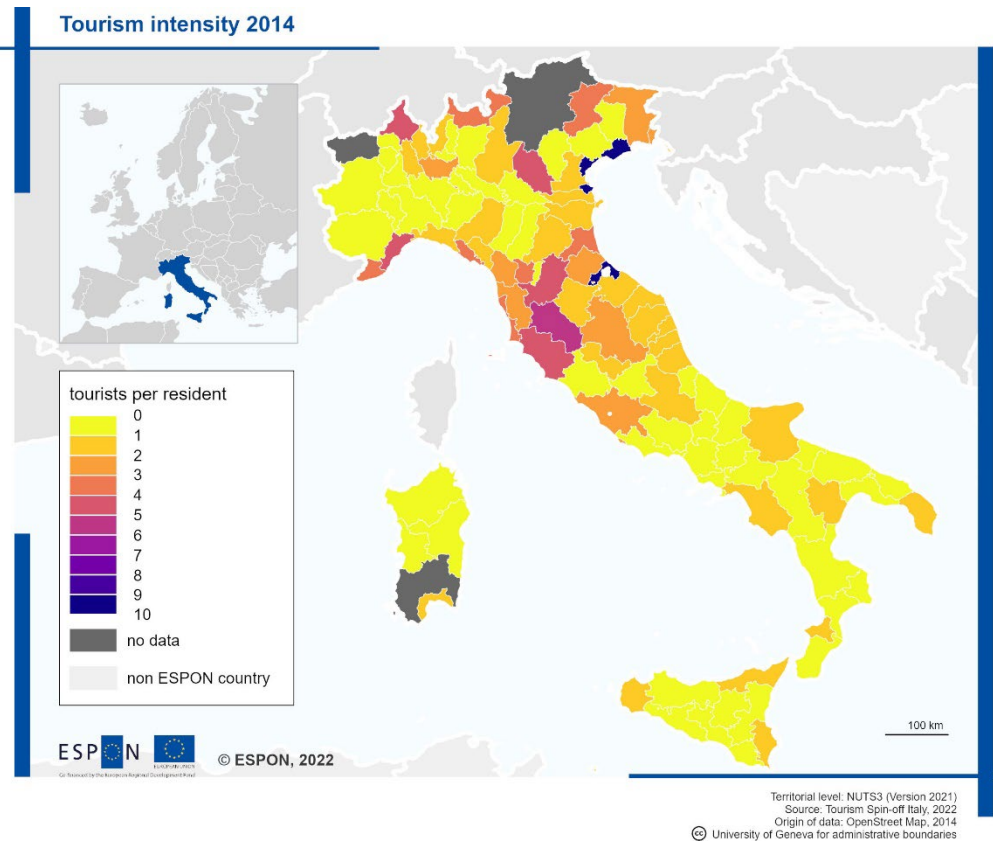


Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order).

Sondrio started in the year 2014 somewhere in the middle between the 50% and the 75% quartile trend. In 2020 it already ended up close to the 50% quartile threshold. Even if there is a general trend towards shorter stays visible from the threshold trends over time, Sondrio's drop in the length of stay goes much faster compared with all other regions in the database.

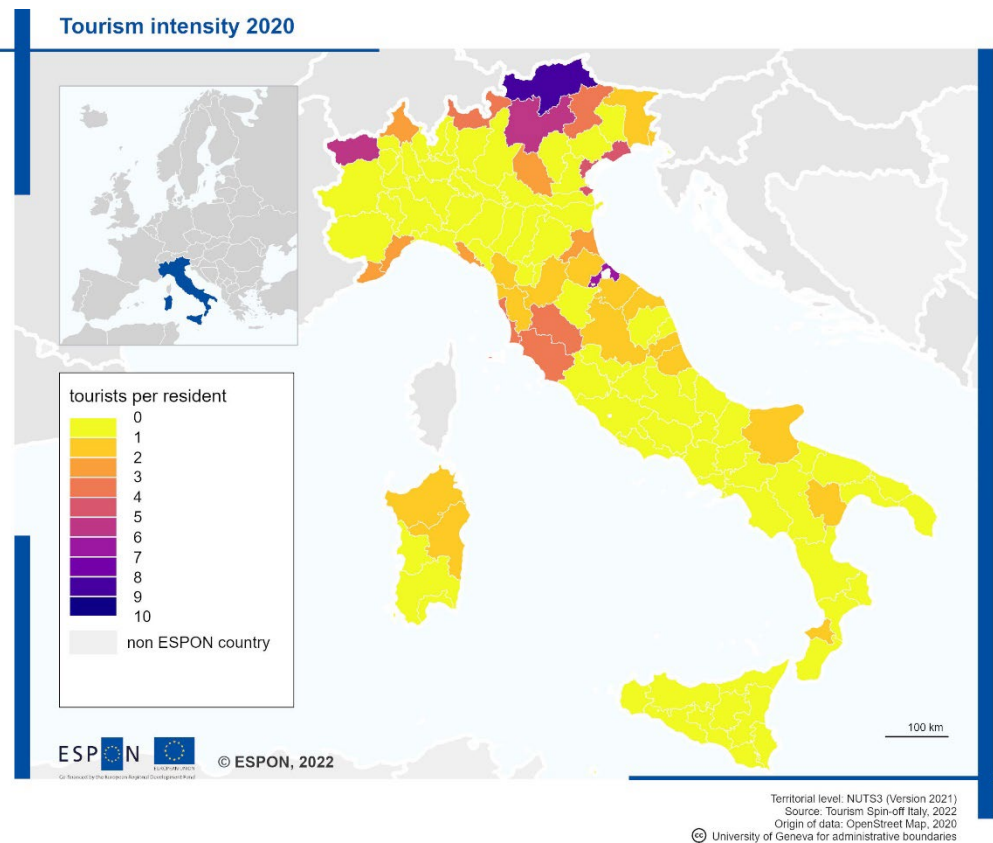
The two figures below (see Figure 3.11 and Figure 3.12) provide a spatial overview through all Italian provinces in terms of tourism intensity (the number of tourist arrivals per resident). Venezia, Rimini and Siena had the highest tourism intensity in 2014, Sondrio was ranked 13. In 2020, the top destinations in terms of tourism intensity were Bolzano/Bozen, Rimini, Valle d'Aosta/Vallée d'Aoste, Trento and Venezia. Sondrio took on rank place 12, pinpointing an increase in tourism intensity. In addition, given that for some of the top ranked destinations in 2020, data was not available for 2014, the rise in tourism intensity for Sondrio must be interpreted even stronger. However, e.g., Rimini's tourism intensity is much higher compared with the one of Sondrio.

**Figure 3.11: Spatial Comparison and Development of Tourism Intensity**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order).

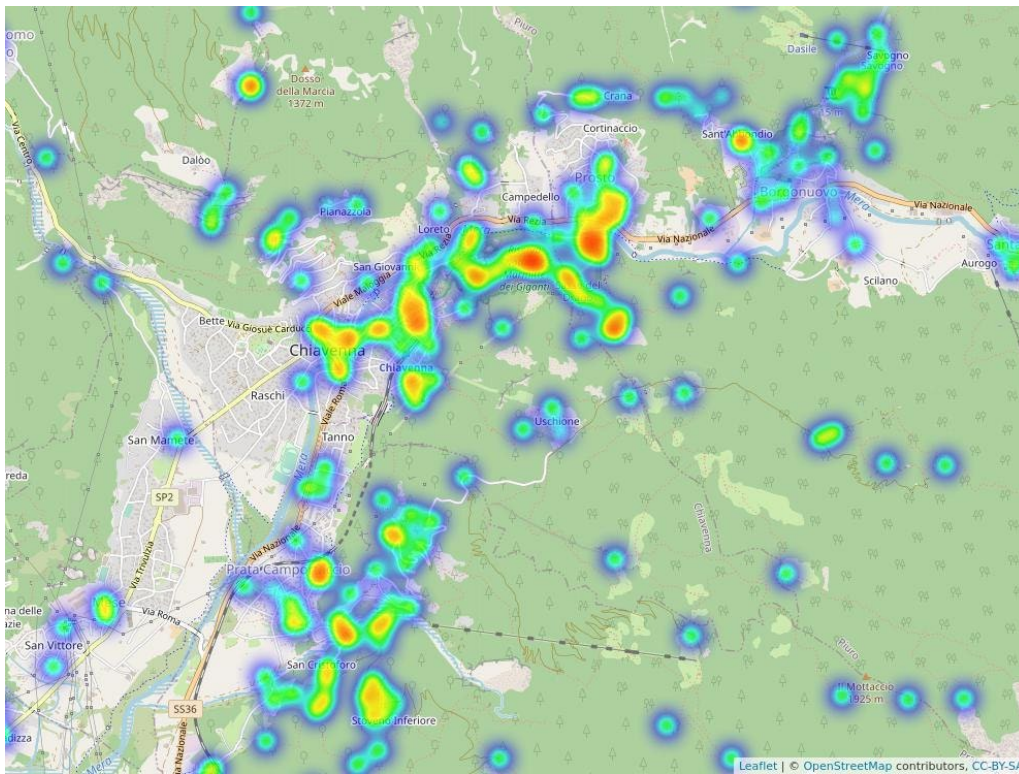
**Figure 3.12: Spatial Comparison and Development of Tourism Intensity**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order).

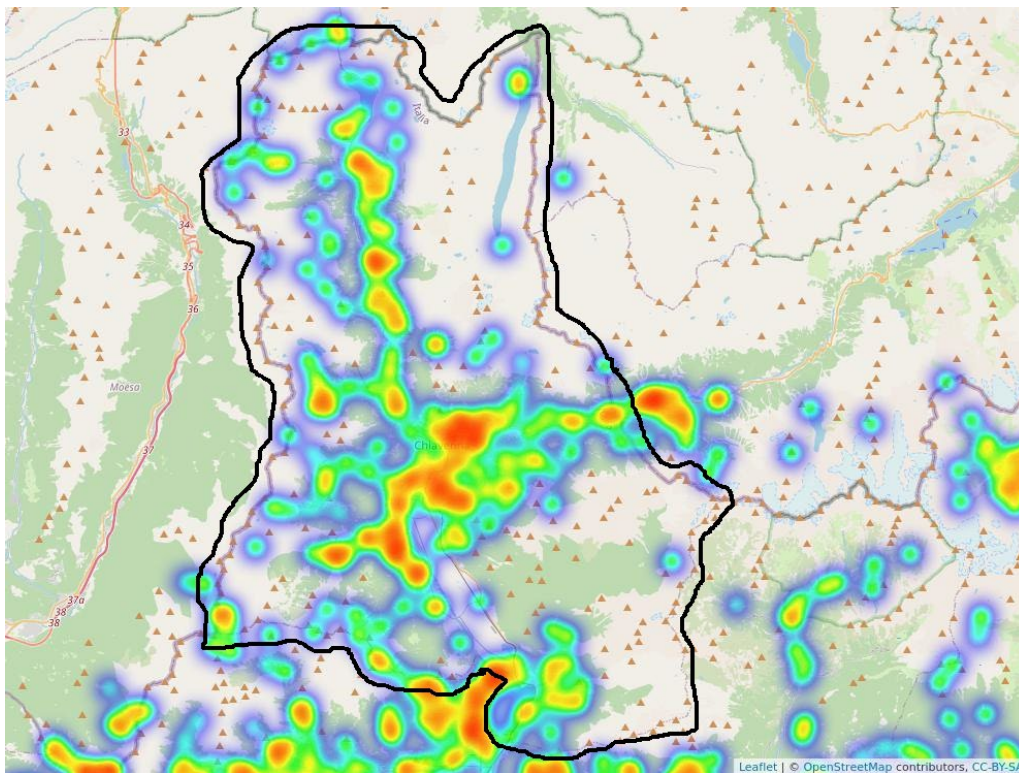


**Figure 3.13: Touristic OpenStreetMap (OSM) Points-of-Interest (POIs) Hotspots around Chiavenna**



Source: Consortium, 2022 (OpenStreetMap data). Note: the concentration of hotspots is pictured as a heatmap, red implying the highest density of hotspots.

**Figure 3.14: Touristic OpenStreetMap (OSM) Points-of-Interest (POIs) Hotspots in Valchiavenna**



Source: Consortium, 2022 (OpenStreetMap data). Note: the concentration of hotspots is pictured as a heatmap, red implying the highest density of hotspots.

Apart from statistical data, presented in the graphs above, tourism flow can be measured with big data as well, here OpenStreetMap data. Figure 3.13 and Figure 3.14 above show the density of touristic OpenStreetMap POIs. Red areas highlight dense areas of OSM POI, yellow ones have a lower density of POI. The following categories are included based on a pre-selection of tourism-relevant OSM-POIs: campsites, restaurants, bars, guesthouses, memorials, artwork, fountains, monuments, pubs, viewpoints, observation towers, tourist information, castles, attractions, cafes, theatres, wayside shrines, arts centres, town halls, hostels, travel agents, museums, caravan sites, fast food restaurants, ruins, picnic sites, stadiums, department stores, parks, archaeological places, water works, bicycle rentals, food courts, bed and breakfast (B&Bs), theme parks, gift shops, motels, beer gardens, malls, nightclubs, and golf courses. Hotspots along the main streets SS36 from the South to Chiavenna, and the SS37 from Chiavenna to the West, are clearly visible.

### 3.7 Tourist flow prediction

The next figures show out-of-sample annual forecasts for the total arrivals, overseas arrivals, and domestic arrivals.<sup>4</sup> However, summarised due to the drop down in 2020, most likely caused by COVID-19, forecasts do not show an increasing trend predicted for the future. This needs to be taken into account whilst interpreting the figures of this section.

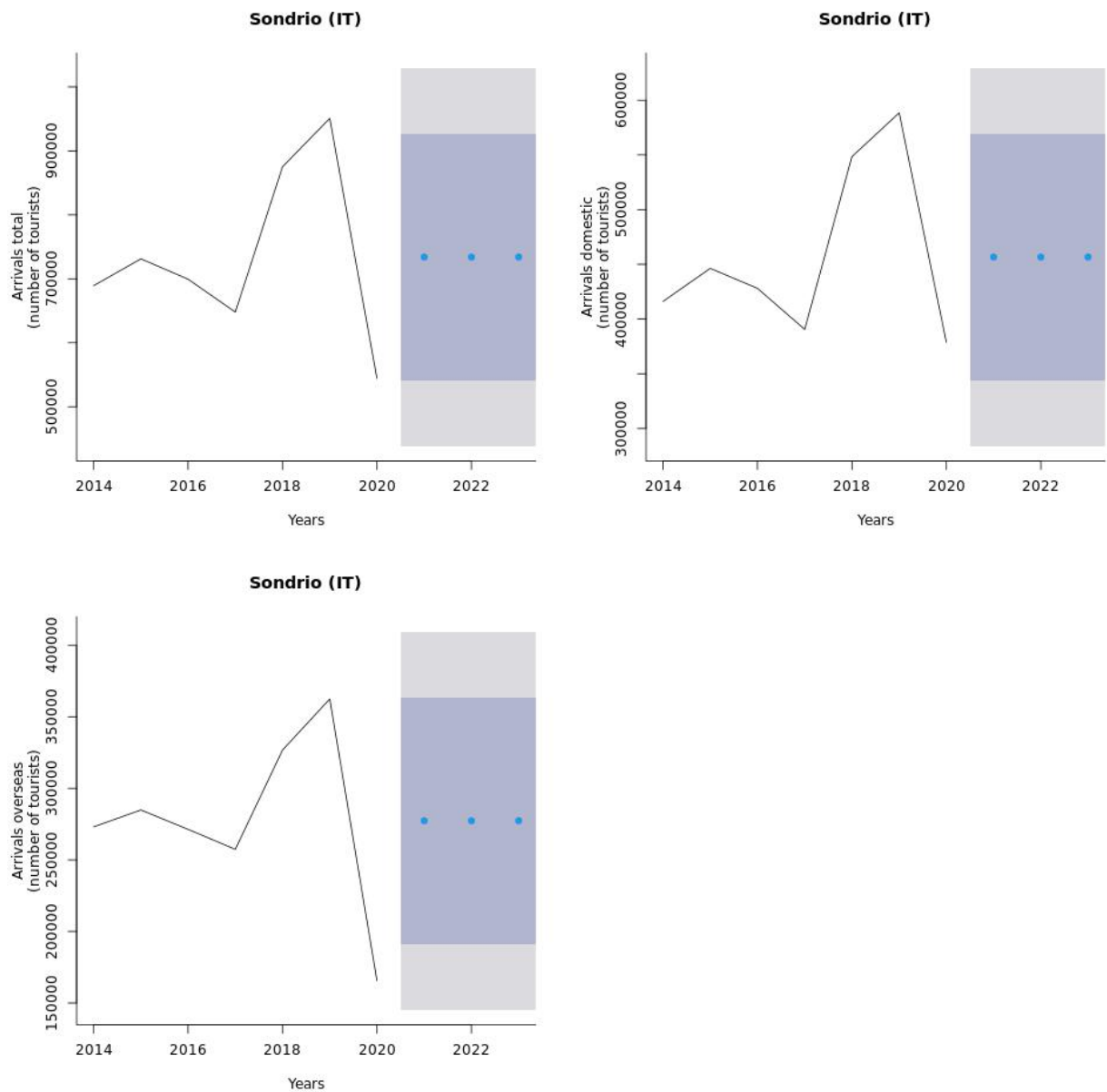
Domestic arrivals and overnights (Figure 3.15) are higher and show a steeper increase over time, compared with overseas arrivals that are lower and outline a not that steep increasing trend.

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<sup>4</sup> Out-of-sample forecasts are produced using the 'forecast' package for R and its 'forecast' function (Hyndman and Kandakar, 2008; Hyndman et al., 2020). In more detail, point and interval forecasts (80% – blue – and 95% – grey – confidence intervals) are calculated for a forecast horizon of three periods ahead, while being robust against missing values and outliers in the forecast variable. The forecast model employed is selected automatically from a range of 30 possible specifications of the univariate Error Trend Seasonal (ETS) forecast model class by minimizing the Corrected Akaike Information Criterion (AICc), which is suitable for small samples. The ETS forecast model class, which comprises all traditional exponential smoothing models, is a state-space framework consisting of one signal equation for the forecast variable, as well as of one up to three state equations for the unobservable components of the forecast variable. The parameters of the different ETS specifications are estimated using maximum likelihood methods.



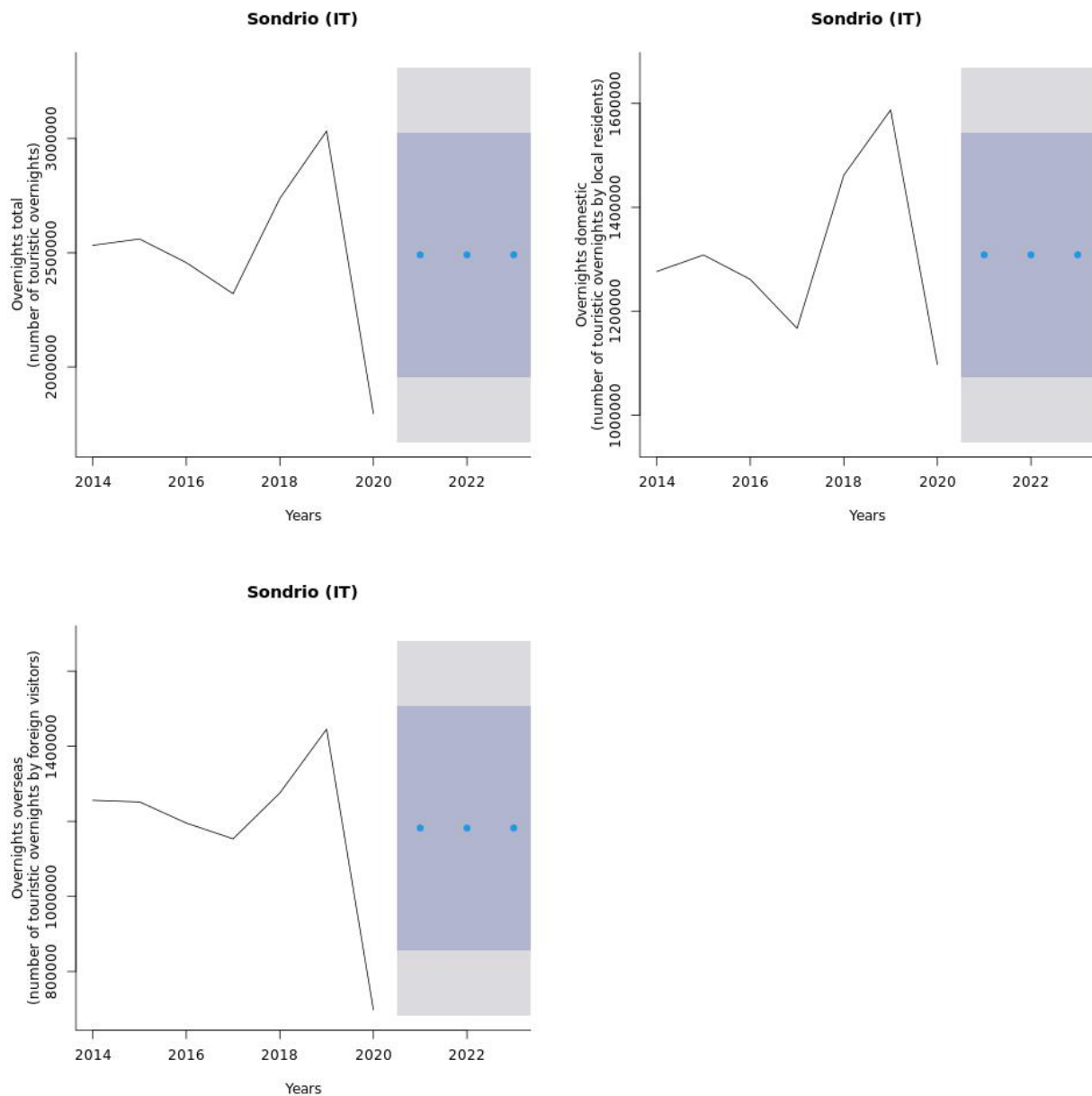
**Figure 3.15: Arrivals (total, domestic, overseas) Prediction**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order). Note: the blue dots are the average forecast, the dark grey colour corresponds to the 80% confidence interval and the light grey is the 95% confidence interval.

The next figures (Figure 3.16) show out-of-sample annual forecasts for the total overnights, overseas overnights, and domestic overnights (from the left to the right). Similar to the predicted forecasts of arrivals, domestic overnights are higher and show a steeper increase compared with overseas overnights being lower and developing only with a slight increase between 2014 and 2019.

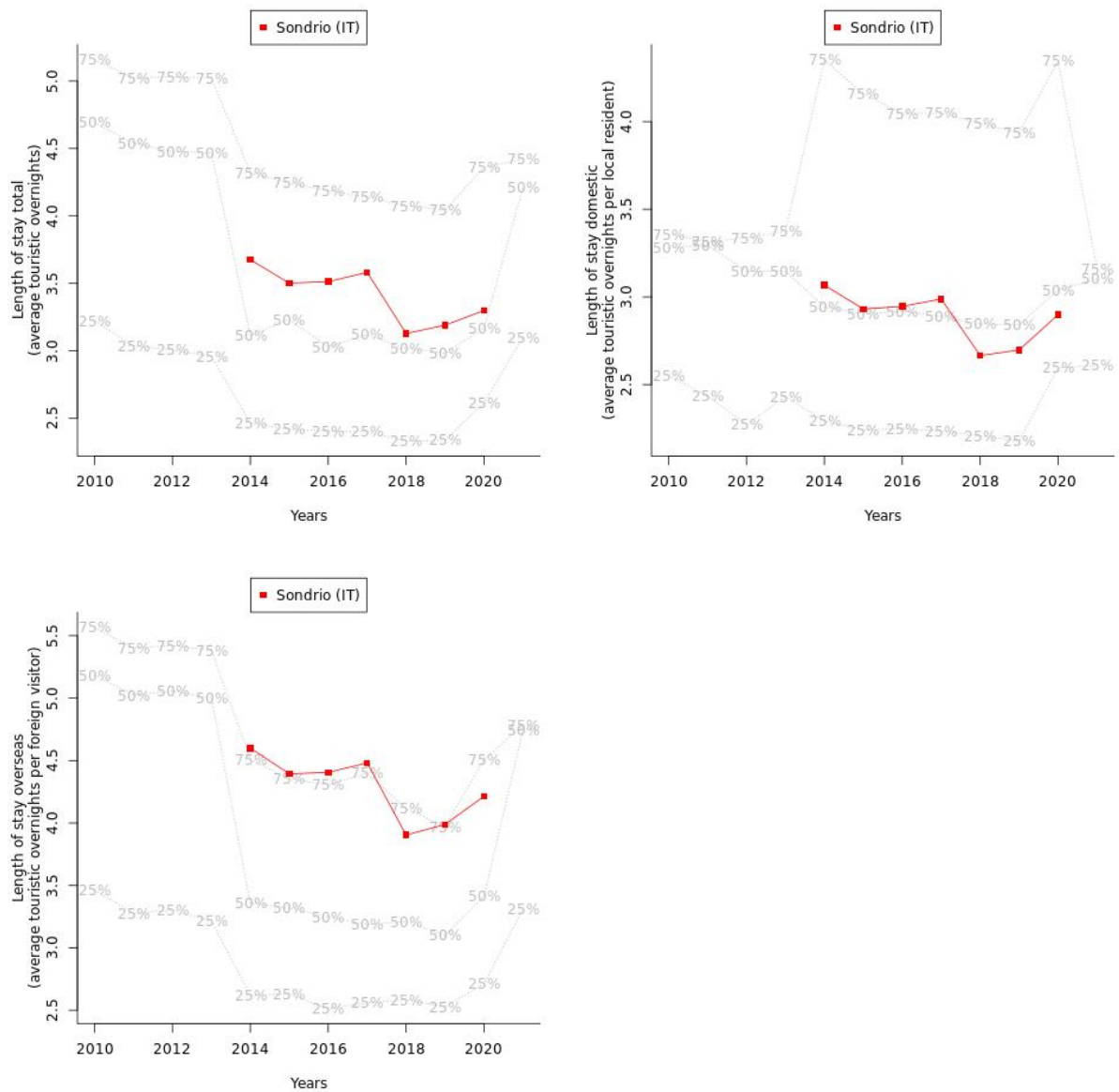
**Figure 3.16: Overnights (total, domestic, overseas) Prediction**



*Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order). Note: the blue dots are the average forecast, the dark grey colour corresponds to the 80% confidence interval and the light grey is the 95% confidence interval.*

Interestingly, the length of stay of overseas tourists is much higher compared with the length of stay of Italian residents (Figure 3.17). Having a look at the quartile thresholds for domestic and overseas lengths of stay derived from all regions in the database, the domestic length of stay moves around the average of all other regions, whereby foreign visitors stay longer in Sondrio compared with the same cohort of all other regions in the database, namely all other Italian provinces, the Slovenian municipality Divaca, and the two Austrian municipalities St. Johann im Pongau and Mayrhofen.

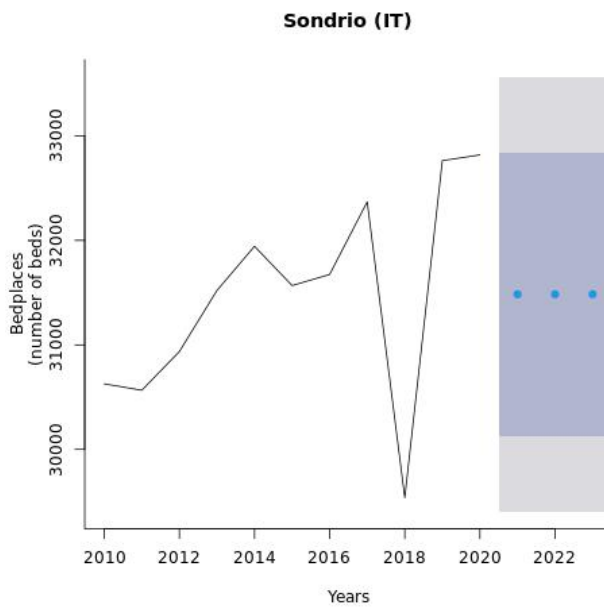
**Figure 3.17: Length of stay (total, domestic, overseas) Prediction**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order).

The number of bed places steadily increased over time from 2010 until 2019 (Figure 3.18). This needs to be seen in the context of the increasing number of overnights.

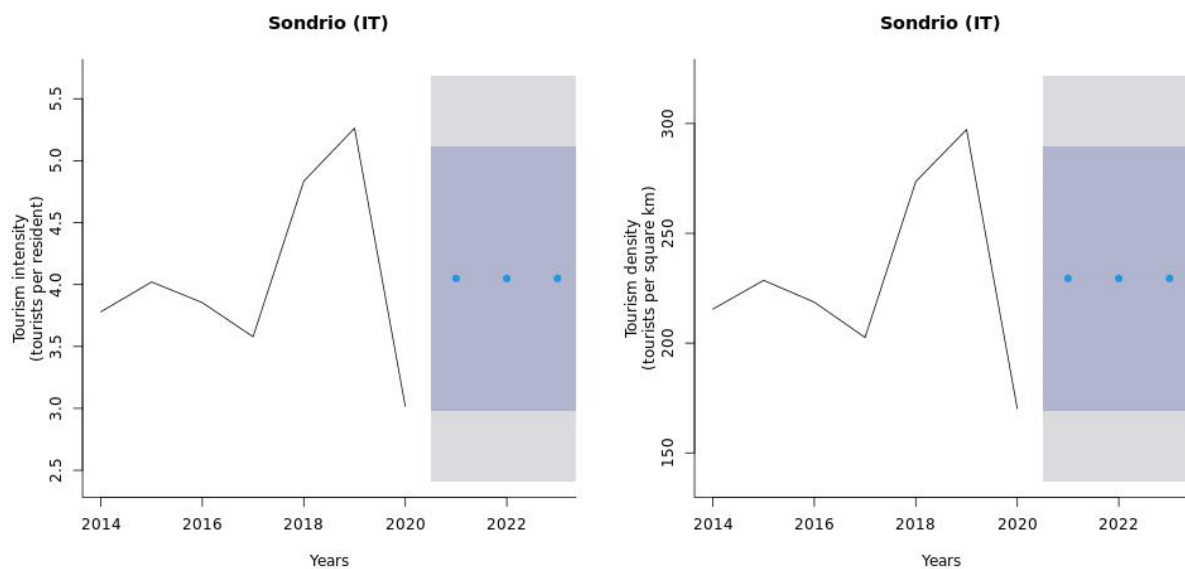
**Figure 3.18: Bed places prediction**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order). Note: the blue dots are the average forecast, the dark grey colour corresponds to the 80% confidence interval and the light grey is the 95% confidence interval.

Finally, tourist flow prediction can be measured with tourism intensity (the number of tourist arrivals per resident), as well as tourism density (the number of tourist arrivals by square kilometre of the region) (Figure 3.19). The former depicts the tourism pressure in relation to the residents, the latter measures tourism pressure in relation to the available space in the region. Both indicators show an increasing trend from 2014 until 2019.

**Figure 3.19: Tourism Intensity and Tourism Density Prediction**



Source: Consortium, 2022 (see Table 3.2: Indicators in the database, alphabetical order). Note: the blue dots are the average forecast, the dark grey colour corresponds to the 80% confidence interval and the light grey is the 95% confidence interval.

## 4 Indicator analysis and assessment of the carrying capacity

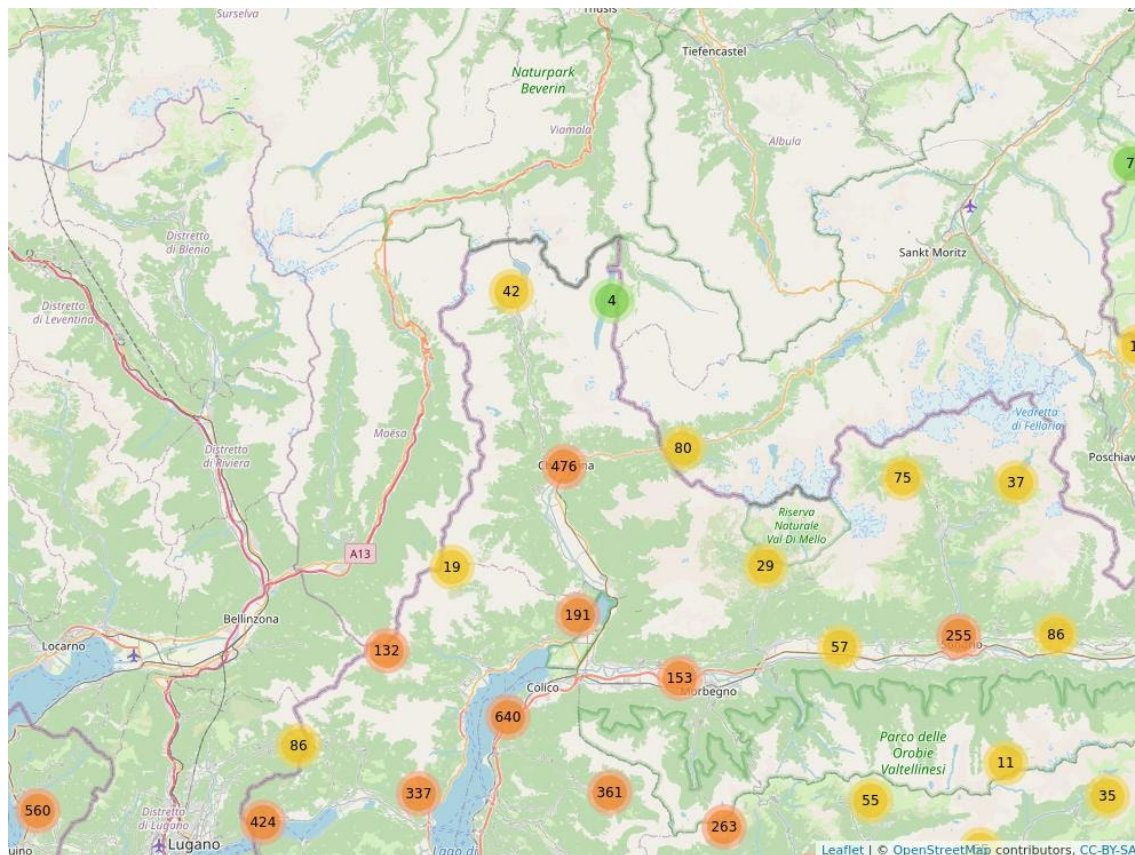
This section presents the analysis of the indicators selected for each identified need.

### Need 1: Inner-regional disparities and un-even distribution of tourism attractions, Valchiavenna is lacking cooperation within the region. Need to foster cooperation

The next two figures (see Figure 4.1 and Figure 4.2) display the absolute number of tourism-related OpenStreetMap (OSM) Points-of-Interest (POIs). The following categories are included based on a pre-selection of tourism-relevant OSM-POIs: campsites, restaurants, bars, guesthouses, memorials, artwork, fountains, monuments, pubs, viewpoints, observation towers, tourist information, castles, attractions, cafes, theatres, wayside shrines, arts centres, town halls, hostels, travel agents, museums, caravan sites, fast food restaurants, ruins, picnic sites, stadiums, department stores, parks, archaeological places, water works, bicycle rentals, food courts, bed and breakfast (B&Bs), theme parks, gift shops, motels, biergartens, malls, night-clubs, and golf courses.

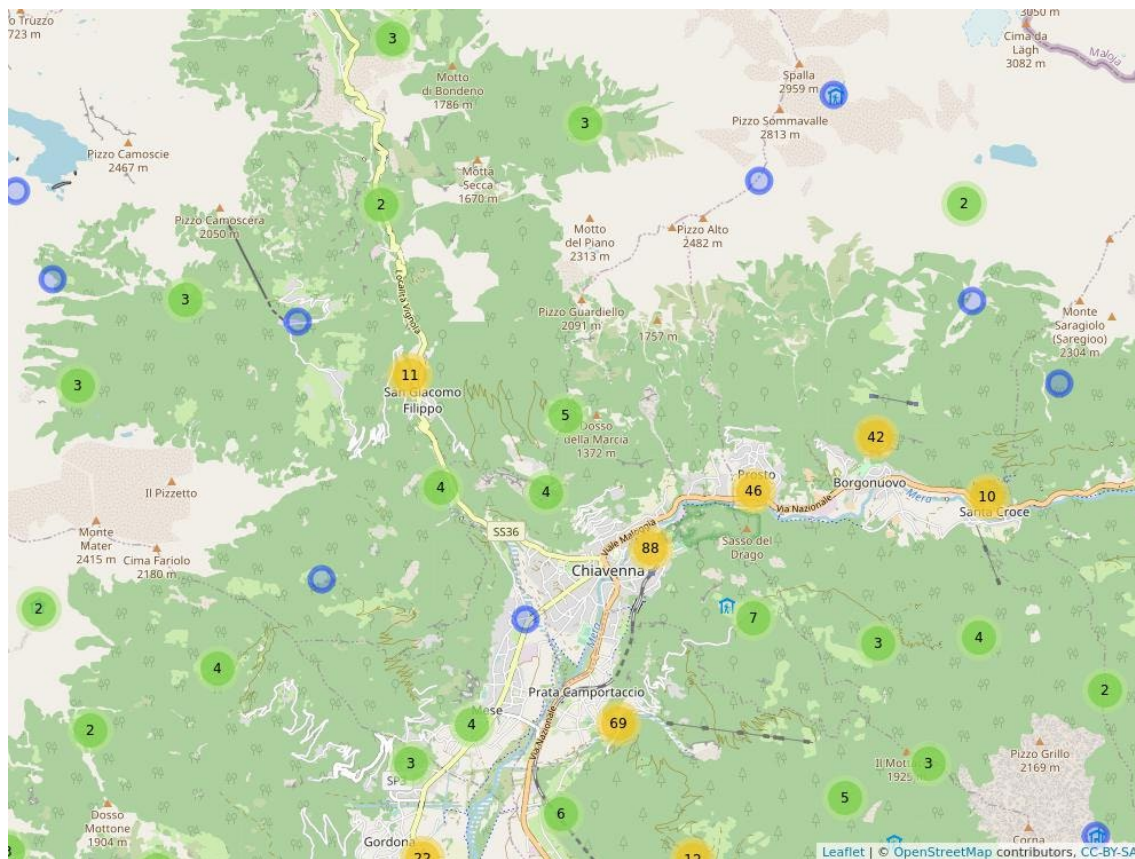
The first graph shows whole Valchiavenna (see Figure 4.1), the second one the area around Chiavenna (see Figure 4.2). Following the circles with a higher absolute number of OpenStreetMap POIs, their alignment along the SS37 up to Chiavenna and along the SS36 towards West are clearly visible. There is only a sparse population of POIs farther away from these main streets indicating an uneven distribution of tourist attractions.

**Figure 4.1: Touristic POI Locations in Valchiavenna**



Source: Consortium, 2022, based on OpenStreetMap (OSM) Points-of-Interest (POI). Note: The colour scheme follows the density of POI with green: lowest, yellow: medium and orange: high.



**Figure 4.2: Touristic POI Locations around Chiavenna**

Source: Consortium, 2022, based on OpenStreetMap (OSM) Points-of-Interest (POI). Note: The colour scheme follows the density of POI with green: lowest, yellow: medium and orange: high.

As visualised in Figure 4.1 and Figure 4.2, the region does not have a tourism centre, it is more characterised by sparsely located attractions which makes it hard to build up a common tourism infrastructure where different entities could for example offer packages or special offers. However, there might be positive externalities resulting of letting tourists explore the region which is quite common in Alpine valleys, since tourists might come across interesting points of interest without having directly targeted them. In terms of the identified need “**Fostering cooperation**”, the region could possibly work on exactly this positive externality approach and identify the explorative points of interest in terms of their potential for cooperation between directly located entities and entities located farther away.

To sum up there is a lack of territorial evidence in terms of cooperation which limits the analysis. Cooperation needs to be analysed on the basis of institutional capacities and governance which goes beyond the scope of the existing study.

### **Need 2: Need for better education and qualification related to tourism and related services – high quality hospitality and sustainable tourism offers as well as language skills**

Each point of the next type of figures shows the combination of the two selected indicators for the selected regions through all years available for both indicators in the database. The darker the coloration of the year (from yellow to red) the more current its observation. Changes along the horizontal/vertical axis depict changes on the “Tourism performance”/“Territorial context” indicator.

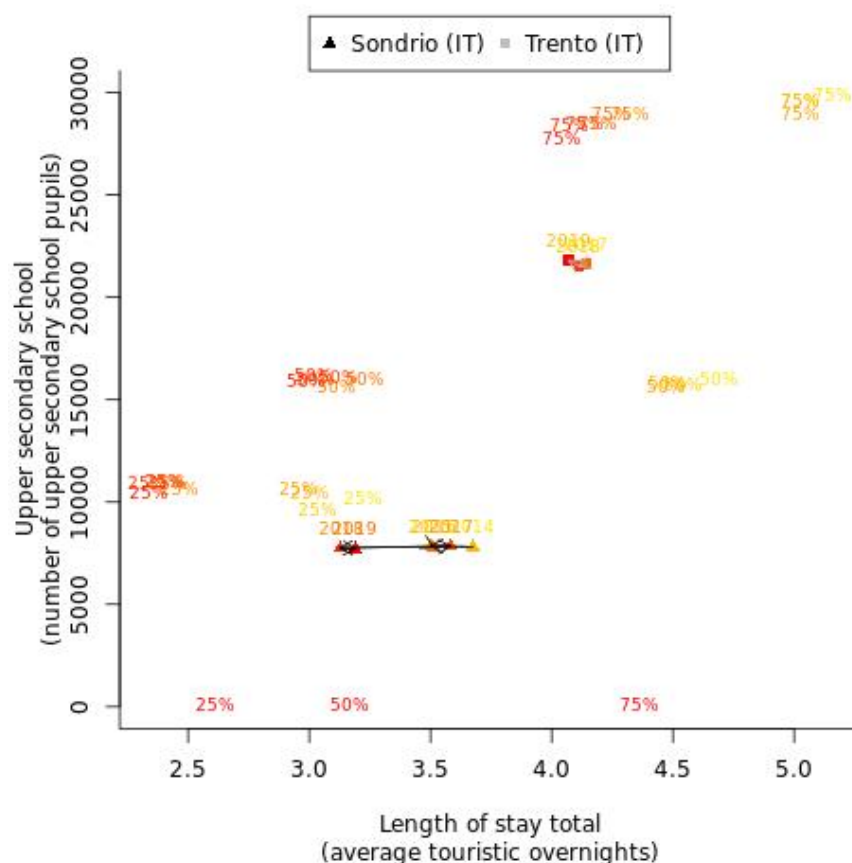
The 25%, 50%, and 75% quartiles are determined (out of all regions for which data is available for the respective year) and these values are displayed over the years. The darker the coloration of the percentage value (from yellow to red) the more current its observation. Quartiles are determined by ranking all regions according to the selected indicator and determining the threshold that separates the 25% of those regions scoring lowest on the selected indicator from the rest, the 50% threshold that cuts the ranked indicator in the

middle and in this way splits all regions half-half (the so-called median), and the 75% threshold separating the highest scoring 25% from the rest.

The number of enrolled pupils in upper secondary schools are used to determine the educational status of Sondrio. Between 2010 and 2019, the number of enrolled pupils ranged within 7,866 (maximum) and 7,682 (minimum) and can be interpreted as quite stable over time. For the purpose of comparing Sondrio with other regions, Trento and Mayrhofen are selected in order to compare Sondrio with one Italian and one Austrian comparison region. Trento's number of enrolled secondary school pupils was varying between 21,836 (maximum) and 21,483 (minimum) between 2010 and 2019. Mayrhofen's number of upper secondary school pupils was 162 in 2011 and 170 in 2019. For need 2, the underlying proposition is that the offer of high-quality jobs in tourism might positively influence the education level, and vice versa. This is the reason why the indicator upper secondary school is visualised against the tourism indicator length of stay in Figure 4.3.

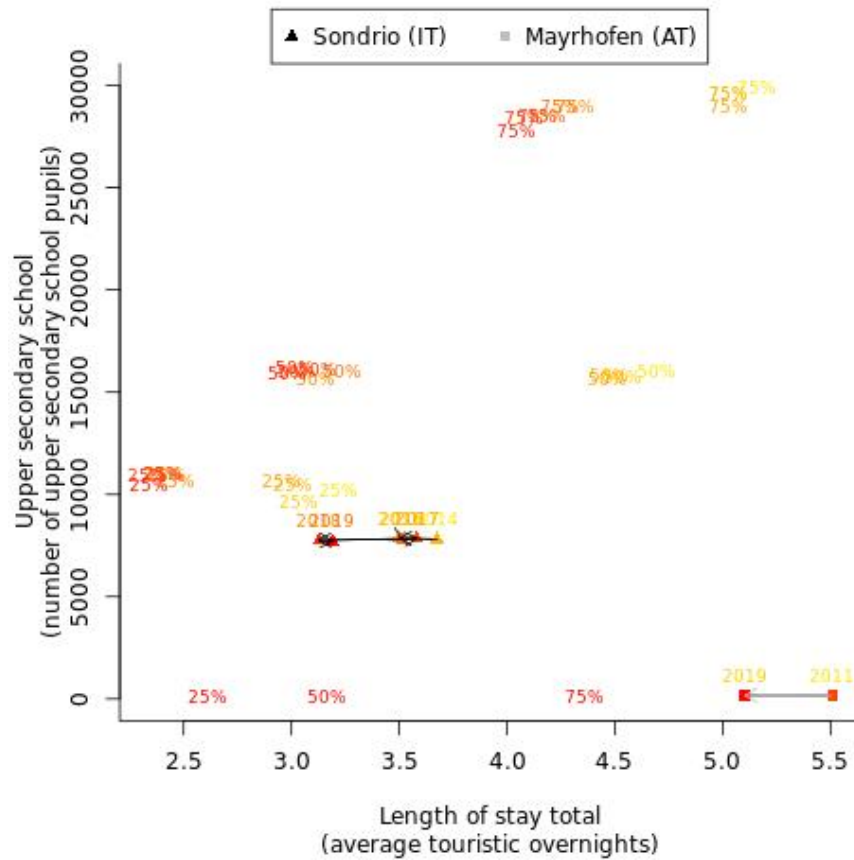
Figure 4.3 visualises the upper secondary school education and its relationship with tourism on the example of length of stay which is defined as the average touristic overnights in the respective destination. Figure 4.4 compares the indicators length of stay and upper secondary school education for Sondrio and for Trento; Trento is characterised by a longer length of stay while having a higher level of upper secondary education. Sondrio is characterised by fewer overnights on average and also a lower level of secondary school education. The graph on the right side compares Sondrio with Mayrhofen in Austria, which is characterized by a relatively long length of stay with five days.

**Figure 4.3: Upper Secondary School Education and its Relationship with Tourism (Comparison with Trento)**



Source: Consortium, 2022 (see Table 3.2). Note: the dark red corresponds to the most recent years and the yellow, the older ones.

**Figure 4.4: Upper Secondary School Education and its Relationship with Tourism (Comparison with Mayrhofen)**



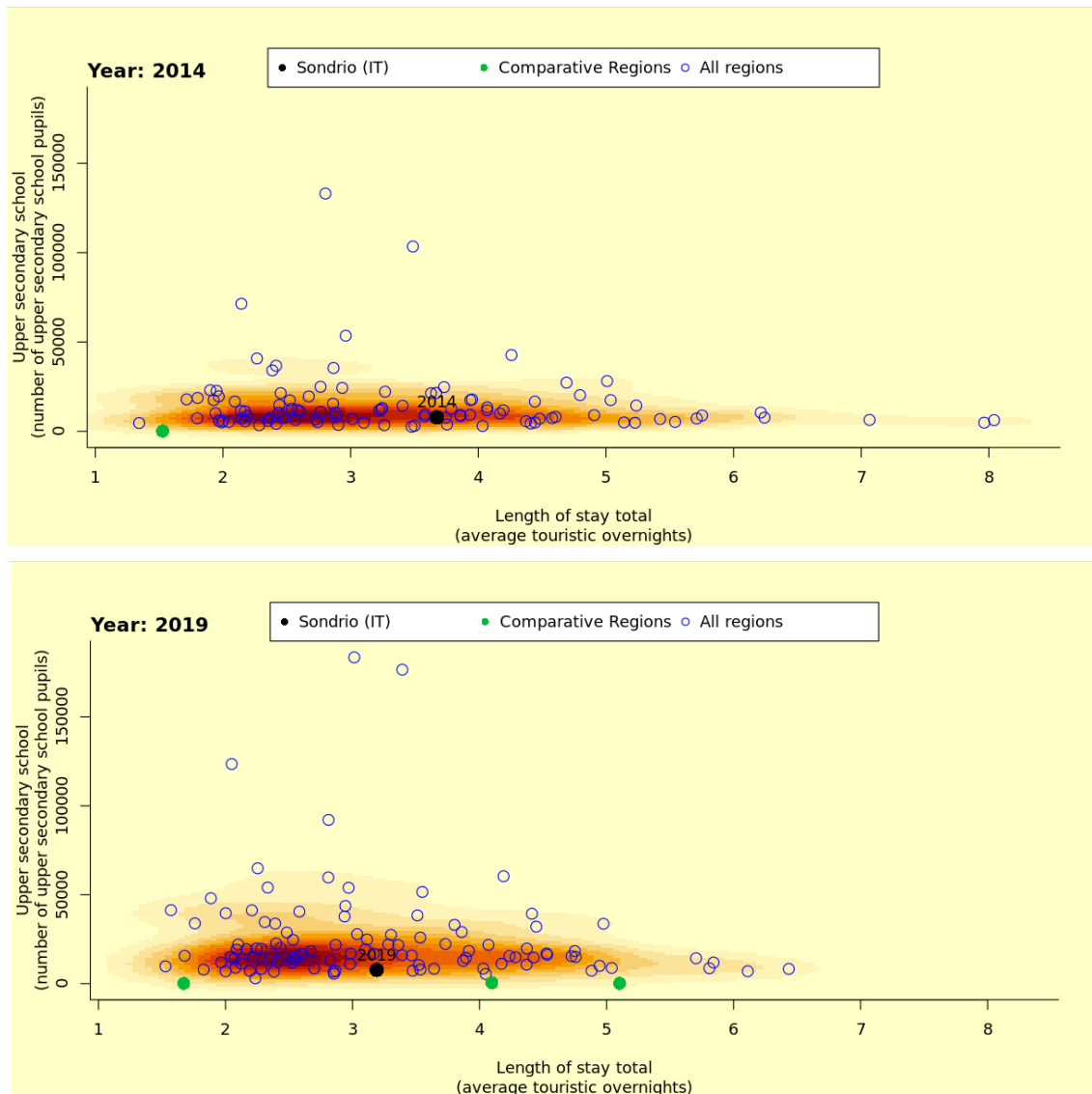
Source: Consortium, 2022 (see Table 3.2). Note: the dark red corresponds to the most recent years and the yellow, the older ones.

In order to benchmark Sondrio with all other regions included in the database with exactly the same indicator pair (length of stay and upper secondary school), a density matrix benchmark visualisation is helpful. In Figure 4.5 each blue circle represents the combination of the two selected indicators (length of stay and upper secondary school education) of all regions where data is available in the database for the displayed year. The big black dot shows Sondrio. The density is calculated using a two-dimensional kernel density estimation. Red areas highlight dense areas of regions, yellow ones are sparsely populated. A region located within/outside the red area is similar/different region compared to all other regions where data is available for in the database. The green dots highlight the before-mentioned comparative regions (Mayrhofen (AT), Sankt Johann im Pongau (AT), and Divaca (SI)). This type of graph helps to see how the destination under study performs in terms of the selected indicators in comparison to all other destinations where data is available in the Dashboard.

As can be seen in Figure 4.5, Sondrio is compared to all other Italian provinces similar in terms of the length of stay both in 2014 and 2019 since it is positioned in the middle of the density cloud. Regarding the number of enrolled upper secondary students in Sondrio, in 2014 Sondrio started in the centre of the densest areas but moves away from the average towards a lower number of enrolled pupils ending up below average. This can also be observed from the two figures above. Sondrio shows a stable trend over time (quite horizontal), compared with a slight increase in the number of enrolled secondary school pupils when following the threshold of the regions located at the 25% threshold over time (from yellow to red).



**Figure 4.5: Upper Secondary School Education and its Relationship with Tourism (Comparison with all Italian provinces, Mayrhofen, Sankt Johann im Pongau, and Divaca)**



Source: Consortium, 2022 (see Table 3.2)

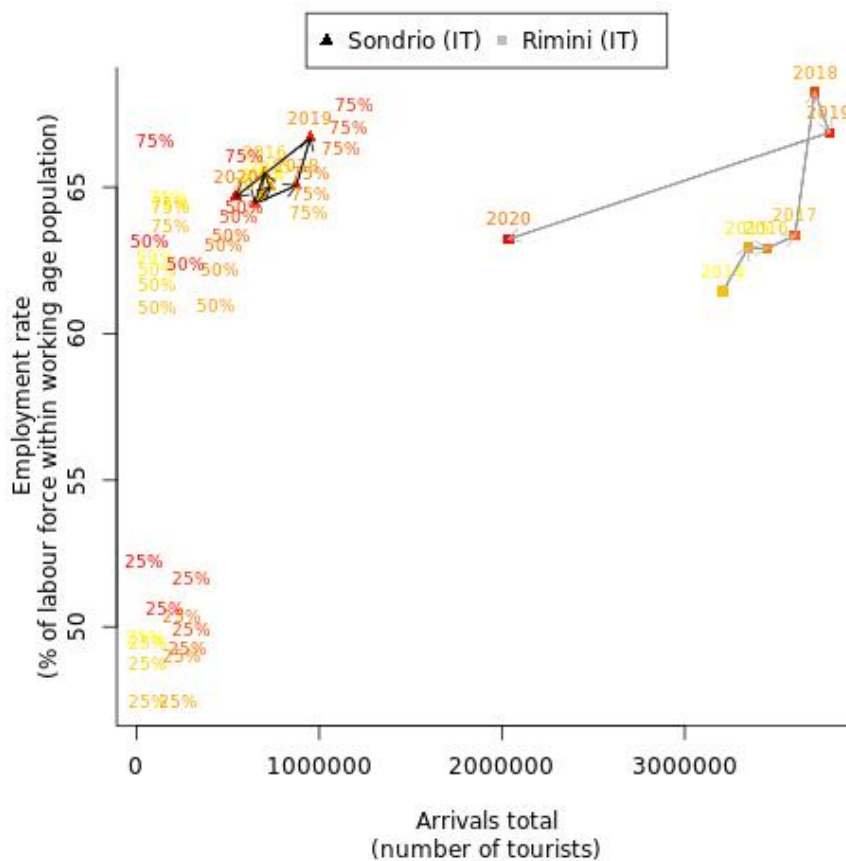
The need “improving education” (Need 2) is in terms of the available data relatively hard to depict since the overall educational level of the residents does not allow any interpretation of the educational level in the tourism industry and related service industries. In order to assess the potential of high-quality hospitality and sustainable tourism offers the needed skills would be measured in the respective fields of employment. Data for indicators like educational level of employees in tourism are not available in the publicly accessible statistic databases at such level. However, the regional stakeholders identified this as one of their pressing needs. Therefore, in order to provide a more in-depth analysis, more specific indicators like the mentioned educational level of employees in tourism would need to be provided by respective public authorities in order to be able to assess this particular need in depth.

**Need 3a: Economic potential has to be enlarged (also but not only related to tourism) in order to counteract brain-drain and depopulation. – Entrepreneurial activities have to be encouraged and fostered**

There is a clear correlation between the number of arrivals and the provided tourism services which leads to the assumption that a higher number of arrivals requests more tourism services. Therefore, an increase could lead to a higher employment rate due to additional job opportunities. Of course, this is not always the

case and one should refrain from interpreting a causal relationship here. Still, it is one of the most important societal facts with relation to tourism development, that even if a strong correlation between tourism activities and employment in general is not taken into account, the secondary and leverage effects of tourism cannot be neglected. This means that the crossing of tourism intensity (as expressed by total arrivals) and employment tells a lot about the welfare creating potential of the tourism sector vis-à-vis the overall regional economy (see Figure 4.6). So, when comparing a rather well-known tourism related region in Italy (like Rimini) and the lagging region of Sondrio it becomes apparent that tourism development shows quite a leap in the "classic" tourism region Rimini and a far less significant development in Sondrio. The "pull-effect" of tourism would therefore imply that overall employment and thus regional value-added should also be significantly better off in Rimini as compared to Sondrio. What can be seen – however – is that while overall the employment development in Rimini is higher (with a peak of well more than 65% on 2018) the difference as compared to Sondrio (and thus Valchiavenna) is not that large (in 2018 employment was in Sondrio at around 65%). The negative implications on the dependency on tourism in Rimini can be seen with the Covid effects in 2020, where Sondrio showed even a better employment situation than the latter. In other words: Sondrio (and with that Valchiavenna) showed with this more balanced employment situation (apparently with less dependency on tourism alone) and thus actually proved a better resilience to shocks. This means that with respect to the need identified, the territorial facts would corroborate that if the economic basis in the region is intended to be extended, it should be done in a balanced way, so that a rising tide may raise all boats equally.

**Figure 4.6: Employment Rate and its Relationship with Tourism (Comparison with Rimini)**

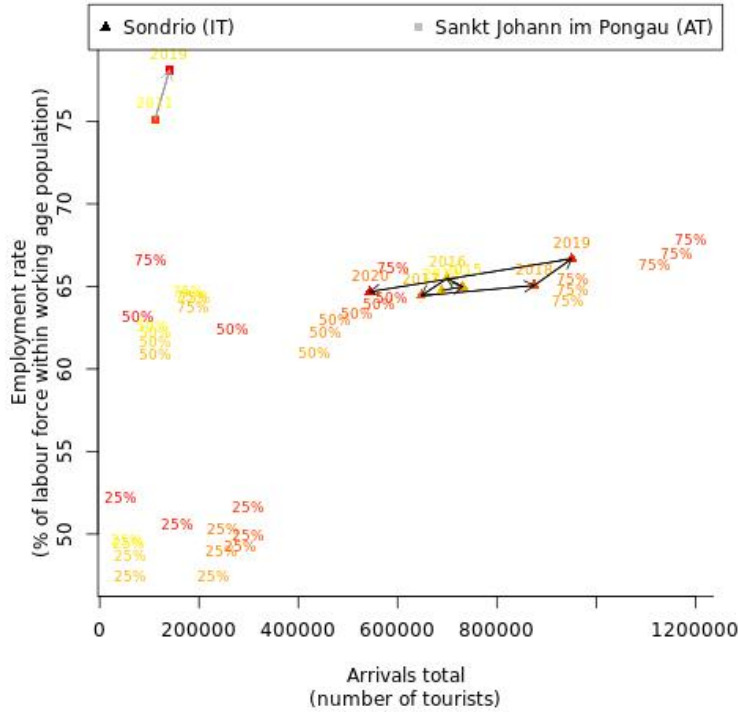


Source: Consortium, 2022 (see Table 3.2). Note: the dark red corresponds to the most recent years and the yellow, the older ones.

Comparing the development of Sondrio's employment rate with two comparable regions from a touristic point of view (compared with the tourism indicator arrivals) shows that the employment rate in Mayrhofen between the two census years (2011: 61.9%, 2019: 66.5%) increased a little bit more, namely 4.6%, compared with the one of Sondrio between the same two respective years (2011: 62.8%, 2019: 66.7%), namely 3.9%. The

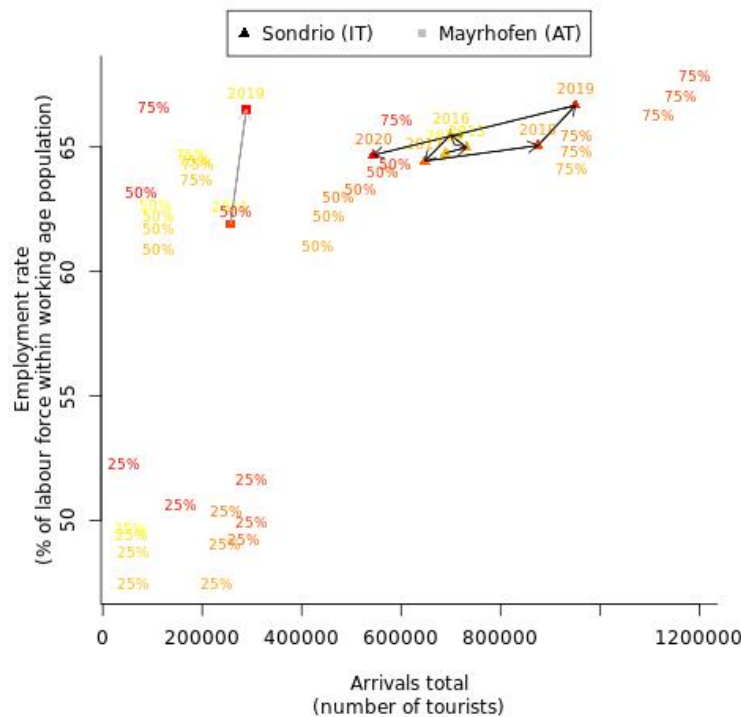
employment rate in Sankt Johann im Pongau increased between the two census years by 3% (2011: 75.1%, 2019: 78.1%).

**Figure 4.7: Employment Rate and its Relationship with Tourism (Comparison with Sankt Johann im Pongau)**



Source: Consortium, 2022 (see Table 3.2). Note: the dark red corresponds to the most recent years and the yellow, the older ones.

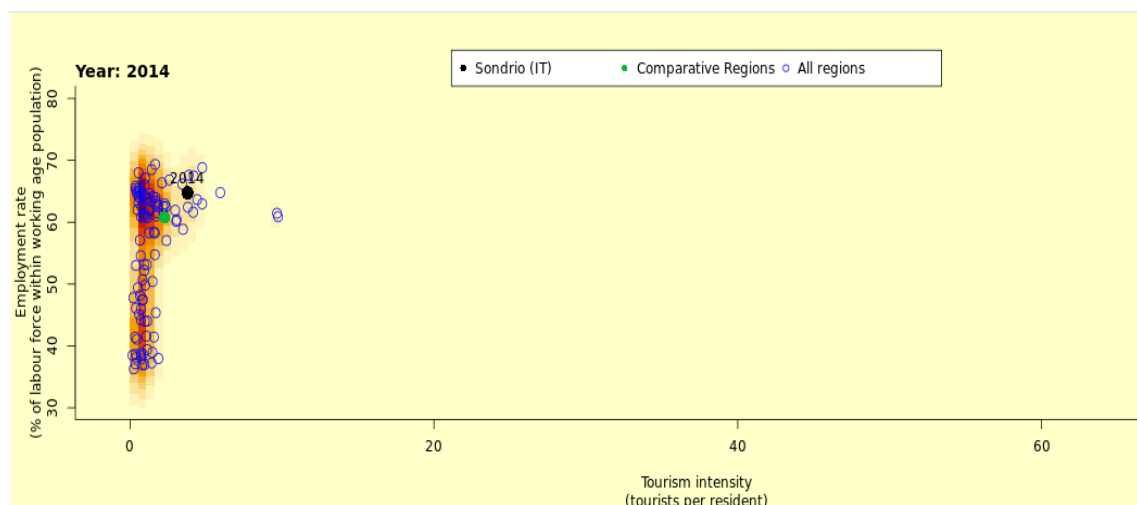
**Figure 4.8: Employment Rate and its Relationship with Tourism (Comparison with Mayrhofen)**



Source: Consortium, 2022 (see Table 3.2). Note: the dark red corresponds to the most recent years and the yellow, the older ones.

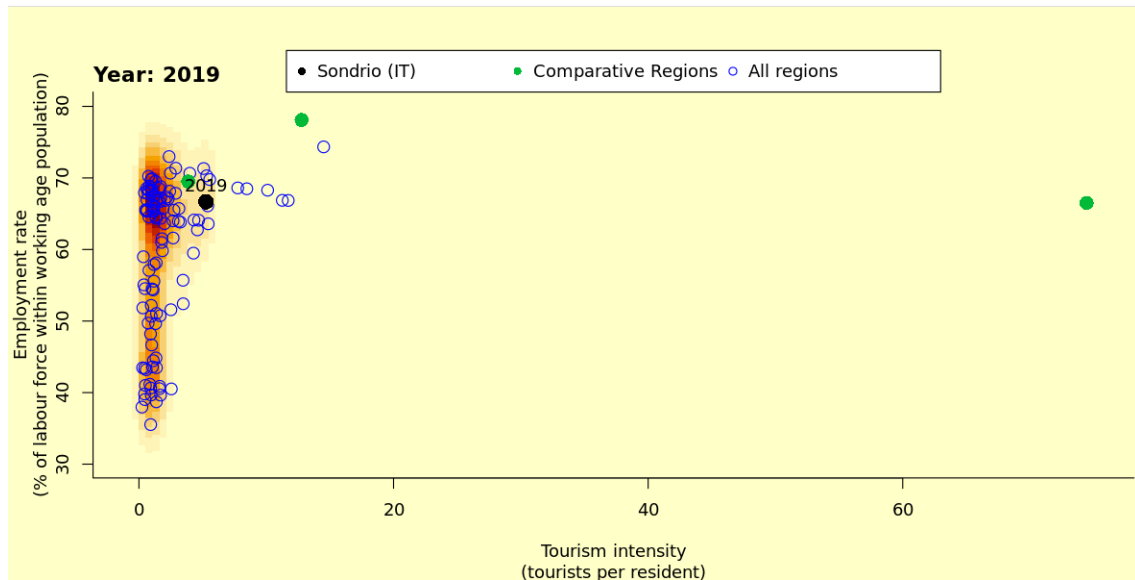
The next two graphs (see Figure 4.9 and Figure 4.10) compare the employment rate and the tourism intensity in relation to each other. Tourism intensity, which is the number of arrivals per resident, increased for Sondrio from 3.8 in 2014, to 5.3 in 2019. Divaca shows a similar increase from 2.26 in 2014 to 3.9 in 2019, as did Sankt Johann im Pongau (10.54 in 2014 to 12.8 in 2019). Mayrhofen showed a tourism intensity in 2014 of 66.9 and in 2019 of 74.4, indicating a lot more pressure per inhabitant and a warning trend. On the other hand, rising employment rates accompanied by tourism intensity positively impact the economy up to a certain level.

**Figure 4.9: Employment Rate and its Relationship with Tourism (Comparison with all Italian provinces, Sankt Johann im Pongau, Mayrhofen and Divaca) (2014)**



Source: Consortium, 2022 (see Table 3.2)

**Figure 4.10: Employment Rate and its Relationship with Tourism (Comparison with all Italian provinces, Sankt Johann im Pongau, Mayrhofen and Divaca) (2020)**



Source: Consortium, 2022 (see Table 3.2)

All in all, what can be deduced from the territorial evidence is that all Inner Alpine valleys seem to have the same trend that tourism does not necessarily boost economic performance as measured by overall employment. This might be explained by the similarity of all three regions which show a vicinity to strong economic centers and thus serve merely as commuting “pools” for these regions (Inn valley, Salzburg, Bergamo/ Milano and Switzerland).

The identified need “**enlarging the economic potential**” (Need 3a) can be analysed on the basis of standard economic indicators like employment and employment rate. In order to provide a tailored analysis, data for indicators like unemployment, unemployment rate, number of touristic businesses, income, etc. would be needed. These specific indicators are not publicly accessible and could therefore not be included into the analysis.

### **Need 3b: To increase the attractiveness of the region to citizens the inner-regional infrastructure (mobility and SGEIs) will have to be improved**

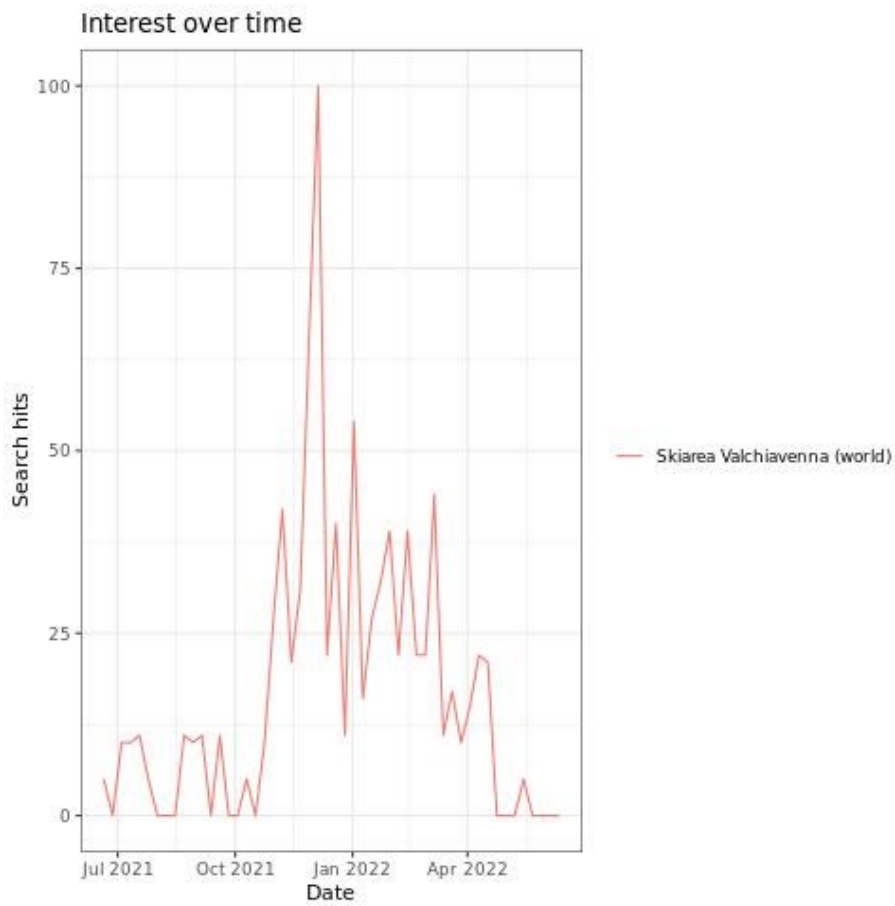
Need 3b can neither be covered in the dashboard by statistical data nor big data. Since such data is not publicly accessible. The only source available has been the EURAC study on SGEIs (Eurac, 2017), which has been quoted amply in the introduction of the region above (see section 2.1.3).

### **Need 4a: Seasonality of tourism will have to be extended – the two main seasons of winter and summer will have to be more integrated and additional tourist segments to be attracted. – This will call for other/sustainable tourism infrastructure**

The next five figures show the interest rate of a search term based on the Google Search hit rate over the time span of one year as an alternative approximate of (touristic) interest in the regions.

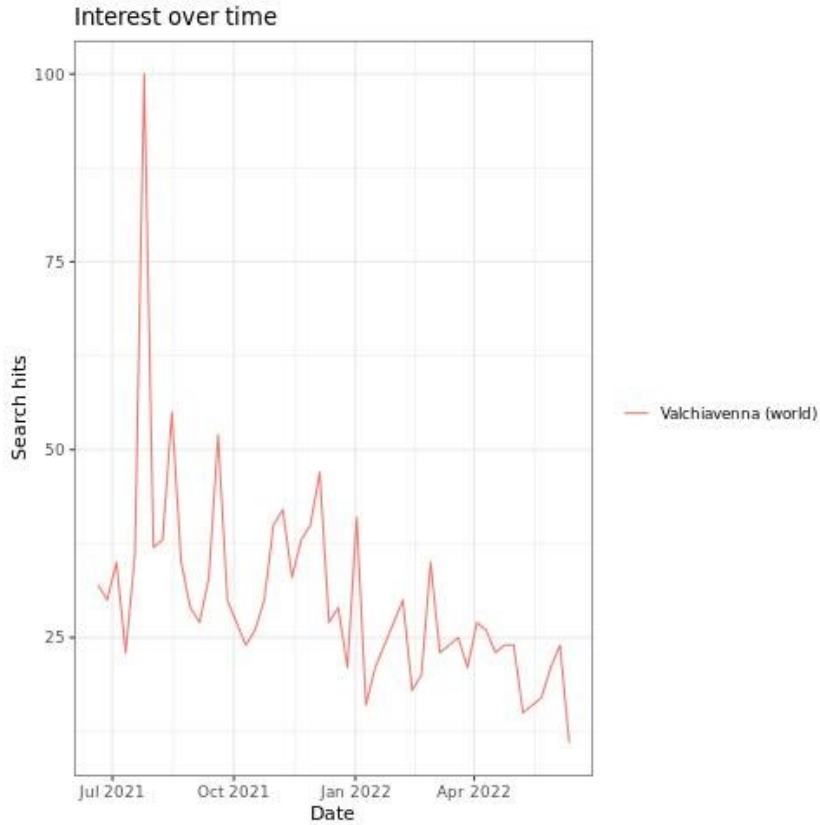
The ski area Valchiavenna has its peak in December, Valchiavenna has its peak in August. Madesimo, a ski area in the province Sondrio, has two high seasons, one from August to September, and another one from November till March. The same is true for Chiesa Valmalenco. Both have a higher peak during the winter season compared with the summer season. Likewise, Mayrhofen, an Austrian ski area, has two peaks during the same months, but the two are of nearly equal weight. This is a good example for an equal spread of tourists among two different seasons.

**Figure 4.11: Google Search Hit Rate of the Skiarea Valchiavenna**



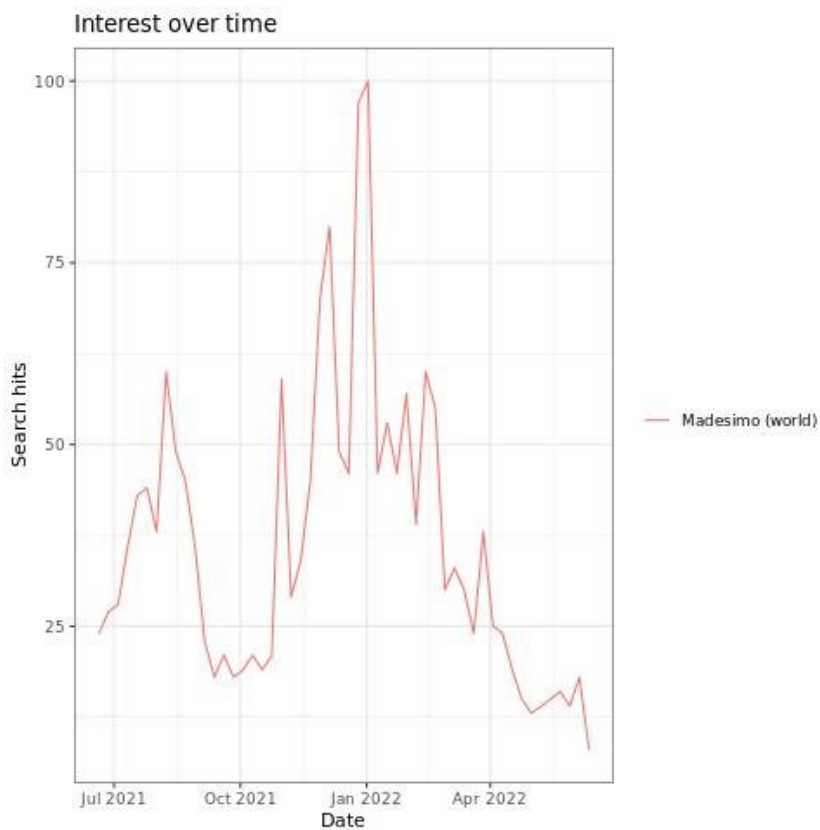
Source: Consortium, 2022 based on Google Search.

**Figure 4.12: Google Search Hit Rate of Valchiavenna**



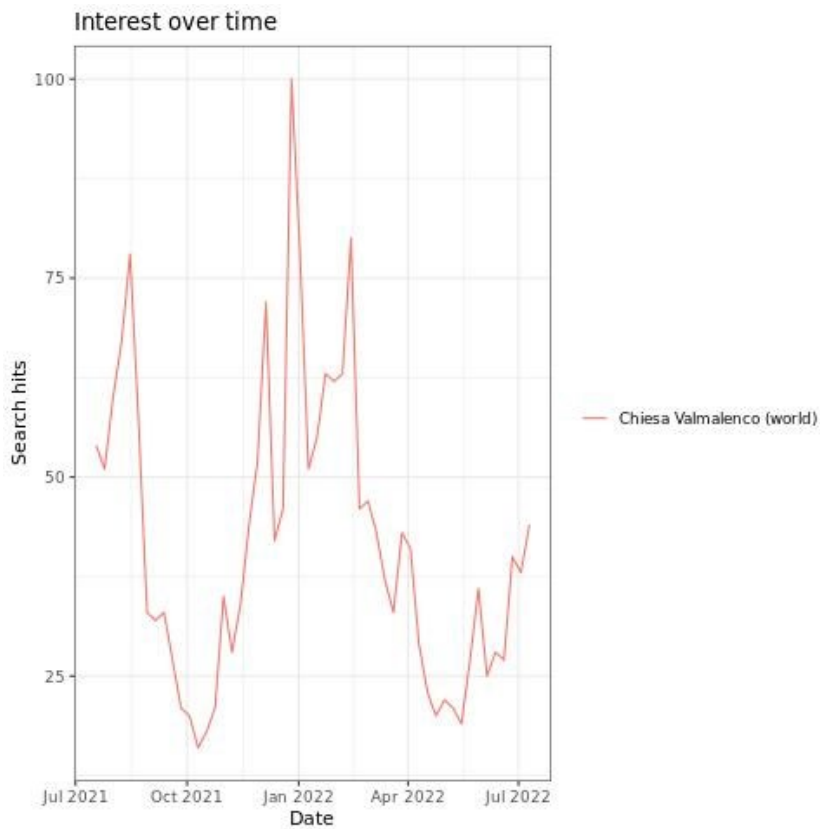
Source: Consortium, 2022. based on Google Search

**Figure 4.13: Google Search Hit Rate of Madesimo**



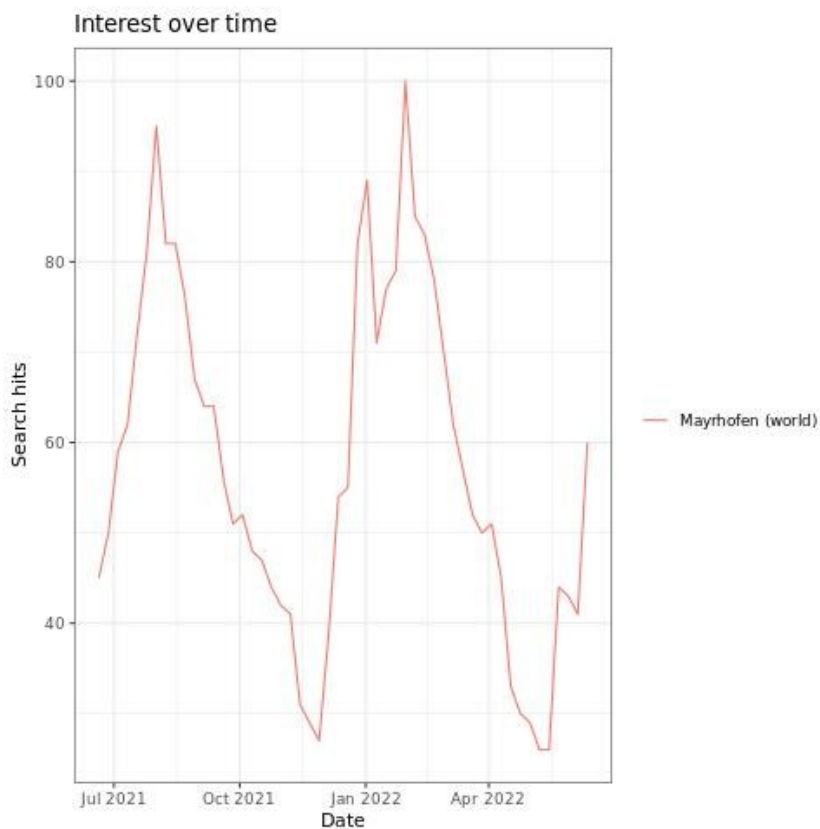
Source: Consortium, 2022. based on Google Search

**Figure 4.14: Google Search Hit Rate of Chiesa Valmalenco**



Source: Consortium, 2022 based on Google Search.

**Figure 4.15: Google Search Hit Rate of Mayrhofen**



Source: Consortium, 2022. based on Google Search

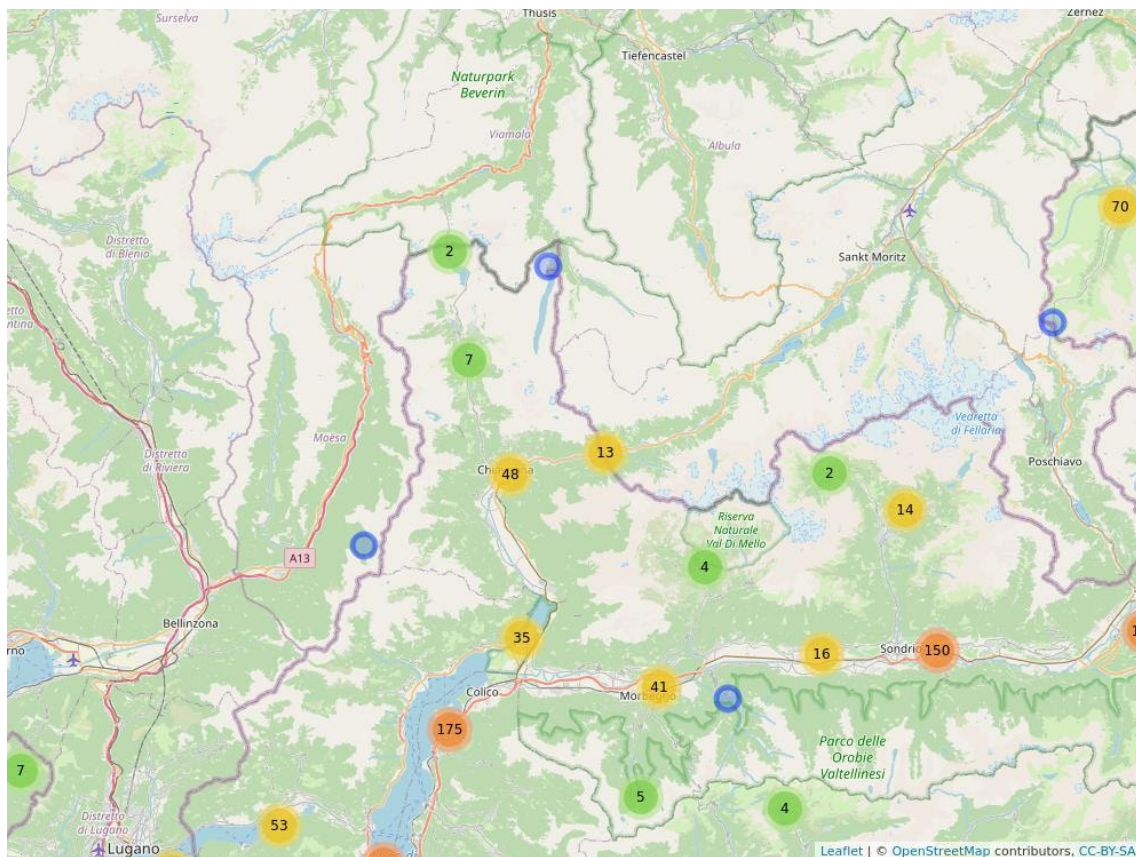


For providing a better overview of the identified need of “extending tourism seasonality”, seasonality data would be needed for integrating indicators like for example arrivals seasonality. The used Google trends (big data) can be seen as a second-best approach which helps to overcome the lack of statistical data.

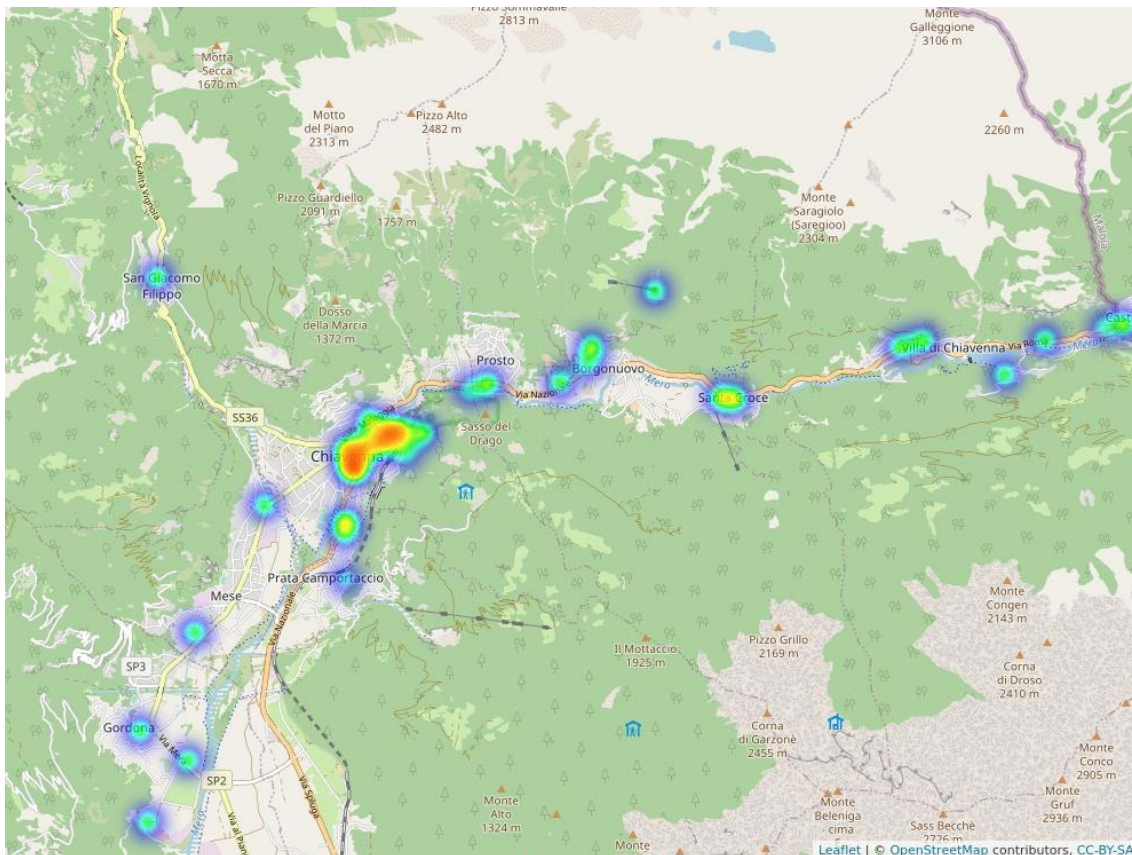
**Need 4b: The concentration of tourism activities in certain areas within the region leads to unwanted hotspots of land-use conflicts and negative externalities of tourism/temporary dwellers. – There is a need for careful land use planning and mix of land use types.**

In order to visualise the concentration of tourism activities, the absolute number of OpenStreetMap (OSM) Points-of-Interest (POIs) displayed for the gastronomic OSM-category including the following categories: Restaurants, pubs, cafes, etc. is selected. As with the touristic POIs, gastronomic locations are also aligned along the main streets SS37 from the South to Chiavenna and along the SS36 from Chiavenna to the West. The same is visible from the next but one figure.

**Figure 4.16: Tourism Intensity and Tourism Density Prediction**



Source: Consortium, 2022. based on OpenStreetMap (OSM) Points-of-Interest (POI). Note: The colour scheme follows the density of POI with green: lowest, yellow: medium and orange: high.

**Figure 4.17: Tourism Intensity and Tourism Density Prediction**

Source: Consortium, 2022 (Open Street Map Data). Note: the concentration of hotspots is pictured as a heatmap, red implying the highest density of hotspots.

The lack of territorial evidence about land use planning did not allow to provide an in-depth analysis of land use in the region. Data about agricultural land or Natura 2000 areas would have helped to increase the level of the identified need “**improving land use planning**” (Need 4b) but was not available for the respective regions.

#### 4.1 Workshop 2: Organisation and participants

The second workshop took place on June 20, 2022 (from 09:15am to 13:30pm CEST). It was organised physically in Chiavenna, at Comunità Montana della Valchiavenna.

The main objectives of this workshop were to:

- Discuss the analyses conducted and presented by the project team to estimate tourism flows and carrying capacity-related information;
- Derive policy recommendations and agree on a common understanding of what a sustainable development of tourism activities corresponds to in the Valchiavenna area.

In total, 15 participants took part in the workshop. This includes three members of the project team. The key stakeholders attending the workshop included representatives from different municipalities in Valchiavenna, the representatives of two regional DMOs, a representative of the commerce community in Chiavenna, youth representatives, hotel owners and representatives of the Comunità Montana della Valchiavenna. Moreover, one representative of the Regione Lombardia participated as well.

#### 4.2 Workshop 2: Discussions and recommendations

This section follows up on the results from the needs analysis and presents the discussion of the stakeholders as well as potentially identified solutions. The stakeholders were explicitly encouraged to discuss the

needs from a local perspective and develop and suggest potential solutions which may be implemented by actors within the region (preferably by the stakeholders present at the workshop).

What became clear very quickly was the problem to separate the needs completely. Overlaps and interconnection have been identified. Thus, the solutions have also been relevant for several needs which also indicates a high degree of interconnectedness.

The following description will still try to follow each individual need, but cross-references to any other relevant need is provided.

#### **4.2.1 Need 1: Inner-regional disparities and un-even distribution of tourism attractions, Valchiavenna is lacking cooperation within the region. Need to foster cooperation**

##### **Challenges**

The discussion in the workshop indicated a common call for a coordinating and motivating actor who would be pivotal enough to embrace and unite several stakeholders. Such an actor would function as a bridging element, moderator and mediator in one person (individual actor) or organisation (institutional actor). The need to foster cooperation originates from an identified lack of commonly agreed goals which leads to scattered and undefined actions and can be assessed as potential pitfall when it comes to formulate for example a commonly defined strategy for sustainable tourism. In addition, an identified lack of knowledge of potential existing coalition partners in achieving sustainable development (not only in tourism) in the region was expressed and discussed at the workshop. Thus, the coordinating actor needs to be equipped with local knowledge and cognition of the institutional environment in Valchiavenna in order to be able to connect the relevant actors and to initiate the needed local governance process. The coordinator would need to introduce participatory and ownership building structures which should ideally be agreed upon all involved actors.

The discussion revealed some pending challenges which could be picked up by the coordinating actor in a first round of stakeholder mobilisation:

- Branding is a problem: there is an overall agreement that nothing can associate Valchiavenna to something well known – a unique selling point which would help to attract visitors.
- Self-identification with a territory is a problem.
- Concentration on quality vs. quantity: this seems to be a common challenge which could be used for a first round of reflection and identification beyond the existing development strategies with the overall goal of initiating a regional sustainability process.

##### **Potential Solutions**

One important aspect has been identified as potential solution within the region is the streamlining of tourism strategies and then streamlining all actors over time to follow suit.

The identification of an actor – or actors – who may activate and unite all stakeholders to create and design a commonly accepted regional development strategy, which represents sustainable development and meets the requirement of a livable and attractive area for its citizens. This process will go far beyond a simple sustainable tourism strategy, but will have to be embedded in a wider regional development process.

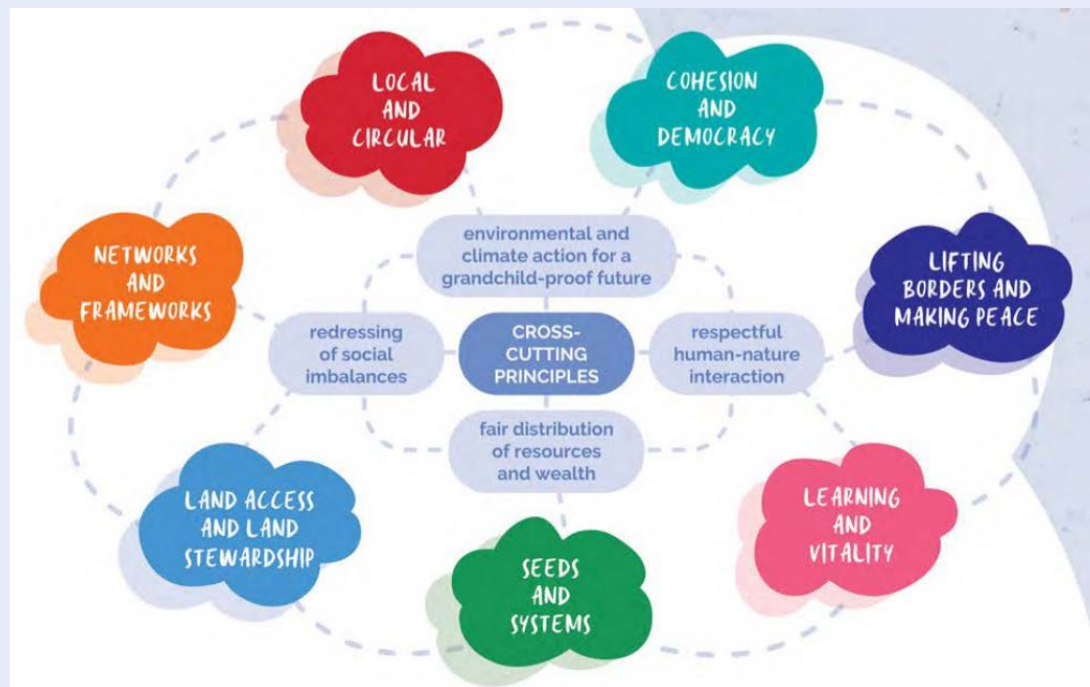
##### **Inspiring cases**

Some examples from other EU regions may serve as inspiration:



## SLOW FOOD SLOW REGION strategy

One potential solution – given the parameters in the region and comparing with other similar Alpine and Italian regions – would be to establish a broad regional strategy, which embraces not only tourism, but all other economic sectors and bundles them to a commonly accepted and lived vision of the Valchiavenna region. It would follow the principle of “resilient regions” (see Forum Synergies and ARC2020 2022<sup>5</sup>) and embrace the seven clouds of rural areas:



This vision may orient itself on these seven fields and establish something like the “slow food, slow region Valchiavenna”. This would imply a linking of especially the agricultural, food processing and tourism sector, but it would also include all other relevant aspects of life in the region – like transport, energy, land use etc.

Other Inner Alpine regions are going this path for quite some time with exactly the attitude which the stakeholders in the process have been claiming to miss in Valchiavenna:

- Cooperation within and across sectors and groups of society;
- Quality instead of quantity;
- The region as sustainable place to live and thus being attractive to tourists;
- Sustaining the traditions which have created a sustainable living (e.g. mountain pastures, dairy, small scale farming, *crotti* and wine production, crafts like *Lavecc* pots).

The Austrian regions of Lesach Valley (<https://lesachtal.gv.at/>) and Innervillgraten (<https://www.innervillgraten.at/>) may be good inspirations.

Within Italy the idea of slow food has been coined in 1986 by Carlo Petrini and has ever since been the inspiration for several regional and tourism development initiatives. It promotes local food and traditional cooking and tries to preserve traditional and regional cuisine and encourages farming of plants, seeds, and livestock characteristic of the local ecosystem. It promotes local small businesses and sustainable foods. It also focuses on food quality, rather than quantity. Like this, this initiative also serves perfectly the general idea of the seven clouds of resilient regions.

<sup>5</sup> <https://heyzine.com/flip-book/841a2cd9ab.html>

## BERGSTEIGER DÖRFER Austria – Mountaineering Villages – Transnational

The Mountaineering Villages initiative originally came from the Alpine clubs and goes back to a project started by the Austrian Alpine Association. With the help of the Ministry for an Austria Worth Living In (BMLFUW) and grants from the European Fund for Rural Development (2007-2013 and 2014-2020), the Mountaineering Villages have been able to establish themselves locally and in the public’s mind as a visible, implementation project as defined by the Alpine Convention.

Thanks to a European and Alpine-wide collaboration, involving neighboring Alpine Associations in Germany, South Tyrol, Slovenia and Italy, the Mountaineering Villages outside Austria have won awards.

The aim of the Mountaineering Villages platform, through the distinctive outdoor sports and recreational activities offered in the various villages, from hamlets and municipalities to entire valleys, is to address the target group of Alpine sports enthusiasts and nature lovers and also support any local added value, but not at the expense of the natural world and the environment.

The philosophy of tourism, visual impact and Alpine charm, mountain farming and forestry, nature and landscape conservation, environmentally-friendly mobility/transport, good communications and the exchange of information are the founding pillars of the initiative and are aligned with the aims of the Alpine Convention.

Strict criteria apply when new municipalities wish to join:

- Intimacy but with respect,
- Enjoyment with no worries,
- Independent mobility,
- Stimulation without all the hustle and bustle,
- A lively atmosphere but without the noise.

The Mountaineering Villages are fully committed to implementing the protocols of the Alpine Convention. The Alpine Convention is an international treaty concluded between the eight Alpine countries and the European Union. Its signatories believe wholeheartedly in the sustainable development and protection of the Alps.

At its core are mountain sports in all their forms and the focused, all-embracing experience of nature through these elements: physical exercise, coping with the difficult Alpine terrain, competence and risk management on the mountains, enjoyment of natural beauty spots, slowing down. For local tourism providers this means showing restraint in the technical expansion of the mountain region. When accommodating guests, the villages should show restraint and use only smaller businesses and promote established providers in the region. Mountain refuges are to be retained for the long term in their role as high-altitude accommodation facilities, while serving as a base and as a functional extension of the accommodation available in the valley.

As such the idea of the Mountaineering Villages might be an additional inspiration and guiding principle for Valchiavenna. In Italy the villages/regions of Balme (Piemont), Matsch, Lungiarü (Alto Adige), Val do Zoldo (Veneto) and Paularo (Friuli Venezi Giulia) are members (see <https://eng.bergsteigerdoerfer.org/>).

Potential actors of coordination of this development process:

- LAG (GAL) Valtellina-Valle dei Sapori
- Regional Development Agency of the Lombardia region
- Farmer’s cooperatives
- DMOs of the region
- Comunità Montana della Valchiavenna

### 4.2.2 **Need 2: Need for better education and qualification related to tourism and related services – high quality hospitality and sustainable tourism offers as well as language skills**

#### Challenges

Traditionally – like in several Alpine valleys, the attractiveness of neighbouring regions has led to outmigration. In the geographical position of Valchiavenna, it is specifically the attractive salaries in Switzerland which pushes local residents to commute regularly. According to stakeholders at the workshop, there seems to be

a relatively high commuting attitude especially in tourism and the construction industry. This leads to a local challenge which can be summarised as a growing lack of workforce in Valchiavenna.

In addition to the pre-existing commuting culture, the COVID-19 pandemic has aggravated the brain-drain and lack of personnel in the region.

Due to the lack of working force, many bars or restaurants have reduced opening hours. In the more remote areas, the problems arise when one bar is closed and cannot provide any kind of service. The solution would be to copy how pharmacies work, and have an announcement regarding which bar is open and where. Another challenge is that in Italy all commercial activities need to close one day a week. They can overcome this issue by following specific rules and in case they have extra persons hired. The main problem in Valchiavenna is that many times restaurants chose to close all at the same day and it is nearly impossible to find a place to eat. So, they have to agree on who will keep the restaurant open and when which is again a needed coordinating effort.

Additionally, there is a lack of qualification opportunities within the region visible due to the fact that for example the nearest secondary education for tourism qualification is located in Milano. Locals who are leaving Valchiavenna for educational purposes do see low incentives to return to the region due to a lack of, for example, higher quality hospitality industry jobs. Moreover, stakeholders indicated a lack of sustainable/green certified hotels and a lack of innovative services in tourism which altogether prevents the region of becoming attractive for highly skilled tourism personnel.

### Potential Solutions

The discussion at the workshop revealed ideas for solutions which would need to be integrated into the above-mentioned coordinated strategy for regional sustainability:

- Incentivising the youth with targeted offerings of opportunities: this initiative needs a concerted effort of businesses as well as other economic entities as well as an interactive process with educational institutions. In order to develop the most attractive opportunities for young people, their own wishes and desires need to be picked up and integrated.
- Attractiveness of workplaces especially in the tourism industry:
  - This includes working hours, fringe benefits with innovative services in hospitality industry such as guides, sustainable adventures (forest adventure parks, rafting, guided climbing,..), higher quality in sustainable tourism facilities (sustainability management in hotels and restaurants), culinary and local produce expertise.
  - Enabling this attractiveness through cooperation of tourism actors via for example coordinating opening hours and days regionally.
- Creating a regional identity and social network among the youth.

### Inspiring case

#### Potential example EISENSTRASSE – Austria

The Austrian LAG Eisenstrasse in Lower Austria (located in the Alpine border area to Styria) has initiated a project which has by now become a bundle of initiatives, which aim at binding the local youth to the regions despite the fact that they may leave the region temporarily for education and qualification purposes. The initiatives combine social media (chat platforms and support), support services for young people (job- and housing platforms) and events to establish a bonding to the region and maintain this over time (see <https://www.get-the-most.at/>). The success of the initiative has been palpable by the significantly higher return rate of young, better educated people to the region. This trend has been also fostered by support measures such as start-up platforms and cooperation with local enterprises.

### 4.2.3 **Need 3a: Economic potential has to be enlarged (also but not only related to tourism) in order to counteract brain-drain and depopulation. – Entrepreneurial activities have to be encouraged and fostered**

#### Challenges

The discussion of this need was characterised by links to other needs. The economic potential depends on education and the attractiveness of the region but needs different incentives. Stakeholders at the workshop identified a lack of information, for example, when shops are open, from what time to what time which clearly impedes an open economic environment. The Comunita' Montana della Valchiavenna may serve as an example as well. It is a service institution of the public sector, which should serve as platform of exchange and information provision. The Comunita has recently changed location without publishing it, which makes it hard for the general public to take stock of its services. With this example it becomes clear that information flows are hampered and that exchange within economic sectors and stakeholder groups – let alone among those – is limited.

#### Potential Solutions

**Tourism Tax** (paid by tourists), which is not levied in Valchiavenna as opposed to a lot regions in Italy – may act as financing source for social services and other low-key solutions which go in line with a new sustainable regional development/tourism strategy

The stakeholders also emphasised the importance of cooperation and a commonly agreed sustainable regional development strategy which will unite all actors to pull together towards a sustainable and resilient development of the region (see box SLOW FOOD – SLOW REGION above).

#### Inspiring Case

##### **Sagra dei Crotti Italy– a potential socio-economic focal point for economic potential - Italy**

Every year the Consorzio Turistico Valchiavenna with cooperation of several economic actors like the local dairy, the local chain of supermarkets, Valchiavenna Energie, Brasimoka etc. organise a festival around the local “Crotti” (the typical caves around the Valchaivenna region).

These festivities are a clear sign that local economic actors may assemble themselves around a manifest of cultural heritage and follow the goal of coordinating their efforts to maintain a tradition and attract visitors at the same time. – in a way this example may serve as nucleus for a broader cooperation platform of economic and maybe even societal actors to increase cooperation across sectors and thus enlarging the economic basis of the region in general.

In several Alpine valleys cultural associations embracing several economic and societal actors show the example of strengthening the sense of belonging and also the socio-economic fabric of a region. – See e.g. the traditions of “Trachten-Associations” (associations for typical traditional outfits).

### 4.2.4 **Need 3b: To increase the attractiveness of the region to citizens the inner-regional infrastructure (mobility and SGEIs) will have to be improved**

#### Challenges

The already identified lack of connectivity (see need 1) leads to limited critical mass for infrastructures and services of general economic interests (SGEI), especially hospitals, child care services, elderly care institutions which has in turn significant repercussions on the following areas:

- employment opportunities for women who have to take over care responsibilities which might lead to a lack in tourism work force;
- service provided for tourists.

In terms of mobility, Valchiavenna is characterised by the usual problem in inner-alpine valleys which have one main route for coming into and out of the region. This leads to the phenomenon of draining of public transport services and accessibility is based only on individual motorised transport. As a consequence, the region suffers under congestion and use conflicts – the entry of cars to sensible historic village centres creates conflict situations with residents and tourists alike.

### Potential solutions

It has been agreed that within the realm of the Valchiavenna region, large scale investments may not be triggered. Thus, the solution may be the establishment of small-scale infrastructures – e.g.

- small medical units (small and temporal Emergency Rooms);
- mobile health care ;
- small scale services of general economic interest – like pooled and self-organised child and elderly care.

### Inspiring cases

The following concrete examples may provide an inspiration in this respect:

#### MOBILE NURSES

In several rural areas in Europe with the challenge of disperse and remote areas and settlements the establishment of health care as stationary service in centres does not fulfil the needs of the rural population.

Communities like LAGs or groups of villages have therefore established mobile services for health care. These may take the form of “flying doctors” or mobile nurses. The financing of these services is provided by either the Rural development Fund through LEADER or by pooling funds of several communities.

The main challenge in this approach is to establish a long-term perspective for this service. Thus, a community-based financing, which is independent of public funding household periods would be preferable.

#### GAL APPENNINO GENOVESE/Child day care pooling

Already in the programming period of LEADER+ (2000-2006) the Local Action Group in the hinterland of Genova (the GAL Appennino Genovese ) established a project which addressed the specific problem of many mountain communities with commuting population: child day care.

The community established a pooled kindergarten which was funded and staffed by the communities. As the facility had to be served by several villages of the area in order to arrive at the critical mass of children, a transport service was established as well, which served all villages and safeguarded an early pick-up and late enough return of the children so that especially mothers had the chance to maintain their jobs in the nearby centres and still be able to stay in the region.

#### SOLIDARITY COMMUNITIES AND SILVER ECONOMY/Financing elderly care by making use of the silver economy

The demographic change and ageing of population is one of the most pressing social issues especially in remote and peripheral areas. Services related to elderly care are therefore in increasing demand and in valleys and fractured landscapes the sustaining of such services is challenging and cost intensive.

In some rural areas in Europe regional population has taken its own initiative and organised themselves in solidarity communities by either pooling resources and thus establishing mobile care facilities (see box above) or by activating elderly in a “help-to-help-yourself” movement. This is organised by creating a platform, where especially elderly may offer their services to support others. This may be organised in a remunerated way by local exchange and trading systems (LETS) operating on virtual money. It may also be triggered by offering incentives (like providing community paid transport). This example of “silver economy” may for instance be found in rural Spain (e.g. Castillia e Leon).



## WERFENWENG/BOLZANO Region/Innovative and creative transport solutions

The rural community of Werfenweng is particularly characterised by tourism. It is a member of the cooperation Alpine Pearls11, which offers its guests environmentally friendly and sustainable tourism. It also belongs to the e5-municipalities of Salzburg (SIR Salzburg). The special feature of the municipality is the strong population growth and the low average age of the population. According to the representative of the tourism association of Werfenweng (Tourismusverband Werfenweng), it is a municipality with a high quality of life and good job opportunities.

Key levers for energy transition and climate protection fall within the competence of Austria’s nine federal states (with their own climate and energy policy strategies) (Austrian Energy Agency, 2021). The mayor of Werfenweng rated the region’s autonomy to act on transformation towards climate neutrality as medium. On the one hand, the municipality has a lot of organisational and administrative leeway (for example, in the field of public transport, energy management, awareness raising), on the other hand, as part of an administrative association, it is also dependent on higher-level framework conditions.

The initiative “Werfenweng Card” (which was initiated at the end of 2021) is a follow-up project of the “Samo-Card” (“Stay mobile, but softly please!”). Whereas the focus from the Samo-Card was primarily on sustainable mobility solutions, the Werfenweng Card aims at including additional aspects of sustainability into its concept. Tourists (but also locals) benefit from this card by receiving the different services at a much lower rate compared to a situation if purchased individually. In addition, they are transported to these different sites for free. Thus, the new card links sustainable mobility with regional (winter and summer) offers. The original aim in the mid-1990s was to make the municipality of Werfenweng more attractive and to enhance its position compared to other touristic regions. Economic reasons were in the foreground for this plan. The community tried to create a new profile – attractive for tourists – and thus to become more competitive. In 1994, a mission statement was developed. Other car-free regions were considered as models (for example Swiss role models). In contrast to these regions, which primarily focused on sustainable mobility on site, Werfenweng also tried to promote the arrival and departure of tourists via sustainable means of transport (especially by train). In addition to the original economic focus, environmental aspect also gained importance. In 1996, Werfenweng was chosen as a model region by the Austrian Ministry of the Environment (in cooperation with the ministry of Transport and Economy) and received financial support. In 1999, the working group “Vacation from the Car” (Urlaub vom Auto) was founded and involved experts from different levels (i.e. ministries, Land Salzburg, transport planners and regional developers) to promote soft mobility solutions (Klimabündnis Österreich).

Since the region is characterised by its alpine location, the importance of climate neutrality and the protection of nature are reflected in its goals. Beside enhancing the pull for tourists, it also should remain an attractive place for living. The new “Werfenweng Card” aims at integrating in particular offers from the region, which should ensure that the money stays in the region. As the main public subsidies have already expired a few years prior, the initiative is now financed primarily by participating companies and the sale of the Werfenweng card. Participating companies are accommodations such as hotels, which pay EUR 1.70 per guest per night so that their guests receive the Werfenweng Card at a lower price. The organisation mainly in charge of the initiative is the tourism association of Werfenweng. In addition, companies and locals are also involved in the initiative.

The following topics are reflected in the initiative:

- Moving without emission, due to its comprehensive mobility offers (e.g. a shuttle from the train station or different fun mobility offers such as Velo-Taxis), people have the opportunity to be mobile without being dependent on the own car.
- Lifestyle changing, sustainable mobility is a major topic of Werfenweng and the use of alternative means of transport has become established among both guests and residents.

A similar initiative has been established in the Bolzano region linking the city with its hinterland.

There are various other low-key initiatives in mountain rural areas which range from community-based car sharing initiatives pooling resources to buy an electric car and then pooling the use by several individuals. If this car is a prestigious object like a Tesla, the attractiveness is even more increased. Another approach would be the “hitchhikers’ bench” in villages, where the use of certain benches by the street would signal the need to be sharing a ride to the next village or facility.

#### 4.2.5 **Need 4a: Seasonality of tourism will have to be extended – the two main seasons of winter and summer will have to be more integrated and additional tourist segments to be attracted. – This will call for other/sustainable tourism infrastructure**

##### Challenges

One of the lessons learnt from the evidence provided through the dashboard was that apparently there has been a misperception of the “two seasons of tourism” prevailing in the stakeholders’ eyes – i.e. that summer and winter are equally important and leading to a more stable situation.

Evidence has shown that still winter is dominating and the trend towards unsustainable skiing tourism is ongoing. A cursory analysis of marketing initiatives of with regards to attempts to shift seasonality has mainly been oriented towards the Italian summer tourist with an emphasis on a few “hot spots” (waterfall, *crotti*, biking – both motor and regular).

During the workshop, there has been limited fantasy as to how to break up this vicious circle.

##### Potential solutions

One overlapping solution, which has been tackled under need 1 would be to establish and maintain cooperation between all stakeholders in the region and a widening of the tourism strategy in a more regional strategy and identity – see the SLOW FOOD, SLOW REGION concept with an altogether seasonal independency

##### Warning case

#### Excursus on bi-seasonal extension in other Alpine destination – the “unsustainable perspective”

Here it may be appropriate to insert an excursus on the dilemma many alpine destinations are facing who have extended their one-seasonal dependency (i.e. winter) to two seasons (winter and summer). The dilemma is based on the problem to increase unsustainable tourism forms to two seasons. The intensified mechanization of skiing tourism (carving technology in skiing leading to the need for mechanically heavy preparation of slopes, artificial snow, lack of skiing skills and mass tourism calling for more energy and space intensive accession aids) is now extended to the summer season. The mountains are by this treated as “adventure parks” with skiing in winter and climbing, rafting, canyoning, mountain biking in summer. This use of mountain areas is highly unsustainable and burdensome for the fragile ecology and natural conditions of the Alps. “The mountains are no “playground” but a rather dangerous place, which has to be approached with respect” (R. Messner). This development has in many mountain destinations lead to a strong path dependency, which cannot be easily abandoned due to the needed return on investments. Valchiavenna should definitely stay away from this path and try to take these bad examples of mass tourism in mountain destinations into account when formulating a sustainable tourism/regional development strategy.

#### 4.2.6 **Need 4b: The concentration of tourism activities in certain areas within the region leads to unwanted hotspots of land-use conflicts and negative externalities of tourism/temporary dwellers. – There is a need for careful land use planning and mix of land use types.**

##### Challenges

This need has been identified as a by-product of tourism concentration. However, it is a common phenomenon in mountain destinations due to the lack of space in fragmented landscapes. As a consequence, land-use conflicts of different types are identified. According to the workshop participants, in Valchiavenna, this phenomenon is rather restricted to specifically attractive areas (e.g. Madesimo and Chiavenna).

So far, the region has not yet been inflicted by phenomena like “chalet villages” as part time homes for city dwellers, but certainly is facing in certain “hot spots” the problem of “second house” owners who do not actively contribute to supporting the social fabric of the community. In other rural areas, this may not be such

a burden, but in a highly fragmented and disperse community like in mountain valleys, only a few of these “gaps” in the community social network may cause harm.

### Potential solutions

One of the specifics of the Valchiavenna region is the heritage tradition of splitting up inheritance by all siblings equally, which leads to multiple ownerships and the risk of selling off the heritage instead of keeping in the families. One potential way out of this problem of increasing concentration phenomena in real estate may be a breaking up of this tradition.

But more importantly, careful land use planning and zoning would lead to a responsible and mindful land use and avoiding of unsustainable spreading of settlements. Careful observation of real estate developments will then also allow for local population to settle and find place for living.

## 5 Conclusions and policy recommendations

The region of Valchiavenna is one of the inner areas laid out in the Italian Strategy for Inner Areas SNAI (*Strategia nazionale per le aree interne*) and is characterised by mountain tourism. As an Alpine region in the border area of Switzerland, the destination provides strong historical and cultural commonalities with many other alpine regions in this geographical area but provides at the same time a unique setting. The region was heavily affected by COVID-19 as many other destinations. In order to measure the tourism impact and the carrying capacity, the destination is benchmarked against all Italian provinces as well as two other Alpine destinations in Austria, Mayrhofen and St. Johann I, Pongau and one Slovenian destination, Divača. Based on the needs identification process with the stakeholders the main challenges have been identified in the course of the analysis along the main tourism characteristics (arrivals, overnights, tourism intensity, length of stay, tourism density).

As indicated in the introductory section of this report, seven regional and tourism development questions have been taken into consideration. Based on the analysis carried out and presented in this report in regards to the situation in Valchiavenna, some answers and hints are provided, respectively for each question. It should be highlighted that this project only initiated and fostered reflections which may help local stakeholders transition towards sustainable tourism pathways. Nonetheless, the closure of this project does not bring definitive answers and solutions to a process which should be further continued by the involved stakeholders.

### 1. Based on the SNAI (Strategia nazionale per le aree interne) action plan for the inner area "Valchiavenna", which concrete actions could be implemented to take a path towards sustainable and resilient tourism in the region?

The different needs identified during the first workshop underline the need for more cross-sectoral cooperation and collaboration from and for inhabitants, private as well as public actors and tourists. Increased cooperation and communication between key local and regional actors is essential to establish sound, sustainable and resilient foundations for the development of the region and its tourism industry. As such, a sustainable and resilient tourism strategy for the region can only be developed hand in hand with a regional resilient development strategy. Beside its inclusiveness, the success of any strategy relies on its acceptance by local stakeholders, thus allowing the empowerment of these actors to implement concrete actions.

The analyses also revealed that strengthening access to infrastructures and services of general interests for the local population is indispensable. Such investments will indeed simultaneously enhance services for tourism and help spread touristic activities. Likewise, fostering local, smart mobility, small scale health infrastructure, strengthening young people's sense of belonging to the region to mitigate the brain-drain of the labour force are areas of intervention indirectly contributing to a more sustainable and resilient tourism in the region.

All in all, establishing a sustainable and resilient tourism industry shall not be a goal in itself. Rather, it is to be achieved by considering the wider social, economic and environmental ecosystem. The region's tourism may only become more sustainable and resilient when supported by a diversified local economy, functioning infrastructure and services, and a stronger cooperation and communication between key actors moved by a common goal.

### 2. How to develop new approaches and how to spread the experiences to other similar situations? How to be innovative in order to develop a sustainable tourism and how to involve local stakeholders?

As indicated, this project only initiated and fostered grassroots discussions on local needs linked, to a varying degree, to tourism, being one of Valchiavenna's main economic sectors. Such exercise, which intended to broaden the local actors' views on common challenges and needs, may be applied and replicated to any region. Nonetheless, a corner stone element of the approach applied shall still be undertaken by the involved parties, namely, the identification and specific tasks and attribution of responsibilities. Empowering local stakeholders to undertake the changes they want to see is a key pillar of this methodology.

The involvement of the widest array of stakeholders, from various sector, representing various interests, both in favour and possibly against the tourism industry is necessary to ensure the inclusiveness and sustainability of the process. Any participatory approaches must be continuous rather than occurring a specific point in time.

### **3. Should the inner area “Valchiavenna” focus only on one type of tourism or should they enlarge the offer in order to attract more tourists?**

Issues brought forward by participants included the need to move away from the “traditional” winter/summer tourism seasons. This does not necessarily imply attracting more tourists, but rather enlarging the tourism offer as to attract visitors outside of the peak seasons. Enlarging the seasonality also goes hand in hand with the need to diversify the local economy. Examples of “slow tourism” have been proven effective in numerous rural and remote areas in order to attract certain types of tourists interested in the natural and cultural assets of the region.

### **4. Which are the obstacles that have to be overcome and how?**

The region’s topography, following a valley divide, is an obstacle in itself. It hinders communication and collaboration of actors across the region. Also, it may contribute to reduce awareness of existing programmes or initiatives playing a key role in the region’s development (e.g. Local Action Groups). Public administrations such as the Comunità Montana della Valchiavenna may act as central catalyst for change and platform of exchange and dialogue, albeit providing that it can reach out to stakeholders all over the area. The existence of “simple” issues such as the lack of coordination regarding the opening hours/days of restaurants and bars reveals the need for a communication and exchange platform gathering practitioners and relevant public authorities.

Other obstacles regarding the sustainable development of the region and its tourism activities include the lack of trained and skilled workers. Attracting and retaining a skilled labour force to the region has also been identified as a critical issue, particularly for the tourism industry (e.g. lack of foreign language skills). Other aspects such as inheritance laws leading to complex ownership systems also need to be addressed.

A system of local/regional tourism tax (already in place in numerous other regions) may help local public authorities finance training schemes and improved means of communications and collaboration.

### **5. How have touristic places survived and reacted to the COVID-19 impact and with the help of what economic means?**

The impacts of the COVID-19 pandemic were particularly felt in the tourism sector. This analysis carried out within the framework of this project revealed the severe drop in visitor numbers resulting from travel bans and lockdowns enforced throughout Europe and beyond. The sector is now recovering, a situation which provides a chance to break away from path dependencies and “silo approaches” as well as traditional tourism management practices. Despite of the economic downturn in Valchiavenna, the region may still have benefited from the increasing interest for nature-based tourism.

### **6. In the context of policies on territorial resilience, are there any knowledge gaps preventing from delivering a more effective policy response? What is the character of those knowledge gaps? Do they result from difficulty in understanding the territorial development trends and challenges? Or, from lack of access to good practice on how similar places in Europe have dealt with those trends and challenges through the use of projects or policy instruments?**

One of the main challenges faced throughout the project cycle is the region’s lack of statistical unity. This makes it particularly difficult to analyse development trends or the monitoring of indicators. As such, a need for more regionally cohesive data set is identified. Furthermore, the region could benefit from the experience of other alpine regions in similar situations and which implemented solutions and programmes (e.g. the programme LEADER). The creation of a benchmark of already existing programmes and projects targeting similar issues than the ones faced by Valchiavenna could help kick-start the implementation of concrete actions. Examples of such projects have been provided in this report. It seems important to keep in mind

that not only specific tourism targeted projects can be of relevance but also projects improving the local services of general interest, services for the inhabitants which will indirectly benefit visiting tourists as well.

### **7. How to unlock the potential of places in decline, peripheries, places undergoing marginalization? How to make such geographies more connected and as places that matter?**

The ESPON Tourism methodology applied in this project appears to be successful enhancing dialogue and grassroots communication with the actors of the regions. The continuation of the dialogue across sectors and territories to develop a common regional strategy already has the potential of revealing regional capacities. However, and to obtain concrete results, the outcomes of this dialogue, as described in section 4.2, must be operationalised through the repartition of tasks and responsibilities. Unlocking the potential of marginalised regions requires a common, broadly shared vision attached to the place as well as empowered and coordinated local actors.

Overall, the main conclusions for Valchiavenna are:

- There is a need to foster targeted cooperation for defining tourism as a cross-cutting service in order to find synergies with other services and industries.
- It seems that the tourism supply chain lacks a bridging function. This was expressed by the stakeholders in terms of a perceived uncontrolled industrialisation.
- In order to overcome this lack of cooperation, bringing together a broader set of stakeholders belonging to different services and industries and to develop a common strategy which would go beyond a purely and isolated sustainable tourism strategy is needed.

The applied methodology is designed for a destination specific application and as described in the report also applicable for other destination but needs its own set of committed stakeholders and the provision of respective background documents which help to grasp the development over time (for at least one decade). As such the methodology is replicable but not the specific results. Thus, the methodology can be applied for any other inner area laid out in the SNAI but with its own set of stakeholders, documents, data and most important the commitment for an interactive process.





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# Annexes

## A.1 ESPON Tourism methodology

Throughout the European Union, tourism is a major economic activity relevant equally to large, densely populated cities and peripheral, sparsely populated mountain areas, as well as many other types of regions. While it already contributes to a considerable degree to Gross Domestic Product (GDP) at the EU level, single regions in many cases can be completely dependent on tourism as the largest factor of regional GDP. On the one hand, this can ensure the “survival” of regions which could not sustain their population and their livelihood through other economic activities. A high inflow of tourists into a region however can lead to numerous problems, especially related to the social and the environmental dimensions. What the critical thresholds for such an inflow of tourists are, is an intensively discussed topic relevant to policy makers, practitioners and academia at the same time and in general is linked to one specific concept – “carrying capacity”.

While numerous methodologies exist for addressing the question what these critical thresholds are, how many tourists a region (or a destination) can receive in a sustainable manner, without compromising their economic development and their social and ecological quality, many are specific to a type of region and not flexible enough to be used in other contexts.

### The definition of a carrying capacity

Already for decades, the carrying capacity has been at the core of sustainable tourism and aims at offering “time/space-specific answers” at the individual localities (Saarinen, 2006: 1125). There are many definitions of this concept, arguably the most prominent one being the one of the United Nations World Tourism Organization (UNWTO, 2018). Here, tourism’s carrying capacity is defined as:

*“the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and sociocultural environment and an unacceptable decrease in the quality of visitors’ satisfaction” (UNWTO, 2018: 3).*

The reality is that the calculation of this “magic number” is often not feasible for reasons such as differences in threshold established by tourists and residents, ecological limits, multitude of resources, and so on (Saarinen, 2006; Jurado et al., 2012). However, in spite of not measuring an absolute limit, one can still use it for identifying critical thresholds and for examining changes over time (O’Reilly, 1986). Thus, the goal of the application of the methodology is to provide a set of relevant information for policy makers, rather than one concrete “magic number”.

### The definition of a destination

The European Tourism Indicator System (ETIS) defines a destination as (European Commission 2016):

- “a geographic area that is currently or potentially attractive to visitors/tourists;
- a place or area which is recognised and can easily be defined as a visitor destination and has a range of facilities and products in place for tourism purposes;
- a place or area which is promoted as a destination;
- a place or area where it is possible to measure the supply of and demand for tourism services, i.e. the visitor economy;
- a place or area where the visitor management process usually includes a range of public and private-sector stakeholders together with the host community.”

However, in the project the destination is pre-defined by the destinations themselves. For analytical purposes the destination will be broken down to the LAU2 (Local Administration Unit) or NUTS 3 level. The same approach applies to defining cross-border destinations.

Moreover, there are several terms which should be clarified:

- Stakeholder- refers to identified stakeholders *in the examined destination*. There are different types of stakeholders that should be consulted at different stages. These can be local, regional or national authorities, representatives of tourism organisations/destination management organisations, tourism operators, representatives of statistical offices and other relevant types of stakeholders.
- Facilitator- refers to the facilitator applying the carrying capacity methodology in a specific destination.

### Assumptions of the methodology

The development of the methodology in the project is rooted in the review of existing methodologies, and their strengths and weaknesses. Deducted from the literature analysis and the related methods to assess carrying capacity, the following main points can be outlined:

- **There is no single denominator for carrying capacity** – a multitude of aspects in the socio-economic context of destinations are touched upon and carrying capacity is strongly related to the dimensions of sustainability and its conceptual components (i.e. economy, society and the environment). Still the challenge is to establish a causality between tourism as a sub-sector of the economy and spatial phenomena (flows and concentration) and all these multiple aspects. These causal loops, which in the methodology will be captured via a **systemic picture**, are to be kept transparent and simple enough for decision makers to understand and sufficiently robust to actually reflect the impact of tourism in the territorial context. The way to establish this link is by intertwining context related territorial information (as expressed by indicators) with tourist related information. In accordance, one step will be to establish a set of territorial specific indicators, which will be tailored to the circumstances of each of the destinations/regions and compare them with tourist related indicators expressing both stocks and flows of tourists and their concentration in the territory of the destination.
- There is **no single way of capturing the carrying capacity** along the different dimensions (social, economic and environmental). The methodological approach meets this challenge by allowing for different ways to assess normative borders for carrying capacities. While for some indicators carrying capacity is to be understood as staying within a limit or getting closer to it (e.g. economic growth induced by tourism), for other indicators it would mean to stay within a corridor of an “optimal” condition (e.g. biodiversity within a tourist destination), while getting closer to the limit would indicate a critical condition. In other words, the method will have to be able to deal with various ways to describe and measure the target values of carrying capacity. The decision about whether carrying capacity in a specific context should be understood as threshold or corridor, as well as its value, will be done also based on a broad consultation process with the stakeholders and their assumed strategies in the destinations.
- There is **no unified way to take territorial specifics of tourist destinations into account** when assessing their carrying capacity. Not only will carrying capacity be different in different regional circumstances, but there is also no one-size-fits-all approach for assessing carrying capacity of tourist destinations. The consequence for the methodology to be developed will be that the method suggested will have to provide a guidance and procedure rather than a single measurement approach. The ultimate decision on the methodology to be applied will have to be made by the facilitator based on their expertise as well as findings with regards to the destination. The methodology developed sets the overall frame and will thus be universally applicable, but the single elements of measurement (the indicators to be selected to describe territorial context) will have to be tailored to the territorial specifics, i.e. picked from suggested and available context indicators.

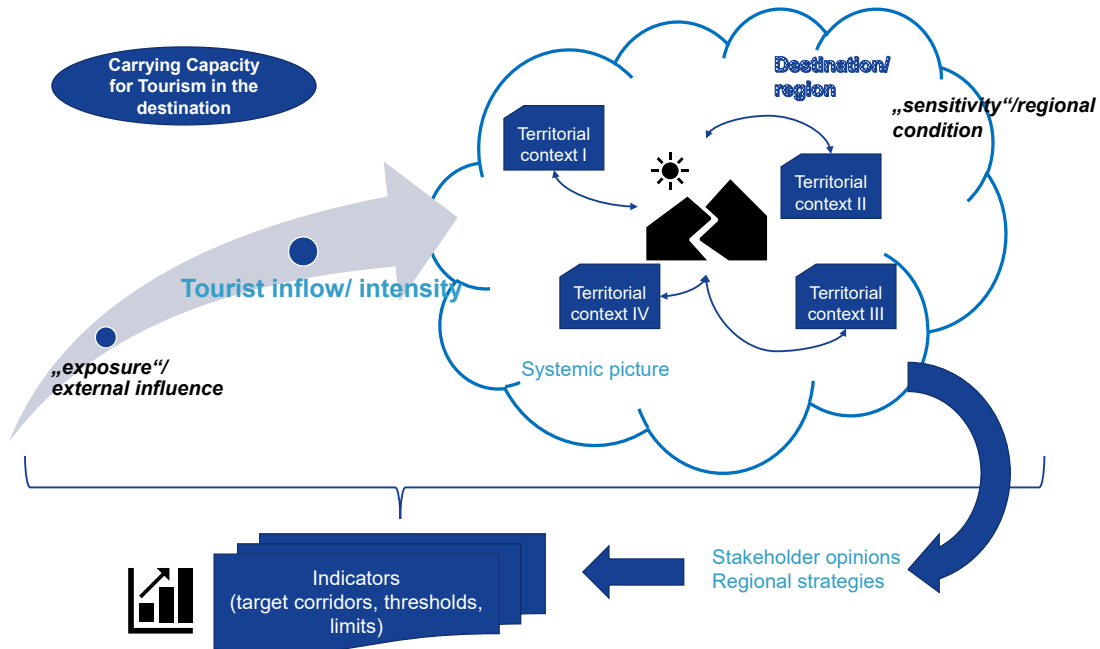
This means when capturing carrying capacities for tourism, multidimensional issues that depict the territorial characteristics and the external influence on this territory should be captured:

- tourism intensity and concentration in territorial terms and in time;
- tourism flows into and within the destination;
- the consequence in terms of causal loops that refer to user conflicts, opportunity costs connected to it – on the territorial conditions of the destination – economic, social and environmental.

## The outline of the methodology

The following figure depicts these interrelations and the consequential approach which will be developed for the destination.

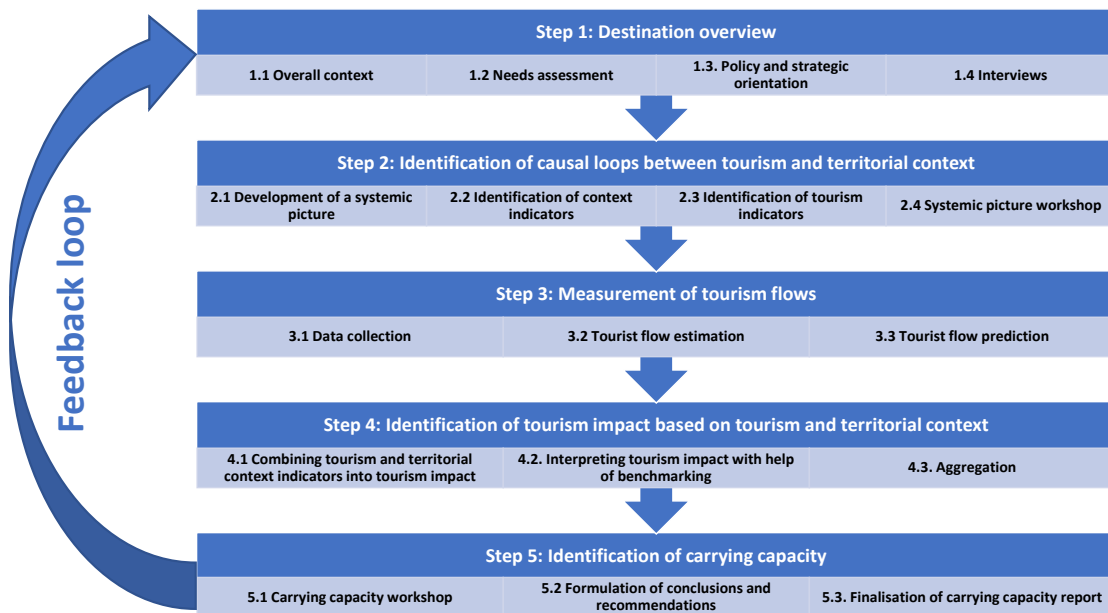
**Figure A.1: Carrying capacity assessment**



Source: Consortium, 2020.

The framework of the carrying capacity methodology implies a step-by-step approach, whereby each individual step can be considered as an individual vertebra, together forming a unified methodological backbone (*universal approach*), but with enough flexibility at each step for adaptation to destination- or region-specific conditions and circumstances (*tailor-made approach*). Moreover, it is possible to further adapt in situations where an external shock such as the COVID-19 pandemic necessitates re-orientation and recovery (*resilience approach*). This makes the methodology an attractive tool since destinations and regions experience and learn about their carrying capacity based on their own destination- and region-specific understanding and knowledge. This case-specific knowledge is needed since there is no single universally accepted definition and measure of carrying capacity. The methodology has with this step-wise approach a strong process orientation and thus it is recommended to have the process accompanied by external moderation and expertise, which may open rooms for reflection and decision making, which would be more difficult, if the actors in the region do that themselves.

Figure A.2 Fehler! Verweisquelle konnte nicht gefunden werden. summarizes the five steps of the methodology and starts with the destination overview (Step 1), followed by the identification of relevant causal loops between tourism and the territorial context (Step 2) before explicitly focusing on the measurement of tourism flows (Step 3) as well as tourism impacts in conjunction with the territorial context (Step 4). Steps 3 and 4 are conducted with the support of a visualisation tool (ESPON Carrying Capacity Dashboard). Step 5 has to be understood as the identification of the destination specific carrying capacity (based on the measurement in Step 4) and the derived policy recommendations. This final step allows a feedback loop to the needs assessment in Step 1 and the developed systemic picture in Step 2 in order to reflect upon needed adjustments due to external shocks such as the COVID-19 pandemic. Therefore, stakeholders are requested at the carrying capacity workshop (Step 5) to adjust the systemic picture on the basis of changing needs.

**Figure A.2: Overview of methodological steps, including contents and methods**

Source: Consortium, 2020.

The methodology is process oriented and designed as an advisory tool for destinations, which trains stakeholders to understand, analyse and monitor the destination's carrying capacity. Thus, an external facilitator (ideally accompanied by a small group of experts) for incorporating the methodology is needed. The role of the facilitator is to support the destination from Step 1 to Step 5 as an external moderator in a neutral position.

## A.2 ESPON Carrying Capacity Dashboard/user manual

### A.2.1 Menu Structure

The navigation structure of the dashboard (<http://dashboards.modul.ac.at/italy/>) consists of two tab panels, namely Level 1 (main topics) and Level 2 (sub-topics) (see User Interface). Table A.1 presents the structure of the two levels. Level 2 tabs appear after the selection of the respective Level 1 tabs.

**Table A.1: Menu Structure (Level 1, Level 2)**

Level 1 (main topics)	Level 2 (sub-topics)
Carrying Capacity	Quartile-Matrix-Benchmark Density-Matrix-Benchmark
Tourist Flow	Prediction (3-years) Time-Series-Quartile-Benchmark Spatial-Benchmark
Database	Raw Data Inspection Last Observation Descriptive Statistics Variable Description
OpenStreetMap (OSM)	Touristic POI Locations Touristic POI Hotspots Gastronomic Locations Gastronomic Hotspots Accommodation Locations Accommodation Hotspots
Google Trends	Over Time Accommodation Hotspots
Upload/Analyse Text	STEP 1 (own data): Data Upload STEP 2 (own data): Calculate Overall Sentiment/Basic Emotion Values STEP 3a (own data): Overall Sentiment STEP 3b (own data): Basic Emotions STEP 3c (own data): WordCloud STEP 3d (own data): Topic Detection

Source: Consortium, 2022.

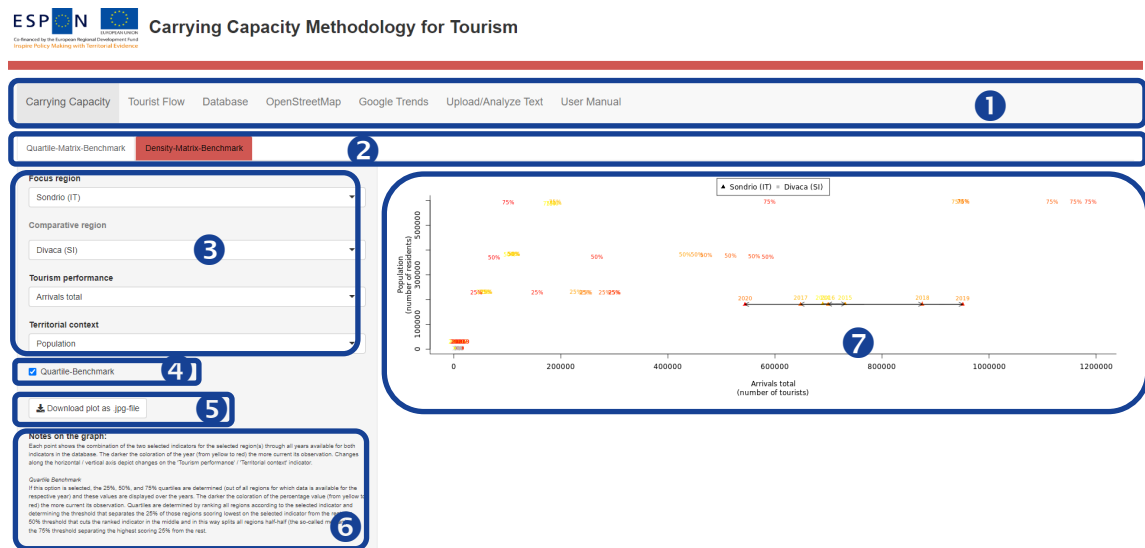


## A.2.2 User Interface

Figure A.3 shows the general structure of the tabbed user interfaces.

- 1 Main topics (Level 1) [default colour: light grey; selection: dark grey]
- 2 Sub-topics (Level 2) [default colour: red; selection: white]
- 3 Selection (compulsory) [drop-down menu]
- 4 Selection (optional) [checkbox]
- 5 Download-button [.jpg-file]
- 6 Notes
- 7 Visualization surface

Figure A.3: Dashboard Structure



Source: Consortium, 2022 <http://dashboards.modul.ac.at/italy/>.

## A.2.3 Features

### A.2.3.1 Carrying Capacity

Level 1 tab – Carrying Capacity – includes two Level 2 tabs:

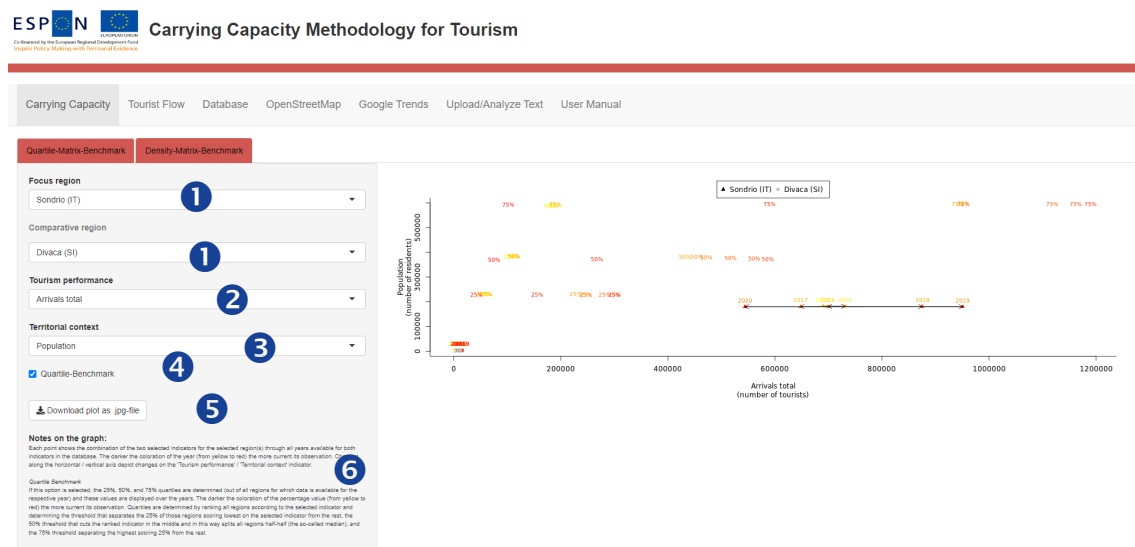
- Quartile-Matrix-Benchmark
- Density-Matrix-Benchmark

### Quartile-Matrix-Benchmark

Figure A.4 gives an example for the Quartile-Matrix-Benchmark.

- 1 Step 1 (compulsory): Select the focus region and the comparative region to be displayed.
- 2 Step 2 (compulsory): The "Tourism Performance"-indicator selected from the drop-down menu is plotted along the horizontal axis.
- 3 Step 3 (compulsory): The "Territorial Context"-indicator selected from the drop-down menu is plotted along the vertical axis.
- 4 Step 4 (optional): Select the "Quartile-Benchmark"-checkbox to compare the selected region of Step 1 with all other regions in the database for which data is available for the respective years. If this option is selected, the 25%, 50%, and 75% quartiles are determined (out of all regions for which data is available for the respective year) and these values are displayed over the years. The darker the coloration of the percentage value (from yellow to red) the more current its observation. Quartiles are determined by ranking all regions according to the selected indicator and determining the threshold that separates the 25% of those regions scoring lowest on the selected indicator from the rest, the 50% threshold that cuts the ranked indicator in the middle and in this way splits all regions half-half (the so-called median), and the 75% threshold separating the highest scoring 25% from the rest.
- 5 Download plot in .jpg format.
- 6 Notes: Each point shows the combination of the two selected indicators for the selected region(s) through all years available for both indicators in the database. The darker the coloration of the year (from yellow to red) the more current its observation. Changes along the horizontal/vertical axis depict changes on the "Tourism performance"/"Territorial context" indicator.

Figure A.4: Quartile-Matrix-Benchmark



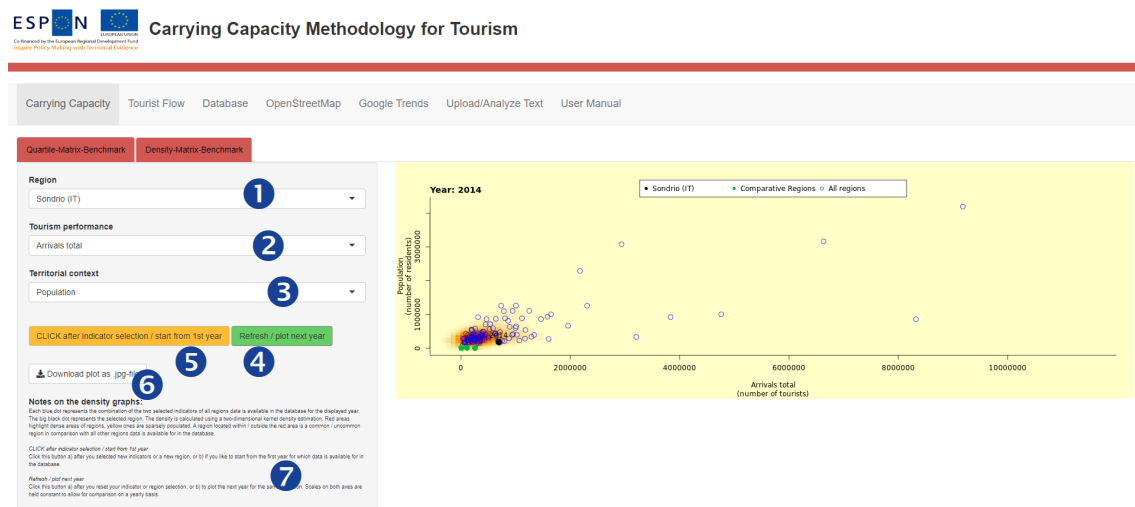
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Density-Matrix-Benchmark

Figure A.5 gives an example for the Density-Matrix-Benchmark.

- 1 Step 1 (compulsory): Select the region to be displayed.
- 2 Step 2 (compulsory): The “Tourism Performance”-indicator selected from the drop-down menu is plotted along the horizontal axis.
- 3 Step 3 (compulsory): The “Territorial Context”-indicator selected from the drop-down menu is plotted along the vertical axis.
- 4 Step 4 (compulsory): The “Refresh/plot next year”-button needs to be pushed to 1) plot the 1<sup>st</sup> year data is available for in the database for the chosen region and 2) to browse through the years available in the database for the chosen region.
- 5 Step 5 (optional): The “CLICK after indicator selection/start from 1<sup>st</sup> year”-button needs to be pushed a) after new indicators or a new region has been selected (Steps 1-3), or b) to start from the first year for which data is available for in the database. The “Refresh/plot next year”-button always needs to be pushed afterwards.
- 6 Download plot in .jpg format.
- 7 Notes: Each blue dot represents the combination of the two selected indicators of all regions data is available in the database for the displayed year. The big black dot represents the selected region. The density is calculated using a two-dimensional kernel density estimation. Red areas highlight dense areas of regions, yellow ones are sparsely populated. A region located within/outside the red area is a common/uncommon region in comparison with all other regions data is available for in the database.

### Figure A.5: Density-Matrix-Benchmark



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

### A.2.3.2 Tourist Flow

Level 1 tab – Tourist Flow – includes three Level 2 tabs:

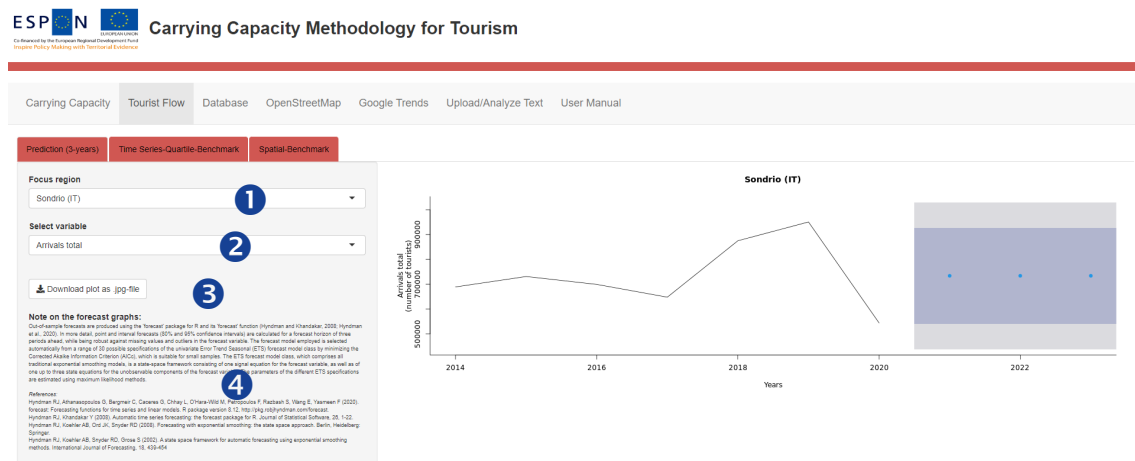
- Prediction (3-years)
- Time-Series-Quartile-Benchmark
- Spatial-Benchmark

#### Prediction (3-years)

Figure A.6 gives an example for a 3-years Prediction.

- 1 Step 1 (compulsory): Select the region to be displayed.
- 2 Step 2 (compulsory): Select the indicator to be plotted along the vertical axis.
- 3 Download plot in .jpg format.
- 4 Notes: Blue dots give the predicted trend, the dark/light grey areas the 80%/95% confidence intervals. Out-of-sample forecasts are produced using the "forecast" package for R and its "forecast" function (Hyndman and Khandakar, 2008; Hyndman et al., 2020). In more detail, point and interval forecasts (80% and 95% confidence intervals) are calculated for a forecast horizon of three periods ahead, while being robust against missing values and outliers in the forecast variable. The forecast model employed is selected automatically from a range of 30 possible specifications of the univariate Error Trend Seasonal (ETS) forecast model class by minimizing the Corrected Akaike Information Criterion (AICc), which is suitable for small samples. The ETS forecast model class, which comprises all traditional exponential smoothing models, is a state-space framework consisting of one signal equation for the forecast variable, as well as of one up to three state equations for the unobservable components of the forecast variable. The parameters of the different ETS specifications are estimated using maximum likelihood methods.

Figure A.6: Prediction (3-years)



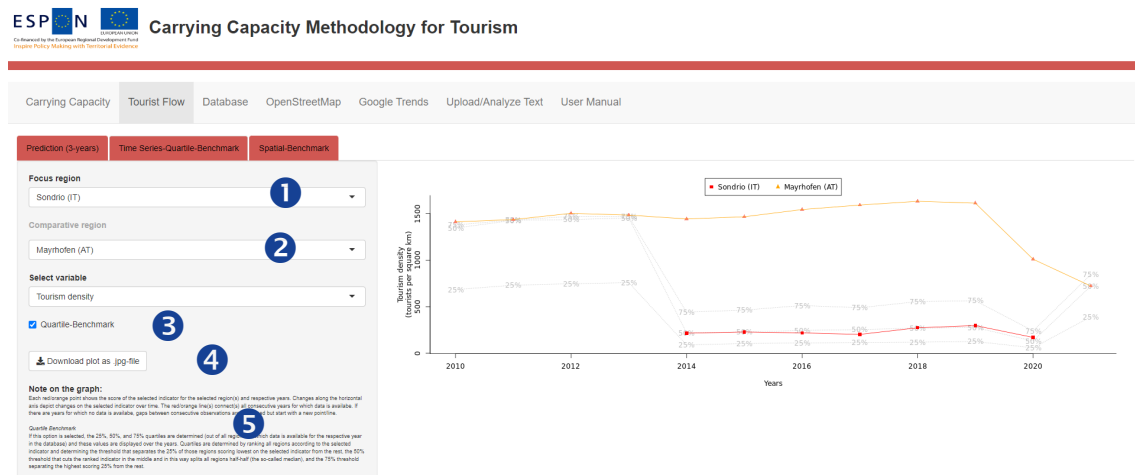
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Time-Series-Quartile-Benchmark

Figure A.7 gives an example for a Time-Series-Quartile-Benchmark.

- 1 Step 1 (compulsory): Select the focus region and the comparative region to be displayed.
- 2 Step 2 (compulsory): Select the indicator to be plotted along the vertical axis.
- 3 Step 3 (optional): Select the "Quartile-Benchmark"-checkbox to compare the selected region with all other regions in the database for which data is available for the respective years. If this option is selected, the 25%, 50%, and 75% quartiles are determined (out of all regions for which data is available for the respective year in the database) and these values are displayed over the years. Quartiles are determined by ranking all regions according to the selected indicator and determining the threshold that separates the 25% of those regions scoring lowest on the selected indicator from the rest, the 50% threshold that cuts the ranked indicator in the middle and in this way splits all regions half-half (the so-called median), and the 75% threshold separating the highest scoring 25% from the rest.
- 4 Download plot in .jpg format.
- 5 Notes: Each red/orange point shows the score of the selected indicator for the selected region(s) and respective years. Changes along the horizontal axis depict changes on the selected indicator over time. The red/orange line(s) connect(s) all consecutive years for which data is available. If there are years for which no data is available, gaps between consecutive observations are not closed but start with a new point/line.

Figure A.7: Time-Series-Quartile-Benchmark



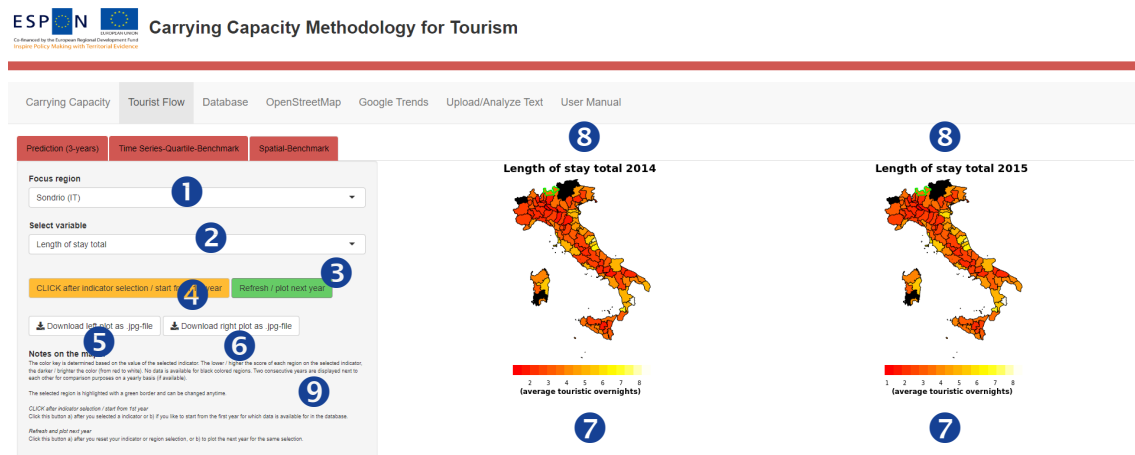
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Spatial-Benchmark

Figure A.8 gives an example for a Spatial-Benchmark.

- 1 Step 1 (compulsory): Select the region to be highlighted with a green border. This selection can be changed anytime.
- 2 Step 2 (compulsory): Select the indicator to be plotted on the map.
- 3 Step 3 (compulsory): The "Refresh/plot next year"-button needs to be pushed to 1) plot the 1<sup>st</sup> year data is available for in the database for the chosen region and 2) to browse through the years available in the database for the chosen region.
- 4 Step 4 (optional): The "CLICK after indicator selection/start from 1<sup>st</sup> year"-button needs to be pushed a) after a new indicator has been selected, or b) to start plotting from the first year for which data is available for in the database. The "Refresh/plot next year"-button always has to be pushed afterwards.
- 5 Download left plot in .jpg format.
- 6 Download right plot in .jpg format.
- 7 The colour key is determined based on the value of the selected indicator. The lower/higher the score of each region on the selected indicator, the darker/brighter the colour (from red to white).
- 8 Two consecutive years are displayed next to each other for comparison purposes on a yearly basis (if available).
- 9 Notes: No data is available for black coloured regions.

### Figure A.8: Spatial-Benchmark



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

### A.2.3.3 Database

Level 1 tab – Database – includes four Level 2 tabs:

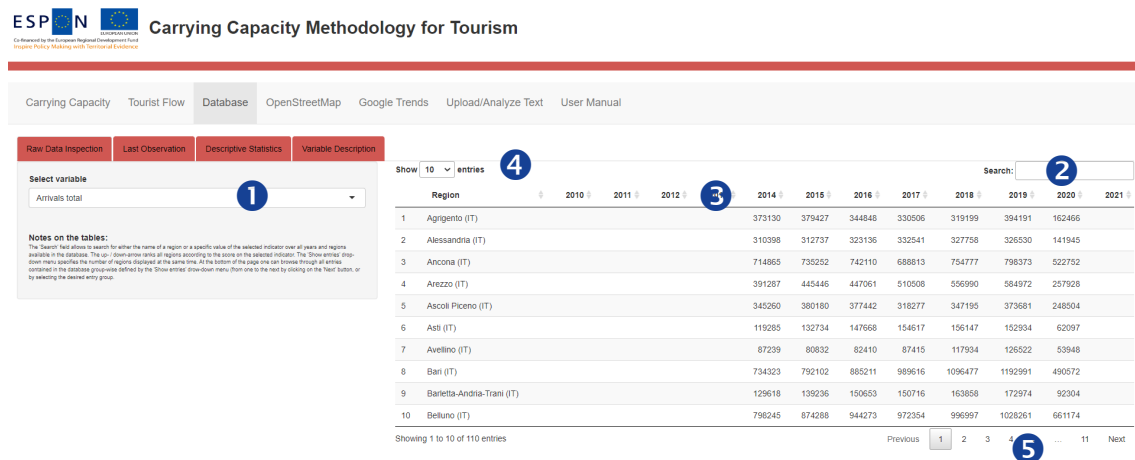
- Raw Data Inspection
- Last Observation
- Descriptive Statistics
- Variable Description

### Raw Data Inspection

Figure A.9 gives an example for the Raw Data Inspection.

- 1 Step 1 (compulsory): Select the indicator to be displayed.
- 2 Step 2 (optional): The “Search” field allows to search for either the name of a region or a specific value of the selected indicator through all years and regions available in the database.
- 3 Step 3 (optional): The up-/down-arrow ranks all regions according to the score on the selected indicator.
- 4 Step 4 (optional): The “Show entries” drop-down menu specifies the number of regions displayed at the same time.
- 5 Step 5 (optional): One can browse through all entries contained in the database group-wise defined by the “Show entries” drop-down menu from one to the next by clicking on the “Next”-button or the “Previous”-button, or by selecting the desired entry group (one of the displayed numbers).

Figure A.9: Raw Data Inspection



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

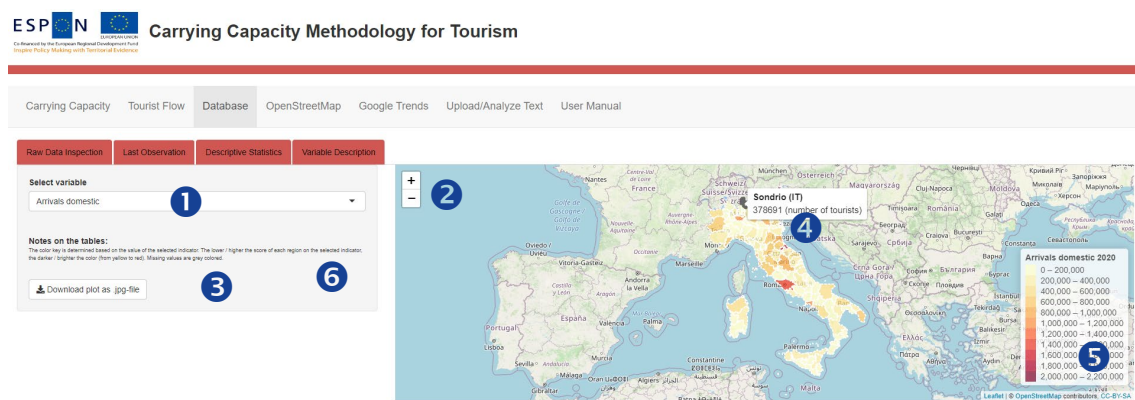


## Last Observation

Figure A.10 gives an example for Last Observation.

- ❶ Step 1 (compulsory): Select the indicator to be displayed.
- ❷ Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down.
- ❸ Download plot in .jpg format.
- ❹ Mouse-over a specific region shows the value of the selected indicator for this region.
- ❺ Legend: The colour key is determined based on the value of the selected indicator. The lower/higher the score of each region on the selected indicator, the darker/brighter the colour (from yellow to red). If "NA" shows up in the legend, this means that data for this/these region(s) is "Not Available".
- ❻ Missing values are grey coloured.

### Figure A.10: Last Observation



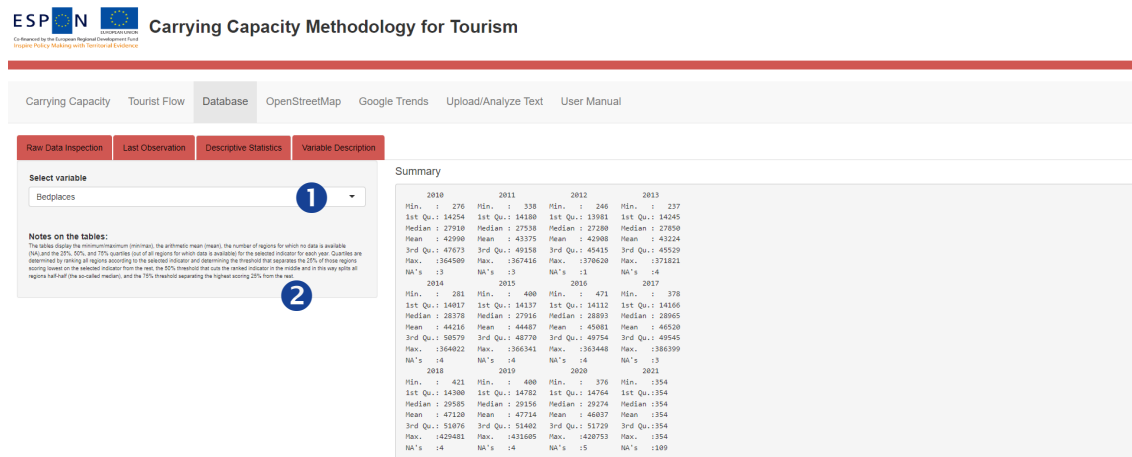
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Descriptive Statistics

Figure A.11 gives an example for Descriptive Statistics.

- 1 Step 1 (compulsory): Select the indicator to be displayed.
- 2 Notes: The tables display the minimum/maximum (min/max), the arithmetic mean (mean), the number of regions for which no data is available (NA), and the 25%, 50%, and 75% quartiles (out of all regions for which data is available) for the selected indicator for each year. Quartiles are determined by ranking all regions according to the selected indicator and determining the threshold that separates the 25% of those regions scoring lowest on the selected indicator from the rest, the 50% threshold that cuts the ranked indicator in the middle and in this way splits all regions half-half (the so-called median), and the 75% threshold separating the highest scoring 25% from the rest.

### Figure A.11: Descriptive Statistics



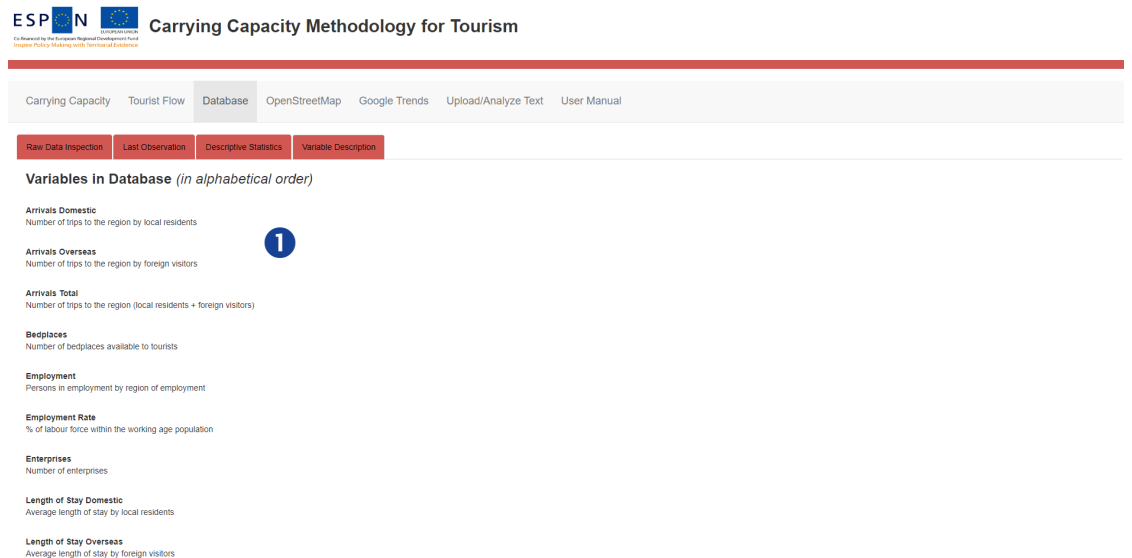
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Variable Description

Figure A.12 shows the Variable Descriptions of the indicators contained in the database.

- 1 The indicators contained in the database are listed in alphabetical order with additional explanations.

### Figure A.12: Variable Description



Source: Consortium, 2022 <http://dashboards.modul.ac.at/italy/>.

#### **A.2.3.4 OpenStreetMap (OSM)**

Level 1 tab – OpenStreetMap (OSM) – includes six Level 2 tabs:

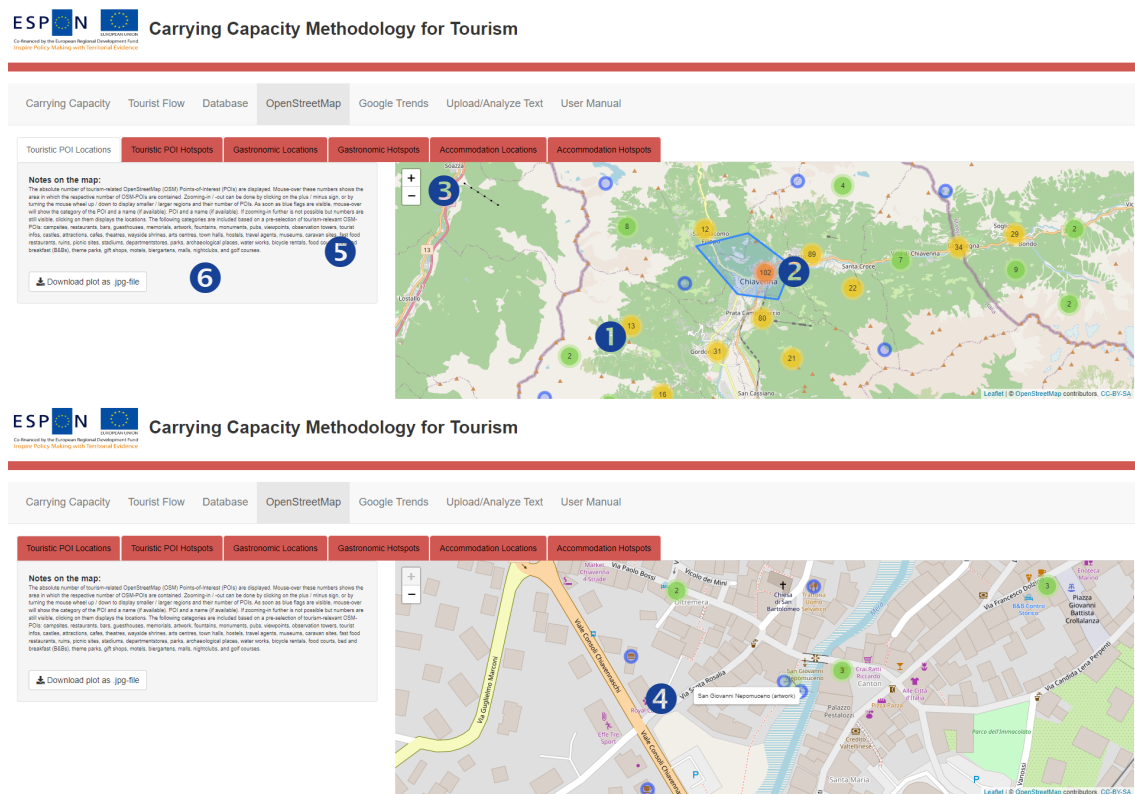
- Touristic POI Locations
- Touristic POI Hotspots
- Gastronomic Locations
- Gastronomic Hotspots
- Accommodation Locations
- Accommodation Hotspots

## Touristic POI Locations

Figure A.13 shows a map of Touristic Points-Of-Interest (POI) Locations.

- 1 The absolute number of tourism-related OpenStreetMap (OSM) Points-of-Interest (POI).
- 2 Mouse-over the numbers shows the area in which these OSM-POIs are contained.
- 3 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their number of POIs.
- 4 Mouse-over blue flags shows the category of the POI and a name (if available). If zooming-in further is not possible but numbers are still visible, clicking on them displays the locations.
- 5 Note: Included categories based on pre-selected tourism-relevant OSM-POIs: campsites, restaurants, bars, guesthouses, memorials, artwork, fountains, monuments, pubs, viewpoints, observation towers, tourist infos, castles, attractions, cafes, theatres, wayside shrines, arts centres, town halls, hostels, travel agents, museums, caravan sites, fast food restaurants, ruins, picnic sites, stadiums, department stores, parks, archaeological places, water works, bicycle rentals, food courts, bed and breakfast (B&Bs), theme parks, gift shops, motels, biergartens, malls, nightclubs, and golf courses.
- 6 Download plot in .jpg format.

### Figure A.13: Touristic POI Locations



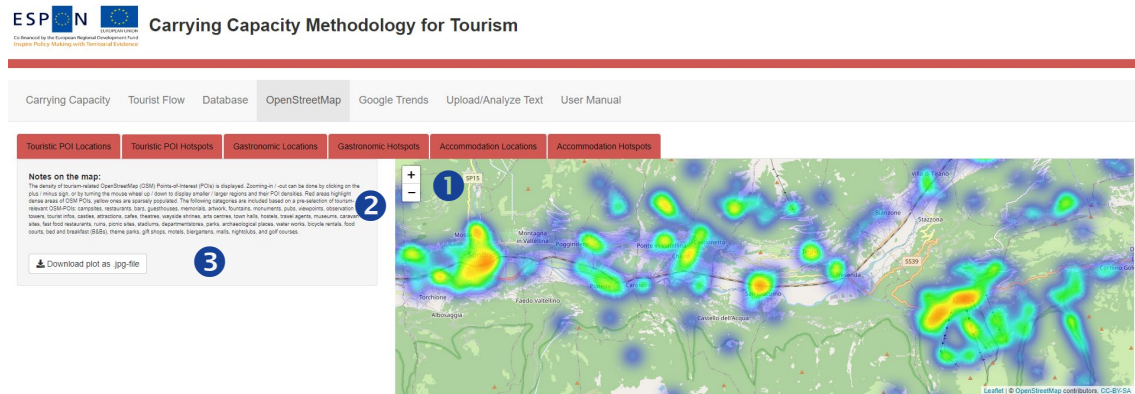
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Touristic POI Hotspots

Figure A.14 gives an example for a Touristic Points-Of-Interest (POI) Hotspot map.

- 1 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their POI densities.
- 2 Note: The density of tourism-related OpenStreetMap (OSM) Points-of-Interest (POIs) is displayed. Red areas highlight dense areas of OSM POIs, yellow ones are sparsely populated. Included categories based on pre-selected tourism-relevant OSM-POIs: campsites, restaurants, bars, guesthouses, memorials, artwork, fountains, monuments, pubs, viewpoints, observation towers, tourist infos, castles, attractions, cafes, theatres, wayside shrines, arts centres, town halls, hostels, travel agents, museums, caravan sites, fast food restaurants, ruins, picnic sites, stadiums, department stores, parks, archaeological places, water works, bicycle rentals, food courts, bed and breakfast (B&Bs), theme parks, gift shops, motels, biergartens, malls, nightclubs, and golf courses..
- 3 Download plot in .jpg format.

Figure A.14: Touristic POI Hotspots



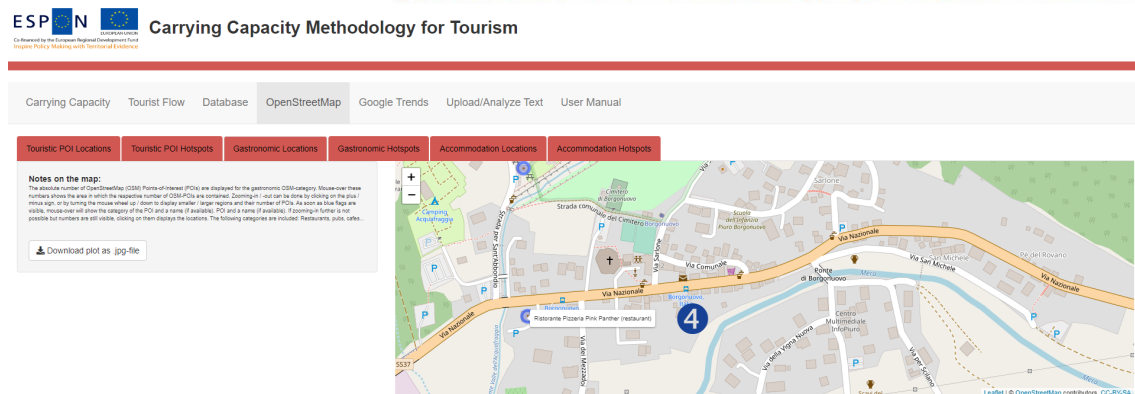
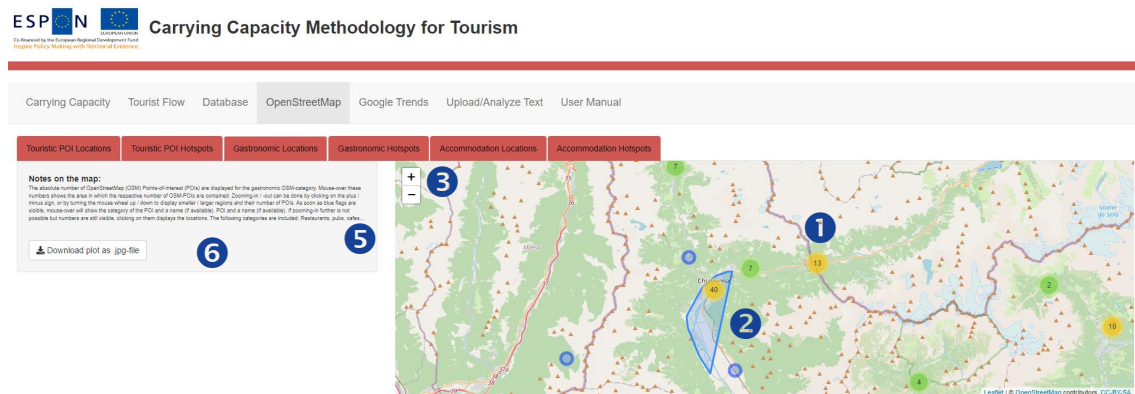
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Gastronomic Locations

Figure A.15 shows a map of Touristic Locations.

- 1 The absolute number of OpenStreetMap (OSM) Points-of-Interest (POI) are displayed for the gastronomic OSM-category.
- 2 Mouse-over the numbers shows the area in which these OSM-POIs are contained.
- 3 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their number of POIs.
- 4 Mouse-over blue flags shows the category of the POI and a name (if available). If zooming-in further is not possible but numbers are still visible, clicking on them displays the locations.
- 5 Note: The following categories are included: Restaurants, pubs, cafes...
- 6 Download plot in .jpg format.

Figure A.15: Gastronomic Locations



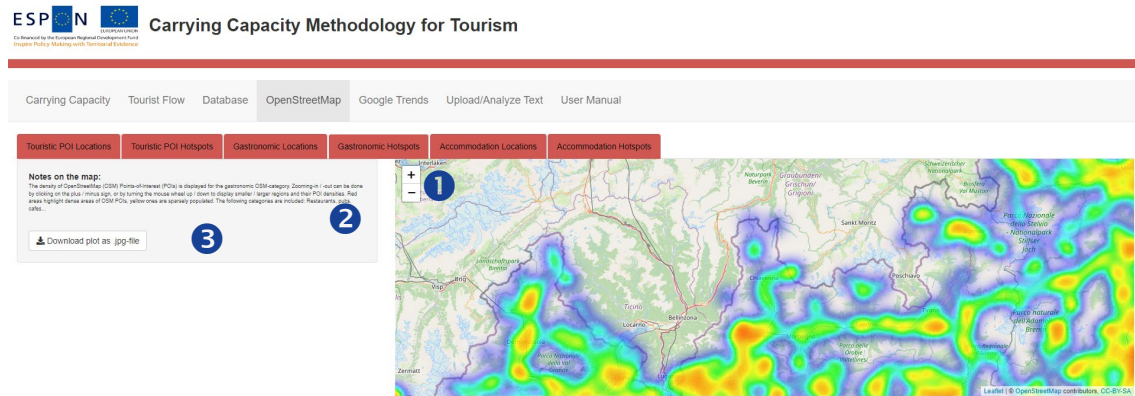
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Gastronomic Hotspots

Figure A.16 gives an example for a Gastronomic Hotspot map.

- 1 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their POI densities.
- 2 Note: The density of OpenStreetMap (OSM) Points-of-Interest (POIs) is displayed for the gastronomic OSM-category. Red areas highlight dense areas of OSM POIs, yellow ones are sparsely populated. The following categories are included: Restaurants, pubs, cafes...
- 3 Download plot in .jpg format.

### Figure A.16: Gastronomic Hotspots



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

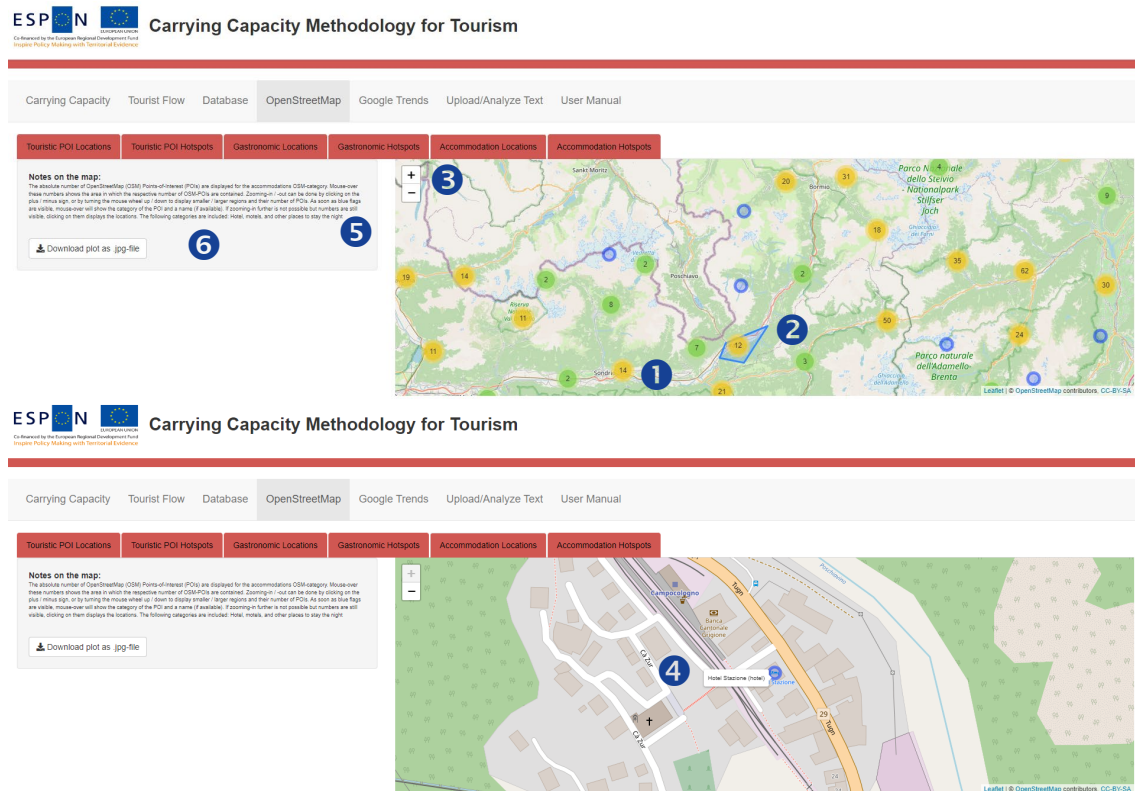


## Accommodation Locations

Figure A.17 shows a map of Accommodation Locations.

- 1 The absolute number of OpenStreetMap (OSM) Points-of-Interest (POIs) are displayed for the accommodations OSM-category.
- 2 Mouse-over the numbers shows the area in which these OSM-POIs are contained.
- 3 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their number of POIs.
- 4 Mouse-over blue flags shows the category of the POI and a name (if available). If zooming-in further is not possible but numbers are still visible, clicking on them displays the locations.
- 5 Note: The following categories are included: Hotel, motels, and other places to stay the night.
- 6 Download plot in .jpg format.

**Figure A.17: Accommodation Locations**



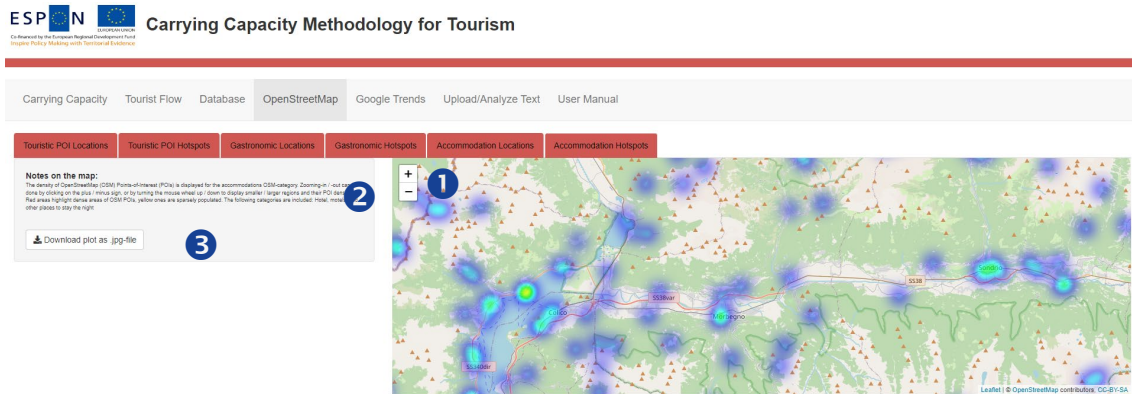
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Accommodation Hotspots

Figure A.18 gives an example for an Accommodation Hotspot map.

- 1 Zooming-in/-out can be done by clicking on the plus/minus sign, or by turning the mouse wheel up/down to display smaller/larger regions and their POI densities.
- 2 Note: The density of accommodation-related OpenStreetMap (OSM) Points-of-Interest (POIs) is displayed. Red areas highlight dense areas of OSM POIs, yellow ones are sparsely populated. The following categories are included: Hotel, motels, and other places to stay the night.
- 3 Download plot in .jpg format.

### Figure A.18: Accommodation Hotspots



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

### A.2.3.5 Google Trends

Level 1 tab – Google Trends – includes two Level 2 tabs:

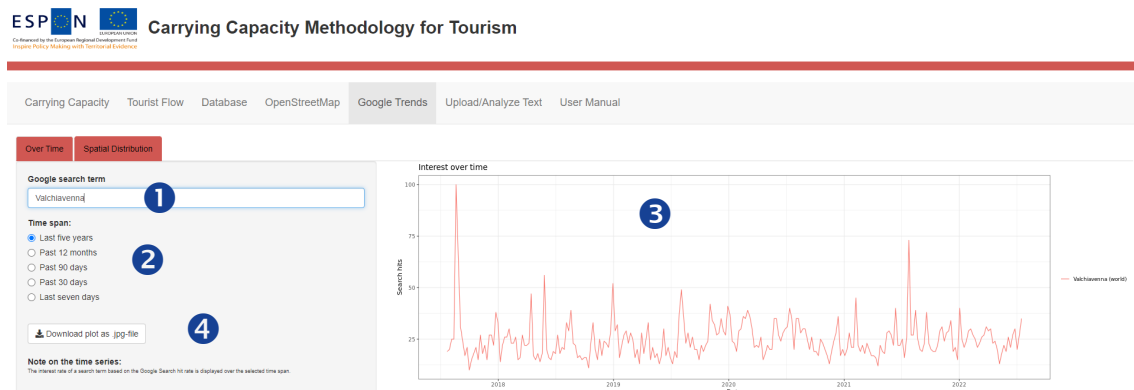
- Over Time
- Accommodation Hotspots

#### Over Time

Figure A.19 shows a map of Google Trends over time.

- 1 After entering a single term/several terms a real time query is sent to Google Trends.
- 2 The previous time span to be displayed can be specified. The following options are available: “Last five years”, “Past 12 months”, “Past 90 days”, “Past 30 days”, and “Last seven days”.
- 3 The interest rate of a search term based on the Google Search hit rate is displayed over the selected time span.
- 4 Download plot in .jpg format.

**Figure A.19: Over Time**



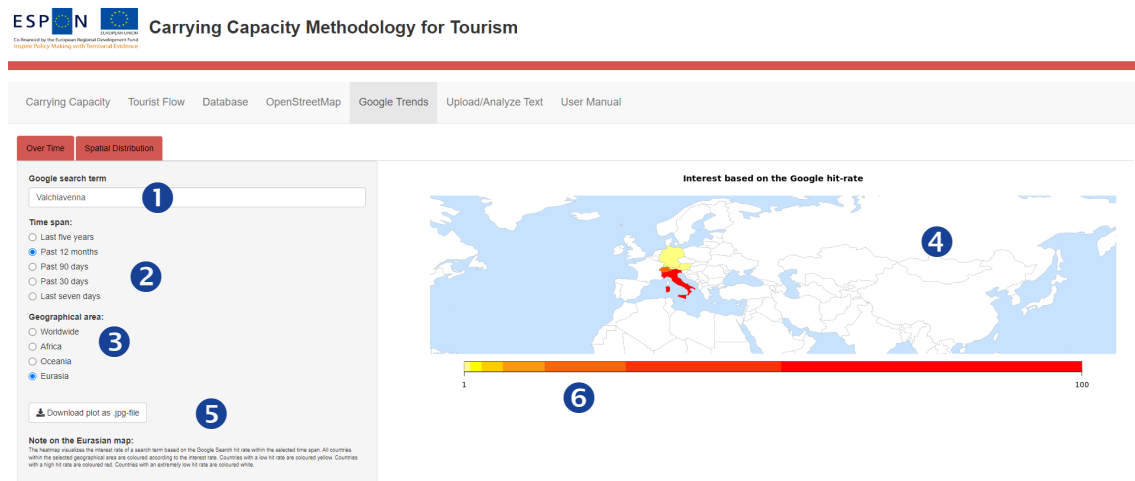
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## Accommodation Hotspots

Figure A.20 gives an example for an Accommodation Hotspot map.

- 1 After entering a single term/several terms a real time query is sent to Google Trends.
- 2 The previous time span to be displayed can be specified. The following options are available: "Last five years", "Past 12 months", "Past 90 days", "Past 30 days", and "Last seven days".
- 3 The geographical coverage can be specified. The following options are available: "Worldwide", "Africa", "Oceania", and "Eurasia".
- 4 The heatmap visualizes the interest rate of a search term based on the Google Search hit rate within the selected time span. All countries within the selected geographical area are coloured according to the interest rate.
- 5 Download plot in .jpg format.
- 6 Countries with a low hit rate are coloured yellow. Countries with a high hit rate are coloured red. Countries with an extremely low hit rate are coloured white.

**Figure A.20: Accommodation Hotspots**



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

### **A.2.3.6 Upload/Analyse Text**

Level 1 tab – Upload/Analyse Text – includes six Level 2 tabs:

- STEP 1 (own data): Data Upload
- STEP 2 (own data): Calculate Overall Sentiment/Basic Emotion Values
- STEP 3a (own data): Overall Sentiment
- STEP 3b (own data): Basic Emotions
- STEP 3c (own data): WordCloud
- STEP 3d (own data): Topic Detection

## STEP 1 (own data): Data Upload

Figure A.21 lists the steps necessary to conduct before analysing own text upon its sentiment/topics, or creating word clouds.

- 1 Preparatory work: Save the text to be analysed in csv.-format. The maximum upload size is restricted to 12.5 MB. The .csv-file has to contain the text in a column starting with the term "caption".
- 2 The "Browse" button opens a window to browse for the file containing the textual information. The upload function tries to capture the other format specifications automatically. If the displayed file looks strange, several options can be specified manually.
- 3 Depending on whether the .csv file contains a header or not, this field has to be marked.
- 4 The separator has to be chosen (comma, semicolon, or tab).
- 5 The quote has to be chosen (none, double quote, or single quote).
- 6 "Display" allows to show just the header (first entries) or all data of the uploaded .csv-file.

Figure A.21: STEP 1 (own data): Data Upload

Maximum upload size (12.5MB) equals ~10,000 Instagram posts including additional information.

**Choose CSV File**

Browse... test.csv

Upload complete

Header

**Separator**

Comma

Semicolon

Tab

**Quote**

None

Double Quote

Single Quote

**Display**

Head

All

**Notes on the Head definitions:**

The 'Browse' button allows to browse for the file containing textual information of one's own region. The .csv-file has to contain the text in a column starting with the term 'caption'. The upload function tries to capture the other options automatically. If the displayed file looks strange, the following options have to be specified manually. Depending on whether the .csv file contains a header or not, the 'Header' field has to be marked. The separator has to be chosen (comma, semicolon, or tab). The quote has to be chosen (none, double quote, or single quote). 'Display' allows to show just the header (first entries) or all data contained in the uploaded .csv-file.

caption

The weather is nice and it was such a beautiful day. Simply amazing.

The streets were dirty and the smell was strange, I would never go there again. Definitely not recommended...

I loved the city :-)) because its very multicultural.

SUPER, SUPER, SUPER!!!!!!!!!!!!

Such ugly pieces of food. Legend describes how people lived.

Oh, I have

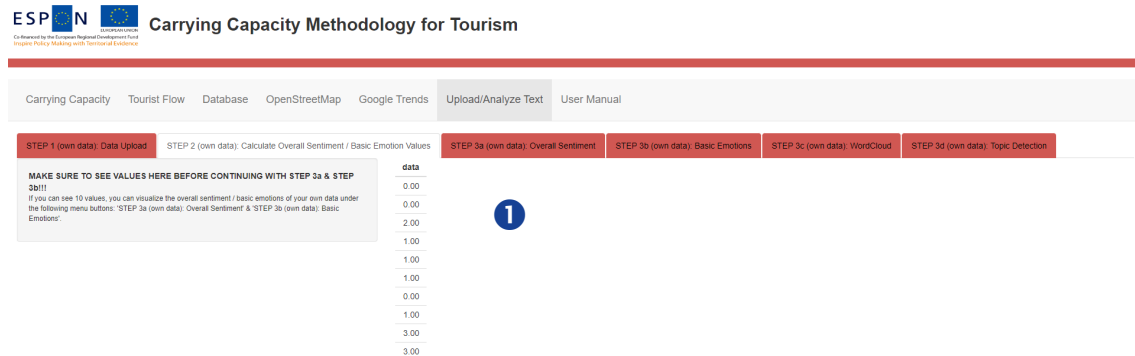
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## STEP 2 (own data): Calculate Overall Sentiment/Basic Emotion Values

Figure A.22 displays a visual test whether the own textual data uploaded was processed and completed accordingly by the sentiment algorithm.

- 1 Note: Before continuing with STEP 3a (own data): Overall Sentiment, STEP 3b (own data): Basic Emotions, STEP 3c (own data): WordCloud, and/or STEP 3d (own data): Topic Detection, one has to make sure to see 10 values. If this is not the case, one has 1) to wait till the algorithm processed all the data, or 2) to go back to STEP 1 (own data): Data Upload to make sure all specifications have been set properly.

Figure A.22: STEP 2 (own data): Calculate Overall Sentiment/Basic Emotion Values



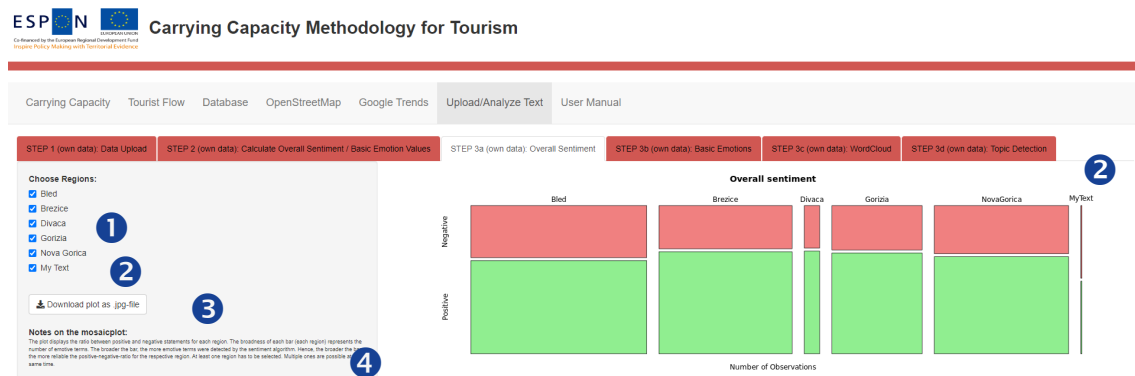
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

## STEP 3a (own data): Overall Sentiment

Figure A.23 shows the overall sentiment of the uploaded text.

- 1 Step 1 (compulsory): Select the regions to be displayed.
- 2 The overall sentiment of the uploaded text is named with the header "My Region".
- 3 Download plot in .jpg format.
- 4 Note: The plot displays the ratio between positive and negative statements for each region. The broadness of each bar (each region) represents the number of emotive terms. The broader the bar, the more emotive terms were detected by the sentiment algorithm. Hence, the broader the bar, the more reliable the positive-negative-ratio for the respective region. At least one region has to be selected. Multiple ones are possible at the same time.

Figure A.23: STEP 3a (own data): Overall Sentiment



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

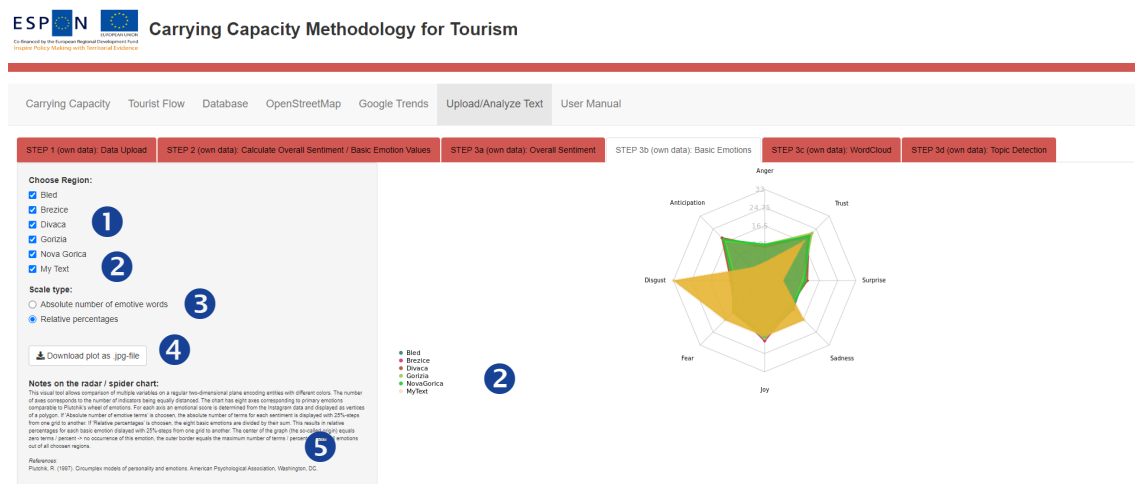


## STEP 3b (own data): Basic Emotions

Figure A.24 shows basic emotions of the uploaded text.

- 1 Step 1 (compulsory): Select the regions to be displayed.
- 2 Basic emotions of the uploaded text are named with the header "My Region".
- 3 If "Absolute number of emotive terms" is chosen, the absolute number of terms for each sentiment is displayed with 25%-steps from one grid to another. If "Relative percentages" is chosen, the eight basic emotions are divided by their sum. This results in relative percentages for each basic emotion displayed with 25%-steps from one grid to another.
- 4 Download plot in .jpg format.
- 5 Note: This visual tool allows comparison of multiple variables on a regular two-dimensional plane encoding entities with different colours. The number of axes corresponds to the number of indicators being equally distanced. The chart has eight axes corresponding to primary emotions comparable to Plutchik's wheel of emotions. For each axis an emotional score is determined from the Instagram data and displayed as vertices of a polygon. The center of the graph (the so-called origin) equals zero terms/percent → no occurrence of this emotion, the outer border equals the maximum number of terms/percentage over all emotions out of all chosen regions.

Figure A.24: STEP 3b (own data): Basic Emotions



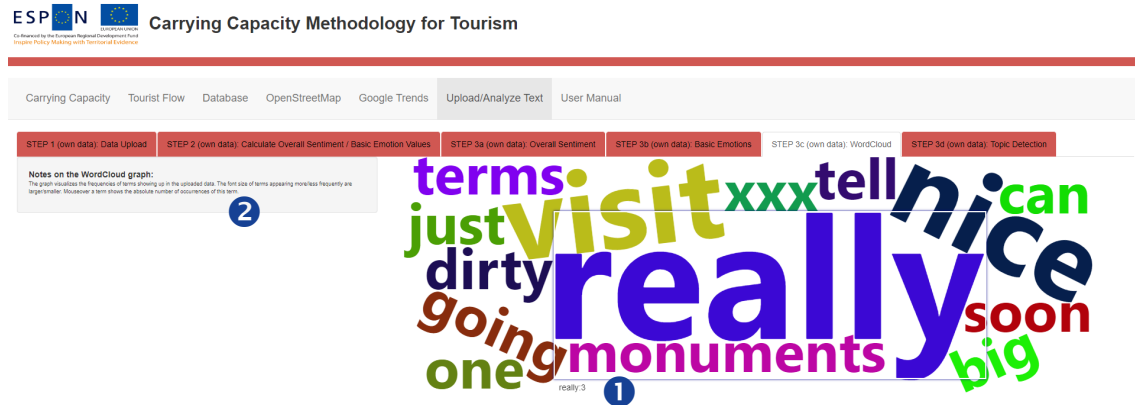
Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

### STEP 3c (own data): WordCloud

Figure A.25 shows a word cloud of the uploaded text.

- 1 Mouseover a term shows the absolute number of occurrences of this term.
- 2 Note: The graph visualizes the frequencies of terms showing up in the uploaded data. The font size of terms appearing more/less frequently are larger/smaller.

Figure A.25: STEP 3c (own data): WordCloud



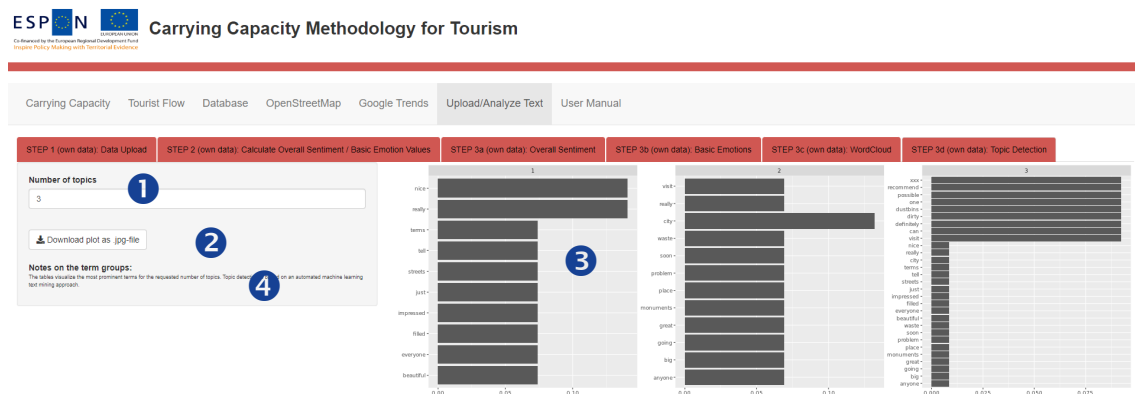
Source: Consortium, 2022. <http://dashboards.modul.ac.at/ireland/>

### STEP 3d (own data): Topic Detection

Figure A.26 shows topics detected in the uploaded text.

- 1 Step 1 (compulsory): Select the number of topics to be determined.
- 2 Download plot in .jpg format.
- 3 The tables visualize the most prominent terms for the requested number of topics.
- 4 Note: Topic detection is based on an automated machine learning text mining approach.

Figure A.26: STEP 3d (own data): Topic Detection



Source: Consortium, 2022. <http://dashboards.modul.ac.at/italy/>

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