The Sustainable Tourism Observatory of South Tyrol (STOST)

Annual Progress Report – 2024 edition

eurac research

UN Tourism INSTO International Network of Sustainable Tourism Observatories

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AUTONOME PROVINZ BOZEN SÜDTIROL
PROVINCIA AUTONOMA DI BOLZANO ALTO ADIGE
PROVINZIA AUTONOMA DE BULSAN SÜDTIROL

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South Tyrol in brief

South Tyrol is an Italian Autonomous Province and constitutes, together with the Autonomous Province of Trento, the region Trentino-South Tyrol. Located in the northern part of the Italian Alps, it borders Austria and Switzerland. The province has an area of 7,400 square kilometres and a total population of over 530,000. Its capital is the city of Bozen/Bolzano, with over 100,000 inhabitants, but it also includes other small cities with populations of around 20,000 or more (Meran/Merano, Brixen/Bressanone and Bruneck/Brunico).

South Tyrol is officially a trilingual region, with German, Italian and Ladin speakers. The statute-of autonomy, which came into force in 1972, contains concrete measures to protect the German- and Ladin-speaking minorities, such as German and Ladin schools, minority language radio and television broadcasts, as well as administrative and law-making rights.

The territorial morphology is characterised by mountains and valleys. South Tyrol is known for its mountainous areas and natural landscapes, which cover approximately 90% of the territory. A quarter of the South Tyrolean surface consists of protected areas (Morello & Oggiano, 2015). This includes those protected areas that are a part of the core of the renowned Dolomites natural heritage site, which was declared a UNESCO World Natural Heritage (WHS) site in 2009 for its landscape aesthetics and geologic and geomorphologic importance in science.

Tourism in South Tyrol: general trends and dynamics

Tourism plays a major role in South Tyrol's economy, contributing to 11.4% of the local GDP in 2019 through direct impacts alone (ISTAT, 2022). In 2023, the province recorded over 8.4 million tourist arrivals and 36.1 million overnight stays, reflecting a 79.1% increase in arrivals and 40.6% in overnight stays over the past two decades (i.e. since 2004). While the pandemic years of 2020 and 2021 saw a temporary decline due to travel restrictions, tourism has rebounded since 2022, reaching new record levels for the second consecutive year. These post-pandemic figures surpass those of the pre-pandemic peak in 2019, signalling a new challenge for South Tyrol's tourism sector tied to growing concerns about overtourism and the strain it places on both social and natural resources. Given the high intensity of tourism in some destinations, the focus in the coming years should shift from pursuing further quantitative growth to redistributing existing demand more evenly across regions and throughout the year. More broadly, it will be essential to rethink tourism development strategies in South Tyrol by recognising the limits to growth and incorporating social and ecological considerations (even) more seriously into future planning.

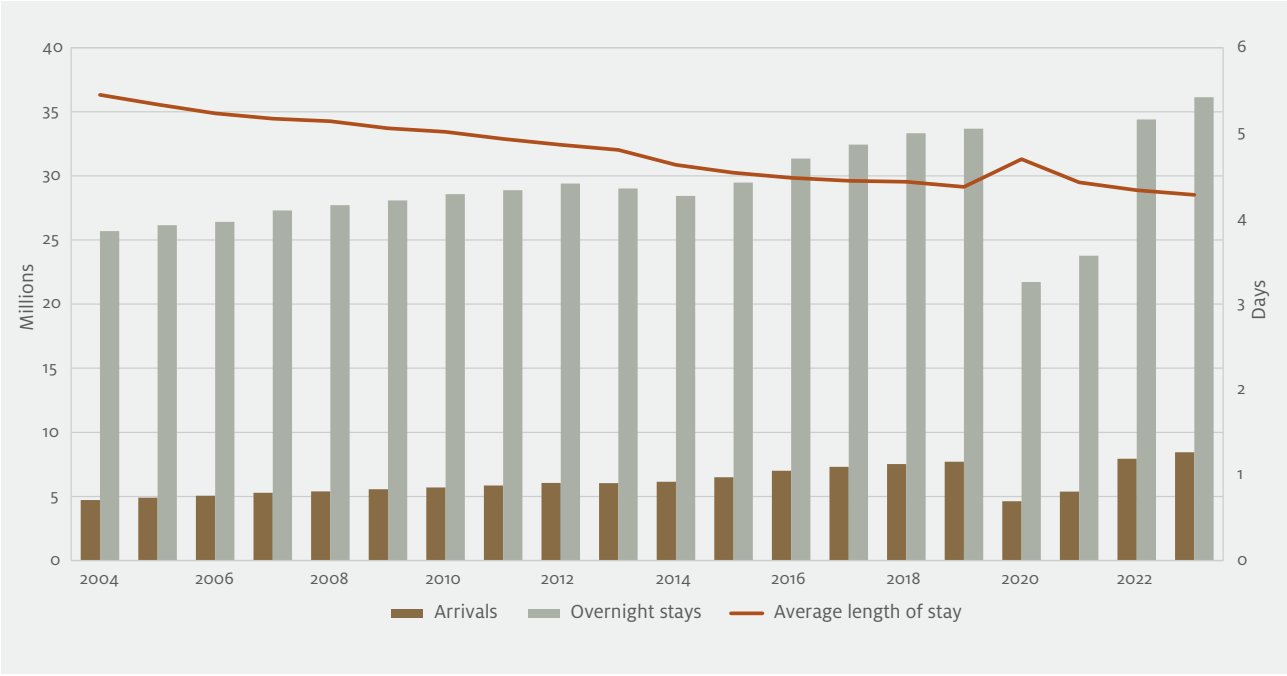

Figure 1: Tourist arrivals and overnight stays (left scale) and average length of stay (right scale) in all accommodation facilities, South Tyrol 2004-2023. Yearly data in millions.
Source: ASTAT, own elaboration.

Over the past two decades, the hospitality sector has undergone an interesting development process, with an increase in the quality and dimension of the accommodation facilities. During this period, the number of hotels and similar accommodation facilities in South Tyrol has steadily declined, dropping from 4,417 in 2004 to 3,917 in 2023 (-11.3%). However, the total number of available beds has followed an opposite trend, increasing by 5.2% during the same period. This indicates a growing average bed capacity per facility, rising from 33.4 to 39.7 beds, suggesting a shift toward larger establishments. This trend likely reflects an overall pivot to higher-quality accommodations. As shown in Figure 2, the share of 1- and 2-star hotels has decreased significantly: in 2004, these lower-category hotels represented 46.1% of all accommodations, but by 2023, their share has dropped to just 24.5%. Meanwhile, the proportion of 4- and 5-star hotels has surged over the same period, rising from 5.6% in 2004 to 15.4% in 2023. A more moderate increase can be seen in the share of 3-star hotels, which grew from 32.9% to 37.6%.

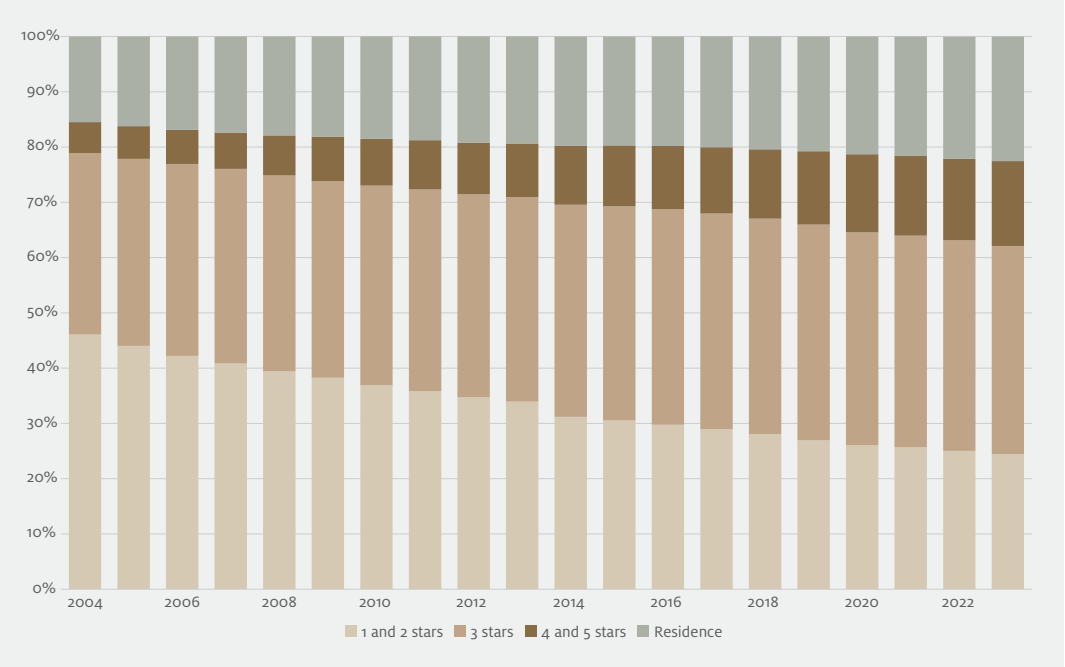

Figure 2: Hotels and similar establishments by accommodation category, South Tyrol 2004-2023. Percentage values.
Source: ASTAT, online database, own elaboration.

While the number of hotels and similar establishments has declined over the past two decades, with a shift toward higher quality and larger bed capacity per facility, other types of accommodation—such as campsites, private lodgings, and agritourism ventures—have seen significant growth. From 2004 to 2023, the number of these alternative accommodation services increased by 36.7%, rising from 5,746 to 7,852. Similarly, the total number of available beds in these services grew by 33.7%, from 65,832 to 87,992. These figures underscore the growing importance of non-traditional accommodation options. As of 2023, such services account for 66.7% of all accommodation establishments and provide 36.1% of all beds, a trend that continues to rise.

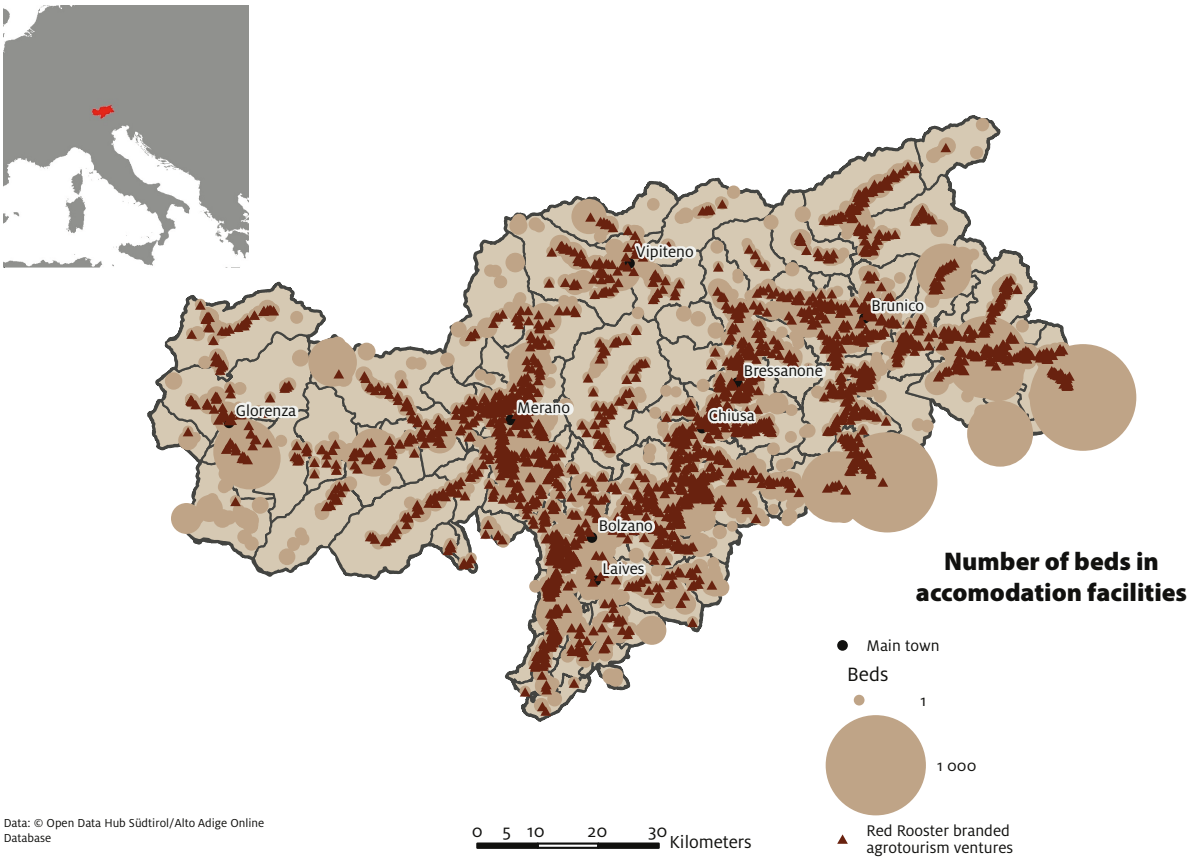

Figure 3: Location of Red Rooster branded agritourism ventures and beds of accommodation facilities.
Source: Open Data Hub Südtirol/Alto Adige, Online Database.

In terms of guest origin, proximity markets dominate over long-distance ones. The main tourist markets for South Tyrol are the "DACHI countries" (Germany, Austria, Switzerland, and Italy). For the past two decades, German tourists have consistently made up the largest share, accounting for close to 50% of overnight stays. In 2020, due to the Covid-19 pandemic and a sharp decline in international visitors, this share dropped to 41.8%, partially offset by an increase in Italian tourists, who represented 40.8% of stays. By 2023, market distribution returned to pre-pandemic levels, with Germany accounting for 48.2% of overnight stays, Italy 29.6%, Switzerland and Liechtenstein 4.6%, the Benelux countries 3.5%, Austria 3.4% and other countries for 10.8%.

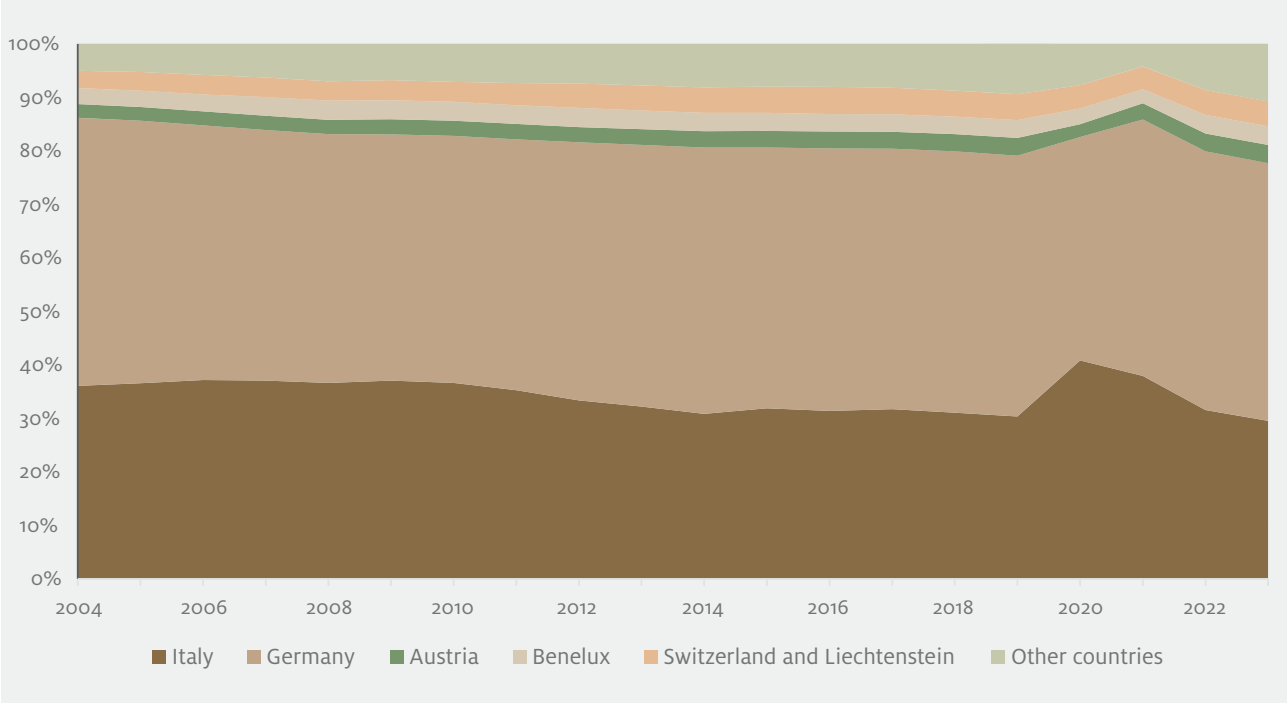

Figure 4: Overnight stays in all accommodation facilities by market of origin, South Tyrol 2004-2023.
Source: ASTAT, own elaboration.

STOST: a tourism intelligence tool

The Sustainable Tourism Observatory of South Tyrol (hereafter STOST) was launched in 2018. It belongs to the United Nations World Tourism Organization's (UN Tourism) International Network of Sustainable Tourism Observatories (INSTO), a network of organisations monitoring the economic, environmental, and social impact of tourism at the regional level. The initiative is based on UN Tourism's long-standing commitment to the sustainable and resilient growth of the sector through measurement and monitoring, supporting an evidence-based management of tourism (http://insto.unwto.org). The observatory strives to achieve a series of objectives in line with the following vision and mission.

Vision

Through intersectoral and destination-wide cooperation as well as new monitoring and communication models, STOST seeks to contribute to the creation of a liveable socio-environmental habitat for South Tyrol's future generations and their guests.

Mission

STOST monitors, evaluates, and communicates tourism developments in South Tyrol. STOST examines benefits and costs of tourism for South Tyrol and provides recommendations and guidelines for policy makers to support sustainable tourism management. The enabling of a transformation of the tourism sector based on awareness, learning, and evidence-based decision making for different target groups of South Tyrol's society lies at its very core.

Objectives

Striving towards the achievement of the vision and implementation of the mission, various short-, medium- and long-term objectives for the observatory were developed based on a synthesis of expert interviews conducted during the preliminary phase of the STOST settlement. They can be divided into five overarching goals: **(1)** stay informed on developments and regularly communicate them; **(2)** serve as a think tank promoting sustainability in tourism; **(3)** raise awareness and enable learning processes; **(4)** provide evidence for decision makers; **(5)** build trust between stakeholders and facilitate communication, cooperation, and networking.

More information on STOST and its structure as well as on related activities, news, and projects can be found on our website (see **https://sustainabletourism.eurac.edu/**). In addition, a detailed technical description of all indicators is provided on the website, along with information on the data management workflow and an extensive list of organisations that have supported STOST in the past years, both with data and precious knowledge and advice.

Governance of STOST: founding bodies and stakeholder working group

The governance of STOST is shaped by many different actors within and outside the destination. The observatory was established by the Center for Advanced Studies at Eurac Research in cooperation with the local destination management organisation IDM South Tyrol (abbreviation for Innovation, Development, Marketing) and the provincial government of South Tyrol. The former two institutions keep up to date through regular online meetings.

The stakeholder working group actively contributes to the development of the observatory by supporting Eurac Research in the design of monitoring frameworks, in data management and feedback processes, and in the validation of results. The stakeholder working group includes a) data providers, such as, the Provincial Statistical Office (ASTAT), the Chamber of Commerce and Industry, the local Environmental Agencies; b) support providers, for example, the Free University of Bozen/Bolzano, the Hotel and Gastronomy Association (HGV), the Fair of Bozen/Bolzano, and other local research institutions and trade associations. A complete list of the organisations participating in the working group workshops is listed on our website.

Finally, additional organisations, such as UN Tourism, the National Ministry for Agriculture and the Ministry of Tourism, the provincial administration and international treaties such as the Alpine Convention, support the advancement of the observatory by sharing their expertise and bringing in best practices. These entities are crucial because they offer benchmarking opportunities and access to a supra-regional knowledge network.

The last official stakeholder meeting was held in July 2024, with representatives from the core organisations involved in STOST – Eurac Research, IDM, HGV and the provincial government. The overarching aim was to discuss the achievements of the observatory in the past years, recent activities and studies, as well as future challenges and new strategic directions.

Find out more on our website!

Methodological strategy: how to measure and understand sustainable tourism development

In this report we refer to sustainable tourism, in accordance with the UN Tourism definition, as a form of tourism that ***"takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities"*** (UNEP & UNWTO, 2005). Following this definition, "sustainability principles refer to the environmental, economic and socio-cultural aspects of tourism development", implying that a "suitable balance must be established between these three dimensions to guarantee its long-term sustainability" (ibid.).

The UN Tourism guidelines for INSTO observatories propose eleven mandatory issue areas to monitor sustainability performance in tourism. These are: tourism seasonality, employment, economic benefits, governance, local satisfaction, energy management, water management, waste water management, solid waste management, climate action, and accessibility. Further monitoring areas are welcomed by UN Tourism to assess context-specific topics and issues. Based on 29 qualitative interviews undertaken with local and international tourism experts during the preliminary phase in 2018, the STOST research team defined three additional issue areas: mobility, nature conservation, and land use and landscape diversity. In the year 2020, an additional issue area on culture was added, with the goal to measure the reciprocal effects of culture and tourism in South Tyrol. Thus, currently, STOST is monitoring 15 issue areas, which are depicted in **Figure 5**.

Figure 5: Mandatory (in black) and additional (in green) issue areas.
Source: own elaboration.

For each of these issue areas, indicators were selected with reference to international standards (e.g. European Tourism Indicators System for sustainable destination management – ETIS, Global Sustainable Council Tourism Criteria for Destinations – GSTC-D). This was done in collaboration with different administrative and private stakeholders. Some indicators were revised and improved over the years, informed by stakeholder feedback gathered during "think tanks". These think tanks—which usually take place during a working group workshop for a specific issue area—are an opportunity to discuss emergent or innovative aspects in the respective fields for which quantitative data is often not available yet.

Indicators were classified according to the DPSIR (Driving forces, Pressures, States, Impacts, Responses) framework (Burkhard & Müller, 2008). This framework enables the classification of indicators based on their typology as: a) driving forces of an impact (DF); b) indicators of pressure on the environment (P); c) indicators of the state of the environment (S); d) indicators of impact measured on the environment (I); and d) indicators of response typically undertaken by civil society to minimise impacts (R). **Table 1** illustrates the indicators and their classification. Beside each indicator, a circular symbol helps to identify the DPSIR typology, as well as the dimension it refers to: a blue circle indicates the economic dimension, a brown one the social-cultural dimension, and a green one the environmental dimension. In addition, a reference to the Sustainable Development Goals (SDGs) linked to each issue area is provided.

ISSUE AREA	INDI-CATOR	DESCRIPTION	DIMENSIONS	TYPOLOGY (DPSIR)		SDGS
1 **Seasonality** 	1.1	Tourist arrivals by month and market	Economic	Driving force	DF	
	1.2	Overnight stays by month and period	Economic	Driving force	DF	
	1.3	Tourist arrivals in peak weeks by municipality	Economic	Driving force	DF	
2 **Employment** 	2.1	Employees in the accommodation and food service sector	Economic/ Social-cultural	Driving force	DF	
	2.2	Female enterprises in the accommodation and food service sector	Economic/ Social-cultural	State	S	
	2.3	Employees in the accommodation and food service sector by citizenship	Economic/ Social-cultural	State	S	
3 **Economic benefits** 	3.1	Value added by the accommodation and food service sector	Economic	Driving force	DF	
	3.2	Earnings situation for the accommodation and food service sector	Economic	State	S	
	3.3	Gross occupancy rates of bed places by municipality and tourism exposure	Economic	Driving force	DF	
4 **Governance** 	4.1	Municipalities, accommodation facilities and events involved in voluntary certification schemes for sustainability	Environmental/ Social-cultural	Response	R	
	4.2	"Red Rooster" branded agritourism ventures producing and selling regional products	Environmental/ Social-cultural	Response	R	
	4.3	Organic milk sold to the members of the main local buying syndicate	Environmental/ Social-cultural	Response	R	

ISSUE AREA	INDI-CATOR	DESCRIPTION	DIMENSIONS	TYPOLOGY (DPSIR)	SDGS
5 **Local and visitor satisfaction** 	**5.1**	Tourism intensity index	Social-cultural	Pressure P	
	5.2	Difference in minimum rent prices by tourism exposure	Social-cultural	Pressure/ State P S	
6 **Energy management** 	**6.1**	Estimated minimum electricity consumption in accommodation facilities	Environmental	Pressure P	
	6.2	Electricity consumption of cable cars and snow guns	Environmental	Pressure P	
7 8 **Water management** **Waste water management** 	**7.1**	Estimated minimum water consumption in accommodation facilities	Environmental	Pressure P	
	7.2	Water use by snow guns	Environmental	Pressure P	
9 **Waste management** 	**9.1**	Estimated waste production in accommodation facilities	Environmental	Pressure P	
10 **Mobility** 	**10.1**	Mobilcards, bikemobil Cards, museumobil Cards and guest tickets	Environmental/ Social-cultural	Response R	
	10.2	Ski-lift and cable car users by season	Environmental/ Economic	Driving force DF	
	10.3	Charging stations for e-mobility	Environmental	Response R	

ISSUE AREA	INDI-CATOR	DESCRIPTION	DIMENSIONS	TYPOLOGY (DPSIR)	SDGS
11 **Land use and landscape diversity**	**11.1**	Beds per land use zone and category	Environmental/ Social-cultural	Pressure (P)	
	11.2	Areas for tourist facilities	Environmental/ Social-cultural	Driving force (DF)	
	11.3	Bed density in residential zones	Environmental/ Social-cultural	Pressure (P)	
12 **Nature conservation**	**12.1**	Endangered biodiversity in natural and protected areas in relation to municipalities by tourism intensity	Environmental/ Social-cultural	State (S)/ Driving force (DF)	
13 **Culture and tourism**	**13.1**	Museums by type and level of municipality tourism exposure	Cultural	State (S)	
	13.2	Percentage of tourists of total museum visitors	Cultural	State (S)	
14 **Climate action**	**14.1**	Car-related CO_2 equivalent emissions from inbound tourism	Environmental	Pressure (P)	
15 **Accessibility**	**15.1**	Accessible gastronomy and accommodation facilities	Social-cultural	State (S)/ Response (R)	
	15.2	Accessible cultural facilities and free time activities	Social-cultural	State (S)/ Response (R)	

Table 1: List of indicators and their classification.
Source: own elaboration.

As different areas in South Tyrol are affected by and exposed to tourism activity to different degrees, we use the term "tourism exposure" through this report – an index composed of the tourism intensity and the number of beds per surface – as a variable to group municipalities into three categories (high, average, low). This helps to analyse and better understand whether exposure to tourism influences the indicators we measure in the following issue areas (for a detailed description of how the tourism exposure is calculated please refer to the technical notes on indicators which you can find on our website).

In addition, to better compare trends across the monitored fields, this report includes summarising tables for each issue area. These tables provide an overview of the absolute values for the year 2023, as well as of the long-term trends (2014-2023 variations) and any variation between the last two years (2022-2023). If values for 2023 are not yet available, the most recent year for which date is available will be displayed instead. The same holds for cases where time series do not go back as far as 2014. In these instances, the percentage change between the most recent and the oldest data point will be calculated and shown in the table.

INDICATOR		VALUE	CHANGE	
1.1	**Indicator name**	**2023**	**2014-2023**	**2022-2023**
		Value 1	Change 1 (%/PP)	Change 2 (%/PP)

Table 2: Structure of the summarising tables used in this report.
Source: own elaboration.

Issue areas

1.

Tourism seasonality

Philipp Corradini

The variation in tourist arrivals and overnight stays, known as tourism seasonality, is a hallmark of the global tourism industry. While often considered inevitable and driven by external factors like mandatory holidays, this uneven distribution of tourists throughout the year in a particular area, such as the Autonomous Province of Bozen/Bolzano, can lead to challenges like overcrowding, inflated prices, strained infrastructure during peak seasons, and a shortage of services and employment opportunities during low and shoulder seasons. To mitigate these issues and reduce the strain on resources and local communities, it is essential to understand the seasonal trends in the destination. Tracking tourist arrivals on a monthly and weekly basis helps identify periods of low and high activity, allowing for the early identification and resolution of related problems. Furthermore, this data is key to effectively managing visitor flows and balancing fluctuations in demand. In South Tyrol, specific objectives include lowering demand during peak seasons, shifting demand to low and shoulder seasons, and redistributing tourist activity from areas with high tourism exposure to those with moderate or lower levels of exposure.

Find out more on our website!

INDICATOR		VALUE	CHANGE	
1.1	**Tourist arrivals by month and market (Reported value: Gini index)**	**2023**	**2014-2023**	**2022-2023**
		0.265 (Germany)	-1.7% (Germany)	-14.0% (Germany)
		0.365 (Italy)	-2.5% (Italy)	-1.4% (Italy)
1.2	**Overnight stays by month and period (Reported value: Percentage of overnight stays in peak month)**	**2023**	**2014-2023**	**2022-2023**
		16.2% (August)	-2.1 pp	-1.6 pp
1.3	**Tourist arrivals in peak weeks by municipality**	**2023**	**2014-2023**	**2022-2023**
		4.2% (Abtei/Badia, week 53)	-1.1 pp	+0.2 pp
		3.2% (Meran/ Merano, week 33)	-0.2 pp	0.0 pp
		2.8% (Bozen/ Bolzano, week 33)	0.0 pp	-0.2 pp

Table 3: Indicators for seasonality.
Source: own calculation based on data from ASTAT 2024 (1.1, 1.2, 1.3).

Figure 6 presents the average monthly tourism arrivals in South Tyrol from 2014 to 2023, broken down by source markets. The data reveals a clear seasonal pattern, with peak tourism occurring during the winter and summer months, driven by holidays in the main source markets, events, and favourable weather conditions. The main tourist source markets, Italy and Germany, show different seasonal preferences: Italian tourists primarily visit in August (22%), July (14.8%), and December (13.9%), while German tourists are more evenly distributed across the year. Tourists from Austria, Switzerland, and Liechtenstein, who collectively account for over 9% of total arrivals, largely prefer the summer months, with more than 72% of their visits occurring between May and October.

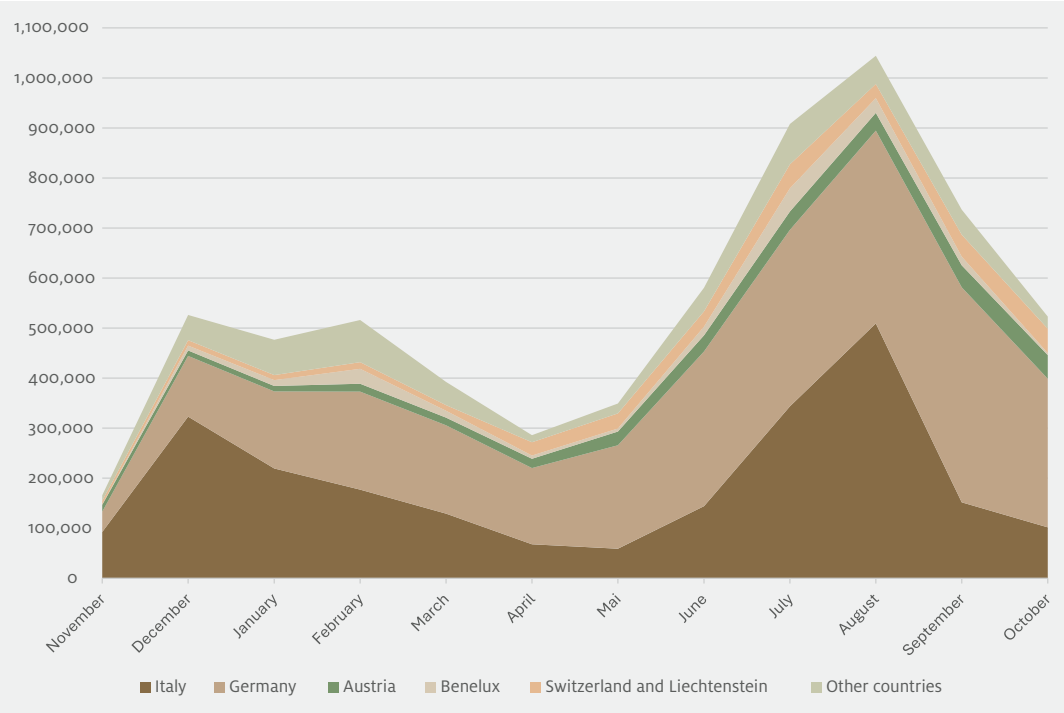

Figure 6: Tourist arrivals by month and market, South Tyrol 2014-2023. Monthly average values.
Source: ASTAT, own elaboration.

Over the 10-year period from 2014 to 2023, an analysis of the **Gini index**[1] for tourist source markets reveals that German visitors had the most balanced distribution of arrivals throughout the year, with a Gini value of 0.323. Austria followed closely with a value of 0.326, while Switzerland and Liechtenstein had a Gini index of 0.361. Italian tourists showed a slightly less even distribution, with a Gini value of 0.391. On the other hand, although the number of tourists from the Benelux countries was relatively small, their arrivals were the most unevenly distributed, with a Gini index of 0.470.

The analysis of the **monthly distribution of overnight stays** reveals a similar trend. Over the 10-year period from 2014 to 2023, there is a notable concentration of stays during the summer months, particularly in August (18.9%) and July (14.7%). However, in 2023, there was a slight decrease in seasonal variations compared to 2022, with a lower concentration of overnight stays in August, which accounted for 16.2% of the total, down from 17.8% in August 2022.

The analysis of **tourist arrivals in peak weeks at the municipal level** over the past decade (2014-2023) confirms their concentration during the summer months. Among South Tyrol's 116 municipalities, 110 experienced their highest number of arrivals in August. Specifically, calendar week 33 accounted for the peak week in 57.8% of these municipalities, while 19.8% saw their highest arrivals in week 34, and 17.2% in week 32. These weeks represent periods of heightened demand for tourist attractions and critical infrastructure, such as roads and railways. Municipalities with lower tourism exposure exhibited a more pronounced concentration of arrivals, with Laurein/Lauregno (9.6% of annual arrivals in week 32), Proveis/Proves (8.3% in week 32), and Margreid/Magrè (6.7% in week 34) leading this trend. In contrast, municipalities with higher tourism exposure saw weekly peaks ranging from 3% (Hafling/Avelengo) to 4.9% (Stilfs/Stelvio).

1 The Gini index measures inequality in distributions, including tourist markets' seasonality. A value of 0 signifies even distribution of arrivals in all the months of the year, while 1 indicates all guests arrive in a single month.

2.

Employment

Philipp Corradini

Tracking employment in the tourism sector is essential, as it influences both the quality of life for residents as well as tourists' overall satisfaction. Comparing the workforce size in tourism to other industries offers an insight into the sector's economic significance. Delving into further employment factors can provide a deeper understanding of tourism's socioeconomic impacts on a destination. For example, gender equality metrics shed light on job quality. Gender distribution is significant, as tourism often displays both horizontal and vertical gender segregation (see Baum, 2013). Women are frequently found in roles such as waitressing and cleaning, while men dominate areas like maintenance, construction, and management (horizontal segregation). Additionally, women are overrepresented in lower-level jobs with limited advancement opportunities, whereas men tend to hold more managerial roles (vertical segregation, see Campos-Soria et al., 2011). In South Tyrol, where the accommodation and food service sectors play a key role in the economy, specific objectives should focus on enhancing tourism as a prominent employer, addressing gender imbalances in the industry, and improving working conditions for both local and international tourism workers.

Find out more on our website!

INDICATOR		VALUE	CHANGE	
2.1	**Employees in the accommodation and food service sector**	**2023**	**2014-2023**	**2022-2023**
		33,942 (yearly avg.)	+49.3%	+6.3%
2.2	**Female enterprises in the accommodation and food service sector**	**2023**	**2014-2023**	**2022-2023**
		36.2%	+1.3 pp	-0.2 pp
2.3	**Employees in the accommodation and food service sector by citizenship**	**2023**	**2014-2023**	**2022-2023**
		63.9% (domestic) 36.1% (foreign)	+1.4 pp (domestic) -1.4 pp (foreign)	-1.1 pp (domestic) +1.1 pp (foreign)

Table 4: Indicators for employment.
Source: own calculation based on data from AMB (2.1, 2.3) and WIFO (2.2).

Between the years 2017 and 2019, the **accommodation and food service sector encompassed an average of 13.7% of the overall workforce** in South Tyrol. Throughout the pandemic years of 2020 and 2021 this fell to 11.1%. In 2023 the share increased to 14.8%, surpassing the year 2022 by 0.6 percentage points. In all months, the monthly total workforce number of 2023 exceeded the 3-year average of the pre-Covid years (2017, 2018 and 2019). In **Figure 7** this development is represented by the relation between the absolute numbers of 2023 and the average values from the pre-Covid years[2].

Figure 7: Employees in the accommodation and food service sector by month, South Tyrol 2018-2023 (left axis) and percentage change of 2023 in relation to the pre-Covid years' 2017, 2018 and 2019 average (right axis).
Source: AMB, own elaboration.

2 It is important to mention that the data displayed in Figure 7 refer to employees and do not include the self-employed. They also exclude all other tourism-related economic activities (e.g. museums, natural parks, commercial activities).

The **share of female led tourism enterprises**, as defined by the Institut für Wirtschaftsforschung (Institute of Economic Research, hereafter WIFO) of the Chamber of Commerce of Bozen/ Bolzano, saw a steady increase from 34.9% in 2014 (2,470 enterprises) to 36.2% in 2023 (2,858 of 7,887 overall active enterprises). This represents a positive trend towards female leadership development and gender equality, even though its peak share of 37% was registered in 2020.

In 2022 Italian nationals accounted for 65% of the overall **employees in the accommodation and food service sector**, yet their share decreased to 63.9% in 2023, followed by non-European citizens with a share of 13.9%. Furthermore, in 2023 citizens of EU member states after 2004 represented 12.3% of the workforce, while citizens of other European (non-EU) countries accounted for 7.7%. Lastly, citizens of the EU-15 states represented the remaining 2.2% of the overall tourism workforce.

3.

Economic benefits at the destination level

Philipp Corradini

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Tourism is widely acknowledged as a key driver of economic growth and regional prosperity (Brida & Risso, 2009). It generates employment opportunities, attracts private investments, and encourages infrastructure development. Although tourism is quite susceptible to disruptions (Becken et al., 2014), well-managed tourism systems can recover rapidly (see Sharma et al., 2021). In South Tyrol, tourism plays a crucial role in the local economy, providing employment for over 30,000 people throughout the year and making a significant contribution to the gross domestic product. Tracking the Gross Value Added (GVA) of the accommodation and food service sector over time can serve as an indicator of tourism's overall economic contribution. Additional metrics, such as business profit reports and accommodation occupancy rates, help gauge tourism exposure. By combining objective indicators like gross value added and occupancy with subjective assessments and employment data, a comprehensive understanding of the local tourism benefits can be achieved. Key objectives for South Tyrol include improving the assessment of tourism's economic impact, which involves accounting for indirect effects in GVA calculations and analysing resource consumption linked to positive economic outcomes. Another goal is to address seasonality by maintaining a balanced occupancy rate throughout the year. Low-exposure municipalities should focus on extending the overall tourism season, while high-exposure destinations should aim to redistribute tourism flows to the shoulder seasons.

INDICATOR		VALUE	CHANGE	
3.1	Value added by the accommodation and food service sector	2021*	2014-2021*	2020-2021*
		2,048.6 Mio € (8.8% of GVA)	-0.3 pp	+6.4 pp
3.2	Earnings situation for the accommodation and food service sector	2023	2014-2023	2022-2023
		90.0%	+15.3 pp	-1.7 pp
3.3	Gross occupancy rates of bed places	2023	2014-2023	2022-2023
		40.6%	+4.9 pp	+0.4 pp

Table 5: Indicators for economic benefits.
Source: own calculation based on data from ISTAT 2024 (3.1), WIFO (3.2) and ASTAT 2024 (3.3).

**Latest available data.*

According to the relative contribution of individual European NACE Rev2 categories (EUROSTAT, 2008), South Tyrol's total **Gross Value Added** (economic output) in 2021[3] reached €23,298 million, marking a 7.5% increase compared to 2020. During the pandemic in 2020, the accommodation and food service sector contributed €1,925.3 million to the region's total output, accounting for 8.9% of the overall economy. By 2021, the sector experienced a rise of €123.3 million, bringing its contribution to €2,048.6 million—an increase of 6.4% compared to 2020—making it the fourth-largest driving force in South Tyrol's economy[4].

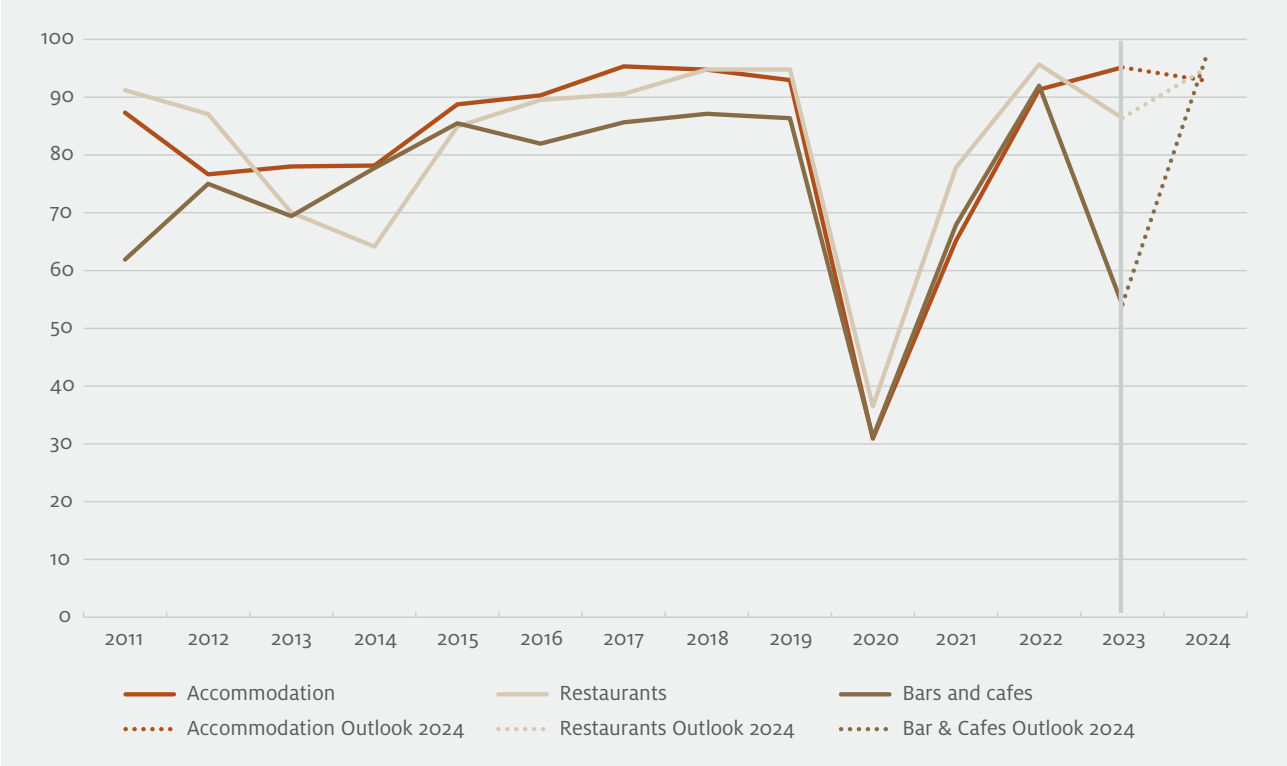

Figure 8: Earnings situation in the accommodation and food service sector, South Tyrol 2011-2023, index and expectations for 2024.
Source: WIFO, own elaboration.

3 Unfortunately, at the time of writing, more recent data were not available.

4 It must be underlined that the national account data consider only the direct effects produced by this sector, while the indirect and induced economic activities produced by tourism, i.e., how much the output of other sectors depends on demand from the tourism sector itself, are not considered.

The **earnings situation for accommodation, restaurants, and bars and cafes** in South Tyrol, represented in **Figure 8**, is the indicator based on business tendency surveys conducted by WIFO among a large panel of firms[5]. With respect to 2022, 2023 saw a slight decrease from 91.7% to 90.0%. The earnings situation for 2023, divided by the subsectors, encompass accommodations (95.2%), restaurants (86.4%) and bar & cafes (54.1%). The latter experienced the largest decrease from 92.0% in 2022. The outlook for the year 2024 in terms of good/satisfactory profitability expectation comprises 93.6% for the overall tourism sector.

As an additional measure of economic benefits, the **gross occupancy rate** reflects how fully the available bed places in accommodation establishments are being utilized. When not solely driven by price reductions, a high occupancy rate can indicate greater profit margins and a positive trend in the contribution margin. After rising to 40.5% in 2022—nearly reaching pre-pandemic levels (41% in 2019)—the overall occupancy rate in South Tyrol stabilized at 40.6% in 2023.

5 At the beginning of each year, WIFO asks firms to assess their profit of the previous year. Therefore, we report the reference year and not the survey year. The indicator refers to the share of enterprises for each subsector of the tourism industry (Accommodation, Restaurant and Bar & Cafes) who have reported either a good or at least satisfactory profitability in the reference year.

4.

Governance

Maximilian Walder

Monitoring different steering approaches to sustainability is essential to understand local decision-making capacities, observe the presence of a common vision and strategy, and track the coherence of local and cross-sectoral policies. Key objectives for achieving an effective sustainability governance in tourism regard a coordinated advancement in the use of local resources and products in the hospitality sector, as well as an orientation towards the achievement of green labels for businesses, destinations and events. To ensure this, it is essential to achieve concerted action among stakeholders, fostering collaboration through both top-down and bottom-up initiatives. Certification schemes can play a pivotal role in strengthening intersectoral governance, ensuring alignment across diverse sectors.

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INDICATOR		VALUE	CHANGE	
4.1	**Municipalities, accommodation facilities and events involved in voluntary certification schemes for sustainability**	**2023**	**2014-2023****	**2022-2023****
		209	+375.0%	+49.3%
4.2	**"Red Rooster" branded products**	**2023**	**2014-2023**	**2022-2023**
		834	+86.2%	-1.2%
4.3	**Organic milk sold to the members of the main local buying syndicate**	**2023**	**2016*-2023**	**2022-2023**
		24.0%	+23.4 pp	0.0 pp

Table 6: Indicators for governance.
Source: own calculation based on data from Bio Hotels, KlimaHaus, ISPRA, Provincial department for waste management (4.1), Red Rooster (4.2) and Hogast (4.3).

** Earliest available data.*
*** One certification scheme was only introduced in 2016, one in 2019 and one in 2023.*

Various certification schemes are currently active in South Tyrol. **Indicator 4.1** aims at tracking available certification schemes rooted in sustainability principles, independently of their internal or external auditing procedure and standard[6]. The local destination management agency, IDM, recently introduced a new South Tyrol label to which both accommodation facilities and municipalities can apply. For more information on the South Tyrol label see **Box: Sustainability Program and Sustainability Label South Tyrol – Two Exciting Years.** The overall trend for certification schemes, both for accommodation facilities and destinations is positive and reached a new height with a total number of 209. Looking closer at events only, there was a slight decrease in 2023 compared to 2022 (82 and 95 respectively) but looking at the ten-year trend, we can observe a significant increase. Compared to the large number of accommodation facilities in South Tyrol, the 83 hotels with sustainable certifications may seem relatively few, but the introduction of the Sustainability Label South Tyrol has brought new momentum into the adoption and development of sustainable certifications. As of 2023, already 57 accommodation facilities and 4 destinations reached their standard.

"Red Rooster" branded facilities are placing a particularly strong emphasis on sustainable, regional, and seasonal products, which they sell to tourists and other clients. These agrotourism establishments produce a variety of local goods, ranging from fruits and jams to alcoholic beverages and processed foods like pasta (see **Figure 9**), contributing positively to the local agricultural sector. In 2023, 83 farms produced and sold a total amount of 834 labelled products. Over the past decade, the number of facilities offering such products has steadily increased, although it slightly declined after 2022. Figure 9 illustrates the growth in the number of facilities offering these branded food products, showing a notable increase in the last 10 years (+75.4%).

The share of **organic milk sold to the members of the main local buying syndicate** has increased significantly between 2016 and 2018 (18.7 pp). After that, the value has remained stable at around 24%.

6 It is important to remark that due to limited data availability, not all certification schemes currently applied in South Tyrol are included in the indicator. The certification schemes collected in the indicator are: Biohotel, Climahotel, Ecolabel, ComuniClima, Alpine Pearls, Sustainability Label South Tyrol, GreenEvent, and Going GreenEvent.

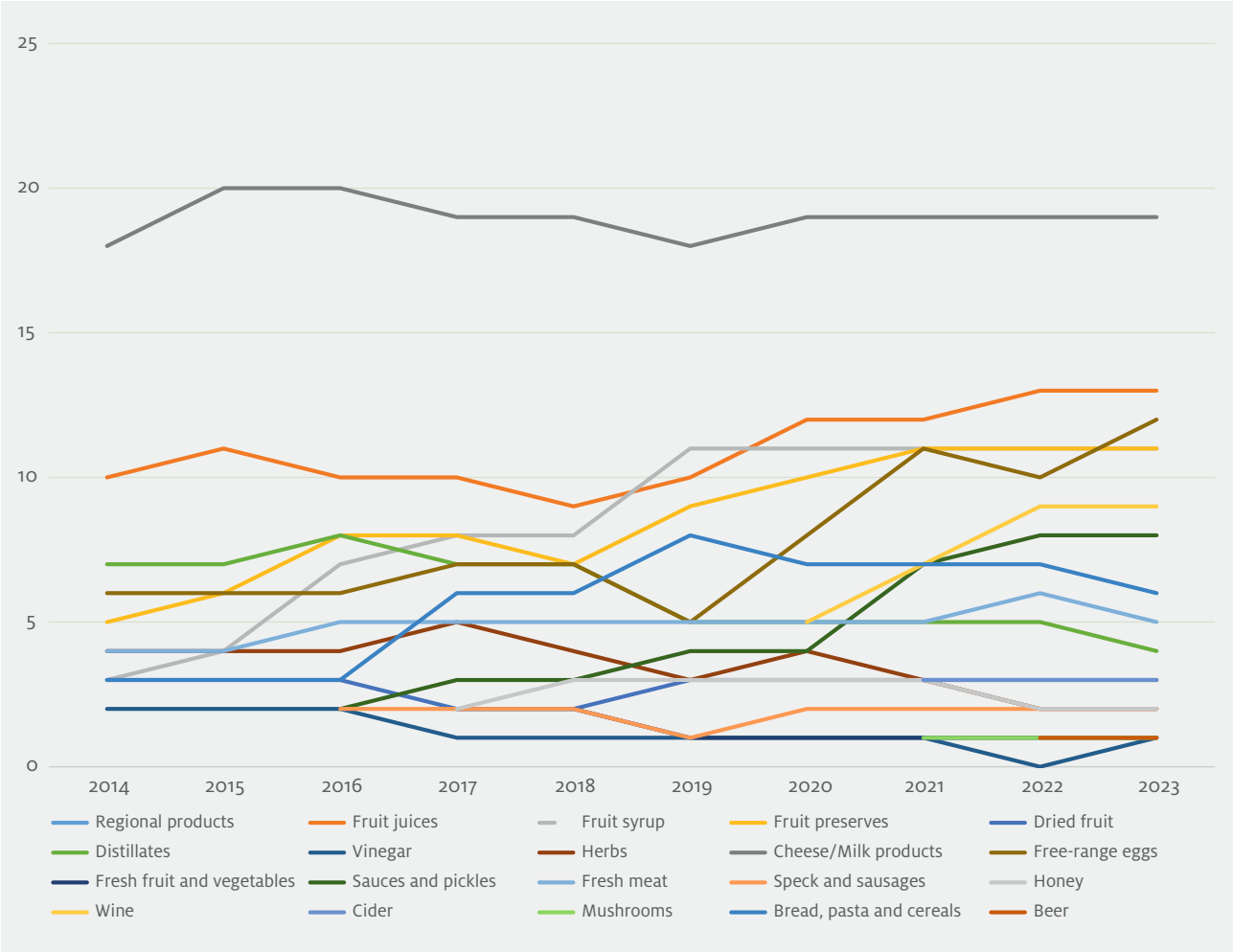

Figure 9: Number of "Red Rooster" labelled agrotourism ventures selling "Red Rooster" branded products, 2014-2023.
Source: Red Rooster, own elaboration.

BOX: SUSTAINABILITY PROGRAM AND SUSTAINABILITY LABEL SOUTH TYROL – TWO EXCITING YEARS

Hannes Waldmüller, IDM South Tyrol

In March 2025, the sustainability program for tourism in South Tyrol will celebrate its second anniversary. The program distinguishes between destinations and accommodation businesses and was developed by IDM South Tyrol in collaboration with the Hotel and Restaurant Association (HGV) to encourage the transition towards a more sustainable form of tourism and to acknowledge the progress made using external certifying schemes.

Destinations wanting to obtain a sustainability certification need to adhere to the criteria set by the Global Sustainable Tourism Council (GSTC), which are divided into four main areas: management, socio-economy, culture, and ecology. On behalf of the provincial administration, IDM South Tyrol, along with various partners, including Eurac Research, developed indicators to make these criteria easier to understand and measure. It is worth noting that some of the indicators of the STOST observatory could be used for the certification assessment at the local level. Destinations are encouraged to create a sustainability strategy through a participatory process, from which they then develop a concrete action plan. Examples include strengthening regional supply chains, where farmers supply more products to local restaurants, or encouraging guests to use public transport.

After about a year of working on the criteria, each destination undergoes an on-site audit. All documents are reviewed by independent auditors accredited by the GSTC, businesses are visited, and various stakeholders interviewed. This audit determines which level of the sustainability program the destination has reached. The highest level, Level 3, is recognized by the GSTC. A re-audit is conducted every three years to ensure that the program is still being implemented after the initial certification.

By October 2024, nine destinations had reached Level 3, and one had reached Level 1. These destinations are Eggental/Val d'Ega, Brixen/Bressanone, St.Vigil/San Vigilio, Seiser Alm/Alpe di Siusi, Gröden/Val Gardena, Ritten/Renon, Meran/Merano, Partschins/Parcines, Ahrntal/Valle Aurina and Passeiertal/Val Passiria. An additional 13 destinations, both large and small, are either undergoing audits or preparing to start soon. In some cases, multiple tourism organizations combine to form a single destination, meaning that around 50% of all tourism organizations in South Tyrol are already involved in the sustainability program. All these destinations have appointed sustainability managers, a role that didn't exist just two years ago. These managers are passionate about the topic and becoming "change agents," driving positive transformation in tourism.

Accommodation businesses are a crucial dimension of every destination. That's why, together with the Hotel and Restaurant Association (HGV), a sustainability program for these businesses was developed. It follows the GSTC criteria and is also divided into three levels. The system builds on existing certifications issued by independent third parties, such as the Economy for the Common Good, Earth Check, and GSTC. In addition to sustainable management and communication, Level 1 also considers resource consumption and waste management. At Level 2, employee management and procurement are evaluated. To reach Level 3, businesses must demonstrate sustainable development in areas like mobility, culture, and building design.

Additionally, businesses at all three levels must provide a self-declaration proving that they have sourced specific South Tyrolean products, such as fresh milk, butter, yogurt, apples, and apple juice. South Tyrol must also be the most represented region on their wine lists. The South Tyrolean Quality Control (SQK) is responsible for verifying these self-declarations and conducts random checks.

Now, after two years of experience, these criteria, originally designed for large accommodation businesses, are being slightly adjusted. Currently, 95 businesses have achieved the Level 1 sustainability label, and 29 have even reached Level 3. IDM South Tyrol is now working with the Association of Private Landlords (VPS) and the Camping Operators' Association to expand the program to smaller and non-commercial businesses. It is also committed to training its own staff from various departments through GSTC courses, with the option of taking a final exam. These training sessions, along with workshops on sustainability communication under the European Green Claims Directive, have also been organized for tourism partners. IDM South Tyrol also leads a sustainability community that meets regularly to exchange ideas. International experts present different topics and best practices related to sustainable tourism.

5.

Local and visitor satisfaction

Maximilian Walder

Sustainable tourism involves considering both the positive and negative effects of tourism on the local population and visitors, striving to promote the positive effects while avoiding or minimising the negative ones (UNWTO, 2004). Tourism plays a vital role in South Tyrol's economic structure. Many residents profit directly or indirectly from it (e.g. through direct income), while others primarily experience the negative impacts (e.g. pressure on infrastructure). Maintaining high levels of visitor satisfaction is crucial to remaining a competitive tourism destination. This requires continuous monitoring of satisfaction levels among both locals and visitors, as well as conducting policy interventions where necessary. At the moment, STOST measures two indicators within this issue area: the tourism intensity index, which describes the average daily overnight stays per 100 inhabitants in South Tyrol, and the difference in minimum rent prices by tourism exposure. Concrete goals for South Tyrol in this context include incorporating the needs and concerns of the local population in destination management (e.g. by applying a tourism sensitivity index as proposed in the current tourism development concept of South Tyrol [Pechlaner et al., 2022]), securing affordable living costs for the local population, as well as increasing quality standards in tourism offers instead of focusing on the increase of quantitative tourism flows.

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INDICATOR		VALUE	CHANGE	
5.1	**Tourism intensity index**	**2023**	**2014-2023**	**2022-2023**
		18.4	+22.2%	+4.6%
5.2	**Difference in minimum rent prices by tourism exposure (high vs. low tourism exposure)**	**2023**	**2014-2023**	**2022-2023**
		3.2 €/m²	+15.9%	+ 1.8%

Table 7: Indicators for local and visitor satisfaction.
Source: ASTAT (5.1), own calculation based on data from Agenzia del Territorio (5.2).

The **tourism intensity index** shows a slight increase compared to last year. The overall intensity in South Tyrol's municipality now stands at 18.4 overnight stays per 100 inhabitants. This is related to the record number of stays reported last year, further highlighting the increasing pressure on the local population from the tourism sector. While this indicates an overall trend for South Tyrol, there are significant differences between individual municipalities. Looking at **Figure 10** we can observe the geographic differences of tourism intensity. Traditionally, the Dolomites region exhibits a very high intensity. The municipality with the highest tourism intensity can be found here, Abtei/ Badia (99.8), followed by two municipalities in the Meran/Merano area, Dorf Tirol/Tirolo and Schenna/Scena (98.5 and 97.8 respectively). On the other hand, Vinschgau valley/ Val Venosta and the western part of the region appear to be exposed to less tourism intensity. The municipalities with the lowest intensity in 2023, as in the previous year, are located in the south: Branzoll/Bronzolo and Neumarkt/Egna.

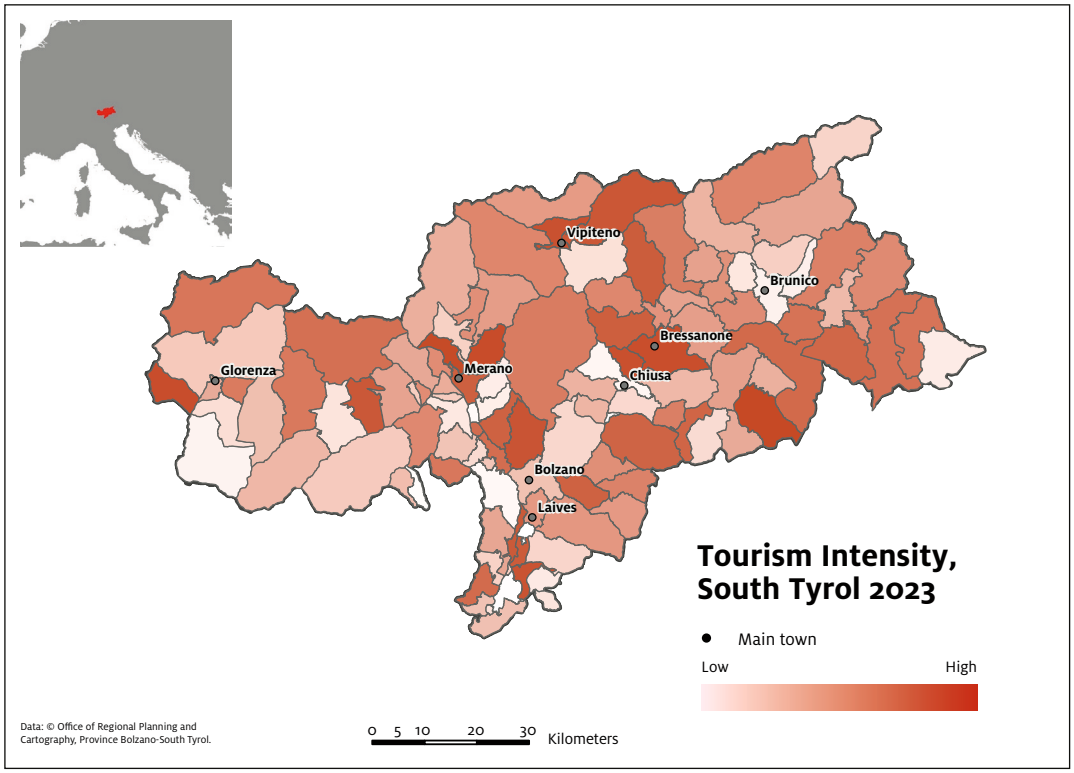

Figure 10: Tourism intensity, South Tyrol 2023.
Sources: ASTAT and office of Regional Planning and Cartography, Province Bolzano-South Tyrol, own elaboration.

Indicator 5.2 shows the steadily increasing **gap between rent prices in municipalities** with low and high tourism exposure. Since 2022, the gap increased by 1.8% and is now at 3.2 € per m^2. Looking back ten years, the gap in minimum rent prices widened by almost 16%. Although it is true that rent prices grew in all three municipality categories, it grew comparatively faster in highly touristic municipalities.

6.

Energy management

Valentin Wallnöfer

Energy consumption plays a significant role in rising CO_2 emissions and the acceleration of climate change. However, measuring the impact of tourism on energy consumption is challenging, as there is both direct energy consumption, such as that used by guests in accommodation facilities, and indirect consumption. As an example of the latter, STOST includes data on the electricity use of cable cars and snow guns, as these are important touristic infrastructures in South Tyrol. For a more complete picture, however, also other forms of energy use — such as in transportation and heating— would need to be monitored. Furthermore, enterprises should actively be encouraged (e.g. by destinations and political authorities) to measure and monitor their own energy consumption, which would eventually facilitate an overall reduction of energy used. Key measures to reduce the negative environmental impact of energy consumption include improving energy efficiency, replacing fossil fuels with renewable sources, and generally lowering consumption through energy-saving initiatives.

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INDICATOR		VALUE	CHANGE	
6.1	**Estimated minimum electricity consumption in accommodation facilities**	**2023**	**2014-2023**	**2022-2023**
		299.1 GWh	+28.6%	+5.3%
6.2	**Electricity consumption of cable cars and snow guns**	**2021***	**2014-2021***	**2020-2021***
		97.6 GWh	-5.7%	-27.4%

Table 8: Indicators for energy management.
Source: own calculation based on data from ASTAT (6.1, 6.2).

** Latest available data.*

Since there is no direct data on the electricity consumed by tourists, STOST estimates the **electricity consumption in accommodation facilities** based on overnight stays and consumption coefficients per accommodation category (Bundesministerium für Wirtschaft, Familie und Jugend, Wirtschaftskammer Österreich, Fachverband Hotellerie, Fachverband Gastronomie, Österreichische Hoteliervereinigung, 2015). These coefficients represent a proxy for the energy consumption of an energy-efficient accommodation facility in South Tyrol, which is why the estimate can be interpreted as a lower bound. Moreover, changes in individual consumption patterns aren't factored into this estimate (for more detailed information on the calculation procedure, see our website). In 2023, because of the rise in tourism flows, the estimated minimum electricity consumption reached a new peak of 299.1 GWh, marking a 28.6% increase since 2014 and a 5.3% increase since its previous peak, which was reached in 2022.

The **electricity consumption of cable cars and snow guns**, on the other hand, shows a fluctuating trend (see Figure 11). It peaked in 2015, but has since declined, with the most recent data from 2021 showing a 27.4% drop from 2020 and a 5.7% decrease compared to 2014. This reduction is largely due to Covid-19 restrictions, as the facilities were partly closed during the winter of 2021. While cable cars and ski resorts are important parts of South Tyrol's tourism infrastructure, they are also used by residents, so their energy consumption cannot be solely attributed to tourism. Comparing the two indicators in this issue area shows that the energy consumption of cable cars and snow guns amounts to about one third of the consumption of electrical energy in accommodation facilities.

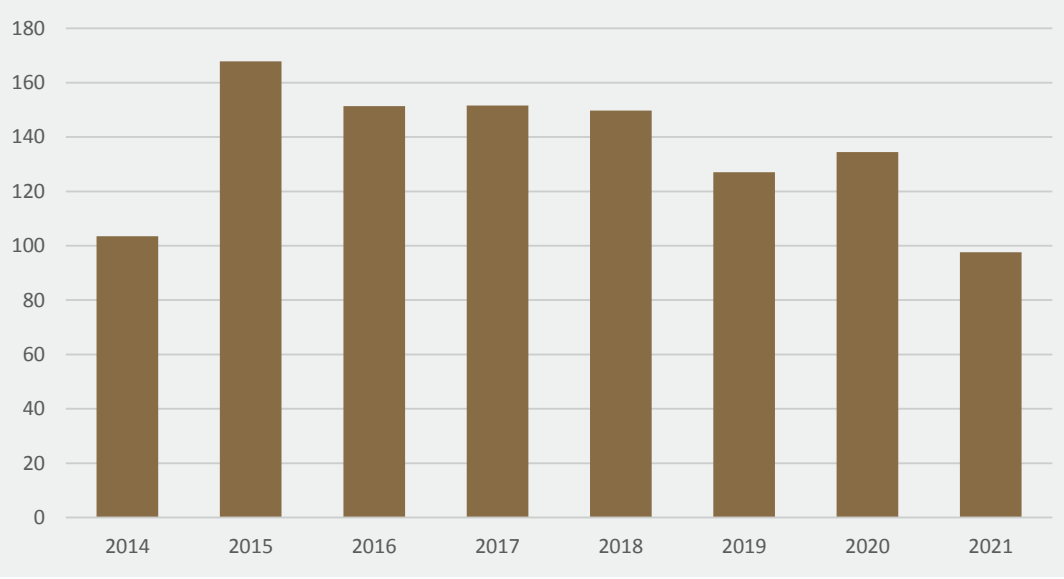

Figure 11: Electricity consumption of cable cars and snow guns, South Tyrol 2014-2021. In GWh.
Source: ASTAT 2023, own elaboration.

7. & 8.

Water and waste water management

Valentin Wallnöfer

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Water is a key resource for tourism since its use is essential for various recreational activities such as swimming, golf, and skiing. It is also necessary to uphold the high hygiene standards of accommodation facilities, e.g. for cleaning rooms and washing bed and table linen (Gössling, 2015). At the same time, climate change is leading to reduced snowfall and increased evapotranspiration, making water a more limited resource in South Tyrol and beyond (Zebisch et al., 2018). This also fosters conflicts between sectors like tourism and agriculture over water use. Monitoring water consumption is therefore critical to anticipate and mitigate potential water shortages and stresses. To better understand the relationship between water and tourism, STOST estimates the yearly minimum water consumption in accommodation facilities and includes data on the water use of snow guns, both of which have been increasing over the past two decades. Key objectives of this issue area include reducing water consumption and enhancing water use efficiency in accommodation facilities, which will consequently also result in a decrease of waste water generation.

INDICATOR		VALUE	CHANGE	
7.1	**Estimated minimum water consumption in accommodation facilities**	**2023**	**2014-2023**	**2022-2023**
		8.3 million m³	+28.5%	+5.6%
7.2	**Water use by snow guns**	**2021/22***	**2013/14-2021/22***	**2020/21-2021/22***
		7.7 million m³	+29.5%	+3.5%

Table 9: Indicators for water and waste water management.
Source: own calculation based on data from ASTAT (7.1) and APAC (7.2).

**Latest available data.*

As seen in the figure below, the **estimated minimum water consumption in accommodation facilities** increased by 28.5% from 2014 to 2023, reaching a new record level of 8.3 million m³. This is a further 5.6% increase compared to the previous peak of 2022 and attributable to the overall increase in overnight stays, but also to the changing structure of the hotel sector in South Tyrol, consisting of more and more high-end hotels with a respectively higher level of water use per night.

To capture other forms of water use in tourism, data on the seasonal **water use by snow guns** is used as an additional indicator for this issue area. The amount of water used for artificial snowmaking has steadily increased over the past two decades, reaching 7.7 million m³ in the winter season of 2021/22, a 29.5% rise compared to 2013/14. However, this number is still below the peaks of earlier years. The amount is, of course, not exclusively connected to tourism flows; it also depends on the weather conditions of each winter season and the overall rising temperatures due to climate change. However, a high number of ski tourists further drive the need for artificial snowmaking. The lower water usage by snow guns in the 2019/20 and 2020/21 winter seasons was likely due to Covid-19-related restrictions on winter tourism.

Data regarding **waste water generation** is scarce and the impact of tourism is difficult to measure. Since much of the water consumed through tourism also has to be discharged (e.g. water used for swimming pools or cleaning purposes), water consumption and waste water generation are highly intercorrelated, and thus the latter is expected to follow the same trend as the former. An important aspect in this regard is waste water treatment: in 2015, 99.7% of the waste water in South Tyrol was treated in sewage plants, while the Italian average was only 59.6% (ISTAT, 2017).

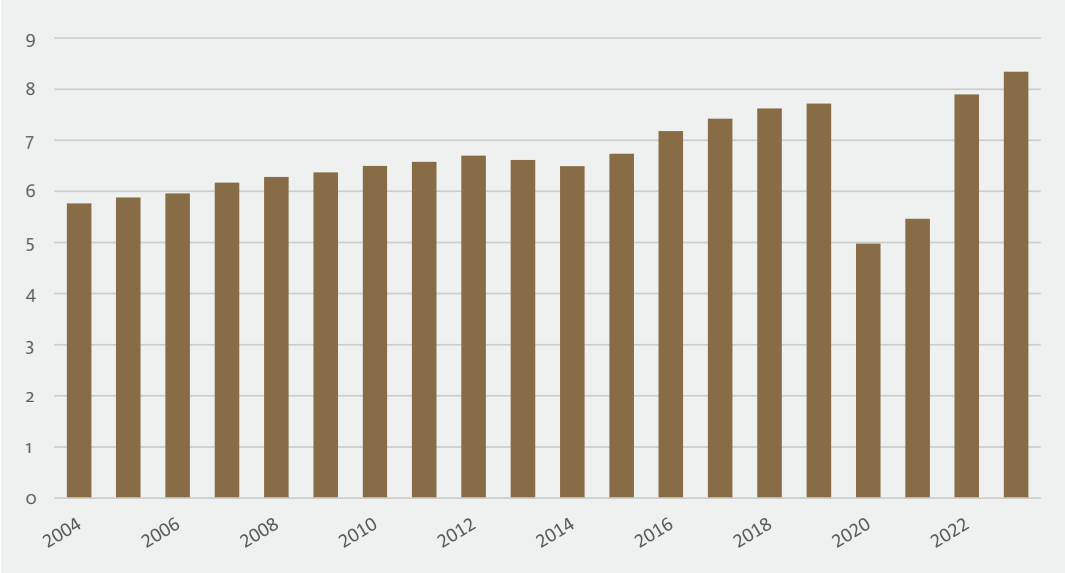

Figure 12: Estimated minimum water consumption in accommodation facilities, South Tyrol 2004-2023. In million cubic meters.
Source: own calculation based on data from ASTAT, own elaboration.

9.

Solid waste management

Valentin Wallnöfer

Solid waste is produced by nearly all human activity. In tourism, however, the demand for higher hygiene standards and a broader variety of food and other services causes waste production levels to surpass the domestic average. Moreover, people tend to use more disposable products while on vacation than they would at home, which further adds to the waste volume (Hamele & Eckardt, 2006). As the number of overnight stays in South Tyrol has been steadily rising, so too has the waste generated by tourism. To counter these trends, a robust waste management system with regular monitoring of waste output at each facility is essential. Additionally, educating guests and staff on ways to reduce, reuse, and recycle can help cut down on waste production (UNWTO, 2004). These measures should not only be implemented at individual accommodation facilities but also on a destination-wide level, where collective goals and strategies can be set. Beyond environmental sustainability, efficient waste management can also reduce costs for tourism businesses, providing further motivation (Pirani & Arafat, 2014).

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INDICATOR		VALUE	CHANGE	
9.1	**Estimated waste production in accommodation facilities**	**2023**	**2014-2023**	**2022-2023**
		71,547 tonnes	+27.1%	+5.0%

Table 10: Indicator for waste management.
Source: own calculation based on data from ASTAT.

Although monitoring waste production is becoming more important in the tourism industry, data on the subject remains scarce. This makes it difficult to pin down the exact contribution of tourism to waste generation. Therefore, as with energy and water management, the **production of waste in accommodation facilities** was estimated using a coefficient from Hamele & Eckardt (2006) that calculates waste per overnight stay. As shown in the graph below, the estimated waste production has steadily increased – following the trend of increasing tourism flows – and reached a new high of 71,547 tonnes in 2023. However, since this estimate doesn't account for possible reductions in waste generation per overnight stay over recent years, further efforts are needed to provide more accurate and location-specific estimates of real waste production. Setting up waste monitoring systems at each facility and sharing data on a destination level could be a key step in achieving this, making individual improvements visible and possibly also serving as a further motivation for accommodation facilities.

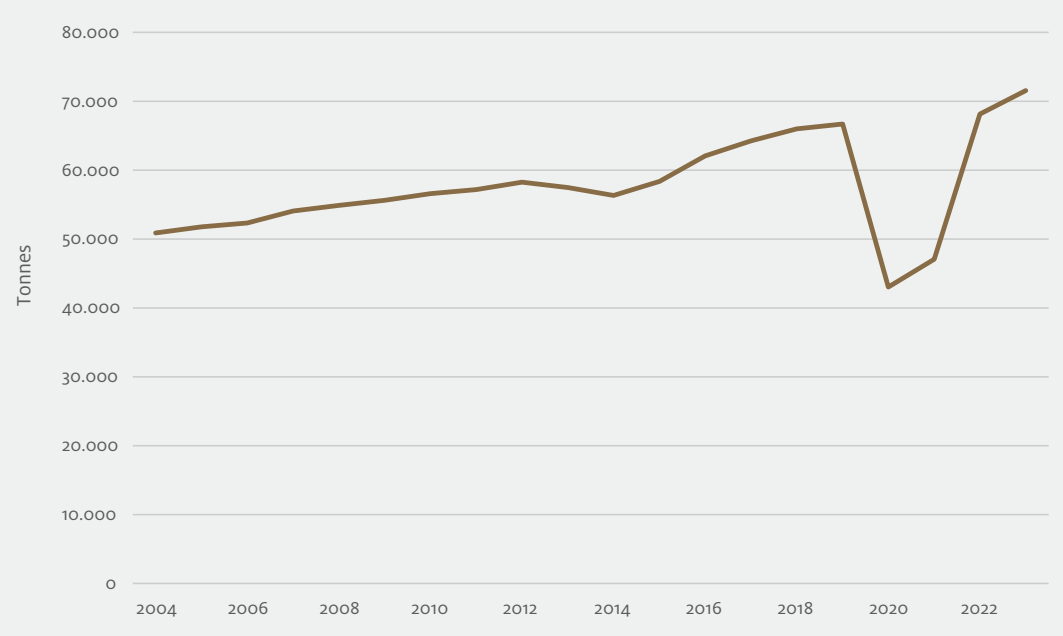
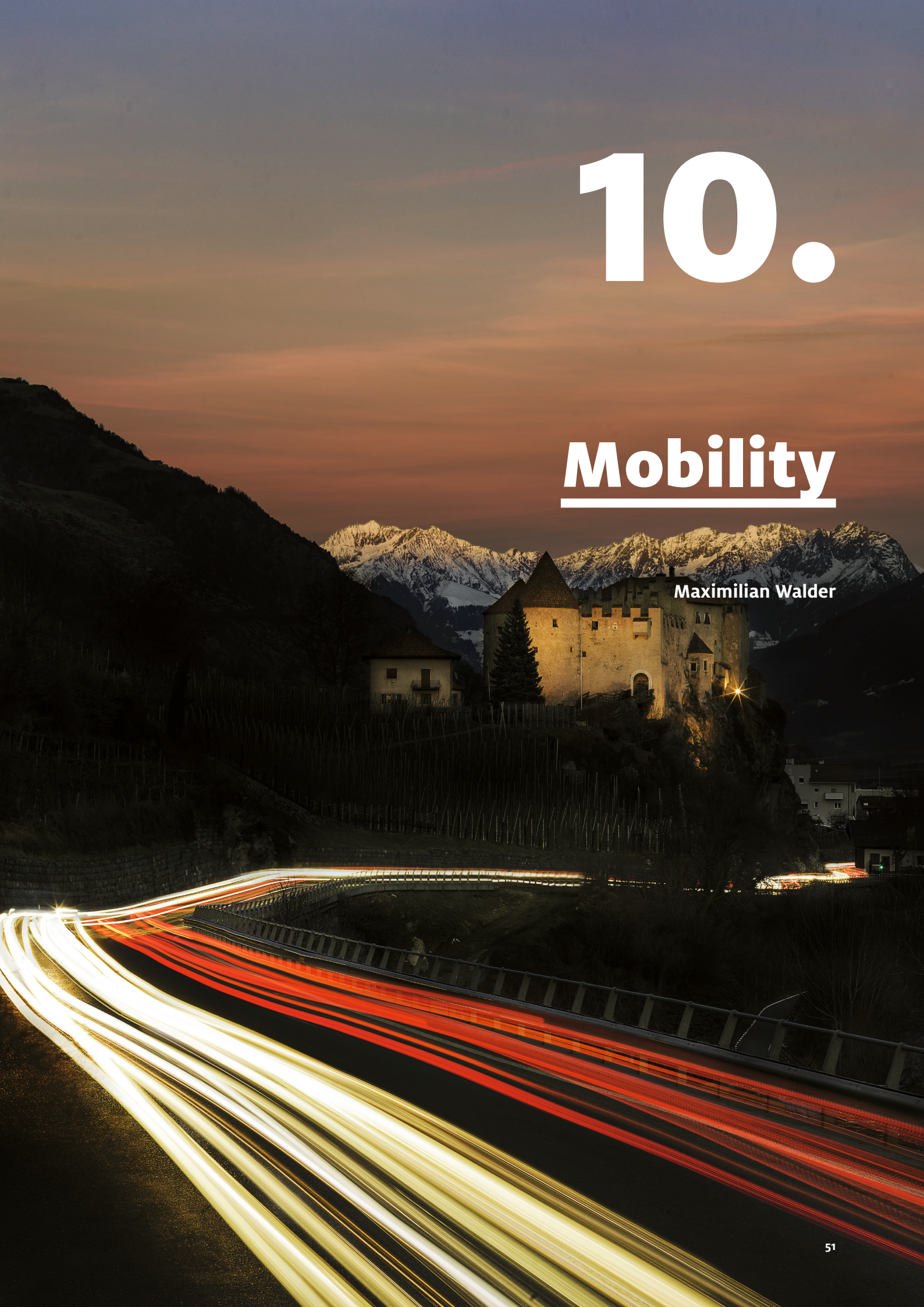


Figure 13: Estimated waste production in accommodation facilities, South Tyrol 2004-2023. In tonnes.
Source: own calculation based on data from ASTAT, own elaboration.



10.

Mobility

Maximilian Walder

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De-carbonising tourist mobility is key to achieving sustainable tourism both globally and locally, as tourism without transportation is inconceivable. However, carbon emissions are not the only negative effects of tourist transport: spatial use, energy consumption, and air and noise pollution are also significant concerns, particularly for remote and rural regions. Therefore, monitoring possible modal shifts towards more sustainable forms of transport is crucial in this issue area. As far as mobility on site is concerned, notwithstanding energy consumption and the potential negative impact on the landscape, the use of cable cars in Alpine contexts can be generally read as an encouraging development. They can substitute less sustainable means of transport, such as private cars or motorcycles, especially in summer and when combined traffic regulations and road closures (see, e.g., Scuttari et al., 2016). In South Tyrol, previous statistics showed that 90.4% of incoming tourists arrived in the region by private transport and 70.3% used this means to travel around during their holiday (De Rachewiltz et al., 2021). Indicators in this issue area were selected to show the actions taken to address this problem and to encourage a shift in modal choices toward public transport or shared vehicle use, rather than to estimate the magnitude of impacts. The issue of transport-related CO_2 emissions is addressed in ***Issue Area 14****. A shift towards a sustainable mobility in the tourism sector, measures should focus on strengthening public transport infrastructure and incentivising its use by guests. Increasing the number of charging stations for e-mobility, both within accommodation facilities and in public areas, is equally essential. Furthermore, limiting touristic traffic in sensitive areas during peak seasons is crucial to protect these environments and ensure a balanced flow of visitors.*

INDICATOR			VALUES (ABSOLUTE)		CHANGE (%)
10.1	**Mobilcards, bikemobil Cards, museumobil Cards and guest tickets**	**Activations**	**2022***	**2014-2022***	**2021-2022***
			1,527,524	+139.1%	+66.6%
		Uses	**2022***	**2014-2022***	**2021-2022***
			6,791,953	+144.3%	+66.7%
10.2	**Number of ski-lift and cable car users by season**	**Winter**	**2021***	**2014-2021***	**2020-2021***
			122,440,230	+1.4%	+5907.9%
		Summer	**2021***	**2014-2021***	**2020-2021***
			10,158,485	+43.4%	+28.9%
10.3	**Number of loading stations for e-mobility**	**In hotels**	**2023**	**2020**-2023**	**2022-2023**
			207	-1.0%	+0.5%
		Public	**2023**	**2020**-2023**	**2022-2023**
			177	+60.9%	+18.0%

Table 11: Indicators for mobility.
Source: STA – Südtiroler Transportstrukturen AG (10.1); ASTAT (10.2); Neogy and Tesla (10.3).

** Latest available data.*
*** Earliest available data.*

Until 2023, to encourage tourists to use public transport, **Mobilcards** could be purchased at hotels, tourism offices, train stations, and local vending locations. These Mobilcards could be obtained for one day, three days, or an entire week, granting guests access to all forms of public transportation. Additionally, certain types of Mobilcards offered extra perks: bikemobil Cards enabled tourists to rent bikes and take them on public transport, while museumobil Cards served as both a travel ticket for public transport and an admission ticket to approximately 80 museums throughout South Tyrol. At the end of 2023, all these cards were combined into a single ticket, the South Tyrol Guest Pass. This new card offers all the perks of the previous cards. Unfortunately, data on the activation and use of Mobilcards was not gathered in 2023, the last year this system was in use. At the same time, data on the new card is still not available. As a result, the most recent data on the use of public transportation cards is from the year 2022. This data shows a certain Covid-19-effect, as both the number of activations and uses increased significantly compared to 2021 (66.6% and 66.7% respectively). Looking back ten years, it is evident that more and more tourists are responding to this offer and are choosing not to rely on private cars for their movement within the destination.

Cable cars and ski lifts offer alternative transportation options for mountain visitors, thereby reducing traffic and CO_2 emissions. The latest data from 2021 highlights a recovery from the strict Covid-19-restrictions that had significantly limited cable car usage in the previous year. While we can observe a return to almost pre-covid numbers during the winter months (over 122 million travels in 2021), summer usage of cable cars and ski lifts approached a new record number of uses, totalling 10,158,485 trips. While more recent data on this indicator is not yet available, given the further increase in touristic arrivals and overnight stays in 2022 and 2023, the number of cable car and ski lift usages might already have surpassed pre-covid peaks.

Another approach to reducing CO_2 emissions is to place greater emphasis on electromobility. In South Tyrol, a noticeable shift towards the electrification of private transportation is evident. The total **number of e-mobility charging stations** has increased significantly in recent years, reaching 384 stations in 2023—an addition of 28 stations compared to the previous year. Tourists can charge their vehicles either at hotels that offer this service or at public charging locations. The coloured symbols on the map below indicate the locations of these stations across the province. Notably, over half of the charging stations (53.9%) are situated within tourism facilities, particularly in high-traffic tourist areas like Val Gardena. While the number of charging stations in hotels is rather stable, the number of public charging stations is steadily increasing, which may encourage locals to consider switching to electric mobility options in the long run.

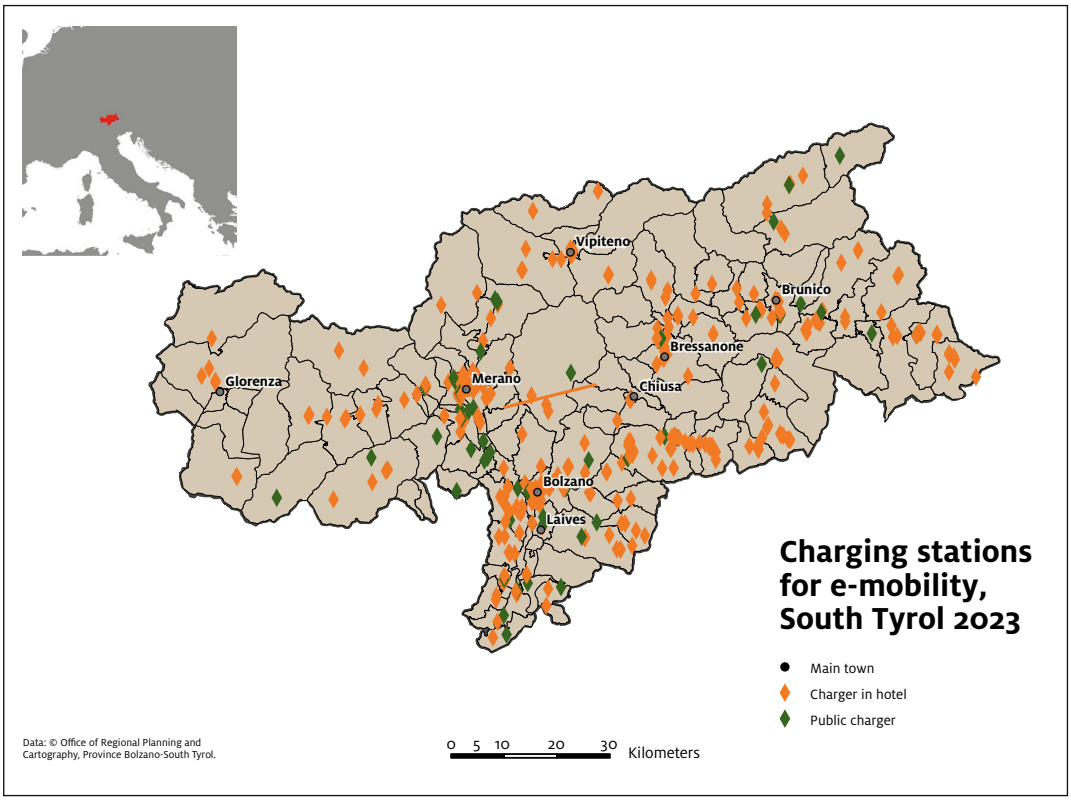

Figure 14: Charging stations for e-mobility in hotels and in public areas, South Tyrol 2023.
Sources: Neogy and Tesla, own elaboration

11.

Land use and landscape diversity

Maximilian Walder

Find out more on our website!

Permanently environmentally friendly land use should contribute to the preservation of natural ecosystems, guarantee the availability of natural resources for humanity, and thereby not endanger the foundation for a good quality of life for both present and future generations. In the Agenda 21 document formulated in 1992, the United Nations emphasized the urgency and relevance of sustainable settlement development (Chapter 7) and the integrated, sustainable planning and management of land resources (Chapter 10) (United Nations, 1992). Similarly, reference to this topic was also made by the United Nations in 2015 in the 17 Sustainable Development Goals, as well as in its adaptation by the UNWTO for tourism, particularly in Goals 11, 13 and 15 (United Nations, 2015; UNWTO, 2015). Especially for an alpine region like South Tyrol, which is characterised by extensive natural landscapes and little more than 5% of area of permanent settlement, a well-founded discussion about the finite resource of land is central (ASTAT, 2013). Humans are the main factor influencing land use and landscape through their consumption and lifestyle habits, as well as through economic activities. Alongside other economic sectors, such as agriculture and industry, tourism also shapes the natural landscape and the land use of South Tyrol. At the same time, intact nature, a well-maintained environment, and an attractive cultural landscape serve as the basis for successful tourism in South Tyrol. Against this backdrop, an analysis of the influence of tourism on landscape diversity and land use is particularly important. Important measures to increase sustainable landscape development include limiting the construction of tourist facilities outside city centres and regulating the quantity of new accommodation and food service establishments in general in South Tyrol.

INDICATOR		VALUE	CHANGE	
11.1	**Beds per land use zone and category (Reported value: Most prevalent area)**	**2023**	Not applicable	
		Residential areas (41.8%)		
11.2	**Areas for tourist activities**	**2023**	**2014-2023**	**2022-2023**
		431.8 ha	+53.4%	0.0%
11.3	**Bed density in residential zones**	**2023**	**2020*-2023**	**2022-2023**
		19.3 beds/ha	-11.0%	+0.5%

Figure 12: Indicators for land use and landscape diversity.
Source: Office of Regional Planning and Cartography (11.1, 11.2, 11.3), Province Bolzano- South Tyrol and LTS (11.1, 11.3).

** Earliest available data.*

To manage land use in South Tyrol, the province is divided into specific land use zones, each with its own regulations and provisions. In 2023, as in previous years, the majority of accommodation beds (hotels, red rooster establishments, and residences) were situated in residential areas (Zones A, B, C), accounting for 41.8%. Additionally, 36.9% of beds were found in agricultural zones, primarily associated with agrotourism establishments, while 9.7% were in various other land use zones. The remaining 11.6% of beds were in zones **designated for tourist facilities**, special areas established by municipalities since 2007/2008 for tourism activities. Same to last year, a total of 101 municipalities have utilised this designation[7]. Since last year, the total areas of designated tourism zones remained unchanged, with no new areas designated. It is important to note that past changes were often minimal and the concept of tourist facility areas is still subject to debate. The primary goal of this designation is to protect the environment and local communities while limiting the proliferation of hotels and similar establishments. Interestingly, two highly touristic municipalities, Schenna/Scena and Dorf Tirol/Tirolo, do not have such designated zones. In these contexts, implementing such zones could be beneficial due to their restrictive nature.

In **Figure 15**, the impact of accommodation facilities on residential zones is presented. From an ecological standpoint, the concentration of beds in residential zones is positive, while the spread of bed places in agricultural or green zones represents a critical fact, as it consumes more land. Looking at the map, the darker the color in each municipality, the greater the **bed density in residential areas** (for details on how bed density is calculated, please refer to the technical description on our website). The average density across South Tyrol is 19.8 beds per hectare. It is noteworthy that bed density is higher in the eastern part of the province, particularly in Gröden/Val Gardena (in the middle of the UNESCO World Heritage Site Dolomites). The municipalities with the highest bed density in residential zones in 2023 are Dorf Tirol/Tirolo and Hafling/Avelengo (299 and 385 beds per hectare respectively). Conversely, two municipalities, Pfatten/Vadena and Laurein/Lauregno, have no beds in residential zones.

7 Municipalities without areas for tourist facilities: Altrei/Anterivo, Andrian/Andriano, Gais, Kuens/Caines, Kurtinig/Cortina sulla strad del vino, Laurein/Lauregno, Margreid/Magrè, Mölten/Meltina, Nals/Nalles, Percha/Perca, Schenna/Scena, Taufers/Tubre, Dorf Tirol/Tirolo, Tscherms/Cermes, Waidbruck/Ponte Gardena.

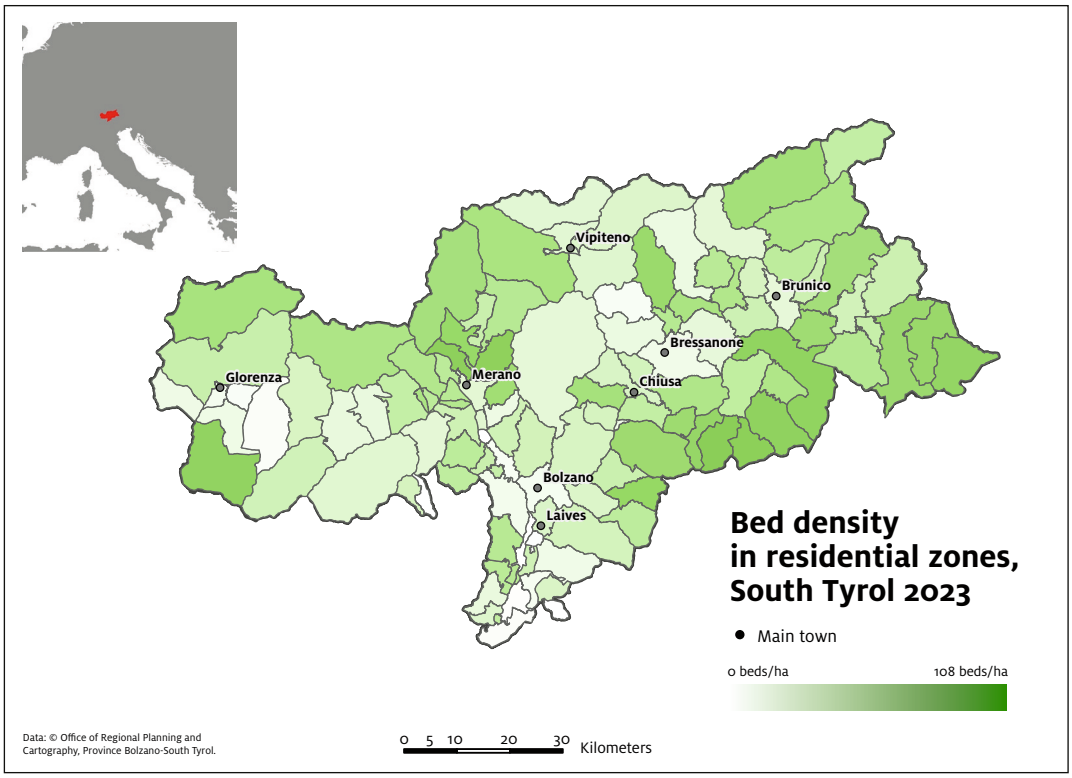

Figure 15: Bed density in residential zones at municipality level, South Tyrol 2023.
Source: Office of Regional Planning and Cartography, Province Bolzano-South Tyrol and LTS, own elaboration.

12.

Nature conservation

Maximilian Walder

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Biodiversity indicates the diversity within and between species, as well as the diversity of ecosystems. The integrity of biodiversity can be described in terms of genetic diversity, as well as resilience at both the species and ecosystem level. (Martens et al., 2003). It is integral to natural and cultural dimensions of heritage (Hall, 2010). Depending on the intensity, concentration, and behaviour of visitors, tourism can either constitute an impulse for positive change or endanger biodiversity and ecosystems, becoming a source of stress for nature and certain fragile environments. Fossil-fuel driven capitalist development, with its pursuit of continuous economic growth, has been identified as one of the main causes of recent biodiversity loss (Büscher et al. 2017). Tourism is one of the largest and fastest growing industries in the world, and as such, it carries a special responsibility for environmental conservation (Büscher & Fletcher, 2019). In order to enhance biodiversity, tourism development should be designed to promote biodiversity at both the individual and collective levels while respecting ecological boundaries. This necessitates a move beyond traditional models of mass tourism and the classical nature-culture dichotomy. One concrete approach to tackle biodiversity loss can be found in "convivial conservation", which fosters the integration of non-human nature into social, cultural, and ecological contexts (Bhola et al. 2020). A sustainable conservation strategy needs to include biodiversity policies into all policy areas. Moreover, it is necessary to recognise that biodiversity conservation should also protect biocultural diversity, thereby preserving and enhancing the communities that co-evolve with biodiversity (Moranta et al. 2022).

Biodiversity data and tourism intensity hotspots have been analysed and compared in this area of interest to connect tourism with nature conservation. It is important to recognise that establishing a direct causal link between tourism intensity and biodiversity loss is complex, and perhaps even impossible, due to the numerous interrelated factors that influence biodiversity. In South Tyrol, agricultural activity is one of the main contributors to biodiversity loss. Due to the complex nature of this data and only marginal changes over the past year, the data presented in this report is consistent with that of last year.

Figure 16 highlights the **distribution of critically endangered and vulnerable species** within UNESCO and Natura 2000 sites in South Tyrol, mapped against tourism intensity by municipality in 2022. Each point represents geo-referenced data (dating back to 1980) regarding species' taxonomic classification. In total, 28 endangered, 120 critically endangered, and 192 vulnerable species have been recorded in South Tyrol's protected areas, with the endangered and critically endangered species predominantly consisting of vascular plants.

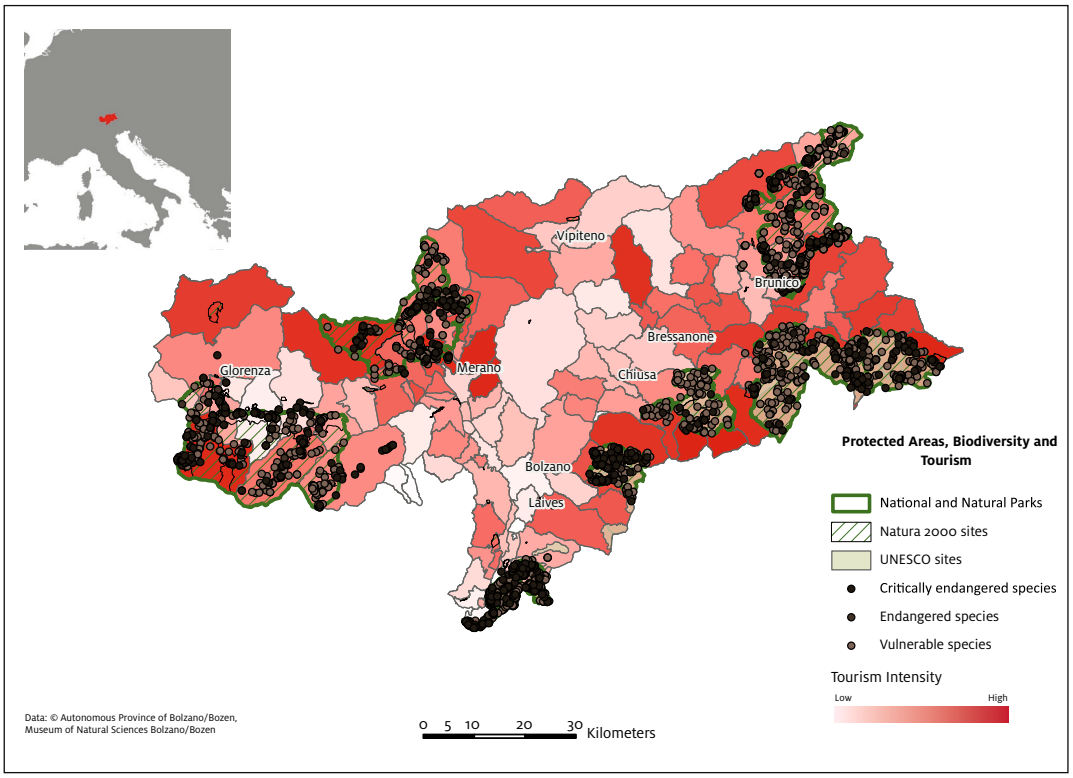

Figure 16: Endangered biodiversity in natural and protected areas in relation to municipalities by tourism intensity. Red to white: high to low tourism intensity.
Source: Naturmuseum Südtirol Bozen/Museo di Scienze Naturali Bolzano, Office of Regional Planning and Cartography, Province Bolzano-South Tyrol and LTS, own elaboration.

Tourism hotspots and areas at high risk of biodiversity loss are often located near to each other – or even superimposed. This connection is illustrated in the map above. The proximity to ecologically sensitive zones can be observed especially in the Dolomites and in the nature park Texelgruppe/Gruppo di Tessa near the city of Meran/Meran. In general, wildlife disturbance, poaching, vegetation removal (through activities such as trampling or trail creation), forest degradation from trekking infrastructure, poor waste management, accidental fires in forests or grasslands, and other human activities can result in biodiversity loss or species displacement, particularly in fragile environments. Given that touristic areas are often ecologically valuable and vulnerable, it is critical for tourism stakeholders and policymakers to raise awareness about nature reserves, mitigate negative impacts through regulations and guidelines, and actively promote biodiversity through concrete actions.

13. Culture

Maximilian Walder

South Tyrol is a popular holiday destination for culturally interested tourists due to its many cultural treasures and its rich history. Over the past 150 years, tourism has significantly impacted a wide range of cultural forms around the world. The influence of tourism on immaterial cultural assets is difficult to assess and is underexplored in tourism research, but tourism stakeholders report that it clearly exists. When investigating and collecting data on culture and tourism, some key objectives need to be established and pursued in order to continually develop this issue area. First of all, establishing the issue area of culture and tourism has shown that raising awareness of the importance of both tangible and intangible culture is a key element for sustainable development in the region. Second, culture should be preserved and promoted as living heritage for future generations, benefitting both locals and tourists. The transformative experiences of tourists and their contribution to intercultural understanding are important for this development. However, it is equally important to monitor and reduce negative aspects such as the commodification and homogenization of culture, cultural appropriation, and the loss of identity. Third, the role of hosts in mediating cultural experiences is crucial for communicating and transferring principles of cultural sustainability to guests.

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INDICATOR		VALUE	CHANGE	
13.1	Museums by type and level of municipality tourism exposure (Reported value: Total numbers of museums)	2022*	2014-2022*	2021-2022*
		112	+ 31.8%	+7.1%
13.2	Percentage of tourists of total museum visitors	2022*	2016**-2022*	2021-2022*
		80.2%	+3.9 pp	+1.1 pp

Table 13: Indicators of Culture.
Source: ASTAT (13.1) and Lorima (13.2).

** Latest available data.*
*** Earliest available data.*

Indicator 13.1 shows the **variety of museums** in each tourism exposure category. The total number of museums[8] in South Tyrol rose from 104 in 2021 to 112 in 2022, even topping the number of museums in the year 2019 (111), before museums were forced to shut down due to the Covid-19 restrictions. The most prominent type of museum is still "Special museum for cultural history", followed by institutions that focus on art. Looking at **Figure 17**, we can see that the types of museum offerings vary by the degree of tourism exposure. In municipalities with less tourism there are more town and village museums. Art museums are mostly in municipalities with high and

8 The indicator accounts for every museum that is officially recognised by the province Bolzano-South Tyrol. There are numerous other museums in the province that are not accounted for in this calculation.

average tourism exposure, whereas natural history museums can be found exclusively in these types of municipalities.

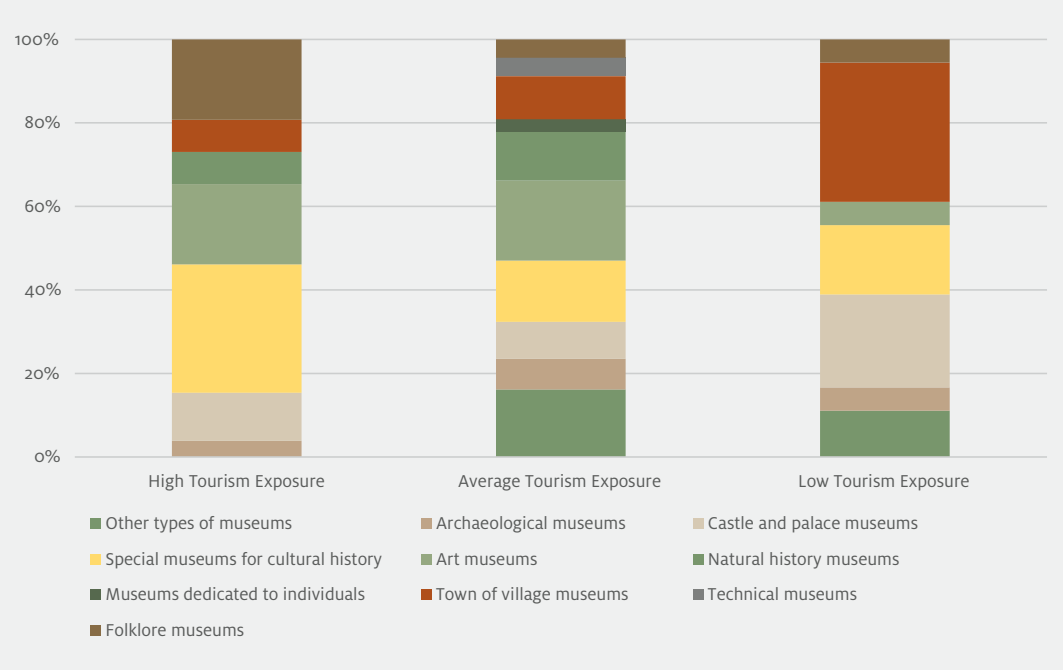

Figure 17: Museums by type and tourism exposure, South Tyrol 2022.
In percentage values.
Source: ASTAT, own elaboration.

Tourists represent a significant **portion of museum visitors** in South Tyrol, accounting for an estimated 76.3% of total museum visits in 2016. This percentage decreased to around 66% in 2018 and 2019 but rose again to 80.2% in 2022 (ASTAT, 2022). Despite a sharp decline in overall visitor numbers due to the COVID-19 pandemic, there is a noticeable trend toward combined tourism products, particularly with respect to mobility and museum admissions (see also Issue Area 10). July, August, and October consistently rank as the months with the highest visitor numbers.

14.

Climate action

Felix Windegger

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Responsible for around 8% of global greenhouse gas emissions (Lenzen et al., 2018), the tourism industry substantially contributes to climate change. At the same time, the touristic offer is directly affected by changing climate conditions, with negative effects for many destinations worldwide (Scott et al., 2012). South Tyrol is no exception when it comes to this two-way relationship. Rising average temperatures, a lack of snowfall and the increasing risk of avalanches, as well as extreme weather events pose major challenges for future tourism in South Tyrol. Although data on the emissions attributable to the tourism sector in South Tyrol are rare – as they are quite difficult to measure – three key monitoring areas can be identified: transport, accommodation, and touristic activities. While no data is available for tourist attractions and activities, according to a recent estimation, accommodation facilities alone are responsible for almost 5% of South Tyrol's total greenhouse gas (GHG) emissions (Zebisch et al., 2018). As the transport sector constitutes the largest emitter of CO_2 emissions in South Tyrol, this issue area aims to provide a regular estimation of transport-related touristic emissions. This is in line with the new Climate Plan 2040 of the Provincial Government of South Tyrol, according to which touristic mobility constitutes one of the biggest leverage points for climate change mitigation in South Tyrol. Reducing transport-related emissions from tourism in South Tyrol in the long term requires several key measures. The most crucial of these is promoting alternatives to private, fossil-fuel-based transportation, such as public transport and electric mobility, both for tourists' arrivals/departures and their movement within the region. In addition, strategic targeting of closer tourist markets – for which South Tyrol is already well-positioned – can help to mitigate emissions by reducing travel distances.

INDICATOR		VALUE	CHANGE	
14.1	Estimated car-related CO_2 equivalent emissions from inbound tourism	2023	2014-2023	2022-2023
		99.2 kt CO_2eq	+37.4%	+4.4%

Table 1: Indicator for climate action.
Source: own calculation based on data from ASTAT, STOST, Google Maps, German Umweltbundesamt (UBA).

To estimate the transport-related emissions from tourism in South Tyrol, we can draw on multiple data sources to gather key information, including the number of tourist arrivals by market of origin, their travel behaviour, and average emission factors per vehicle kilometer. To simplify the analysis and given that close to 90% of tourists arrive by car (de Rachewiltz et al., 2021), our analysis focuses on private cars, excluding other forms of transportation like trains, coaches, or motorcycles. In line with the territorial principle—used by organisations like the International Panel on Climate Change (IPCC) and in the Climate Plan 2040—only emissions produced within South Tyrol's geographic boundaries are attributed to the region. This means we consider tourist travel emissions from the moment they cross the South Tyrolean border to the time they leave, including both arrival/departure and internal mobility. Due to data availability constraints, our analysis is limited to tourists who spend at least one night in an accommodation facility in South

Tyrol, implying that day visitors are not accounted for. A detailed explanation of our estimation process can be found in the Online Annex on our website.

Our calculations indicate that in 2023, **car-related CO_2 emissions from inbound tourism** in South Tyrol amounted to 99.2 kilotonnes (kt) of CO_2 equivalent (CO_2eq). This represents a 4.4% increase compared to the previous year and sets a new peak. When compared to South Tyrol's total traffic-related emissions in 2022 (the most recent year for which data for different vehicle categories is available[9]), around 8% can be attributed to car-related touristic mobility. When considering South Tyrol's total emissions from private cars alone, the proportion attributable to touristic car travel increases to about 13%.

While the territorial approach offers valuable insights for international and interregional accounting and comparison, a more comprehensive analysis would also include emissions generated outside of South Tyrol's borders. When accounting for the entire journey to and from the region, total emissions rise significantly. Additionally, adopting a consumption-based approach—which accounts for factors such as the lifetime mileage of vehicles and upstream emissions from fuel production (Davis & Caldeira, 2010)—increases our estimate of car-related emissions by about 35%. With non-traditional, more distant markets making up an increasing proportion of guests, in the future, also emissions generated by other types of transports, in particular flights, might become more relevant for South Tyrol.

9 https://www.eurac.edu/de/data-in-action/klimaplan-monitoring-suedtirol/gesamtemissionen-des-verkehrssektors

15.

Accessibility

Maximilian Walder

Accessibility is a comprehensive concept that aims to enable everyone to participate in social life on an equal basis; it is thus not limited to special solutions for people with disabilities (PwD). According to the WHO, approximately 15% of the global population require some form of accessibility assistance (WHO, 2022). This number includes people with temporary difficulties, like pregnant women or those recovering from accidents, as well as elderly people in our increasingly aging society. In order to ensure a fair society with room (and to move in this room) for everyone, every part of life needs to be accessible. This includes people's holidays. To ensure that people with disabilities and their caregivers can fully enjoy the destination, certain standards need to be established. Independent L., a social association dedicated to promoting self-determined living and mobility for PwD in South Tyrol, amongst other initiatives, provides the online platform Südtirol für alle – Alto Adige per tutti. The organization employs trained staff to evaluate and describe the accessibility of structures and services, including those that meet acceptable standards on their platform. Independent L. ranks accessibility from 1 to 5, with 5 representing the highest grade of accessibility and 1 the lowest. Indicators for the level of accessibility are e.g. reserved parking spaces for PwD, level-access showers, inclusive menus or barrier-free facilities within the structure. To create an inclusive and accessible environment in South Tyrol, it is essential to provide the necessary resources for adapting stations, stops, and public transport to meet accessibility requirements. Enhancing accessibility to accommodation facilities and touristic attractions is equally important. These efforts should be integrated into a comprehensive concept aimed at establishing a barrier-free South Tyrol.

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INDICATOR			VALUES	CHANGE	
10.1	**Number of accessible gastronomy and accommodation facilities**	**Accommodation**	**2023**	**2021*-2023**	**2022-2023**
			407	+12.4%	+11.5%
		Gastronomy	**2023**	**2021*-2023**	**2022-2023**
			195	+14.7%	+12.7%
10.3	**Number of accessible cultural facilities and free time activities**		**2023**	**2021*-2023**	**2022-2023**
			277	+13.5%	+10.4%

Table 15: Indicators for accessibility.
Source: independent L.

** Earliest available data.*

In 2023, there were 407 **accommodation facilities** in South Tyrol that were designated as "accessible" by independent L. standards. This represents an 11.5% increase from the previous year. However, it still represents a relatively small portion of the total number of accommodation facilities in the region (3.5% of 11,770 establishments). Approximately three quarters of all accessible accommodations have a rating of grade 3 or higher, indicating a strong level of accessibility among these establishments. The distribution of accessible facilities is fairly even across the province, with the highest concentration found in the greater area of Meran/Merano. In the service sector, 195 restaurants and bars were labelled as accessible in 2023. Similar to accommodation facilities, this constitutes a small percentage of the total number of establishments. Also in this regard, Meran/Merano offers the largest selection of accessible dining options within the province. **Table 18** illustrates that most accessible restaurants are concentrated in the main towns.

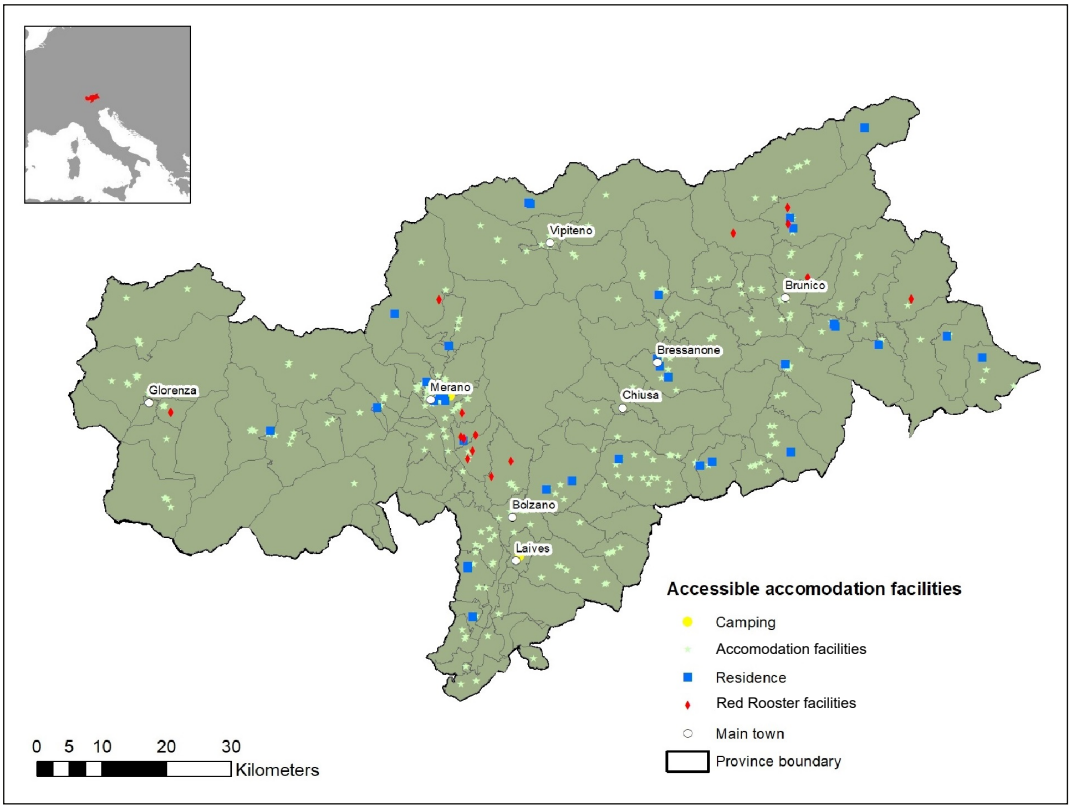

Figure 18: Accessible accommodation facilities by the standards of Südtirol für alle - Alto Adige per tutti, South Tyrol 2023.
Source: independent L., own elaboration.

In 2023, *Südtirol für alle* labelled 83 **museums and cultural institutions** as accessible. Only 24 out of the 107 museums in the destination are not recognised as accessible. Most of the accessible museums are located in the two main towns, Bozen/Bolzano and Meran/Merano. Furthermore, guests have the possibility to use 79 barrier-free hiking trails and promenades all over the province. Alongside the options available in the cities, Sand in Taufers/Campo Tures offers the most accessible opportunities (10 trails and promenades). South Tyrol offers 62 accessible spa and sport activities, including pools, sport venues and gyms, alongside 41 accessible playgrounds for children. This count also includes other activities that were not explicitly mentioned such as accessible cinemas, theatres, castles, and cultural centers.

Conclusions and outlook

After fully recovering from the negative impacts of the Covid-19 pandemic in 2022, South Tyrol's tourism industry continued to grow in 2023. Tourist arrivals and overnight stays have once again reached record levels, returning to pre-pandemic growth patterns. This is reflected in the rising number of people employed in the accommodation and food service sector, as well as the overall very positive profit assessments by tourism firms. Furthermore, there has been an increase in the number of available beds, along with a growing share of higher-end accommodation facilities.

However, also the environmental impact of the continued growth in tourism arrivals and overnight stays has become more evident, with increased energy and water consumption, along with higher levels of waste generation and rising emissions from car-related touristic mobility. At the same time, the renewed growth in tourism flows has led to a new peak in tourism intensity, sparking public debates on overtourism and the social pressures associated with mass tourism in South Tyrol. Growing concerns were raised by civil society actors, local communities and media outlets, even prompting some smaller protest actions. All this points to the significant challenge for South Tyrol to rethink its tourism development model, shifting the focus from further quantitative growth to a more balanced distribution of guests across the region and throughout the year, while placing greater emphasis on the well-being of residents and reducing negative environmental impacts.

In response to this challenge, regional tourism stakeholders have already begun to reinforce their commitment to sustainability, as shown by the growing participation in certification schemes and the expansion of the South Tyrol Sustainability Program. While the level of engagement of private business and visitors remains low, albeit increasing, these initiatives are positive steps forward. Yet, the challenge of aligning tourism with social and ecological limits – and gain a wider acceptance of novel development models within these limits – remains significant and increasingly urgent. Sustainability needs to be further integrated into all aspects of tourism, from infrastructure development and visitor experience design to market selection and marketing strategies. Moving forward, continuous efforts to enhance stakeholder collaboration, foster social innovation, and ensure ongoing monitoring will be crucial in creating a tourism model that not only supports economic prosperity but also considers the needs and concerns of the local population while preserving South Tyrol's unique cultural and natural heritage.

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