



# Agenda 2030 SDGs: an indicator-based toolkit to measure sustainability in tourism

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## Abstract

Agenda 2030 provides a comprehensive frame for the analysis of sustainable tourism, addressing issues such as economic inequality, socio-cultural heritage, climate change, and biodiversity, in the perspective of 17 Sustainable Development Goals (SDGs). Agenda 2030 calls for reliable, valid, and tested indicators to measure and monitor the accomplishment of each Goal. The role of the sustainable tourism indicators (STIs) is crucial to measure the impacts of tourism on long-term sustainability. Nevertheless, linking STIs to the framework of the SDGs is still a challenge. In addressing this gap, the present study proposes an innovative classification of a wide array of STIs by each SDG. It offers an indicator-based toolkit to measure and monitor the role of sustainable tourism in achieving each SDG and to assess policies/strategies affecting tourism sustainability. The result is a total of 262 STIs matched to the 17 SDGs and classified through several analytical categories, including: sustainability issue, SDG target, stakeholder perspective, data source, data feature, geographical area, and reference. This study provides decision-makers, researchers, and practitioners with a versatile instrument to support evidence-based policy-making and strategic planning in tourism governance.

**Keywords** Sustainability dimensions · Agenda 2030 SDGs · Sustainable tourism · STIs classification

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## 1 Introduction

Sustainability has received much attention in research from a threefold perspective that includes environment, society, and economy. This concept is multifaceted and debated (Johnston et al. 2007) in several strands of the scientific literature pertaining different research fields (Roberts et al. 2022). Even if there is a general lack of consensus concerning the definition of sustainability, due to the different research perspectives (Purvis et al. 2019), some basic principles and scopes can be identified following a holistic approach (Bassi and Martín 2024).

As far as tourism is concerned, the environmental dimension of tourism sustainability concerns the aware use of the environmental resources and the protection the biodiversity of tourism destinations. Social sustainability calls for cooperation processes within and among countries, to foster mutual knowledge and tolerance while preserving social cultural heritage of host communities. Economic sustainability requires to support tourism activities, employment, and services for host communities to increase the population well-being and reduce poverty in a long-term perspective (UNWTO 2022).

The need of instruments for measuring and monitoring sustainability in the tourism domain is widely recognised (Torres-Delgado and Palomeque 2014). In 2016, the UNWTO envisages as “*fundamental measurement issues*” data collection and measurement by indicators, and the definition of a conceptual and methodological frame, time horizon, territorial scale (e.g. local destinations or countries), and stakeholder standpoint (local businesses, government official, visitors, local communities).

Despite the acknowledgment of the role of the Sustainable Tourism Indicators (STIs), linking the STIs to the Sustainable Development Goals (SDGs) of Agenda 2030 is still a real challenge (Miller and Twining-Ward 2005). In this perspective, the present study aims to advance tourism research by proposing an indicator-based approach to measure tourism contribution to sustainable development by framing a rich set of STIs by each SDG. The proposed classification encompasses several criteria: sustainability dimension, stakeholders’ perspective (tourism companies/businesses as supply side, visitors as demand side, host communities, policy-makers/governments, non-governative organisations etc.) and methodological features of data (e.g., source, time frequency, territorial level, etc.). A toolkit is built to monitor the role of sustainable tourism in achieving each SDG, assess policies and strategies that affect tourism sustainability and thus support policy-makers’ decisions.

## 2 Sustainability and sustainable tourism

Sustainability is a multidimensional concept. According with the *Russian doll model* of sustainability (Levett 1998), the three primary<sup>1</sup> dimensions of sustainability are nested. The more inclusive dimension is the environment, backing the social-cultural and economic development. The concept of sustainable development refers to concurrent environmental, social, and economic development, stemming from the balance of intra- and inter-generational interests.

*Our Common Future*, also known as the Brundtland Report (WCED 1987), puts sustainability at the centre of the international agenda as an imperative prerequisite for develop-

<sup>1</sup> Some scholars also add one or more dimensions to the 3 most important dimensions of sustainability, such as institutional sustainability, declined in terms of local oriented control policy, political participation, local planning policy and political support at different levels of government (Ko 2001; 2005; Viljoen 2007).

ment stressing the need to endorse the perspectives of both present and future generations (pp. 34-37). This path-breaking Report provides the stage for Agenda 21, the outcome of the Rio de Janeiro *United Nations Conference on Environment and Development* (UNCED 1992), setting out the objectives of sustainable development and the actions needed to achieve it. Sustainability remains at the core of the United Nations agenda and on September 2015, the high-level plenary meeting of the General Assembly produces as outcome the United Nations Agenda 2030 for Sustainable Development (UN 2015).

Agenda 2030 states 17 SDGs and 169 related targets balancing the environmental, social, and economic dimensions of sustainable development. SDGs are the outcome of a political process, and their implementation is inherently political as well (Hall et al. 2022). According with a systemic approach, the 17 SDGs provide an up-to-date, holistic, and integrated perspective of sustainability as a requirement of a well-balanced development, in a continuous process of trade-off among the environmental, social, and economic domains.

Since the *Brundtland Report*, the growing relevance of the sustainable development paradigm for tourism is witnessed by UNWTO documents (UNWTO 1997; WTO 2004; UNEP/UNWTO 2005) and by the several reports, issued by the Secretariat of the World Tourism Organization for the General Assembly of the United Nations on the application of UN resolutions, on policies and programs to foster sustainable tourism (<https://www.unwto.org/sustainable-development/unga>).

Sustainable tourism is a major research issue in the academic debate, as it is an acknowledged component of a wider sustainable development concept (Mohamadi et al. 2022; Torres-Delgado 2023), due to the pivotal role that tourism has for environmental, socio-cultural, and economic development at local, national, and global scale.

Tourism activities and destination management practices are sustainable if they conform to all the 3 primary dimensions (Purvis et al. 2019; UNWTO 2022) of sustainability and allow at: promoting the aware use of environmental and natural resources, key elements in tourism development; providing resources to preserve the natural heritage and the biodiversity; caring the socio-cultural heritage and legacy of host communities; ensuring viable, long-term socio-economic benefits to all stakeholders in all destinations; reaching a high level of tourist satisfaction with safe and pleasing experiences; planning and managing tourism activities and policies in a long-term perspective by monitoring the impacts of tourism.

If tourism may act as an ally of sustainable development, when properly managed, it may also be a cause of undesired environmental, socio-cultural, and economic effects when only the short-term positive impacts on employment, taxes revenues, and business growth are endorsed (Fabry and Zeghni 2019; Bramwell et al. 2017). Moreover, tourism not only affects but also depends on environmental, social, and economic assets to preserve and ameliorate.

Since decades, the flowering of national and supranational policies and programs to back sustainable tourism development has been matched by the quest for specific, reliable, and valid measures of performance to monitor the progress toward sustainability.

### **3 The indicator-based approach to measure the tourism impacts**

Measuring positive and negative impacts of tourism on sustainability dimensions is crucial to design, implement, and evaluate policies and actions conducive to the achievement of sustainable tourism and, thus, sustainable development.

Tourism research has long been concerned in measuring exclusively the economic impact of tourism (Mathieson and Wall 1982) but the focus on the environmental and social effects (Fodness 2017; Hall 2019; Saarinen 2015) and on their measurement at the global, national, and regional level is increasing (Torres-Delgado et al. 2023; Rasoolimanesh et al. 2023; Epler Wood et al. 2019; Torres-Delgado and Palomeque 2014).

The *environment* protection is a key factor for both tourism industry and host communities in a long-term perspective of balanced growth. Indeed, the environment is one of the main attractions for tourism demand. Thus, measuring the environmental impact generated by tourism and tourists themselves is relevant since tourism activities can cause landscape degradation, biodiversity loss and human-induced climate change by means of the carbon dioxide emissions of transport systems (UNWTO 2022). The level of stress on destinations, evaluated measuring the overcrowding in terms of the overall population density, tourists as well as residents, is paramount. On the other side, the measurement of tourism-generated revenue, which can in turn be reinvested to preserve areas from dangers, allows for an assessment of tourism impact on environmental sustainability.

Concerning the *social* impact, the cultural ‘distance’ among residents and tourists is relevant (Kim et al. 2020). Indeed, beyond the mutual cultural growth stemming from the interaction among different backgrounds, social conflicts could arise if tourists do not have an adequate knowledge of the local culture and customs (UNEP/UNWTO 2005).

This resident-oriented perspective also implies that the residents' support for tourism-essential for successful sustainable tourism development (Gursoy et al. 2010; Sharpley 2014)-is affected by the perceived personal benefits and the positive impacts on host destinations. Overcrowding causes hostility, among residents and between residents and tourists, due to an increase in the cost of living and a decrease of well-being level. Likewise, the level of traffic congestion and the likely increase in the number of road accidents raises safety issues. On the other hand, fiscal revenues from tourism and the willingness to increase the number of visitors can boost investments to improve public infrastructures and services and preserve the historic and cultural heritage of host community (UNWTO 2023). Hence, it is crucial to adopt also a tourist-oriented perspective and measuring customer satisfaction for a successful tourism destination management (Song et al. 2012).

Finally, both the extent of direct and indirect *economic* benefits must be considered and measured. The direct benefits are given through tourists' expenditure at destination (for food, souvenirs, excursions, tips, etc.) and the money paid by tour operators to local suppliers (for accommodation infrastructures, local transport companies, etc.). The indirect benefits, instead, derive from job incomes and revenues earned by local farmers or factories producing goods and services purchased by tourists, where seasonality is a challenging factor for stability in employment and in specific tourism activities. Moreover, the need of tourism-qualified employees could positively affect the increase of human capital (Niedziółka 2014). By tourism, countries can gain international credit and appreciation and can, therefore, attract foreign direct investment flows, which economic development may depend on (UNWTO 2022). Negative indirect effects are generated both by revenue ‘leakages’ of goods and services for tourists produced or purchased outside the country-diverting funds otherwise used for producing local goods and providing local services-or by higher costs for local population, due to increased prices of goods and services in high-seasonality period. For example, the use of local products could reveal, through a proper measurement, that a

destination needs fewer tourists to generate the same economic benefit for tourism enterprises by a stronger market position and less vulnerability to short-term economic changes.

The indicator-based approach helps to make heuristic the concept of sustainable tourism identifying tourism effects, their evolution, and their potential threats. STIs, along their *instrumental* role (Gudmundsson 2003; Gasparini and Mariotti 2021) are evidence-based tools to support decision-makers in developing data-informed policies (Marinello et al. 2023). STIs measure the effects of tourism activities on, at least, one of 3 principal dimensions of sustainability (Ko 2005; Mowforth and Munt 2003). STIs focus on benefits and on risk factors derived from tourism in the perspective of host destinations and larger territorial areas.

To reinforce leadership and shared guidance on STIs, WTO (2004), UNWTO and UNDP (2017), WEF (2022), and, along a specific project-based perspective, UNWTO (2023) have generated systems of core STIs.

#### 4 SDGs and sustainable tourism: what indicators?

The crucial role of the tourism sector to achieve sustainability is widely acknowledged and the WTO itself is engaged in connecting SDGs and tourism activities (WTO 2024).

To evaluate the contribution of tourism to the achievement of the SDGs (UNWTO and UNDP 2017) accurate indicator systems are essential as measurement tools (Glyptou 2022). STIs allow at monitoring strategies and policies as they provide insights about endogenous and exogenous factors affecting all sustainability dimensions (Lozano-Oyola et al. 2012; Miller and Twining-Ward 2005; Stoddard et al. 2012).

In 2024, the UNWTO publishes the *Statistical Framework for Measuring Sustainable Tourism* (MST). The report highlights the link between STIs and SDGs. This is a guideline to exploit the richness of available data and promote more effective data production, management, and integration aiming to assess the tourism role in sustainable development in the Agenda 2030 perspective.

SDGs address a range of issues, including poverty, hunger, disease prevention, and gender equality, with a particular focus on income inequality, climate change, and biodiversity loss. Hence, a STIs system, leveraging on the SDGs, can be an effective way to explore the sustainability of tourism activities (Glyptou et al. 2022). UNWTO calls to accelerate sustainable consumption and production practices, climate action, the protection of marine and terrestrial ecosystems to fulfill SDG12, SDG13, SDG14, and SDG15 (One Planet Network 2020).

Nevertheless, in Agenda 2030, the topic of sustainable tourism is explicitly mentioned in only 3 SDGs and related targets:

- SDG8-*Decent Work and Economic Growth*, target 8.9
- SDG12-*Responsible Consumption and Production*, target 12.b
- SDG14-*Life below Water*, target 14.7.

In 2020, the United Nations propose specific STIs associated only to SDG8 and SDG12 and their targets, such as indicator 8.9.1 *Tourism direct GDP as a proportion of total GDP and in growth rate* and indicator 12.b.1 *Implementation of standard accounting tools to monitor the economic and environmental aspects of tourism sustainability* (Glyptou et al. 2022).

On the basis of the above cited literature and following the latest UNWTO (2024) suggestion, the present study proposes a methodological tool for measuring tourism contribution to the accomplishment of each SDG. With this aim, a wide set of indicators is structured within the SDGs frame to link selected STIs to a specific SDG and its targets. The matching between STIs and each SDG is proposed by focusing on the strongest and more direct link. However, since the SDGs are all interconnected other links could be observed between STIs and SDGs and their targets.

STIs are classified according with both the criteria (e.g., sustainability dimension, sustainability issue, etc.) of UNWTO (WTO 2004; UNWTO 2015, 2020, 2022) and the methodological features of the data employed to build each STI (e.g., source, time frequency, territorial level, etc.).

As starting step, the present study adopts as benchmark the pioneering work of the *World Tourism Organization and United Nations Development Programme* (UNWTO and UNDP 2017) that proposes the first attempt of mapping a core of 36 STIs according with the 17 SDGs and related targets. Each STI measures the progress towards the accomplishment of a SDG and specific target.<sup>2</sup> Moreover, it provides for each SDG a specific tourism link (UNWTO and UNDP 2017, 16-17) in terms of the expected effects of tourism activities on the achievement of the SDG.

Following the above SDG-tourism link perspective, the present contribution suggests a wide range of STIs to measure not only the direct effects of tourism activities on specific SDG targets-as UNWTO and UNDP (2017)-but also the tourism impacts on the environmental, social, and economic dimensions, fostering the achievement of each SDG and targets. For example, the indicator computed as *percentage of GDP attributable to the activities of Hotels and Restaurants* measures not a direct effect on the reduction of poverty (SDG1) but the contribution of tourism to GDP in the perspective of the tourism link: *Tourism provides income through job creation at local and community levels. It can be linked with national poverty reduction strategies and entrepreneurship ...* (UNWTO and UNDP 2017, 16).

In the light of this and with no claim to exhaustiveness, the study enriches the core of 36 STIs of UNWTO and UNDP (2017) with a rich set of STIs extracted from: the *Insight Report of the World Economic Forum* (WEF 2022) proposing a list of 110 STIs at the national level and also providing the data sources worldwide,<sup>3</sup> the *European Tourism Indicator System* (ETIS) (European Commission 2016) suggesting 40 STIs at the local-destination level and offering a methodological guide to collect data useful for destinations management, and the seminal paper of Blancas et al. (2015) identifying 78 STIs for the European Union (mostly available in EUROSTAT databases at NUTS 1 level and others at NUTS 2 level). As a result, a total number of 262 STIs-36 core indicators and 226<sup>4</sup> from

<sup>2</sup>For example, as far as SDG1 (*No poverty*) is concerned, the target 1.2 (<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>) is associated with 2 indicators to measure the reduction of poverty (UNWTO and UNDP 2017, Annex 5).

<sup>3</sup>Even though the quality-based indicators are available and comparable only at national scale, methodological approaches to transform the scale in other intermediate territorial levels have been developed. Specifically, sustainable tourism indicators on regional scale have been created with the aim to assign regional variability to national indicators on the basis of one or more regional variables used to assign a weight to each component of national indicators (Bertocchi et al. 2023).

<sup>4</sup>Only an indicator-*Average length of stay*-in Tourism demand issue of SDG1 (see Table 1) is present in all the 3 sources considered. Then, in the sum it is computed only once: the total number of STIs added to the core is not 228, but 226.

the 3 sources-are matched to the 17 SDGs and their respective targets and also the original data sources are provided. The rationale of this STIs selection is the awareness that, even if tourism sustainability assessment should not be merely data-driven, the availability of data is relevant in the perspective of comparability among different territorial areas.

The present study is framed within the branch of literature about the measurement of the tourism industry contribution to each pillar of sustainability at several levels of territorial governance, taking into account the different stakeholders. Actually, this literature is quite rich. Nevertheless, the matching between STIs and SDGs is treated in a cavalier way (Rasoolimanesh et al. 2023).

It is worthwhile mentioning that in a recent publication of the *World Tourism Organization* (UNWTO 2023), STIs are connected to SDGs but within a specific project-based perspective, different-but complementary-to the territorial governance and stakeholder perspective of the present analysis.

## 5 A toolkit for sustainable tourism research

The classification of STIs into analytical categories here proposed is a toolkit for tourism research. It can support policy-makers in planning, managing, and monitoring tourism strategies and policies aimed to achieve each SDG (UNWTO and UNDP 2017).

According to specific sustainability issues (Blancas et al. 2015), Table 1 presents a matching of STIs with each SDG and its targets on the basis of the strongest link to a SDG. Since all the SDGs and targets are mutually dependent, additional links to other SDGs and targets are also suggested (in brackets and in italics).

For each SDG, the STIs suggested by UNWTO and UNDP (Annex 5, 2017) are here adopted as benchmark and reported employing the following analytical categories (grey areas in Table 1):

- SDG (*label: definition by Agenda 2030*)
- Sustainability Dimension: (SD: *Environmental, Social, Economic*)
- Tourism Link (TL: *description*) to the SDG
- Target (*number*) of SDG linked to STIs
- Target link to STI (*number*). Sustainable Tourism Indicator: *definition*.

The core of the toolkit is an innovative classification pattern of a wide set of STIs, derived from reports of major institutional relevance-WEF (2022), ETIS (2016)-and the pivotal study by Blancas et al. (2015). Taking into account but not being bounded to the tourism link proposed by the benchmark (UNWTO and UNDP 2017), STIs are here organised by each specific SDG and classified through the following analytical categories, enriching those contemplated by UNWTO and UNDP (2017), as shown in the white areas of Table 1:

- Sustainability issue (*e.g., tourism demand, tourism employment, revenue, integration and reduction of gender inequality, pollution, safety in urbanisation and transport, etc.*)
- Target (*number*) of SDG linked to STIs and *additional SGD and target link* suggest links with other SDGs and associated targets
- *Sustainable Tourism Indicator(s)*: to each STI one superscript is assigned. Each super-

**Table 1** The toolkit: a SGDs framework for STIs

Benchmark		SDG (label: definition) Sustainability dimension (SD): (Environmental; Social; Economic) Tourism Link (TL) (description) (UNWTO and UNDP, 2017) Target link to STI (number), Sustainable Tourism Indicator (definition) (UNWTO and UNDP, Annex 5, 2017)			Reference
Sustainability issue e.g.: tourism demand; tourism employment; etc.	Target: (number)	Sustainable Tourism Indicator(s) <sup>(superscripts)</sup> (polarity +/-)	Stakeholders perspective: Supply side (private/public sectors, local businesses), Demand side (tourist/visitor), Host community/ destinations, Government (local, regional, national, supranational), Non Governmental Organization (NGO)	Data a. Data source: Administrative, Survey, Scraping data b. Data features: b1. Time frequency b2. Territorial NUTS level b3. Quantitative (raw data, ratios, % over total, etc.) and/or Qualitative b4. Timespan c. Geographical area/s *Data to gather/compute	
<p><b>SDG1: No poverty SD: Economic</b>  <b>TL: Tourism provides income through job creation at local and community levels. It can be linked with national poverty reduction strategies and entrepreneurship. Low skills requirement and local recruitment can empower less favoured groups, particularly youth and women.</b></p>					
<p><b>Target:</b> 1.2 1.2.1. Proportion of population living below the national poverty line, by sex and age 1.2.2. Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions</p>					
<p><b>1.a</b> 1.a.1. Proportion of resources allocated by the government directly to poverty reduction programmes</p>					
<p><b>Socioeconomic resilience and conditions</b></p> <p>Targets: 1.1<sup>1</sup>, 1.2<sup>1</sup>, 1.3<sup>2,3</sup> (SDG10: 10.4<sup>1-3</sup>)</p>		<p>Proportion of people living below 50% of median income<sup>1</sup> (-) Government<sup>1-3</sup> NGOs<sup>1-3</sup></p> <p>Proportion of population covered by at least one social protection benefit<sup>2</sup> (+) Government expenditure on social security and welfare as a percentage of GDP<sup>3</sup> (+)</p>		<p>a. Administrative: WB-WDI<sup>1</sup>, ILO and ILOSTAT database<sup>2</sup>, EPI<sup>3</sup> b1. Yearly data<sup>1-3</sup> b2. Country level<sup>1-3</sup> b3. Quantitative: percentage<sup>1,3</sup>, ratio<sup>2</sup> b4. 2019 or most recent<sup>1</sup>, 2020 or most recent<sup>2</sup>, 2020<sup>3</sup> c. Worldwide<sup>1-3</sup></p> <p>WEF (2022) Pillar 16: (16.01-16.03)<sup>1-3</sup></p>	

Table 1 (continued)

<p><b>Available income per inhabitant</b></p> <p>Targets: 1.1, 1.2 (SDG8: 8.1)</p>	<p>Net national available income per inhabitant (+)</p>	<p>Government</p>	<p>a. Administrative: EUROSTAT b1. Yearly data b2. Country level b3. Quantitative: ratio b4. (2011-2022) c. EU (28 countries till <i>Brexit</i>)</p>	<p>Blancais et al. (2015)</p>
<p><b>Contribution of tourism to GDP</b></p> <p>Targets: 1.1<sup>1,8</sup>, 1.2<sup>1,8</sup></p>	<p>Percentage of GDP attributable to the activities of hotels and restaurants<sup>1</sup> (+)</p> <p>T&amp;T GDP multiplier<sup>2</sup> (+)</p> <p>Average annual gross income in tourism jobs<sup>3</sup> (+)</p> <p>Ratio of average annual gross income in tourism jobs on the average for other economic activities<sup>4</sup> (+)</p> <p>Tourist expenditure<sup>5</sup> (+)</p> <p>Relative contribution (% GDP) of tourism to the destination's economy<sup>6</sup> (+)</p> <p>Daily spending per overnight tourist at destination<sup>7</sup> (+)</p> <p>Daily spending per same-day visitors at destination<sup>8</sup> (+)</p>	<p>Supply<sup>1,3,4</sup>, Host community/destination<sup>6,8</sup>, Government<sup>1-6</sup></p>	<p>a. Administrative: WT&amp;TC<sup>2</sup>, EUROSTAT<sup>1,3,5</sup> b1. Yearly data<sup>1-5</sup> b2. Country level<sup>1-5</sup>, Destination level<sup>6-8</sup> b3. Quantitative: percentage<sup>1,6</sup>, ratio<sup>2,4</sup>, raw data<sup>3</sup>, average<sup>3,8</sup> b4. 1975-2022<sup>1,3,4</sup>, 2020<sup>2</sup>, 2013-2022<sup>5</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,3-5</sup>, Worldwide<sup>2</sup></p>	<p>WEF (2022) Pillar 17: (17.01)<sup>2</sup>  Blancais et al. (2015)<sup>1,3,5</sup>  ETIS (2016) (Indicator reference: B.1.3-B.1.5)<sup>6-8</sup></p>
<p><b>Tourism demand</b></p> <p>Targets: 1.1<sup>1,7</sup>, 1.2<sup>1,7</sup></p>	<p>Total number of tourists arrivals<sup>1</sup> (+)</p> <p>Average length of stay<sup>2,a-2,c</sup> (+)</p> <p>Number of tourist nights per month<sup>3</sup> (+)</p> <p>Number of same-day visitors per month<sup>4</sup> (+)</p> <p>Natural tourism Digital Demand (online search volume)<sup>5</sup> (+)</p> <p>Cultural and entertainment tourism Digital Demand (online search volume)<sup>6</sup> (+)</p> <p>Non-leisure tourism Digital Demand (online search volume)<sup>7</sup> (+)</p>	<p>Supply<sup>1,7</sup>, Host community/destination<sup>1,4</sup></p>	<p>*Data to gather/compute<sup>6,8</sup></p> <p>a. Administrative: EUROSTAT<sup>1,2,b</sup>, Scraping data: EI<sup>2,a</sup>, BloomCons<sup>5,7</sup> b1. Monthly data<sup>1,2,b</sup>, Yearly data<sup>2,a,5,7</sup> b2. NUTS 2<sup>1,2,b</sup>, Country level<sup>2,a,5,7</sup>, Destination level<sup>2,c,3,4</sup> b3. Quantitative: raw data<sup>1,5,7</sup>, average<sup>2</sup>, moving average<sup>2,a,3,4</sup> b4. 1990,1-2023,11<sup>1,2,b</sup>, 2018, 2019, 2020<sup>a,5,7</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,2,b</sup>, Worldwide<sup>2,a,5,7</sup></p>	<p>WEF (2022) Pillar 12 (12.04)<sup>5</sup> Pillar 13 (13.04)<sup>6</sup> Pillar 14 (14.04)<sup>7</sup> Pillar 17 (17.02)<sup>a</sup>  Blancais et al. (2015)<sup>1,2,b</sup>  ETIS (2016) (Indicator reference: B.1.1, B.1.2, B.2.1)<sup>2,c,3,4</sup></p>

Table 1 (continued)



	<p><b>G2: Zero hunger SD: Economic</b>  <i>TL: Tourism can spur sustainable agricultural by promoting the production and supplies to hotels, and sales of local products to tourists. Agro-tourism can generate additional income while enhancing the value of the tourism experience</i></p>		<p><b>No targets</b></p>
<p>Targets: 2.3, 2.4</p>	<p>Percentage of locally produced food, drinks, goods and services sourced by the destination's tourism enterprises (+)</p>	<p>Supply, Host community/ destination Government NGOs</p>	<p>ETIS (2016) (Indicator reference: B.4.1)</p>
	<p><b>G3: Good health &amp; well-being SD: Social</b>  <i>TL: Tax income generated from tourism can be reinvested in health care and services, improving maternal health, reduce child mortality and preventing diseases. Visitors fees collected in protected areas can as well contribute to health services.</i></p>		<p><b>*Data to gather/compute</b></p>
<p>Target: 3.8</p>	<p>3.8.1. Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, new-born and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)</p>	<p>Supply<sup>1-6</sup> Demand<sup>1-6</sup> Government<sup>1-6</sup> NGOs<sup>1-6</sup></p>	<p>WEF (2022) Pillar 3: (3.01, 3.04-3.06)<sup>1-4</sup>  Blancas et al. (2015)<sup>5,6</sup></p>
<p>Capacity of health services</p>	<p>Physician density per 1,000 population<sup>1</sup> (+)  Number of hospital beds per 10,000 population<sup>2</sup> (+)  Accessibility of healthcare services (<i>In your country, to what extent do all members of the population have sufficient access to the following safety nets and services: Physical healthcare? 1...? = to a great extent</i>)<sup>3</sup> (+)  Selected communicable disease incidence rate per 100,000 population<sup>4</sup> (+)  Number of inhabitants per Hospital beds<sup>5</sup> (-)</p>	<p>Supply<sup>1-6</sup> Demand<sup>1-6</sup> Government<sup>1-6</sup> NGOs<sup>1-6</sup></p>	<p><b>a. Administrative: WHO-GHODR<sup>1,2</sup>, Survey: WEF-EOS<sup>3</sup>, EUROSTAT<sup>5,6</sup></b>  <b>b1. Yearly data<sup>1-6</sup></b>  <b>b2. Country level<sup>1-4</sup>, NUTS 2<sup>5,6</sup></b>  <b>b3. Quantitative: ratio<sup>1,2,4,6</sup>, weighted average of scores<sup>3</sup></b>  <b>b4. 2019 or most recent<sup>1,2</sup>, 2020-2021<sup>3</sup>, 2019<sup>4</sup>, 1993-2022<sup>5,6</sup></b>  <b>c. Worldwide<sup>1-4</sup>, EU (28 countries till Brexit)<sup>5,6</sup></b></p>
<p>(SDG 10: 10.4) <b>Effects on living conditions that affect population longevity</b></p>	<p>Number of inhabitants per Staff employed in hospitals<sup>6</sup> (-)  Life expectancy at birth on average (+)</p>	<p>Government NGOs</p>	<p>Blancas et al. (2015)</p>
<p>Targets: 3.1-3.6, 3.9, 3.a, 3.b</p>	<p>Government NGOs</p>	<p>Government NGOs</p>	<p><b>a. Administrative: EUROSTAT</b>  <b>b1. Yearly data</b>  <b>b2. Country level</b>  <b>b3. Quantitative: average</b>  <b>b4. (1960-2022)</b>  <b>c. EU (28 countries till Brexit)</b></p>

Table 1 (continued)



	<p><b>G4: Quality education SD: Social</b>  <i>TL: Tourism has the potential to promote inclusiveness. A skilled workforce is crucial for tourism to prosper. The tourism sector provides opportunities for direct and indirect jobs for youth, women, and those with special needs, who should benefit through educational means.</i></p>
<p><b>Targets:</b> 4.3, 4.4, 4.7</p>	<p>4.3.1. Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex</p> <p>4.4.1. Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill</p>
<p><b>Education levels of residents</b></p> <p>Targets: 4.1-4.7; 4.c</p>	<p>4.7.1. Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment</p> <p>Average number of years of education received by people ages 25 and older<sup>1</sup></p> <p>Gross secondary education enrolment rate<sup>2</sup></p> <p>Extent of staff training (In your country, to what extent do companies invest in training and employee development? 1...7=to a great extent)<sup>3</sup></p> <p>Education system's ability to meet needs (In your country, how well does the education system meet the needs of a competitive economy? 1...7=to a great extent)<sup>4</sup> (+)</p> <p>Percentage of population enrolled in non-compulsory education (Tertiary educational attainment)<sup>5</sup> (+)</p>
<p>(SDG/0: 10, 3<sup>4</sup>)</p>	<p>Supply<sup>3</sup> Government<sup>1-5</sup></p> <p>a. Administrative: UNDP<sup>1</sup>, UNESCO Institute for Statistics<sup>2</sup>, EI 2021<sup>2</sup>; Survey: WEF-EOS<sup>3,4</sup>, EUROSTAT<sup>5</sup>  b1. Yearly data<sup>1-5</sup>  b2. Country level<sup>1-5</sup>  b3. Quantitative: average<sup>1</sup>, ratio<sup>2</sup>, weighted average of scores<sup>3,4</sup>, percentage<sup>5</sup>  b4. 2019 or most recent<sup>1</sup>, 2021 or most recent<sup>2</sup>, 2020-2021<sup>3,4</sup>, (2000-2022)<sup>5</sup>  c. Worldwide<sup>1-4</sup>, EU (28 countries till Brexit)<sup>5</sup></p>
<p><b>5</b></p>  <p><b>Target:</b> 5.c</p>	<p><b>G5: Gender equality SD: Social</b>  <i>TL: Tourism can empower women, particularly through the provision of direct jobs and income-generation from MMEs in tourism and hospitality related enterprises. Tourism can be a tool for women to become fully engaged and lead in every aspect of society</i></p> <p>5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment</p> <p>Gender inequality Index<sup>1</sup> (-)</p> <p>Ratio of the percentage of women employed in the tourism sector and the percentage in other activities<sup>2</sup> (+)</p> <p>Percentage of employed women (tourism sector)<sup>3</sup> (+)</p> <p>Percentage of employed women in the tourism sector with low-wages<sup>4</sup> (-)</p>
<p>Supply<sup>2-6</sup> Government<sup>1-8</sup> NGOs<sup>1</sup></p> <p>a. Administrative: UNDP<sup>1</sup>, EUROSTAT<sup>2,3</sup>  b1. Yearly data<sup>1</sup>, Quarterly data<sup>2,3</sup>,  b2. Country level<sup>1-3</sup>  b3. Quantitative: index<sup>1</sup>, ratio<sup>2,5</sup>, percentage<sup>3,6</sup>  b4. 2019 or most recent<sup>1</sup>, 2007-Q1-2023.Q3<sup>2,3</sup>  c. Worldwide<sup>1</sup>, EU (28 countries till Brexit)<sup>2,3</sup></p>	<p>WEF (2022) Pillar 16 (16.07)<sup>1</sup></p> <p>Biancas et al. (2015)<sup>2-3</sup></p> <p>ETIS (2016) (Indicator)</p>

Table 1 (continued)

<p>(SDG8: 8.5<sup>1,4,6</sup> SDG16: 16.6<sup>6</sup>)</p>	<p>Ratio of the percentage of women employed in the tourism sector with low-wages and the percentage in other activities<sup>5</sup> (-) Percentage of tourism enterprises where the general manager position is held by a woman<sup>6</sup> (+)</p>	<p>*Data to gather/compute<sup>4,6</sup></p>	<p>reference: C.3.2)<sup>6</sup></p>
<p><b>G6: Clean water &amp; sanitation SD: Environment</b> <b>TL: Tourism investment requirement for providing utilities can play a critical role in achieving water access and security, as well as hygiene and sanitation for all. The efficient use of water in tourism, pollution control, and technology efficiency can be key to safeguarding our most precious resource.</b></p> <p><b>6.4.1</b> Change in water-use efficiency over time</p> <p><b>6.6.1</b> Change in the extent of water-related ecosystems over time</p>			
<p><b>Water and wastewater</b></p> <p>Targets: 6.1<sup>1</sup>, 6.2<sup>2</sup>, 6.3<sup>1+6</sup>, 6.4<sup>3</sup>, 6.6<sup>6</sup></p> <p>(SDG3: 3.9<sup>1,2</sup> SDG12: 12.2<sup>6</sup>, 12.5<sup>6</sup>)</p> <p><b>Water management in the tourism sector</b></p> <p>Targets: 6.4<sup>1-3</sup>, 6.6<sup>2-3</sup> (SDG12: 12.2<sup>1,3</sup>)</p>	<p>People using at least basic drinking water services as a percentage of total population<sup>1</sup> (+)</p> <p>People using at least basic sanitation services as a percentage of total population<sup>2</sup> (+)</p> <p>Baseline water stress: Annual water withdrawals on renewable ones<sup>3</sup> (-)</p> <p>Percentage of wastewater that receives treatment weighted by connection to wastewater treatment rate<sup>4</sup> (+)</p> <p>Number of urban wastewater treatment plants per 1000 inhabitants<sup>5</sup> (+)</p> <p>Percentage of sewage from the destination treated to at least secondary level prior to discharge<sup>6</sup> (+)</p> <p>Water consumption attributed to tourism<sup>1</sup> (-)</p> <p>Percentage of tourism enterprises taking actions to reduce water consumption<sup>2</sup> (+)</p> <p>Percentage of tourism enterprises using recycled water<sup>3</sup> (+)</p>	<p>Supply<sup>1-6</sup> Host community/ destination<sup>6</sup> Government<sup>1-6</sup> NGOs<sup>1,2</sup></p> <p><b>a. Administrative:</b> WB, WDI<sup>1,2</sup>, WRI-A3.0.CR<sup>3</sup>, YCELP<sup>4</sup>, EUROSTAT<sup>5</sup> <b>b1.</b> Y early data <b>b2.</b> Country level<sup>1-5</sup> <b>b3.</b> Quantitative: percentage<sup>1,2,4</sup>, ratio<sup>3,5</sup> <b>b4.</b> 2020 or most recent<sup>1,2</sup>, 2019 or most recent<sup>3</sup>, 2016<sup>4</sup>, 2000-2012<sup>5</sup> <b>c.</b> Worldwide<sup>1-4</sup>, 5 countries<sup>5</sup></p> <p>Blancas et al. (2015)<sup>5</sup></p> <p>ETIS (2016) (Indicator reference: D.4.1)<sup>6</sup></p> <p>*Data to gather/compute<sup>6</sup></p>	<p>WEF (2022) Pillar 3 (3.02, 3.03)<sup>1,2</sup> Pillar 15 (15.06, 15.09)<sup>3,4</sup> Blancas et al. (2015)<sup>5</sup> ETIS (2016) (Indicator reference: D.4.1)<sup>6</sup></p> <p>Blancas et al. (2015)<sup>1</sup> ETIS (2016) (Indicator reference: D.5.2, D.5.3)<sup>2,3</sup></p>

Table 1 (continued)



<p><b>7</b>  <b>RENEWABLE ENERGY</b></p> <p><b>Targets:</b> 7.3, 7.b</p>	<p><b>G7: Affordable &amp; clean energy SD: Environment</b>  <i>TL:</i> As a sector which is energy intensive, tourism can accelerate the shift towards increased renewable energy shares in the global energy mix. <i>By promoting investments in clean energy sources, tourism can help to reduce greenhouse gases, mitigate climate change and contribute to access of energy for all</i>  <b>7.3.1.</b> Energy intensity measured in terms of primary energy and GDP</p> <p><b>7.b.1.</b> Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services</p>
<p><b>Energy consumption/ Intensity</b></p> <p><b>Targets:</b> 7.2,4,5,8, 7.3,1,3,6,7</p>	<p>Final energy consumption attributable to tourism<sup>1</sup> (-)</p> <p>Percentage of renewable energy consumption with respect to the total attributable to tourism<sup>2</sup> (+)</p> <p>Energy intensity attributable to tourists<sup>3</sup> (-)</p> <p>Greenhouse gas (GHG) emissions per capita<sup>4</sup> (-)</p> <p>Renewable energy share<sup>5</sup> (+)</p> <p>Energy consumption per tourist night compared to general population energy consumption per resident night<sup>6</sup> (-)</p> <p>Percentage of tourism enterprises that take actions to reduce energy consumption<sup>7</sup> (+)</p> <p>Percentage of annual amount of energy consumed from renewable sources (Mwh) compared to overall energy consumption at destination level per year<sup>8</sup> (+)</p>
<p><b>Investment in green energy and infrastructure</b></p> <p><b>Targets:</b> 7.1- 7.3, 7.a, 9.4</p>	<p>Investment in green energy and infrastructure (In your country, to what extent does the government fund and subsidize investment in green and sustainable energy and infrastructure? 1...7=to a great extent) (+)</p>
<p><b>8</b>  <b>DECENT WORK AND ECONOMIC GROWTH</b></p>	<p><b>G8: Decent work &amp; economic growth SD: Economic</b>  <i>TL:</i> Tourism, as services trade, is one of the top four export earners globally, currently providing one in ten jobs worldwide. Decent work opportunities in tourism, particularly for youth and women, and policies that favour better diversification through tourism value chains can enhance tourism positive socio-economic impacts</p>

Table 1 (continued)

<p><b>Targets:</b> 8.4, 8.6, 8.7, 8.9</p>	<p>8.4.1 Material footprint, material footprint <i>per capita</i>, and material footprint <i>per GDP</i> 8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training 8.7.1 Proportion and number of children aged 5-17 years engaged in child labour, by sex and age 8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate</p>	<p>8.9.2 Number of jobs in tourism industries as a proportion of total jobs and growth rate of jobs, by sex</p>	<p>8.9.2 Sector output (gross value added) divided by employed population (in constant 2020 PPP \$) (+)</p>	<p>8.9.2 Supply Government</p>	<p>WEF (2022), Pillar 4 (4.08)</p>
<p><b>Productivity in tourism related sectors</b></p> <p>Target: 8.1, 8.9</p>	<p>Occupancy rate in commercial accommodation <i>per month</i> and average for the year (+)</p>	<p>Supply Host community/Destination</p>	<p>Supply Government</p>	<p>ETIS (2016) (Indicator reference: B.2.2)</p>	
<p><b>Tourism enterprises' performance</b></p> <p>Targets: 8.1, 8.9</p>	<p>Hiring and firing practices (<i>In your country, to what extent do regulations allow flexible hiring and firing of workers? 1...7=to a great extent</i>)<sup>1, (+)</sup> Ease of finding skilled employees in local labour market (<i>In your country, to what extent can companies find people with the skills required to fill their vacancies in the local labour market? 1...7=to a great extent</i>)<sup>2, (+)</sup> Flexible working arrangements (<i>In your country, to what extent do companies offer flexible working arrangements such as remote and part-time work? 1...7=to a great extent</i>)<sup>3, (+)</sup> Average length of service with same employees<sup>4, (+)</sup> The ITUC Global Rights Index: violations of workers' rights in law and practice<sup>5, (-)</sup></p>	<p>Supply<sup>1,5</sup> Host community/Destination<sup>1-5</sup> Government<sup>1,5</sup></p>	<p>*Data to gather/compute a. <i>Survey</i>: WEF-EOS<sup>1,5</sup>; <i>Administrative</i>: EUROSTAT<sup>4</sup>, ITUC Global Right Index<sup>5</sup> b1. Yearly data<sup>1-5</sup>, Quarterly data<sup>4</sup> b2. Country level<sup>1-5</sup> b3. Quantitative: weighted average of scores<sup>1,3</sup>, average<sup>4</sup>, index<sup>5</sup> b4. 2020-2021<sup>1,5</sup>, 2007 Q1 - 2023 Q1<sup>4</sup>, 2021<sup>5</sup> c. Worldwide<sup>1-3,5</sup>, EU (28 countries till Brexit)<sup>4</sup></p>	<p>WEF (2022) Pillar 4 (4.05-4.07)<sup>1-3</sup> Pillar 16 (16.06)<sup>5</sup> Blancas et al. (2015)<sup>4</sup></p>	
<p><b>Labour market</b></p> <p>Targets: 8.3<sup>1-4</sup>, 8.8<sup>5</sup>, 8.9<sup>1-4</sup></p> <p>(SDG4: 4.4<sup>7</sup>)</p>	<p>Percentage of employees in the service sector with respect to total employment<sup>1, (+)</sup></p>	<p>Supply<sup>1,5</sup> Government<sup>1-5</sup></p>	<p>a. <i>Administrative</i>: EUROSTAT<sup>1-3</sup> b1. Yearly data<sup>1,2</sup>, quarterly data<sup>3</sup></p>	<p>Blancas et al. (2015)<sup>1-3</sup></p>	

Table 1 (continued)

<p><b>employment</b> Targets: 8.3<sup>1</sup>, 8.5<sup>2,5</sup>, 8.8<sup>4</sup>, 8.9<sup>3,5</sup></p>	<p>Percentage of full-time employees in the service sector<sup>2</sup> (+) Quarterly unemployment rate in high season with regard to the unemployment rate registered in low season<sup>1</sup> (-) Percentage of jobs in tourism that are seasonal<sup>4</sup> (-) Percentage of men and women employed in the tourism sector<sup>5</sup> (+)</p>	<p>b2. Country level<sup>1,3</sup> b3. Quantitative: percentage<sup>1,2,4,5</sup>, rate<sup>3</sup> b4. 2008-2023<sup>1,2</sup>, 2008 Q1-2023_Q4<sup>3</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,3</sup></p>	<p>ETIS (2016) (Indicator reference: B.3.2, C.3.1)<sup>4,5</sup></p>
<p><b>Tourism seasonality</b> Targets: 8.9<sup>1,2</sup></p>	<p>Ratio of low-season tourists to peak-season tourists (Arrivals at tourist accommodation establishments)<sup>1</sup> (+) Top three months' share of total yearly international tourist arrivals<sup>2</sup> (-)</p>	<p>*Data to gather/compute<sup>4,5</sup> a. <i>Administrative</i>: EUROSTAT<sup>1</sup>, UNWTO<sup>1</sup> b1. Quarterly data<sup>1</sup>, yearly data<sup>2</sup> b2. Country level<sup>1,2</sup> b3. Quantitative: ratio<sup>1</sup>, moving average<sup>2</sup> b4. 2007-Q1-2023_Q3<sup>1</sup>, 2018-2019<sup>2</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1</sup>, Global<sup>2</sup></p>	<p>WEF (2022), Pillar 17 (17.03)<sup>2</sup> Blancas et al. (2015)<sup>1</sup></p>
<p><b>Tourism quality</b> Targets: 8.1<sup>1-4</sup>, 8.9<sup>1-4</sup></p>	<p>Percentage of high-quality accommodation establishments with respect to the total of the official offer<sup>1</sup> (+) Number of different attractions in a destination<sup>2</sup> (+) Rating average obtained by the destinations of the country, including in the international ranking of <i>National Geographic Traveler</i> associated with the stewardship index for well-known destinations<sup>3</sup> (+)</p>	<p>Supply<sup>1,2</sup> Demand<sup>1,4</sup> Host community/ Destination<sup>2,3</sup></p>	<p>Blancas et al. (2015)<sup>1-4</sup></p>
<p><b>Customer satisfaction</b> Target: 8.3<sup>1,2</sup></p>	<p>Number of companies dedicated to restoration activities per 1000 inhabitants (restaurant and mobile food services)<sup>1</sup> (+) Percentage of tourists and same-day visitors that are satisfied with their overall experience in the destination<sup>1</sup> (+)</p>	<p>*Data to gather/compute<sup>1,4</sup></p>	<p>ETIS (2016) (Indicator reference: A.1.1-A.2.1)<sup>1,2</sup></p>
<p><b>Potential overcrowding</b> Targets: 8.9<sup>1-4</sup></p>	<p>Percentage of repeat/return visitors (within 5 years)<sup>2</sup> (+) Share of an economy's total page views that its top 10% of viewed cultural attractions received on Tripadvisor<sup>1</sup> (-) Share of an economy's total page views that its top 10% of viewed nature attractions received on Tripadvisor<sup>2</sup> (-)</p>	<p>*Data to gather/compute<sup>1,2</sup> a. <i>Scraping data</i>: Tripadvisor<sup>1,2</sup> b1. Yearly data<sup>1,2</sup>, WEF-EOS<sup>3</sup> b2. Country level<sup>1,3</sup> b3. Quantitative: moving average<sup>1,2</sup>, weighted average<sup>3</sup></p>	<p>WEF (2022), Pillar 17 (17.04-17.06)<sup>1,3</sup> Blancas et al.</p>

Table 1 (continued)

<p><b>T&amp;T prioritisation</b></p> <p>Targets: 8,9<sup>1,5</sup></p>	<p>Geographically dispersed tourism (In your country, to what extent are foreign visitors, tourists, and business travellers) dispersed throughout the country? 1...7=equally distributed)<sup>3</sup> (+)</p> <p>Vacancies in official tourism accommodation establishments per inhabitant<sup>4</sup> (+)</p> <p>T&amp;T government expenditure as a percentage of total government budget (+)</p> <p>Comprehensiveness of T&amp;T data: score on data available<sup>2</sup> (+)</p> <p>Timeliness of T&amp;T data: score on latest data available<sup>3</sup> (+)</p> <p>Country brand strategy rating<sup>4</sup> (+)</p> <p>Travel and tourism capital investment as a percentage of total capital investment<sup>5</sup> (+)</p> <p>Property rights (In your country, to what extent are property rights, including financial assets, protected? 1...7=to a great extent)<sup>1</sup> (+)</p> <p>Impact of rules on FDI (In your country, how restrictive are rules and regulations on foreign direct investment (FDI)? 1...7=not restrictive at all)<sup>2</sup> (+)</p> <p>Efficiency of legal framework in settling disputes (In your country, how efficient are the legal and judicial systems for companies in settling disputes? 1...7=extremely efficient)<sup>3</sup> (+)</p> <p>Efficiency of legal framework in challenging actions (In your country, how easy is it for private businesses and citizens to challenge government actions through the legal system? 1...7=extremely easy)<sup>4</sup> (+)</p> <p>Burden of government regulation (In your country, how easy is it for companies to comply with government regulation and administrative requirements e.g. permits, reporting, legislation? 1...7=extremely easy)<sup>5</sup> (+)</p>	<p>Supply<sup>1,5</sup> Government<sup>1,5</sup></p>	<p><b>b4.</b> 2019-2020-2021<sup>1,2</sup>, 2020-2021<sup>3</sup> <b>c.</b> Global<sup>1,3</sup></p> <p>*Data to gather/compute<sup>4</sup> <b>a.</b> Administrative WT&amp;TC-2021<sup>1,5</sup>, UNWTO<sup>2</sup>, Bloom Cons.<sup>4</sup> <b>b1.</b> Yearly data<sup>1,5</sup> <b>b2.</b> Country level<sup>1,5</sup> <b>b3.</b> Quantitative: percentage<sup>1,5</sup>, score<sup>2,3</sup>, moving average<sup>4</sup> <b>b4.</b> 2020<sup>1</sup>, 2014-2017<sup>2</sup>, 2019-2020<sup>0</sup>, 2018-2020<sup>4</sup>, 2020<sup>5</sup> <b>c.</b> Worldwide<sup>1,5</sup></p>	<p>(2015)<sup>4</sup></p> <p>WEF (2022), Pillar 6 (6.01-6.05)<sup>1,5</sup></p>
<p><b>Business environment</b></p> <p>Targets: 8,4<sup>8</sup>, 8,9<sup>3,7,9</sup>, 8,10<sup>1,2</sup></p>	<p>Supply<sup>1,8</sup> Government<sup>1,8</sup></p> <p><b>a.</b> Survey: WEF-EOS<sup>1,8</sup>, TI-CPI, 2020<sup>9</sup> <b>b1.</b> Yearly data<sup>1,9</sup> <b>b2.</b> Country level<sup>1,9</sup> <b>b3.</b> Quantitative: weighted average of scores<sup>1,8</sup>, index: average of standardized scores<sup>9</sup> <b>b4.</b> 2020-2021<sup>1,8</sup>, 2020<sup>9</sup> <b>c.</b> Worldwide<sup>1,9</sup></p>	<p>WEF (2022) Pillar 1 (1.01-1.07, 1.09)<sup>1,7,9</sup> Pillar 2 (2.01)<sup>8</sup></p>	<p><b>b4.</b> 2019-2020-2021<sup>1,2</sup>, 2020-2021<sup>3</sup> <b>c.</b> Global<sup>1,3</sup></p> <p>*Data to gather/compute<sup>4</sup> <b>a.</b> Administrative WT&amp;TC-2021<sup>1,5</sup>, UNWTO<sup>2</sup>, Bloom Cons.<sup>4</sup> <b>b1.</b> Yearly data<sup>1,5</sup> <b>b2.</b> Country level<sup>1,5</sup> <b>b3.</b> Quantitative: percentage<sup>1,5</sup>, score<sup>2,3</sup>, moving average<sup>4</sup> <b>b4.</b> 2020<sup>1</sup>, 2014-2017<sup>2</sup>, 2019-2020<sup>0</sup>, 2018-2020<sup>4</sup>, 2020<sup>5</sup> <b>c.</b> Worldwide<sup>1,5</sup></p>	<p>(2015)<sup>4</sup></p> <p>WEF (2022) Pillar 1 (1.01-1.07, 1.09)<sup>1,7,9</sup> Pillar 2 (2.01)<sup>8</sup></p>

Table 1 (continued)

<p><b>Job security</b> (SDG16: 16.3<sup>1</sup>, 16.5<sup>9</sup>) Targets: 8, 8</p>	<p>Government ensuring policy stability (In your country, to what extent does the government ensure a stable policy environment for doing business? 1...7=to a great extent)<sup>6</sup> (+) Ease of complying to tax system (In your country, to what extent are taxes easy to comply with? 1...7=to a great extent)<sup>7</sup> (+) Business costs of crime and violence (In your country, to what extent do the following impose costs on businesses: Incidence of crime and violence? 1...7=no cost)<sup>8</sup> (+) Corruption perceptions index (0 ... 100=very clean)<sup>9</sup> (+) Incidence rate of accidents at work in the tourism sector (hotels and restaurants) (-)</p>	<p>Supply</p>	<p>a. Administrative: EUROSTAT b1. Yearly data b2. Country level b3. Quantitative: rate b4. (2008-20212) c. EU (28 countries till Brexit)</p>	<p>Blancas et al. (2015)</p>
<p><b>Price competitiveness</b> Targets: 8, 1<sup>1-5</sup></p>	<p>Index of relative cost of access (ticket taxes and airport charges to international air transport services 0-100)<sup>1</sup> (-) Hotel price index<sup>2</sup> (-) Purchasing power parity<sup>3</sup> (+) Fuel price levels<sup>4</sup> (-) Short-term rental price (Average daily rate for active properties on Airbnb and similar platforms)<sup>5</sup> (-)</p>	<p>Supply<sup>1-5</sup> Demand<sup>1-5</sup> Host community/ Destination<sup>1-5</sup> Government<sup>1,4</sup></p>	<p>a. Survey: IATA, SRS Analyser<sup>1</sup>, STR<sup>2</sup> Administrative: WB-WDI<sup>3</sup>, Globalpetrolprices.com<sup>4</sup>, GIZ International Fuel Prices 2018/2019<sup>4</sup>, AirDNA<sup>5</sup> b1. Yearly data<sup>1-5</sup> b2. Country level<sup>1-5</sup> b3. Quantitative: index<sup>1</sup>, average<sup>2-5</sup> b4. 2018 or most recent<sup>1</sup>, July2020-July 2021<sup>2</sup>, 2020 or most recent<sup>3</sup>, 2021 or most recent<sup>4</sup>, June2020-June 2021<sup>5</sup> c. Global<sup>1-5</sup></p>	<p>WEF (2022) Pillar 8 (8.01-8.05)<sup>1-5</sup></p>
<p><b>Evaluation of the prices of tourism services</b> Targets: 8, 1</p>	<p>Ratio for the tourist service harmonised price index and the harmonised price index (all products) (+)</p>	<p>Supply Demand Host community/ Destination Government</p>	<p>a. Administrative: EUROSTAT b1. Quarterly data b2. Country level b3. Quantitative: ratio b4. (1996:Q1-2023:Q4) c. EU (28 countries till Brexit)</p>	<p>Blancas et al. (2015)</p>

Table 1 (continued)


 <p><b>9</b> INDUSTRY, INNOVATION &amp; INFRASTRUCTURE</p>	<p><b>G9: Industry, innovation &amp; infrastructure SD: Economic</b>  <i>TU: sustainable industrialization and foster innovation Tourism development relies on good public and private infrastructure. The sector can influence public policy for infrastructure upgrade and retrofit, making them more sustainable, innovative and resource-efficient and moving towards low carbon growth, thus attracting tourists and other sources of foreign investment.</i>                  9.1.2 Passenger and freight volumes, by mode of transport                  9.3.1 Proportion of small-scale industries in total industry value added                  9.e.1 Proportion of population covered by a mobile network, by technology</p>				<p>Blancais et al. (2015)</p>
<p><b>Targets:</b> 9.1, 9.3, 9.c</p>	<p><b>Use of official tourism accommodation</b> (Target 9.1)</p>	<p>Supply Demand Host community/ Destination</p>	<p><b>a. Administrative:</b> EUROSTAT  <b>b1.</b> Quarterly data  <b>b2.</b> Country level  <b>b3.</b> Quantitative: percentage  <b>b4.</b> (2012-2022)  <b>c.</b> EU (28 countries till <i>Brexit</i>)</p>	<p>Blancais et al. (2015)</p>	
<p><b>ICT readiness</b>                   Targets:                  9.1<sup>1-4</sup>, 6, 7, 8, 9, 3<sup>5</sup>, 9, 4<sup>8</sup>,</p>	<p>Percentage of individuals using the internet<sup>1</sup> (+)                  Fixed broadband internet subscriptions per 100 population<sup>2</sup> (+)                  Active mobile-broadband subscriptions per 100 inhabitants<sup>3</sup> (+)                  Percentage of total population covered by at least a 3G mobile network signal<sup>4</sup> (+)                  Use of digital platform for providing financial services (<i>In your country, to what extent are digital platforms used to provide the following service: Financial? 1...7=to a great extent</i>)<sup>5</sup> (+)                  Use of digital platforms for providing transportation and shipping (<i>In your country, to what extent are digital platforms used to provide the following service: Transportation and shipping? 1...7=to a great extent</i>)<sup>6</sup> (+)                  Use of digital platform for providing hotels, restaurants and leisure activities services (<i>In your country, to what extent are digital platforms used to provide the following service: hotels, restaurants and leisure activities? 1...7=to a great extent</i>)<sup>7</sup> (+)</p>	<p>Supply<sup>1,10</sup> Demand<sup>1,7, 10</sup> Host community/ Destination<sup>4, 7, 10</sup> Government<sup>8, 8, 9</sup></p>	<p><b>a. Administrative:</b> WEF-ITU-WTI-2021<sup>1-4</sup>, IEA-EDCS<sup>5</sup>, World Bank<sup>9</sup> Survey: WEF-EOS<sup>5-7</sup>  <b>8.a.</b> Yearly<sup>1-9</sup>  <b>b2.</b> Country level<sup>1-9</sup>  <b>b3.</b> Quantitative: percentage<sup>1,4,8,9</sup>, ratio<sup>2,3</sup>, weighted average of scores<sup>5-7</sup>  <b>b4.</b> 2020 or most recent<sup>1-4</sup>, 2020-2021<sup>5,7</sup>, 2019<sup>8</sup>, 1980-2022<sup>9</sup>  <b>c.</b> Worldwide<sup>1-8</sup>, EU (28 countries till <i>Brexit</i>)<sup>9</sup></p>	<p>WEF (2022) Pillar 5 (5.01-5.08)<sup>1-8</sup>                   Blancais et al. (2015)<sup>9, 10</sup></p>	

Table 1 (continued)

<p>Electric power transmission and distribution losses as a percentage of domestic supply<sup>8</sup> (-)</p> <p>Information technology expenditure (percentage with respect to GDP)<sup>9</sup> (+)</p> <p>Percentage of tourism enterprises with internet access<sup>10</sup> (+)</p> <p>Efficiency of air transport services (<i>In your country, how efficient (in terms of frequency, punctuality, speed and price) are the following transport services: Air transport services?</i> 1...7=<i>extremely efficient</i>)<sup>1</sup> (+)</p> <p>Domestic and international seat kilometres originating in country per week (year average) per population<sup>2</sup> (+)</p> <p>Number of operating airlines<sup>3</sup> (+)</p> <p>Airport connectivity: number of available seats to each destination weighted by the size of the destination airport (<i>1 to 7 score</i>)<sup>4</sup> (+)</p> <p>Number of public use airports<sup>5</sup> (+)</p> <p>Total volume of the fleet of aircraft for the air transport of passengers per 1000 inhabitants<sup>6</sup> (+)</p> <p>Percentage of tourism trips in which the visitor uses air transport<sup>7</sup> (+)</p>	<p>Supply<sup>1,7</sup> Demand<sup>1,7</sup> Host community/ Destination<sup>1,7</sup> Government<sup>1,7</sup></p>	<p>*Data to gather/compute<sup>10</sup> a. Survey: WEF-EOS<sup>1</sup>; Administrative: IATA, OAG data<sup>2,3,4</sup>, EUROSTAT<sup>5</sup> 8.a. Yearly<sup>1-5</sup>, quarterly<sup>6</sup> b2. Country level<sup>1,9</sup> b3. Quantitative: weighted average of scores<sup>1</sup>, weakly average<sup>2</sup>, raw data<sup>3,5</sup>, index<sup>4</sup>, ratio<sup>6</sup>, percentage<sup>7</sup> b4. 2020-2021<sup>1,5</sup>, 2020-2021<sup>3,4</sup>, 1990.Q1-2024Q1<sup>6</sup>, 2012-2022<sup>7</sup> c. Worldwide<sup>1</sup>, EU (28 countries till <i>Brexit</i>)<sup>5,7</sup></p>	<p>WEF (2022) Pillar 9 (9.01-9.04)<sup>1-4</sup>  Blancas et al. (2015)<sup>5,7</sup></p>
<p><b>Ground and port infrastructure</b></p> <p>Target: 9.1<sup>1-14</sup></p>	<p>Supply<sup>1,14</sup> Demand<sup>1-14</sup> Host community/ Destination<sup>1-14</sup> Government<sup>1-14</sup></p>	<p>a. Administrative: EI, WB-WDI<sup>1</sup>, WB-WDI: <i>The World Factbook 2021</i><sup>2</sup>, EUROSTAT<sup>3-7,8</sup> Survey: WEF-EOS<sup>10-14</sup> b1. Yearly<sup>1-8, 10-14</sup> b2. Country level<sup>1-8, 10-14</sup> b3. Quantitative: ratio<sup>1-5, 8,9</sup>, percentage<sup>6,7</sup>, weighted average of scores<sup>10,14</sup> b4. 2020<sup>1</sup>, 2019 or most recent<sup>2</sup>, 1970-2022<sup>3,8</sup>, 1990-2022<sup>4,5</sup>, 2012-2022<sup>6,7</sup>, 2020-2021<sup>10-14</sup> c. EU (28 countries till <i>Brexit</i>)<sup>3,8</sup></p>	<p>WEF (2022) Pillar 10 (10.01-10.07)<sup>1,2, 10-14</sup>  Blancas et al. (2015)<sup>3,9</sup></p>

Table 1 (continued)

<p><b>Tourist service infrastructure</b> Target: 9, 1<sup>1-5</sup></p>	<p>other scheduled passenger transports by land, renting of automobiles and air passenger transport per 1000 inhabitants<sup>9</sup> (+) Quality of roads (In your country, how is the quality (extensiveness and condition) of road infrastructure? 1...7=extremely good)<sup>10</sup> (+) Efficiency of train services (In your country, how efficient (in terms of frequency, punctuality, speed, price) are the following transport services: Train services (if applicable)? 1...7=extremely efficient)<sup>11</sup> (+) Efficiency of public transport services (In your country, how efficient (in terms of frequency, punctuality, speed, price) are the following transport services: Public transport (e.g. buses, trains, subways, electric bikes and taxis)? 1...7=extremely efficient)<sup>12</sup> (+) Adequate access to public transport (In your country, how far do all members of the population have sufficient access to the following: Public transportation? 1...7=to a great extent)<sup>13</sup> (+) Efficiency of seaport services (In your country, how efficient (in terms of frequency, punctuality, speed, price) are the following transport services: Seaport services (ferries, boats)? 1...7=extremely efficient)<sup>14</sup> (+) Hotel rooms density: Number of rooms per 100 population<sup>1</sup> (+) Short-term rental listing density: Number of active properties on Airbnb and similar platforms per 10,000 people<sup>2</sup> (+) Presence of major car rental companies (0 to 12)<sup>3</sup> (+) Number of automatic teller machines divided by the number of adults (100,000)<sup>4</sup> (+) Competitive tourism services (In your country, how competitive is the provision of the following services: Hotels, restaurants and leisure activities? 1...7=extremely competitive)<sup>5</sup> (+)</p>	<p>Supply<sup>1-5</sup> Demand<sup>1-5</sup> Host community/ Destination<sup>1-5</sup> Government<sup>1-5</sup></p>	<p>*Data to gather/compute<sup>9</sup> <b>a.</b> Administrative: UNWTO<sup>1</sup>, WB, WDI<sup>1,2</sup>, 4, AirDNA<sup>2</sup>; <i>Scraping data:</i> Company websites<sup>3</sup>; <i>Survey:</i> WEF-EOS<sup>5</sup> <b>b1.</b> Yearly<sup>1-5</sup> <b>b2.</b> Country level<sup>1-5</sup> <b>b3.</b> Quantitative: ratio<sup>4</sup>, annual average<sup>2</sup>, score<sup>5</sup>; weighted average of scores<sup>5</sup> <b>b4.</b> 2019 or most recent<sup>1,4</sup>, June 2020-June 2021<sup>2</sup>, 2021<sup>3</sup>, 2020-2021<sup>5</sup> <b>c.</b> Worldwide<sup>1,5</sup></p>	<p>Worldwide<sup>1,2, 10-14</sup></p>	<p>WEF (2022) Pillar 11 (11.01-11.05)<sup>1-5</sup></p>
<p><b>Access of small-scale</b></p>	<p>SME access to finance (In your country, to what extent can SMEs</p>	<p>Supply</p>	<p><b>a. Survey:</b> WEF-EOS</p>	<p>WEF (2022)</p>	

Table 1 (continued)

<p><b>industrial and other enterprises to financial services</b></p> <p>Target: 9.3</p> <p>(SDG8: 8.3)</p>	<p><i>access the finance they need for their business operations through the financial sector? 1...7=to a great extent) (+)</i></p>	<p>Government</p>	<p>b1. Yearly data b2. Country level b3. Quantitative: weighted average b4. 2020-2021 c. Worldwide</p>	<p>Pillar 1 (1.08)<sup>1</sup></p>
<p><b>Non-Leisure Resources</b></p> <p>Target: 9.1<sup>2</sup>, 9.5<sup>3</sup></p>	<p>Presence of Forbes Global 2000 HQ locations<sup>1</sup> (+) Presence of global cities<sup>2</sup> (+) Number of top universities<sup>3</sup> (+)</p>	<p>Supply<sup>1,3</sup> Demand<sup>1,3</sup> Host community/ Destination<sup>1,3</sup> Government<sup>1,3</sup></p>	<p>a. <i>Administrative</i>: Forbes, 2019–2021 Global 2000<sup>1</sup>, WB-WDI<sup>1</sup> GaWC-RN<sup>2</sup>, CL-CSC<sup>3</sup>, UNESCO-CCNSD-2020<sup>1</sup> b1. Yearly<sup>1,3</sup> b2. Country level<sup>1,3</sup> b3. Ratio moving average<sup>1</sup>, score<sup>2</sup>, weighted average of ranking tiers<sup>3</sup> b4. 2018-2020<sup>1</sup>, 2020<sup>2</sup>, 2021<sup>3</sup> c. Worldwide<sup>1,3</sup></p>	<p>WEF (2022), Pillar 14 (14.01–14.03)<sup>1,3</sup></p>
<p><b>10</b></p> <p><b>REDUCED INEQUALITY</b></p> <p><b>SD: Social</b></p>	<p><b>G10: Reduced inequality SD: Social</b> <b>T1: Tourism can be a powerful tool for reducing inequalities if it engages local populations and all key stakeholders in its development. Tourism can contribute to urban renewal and rural development by giving people the opportunity to prosper in their place of origin. Tourism is an effective means for economic integration and diversification</b></p>			
<p><b>Target:</b> 10.4</p>	<p><b>10.4.1</b> Labour share of GDP, comprising wages and social protection transfers</p>			
<p><b>Inequality in communities</b></p> <p>Targets: 10.1<sup>2</sup>, 10.2<sup>1</sup></p> <p>(SDG1: 1.2<sup>1</sup>, 1.3<sup>1</sup>, 1.4<sup>1</sup>)</p> <p><b>Equal workforce opportunities</b></p> <p>Target: 10.2</p> <p>(SDG8: 8.5, 8.8 SDG16: 16.b)</p>	<p>Percentage of population at-risk-of-poverty or social exclusion after social transfers<sup>1</sup> (-) <i>Gini</i> coefficient of equivalised disposable income<sup>2</sup> (-) Equal workforce opportunities (In your country: to what extent do companies give workforce opportunities to: a. Women; b. Those from a typically disadvantaged religious, ethnic or racial background; c. Those with disabilities; d. Those who identify as LGBTQ)? 1...7=to a great extent? (+)</p>	<p>Government<sup>1,2</sup>  Government</p>	<p>a. <i>Administrative</i>: EUROSTAT<sup>1,2</sup> 8.a. Yearly data<sup>1,2</sup> b2. Country level<sup>1,2</sup> b3. Quantitative: percentage<sup>1</sup>; scale from 0 to 100<sup>2</sup> b4. (2012-2023)<sup>1,2</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,2</sup> a. <i>Survey</i>: WEF-EIOS b1. Yearly data b2. Country level b3. weighted average of scores b4. 2020-2021 c. Worldwide</p>	<p>Blancais et al. (2015)<sup>1,2</sup>  WEF (2022) Pillar 16 (16.05)</p>

Table 1 (continued)


<p><b>11</b>  <b>Sustainable cities &amp; communities</b></p> <p><b>Target:</b> 11.4</p>	<p><b>G11: Sustainable cities &amp; communities SD: Environmental, Social, Economic</b></p> <p><b>TL: Tourism can advance urban infrastructure and accessibility, promote regeneration and preserve cultural and natural heritage, assets on which tourism depends. Investment in green infrastructure (more efficient transport, reduced air pollution) should result in smarter and greener cities for, not only residents but also tourists.</b></p> <p>11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)</p> <p><b>Safety of mobility of the demand</b></p> <p>Target: 11.1.2, 11.2.1, 11.2.2</p> <p>(SDG3: 3.6)</p> <p><b>Management of solid urban waste and sewage treatment</b></p> <p>Target: 11.6<sup>1-11</sup></p> <p><b>Cultural, natural, and</b></p> <p>(SDG12: 12.4<sup>1-11</sup>)</p>
<p>Number of people killed in road accidents per 1000 persons (including host and visiting population)<sup>1</sup> (-)</p> <p>Percentage of air and rail accidents with respect to the total train movements and commercial passenger air flights<sup>2</sup> (-)</p> <p>Volume of waste generated<sup>1</sup> (-)</p> <p>Volume of waste treated<sup>2</sup> (+)</p> <p>Percentage of waste managed by energy recovery<sup>3</sup>/incineration<sup>4</sup>/disposal<sup>5</sup> with respect to waste managed (+)</p> <p>Volume of recycled packaging waste<sup>6</sup> (+)</p> <p>Percentage of recycled packaging waste with respect to what is recovered<sup>7</sup> (+)</p> <p>Waste production per tourist night compared to general population waste production per person (kg)<sup>8</sup> (-)</p> <p>Percentage of tourism enterprises separating different types of waste<sup>9</sup> (+)</p> <p>Percentage of total waste recycled per tourist compared to total waste recycled per resident per year<sup>10</sup> (+)</p> <p>Percentage of sewage from the destination treated to at least secondary level prior to discharge<sup>11</sup> (+)</p> <p>Number of world heritage natural sites in the country<sup>1</sup> (+)</p>	<p>Demand<sup>1,2</sup></p> <p>Host community/ Destination<sup>1,2</sup></p> <p>Government<sup>1,2</sup></p> <p>Supply<sup>1-11</sup></p> <p>Demand<sup>1-11</sup></p> <p>Host community/ Destination<sup>1-11</sup></p> <p>Local Government<sup>1-11</sup></p> <p>*Data to gather/compute<sup>8,11</sup></p> <p>a. Administrative; UNESCO-WHL<sup>1,2,3</sup>, WEF (2022)</p>
<p>Blancas et al. (2015)<sup>1,2</sup></p> <p>a. Administrative; EUROSTAT<sup>1,2</sup></p> <p>b1. Yearly data<sup>1,2</sup></p> <p>b2. Country level<sup>1,2</sup></p> <p>b3. Quantitative: ratio<sup>1</sup>, percentage<sup>2</sup></p> <p>b4. 1999-2022<sup>1</sup>, 2006-2022<sup>2</sup></p> <p>c. EU (28 countries till Brexit)<sup>1,2</sup></p>	<p>Blancas et al. (2015)<sup>1-7</sup></p> <p>ETIS (2016) (Indicator reference: D.3.1-D.3.3; D.4.1)<sup>8,11</sup></p> <p>a. Administrative EUROSTAT<sup>1-7</sup></p> <p>b1. Biennial data<sup>1-5</sup>; Yearly<sup>6,7</sup></p> <p>b2. Country level<sup>1-7</sup></p> <p>b3. Quantitative: kg per capita<sup>1,2,6,8</sup> percentage<sup>3,5,7,9-11</sup></p> <p>b4. 2004-2020<sup>1-7</sup></p> <p>c. EU (28 countries till Brexit)<sup>1-7</sup></p>

Table 1 (continued)

<p><b>Intangible heritage</b> Target: 11.4<sup>1,7</sup></p>	<p>Number of world heritage cultural sites in the country<sup>2</sup> (+) Number of oral and intangible cultural heritage<sup>3</sup> (+) Total number of sports stadiums in a country with a capacity greater than 20,000 seats<sup>4</sup> (+) Percentage of the destination's surface considered to be a protected natural area<sup>5</sup> (+) Percentage of residents that are satisfied with the impacts of tourism on the destination's identity<sup>6</sup> (+) Percentage of the destination's events that are focused on traditional/local culture and heritage<sup>7</sup> (+) Number of cities that are members of UNESCO's Creative Cities Network (+)</p>	<p>Demand<sup>1,7</sup> Host community/ Destination<sup>1,7</sup> Government<sup>1,5</sup> Local Government<sup>7</sup></p>	<p>EUROSTAT<sup>5</sup>: <i>Scrapping data</i>: Worldstadiums.com<sup>4</sup> b1. Yearly<sup>1,5</sup> b2. Country level<sup>1,5</sup> and Nuts2<sup>1,4</sup> b3. Quantitative: raw data<sup>1,4</sup>, percentage<sup>5,7</sup> b4. 2021-different years may be covered<sup>1,4</sup>, 1990-2023<sup>5</sup> c. Worldwide<sup>1,4</sup>, EU (28 countries till <i>Brexit</i>)<sup>5</sup></p>	<p>Pillar 12 (12.01)<sup>1</sup> Pillar 13 (13.01-13.03)<sup>2-4</sup> Blancas et al. (2023)<sup>5</sup> ETIS (2016) (Indicator reference: C.5.1, C5.2)<sup>6,7</sup></p>
<p><b>Creative Cities</b> Targets: 11.4</p>	<p>Supply Demand Host community/ Destination Government</p>	<p>*Data to gather/compute<sup>6,7</sup> a. <i>Administrative</i>: UNESCO-CCNSD b1. Yearly b2. Country level b3. Quantitative: raw data b4. 2020-different years may be covered c. Worldwide</p>	<p>WEF (2022), Pillar 13 (13.05)</p>	
<p><b>Quality of town and city centres</b> Target: 11.3</p>	<p>Supply Demand Host community/ Destination</p>	<p>a. Survey: WEF-EOS b1. Yearly data b2. Country level b3. Quantitative: weighted average of scores b4. 2020-2021 c. Worldwide</p>	<p>WEF (2022) Pillar 17 (17.07)</p>	
<p><b>Community/social impact</b> Target: 11.3</p>	<p>Supply<sup>1,2,4,5</sup> Demand<sup>4,5</sup> Host community/ Destination<sup>3,5</sup></p>	<p>a. <i>Administrative</i>: EUROSTAT<sup>1</sup> b1. Yearly data<sup>1</sup> b2. Country level<sup>1</sup> b3. Quantitative: percentage<sup>1</sup> b4. 1990-2023<sup>1</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1</sup></p>	<p>Blancas et al. (2015)<sup>1</sup> ETIS (2016) (Indicator reference: C.1.1-C.1.4)<sup>2,5</sup></p>	

Table 1 (continued)

<p><b>Inclusion/ accessibility</b> Targets: 11.2<sup>1</sup>, 11.3<sup>1</sup>, 11.7<sup>3</sup></p>	<p>Percentage of commercial accommodation establishments participating in recognised accessibility information schemes<sup>1</sup> (+) Percentage of public transport that is accessible to people with disabilities and specific access requirements<sup>2</sup> (+) Percentage of tourist attractions that are accessible to people with disabilities and/or participating in recognised accessibility information schemes<sup>3</sup> (+) Percentage of foreign population residing in the destination (- or +)</p>	<p>Supply<sup>1,3</sup> Demand<sup>1,3</sup> Host community/ Destination<sup>1,3</sup></p>	<p>* Data to gather/compute<sup>1,3</sup> a. <i>Administrative</i>: EUROSTAT b1. Yearly data b2. Country level b3. Quantitative: percentage b4. 2012-2023 c. EU (28 countries till <i>Brexit</i>)</p>	<p>ETIS (2016) (Indicator reference C.4.2-C4.4)<sup>1,3</sup></p>
<p><b>Foreign culture on host culture: pressure (-) or enrichment (+)</b> Targets: 11.3</p>	<p>Percentage of young people (under 20 years old)<sup>1</sup> (+) Percentage of non-active population (over 65 years old)<sup>2</sup> (-) Number of individuals <i>per</i> unit destination area<sup>3</sup> (-) Net migration rate<sup>4</sup> (-) Variation of population level<sup>5</sup> (-) Rate of natural increase<sup>6</sup> (-)</p>	<p>Host community/ Destination<sup>1,2</sup></p>	<p>* Data to gather/compute<sup>1,3</sup> a. <i>Administrative</i>: EUROSTAT<sup>1,2,3,7</sup> b1. Yearly data<sup>1,2,4</sup>, NUTS 3<sup>5</sup>; NUTS 3<sup>3</sup> b2. Country level<sup>1,2,4</sup>, NUTS 3<sup>5</sup>; NUTS 3<sup>3</sup> b3. Quantitative: percentage<sup>1,2</sup> ratio<sup>3</sup>, rate<sup>4,6</sup>, variation<sup>5</sup>, index<sup>7</sup> b4. 1960-2023<sup>1,2,7</sup>, 2011-2022<sup>3</sup>, 1990-2021<sup>4</sup>, 1990-2023<sup>5</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,5,7</sup></p>	<p>Blancas et al. (2015)</p>
<p><b>Effects on access to housing</b> Target: 11.1</p>	<p>General demographic dependency index<sup>1</sup> (-) Taxes on land, buildings, and other structures (% of GDP) (-)</p>	<p>Host community/ Destination Government</p>	<p>* Data to gather/compute<sup>1</sup> a. <i>Administrative</i>: EUROSTAT b1. Yearly data b2. Country level b3. Quantitative: percentage b4. 1998 to 2021 c. EU (23 countries)</p>	<p>Blancas et al. (2015)</p>
<p><b>G12: Responsible consumption and production</b> TU1: The tourism sector needs to adopt sustainable consumption and production (SCP) modes, accelerating the shift towards sustainability. Tools to monitor sustainable development impacts for tourism including for energy, water, waste, biodiversity and job creation will result in enhanced economic, social and environmental outcomes.</p>		<p><b>SD: Environmental, Social, Economic</b></p>		

Table 1 (continued)

<p><b>Targets:</b> 12.1., 12.8., 12.b</p>	<p><b>12.1.1.</b> Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies <b>12.8.1.</b> Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment <b>12.b.1.</b> Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools</p>	<p>WEF (2022), Pillar 15 (15.13)<sup>1</sup> ETIS (2016) (Indicator reference: D.2.2, D.7.1)<sup>2,3</sup></p>
<p><b>Production impact on the environment and nature</b></p> <p>Targets: 12.2.1-3, 12.4.1-3 (SDG13: 13.1<sup>1-4</sup>)</p>	<p>Supply<sup>1,3</sup> Host community/ Destination<sup>1,3</sup> Government<sup>1,3</sup></p> <p><i>Supply<sup>1,3</sup> Host community/ Destination<sup>1,3</sup> Government<sup>1,3</sup></i></p>	<p>a. Administrative: WEF-EOS<sup>1</sup>; b1. Yearly data<sup>1</sup> b2. Country level<sup>1</sup> b3. weighted average of scores<sup>1</sup> b4. 2020-2021<sup>1</sup> c. Worldwide<sup>1</sup></p> <p>*Data to gather/compute<sup>2,3</sup></p>
<p><b>Transport impact</b></p> <p>Targets: 12.5<sup>1-4</sup></p> <p>(SDG13: 13.1<sup>1-4</sup>)</p>	<p>Supply<sup>1,4</sup> Demand<sup>1,4</sup> Host community/ Destination<sup>1,4</sup> Government<sup>1,4</sup></p>	<p>ETIS (2016) (Indicator reference: D.1.1-D.1.4)<sup>1-4</sup></p>
<p><b>Sustainable tourism public policy</b></p> <p>Target: 12.6</p> <p>(SDG13: 13.1<sup>1-4</sup>)</p>	<p>Supply Host community/ Destination Government</p>	<p>*Data to gather/compute<sup>1,4</sup></p> <p>ETIS (2016) (Indicator reference: A.1.1)</p>

Table 1 (continued)


<p><b>The land-use planning</b> Target: 1.2.b</p>	<p>Percentage of soil surface intended for services and residential uses (+)</p>	<p>Supply Demand Host community/ Destination Government</p>	<p>a. Administrative: EUROSTAT b1. Triennial data b2. NUTS 2 b3. Quantitative: percentage b4. (2009, 2012, 2015, 2018) c. EU (28 countries till <i>Brexit</i>)</p>	<p>Blancas et al. (2015)</p>
<p><b>Use of resources/ intensity of tourism use</b> Target: 12.2.1, 2</p>	<p>Domestic material consumption<sup>1</sup> (-) Total tourists per unit area<sup>2</sup> (-)</p>		<p>a. Administrative: EUROSTAT<sup>1,2</sup> b1. Yearly data<sup>1,2</sup> b2. Country level<sup>1,2</sup> b3. Quantitative: tonnes per capita<sup>1</sup>, ratio<sup>2</sup> b4. 1990-2022<sup>1</sup>, 1995-2020<sup>2</sup> c. EU (28 countries till <i>Brexit</i>)<sup>1,2</sup></p>	<p>Blancas et al. (2015)<sup>1,2</sup></p>
<p> <b>13: Climate action SD: Environment</b> TU: Tourism contributes to and is affected by climate change. Tourism stakeholders should play a leading role in the global response to climate change. By reducing its carbon foot-print, in the transport and accommodation sector, tourism can benefit from low carbon growth and help tackle one of the most pressing challenges of our time. Target: 13.2</p>	<p>13.2.1. Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)</p>			
<p><b>Nature protection</b> Targets: 13.1<sup>1,3,5</sup>, 13.2<sup>4,5</sup></p>	<p>Number of animal, plant, fungus, and chromista species in the country<sup>1</sup> (+) Global climate risk index<sup>2</sup> (-) The Red List Index measures changes in aggregate extinction risk across groups of species<sup>3</sup> (-) Adequate protection for nature (In your country to what extent is the environment and nature adequately protected? 1...7=to a great extent)<sup>4</sup> (+) Government expenditure on environmental protection per inhabitant<sup>5</sup> (+)</p>	<p>Supply<sup>1,4</sup> Demand<sup>1,4</sup> Host community/ Destination<sup>1,4</sup> Government<sup>1,5</sup> NGOs<sup>1,5</sup></p>	<p>a. Administrative: IUCN Red List<sup>1</sup>, GGCRIP<sup>2</sup>, UNSD-GSDG-ID<sup>3</sup>, WEF-EOS<sup>4</sup>, EUROSTAT<sup>5</sup> b1. Yearly data<sup>1,5</sup> b2. Country level<sup>1,5</sup> b3. Quantitative: raw data<sup>1,5</sup>, index<sup>2,3</sup>, weighted average of scores<sup>4</sup> b4. 2021<sup>1,5</sup>, 2019<sup>2</sup>, 2020-2021<sup>4</sup>, 2006-2021<sup>5</sup> c. Worldwide<sup>1,4</sup>, EU (28 countries till <i>Brexit</i>)<sup>5</sup></p>	<p>WEF (2022), Pillar 12 (12.02)<sup>1</sup> Pillar 15 (15.03,15.05, 15.07,15.12)<sup>2,4</sup> Blancas et al. (2015)<sup>5</sup></p>
<p><i>(SDG12: 12.2<sup>4,5</sup>)</i> <b>Atmospheric pollution</b> Target: 13.1<sup>1,5</sup></p>	<p>Government expenditure on environmental protection per inhabitant<sup>5</sup> (+) Emissions of air pollution (sulphur oxides, nitrogen oxides, ammonia, non-methane volatile organic compounds) per person and day<sup>1</sup> (-) CO2 emissions per inhabitant<sup>2</sup> (-)</p>	<p>Supply<sup>1,5</sup> Demand<sup>1,5</sup> Host community/ Destination<sup>1,5</sup> Government<sup>1,2,4,5</sup></p>	<p>a. Administrative: EUROSTAT<sup>1,3</sup>, HEI SGA<sup>5</sup> b1. Quarterly data<sup>1</sup>; Yearly data<sup>2,3</sup> b2. Country level<sup>1,3</sup> b3. Quantitative: ratio<sup>1,2</sup>, percentage<sup>3,4</sup></p>	<p>WEF (2022), Pillar 15 (15.05)<sup>5</sup> Blancas et al.</p>

Table 1 (continued)



<p>(SDG12: 12.2, 2.4, 5)</p> <p><b>International environmental treaties</b></p> <p>Targets: 13.2</p>	<p>Percentage of total population affected by noise from neighbours or from the street<sup>1</sup> (-)</p> <p>Percentage of tourism enterprises involved in climate change mitigation schemes - such as: CO2 offset, low energy systems, etc. - and 'adaptation' responses and actions<sup>4</sup> (+)</p> <p>Population-weighted exposure to particular matter (2.5)<sup>2</sup> (-)</p> <p>Total number of ratified environmental treaties (+)</p>	<p>NGOs<sup>3,5</sup></p>	<p>weighted average<sup>5</sup> b4. 2010Q1-2022Q2<sup>1</sup>, 2013-2022<sup>2</sup>, 2003-2021<sup>3</sup>, 2019<sup>5</sup> c. EU (28 countries till Brexit)<sup>1,3</sup>, Worldwide<sup>5</sup></p>	<p>(2015)<sup>1,3</sup> ETIS (2016) (Indicator reference: D.2.1)<sup>3</sup></p>
<p>Targets: 13.2</p> <p>(SDG14: 14.c)</p>	<p>Government, NGOs</p>	<p>*Data to gather/compute<sup>4</sup> a. Administrative: IUCN-ELCETD 8.a. Yearly data b2. Country level b3. Quantitative: raw data b4. 2021 c. Worldwide</p>	<p>WEF (2022) Pillar 15 (15.11)</p>	
<p><b>14</b>  <b>Life below water</b></p> <p><b>Healthy marine ecosystems</b></p> <p>Targets: 14.2, 14.4, 14.3, 14.5, 14.2.4</p>	<p><b>G14: Life below water SD: Environment</b></p> <p><b>T1:</b> Coastal and maritime tourism rely on healthy marine ecosystems. Tourism development must be a part of Integrated Coastal Zone Management in order to help conserve and preserve fragile marine ecosystems and serve as a vehicle to promote a blue economy, contributing to the sustainable use of marine resources</p> <p>No indicators</p>	<p>Supply<sup>1,4</sup> Demand<sup>1,4</sup> Host community/ Destination<sup>1,4</sup> Government<sup>1,4</sup> NGOs<sup>1,4</sup></p>	<p>a. Administrative: UNEP-WCMC, WDPA<sup>1</sup>, One Earth and FEOW<sup>2</sup>, GOHP<sup>3</sup>, UNSD-GSDG-ID and UNEP-WCMC, WDPA<sup>4</sup> b1. Yearly data<sup>1,4</sup> b2. Country level<sup>1,4</sup> b3. Quantitative: raw data<sup>1,2</sup>, score<sup>3</sup>, average proportion<sup>4</sup> b4. 2021<sup>1</sup>, 2019<sup>2</sup>, 2020<sup>3</sup>, 2014-2022<sup>4</sup> c. Worldwide<sup>1,4</sup></p>	<p>WEF (2022), Pillar 12 (12.03, 12.05)<sup>1,2</sup> Pillar 15 (15.10, 15.15)<sup>3,4</sup></p>
<p><b>15</b>  <b>Life on land</b></p> <p><b>SD: Environment</b></p> <p>Targets: 15.2, 15.7, 15.c</p>	<p>Total square kilometres of terrestrial and marine areas under protection<sup>1,2</sup> (+)</p> <p>Number of terrestrial and freshwater ecoregions<sup>2</sup> (+)</p> <p>Ocean Health Index score for clean waters<sup>3</sup> (+)</p> <p>Average proportion of marine, freshwater and terrestrial KBAs covered by protected areas<sup>4</sup> (+)</p>	<p><b>G15: Life on land SD: Environment</b></p> <p><b>LM:</b> Rich biodiversity and natural heritage are often the main reasons why tourists visit a destination. Tourism can play a major role if sustainably managed in fragile zones, not only in conserving and preserving biodiversity, but also in generating revenue as an alternative livelihood to local communities.</p> <p><b>15.2.1.</b> Progress towards sustainable forest management</p> <p><b>15.7.1.</b> Proportion of traded wildlife that was poached or illicitly trafficked</p> <p><b>15.c .</b> Proportion of traded wildlife that was poached or illicitly trafficked</p>	<p>*Data to gather/compute for marine areas<sup>1,4</sup></p>	

Table 1 (continued)

<p><b>Healthy terrestrial ecosystems</b></p> <p>Targets: 15.1<sup>1-6</sup></p>	<p>Total square kilometres of terrestrial and marine areas under protection<sup>1,7</sup> (+)</p> <p>Number of terrestrial and freshwater ecoregions<sup>2*</sup> (+)</p> <p>Five-year moving average of annual tree cover loss to forest extent in 2000, in areas with greater or equal to 30% tree cover<sup>3</sup> (-)</p> <p>Average proportion of marine, freshwater and Terrestrial KBAs covered by protected areas<sup>4*</sup> (+)</p> <p>Built area<sup>5</sup> (-)</p> <p>Total area of natural landscape<sup>6</sup> (+)</p>	<p>Supply<sup>1,6</sup> Demand<sup>1-6</sup> Host community/ Destination<sup>1-6</sup> Government<sup>1-6</sup> NGOs<sup>1-6</sup></p>	<p><b>a. Administrative:</b> UNEP-WCMC, WDPA<sup>1</sup>, One Earth and FEOW<sup>2</sup>, GFW<sup>3</sup>, UNSD-GSDG-ID and UNEP-WCMC, WDPA<sup>4</sup>, EUROSTAT<sup>5,6</sup></p> <p><b>b1.</b> Yearly data<sup>1-6</sup></p> <p><b>b2.</b> Country level<sup>1-4</sup>, NUTS 2<sup>5,6</sup></p> <p><b>b3.</b> Quantitative: moving average<sup>1</sup>, score<sup>2</sup>, absolute value<sup>3</sup>, index<sup>4</sup>, Square Kilometers<sup>5,6</sup></p> <p><b>b4.</b> 2021<sup>1</sup>, 2019<sup>2</sup>, 2016-2020<sup>3</sup>, 2014-2022<sup>4</sup>, 2009<sup>5,6</sup>, 2012<sup>5,6</sup>, 2015<sup>5,6</sup>, 2018<sup>5,6</sup></p> <p><b>c.</b> Worldwide<sup>1-4</sup>, EU (28 countries till <i>Brexit</i>)<sup>5-6</sup></p> <p>*Data to gather/compute for terrestrial areas</p>	<p>WEF (2022), Pillar 12 (12.03,12.05)<sup>1,2</sup> Pillar 15 (15.08, 15-15)<sup>3,4</sup> Blancas et al. (2015)<sup>5,6</sup></p>
<p><b>SD: Social</b></p> <p><b>G16: Peace &amp; justice and strong institutions</b></p> <p><b>TI:</b> As tourism revolves around billions of encounters between people of diverse cultural backgrounds, the sector can foster multicultural and inter-faith tolerance and understanding, laying the foundation for more peaceful societies. Tourism, which benefits and engages local communities, can also consolidate peace in post-conflict societies.</p> <p>No indicators</p>				
<p><b>Safety and Security</b></p> <p>Targets: 16.1<sup>1-6</sup>, 16.3<sup>1,7,9</sup>, 16.4<sup>5</sup></p>	<p>Reliability of police services (<i>In your country, to what extent can police services be relied on to efficiently enforce law and order? 1...7=to a great extent</i>)<sup>1</sup> (+)</p> <p>Safety walking alone at night (<i>Do you feel safe walking alone at night in the city or area where you live?</i>)<sup>2</sup> (+)</p> <p>Number of homicide cases per 100,000 population<sup>3</sup> (-)</p> <p>Terrorism Index: composite measure of impact<sup>4</sup> (-)</p> <p>Number of organized violence, deaths per 100,000 population<sup>5</sup> (-)</p> <p>Number of crimes recorded by the police in the destination per 1000 inhabitants<sup>6</sup> (-)</p> <p>Number of police officers per 1000 inhabitants<sup>7</sup> (+)</p>	<p>Supply<sup>1,9</sup> Demand<sup>1-9</sup> Host community/ Destination<sup>1-9</sup> Government<sup>1-9</sup></p>	<p><b>a. Survey:</b> WEF-EOSI<sup>1</sup>, Gallup, 2021 Legatum Prosperity Index<sup>2</sup> <b>Administrative:</b> UNODC<sup>3</sup>, IEPG-GTI<sup>4</sup>, UCDP, WB-WDI<sup>5</sup>, EUROSTAT<sup>6,8</sup></p> <p><b>b1.</b> Yearly data<sup>1-8</sup></p> <p><b>b2.</b> Country level<sup>1-8</sup></p> <p><b>b3.</b> Quantitative: weighted average of scores<sup>1</sup>, average<sup>2</sup>, ratio<sup>3,6,7</sup>, scale<sup>4</sup>, moving average<sup>5</sup>, percentage<sup>8</sup></p> <p><b>b4.</b> 2020-2021<sup>1</sup>, 2021<sup>2</sup>, 2018 or most recent<sup>3</sup>, 2019<sup>4</sup>, 2016-2020<sup>5</sup>, 2010-2020<sup>6</sup>, 1993-2007<sup>7</sup>, 1990-2022<sup>8</sup></p> <p><b>c.</b> Worldwide<sup>1-3</sup>, EU (28 countries till <i>Brexit</i>)<sup>4,8</sup></p>	<p>WEF (2022) Pillar 2 (2.01-2.06)<sup>1-5</sup> Blancas et al. (2015)<sup>6,8</sup> ETIS (2016) (Indicator reference: C.2.1)<sup>9</sup></p>

Table 1 (continued)

	<p>General government expenditure by public order and safety (percentage of GDP)<sup>8</sup> (+)</p>			
<p><b>17 PARTNERSHIPS FOR THE GOALS</b></p> <p><b>Targets:</b> 17.6, 17.11, 17.14, 17.16, 17.17, 17.18</p>	<p>Percentage of tourists who register a complaint with the police<sup>(-)</sup></p> <p><b>SD: Social</b></p> <p><b>G17: Partnerships for the goals</b> <i>TI: Due to its cross-sectorial nature, tourism has the ability to strengthen private/public partnerships and engage multiple stakeholders – international, national, regional and local – to work together to achieve the SDGs and other common goals. Public policy and innovative financing are at the core for achieving the Agenda 2030.</i></p> <p>17.6.1. Number of science and/or technology cooperation agreements and programmes between countries, by type of Cooperation</p> <p>17.11.1.1. Developing countries' and least developed countries' share of global exports</p> <p>17.14.1. Number of countries with mechanisms in place to enhance policy coherence of sustainable development</p> <p>17.16.1. Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals</p> <p>17.17.1. Amount of United States dollars committed to public-private and civil society partnerships</p>	<p>*Data to gather/compute<sup>9</sup></p>	<p>WEF (2022) Pillar 7 (7.01-7.04)<sup>1-4</sup></p>	
<p><b>International Openness</b></p> <p><b>Targets:</b> 17.1<sup>1</sup>, 17.10<sup>1-4</sup></p> <p>(SDG8: 8.10<sup>1</sup>)</p>	<p>17.18.1. Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics</p> <p>Visa requirements for entry in the destination country for a tourism visit (0= <i>traditional VISA required for visitors from every source market</i>, ..., 100= <i>no VISA required</i>) (+)</p> <p>Number of bilateral air service agreements weighted by level of liberalization<sup>(+)</sup></p> <p>Number of regional trade agreements in force: number of goods (RTAs) and services (BIAs) notification<sup>(+)</sup></p> <p>Degree of financial openness: Chinn-Ito Index<sup>(+)</sup></p>	<p>Supply<sup>1</sup> Demand<sup>1</sup> Government<sup>1-4</sup></p>	<p><b>a. Administrative:</b> UNWTO<sup>1</sup>, ICAO-WD<sup>2</sup>, WTO; (RTA-IS)<sup>3</sup>, IMF's AREAER<sup>4</sup></p> <p><b>8.a.</b> Yearly<sup>1-4</sup></p> <p><b>b2.</b> Country level<sup>1-4</sup></p> <p><b>b3.</b> Quantitative: rating score<sup>1</sup>, weighted number<sup>2</sup>, raw data<sup>3</sup>, index<sup>4</sup></p> <p><b>b4.</b> 2018<sup>1</sup>, 2021<sup>2,3</sup>, 2019<sup>4</sup></p> <p><b>c.</b> Worldwide<sup>1-4</sup></p>	
<p><b>LEGEND:</b>                  AREAER: Annual Report on Exchange Arrangements and Exchange Restrictions                  Bloom Cons.: Bloom Consulting and DD – Digital Demand data, market leader search engines across the world (mobile and desktop)                  TI-CPH: Transparency International-Corruption Perceptions Index                  CL-CSIC: Cybermetrics Lab, Consejo Superior de Investigaciones Científicas                  CWH-GHGE: Climate Watch Historical-GHG Emissions, Washington, DC: World Resources Institute, 2021                  EC-MSDIT: European Commission, Manual on sustainable development indicators of tourism, 2006</p>				

Table 1 (continued)

EL: Euromonitor International, 2021	
ESI: Environmental Sustainability Index, 2005	
ETIS: European Tourism Indicator System, European Commission, 2016	
FEOW: Freshwater Ecoregions of the World	
GAWC-RN: Globalization and World Cities Research Network	
GFW: Global Forest Watch	
GOHI: Global Ocean Health Index, 2020	
GGCRI: Germanwatch, Global Climate Risk Index, 2021	
GGMTs: Green Guides Michelin Travel	
HELSCA: Health Effects Institute -State of Global Air, Boston, MA, 2020	
ICAO-WD: International Civil Aviation Organization: WASA Database	
ILO: International Labour Organization	
ILO-WSPRep: World Social Protection Report	
ILOSTAT database: ILO Statistical Database	
IMF: International Monetary Fund	
ITUC: International Trade Union Confederation	
IMF's AREAER: IMF's Annual Report on Exchange Arrangements and Exchange Restrictions	
IEPFG-GTI: Institute for Economics and Peace-Global Terrorism Index, 2020	
IUCN: International Union for Conservation of Nature and Natural Resources (Red List)	
IUCN- ELCETD: International Union for Conservation of Nature and Natural Resources-Environmental Law Centre ELIS Treaty Database	
IEA-EDC: International Energy Agency, Energy Data Center	
KBAs: Key Biodiversity Areas	
KGOE: Kilograms of oil equivalent	
NGT: National Geographic Traveller	
RTAIS: Regional Trade Agreements Information System	
SMEs: Small- and medium-sized enterprises	
STR: STR, global hospitality data and analytics company	
T&T: Travel and Tourism	
UNESCO: United Nations Educational, Scientific and Cultural Organization	
UNESCO- CCNSD: UNESCO Creative Cities Network for sustainable development, 2020	
UNESCO-WHL: UNESCO World Heritage List	
UNEP-WCMC, WDPA: UNEP-WCMC, World Database of Protected Areas, 2021	
UNODC: United Nations Office on Drugs and Crime	
UNDP: United Nations Development Program	
UNSD-GSDG-ID: United Nations Statistics Division-Global SDG-Indicators Database	
UNWTO (2015): UNWTO Visa Openness Report, 2015	
UNWTOYOR: United Nation World Tourism Organization	
UCDP: Uppsala Conflict Data Program	
WHO-GHODR: World Health Organization-Global Health Observatory Data Repository	
WTO-RTAIS: World Trade Organization-Regional Trade Agreements-Information System	
WEP: World Economic Forum	
WEP-EOS: World Economic Forum-Executive Opinion Survey	
YCELP: Yale Centre for Environmental Law & Policy, 2018	
WEP-ITU-WTI: World Economic Forum-International Telecommunication Union-World Telecommunication Indicators, 2021	
WB-WDI: World Bank-World Development Indicators	
WRI-A3.0.CR: World Resources Institute-Aqueduct 3.0 Country Ranking	
WT&TC: World Travel & Tourism Council, Travel & Tourism Economic Impact Research, 2021.	

script is associated to SDG target(s), data sources, data features, geographical area, and references.<sup>5</sup> When a sustainability issue is matched with only one STI, no superscript is employed. The polarity of indicators is denoted through a positive/negative sign, if the STI measures an improvement/worsening in sustainability (*polarity*±)

- Stakeholders' perspective: *Supply side* (public and/or private tourism businesses), *Demand side* (tourists/visitors), *Host community/destinations*, *Governments*, *Non Governmental Organizations (NGO)*
- Data source (a.): *Administrative* (EUROSTAT, World Bank, etc.), *Survey*, *Scraping data*
- Data features (b.): (b1.) *Time frequency*: daily, weekly, monthly, quarterly, yearly; (b2.) *Territorial NUTS level*-global, supra-national areas (referring to sets or organizations of countries, e.g. EU, etc.), national/country level, regional or administrative units (e.g. NUTS 2 in the EU territorial classification), municipality or city as administrative local units with large populations, locations or tourism destinations within a given municipality-where tourism activities and businesses are concentrated; (b3.) *Quantitative* (measures by row data, ratios, % over total) and/or *Qualitative* (opinions, perceptions, attitudes, etc.) or their integration; (b4.) *Timespan*
- Geographical/spatial area/s (c.)
- Reference(s).

To make easier the reading of Table 1, the following example is provided:

## 5.1 SDG1-no poverty

In addition to the 3 indicators identified by UNWTO and UNDP (Annex 5, 2017), shown in the grey area of Table 1, 19 STIs are distributed in 4 sustainability issues and classified on the basis of the direct link to SDG1-*No poverty*, falling under the economic sustainability dimension.

All the sustainability issues are linked to SDG1 as the contribution of the tourism industry can produce economic benefits to fight poverty. Most of STIs in the specific sustainability issues *Socioeconomic resilience and conditions* (STIs<sup>1-3</sup>), *Available income per inhabitant* (Net national available income per inhabitant), and *Contribution of tourism to GDP* (STIs<sup>1-4, 6</sup>) can be employed as direct measures of the achievement of the associated targets of SDG1 in line to the benchmark approach.

In addition, the STIs related to the first 2 issues are economic measures of progress towards SDG1 and its subgoals without any direct reference to tourism. However, these STIs can be crucial in the economic analysis focused on the outcome of tourism activities. STIs<sup>1-4, 6</sup> in *Contribution of tourism to GDP* issue are directly related to the tourism industry. Moreover, the STIs<sup>5, 7, 8</sup> in this last third issue and the STIs<sup>1-7</sup> in *Tourism demand* issue are not direct measures of achievement of SDG1 and targets. Nevertheless, they can be employed to assess tourism capability in generating economic benefits, e.g., the higher the *Total number of tourists arrivals*, the higher the revenues, the closer the achievement of target 1.1 and target 1.2.

<sup>5</sup> In Table 1, the *Tourism demand* issue of SDG1 encompasses the STI Average length of stay<sup>2.a-2.c</sup>. Only in this case, a STI is associated with more than a superscript because the specific STI is drawn from all the 3 references: the superscript <sup>2.a</sup> is referred to WEF (2022), <sup>2.b</sup> to Blancas et al. (2015), <sup>2.c</sup> to ETIS (2016) and related features.

It is worthwhile stressing that when the stakeholders' perspective is considered, the choice of *Government* is common to most of the sustainability issues considered in SDG1. This is due firstly to the relevance of the measured sustainability aspects at the national governmental level and, thus, the identified STIs are built through country level data. In addition, if the measure is transformed at other intermediate territorial level (Bertocchi et al. 2023), other stakeholder perspectives can be adopted as the host communities/destinations. Furthermore, the supply stakeholders can be involved in the STIs in the same issue because the indicators are performance measures of the tourism industry.

Finally, the 19 STIs are also associated to other SDGs and targets with additional links. For example, in the *Socioeconomic resilience and conditions* issue, the STIs<sup>2, 3</sup> are also related to *SDG10-Reduced inequality* and, specifically to target 10.4, referred to the social sustainability dimension.

## 6 Discussion

Table 1 shows that the number of proposed indicators linked to each SDG is very different. Major relevance is assigned to the economic dimension since the highest number of STIs (104) is classified according to SDGs related to this dimension, whereas the benchmark (UNWTO and UNDP 2017) proposes only 11 STIs in the economic dimension.

A detailed analysis of the toolkit allows at appreciating the twofold relationship between tourism and sustainable development measured by STIs. On the one hand, STIs can be measures of the *tourism impacts* on environmental, social, and economic sustainability. On the other hand, STIs are measures of sustainability, which once achieved, positively *affects tourism* and, therefore, the sustainability of tourism itself. Hence, the key questions are:

*Q1:* do STIs measure the direct/indirect contribution of sustainable tourism to the achievement of environmental, social, and economic sustainability?

*Q2:* do STIs measure the achievement of sustainability by specific strategies or policies or infrastructure systems that, in turn, affect the sustainability of tourism?

To answer these research questions, the STIs grouped by SDGs are discussed starting from the environmental dimension of sustainability, which encompasses all the others as suggested by the *Russian dolls model* (Levett 1998).

In the environmental dimension, 39 STIs are grouped by SDG6, SDG7, SDG13, SDG14, and SDG15 while the benchmark lists only 8 STIs. Direct measures of the tourism impact on environmental sustainability, as the respective tourism links provided by UNWTO and UNPD (2017) suggest, are all the 3 STIs in the sustainability issue named *Water management in the tourism sector* for SDG6, and 5 STIs (namely, STI<sup>1-3</sup> and STI<sup>6,7</sup>) in the *Energy consumption/intensity* issue for SDG7. Hence, the above-mentioned STIs allow at answering *Q1*.

All the other STIs can be employed to measure the progress towards sustainability and, as a consequence, the benefits for tourism. It is noteworthy the key role of the tourism stakeholders and, above all, of the governments (UNEP/WTO 2005) in promoting investments, actions, and strategies to ensure the efficient use of environmental resources affecting the

development of sustainable tourism systems.<sup>6</sup> These last STIs in the environmental dimension can be used to answer *Q2*.

In the social dimension, 34 STIs are classified while in the benchmark only 12 STIs are presented. In SDG5, STIs<sup>2-6</sup> directly measure how much tourism industry helps to reach gender equality, e.g. the *Ratio of the percentage of women employed in the tourism sector and the percentage in other activities (Q1)*. On the other hand, the *Gender inequality index-STI<sup>1</sup>* in the SDG5-and all the other STIs falling in SDG3, SDG4, and SDG10, may be used to assess strategies of social welfare, education policies, possibly implemented by tourism revenues, that in turn affect the sustainability of tourism (*Q2*). SDG16 encompasses STIs measuring safety conditions and institutional effort to achieve the public order and peaceful society. Furthermore, the STIs in SDG17 measure the results of the engagement of international, national, regional, and local stakeholders in building collaborative networks to reach the success of Agenda 2030 goals (*Q2*).

In the economic dimension, the above mentioned 104 STIs fall in SDG1, SDG2, SDG8, and SDG9. In the SDG1, notwithstanding the differences highlighted in the discussion of the example (see, the previous section of the present manuscript), all STIs can be used to measure the tourism contribution to SDG1 (*Q1*), the same applies to the single STI in SDG2. In SDG8, the STIs related to the issues *Productivity in tourism related sectors, Tourism enterprises' performance, Employment generated by tourism and quality of employment, Tourism seasonality, Tourism quality, Customer satisfaction, Potential overcrowding, Job security, and Evaluation of the prices of tourism services* strictly refer to the impact of tourism activities on the fair labour opportunities and economic growth (*Q1*). All the STIs in the other issues of SDG8 allow at assessing economic choices or policies supporting sustainability and thus tourism sustainability (*Q2*). Also all the STIs in SDG9 allow at answering *Q2*, as they are referred to the extent and quality of several typologies of infrastructures, some specific for the tourism industry (e.g., *Percentage of tourism enterprises with internet access<sup>10</sup>* in *ICT Readiness* issue) and others relevant for all industries (e.g., *Use of digital platforms for providing transportation and shipping<sup>6</sup>* in *ICT Readiness*).

As far as SDG11 and SDG12 are concerned, not a single dimension of sustainability is prominent but all of them are relevant, as the tourism links in the benchmark suggest. In these two SDGs are grouped 50 STIs, whereas in the benchmark only 4 STIs are identified. For SDG11, the STIs in the issues named *Community/social impact, Foreign culture on host culture, Effects on national population structure, Effects on access to housing* measure the effects of tourism activities on the host community. For this reason, such indicators are useful to answer *Q1*. All the other STIs grouped in the remaining issues can be used to monitor strategies and policies adopted to reach sustainability and make tourism thrive (*Q2*). In SDG12, STIs<sup>2,3</sup> in the *Production impact on the environment and nature* issue and all the STIs in the *Transport impact Sustainable tourism public policy, Use of resources/intensity of tourism use* issues measure how much tourism industry helps to reach sustainable consumption and production (*Q1*). All the other STIs can be employed to monitor sustainable consumption and production policies, which in turn affect tourism (*Q2*).

If used to answer *Q1* or *Q2*, the above classification of STIs can provide the-too often missing-connection between indicators and sustainability targets and help to reducing the

<sup>6</sup>This is also evident in the increasing focus on the impacts of climate change that tourism supranational authorities are urging policy-makers to address (Zhou et al. 2024).

divide between theoretical frameworks and actual use of indicators for evidence-based decisions (Font et al. 2023).

The analysis of Table 1 shows that only few measures are available at NUTS2 or NUTS3 territorial level and ever fewer can be employed for real-time monitoring.

## 7 Conclusions

Since tourism is one of the largest and fastest growing economic sectors in the world, a careful assessment of its sustainability is called for. Over the years, the urge of sustainability has driven fundamental changes in tourism planning and management. Nevertheless, sustainable tourism models have not yet been fully framed within the SDGs. This could be due to the scanty explicit references to tourism in Agenda 2030 (Hall 2019). However, SDGs are a sound frame of reference to assess the tourism's contribution to sustainable development, aligning the idea of *profitability* with *conservation* for future generations.

As suggested by UNECE (2015), the relevance of an integrated conceptual framework to support sustainability measurement across environmental, social, and economic dimensions must continue to grow through the development of indicators for the measurement of progress towards the SDGs.

In this perspective, the present contribution provides a framework as a research toolkit to measure the direct/indirect contribution of tourism in the achievement of environmental, social, and economic sustainability by means of STIs (*Q1*). It can be also employed to monitor strategies and policies, aimed at achieving Agenda 2030 goals that affect the sustainability of tourism (*Q2*).

The toolkit, by providing classification criteria for large STIs subsets, allows at overcoming the issues of completeness and comparability (Alfaro Navarro et al. 2020; Buckley 2012; Font et al. 2023) that often drive researchers to simply apply pre-existing indicators to new contexts, merely oriented by *what can be measured* rather than *what needs to be measured*.

The present study highlights a potential problem of lack of indicators for the management of resources and the policies for the tourism industry at the regional and local level. Digital platforms could be a promising solution, although their reliability and consistency must always be investigated to ensure the comparability over time and space of the indicators made available to decision-makers.

With the aim to comply with *what needs to be measured*, mobile roaming or credit card transactions, Big Data and *Internet of Things* and, thus, Artificial Intelligence are highly promising in this research field to obtain new knowledge about the complexity of tourism (Balaš and Abson 2022). As a matter of fact, tourism complexity is ever growing. The development of the digital tourism, driven by the enabling technologies of *Industry 4.0* (Duman and Binbasioglu 2023), is transforming the tourism industry (Annamalalah et al. 2023) and even the tourists' experiences (Verma et al. 2022). This requires new measurement procedures, specifically tailored to assess the digital performance of the tourism industry.

Finally, if the wide array of indicators, in the quest of completeness, could negatively affect their operability (Blancas et al. 2015), the suggested classification criteria here proposed—such as sustainability dimensions, issues, SDG targets—can be used as a pattern to build synthetic measures from elementary indicators. In this process, specific data features

can be used for the selection of STIs to improve the weak integration of STIs into tourism policy and planning (Asmelash and Kumar 2019). STIs can be not only used because of their *instrumental* role (Gudmundsson 2003) to implement and evaluate tourism policies and monitor their outcomes but also according with their *conceptual* role to foster stakeholder awareness and enhance capacity building on sustainability issues, and challenge tourism traditional consumption patterns (McLoughlin et al. 2018; Modica et al. 2018).

A clear structure of *what* must be meaningfully measured and *how* the information makes sense is needed to bridge the gap between policy demand and evidence-based findings about sustainable tourism development. In this perspective, it is useful to explore new and synthetic indicators to monitor tourism sustainability according to the SDGs and fully inform policy-makers on the progress towards the achievement of a sustainable management of tourism industry.

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## Declarations

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**Ethical standards** This article does not contain any studies with human participants or animals performed by any of the authors.

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