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D3HUB Tourism of Tomorrow
Data-Driven Destinations Hub

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D3.1 Sustainable Tourism Indicator Dataset and Implementation Guide for Benchmarking

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List of Acronyms

Abbreviation / acronym	Description
CC	European Competence Centre
DG Grow	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DMOs	Destination Management Organisation
EC	European Commission
EU	European Union
TSI	Tourism Support Instrument
PPPA	Pilot Projects & Preparatory Action
T4T	Together for EU Tourism
SMEs	Small and medium enterprises
TTP	Tourism Transition Pathway
GDP	Gross Domestic Product
TSA	Tourism Satellite Account
SEEA	System of Environmental-Economic Accounting
GDPR	General Data Protection Regulation
UN	United Nations
KPIs	Key Performance Indicators
INSTO	International Network of Sustainable Tourism Observatories
ETIS	European Tourism Indicator System
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
ICAO	International Civil Aviation Organisation
OECD	Organisation for Economic Co-operation and Development
DG ENV	Directorate-General for Environment
UNESCO	United Nations Educational, Scientific and Cultural Organisation
SF-MST	Statistical Framework for Measuring the Sustainability of Tourism
EUTD	European Union Tourism Dashboard
NUTS	Nomenclature of Territorial Units for Statistics
ISCED	International Standard Classification of Education
EUROSTAT	European Statistical Office

Executive Summary

This document is a deliverable submitted as part of the D3HUB project, funded by the European Commission under its Pilot Projects & Preparatory Actions (PPPA) Programme.

This deliverable, corresponding to Task 3.1 of the project, introduces the **D3HUB common indicators for measuring tourism sustainability within the identified clusters**. Its main objective is to provide European tourism destinations with a harmonised and practical initiative for **measuring, interpreting, and benchmarking sustainability performance** across key dimensions of tourism—economic, social, and environmental.

This deliverable serves a dual purpose:

1. To present a **coherent and adaptable indicator set** that supports D3HUB's destinations at different maturity levels in tracking and evaluating the sustainability of their tourism systems.

2. To provide recommendations for its **implementation** that enables destinations to apply the indicators consistently and comparably, fostering both internal assessment and benchmarking across peer destinations.

In essence, this deliverable lays the technical and strategic foundation for future D3HUB activities that will pilot and operationalise the Competence Centre's support mechanisms. By standardising sustainability measurement and fostering a culture of data use and collaboration, the deliverable contributes to building **more resilient, transparent, and evidence-informed tourism management systems** across Europe.

1 Introduction

1.1 Purpose of the document

The purpose of this document is to analyse how European tourism destinations use and manage data, identify their key data needs, and establish a framework for selecting sustainability indicators that support effective monitoring and benchmarking. This deliverable, developed within the framework of the D3HUB project, aims to assist the participating Destination Management Organisations (DMOS) in having a common set of indicators for measuring the sustainability of tourism in their destinations, to help destinations improve their business processes and the quality of products and services using real data at the DMO level, and optimise the use of resources, increase green profits, and create green jobs. Ultimately, this document contributes to fostering quality & sustainability-driven decision-making.

The report builds upon the findings of the previous D3HUB deliverable D2.1 Information Needs and Qualifications Report, which rigorously explored the data and information requirements of European DMOs. While D2.1 focused on defining the fundamental data needs and expert qualifications necessary for effective data management in tourism destinations, this document is set to take the next step by:

- Analysing the current state of data use among DMOs, highlighting key applications and gaps that need to be addressed.
- Examining challenges in data collection and management, particularly in the context of sustainability monitoring.
- Mapping relevant data initiatives across Europe to identify best practices, synergies, and opportunities for collaboration.
- Establishing a selection of sustainability indicators that can be effectively used for monitoring and benchmarking at the destination level.

By providing a structured approach to data-driven decision-making, this report equips DMOs with the insights and tools necessary to enhance their strategic planning processes. The goal is to ensure that tourism destinations are better positioned to respond to sustainability challenges, optimise their resource use, and remain competitive in an evolving market that increasingly values environmental and social responsibility.

1.2 Structure of the document

This document is structured into five main sections, starting with this introduction. Section 2 provides an in-depth analysis of data needs and usage in European tourism destinations, identifying key data requirements, applications, and the main challenges in data collection and management. This section builds upon the findings of D2.1 Information Needs and Qualifications Report to further explore how DMOs interact with data and where improvements are needed.

Section 3 focuses on mapping existing data initiatives across Europe. It presents an overview of relevant initiatives and their contributions to improving tourism data management, particularly in the context of sustainability and quality monitoring. This mapping exercise helps to identify best practices and potential synergies between different actors in the European tourism data ecosystem. (Based on ANNEX 1, Transition Pathways Expert Group. (2024). Harmonising Tourism Statistics for Sustainability: Report of the T4T Expert Group. European Commission. https://transition-

pathways.europa.eu/knowledge-documents/harmonising-tourism-statistics-sustainability-report-t4t-expert-group)

Section 4 is dedicated to the selection of sustainability indicators. It outlines the approach used to identify the indicators for monitoring and benchmarking tourism sustainability. The section also details the categorisation of indicators within the D3HUB project's framework and a preliminary exercise on possible actions to be taken by destinations after measuring the proposed indicators. Additionally, it presents a shortlist of recommended indicators that can support DMOs in evidence-based decision-making.

Finally, Section 5 summarises the key findings of the report and presents the conclusions, highlighting the main insights gained regarding data needs, challenges, and opportunities for improvement. It offers recommendations to enhance data-driven destination management.

The following table provides an overview of the report's structure and its corresponding project tasks.

Table 1 Overview of the tasks and the respective chapters of the document

Chapter	Description	Corresponding Project Task
1. Introduction	Outlines the purpose, scope, and structure of the document.	No corresponding task
2. Data needs and usage in EU tourism destinations	Analyses data requirements, applications, and challenges in data management for DMOs.	Task 2.1 – Baseline analysis; Task 2.2 – Information needs and data requirements of DMOs
3. Mapping Data Initiatives	Identifies and reviews existing data initiatives relevant to tourism destinations.	Task 3.1 – Mapping of tourism data initiatives Task 3.2 - Task 3.3 – Common methodology for measuring tourism sustainability
4. Selection of indicators	Defines and categorises sustainability indicators for monitoring and benchmarking.	Task 3.3 – Common methodology for measuring tourism sustainability
5. Conclusions	Summarises key findings and provides recommendations for improving data-driven destination management.	No corresponding task

1.3 Scope

This deliverable focuses on defining a common set of sustainability indicators for each D3HUB cluster, enabling European Destination Management Organisations (DMOs) to monitor tourism sustainability and benchmark their progress effectively. Developed within the framework of the D3HUB project, this report builds on previous analyses of data needs and data management practices to ensure that selected indicators align with real-world destination challenges and opportunities.

The scope of this document includes:

- Assessing data needs and usage: The report analyses how European DMOs currently collect, manage, and utilise tourism-related data, with a particular focus on sustainability and quality

monitoring. It also examines challenges in data accessibility, interoperability, and standardisation that could impact indicator implementation.

- Mapping existing data initiatives: A review of relevant European data initiatives is conducted to identify best practices and synergies that can inform the development of a common indicator framework. This ensures that the selected indicators build upon existing efforts rather than duplicating them.
- Defining a common set of indicators for D3HUB clusters: The core objective of this deliverable is to establish a structured selection of indicators tailored to each D3HUB cluster. These indicators will serve as a standardised framework helping DMOs assess their progress and optimise decision-making processes.
- Providing recommendations for implementation: The report offers a set of practical and policy-oriented recommendations to support the effective implementation of the sustainability indicators framework. These address not only DMOs, but also policymakers, statistical authorities, and other stakeholders, focusing on multilevel coordination, capacity-building, data accessibility, and long-term governance to ensure meaningful, consistent, and scalable use of data across tourism destinations. While this report defines a common set of sustainability indicators, certain aspects remain beyond its scope:
  - It does not provide a technical roadmap for data collection, integration, or IT infrastructure development.
  - The focus is on sustainability monitoring for specific challenges (or clusters as we denote it in the D3HUB project), meaning tourism impact assessments beyond these challenges are not extensively covered.
  - The study is tailored to European DMOs, and while the methodology may be applicable in other regions, adaptations would be necessary based on local governance and tourism data frameworks.

By establishing common indicators for each D3HUB cluster, this deliverable aims to support DMOs in improving sustainability monitoring, fostering resource efficiency, and strengthening their position in a market increasingly driven by environmental and social responsibility.

2 Data needs and usage in EU tourism destinations

This second chapter builds on the findings of D3HUB deliverable D2.1 – Information Needs and Qualifications Report, and aligns them with the strategic vision laid out in the Transition Tourism Pathway: The European Commission's Vision for 2030 (European Commission SWD, 2021). The Tourism Transition Pathway (TTP) outlines a roadmap for the sector's shift towards greater resilience, sustainability, and digitalization by 2030, identifying specific actions and commitments needed from both public and private stakeholders to achieve these goals. This document emphasizes the need for improved data availability, indicator development, and coordinated monitoring to support evidence-based policymaking. Although a new European Tourism Strategy is currently under preparation, the TTP Staff Working Document remains the key reference framework for data-driven transformation and monitoring in EU tourism policy.

2.1 Key data requirements and applications

Tourism in the European Union (EU) is a vital component of the economy, contributing significantly to GDP and employment, particularly in regions heavily reliant on the sector. In this context, data is a foundational tool for effective destination management, enabling informed decision-making, efficient resource allocation, and enhanced visitor experiences. The need for high-quality, timely and granular data spans a wide range of stakeholders—including DMOs, policymakers, tourism service providers, and sustainability actors—who depend on reliable evidence to shape strategies and monitor impacts. Recognising the importance of data in driving the green and digital transitions, the European Commission, in collaboration with Member States, is developing a comprehensive Tourism Dashboard to complement traditional tourism statistics and facilitate the tracking of progress towards a more sustainable, digital and resilient tourism ecosystem (European Commission, Tourism Transition Pathway, SWD, 2021).

Key categories of data requirement

To support effective destination management, EU tourism actors require access to a wide spectrum of data that reflects the complex, multi-dimensional nature of the tourism system. These needs span across six interconnected domains: **visitor and market characteristics, economic impact, environmental sustainability, mobility, digital engagement, and benchmarking**.

Understanding **visitor profiles** remains a fundamental need. Key metrics include arrival and departure data, country of origin, length of stay, purpose of travel, and demographics. These insights help segment markets and tailor tourism products. Complementary data on tourist expenditure (accommodation, transport, food, activities) is essential to quantify the sector's economic impact and guide investment priorities. Visitor satisfaction, often captured through surveys and digital feedback tools, provides critical feedback for service enhancement.

From an **economic perspective**, data on tourism revenue, employment, and business performance supports inclusive growth objectives. The TTP specifically calls for improved labour data disaggregated by gender, contract type, and sector to better monitor tourism's contribution to quality employment and fair working conditions (European Commission SWD, 2021). In addition, tracking the seasonal and structural dynamics of tourism enterprises informs policy on resilience and competitiveness.

The need for **environmental** data is growing rapidly. In line with the European Green Deal, destinations are increasingly expected to monitor their environmental footprint. The TTP advocates the systematic collection

of indicators related to GHG emissions, energy and water consumption, solid waste, and biodiversity pressures to guide greener tourism practices. Projections indicate that southern coastal destinations may face a decline in tourism demand due to increased temperatures, while northern regions could see gains, requiring destination-specific adaptation informed by environmental data (Joint Research Center, 2023). This includes aligning destination strategies with circular economy principles and climate neutrality targets, using shared metrics where possible.

Mobility and transport data is also essential for planning sustainable access and internal circulation within destinations. Tracking the modes of transport used by tourists, congestion hotspots, and public transport capacity enables better infrastructure planning and helps reduce the sector's transport-related emissions, in line with the EU's Sustainable and Smart Mobility Strategy (European Commission SWD, 2021).

The **digitalisation** of tourism has introduced powerful new data sources. Online platforms, mobile applications, social media analytics, and Wi-Fi/GPS signals offer insights into tourist behavior, preferences, and spatial dynamics. These datasets help DMOs track demand trends in near real-time and personalise the visitor experience. However, the TTP warns of disparities in digital readiness among destinations and SMEs, and calls for targeted support to bridge these gaps (European Commission SWD, 2021).

Finally, **benchmarking** through comparative performance indicators enables destinations to monitor their evolution and learn from peers. The Commission encourages the adoption of common KPIs for sustainability, competitiveness and resilience, and proposes the creation of a shared framework (European Commission SWD, 2021), which is the aim of this deliverable within the framework of the European Competence Center that is being designed in the D3Hub project.

A comprehensive, interoperable, and inclusive data ecosystem is therefore a prerequisite for managing tourism transitions effectively. The TTP stresses that data must be not only collected but also used strategically to empower decision-makers and enable coordinated action across the tourism value chain. Building this capacity at all levels—national, regional, and local—is critical to achieving the 2030 vision for a resilient, sustainable, and digitally empowered European tourism ecosystem.

Applications of data in EU tourism destinations

Data is an essential asset for guiding tourism development and improving decision-making across all levels of governance. In EU destinations, its practical applications span planning, sustainability, marketing, policy, and crisis management, contributing to more responsive, inclusive, and forward-looking tourism strategies.

In **destination planning**, data helps anticipate and manage visitor flows, identify capacity thresholds, and inform infrastructure and service adjustments. Accurate insights into travel patterns, demand peaks, and visitor preferences allow authorities to distribute tourism more evenly throughout the year and across territories, improving both resident well-being and visitor experience. These planning functions are central to the adaptive management approach encouraged in the TTP.

Data also plays a key role in advancing **environmental and social sustainability**. Monitoring resource consumption, emissions, and waste generation enables destinations to assess their environmental footprint and prioritise mitigation measures. The integration of such indicators into local strategies supports progress towards the objectives of the European Green Deal, as reflected in the TTP's call for more consistent and comparable sustainability metrics.

Policy design and evaluation benefit significantly from robust datasets. Information on employment, enterprise performance, and resident sentiment helps shape targeted interventions and track their outcomes.

This is particularly relevant for fostering inclusive growth, supporting SMEs, and promoting decent work—areas where the TTP calls for stronger data foundations to monitor social impact and economic resilience.

In **marketing**, the use of digital analytics enables a shift from generic campaigns to personalised outreach. Platforms and social media data provide real-time feedback on traveller interests, enabling destinations to identify emerging markets and tailor messaging. These practices enhance competitiveness and help align promotion with the growing demand for authentic and responsible tourism, a priority noted in the TTP's digitisation agenda.

The COVID-19 pandemic underscored the importance of real-time data for **crisis response**. Destinations that had access to timely information were better equipped to adapt operations, communicate with stakeholders, and manage reopening processes. Strengthening these capabilities is essential to build resilience, not only to future health emergencies, but also to climate-related or geopolitical shocks. The TTP identifies this as a key area for capacity-building across the ecosystem.

Data enables **benchmarking and peer learning**. By tracking common indicators, destinations can monitor progress over time, compare performance with similar regions, and adopt good practices. Initiatives like the EU Tourism Dashboard aim to support this function by providing a more consistent and transparent data framework across Member States.

Finally, another critical application of data is in **monitoring policy effectiveness**. Reliable indicators allow destinations to assess whether tourism strategies and interventions are achieving their intended outcomes, and to make timely adjustments when needed. This feedback loop is essential for ensuring that resources are used efficiently, that unintended consequences are addressed, and that public trust in tourism governance is maintained. As highlighted in the Tourism Transition Pathway, data must be actively used to support adaptive policymaking, enabling destinations to learn from experience, refine their approaches, and stay aligned with long-term sustainability and resilience objectives.

2.2 Challenges in data collection and management

As EU destinations increasingly recognise the value of data for managing tourism sustainably and effectively, persistent structural and operational barriers continue to limit their ability to build coherent and inclusive data ecosystems. These challenges undermine the implementation of data-driven approaches and slow progress towards the goals set out in the TTP, particularly regarding resilience, digitalisation and sustainability.

Fragmentation of data sources

Tourism data is generated by a wide group of stakeholders, including statistical offices, DMOs, regional governments, private platforms, and transport or accommodation providers, often without coordination or shared objectives. Each actor typically collects data based on their operational needs, using different formats, definitions and timelines. As a result, information remains fragmented, siloed, and difficult to integrate across governance levels.

This lack of coordination not only weakens data consistency and comparability but also limits the ability of destinations to form a comprehensive view of tourism dynamics and impacts. While some Member States have established national observatories or data strategies, others continue to operate in a decentralised and unstructured manner. The TTP highlights the importance of establishing governance mechanisms and shared frameworks to overcome these barriers and enable more strategic data use across the tourism ecosystem. This

effort should be guided by the Fundamental Principles of Official Statistics[1] (UN, 2014), which emphasise impartiality, professional independence, and transparency as essential conditions for trustworthy and actionable data.

Lack of standardisation and comparability

Inconsistencies in data definitions, indicators and methodologies are a major obstacle to effective data use and benchmarking. Concepts as fundamental as "visitor", "overnight stay" or "tourism business" may vary between destinations, statistical bodies or countries. This limits comparability, undermines the development of shared indicators, and complicates collaboration between regions.

Despite efforts by Eurostat and international organizations like UN Tourism to promote harmonized tourism statistics, the uptake of common frameworks remains uneven, especially at the sub-national level (e.g., lack of incentives, technical capacity, legal limitations). Without greater alignment on data standards and definitions, it is difficult to build a reliable, comparable, and scalable knowledge base that can inform EU-wide tourism policy and innovation.

These issues are particularly evident in sustainability monitoring. Without harmonised environmental and social indicators, it is difficult to track progress towards green transition goals or align local action with EU-wide objectives. The TTP calls for greater alignment on data standards and the adoption of common KPIs—particularly in the context of the EU Tourism Dashboard.

Data gaps and accuracy issues

Despite the growing emphasis on data-driven tourism governance, many EU destinations still face persistent gaps in data availability, granularity and quality. Smaller or less digitally equipped destinations are particularly affected, with key areas such as environmental impacts, social effects, informal economic activity and visitor satisfaction often underreported or missing entirely. In many cases, data is outdated, based on limited samples or collected irregularly, which reduces its relevance for strategic planning and performance monitoring.

One of the main underlying issues is the misalignment between where data is planned and where it is used. Statistical frameworks are typically defined at national or European level, while tourism policies are implemented at the regional and local level. This disconnect frequently results in the lack of relevant, disaggregated data at the operational level, hindering the ability of destinations to track progress, adjust strategies or design evidence-based interventions. As emphasised in the TTP, stronger integration of local data needs into broader planning processes is essential to close this gap.

Additional challenges arise from the widespread reliance on self-reported data from tourism businesses and visitors. In the absence of standardised protocols or validation mechanisms, such data often lacks consistency or completeness, limiting its use for benchmarking or impact assessment.

The European Tourism Data Space represents a major opportunity to enhance data accessibility, integration and innovation across the sector. However, SMEs and small regional or local destinations often face structural and technical barriers to fully benefit from it. Limited resources, low digital readiness and the absence of dedicated support mechanisms may prevent these actors from participating effectively. Bridging this gap requires not only improved methodologies and closer collaboration with private data holders, but also targeted

[1] United Nations (2014). Fundamental Principles of Official Statistics, A/RES/68/261. Adopted by the General Assembly on 29 January 2014.

support to ensure inclusive access to the Data Space and to promote investment in modern, fit-for-purpose data collection technologies across all types of destinations.

Privacy and ethical concerns

With the growing use of digital tools, geolocation technologies, and big data analytics in tourism, privacy and ethical concerns are becoming increasingly prominent. Data sources such as mobile phone tracking, social media monitoring, and real-time location data offer powerful insights into tourist behavior and movement.

However, these tools raise legitimate questions about personal data protection, informed consent, and the ethical use of sensitive information. The General Data Protection Regulation (GDPR) in the EU has set a strong legal framework for protecting personal data, but it also imposes strict compliance requirements on data collectors, especially public institutions with limited legal or technical expertise. In many cases, DMOs are hesitant to use certain data sources or partner with private providers due to fears of breaching data protection rules or encountering reputational risks. Moreover, there is growing concern about the potential misuse of data (for instance, in surveillance practices, exclusionary marketing, or resident profiling) which can damage trust. Ensuring that tourism data practices are transparent, equitable, and GDPR-compliant is therefore a major governance challenge, especially as technologies continue to evolve faster than regulatory frameworks.

High costs and limited technical capacity

Tourism data collection and analysis often require significant financial and human resources (resources that many local and regional DMOs lack). High-quality data systems involve costs related to software, data purchasing, technical infrastructure, staff training, and sometimes external consultancy. For many destinations, particularly in rural or less developed areas, these investments are beyond reach, resulting in fragmented or rudimentary data practices.

Moreover, the technical expertise required to manage and interpret complex datasets (such as integrating data from multiple platforms, conducting geospatial analysis, or applying predictive modeling) is not always available in-house. This skills gap limits the ability of many DMOs to extract meaningful insights from data or to fully capitalize on emerging technologies such as AI and real-time analytics and to participate in data-sharing networks or EU-wide initiatives. Capacity limitations hinder collaboration with the private sector or participation in larger data-sharing networks. Without targeted investment in digital skills, staff development, and funding mechanisms, many destinations risk being left behind in the shift toward data-driven tourism governance.

Real-Time Data Collection and Utilization

In an increasingly fast-paced tourism environment, the ability to collect and utilize real-time data is becoming essential (but remains underdeveloped across many EU destinations. Real-time insights can enable more agile destination management, such as dynamic crowd control, real-time mobility coordination, or immediate responses to visitor feedback. Yet despite the availability of tools like sensors, mobile data, smart signage, and dynamic dashboards, many destinations still rely heavily on static, historical datasets that do not reflect current conditions. This delay in data processing limits responsiveness and decision-making accuracy, especially in moments of disruption such as natural disasters, public health emergencies, or sudden shifts in demand.

Furthermore, implementing real-time systems often requires partnerships with technology providers, significant IT infrastructure, and continuous data maintenance, all of which present technical and financial challenges. In addition, real-time data, by its nature, raises complex issues of interpretation, noise, and decision overload. Harnessing its potential requires not only advanced technology, but also clearly defined governance protocols and the analytical capacity to translate raw data into actionable insights

2.3 Data and data sets gathered within D3HUB

To gather the data sets existing at the level of each DMO, the data gathering tool was structured in a first survey. The questions included in the survey, are related to a reduced number of indicators that are explained in section.

The survey is structured in different sections starting from general data from the DMO. Taking into account that not all DMOs are able to gather all types of data the survey was prepared to allow YES/NO answer In order to continue filling in the survey. The survey can be found in pdf version as an Annex 2 to this deliverable

This first survey is not addressed to gather data itself, but to get a knowledge on the existing data sets that each DMO can share with D3HUB.

For each data sets the following aspects are requested:

- Frequency
- NUTs level
- Source of data
- Format
- Period covered

The survey, 39 out of 40 DMOs answered the survey, and they offered the answers that are available in Annexe 3.

The second step of the process consists in bilateral meeting with each DMO in order to identify clearly which data are the DMOs able to share in reality. During the first meetings, not all data identified is really able to be shared due to the fact that the DMOs are not really the data owners.

A number of meetings are being organised with all DMOs in order to help them gather and share data.

As defined in the project, some DMOs will be selected as frontrunners and those will be the ones helping to shape the first mock-up of the dashboard.

3 Mapping data initiatives

The transition toward a more sustainable tourism ecosystem in the EU requires a robust, coordinated, and evidence-based approach to data management. As destinations seek to align their operations with sustainability principles, the availability of reliable, comparable, and relevant tourism data becomes critical. A wide variety of initiatives and frameworks have emerged at global, European, and national levels to support the measurement of sustainability in tourism through statistical indicators and methodological guidance. However, this evolving landscape remains fragmented, often inconsistent, and underutilised by many DMOs. To inform the indicator selection process for D3HUB and build a more coherent monitoring and benchmarking system, this chapter presents a structured overview of existing data initiatives related to sustainable tourism. The analysis partially feeds on "Transition Pathways Expert Group. (2024). Harmonising Tourism Statistics for Sustainability: Report of the T4T Expert Group. European Commission". https://transition-pathways.europa.eu/knowledge-documents/harmonising-tourism-statistics-sustainability-report-t4t-expert-group.

3.1 Overview of initiatives

This section provides an overview of the most relevant initiatives and frameworks identified in the T4T Expert Group's *Mapping of Initiatives and Frameworks for Sustainable Tourism Statistics*. These initiatives play a central role in the current landscape of data and indicator development for sustainable tourism at international and European levels. Their scope ranges from methodological frameworks and indicator sets to policy instruments and technical support efforts. The initiatives included here have been selected based on their relevance for measuring the sustainability of tourism in the European context and their alignment with broader policy goals, such as the green and digital transition, data harmonization, and sustainable destination management.

UN Tourism proposals

One of the most significant and advanced international efforts in recent years is being led by UN Tourism (formerly UNWTO) through the development of a comprehensive Statistical Framework for Measuring the Sustainability of Tourism (SF-MST). This statistical framework seeks to systematically integrate environmental, social, and economic dimensions of tourism within a unified measurement structure. It builds on the foundational methodologies of the Tourism Satellite Account (TSA) and the System of Environmental-Economic Accounting (SEEA), enabling countries and destinations to move beyond traditional economic indicators and begin assessing tourism's broader sustainability impacts (such as pressure on natural resources, greenhouse gas emissions, social equity, and quality of life).

As part of the ongoing implementation of this framework, UN Tourism has also led the development of a **proposal for a core set of MST-aligned indicators** to guide national and subnational measurement efforts. These indicators are intended to be both policy-relevant and statistically robust, and are currently being refined through collaborative engagement with national statistical offices, tourism authorities, and pilot countries.

A key milestone in this process is the recent publication MST indicator proposal (Moniche Bermejo, Uresandi Espinosa, Taroncher Verdaguer, Moniche Bermejo, & Díaz Díez, 2024)[2], which presents the

[2] **Moniche Bermejo, A., Uresandi Espinosa, N., Taroncher Verdaguer, L., Moniche Bermejo, L., & Díaz Díez, B.** (2024). *Proposal of Indicators for Measuring the Sustainability of Tourism Statistical Framework (MST SF 2024).* UN Tourism.

first proposal of indicators aligned with the SF-MST. This publication is expected to play a pivotal role in guiding the **deliberations of the UN Tourism Expert Group on MST**. It provides a working basis for the eventual **agreement on a globally accepted, common set of sustainability indicators** for tourism to be applied by countries and destinations worldwide.

In parallel, the **International Network of Sustainable Tourism Observatories (INSTO)** (also facilitated by UN Tourism) continues to support destinations in the practical application of sustainability monitoring. INSTO members track a minimum set of issue areas such as seasonality, employment, local satisfaction, and energy use, while also developing their own context-specific indicators. The INSTO network fosters transparency, shared learning, and data-informed decision-making, positioning it as a key vehicle for local implementation of MST principles.

These efforts collectively reflect a growing international consensus on the importance of moving toward **standardized, multi-dimensional, and comparable tourism sustainability data systems**, with SF-MST as the cornerstone of a globally coordinated approach.

The Glasgow Declaration on climate action in tourism

The Glasgow Declaration on Climate Action aims to implement commitments that support the global goal of halving emissions by the next decade and achieving net-zero emissions before 2050. As part of these efforts, signatories commit to annually reporting on their progress towards interim and long-term targets and the actions taken.

In March 2023, UN Tourism, supported by Germany's Federal Ministry for the Environment and in collaboration with UN Climate Change, published the report "Climate Action in the Tourism Sector – An overview of methodologies and tools to measure greenhouse gas emissions.".[3] This publication offers a comprehensive review of GHG emissions measurement in tourism and evaluates the sector's climate action efforts. It details existing methodologies, outlines the guiding frameworks, and provides tools for practitioners to measure emissions. The report is pivotal in advancing the Glasgow Declaration's implementation, emphasising the measurement of emissions as a primary requirement for signatories, and ensuring that these methodologies align with UN Climate Change standards.

This report underscores the challenges in measuring tourism emissions, primarily due to the use of residential or territorial principles in different methodologies. Additionally, the report explores the complexity of attributing responsibility for indirect tourism effects, presenting dilemmas such as whether the tourism sector or the agricultural sector should be held accountable for CO2 emissions from the food consumed by tourists.

It is clear that the tourism sector needs to undertake substantial efforts to reduce its emissions, especially from transportation. Although new technologies show potential for decarbonizing transport fleets, technology alone is unlikely to be a comprehensive solution to climate change. Consequently, managing air travel flows effectively should be an integral part of a wider strategy to mitigate environmental impact.

MST is based as much as possible on existing internationally agreed measurement frameworks, statistical infrastructures and data. One of the features of the Statistical Framework for MST is the link

Retrieved from http://pre-webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2024-11/NOV_24_Proposal_Indicator_MST_SF_2024.pdf

[3] https://www.e-unwto.org/doi/10.18111/9789284423927.

between the Tourism Satellite Account (TSA) and the System of Economic-Environmental accounting (SEEA). One of the main accounts in this sense relates to the generation of GHG emissions by the tourism industries. Various MST pilots have assessed GHG emissions in tourism industries, yielding insightful findings. For instance, in Germany, the tourism sector is slightly more emission-intensive than the national average, accounting for 4.5% of total emissions, primarily due to transportation services. In Italy, tourism's consumption in 2015 represented 5.2% of the total economy's output, generating 5.9% of its GHGs and consuming 5.5% of the total energy use. Meanwhile, in Sweden, passenger transport services were the major contributors to the sector's GHG emissions in 2018, accounting for over 60% of its total emissions.

One challenge identified is how to fairly allocate responsibility for aviation emissions and avoid double counting. The current approach attributes aviation emissions to the country where the airline is registered, aligning with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) by the International Civil Aviation Organization (ICAO). This scheme, supported by 116 nations, aims to ensure carbon-neutral growth in international flight emissions post-2020.

Further efforts are necessary to define clear guidelines and consensus on measuring aviation emissions by non-aviation tourism stakeholders, especially at the destination level. There is a pressing need for methodologies that are both straightforward and practical to encourage reluctant stakeholders to start measuring emissions, with the goal of progressing to more detailed and complex measurements as capacity grows.

Transparent measurement and accounting are vital to prevent greenwashing and demonstrate that the tourism sector is contributing to climate action. The challenges associated with measurement should not deter immediate efforts toward decarbonization. The sector is aware of the primary sources of its carbon footprint and the urgent need for rapid energy and operational transitions to mitigate these impacts.

EUROSTAT and work conducted by Statistics Sweden

EUROSTAT, the statistical office of the European Union, plays a pivotal role in the collection and harmonization of tourism-related data across EU Member States. While its core work has traditionally focused on areas such as accommodation, arrivals, and expenditure, recent years have seen a significant expansion towards integrating sustainability dimensions into tourism statistics.

Building on earlier efforts—such as the 2006 methodological study by Statistics Sweden on sustainable tourism—Eurostat has intensified its focus on developing a comprehensive framework of sustainability indicators. These indicators aim to capture economic, environmental, social, cultural, and digital dimensions of tourism using existing official statistics, with a pragmatic, bottom-up approach that avoids increasing the reporting burden on the tourism sector.

Between 2020 and 2023, groundwork was laid in collaboration with Member States to prepare this framework. By 2025, the first set of sustainability indicators is expected to be published. These will include:

- Economic indicators (e.g., Tourism Satellite Accounts, Balance of Payments),
- Labour market data (e.g., employment, job characteristics),
- Social and cultural metrics (e.g., participation, tourism pressure, seasonality),
- Environmental factors (e.g., transport-related emissions, links with natural resource accounts),
- Digitalisation metrics (e.g., tourism via online platforms).

Notably, Eurostat also coordinates its efforts with international initiatives such as the UN Tourism's Statistical Framework for Measuring the Sustainability of Tourism (SF-MST) and the Joint Research Center (JRC) Tourism Dashboard. Acknowledging current limitations in environmental and qualitative data (e.g., water use, satisfaction), Eurostat emphasizes the iterative nature of the framework, aiming for gradual improvement in data granularity and thematic coverage.

Additionally, Eurostat has begun embracing alternative data sources such as human mobility data and platform economy statistics. Tourism is seen as a frontrunner in leveraging these innovative approaches, while questions of data governance, legal frameworks, and sustained access remain under discussion.

European tourism indicator system (ETIS)

The **European Tourism Indicator System (ETIS)**[4] was developed by the European Commission to help destinations monitor and improve their sustainability performance. ETIS provided a practical tool, created a peer-group momentum, fostered DMOs to absorb knowledge about the importance of sustainable tourism indicators, to develop their own systems to measure their own progress (Font et al, 2023)[5]. There are multiple examples of destination consortia that adapted ETIS for their own purposes. For instance, the Interreg MITOMED + consortium adopted 33 out of the 43 core ETIS indicators, according to the needs of regions and municipalities in the Mediterranean. Green Destinations of South East Europe adopted the complete ETIS methodology and set of indicators. In addition, ETIS was often mentioned as the starting point for raising awareness within DMOs about the use of indicators, who went on to adopt either methodologies like Green Destinations, joined likeminded destination associations like NECSTouR, or the UN Tourism International Network for Sustainable Tourism Observatories.

However, currently, there is limited ongoing support from the European Commission for this initiative, and destinations or statistical bodies have not widely adopted the ETIS proposal.

OECD tourism committee

The **OECD Tourism Committee** has played a crucial role in providing high-level guidance and policy recommendations on tourism sustainability. Its work focuses on the integration of tourism into broader national sustainability and resilience strategies, especially in the context of recovery from the COVID-19 pandemic and the green transition.

Last OECD Tourism Trends and Policies report[6] have emphasised that effective sustainable tourism policies require reliable, timely, and policy-relevant data. A strategic, policy-led approach to indicator development, designed collaboratively with public and private stakeholders, ensures that data supports real decision-making.

While many economic indicators are well established, there are still major data gaps in measuring environmental and social impacts. Efforts to link the TSA and SEEA frameworks, alongside the use of

[4] https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable/indicators_en

[5] Font, X., Torres-Delgado, A., Crabolu, G., Palomo Martinez, J., Kantenbacher, J., & Miller, G. (2023). The impact of sustainable tourism indicators on destination competitiveness: The European Tourism Indicator System. Journal of Sustainable Tourism, 31(7), 1608-1630.

[6] OECD (2024), *OECD Tourism Trends and Policies 2024*, OECD Publishing, Paris, https://doi.org/10.1787/80885d8b-en.

new data sources such as mobile or satellite data, are helping to close these gaps; however, challenges persist in terms of availability, comparability, and access.

The European Tourism Data Space offers significant potential to improve data sharing and innovation but must be made accessible to SMEs and small destinations through dedicated support.

Setting clear targets and improving data literacy among tourism decision-makers is essential to ensure that indicators are used effectively to guide sustainability strategies at all levels..

EU tourism dashboard[7]

The EU Tourism Dashboard is a policy tool designed to guide tourism decision-making at national and regional levels, focusing on sustainability and the green and digital transitions in the sector. Proposed by EU Member States in May 2021 and launched in October 2022, the Dashboard compiles key indicators related to sustainable tourism. It was developed alongside the Transition Pathway and is a vital tool in the European Agenda for Tourism 2030.

The Dashboard includes indicators that monitor the sector's performance in areas such as environmental sustainability, digital transformation, and socio-economic contributions. These indicators are discussed annually with Member States and form the basis for policy decisions. Despite challenges in gathering comprehensive and representative data across diverse EU countries, the Dashboard now offers accessible data through APIs and standardized formats. Future plans include expanding its dataset with additional indicators, ensuring data quality through rigorous checks, and maintaining transparency regarding data gaps.

The Dashboard's framework is based on three main pillars: Green (environmental sustainability), Digital (technological innovation), and Socio-economic (economic and employment impacts), and Basic descriptors. It uses data from Eurostat, European Environmental Agency, Ookla, Blue flags, UNESCO, Eurocontrol, DG ENV and Tripadvisor to assess tourism's sustainability and support informed policy-making. It is a collaborative effort between DG GROW and the JRC, with continuous consultation with Member States.

Technical support instrument projects related to sustainable tourism

The European Union's Technical Support Instrument (TSI) is a key mechanism for providing tailored expertise to Member States, aiding them in designing and implementing projects that foster sustainable growth. It offers support for a wide range of policy areas, including the development of sustainable tourism practices. The TSI projects are designed to help national and regional authorities address specific challenges and enhance their capacity to implement EU legislation and best practices. In the area of sustainable tourism, the TSI has played a crucial role in supporting Member States in developing robust methodologies for measuring and managing their tourism impacts.

The European Commission, in collaboration with the OECD, has been instrumental in guiding and supporting these TSI projects. The OECD has provided support to the different projects with insights and methodologies, ensuring that the projects align with international best practices and contribute to the EU's broader sustainability goals.

[7] https://tourism-dashboard.ec.europa.eu/

In this context, Spain, Malta, and Slovenia have developed their own TSI's funded by the EU and with the support of the OECD to advance their sustainable tourism measurement:

TSI Spain[8]: Tailoring sustainability measurement at the regional level

Spain's tourism sector, a vital economic engine, faced the challenge of balancing its rapid recovery with the increasing environmental and social pressures that accompany high tourist volumes. Recognizing the limitations of solely relying on economic indicators, the TSI project in Spain aimed to develop a comprehensive system for measuring and monitoring tourism sustainability at the regional level. This initiative was crucial for transitioning towards more balanced development models that prioritize both economic prosperity and the well-being of local communities and the environment.

The project focused on four diverse regions: Andalusia, Catalonia, Navarra, and the Region of Valencia. Each region presented unique tourism characteristics and challenges, requiring a tailored approach. The methodology employed a policy-led approach, first identifying key policy issues and then selecting relevant indicators. This ensured that the measurement framework directly addressed the most pressing concerns, such as economic benefits, seasonality, local resident perceptions, climate change mitigation, and water management.

The resulting indicator framework consisted of 21 core indicators, measured by 47 core metrics, and 9 supplementary indicators, measured by 10 metrics, to capture regional specificities. A subset of 10 "priority" metrics was also identified for simplified monitoring. This multi-tiered approach allowed for both a comprehensive overview and a focused assessment of key sustainability aspects. The framework's design emphasized comparability with international standards while reflecting the local realities of each region.

The project highlighted the importance of collaboration between data specialists and policymakers. By aligning "top-down" policy priorities with "bottom-up" data availability, the project ensured that the indicators were both relevant and actionable. The report also emphasized the need for continuous review and improvement of the indicator system, identifying areas for future development, such as refining methodologies and closing data gaps on cultural heritage, greenhouse gas emissions, waste, and digitalization.

TSI Malta[9]: Strengthening the evidence base for a sustainable tourism future

Tourism is a cornerstone of Malta's economy, yet its rapid growth has led to environmental and social challenges, particularly in a small island context. The TSI project in Malta aimed to develop a practical approach to monitor and benchmark tourism sustainability, considering the island's unique characteristics.

The project adopted a policy-led approach, guided by the Malta Tourism Strategy 2021-2030, which envisions a sustainable and responsible tourism sector. The specific challenges faced by Malta, such as limited land resources, high population density, and vulnerability to coastal overdevelopment, shaped the project's focus. The project identified 37 core indicators, structured around five key policy priorities: optimizing tourism's economic contribution, targeting quality visitors, protecting natural and cultural heritage, fostering community well-being, and promoting a thriving workforce.

[8] OECD (2024), Measuring and Monitoring the Sustainability of Tourism at Regional Level in Spain: Indicator Framework and Compilation Guide, OECD Studies on Tourism, OECD Publishing, Paris, https://doi.org/10.1787/7f116e7f-en.

[9] OECD (2025-01-31), "Strengthening the evidence base for a sustainable tourism future in Malta: A toolkit to operationalize a tailored set of sustainability indicators", OECD Tourism Papers, 2025/01, OECD Publishing, Paris. http://dx.doi.org/10.1787/aa270ff4-en

The indicators addressed a wide range of issues, including tourism's contribution to GDP, visitor length of stay, carbon footprint, waste production, resident perceptions, and workforce development. The project emphasized the importance of collaboration between data specialists and policymakers to ensure the indicators' relevance and feasibility.

A key outcome of the project was the development of a toolkit to operationalize the indicators, bridging the gap between measurement and action. The toolkit outlined five levers for incorporating sustainability indicators into decision-making: market selection and growth strategies, budget allocation, recruitment and training, stakeholder engagement, and strategic partnerships. The report also identified areas for future development, such as refining methodologies for measuring waste production, water consumption, and accessibility.

TSI Slovenia[10]: Towards a smaller footprint and greater value

Slovenia, known for its green tourism, sought to further enhance its sustainable tourism practices through the TSI project. The project aimed to develop a set of indicators to inform evidence-based policy development, aligning with the Slovenian Tourism Strategy 2022-2028, which envisions a tourism sector with a smaller environmental footprint and greater value for all stakeholders.

Given Slovenia's focus on nature-based tourism, the project prioritized decarbonization and reducing the environmental impact of tourism. The project identified 20 core indicators and 35 metrics, structured around five policy priorities: quality and value of tourism products, tourism's contribution to other industries and sustainable development, satisfaction of stakeholders, decarbonization and rebalancing, and effective management structures.

The indicators covered a range of issues, including tourism value added, seasonality, resident and guest satisfaction, carbon footprint, and resource use. The project emphasized the importance of collaboration between data specialists and policymakers, highlighting the need to align "top-down" policy priorities with "bottom-up" data availability.

The report identified areas for future development, such as refining methodologies for measuring resident satisfaction, carbon emissions, water consumption, and sustainable mobility. The project aimed to ensure that the indicator system remained "fit for purpose" through continuous review and improvement.

[10] OECD (2025-02-04), "Strengthening the evidence base for a sustainable tourism future in Slovenia: A tailored set of sustainability indicators", OECD Tourism Papers, 2025/02, OECD Publishing, Paris. http://dx.doi.org/10.1787/12e6bf3e-en

4 Selection of indicators

The selection of indicators for monitoring and benchmarking sustainability in tourism is a crucial task that requires careful consideration of existing frameworks, methodologies, and data sources. In this context, the latest MST indicator document (Moniche Bermejo et al., 2024) plays an important role in guiding the development of the D3HUB project's indicator selection process. This publication, which presents a proposal for a core set of indicators aligned with the UN Tourism Statistical Framework for Measuring the Sustainability of Tourism (SF-MST)[11], offers a comprehensive, internationally recognized approach for measuring and monitoring sustainable tourism.

The relevance of this publication as a foundation for indicator selection lies in its thorough review of existing initiatives and frameworks for tourism sustainability, making it a robust reference for the D3HUB initiative. Specifically, the **SF-MST** is a globally endorsed framework developed by **UN Tourism** that integrates environmental, social, and economic dimensions of tourism within a unified measurement structure. By drawing on the SF-MST and other established frameworks such as the **Tourism Satellite Account (TSA)** and the **System of Environmental-Economic Accounting (SEEA)**, this publication provides a well-rounded and scientifically grounded methodology for assessing the sustainability impacts of tourism at various levels. This alignment with globally recognized standards ensures that the selected indicators will be relevant, comparable, and actionable across different contexts.

The publication's proposed indicators have been developed through ensuring that they are **policy-relevant**. By taking this publication as a starting point, the D3HUB initiative benefits from a strong foundation of **building on previous initiatives, feasibility**, and **global alignment**, making the proposed set of indicators more practical and adaptable for use at the national and regional levels.

In addition to its alignment with SF-MST, the publication offers valuable insights into the practical challenges that destinations face in measuring sustainability in tourism. For instance, it addresses data gaps, the need for proxy indicators, and the feasibility of collecting data at various governance levels, which are critical factors in developing indicators that are both **aspirational** and **implementable**.

The full list of 72 indicators (for more detail on each one of the indicators, their proposed metrics, dimensions, themes and multi-level approach, please refer to the publication (ANNEX 4)) from the mentioned publication is the following:

[11] UN Tourism. (2024, February). *Statistical Framework for Measuring the Sustainability of Tourism (SF-MST)* [Draft]. https://webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2024-02/SF-MST_version_WEB_FEB2024.pdf

Table 2 Indicators from publication Proposal of Indicators for Measuring the Sustainability of Tourism Statistical Framework (MST SF 2024). UN Tourism. Retrieved from http://pre-webunwto.s3.eu-west-1.amazonaws.com/s3fs-public/2024-11/NOV_24_Proposal_Indicator_M

DIMENSION	THEME	INDICATOR NAME
General	Tourism Flows	Average length of stay
		Visitor arrivals
		Nights spent
		Accommodation occupancy
	Tourism concentration	Tourism concentration
		Combined tourism concentration
		Second home ratio
		Tourism capacity
		Tourism employment concentration
		Concentration of tourism establishments
	Tourism seasonality	Seasonality of visitor arrivals
		Seasonality of visitor expenditure
		Seasonality of visitor satisfaction
		Seasonality of tourism employment
	Tourism visitor dependency	Ratio of same-day trips over overnight trips
		Inbound vs domestic visitor ratio
		Inbound vs domestic tourism expenditure ratio
		Percentage of repeat visitors
		Dependency ratio on top source markets
		Dependence on distant origins
		Tourism diversity
Economic	Visitor expenditure	Average tourism expenditure
		Total tourism expenditure per day
	Tourism economic structure	Size of tourism establishments
		Resident ownership of tourism establishments
		Survival of tourism enterprises
		Accommodation Occupancy
	Tourism economic performance	Output of Tourism characteristic products
		Contribution of tourism to GDP
	Distribution of economic benefits	Distribution of benefits to employees in tourism establishments

	Employment in tourism	Weight of the tourism employment
		Rate of employees
		Participation of women in employment
		Labour productivity of different tourism industries
	Tourism Investment	Contribution of tourism to investment
	Government tourism-related transactions	Tourism related government transactions
Social	Visitor Satisfaction	Tourists as victims of crime
		Satisfaction of visitors with their experience in the destination
		Visitor engagement
	Host Community Perception	Crime rate variation
		Perception of host communities of visitors
		Attitude of residents towards tourism activity
	Decent work	Distribution of benefits to employees in tourism establishments
		Average Hourly Earnings
		Tourism Employment conditions
		Participation of women in employment
		Gender Equality in tourism employment
		Vulnerable groups employment in tourism
		Employment stability
		Education and workforce composition in tourism employment
	Governance	Sustainability and Climate Action tools
		Sustainable Tourism Strategy Implementation
		Accessibility measures in the destination
		Tax contribution
		Specific tourism training provided to employeed persons in tourism
		Engagement of Host Community
Environmental	Ecosystem extent (for tourism areas)	Tourism activity in High-Quality Environmental Areas
	Environmental quality of tourism assets	Tourism Impact and Quality of Heritage and Natural Sites
		Quality of water tourism assets
		Environmental Quality of tourism establishments

	Energy flows	Tourism energy consumption
	Solid waste flows	Solid waste generated by tourism activity
		Solid Waste Recycling Rate in Tourism
		Food waste
	Water resources	Tourism wastewater
		Tourism water flows
	GHG emissions	Average length of stay
		Internal GhG emissions
		Tourism Carbon Footprint
	Land Use	Tourism spatial Footprint
	Infrastructures enabling sustainability	Electric charging stations
		Cycling routes

4.1 Indicator Selection per D3HUB cluster

Building on the foundation provided by the aforementioned publication, the indicator selection for the four D3HUB clusters has been carefully crafted to ensure that the chosen metrics are meaningful, actionable, and aligned with international standards as well as true to being able to address the data needs and requirements of D3HUBs pilot DMOs and clusters. These clusters, which represent key areas of sustainable tourism, are:

1. **Redistributing tourist flows in space and time**
2. **Managing the balance between residents, visitors, and stakeholders**
3. **Climate change mitigation and adaptation**
4. **Supporting emerging destinations to attract quality and sustainable tourism**

Each cluster requires specific indicators that address its unique challenges and opportunities. The selection of indicators has been made considering their **relevance**, **measurability**, and **policy impact**.

The following tables present the approach to a common set of indicators, per D3HUB cluster, designed to address and measure each cluster's needs. Each column of the table has been carefully defined to provide clear and detailed information on each indicator and its applicability at different levels of governance. Below is an explanation of each column header.

- **Indicator Name**: Describes the specific indicator proposed for monitoring sustainability within the cluster in line with the SF-MST indicator document (Moniche Bermejo et al., 2024) ensuring alignment with UN Tourism's SF-MST and other European initiatives.
    - **Indicators in light orange on this column on every table, mean that they are common indicators for all 4 D3HUB clusters**. Indicators that are relevant and applicable across all four D3HUB clusters – that is, these indicators reflect sustainability challenges or opportunities that must be addressed within all thematic areas.
    - By being able to identify these shared indicators visually, the table supports easier identification of specific metrics that contribute to a more detailed monitoring approach on each one of the clusters.

- **Match with EU Tourism Dashboard (EUTD).– Name in the EUTD Platform**: States whether the indicator has a corresponding match in the **EUTD**. This match indicates alignment with the currently existing European-level monitoring tool. If applicable, provides the exact name or label of the matched indicator as it appears on the EU Tourism Dashboard platform, facilitating cross-referencing.
- **Match with EUTD – NUTS**: Indicates the statistical territorial level(s) at which the indicator can be measured within the EUTD, following the EU's Nomenclature of Territorial Units for Statistics (NUTS). This is divided into:
    - **NUTS 0:** major socio-economic regions
    - **NUTS 2:** basic regions (for regional policies)
    - **NUTS 3:** small regions (for specific diagnoses)
- **Moniche Bermejo et al. (2024) - N (National), R (Regional), L (Local)**: Drawing from the information on the publication, these columns specify whether the indicator and its metrics are **relevant** and **feasible** to be measured and applied at this level of governance by a "Y" meaning Yes or an "N" meaning No.
- **Moniche Bermejo et al. (2024) - Potential Source**: Also from the information on the publication, this column suggests possible data sources for each indicator. These sources may include national statistics, administrative records, specific surveys, or international databases, providing guidance on where the data needed to measure each indicator can be obtained.
- **Feasibility – Color-coded Scheme:** This column uses a three-color scheme to visually represent the feasibility of measuring each indicator at the national, regional, and local levels. The colors indicate: **Green** for feasible, **Yellow** for partially feasible or high economic effort for gathering data, and **Red** for not feasible. This visual aid helps to quickly assess the practicality of implementing each indicator across different governance levels, supporting decision-making and prioritization in indicator measurement.

Table 3 Indicators for D3HUB cluster: Redistributing tourist flows in space and time

Indicator Name	Match with EUTD					Moniche Bermejo, A., Uresandi Espinosa, N., Taroncher Verdaguer, L., Moniche Bermejo, L., & Díaz Díez, B. (224).				Feasibility		
	Match	Name in the EUTD platform	NUTS0	NUTS2	NUTS3	N	R	L	Potential Source	N	R	L
Average length of stay	EUTD	Average length of stay	✓	✓	✓	Y	Y	Y	Accommodation records/Demand surveysHousehold Surveys			
Visitor arrivals (Inbound, Domestic/ Tourists, Same-day visitors)	EUTD	Arrivals	✓	✓		Y	Y	Y	Accommodation Recordss/MPD/visitor surveys/Household Surveys			
Nights spent	EUTD	Nights spent	✓	✓	✓	Y	Y	Y	Accommodation records/surveys			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Tourism concentration	EUTD	Tourism intensityTourism density	✓	✓	✓	Y	Y	Y	Accommodation records/surveys and census/register			
Combined tourism concentration						N	Y	Y	Accommodation records/surveys, land cover registries (e.g: Pan-European Corin			
Tourism capacity	EUTD	Tourism capacity	✓	✓	✓	Y	Y	Y	Accommodation records			
Tourism employment concentration						Y	Y	Y	Labour force surveys/Tourism Satellite Accounts (TSAs)/estimation from Visitor e			
Concentration of tourism establishments						Y	Y	Y	Accommodation records			
Seasonality of visitor arrivals	EUTD	Tourism seasonality(%) (only tourists)	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Seasonality of visitor expenditure						Y	Y	Y	Visitor expenditure surveys/Credit card data			
Seasonality of visitor satisfaction						Y	Y	Y	Visitor surveys			
Seasonality of tourism employment						Y	Y	Y	Labour force surveys and TSAs or only labour force surveys			
Ratio of same-day trips over overnight trips						Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Inbound vs domestic visitor ratio	EUTD	Share of foreign tourists	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Inbound vs domestic tourism expenditure ratio						Y	Y	Y	Visitor expenditure surveys/Credit card data			
Percentage of repeat visitors						Y	Y	Y	Visitor surveys			
Dependency ratio on top source markets	EUTD	Dependence on top 3 countries of origi	✓			Y	Y	Y	Accommodation records/surveys			
Dependence on distant origins	EUTD	Dependence on distant origins(%)	✓			Y	Y	Y	Accommodation records/surveys			
Tourism diversity (Distribution of tourism accommodation establishments across geogra	EUTD	Tourism diversity(index)	✓	✓	✓	Y	Y	Y	Accommodation records			
Average tourism expenditure	EUTD	Average tourism expenditure(PPS / nigh	✓			Y	Y	Y	Visitor expenditure surveys			
Total tourism expenditure per day						Y	Y	Y	Visitor expenditure surveys			
Size of tourism establishments	EUTD	Tourism enterprises by size	✓			Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)/National or regional accounts			
Resident ownership of tourism establishments						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Survival of tourism enterprises						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Output of tourism characteristic products						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys			
Contribution of tourism to GDP	EUTD	Direct economic contribution of tourism	✓			Y	Y	N	Tourism Satellite Accounts (TSAs) / estimation from Visitor expenditure surveys /			
Distribution of benefits to employees in tourism establishments						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys			
Weight of the tourism employment	EUTD	Share of employment in the tourism ec	✓			Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Rate of employees (Total number of direct tourism employees / direct tourism employed						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Labour productivity of different tourism industries						Y	Y	Y	National or regional Accounts and Labour force surveys			
Perception of host communities of visitors						Y	Y	Y	Host Community surveys			
Attitude of residents towards tourism activity						Y	Y	Y	Host Community surveys			
Employment stability (coefficient of variance of monthly direct tourism employment)						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Education and workforce composition in tourism employment						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Sustainability and climate action tools						Y	Y	Y	Statistics Institute / Public Authorities			
Sustainable tourism strategy implementation						Y	Y	Y	Public Authorities			
Accessibility measures in the destination						Y	Y	Y	Public Authorities / Tourism Business Surveys			
Tax contribution (Amount of tourism tax revenues per inhabitant)						Y	Y	Y	Public Authorities and census/registry			
Specific tourism training provided to employed persons in tourism						Y	Y	Y	Education institutions			
Tourism activity in high-quality environmental areas	EUTD	Share of accommodations in areas with	✓	✓	✓	Y	Y	Y	EUTD			
Tourism impact and quality of heritage and natural sites						Y	Y	Y	UNESCO https://whc.unesco.org/en/soc/?action=list & id_threats=118			
Tourism spatial Footprint (Land Use Change due to Tourism Development: extent of land						Y	Y	Y	Public Administration			
Cycling routes						Y	Y	Y	Opencyclemap			
Share of protected/designated land	EUTD	Share of protected/designated land	✓	✓	✓							
Cultural assets density	EUTD	Cultural assets density	✓	✓	✓							
UNESCO and European heritage sites	EUTD	UNESCO and European heritage sites	✓									

Table 4 Indicators for D3HUB cluster: Managing the balance between residents, visitors, and stakeholders

Indicator Name	Match with EUTD					Moniche Bermejo, A., Uresandi Espinosa, N., Taroncher Verdaguer, L., Moniche Bermejo, L., & Díaz Díez, B. (224).				Feasibility		
	Match	Name in the EUTD platform	NUTS0	NUTS2	NUTS3	N	R	L	Potential Source	N	R	L
Average length of stay	EUTD	Average length of stay	✓	✓	✓	Y	Y	Y	Accommodation records/Demand surveysHousehold Surveys			
Visitor arrivals (Inbound, Domestic/ Tourists, Same-day visitors)	EUTD	Arrivals	✓	✓		Y	Y	Y	Accommodation Recordss/MPD/visitor surveys/Household Surveys			
Nights spent	EUTD	Nights spent	✓	✓	✓	Y	Y	Y	Accommodation records/surveys			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Tourism concentration	EUTD	Tourism intensityTourism density	✓	✓	✓	Y	Y	Y	Accommodation records/surveys and census/register			
Combined tourism concentration						N	Y	Y	Accommodation records/surveys, land cover registries (e.g: Pan-European Corin			
Second home ratio						Y	Y	Y	Survey of Essential Population and Housing Characteristics			
Tourism capacity	EUTD	Tourism capacity	✓	✓	✓	Y	Y	Y	Accommodation records			
Tourism employment concentration						Y	Y	Y	Labour force surveys/Tourism Satellite Accounts (TSAs)/estimation from Visitor e			
Concentration of tourism establishments						Y	Y	Y	Accomodation records			
Seasonality of visitor arrivals	EUTD	Tourism seasonality(%) (only tourists)	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Seasonality of visitor expenditure						Y	Y	Y	Visitor expenditure surveys/Credit card data			
Seasonality of visitor satisfaction						Y	Y	Y	Visitor surveys			
Seasonality of tourism employment						Y	Y	Y	Labour force surveys and TSAs or only labour force surveys			
Ratio of same-day trips over overnight trips						Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Inbound vs domestic visitor ratio	EUTD	Share of foreign tourists	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Inbound vs domestic tourism expenditure ratio						Y	Y	Y	Visitor expenditure surveys/Credit card data			
Percentage of repeat visitors						Y	Y	Y	Visitor surveys			
Dependency ratio on top source markets	EUTD	Dependence on top 3 countries of origi	✓			Y	Y	Y	Accommodation records/surveys			
Dependence on distant origins	EUTD	Dependence on distant origins(%)	✓			Y	Y	Y	Accommodation records/surveys			
Tourism diversity (Distribution of tourism accommodation establishments across geogra	EUTD	Tourism diversity(index)	✓	✓	✓	Y	Y	Y	Accommodation records			
Average tourism expenditure	EUTD	Average tourism expenditure(PPS / nigh	✓			Y	Y	Y	Visitor expenditure surveys			
Total tourism expenditure per day						Y	Y	Y	Visitor expenditure surveys			
Size of tourism establishments	EUTD	Tourism enterprises by size	✓			Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)/National or regional accounts			
Resident ownership of tourism establishments						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Survival of tourism enterprises						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Output of tourism characteristic products						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys			
Contribution of tourism to GDP	EUTD	Direct economic contribution of tourisr	✓			Y	Y	N	Tourism Satellite Accounts (TSAs) / estimation from Visitor expenditure surveys /			
Distribution of benefits to employees in tourism establishments						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys			
Weight of the tourism employment	EUTD	Share of employment in the tourism ec	✓			Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Rate of employees (Total number of direct tourism employees / direct tourism employed						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Participation of women in employment						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or only Labour force			
Labour productivity of different tourism industries						Y	Y	Y	National or regional Accounts and Labour force surveys			
Contribution of tourism to investment						Y	Y	N	National or regional Accounts			
Tourism related government transactions						Y	Y	Y	Public Administration Budgets; Data might be sourced from national accounts			
Tourists as victims of crime						Y	Y	Y	Law Enforcement data reported to statistic authority, Accommodation records/			
Satisfaction of visitors with their experience in the destination						Y	Y	Y	Visitor surveys			
Visitor engagement (e.g. % of visitors attending and participating in cultural performances)						Y	Y	Y	Visitor surveys			
Crime rate variation (perception)						Y	Y	Y	Host Community surveys			
Perception of host communities of visitors						Y	Y	Y	Host Community surveys			
Attitude of residents towards tourism activity						Y	Y	Y	Host Community surveys			
Average hourly earnings						Y	Y	Y	Statistics institute (e.g. Labour force surveys) and TSAs			
Tourism employment conditions						Y	Y	Y	Statistics institute (e.g. Labour force surveys) and TSAs			
Gender equality in tourism employment						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Vulnerable groups employment in tourism						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Employment stability (coefficient of variance of monthly direct tourism employment)						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Education and workforce composition in tourism employment						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys			
Sustainability and climate action tools						Y	Y	Y	Statistics Institute / Public Authorities			
Sustainable tourism strategy implementation						Y	Y	Y	Public Authorities			
Accessibility measures in the destination						Y	Y	Y	Public Authorities / Tourism Business Surveys			
Tax contribution (Amount of tourism tax revenues per inhabitant)						Y	Y	Y	Public Authorities and census/registry			
Specific tourism training provided to employed persons in tourism						Y	Y	Y	Education institutions			
Engagement of host community						Y	Y	Y	Host Community surveys			

Table 5 Indicators for D3HUB cluster: Climate change mitigation and adaptation

Indicator Name	Match with EUTD					Moniche Bermejo, A., Uresandi Espinosa, N., Taroncher Verdaguer, L., Moniche Bermejo, L., & Díaz Díez, B. (224).				Feasibility		
	Match	Name in the EUTD platform	NUTS0	NUTS2	NUTS3	N	R	L	Potential Source	N	R	L
Average length of stay	EUTD	Average length of stay	✓	✓	✓	Y	Y	Y	Accommodation records/Demand surveysHousehold Surveys			
Visitor arrivals (Inbound, Domestic/ Tourists, Same-day visitors)	EUTD	Arrivals	✓	✓		Y	Y	Y	Accommodation Recordss/MPD/visitor surveys/Household Surveys			
Nights spent	EUTD	Nights spent	✓	✓	✓	Y	Y	Y	Accommodation records/surveys			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Tourism capacity	EUTD	Tourism capacity	✓	✓	✓	Y	Y	Y	Accommodation records			
Inbound vs domestic visitor ratio	EUTD	Share of foreign tourists	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys			
Inbound vs domestic tourism expenditure ratio						Y	Y	Y	Visitor expenditure surveys/Credit card data			
Dependency ratio on top source markets	EUTD	Dependence on top 3 countries of origi	✓			Y	Y	Y	Accommodation records/surveys			
Dependence on distant origins	EUTD	Dependence on distant origins(%)	✓			Y	Y	Y	Accommodation records/surveys			
Tourism diversity (Distribution of tourism accommodation establishments across geogra	EUTD	Tourism diversity(index)	✓	✓	✓	Y	Y	Y	Accommodation records			
Average tourism expenditure	EUTD	Average tourism expenditure(PPS / nigh	✓			Y	Y	Y	Visitor expenditure surveys			
Total tourism expenditure per day						Y	Y	Y	Visitor expenditure surveys			
Size of tourism establishments	EUTD	Tourism enterprises by size	✓			Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)/National or regional accounts			
Resident ownership of tourism establishments						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Survival of tourism enterprises						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)			
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO			
Output of tourism characteristic products						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys			
Contribution of tourism to GDP	EUTD	Direct economic contribution of tourisr	✓			Y	Y	N	Tourism Satellite Accounts (TSAs) / estimation from Visitor expenditure surveys /			
Weight of the tourism employment	EUTD	Share of employment in the tourism ec	✓			Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Rate of employees (Total number of direct tourism employees / direct tourism employed						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V			
Labour productivity of different tourism industries						Y	Y	Y	National or regional Accounts and Labour force surveys			
Sustainability and climate action tools						Y	Y	Y	Statistics Institute / Public Authorities			
Sustainable tourism strategy implementation						Y	Y	Y	Public Authorities			
Tax contribution (Amount of tourism tax revenues per inhabitant)						Y	Y	Y	Public Authorities and census/registry			
Specific tourism training provided to employed persons in tourism						Y	Y	Y	Education institutions			
Tourism activity in high-quality environmental areas	EUTD	Share of accommodations in areas with	✓	✓	✓	Y	Y	Y	EUTD			
Tourism impact and quality of heritage and natural sites						Y	Y	Y	UNESCO https://whc.unesco.org/en/soc/?action=list & id_threats=118			
Quality of water tourism assets	EUTD	Excellent bathing water	✓	✓	✓	Y	Y	Y	EUTD			
Environmental quality of tourism establishments	EUTD	Environmental labels and schemes(Nur	✓	✓	✓	Y	Y	Y	EUTD			
Tourism energy consumption (e.g. Expenditure on energy by accommodation establishr						Y	Y	N	Structural Business Statistics in the Service Sector (annual water expenses in eu			
Solid waste generated by tourism activity						Y	Y	N	SEEA - TSA			
Solid Waste Recycling Rate in Tourism						N	N	N	NSO			
Food waste (e.g. Total food waste (organic waste) per visitor)						Y	N	N	NSO			
Tourism wastewater (e.g Tourism wastewater per tourist overnight)						N	N	N				
Tourism water flows (e.g. Tourism water use per visitor)						Y	N	N	TSA + SEEA			
Internal GhG emissions (e.g. Internal tourism GHG emissions per visitor)						Y	Y	N	SEEA - TSA			
Tourism Carbon Footprint						Y	Y	Y	MPD or visitor surveys / TSA SEEA			
Tourism spatial Footprint (Land Use Change due to Tourism Development: extent of lanc						Y	Y	Y	Public Administration			
Electric charging stations						Y	Y	Y	TenTEC - EU			
Cycling routes						Y	Y	Y	Opencyclemap			
Air travel emission intensity	EUTD	Air travel emission intensity	✓			y	y	y	For EU destinations: Eurocontrol			
Tourism GHG intensity	EUTD	Tourism GHG intensity	✓			Y	Y	N	SEEA - TSA			
Tourism energy intensity	EUTD	Tourism energy intensity	✓			Y	N	N	SEEA - TSA			
Share of trips by train	EUTD	Share of trips by train	✓			Y	Y	Y	Visitor Surveys			
Share of protected/designated land	EUTD	Share of protected/designated land	✓	✓	✓							
Presence of Blue flag awarded sites	EUTD	Presence of Blue flag awarded sites	✓	✓	✓	y	y	y	https://www.blueflag.global/			

Table 6 Indicators for D3HUB cluster: Supporting emerging destinations to attract quality and sustainable tourism

Indicator Name	Match with EUTD					Moniche Bermejo, A., Uresandi Espinosa, N., Taroncher Verdaguer, L., Moniche Bermejo, L., & Díaz Díez, B. (224).				Feasibility		
	Match	Name in the EUTD platform	NUTS0	NUTS2	NUTS3	N	R	L	Potential Source	N	R	L
Average length of stay	EUTD	Average length of stay	✓	✓	✓	Y	Y	Y	Accommodation records/Demand surveysHousehold Surveys	🟢	🟢	🟢
Visitor arrivals (Inbound, Domestic/ Tourists, Same-day visitors)	EUTD	Arrivals	✓	✓		Y	Y	Y	Accommodation Recordss/MPD/visitor surveys/Household Surveys	🟡	🟡	🟡
Nights spent	EUTD	Nights spent	✓	✓	✓	Y	Y	Y	Accommodation records/surveys	🟢	🟢	🟢
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO	🟢	🟢	🟢
Tourism concentration	EUTD	Tourism intensityTourism density	✓	✓	✓	Y	Y	Y	Accommodation records/surveys and census/register	🟢	🟢	🟢
Second home ratio						Y	Y	Y	Survey of Essential Population and Housing Characteristics	🔴	🟢	🟢
Tourism capacity	EUTD	Tourism capacity	✓	✓	✓	Y	Y	Y	Accommodation records	🟢	🟢	🟢
Concentration of tourism establishments						Y	Y	Y	Accomodation records	🟢	🟡	🟡
Seasonality of visitor arrivals	EUTD	Tourism seasonality(%) (only tourists)	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys	🟢	🟢	🟡
Seasonality of visitor expenditure						Y	Y	Y	Visitor expenditure surveys/Credit card data	🟡	🟡	🟡
Seasonality of visitor satisfaction						Y	Y	Y	Visitor surveys	🟡	🟡	🟡
Seasonality of tourism employment						Y	Y	Y	Labour force surveys and TSAs or only labour force surveys	🟡	🟡	🟡
Ratio of same-day trips over overnight trips						Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys	🟡	🟡	🟡
Inbound vs domestic visitor ratio	EUTD	Share of foreign tourists	✓	✓		Y	Y	Y	Accommodation records/surveys, MPD or visitor surveys	🟡	🟡	🟡
Inbound vs domestic tourism expenditure ratio						Y	Y	Y	Visitor expenditure surveys/Credit card data	🟡	🟡	🟡
Percentage of repeat visitors						Y	Y	Y	Visitor surveys	🟡	🟡	🟡
Dependency ratio on top source markets	EUTD	Dependence on top 3 countries of origi	✓			Y	Y	Y	Accommodation records/surveys	🟢	🟢	🟢
Dependence on distant origins	EUTD	Dependence on distant origins(%)	✓			Y	Y	Y	Accommodation records/surveys	🟢	🟢	🟢
Tourism diversity (Distribution of tourism accommodation establishments across geogra	EUTD	Tourism diversity(index)	✓	✓	✓	Y	Y	Y	Accommodation records	🟡	🟡	🟡
Average tourism expenditure	EUTD	Average tourism expenditure(PPS / nigh	✓			Y	Y	Y	Visitor expenditure surveys	🟡	🟡	🟡
Total tourism expenditure per day						Y	Y	Y	Visitor expenditure surveys	🟢	🟢	🟢
Size of tourism establishments	EUTD	Tourism enterprises by size	✓			Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)/National or regional accounts	🟢	🟢	🟢
Resident ownership of tourism establishments						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)	🟢	🟢	🟢
Survival of tourism enterprises						Y	Y	Y	Central Balance Sheet Data Offices (ECCBSO)	🟢	🟢	🟢
Accommodation occupancy	EUTD	Occupancy rate	✓	✓		Y	Y	Y	Accommodation records/surveys/ Data are regularly collected by UNWTO	🟢	🟢	🟡
Output of tourism characteristic products						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys	🟢	🟢	🟡
Contribution of tourism to GDP	EUTD	Direct economic contribution of tourisr	✓			Y	Y	N	Tourism Satellite Accounts (TSAs) / estimation from Visitor expenditure surveys /	🟢	🟢	🟡
Distribution of benefits to employees in tourism establishments						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys	🟢	🟢	🟢
Weight of the tourism employment	EUTD	Share of employment in the tourism ec	✓			Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V	🟢	🟢	🟡
Rate of employees (Total number of direct tourism employees / direct tourism employed						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or estimation from V	🟢	🟢	🟡
Participation of women in employment						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or only Labour force	🟢	🟢	🟢
Labour productivity of different tourism industries						Y	Y	Y	National or regional Accounts and Labour force surveys	🟢	🟡	🟡
Contribution of tourism to investment						Y	Y	N	National or regional Accounts	🟢	🟡	🔴
Tourism related government transactions						Y	Y	Y	Public Administration Budgets; Data might be sourced from national accounts	🟢	🟢	🟢
Tourists as victims of crime						Y	Y	Y	Law Enforcement data reported to statistic authority, Accommodation records/	🟢	🟢	🟢
Satisfaction of visitors with their experience in the destination						Y	Y	Y	Visitor surveys	🟡	🟡	🟡
Visitor engagement (e.g. % of visitors attending and participating in cultural performanc						Y	Y	Y	Visitor surveys	🟡	🟡	🟡
Crime rate variation (perception)						Y	Y	Y	Host Community surveys	🟡	🟡	🟡
Perception of host communities of visitors						Y	Y	Y	Host Community surveys	🟡	🟡	🟡
Attitude of residents towards tourism activity						Y	Y	Y	Host Community surveys	🟡	🟡	🟡
Distribution of benefits to employees in tourism establishments						Y	Y	N	Tourism Satellite Accounts (TSAs) or estimation from Visitor expenditure surveys	🟡	🟡	🔴
Average hourly earnings						Y	Y	Y	Statistics institute (e.g. Labour force surveys) and TSAs	🟢	🟡	🟡
Tourism employment conditions						Y	Y	Y	Statistics institute (e.g. Labour force surveys) and TSAs	🟢	🟡	🟡
Participation of women in employment						Y	Y	Y	Labour force surveys and Tourism Satellite Accounts (TSAs) or only Labour force	🟢	🟢	🟢
Gender equality in tourism employment						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys	🟢	🟢	🟡
Vulnerable groups employment in tourism						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys	🟢	🟢	🟡
Employment stability (coefficient of variance of monthly direct tourism employment)						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys	🟢	🟢	🟡
Education and workforce composition in tourism employment						Y	Y	Y	Labour force surveys and TSAs or only Labour force surveys	🟢	🟢	🟡
Sustainability and climate action tools						Y	Y	Y	Statistics Institute / Public Authorities	🟢	🟢	🟢
Sustainable tourism strategy implementation						Y	Y	Y	Public Authorities	🟢	🟢	🟢
Accessibility measures in the destination						Y	Y	Y	Public Authorities / Tourism Business Surveys	🟢	🟢	🟢
Tax contribution (Amount of tourism tax revenues per inhabitant)						Y	Y	Y	Public Authorities and census/registry	🟢	🟢	🟢
Specific tourism training provided to employed persons in tourism						Y	Y	Y	Education institutions	🟢	🟢	🟢
Engagement of host community						Y	Y	Y	Host Community surveys	🟡	🟡	🟡
Tourism activity in high quality environmental areas	EUTD	Share of accommodations in areas with	✓	✓	✓	Y	Y	Y	EUTD	🟢	🟢	🟢
Tourism impact and quality of heritage and natural sites						Y	Y	Y	UNESCO https://whc.unesco.org/en/soc/?action=list & id_threats=118	🟢	🟢	🟢
Quality of water tourism assets	EUTD	Excellent bathing water	✓	✓	✓	Y	Y	Y	EUTD	🟢	🟢	🟢
Cycling routes						Y	Y	Y	Opencyclemap	🟢	🟢	🟢
Presence of Blue flag awarded sites	EUTD	Presence of Blue flag awarded sites	✓	✓	✓					🟢	🟢	🟢
Share of protected/designated land	EUTD	Share of protected/designated land	✓	✓	✓	Y	Y	Y	https://www.blueflag.global/	🟢	🟢	🟢
Cultural assets density	EUTD	Cultural assets density	✓	✓	✓					🟢	🟢	🟢
UNESCO and European heritage sites	EUTD	UNESCO and European heritage sites	✓							🟢	🟢	🟢

4.2 From data to action: strategic use of indicators per D3HUB cluster

This section aims to answer a fundamental question in the monitoring and governance of sustainable tourism: What can we do with the data?

For each D3HUB cluster, a table has been developed that connects the overall objectives of the cluster to the corresponding key indicator(s) and a series of possible actions that stakeholders at different levels could consider. These tables help translate indicator data into meaningful strategies, fostering more targeted, evidence-based decision-making.

Each table follows a consistent structure with three columns:

- Objective: The goals or thematic focus of the cluster.
- Key Indicator: The selected indicator(s) that best align with the objective, based on the aforementioned selection of indicators.
- Possible Actions: Examples of policy responses, management strategies, or stakeholder initiatives that could be developed or enhanced based on the indicator's findings.

This approach facilitates the transformation of data into actionable, context-aware steps, promoting more effective and aligned sustainability planning across destinations in the D3HUB ecosystem.

Table 7 Possible actions for D3HUB cluster: Redistributing tourist flows in space and time

Objective	Key indicator	Possible actions
Identify if there are temporal peaks in demand	Seasonality of visitor arrivals/expenditure/employment	Promote off-season travel, diversify product offering
Monitor spatial pressure in specific areas	Visitors per km² / per 100 residents	Redirect flows, adapt infrastructure, and introduce quotas
Detect short vs. long stay visitor patterns	Ratio of same-day to overnight trips	Design incentives for longer stays (e.g. pricing, experiences)
Track pressure on accommodation capacity	Accommodation occupancy / Tourism capacity	Optimise use of space, adjust licensing policies
Understand tourism's impact on the workforce	Tourism employment concentration/seasonality	Promote stable employment and skills development
Assess reliance on certain markets	Inbound vs. domestic visitor ratio	Promote regional markets and reduce overdependence
Monitor the type and location of tourism activity	Tourism concentration / Combined tourism concentration	Support decentralisation strategies
Support planning with supply-side data	Number and distribution of tourism establishments	Guide zoning, service allocation, and investment strategies

Table 8 Possible actions for D3HUB cluster: Managing the balance between residents, visitors, and stakeholders

Objective	Key indicator	Possible actions
Monitor social pressure from tourism.	Visitor/resident ratio, tourism concentration, second homes	Regulate short-term rentals, limit overcrowding in certain zones
Understand residents' perceptions	Host community surveys, crime perception, satisfaction	Improve bilateral communication, and involve residents in planning
Track housing and affordability impact	Second home ratio, long-term rental pressure (proxy)	Implement resident-inclusive housing policies and protect residential stock
Promote fair employment conditions	Informality, part-time, seasonal, or vulnerable groups in tourism	Encourage stable jobs and support inclusive hiring
Evaluate gender equity in the sector	Share of women in employment/leadership	Promote equal opportunities and monitor career progression
Identify dependency on foreign visitors.	Inbound vs domestic ratio/expenditure	Support diversification of source markets
Ensure benefits reach the local community	Share of employment, tax contribution, and ownership of businesses	Design fiscal and incentive tools that benefit locals, and improve communication of tourism benefits
Track the use of public infrastructure and services	Accessibility measures, education, and healthcare access (proxy)	Adapt services to meet the needs of both residents and tourists

Table 9 Possible actions for D3HUB cluster: Climate change mitigation and adaptation

Objective	Key indicator	Possible actions
Monitor tourism's carbon footprint	Tourism GHG emissions, carbon footprint per visitor or GDP	Promote low-carbon transport, offset schemes, and green certifications
Track long-distance market reliance	Dependence on distant origins, top source markets	Diversify markets, encourage proximity tourism
Assess energy consumption in tourism	Tourism energy use per stay/share of renewable energy	Improve building efficiency, support renewables
Manage tourism-related waste	Solid waste per visitor, recycling rate, and food waste	Implement circular economy practices in tourism services
Protect environmental assets	Activity in protected areas, spatial footprint, and biodiversity	Limit visitor numbers, enforce zoning, and invest in conservation
Measure water stress due to tourism	Tourism water flows, wastewater per overnight	Promote efficiency, reuse and treatment infrastructure

Evaluate adaptation efforts	Existence of climate action tools/plans	Strengthen monitoring frameworks and integrate them into planning
Support low-impact infrastructure	Electric charging stations, cycling routes	Promote soft mobility and low-impact infrastructure

Table 10 Possible actions for D3HUB cluster: Supporting emerging destinations to attract quality and sustainable tourism

Objective	Key indicator	Possible actions
Understand economic viability	Average expenditure per visitor, total tourism expenditure	Promote higher-value products and experiences
Assess business resilience and local control	Survival rate of enterprises, resident ownership	Support local entrepreneurship and reduce leakage
Monitor visitor demand and seasonality	Occupancy rate, visitor satisfaction, and repeat visitors	Enhance quality, boost loyalty, and diversify low-season offers
Promote inclusive and fair employment	Employment rate, share of women and vulnerable groups	Provide targeted training
Improve infrastructure and access	Accessibility indicators, public service access, and safety perception	Prioritise inclusive mobility and visitor-friendly environments
Evaluate sustainability strategy implementation	Existence and execution of sustainability strategies	Support governance, co-creation, and monitoring tools
Ensure positive host community interaction	Host community perception and engagement	Promote activities where there is an interaction between residents and visitors
Encourage low-impact mobility	Cycling routes, soft infrastructure	Promote sustainable transport and recreational options
Protect and valorise natural and cultural assets	Share of accommodations in high-quality environmental areas, heritage	Attract quality tourism through nature and culture-based offerings

4.3 Short-list of indicators for monitoring and benchmarking

Building on the data needs identified in Chapter 2, the mapping of relevant initiatives and frameworks in Chapter 3, and the list of indicators per cluster presented above in Chapter 4, this section presents a proposed short-list of sustainability indicators for continuous monitoring and benchmarking of D3HUBs pilot destinations.

The indicators have been chosen based on their **feasibility, relevance, policy alignment, and capacity to capture key sustainability issues from the D3HUB clusters**.

This shortlist is intended to serve as a **practical tool** for tourism destinations across the EU to measure performance and benchmark progress over time. It also aims to **foster a common understanding and shared measurement language**, contributing to greater comparability and coordination across European tourism destinations. While the list reflects current priorities, it is conceived as a living tool that can evolve in response to emerging challenges, technological advances, and changes in policy or stakeholder needs.

The selection reflects a balance between core indicators that are broadly applicable across all destination types and **specific indicators** that address the unique characteristics and challenges of the four D3HUB clusters.

The indicators are grouped into two main categories:

1. **General indicators** – relevant to all clusters and destinations, providing a baseline for benchmarking and cross-comparison.
2. **Cluster-specific indicators** – designed to reflect the particular sustainability dynamics of each D3HUB destination cluster.

General indicators (applicable across all clusters)

These indicators provide a foundational view of tourism flows, economic impact, and resource use. They are essential for understanding volume, performance, and the overall pressure tourism exerts on local systems. These general indicators are:

- **Average length of stay**
  Reflects the average number of nights a tourist stays in the destination. Longer stays may indicate higher visitor engagement and reduced environmental impact per trip. Ideally, destinations would also work toward measuring the **average length of stay for same-day visitors**. However, this data is currently more difficult to obtain and represents an aspirational goal for more advanced monitoring systems.
- **Visitor arrivals**
  Total number of tourists and same-day visitors arriving at the destination within a defined period.
- **Nights spent**
  Total number of overnight stays registered in tourism accommodations.
- **Accommodation occupancy rate**
  The proportion of available accommodation capacity that is occupied, indicating the efficiency of infrastructure use and demand pressure.
- **Average tourism expenditure**
  The average spending per visitor during their stay reflects the economic contribution and helps assess value versus volume. Ideally, destinations would also work toward measuring **average same-**

day visitor expenditure. However, this data is currently more difficult to obtain and represents an aspirational goal for more advanced monitoring systems.

- **The weight of tourism in employment**
  Proportion of tourism-related jobs in the total employment of the destination, measuring tourism's importance in the local labour market.

Cluster 1: **Redistributing tourist flows in space and time**.

- **Tourism concentration – visitors per 100 residents**
  Measures the intensity of tourism (ideally, tourists and same-day visitors) relative to the local population, which is useful for assessing social pressure and infrastructure demand.
- **Tourism concentration – visitors per km²**
  Reflects the spatial density of tourism activity. If possible, this should be measured within areas designated for tourism use, such as urban cores or protected sites.
- **Seasonality of visitor arrivals (gini index)**
  Assesses the distribution of visitor arrivals across the year. A high Gini coefficient indicates strong seasonality, which can lead to capacity stress during peak periods.

Cluster 2: **Managing the balance between residents, visitors, and stakeholders**

- **Tourism concentration – visitors per 100 residents**
  Used again here to track intensity and help manage potential impacts.
- **Visitor satisfaction**
  Analysing tourists' perception of their experience in the destination. High satisfaction supports destination loyalty and quality-based competitiveness.
- **Participation of women in tourism employment**
  Measures the gender perspective of tourism employment, supporting inclusive and equitable workforce development.

Cluster 3: **Climate change mitigation and adaptation**

- **Dependence on distant origins**
  Proportion of tourists coming from long-haul markets. A high dependency ratio signals a higher environmental impact (e.g., from air travel) and increased vulnerability to external changes.
- **Tourism activity in high-quality environmental areas**
  Measures the share of tourism accommodation capacity located within 200 metres of areas classified as having high nature-based recreational opportunities. The indicator helps assess potential tourism pressure on sensitive natural environments.

Cluster 4: **Supporting emerging destinations to attract quality and sustainable tourism**

- **Dependency ratio on top source markets**
  Measures visitor arrivals from the top source markets. High dependency may increase vulnerability to geopolitical, economic, or climate-related disruptions.

The following table summarises the short-listed indicators for continuous monitoring and benchmarking for D3HUB:

Table 11 Short-listed indicators for continuous monitoring and benchmarking

Category	Indicator
General (all clusters)	Average Length of Stay
	Visitor Arrivals
	Nights Spent
	Accommodation Occupancy Rate
	Average Tourism Expenditure
	Weight of Tourism in Employment
Cluster 1: Redistributing tourist flows in space and time	Visitors per 100 Residents
	Visitors per km²
	Seasonality of Visitor Arrivals (Gini Index)
Cluster 2: Managing the balance between residents, visitors, and stakeholders	Visitors per 100 Residents
	Visitor Satisfaction
	Women's Participation in Tourism Employment
Cluster 3: Climate change mitigation and adaptation	Dependence on Distant Origins
	Tourism Activity in High-Quality Environmental Areas
Cluster 4: Supporting emerging destinations to attract quality and sustainable tourism	Dependency Ratio on Top Source Markets

Following the same logic as in Section 4.2, the tables below address the question: "What can we do with the data?"—this time focusing on a refined short list of indicators selected for easy monitoring and benchmarking.

These indicators have been prioritised to guide effective monitoring and strategic action, providing a practical framework for stakeholders seeking to implement evidence-based decisions.

As in the previous section, each table is structured around three key components:

- Objective: The goal or challenge addressed by the indicator.
- Key Indicator: The specific short-listed indicator that best reflects the objective.
- Possible Actions: Concrete ways the data can be used to inform policy, improve practices, or support collaborative initiatives.

By focusing on a smaller set of actionable indicators, these tables help streamline efforts and ensure that data collection and analysis lead directly to meaningful outcomes at all governance levels, while also facilitating benchmarking with other destinations within the D3HUB ecosystem.

Table 12 Short-listed indicators for continuous monitoring and benchmarking. Common indicators adapted to Cluster 1.

Indicator	Objective	Suggested Action
Average Length of Stay	Understand visitor movement and duration of spatial pressure	Incentivise longer stays in less-visited areas
Visitor Arrivals	Measure total pressure and identify peak influx periods	Adjust transport, signage, and local mobility systems
Nights Spent	Map the temporal distribution of tourism across the territory	Promote off-season stays
Accommodation Occupancy Rate	Detect saturation and room for redistribution	Stimulate demand in low-occupancy areas or seasons
Average Tourism Expenditure	Target demand segments for higher-value, lower-impact tourism	Promote paying sustainable experiences with local produce, local roots, etc.
Weight of Tourism in Employment	Evaluate labour concentration in specific areas	Invest in skills, education, and SME development

Table 13 Short-listed indicators for continuous monitoring and benchmarking. Specific indicators for Cluster 1.

Indicator	Objective	Suggested Action
Visitors per 100 Residents	Identify overburdened destinations	Diversify visitor flows to reduce localised pressure
Visitors per km²	Spot micro-congestion in dense tourism zones	Redistribute flows spatially through planning and routing tools
Seasonality of Arrivals (Gini)	Assess the imbalance of tourism over time	Launch off-peak experiences

Table 14 Short-listed indicators for continuous monitoring and benchmarking. Common indicators adapted to Cluster 2.

Indicator	Objective	Suggested Action
Average Length of Stay	Understand the pressure duration on services and public space	Regulate short-term visits in sensitive urban or residential areas
Visitor Arrivals	Detect potential stress on public services	Coordinate with health, transport, and waste services
Nights Spent	Evaluate potential noise, waste and housing pressure	Improve visitor awareness and local service responsiveness
Accommodation Occupancy Rate	Identify residential-tourism conflicts	Monitor saturation and implement zoning if needed
Average Tourism Expenditure	Assess the distribution of tourism benefits	Support business models with local value retention
Weight of Tourism in Employment	Measure the exposure of residents to tourism volatility	Foster economic diversification and workforce stability

Table 15 Short-listed indicators for continuous monitoring and benchmarking. Specific indicators for Cluster 2

Indicator	Objective	Suggested Action
Visitors per 100 Residents	Gauge perceived crowding and stress on daily life	Introduce visitor caps or reservation systems in critical areas
Visitor Satisfaction	Ensure experience aligns with resident tolerance	Improve service quality while addressing social limits
Women's Participation in Tourism Employment	Promote inclusion in tourism benefits	Support gender-balanced hiring and career development

Table 16 Short-listed indicators for continuous monitoring and benchmarking. Common indicators adapted to Cluster 3

Indicator	Objective	Suggested Action
Average Length of Stay	Evaluate emissions per trip (longer = lower per-night emissions)	Promote longer stays to reduce the transport footprint
Visitor Arrivals	Monitor growth linked to carbon and environmental load	Set sustainable arrival targets; align with emission goals
Nights Spent	Assess energy/water use and waste generation per stay	Keep monitoring this
Accommodation Occupancy Rate	Understand energy/resource load in tourism infrastructure	Promote energy-efficient upgrades
Average Tourism Expenditure	Evaluate the decoupling of income vs. environmental impact	Prioritise higher-value, lower-impact tourism products
Weight of Tourism in Employment	Assess socio-economic risks of climate-sensitive sectors	Support green jobs and reskilling in tourism

Table 17 Short-listed indicators for continuous monitoring and benchmarking. Common indicators adapted to Cluster 3

Indicator	Objective	Suggested Action
Dependence on Distant Origins	Estimate aviation-driven emissions	Incentivise regional markets and low-carbon access
Tourism in High-Quality Environmental Areas	Monitor ecosystem pressure	Apply the carrying capacity and enforce conservation plans

Table 18 Short-listed indicators for continuous monitoring and benchmarking. Common indicators adapted to Cluster 4

Indicator	Objective	Suggested Action
Average Length of Stay	Boost value per visit and reduce the per-day cost of infrastructure	Design immersive, longer-stay experiences
Visitor Arrivals	Monitor emerging popularity and the destination growth curve	Plan infrastructure and services in advance
Nights Spent	Build a baseline for lodging capacity and seasonal behaviour	Promote experiences that potential demand perceives as needing many days to capture it all
Accommodation Occupancy Rate	Ensure a sustainable load as the destination scales up	Prevent boom-bust cycles through early monitoring
Average Tourism Expenditure	Attract value-driven tourism segments	Promote local heritage, gastronomy, and experiential offers
Weight of Tourism in Employment	Track job creation potential in new markets	Invest in skills, education, and SME development

Table 19 Short-listed indicators for continuous monitoring and benchmarking. Specific indicators for Cluster 4

Indicator	Objective	Suggested Action
Dependency Ratio on Top Source Markets	Prevent over-reliance on one market or geography	Diversify markets and build resilience through targeted promotion

5 Recommendations

The development and implementation of a common framework for measuring the sustainability of tourism are only meaningful if they are translated into practice through consistent use, institutional commitment, and the active involvement of tourism destinations across Europe. This deliverable outlines a path forward for aligning data production with the policy needs of a tourism ecosystem that is highly diverse and composed largely of SMEs and small and medium-sized destinations.

While the availability of robust and harmonised indicators is essential, it must be matched by the capacity of DMOS, policymakers, and other stakeholders to interpret, apply, and act upon that information. Equally important is the need for a coherent governance model that enables long-term investment, coordination across different levels of government, and effective integration of statistical and operational data sources.

The following recommendations integrate both high-level policy and governance considerations and practical strategies to support the uptake and use of data by DMOs and local actors. They are based on the findings of this deliverable and respond to the evolving needs of European destinations, aiming to guide the implementation, operationalisation, and scaling of the D3HUB sustainability indicators framework:

1. **Align measurement initiatives with the SF-MST**: all sustainability measurement efforts in tourism should be aligned with the Measuring the Sustainability of Tourism (MST) Statistical Framework, formally endorsed by the United Nations in 2024. This alignment ensures methodological coherence, international comparability, and policy relevance over time.

2. **Foster multilevel coordination between national, regional, and local levels**: while national governments define their statistical plans and contribute to the European Statistical Plan, tourism is mainly managed at the regional and destination level. Strengthening coordination across governance levels is essential to ensure that regional and local actors meaningfully contribute to statistical priorities and play an active role in shaping EU tourism strategies, through platforms such as the Tourism Transition Pathway and the future EU Competence Centre on Tourism Data.

3. **Reinforce the role of the European Statistical System in the Tourism Data Space**: the European Statistical System brings valuable experience in managing data interoperability, confidentiality, and compliance with methodological standards. Its full integration into the European Tourism Data Space is essential to guarantee a reliable, user-centred, and collaborative environment, particularly concerning partnerships with the private sector.

4. **Support SMEs and small destinations in accessing Tourism Data Space**: as the tourism ecosystem is largely composed of SMEs and small destinations, many lack the resources or technical capacity to benefit from data spaces. The EU Tourism Competence Centre should play a key role in ensuring these stakeholders can access relevant data and transform it into actionable knowledge aligned with EU sustainability goals.

5. **Ensure stable, long-term measurement standards beyond political cycles**: meeting the EU Green Deal and climate neutrality targets requires long-term commitment. Indicators and

measurement systems must be institutionalised, stable, and shielded from short-term political cycles, ensuring continuity in planning, monitoring, and evaluation.

6. **Address key operational data gaps** essential for sustainability measurement: several critical data areas require urgent attention, including:

    - Visitor data: destinations need data on all visitor types, including same-day visitors, who often outnumber overnight tourists. Improved methods are required to reflect the full visitor economy.

    - Host community and business perceptions: to understand the social dimension of tourism, comparable methods such as surveys or natural language processing are needed to capture community sentiment and business perspectives.

    - Water and energy consumption: disaggregated data by economic activity is crucial for planning and climate adaptation. Better access and forecasting capacity are needed, requiring collaboration with utilities and local governments.

    - Waste management: Accurate data on the types and volumes of waste generated locally is necessary for implementing circular economy strategies and environmental planning.

    - Education and labour skills: the lack of tourism-specific classifications in international education standards (ISCED) hampers analysis. Tailored indicators are needed to assess the qualifications and skill levels of the tourism workforce, identifying gaps and supporting training policies.

    - Accessibility, certifications, and standards: Data from private stakeholders should be integrated to track progress in areas like universal accessibility, sustainability certifications, and industry standards.

    - Greenhouse gas emissions: National GHG inventories do not provide the granularity needed for tourism policy at the local level. Efforts are required to disaggregate data regionally and align it with EU climate objectives.

7. **Support greater uptake and usage of data at the destination level**: beyond governance and infrastructure, it is crucial to facilitate the practical implementation of data-driven decision-making by DMOS and local stakeholders. The following actions are recommended:

    - Develop user-friendly data platforms: tourism observatories and data platforms should prioritise accessible and intuitive design to encourage use by a wide range of stakeholders. Features such as clear navigation, interactive maps, filters, and visual summaries can lower barriers to entry, particularly for SMES and community actors.

    - Enhance data visualisation to improve understanding: tourism data should be presented using compelling, easy-to-understand formats. Dashboards, infographics, and comparative charts can help users identify trends and interpret key sustainability

indicators, even without advanced technical skills.

- Offer targeted training and capacity-building opportunities: building data literacy across the tourism sector is essential. DMOs and institutions should organise training sessions, webinars, and hands-on workshops tailored to different audiences—policymakers, SMEs, civil society, and researchers—to improve understanding and use of data in planning and decision-making.

- Showcase real-world use cases and success stories: sharing concrete examples of destinations or businesses that have successfully utilised data to inform policies or enhance sustainability performance helps demonstrate value, inspire replication, and strengthen the case for investment in data-driven approaches.

- Facilitate structured dialogue between data producers and users to ensure data reflects actual decision-making needs. Structured mechanisms for collaboration are essential, including user panels, consultation sessions, and the co-design of indicators, which help ensure that observatories and platforms deliver not only more data but also more relevant and actionable insights.

6 Annexes

Annex 1 - T4T data mapping Initiatives.

Annex 2 Survey Template

Annex 3 Results of the Survey

Annex 4 - Proposal of Indicators for Measuring the Sustainability of Tourism Statistical Framework (MST SF 2024)