TOURISM TURNS CLIMATE-SENSITIVE

What is changing and how to tackle the change

edited by Fondazione Santagata and Studio Giaccardi e Associati

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Tourism turns *climate-sensitive.*

What is changing and how to tackle the change

Edited by
Fondazione Santagata per l'Economia della Cultura ETS
Studio Giaccardi & Associati - Management Consultants and Data Analyst

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Fondazione Santagata, a foundation engaged in research, assessment and knowledge transfer projects, the operates along four main thematic pathways: the models for managing the cultural heritage, with particular reference to the economic development of the regions and to the UNESCO programs; contemporary cultural production and cultural innovation, with attention to the emerging markets and new occupations; tourism linked to the tangible and intangible cultural heritage, to the creative industries and to production districts; and sustainable development, with a focus on the relationship between cultural and natural heritage and sustainability.

Founded in 1999, ***Studio Giaccardi & Associati – Consulenti di Direzione e Data Analyst*** is specialised in Strategy, socio-economic Research and data intelligence, Coaching and Mentoring.
In 25 years we have produced over 330 research plans supporting a similar number of development projects for businesses, destinations and districts a range of which are available on www.slideshare.net.
We operate in many Italian Regions – most recently Emilia-Romagna, Puglia, Piedmont, Sardinia and Veneto – at the service of public institutions, businesses, managers of infrastructures and services, universities and research centres, economic associations and chambers of commerce. We have also collaborated several times with ENIT, the Italian National Tourism Agency, for projects of research into international cultural tourism (2018-19), into innovation of services to business and destinations (2022) and climate adaptation (2023-24). The entire experience is documented case by case in the "Tourism Dossier" which can be downloaded from our site.
Over time, we have designed and held territorial training events focussed on innovation, computerisation, design and tourism and contributed to pre- and postgraduate training of 39 "pupils" from several Italian universities who launched and developed their professional career here with new and enhanced skills.
We operate throughout Italy, with frequent international benchmarking and an excellent network of scientific and professional partners. Giuseppe Giaccardi, strategy consultant, and Marco Antonioli, sociologist and chief analyst, are the firm's name partners. All other information is available on our website, www.giaccardiassociati.it, where over 500 articles and technical posts have been published since 2009.

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PREFACE

IVANA JELINIC, MANAGING DIRECTOR ENIT SPA

Tourism constitutes an enormously valuable asset for Italy, and not simply in economic terms given that in 2023 it attracted 51.7 billion euros worth of tourism consumption from abroad directed towards holiday destinations, but also, and above all, because of the sector's ability to generate employment and animate one of the longest business chains, providing a secure future for the host communities involved.

We must however take care of this heritage, especially of the lands, of their excellencies and of their fragilities of which Italy is well endowed thanks to the immense varieties of landscapes, from the coasts to the highest peaks, but which, thanks to a very favourable geographical position, is also put at risk at the same time.

And as a consequence, we must look after our social heritage, our residents, the workers in the sector, the economic future that we have no right to spoil and conserve our beautiful holiday destinations in a sustainable manner with their uniqueness and with a view to growing the sector.

Today, in fact, the greater and greater awareness of progressively rising temperatures, of climate change which sooner or later will have real effects on the Earth, on tourism and on society, is compelling us to rapidly implement solutions that touch all of us as destinations, as operators and as tourists ourselves.

We have resolutely desired to work on this theme so that the Italian tourism system can promptly provide itself with countermeasures for slowing down climate change, ones that put all of us in a position to adapt to the processes and products offered and to contribute personally – also as residents and tourists of the country – to the protection of the heritage that represents us and is at the basis of our daily life: a heritage consisting of inland areas that produce our exceptional agri-food products, our natural coastal and island landscapes sought out by tourists from all over the world, an artistic and cultural heritage which positions us at the top for our UNESCO sites, Alpine and Apennine peaks where we protect the flora and fauna that differentiates us from our neighbours across the Alps, but especially our people who invest in this sector, often with their own families, their lives and their futures.

INTRODUCTION. WHAT OUR "CLIMATE-SENSITIVE TOURISM PROJECT" IS

GIUSEPPE GIACCARDI

ENIT research project, Climate-sensitive tourism, is the fruit of an innovative concept and of several approach stages, and has two goals of general interest:

- Discover, analyse and measure the changes in the tourism demand and supply caused by the climate emergency, and make the data and information available to all the stakeholders
- Contribute towards delineating innovation policies which, through ENIT, would be useful to tourism businesses and destinations and encourage effective "climate adaptation" decisions: climate adaptation" intended as prevention and limitation of the damage and above all as protection of businesses and people – guests, workers and residents – while at the same time seeking opportunities for sustainable development that unquestionably exist.

The Scientific Research Project Committee was established for this purpose and is composed of the university lecturers, Rodolfo Baggio (Bocconi) and Martha Friel (IULM), by the experts Paola Borrione (Fondazione Santagata), Marco Antonioli and Giuseppe Giaccardi (Studio Giaccardi & Associati) and by Elena Di Raco head of Centro Studi ENIT. The Scientific Committee is backed by the analysts, Maddalena Penna (Studio Giaccardi & Associati), destination economist, Andrea Porta, researcher in the field of economics of culture (Fondazione Santagata), and Irene Pinto, researcher in the field of the economics of tourism (Fondazione Santagata).

The goal of this working group is to develop, in a year of joint work, a research project at the country's service with the production of open and structured data, and intervention models and practices of use to public and private stakeholders in the tourism world.

The research project starts off from several aspects and factors of a strategic order, including:

- The significance-guide of the "climate-sensitive" tourism which is gradually populating many scientific papers, technical publications and activities of businesses and destinations with different emphases and nuances.

- The most recent figures on the travel choices and behaviours that reveal a sort of "deseasonalisation in the demand from the bottom"
- Over 40 constantly monitored international sources – research centres, universities, and destination and business projects and initiatives in Italy too – which are generating an intense flow of information on the fundamental relationship between demand and supply for travel, holidays and experiences in climate change conditions
- A new mission for the Italian tourism system which is looking for new models along with "climate-sensitive champions"
- *Policies* and climate adaptation provisions to "treat" as an indispensable and new marketing variable
- The publication of the "Tourism Climatic Index" (TCI) model for measuring climate change and creating adaptation strategies, fine-turned in the scientific work, "Destination Climate Adaptation - A Croatian case", produced by Rodolfo Baggio (Università Bocconi, Italy), Elisa Burrai, Chris Cooper and Jane Turner (Leeds Beckett University, UK), Vanja Krajinović and Nevenka Čavlek (Zagreb University, Croatia)
- The value and inspirational link between tourism and SDGs in the UN's 2030 Agenda of which 8 explicitly connected to the sector
- Protection of the formidable wealth of the 59 UNESCO sites in Italy and of the other very many historical, cultural and environmental attractors whose fragility is increasing, specifically because of climate change, evoking a more advanced level of balancing between conservation and enjoyment
- The integrated management of the different cultural and creative products, through constant dialogue between the operators in the various sectors (tourism, social, economic) and the sharing of enjoyment and sustainable development targets, projects and strategies.
- The different response capabilities of the various parties also depending on their locations and the concretely available resources.
- The new global inequalities that are causing climate change and which, near at hand, are already striking the most fragile areas of the Mediterranean and of our very own country
- Last but not least, the various investment possibilities, for example, for the creation of resilient infrastructures; development of monitoring, research and innovation at multiple levels; use of new training programs; making available tax incentives and facilitated loans;

generation of original awareness-building and tourism communication activities; etc.

The concept

In general, a concept is the embodiment in a few words of an idea or original fact, black on white, so that it can be analysed and eventually finalised.

In scientific works the "climate-sensitive" concept saw the light over twenty years ago. However, its practical application in Italy for the first time can be traced to three investigative interlinked occasions as summarised briefly below.

The first time was with an article dated 08 February 2023, *"Le conseguenze dell'emergenza climatica in Italia e nel turismo - Cosa dice il PNACC del Ministero dell'Ambiente e della Sicurezza Energetica e perché è importante"* (The consequences of the climatic energence in Italy and in tourism- What PNACC of the Ministry of the Environment and Energy Security says and why it is important"), available at https://www.giaccardiassociati.it/2023/02/08/le-conseguenze-dellemergenza-climatica-in-italia-e-nel-turismo/.

The article provides a summary of the *Piano Nazionale di Adattamento al Cambiamento Climatico* (National Climate Change Adaptation Plan (PNACC) - later approved by the Italian Government at the end of 2023 -, illustrates the provisions regarding climate adaptation for the tourism sector, and concludes by affirming that *"Looking at the future with concrete adaptation measures (remember what Darwin said regarding who survives?) is indispensable for obtaining climate-sensitive development that is capable of sustaining tourism businesses and destinations in these new challenges."*

The second occasion was the seminar *"Climate-sensitive management"* published in mid-February 2023 in the official program of the IX edition of the BTM tourism event, Bari Fiera del Levante 1, 2 and 3 March, 2023.

The presentation of the seminar states that *"The people in charge of businesses (hospitality and services), Municipalities and Chambers of commerce, DMOs and DMCs are at the centre of the impact of the climate emergency. But they can be protagonists in the measures of adaptation for:*

- *protecting residents and temporary citizens (tourists)*

- *remodulating local development, investing in order to innovate strategies, products, computerisation, organisational models, competencies, etc.*

First of all, Climate-sensitive Management is a mental asset and then a technical approach for preparing ourselves for managing the impact of the climate emergency on tourism, and taking loving care of places, thereby reinforcing brands, the holiday offer, services and hospitality in all the areas of interest for local development."

The third occasion was the presentation of the ENIT *"Turismo Climate-sensitive"* research project on 12 October 2023 at the TTG in Rimini during the workshop *"Climate change: l'evoluzione di imprese e destinazioni turistiche*" ("the evolution of tourism businesses and destinations").

The workshop concluded with an equally important result: the partnership between Fondazione Santagata of Turin and Studio Giaccardi & Associati of Ravenna which generated the development and progressive completion of the research project of which this publication is one of the informative outputs.

Emerging from these three steps is an initial explanation of what this book can mean for climate-sensitive tourism, experienced from the standpoint of travel and holidaying demand:

"Climate-sensitive Travellers are increasing in number.

And they are becoming particularly numerous as regards the European and international demand. These travellers and tourists are

- increasingly aware of the changes and risks of the climate emergency and therefore able to modify their vacation times, modalities and locations in order to feel well and safe.
- attentive to data and information on the adaptiveness of products, services and destinations that protect people and also contribute to combating the climate emergency
- interested in playing their own part and being considered co-players in countering the climate emergency along with the destinations they decide to travel to and stay in.

Hence the need and strategic convenience of strategically tackling the "challenge of the century" of the impact of the climate emergency on tourism.

The work pathway of the Climate-sensitive Tourism research project

From October 2023 until October 2024, the pathway traced by the Scientific Committee envisages the performance of various activities and outputs as follows:

- drafting two investigation compilation reports
- drafting a scientific paper on Italy's "*Tourism Climatic Index*" methodology.
- definition of the operational research project for the online and field survey on the demand and supply of climate-sensitive tourism.
- the creation of the data analysis and management tools for the online and field survey.
- the development of the online and field survey on the demand and supply for climate-sensitive tourism
- fine-tuning the intermediate results for feeding technical and institutional communications and participation at events, fairs and large thematic and sustainability events.
- drafting the final report of the Climate-sensitive Tourism research
- the creation of the "ENIT Climate-sensitive dashboard" along with a set of new policies and data-driven instructions for destinations and tourism businesses
- structuring and participating at the ENIT event in TTG 2024
- publication and distribution of the two illustrative e-books (this publication is the first of these)

Some original results and important benefits of general interest will have been achieved at the end of this exacting path, for example:

- the metrics and indicators for continuing to monitor over time the impact of climate change on the tourism demand and supply in Italy and in the Euro-Mediterranean scenario
- open data access to these metrics and indicators for all tourism stakeholders
- a structured set of climate-sensitive data comprising sources, information and processing results available to other academics and professional figures for new research projects, new legislative provisions at national and international level and new initiatives by businesses and destinations.

- Enhanced ability of ENIT also to (1) develop climate adaptation and technological hybridisation policies and plans, (2) devise and produce marketing innovation for product areas on the basis of new climate-sensitive variables, engaging the expectations of TOs and international media while at the same time support the renewed offer of destination and business services
- a flow of authoritative information and communications, potentially corresponding to the technical interests of public and private operators as well as to the general interests of the local, national and sectoral media, online and off-line.

In this way we will have taken a first important step for prefiguring and understanding, and above all for preparing ourselves for tackling the challenge of the century in tourism together.

1. WEATHER AND CLIMATE, THE BASICS

RODOLFO BAGGIO

The tourism world has changed profoundly in recent years, especially because of a series of disastrous events. Many people are probably not yet aware of it, but these events have had a notable effect on means of transport, on the choice of destinations and accommodation, on the desire for more authentic experiences, and on the new value scales that place a more marked accent on sustainable practices with lower environmental impact and have as a consequence transformed the way products and services are provided and managed by tourism operators.

Aside from these transformations, however, an even more significant phenomenon will now – and increasingly in the future – have a huge impact on all the activities associated with the tourism world: that body of manifestations known today under the name of climate exchange. A hot topic on the agenda, ubiquitous on all the communications media, it is also one that is understood only superficially by many people, often basing themselves on inexact or approximate knowledge.

In this initial chapter, therefore, we will take stock with the definition of the main concepts and creation of a frame of reference that can be used for a better understanding of the many aspects involved in the discussions that will follow.

Weather and climate

In common language the terms weather and climate are often used in an indistinct manner, but the two expressions refer to different concepts and phenomena.

Weather is the set of conditions that characterise the atmosphere in a certain place in a limited period of time (hours or days). Climate, on the other hand, is the set of mean meteorological conditions in a certain place over a long period of time, usually about 30 years. A place's climate is determined by various factors such as latitude, conformation of the land, distance from the sea, cloud cover, the intensity of solar radiation, etc. the elements considered in the two cases are similar: air temperature, pressure, humidity, wind direction and speed, precipitation. What changes, essentially, is the time scale considered. Weather can be very variable and conditions can change even in a few hours. Climate changes, on the other hand, are much slower and gradual and their effects are only felt over much longer time-scales (years or decades), but can be more persistent. Meteorology and climatology are the disciplines that study the two phenomena.

The atmosphere and the greenhouse effect

The earth's atmosphere is a thin layer of gas that surrounds the planet, and carries out a crucial role for life as we know it.

The atmosphere is subdivided into several "layers", each with its own characteristics:

- **Troposphere:** the lowest layer of the atmosphere, in contact with the earth's crust, where the meteorological phenomena occur and where most of the air we breathe is located.
- **Stratosphere:** contains the ozone layer that absorbs most of the dangerous ultraviolet radiation arriving from the Sun.
- **Mesosphere**: the coldest layer, where temperatures drop rapidly with altitude.
- **Thermosphere:** the highest layer, where temperatures rise rapidly with altitude. It is here (partly along with the mesosphere) that we also find the layer called the ionosphere that reflects the long, medium, short and ultra-short radio waves, thereby permitting long distance communications.
- **Esosphere:** the outermost layer, the transition zone with interstellar space. Here the earth's magnetic field holds back and deviates the solar wind, giving rise to the formation of the polar auroras.

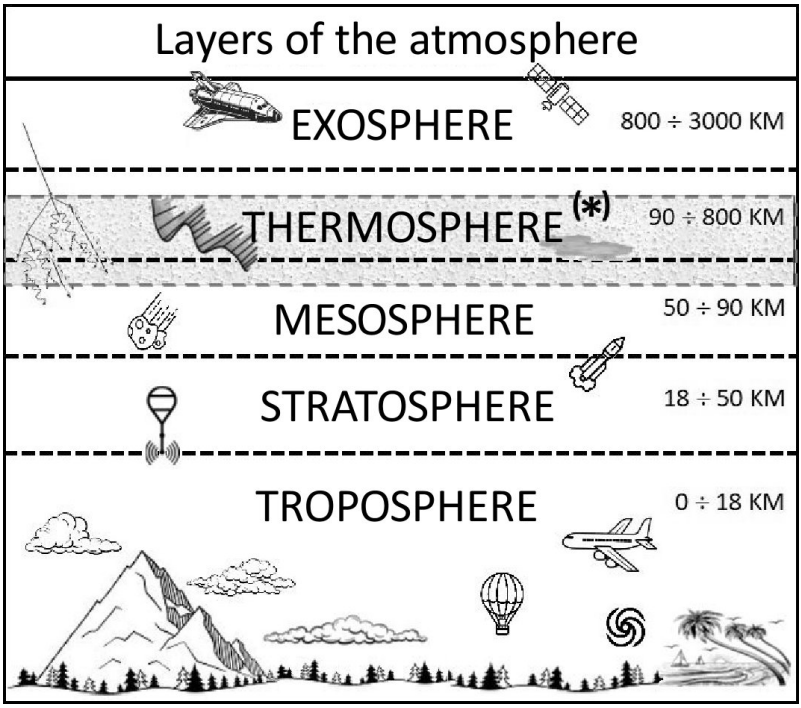


Figure 1. Layers of the atmosphere - (*) = ionosphere

The atmosphere is mainly composed of nitrogen (78%) and oxygen (21%). The minor gases include argon (0.9%), carbon dioxide (0.04%) and water vapour (0.02%). The layers do not all have the same gas concentration: water vapour is almost only present in the troposphere, the lowest layer, and is practically absent in the thermosphere and exosphere which, instead, contain almost all the helium and hydrogen. Most of the ozone is contained in the stratosphere.

The atmosphere carries out several important functions:

- it transports heat while holding back some of the heat from the Sun and contributes to keeping the temperature at the Earth's surface at liveable levels.
- it protects from the sun by filtering out the most dangerous solar radiation such as ultraviolet rays that can damage life on Earth.
- it regulates the climate, contributing to determining it, influencing the distribution of precipitation and temperatures.

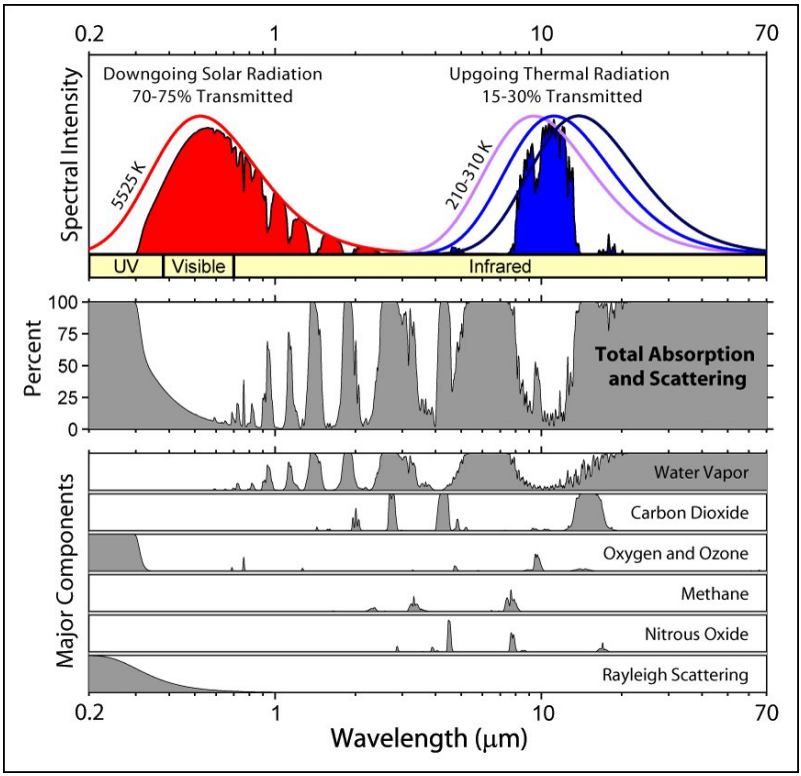


Figure 2. Solar radiation transmitted or absorbed by the atmosphere and by the most important gases (from: https://en.wikipedia.org/wiki/File:Atmospheric_Transmission.png)

The greenhouse effect

The greenhouse effect is a natural phenomenon that occurs in Earth's atmosphere. Some gases, known as greenhouse gases, such as carbon dioxide, water vapour and ozone, absorb or reflect part of the sun's radiation. In particular they contribute to retaining a certain amount of heat in the atmosphere, acting in such a way as to keep the temperature at the Earth's surface at liveable levels. In the absence of greenhouse gases the mean temperature of the Earth would be about -18°C, making life as we know it impossible. The value obtained depends on the concentration of these gases which play an important role for the Earth's energy balance.

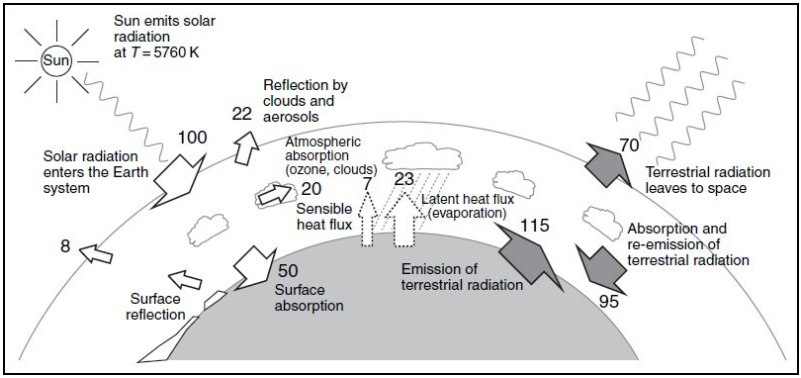


Figure 3. Greenhouse effect and energy balance (the numbers refer to the percentage of solar radiation) (adapted from Jorgensen, S. E., & Fath, B. D. (2008). Encyclopaedia of ecology. Elsevier, p.1277)

To be more precise, the greenhouse effect comprises all the phenomena by means of which nature intervenes to regulate the atmosphere's ability to retain or release solar energy. Even though it has a certain regularity over long periods, the greenhouse effect does not manifest fixed values that are constant over time, and even varies continually during the different seasons of the year. Contrary to a common belief, the greenhouse effect is lowest during the summer when it is hottest, while it is highest in the winter, because in colder conditions the atmosphere tends to retain the "lower heat" from the Sun to a greater extent.

The problem today is that human activity is leading to an increase in the levels of greenhouse gases in the atmosphere. As a consequence there is an increase in the average temperature, a phenomenon known as global warming. This heating (even by just a few degrees) has a considerable impact on the Earth's climate, leading to changes in the general climatic conditions and giving rise to a notable increase of extreme events such as heatwaves, rising sea levels, intense weather events like storms or hurricanes, and alteration of the ecosystems.

When reference is made to rises and falls of the greenhouse effect, what is meant is the tendency of various elements to establish a new balance at higher or lower temperatures. It is important to note that the factors that contribute to climate such as winds, rains, evaporation and ocean currents, always derive from local thermal equilibriums winds, rains, and movements of clouds and air masses are generated by the thermal imbalances caused by

the differing solar exposure of the various regions of the planet, thereby forming fields of high and low pressure as well as ocean currents.

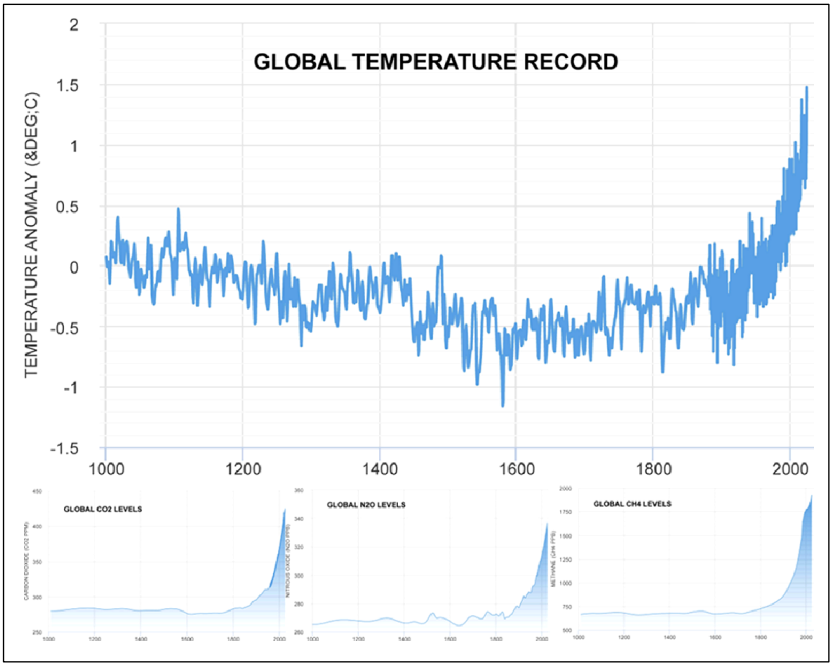


Figure 4. Temperature trends (anomaly = difference between the temperature of a year and the average one for the period 1951-1980) and the concentrations of the main greenhouse gases in the last 1000 years. (adapted from https://www.2degreesinstitute.org/)

The greenhouse effect acts as a climate rebalancing element, operating at local level with continuous modifications due to the features of the land. Despite this, it contributes to the maintenance of a global thermal equilibrium. The global thermal equilibrium makes it possible to compensate for the local variations, both positive and negative, thereby contributing to maintaining overall thermal stability.

The greenhouse effect therefore constitutes the phenomenon that manages the links between climatic cyclicity and variability, transforming the climatic system into an active mechanism of self-regulation and feedback. In fact a change in the climatic parameters such as sunshine or humidity of the air, induces a response from the greenhouse effect which works to establish the global energy conditions of the Earth system in a regular manner that is constant over time.

To be more precise, the greenhouse effect comprises all the phenomena through which nature intervenes to regulate the atmosphere's ability to retain or release solar energy. Even though it has a certain regularity over long periods, the greenhouse effect does not record fixed values that are constant over time, even varying continually during the different seasons of the year. Contrary to a common belief, during the summer, when it is hottest, the greenhouse effect is lowest while it is highest in the winter, because in colder conditions the atmosphere tends to retain the "little heat" from the Sun to a greater extent.

Weather forecasts and climate models

Understanding the causes of atmospheric phenomena has always been attempted in order to foresee their occurrence in sufficient time to carry out various activities, especially those that take place outdoors (agriculture, sheep farming, livestock breeding, hunting, fishing (etc.) and which are therefore closely dependent on weather conditions.

Today weather forecasting is carried out using complex numerical models that consider the various factors in play and the conditions recorded immediately before the period of interest. The reliability and accuracy of these forecasts (which have always been the subject of heated discussions) have improved incredibly in recent years, but they nevertheless remain considerably limited over time compared to the "window" considered (or desired). Reliability ranges today from 90% for one-day forecasts and 80% for three days, 70% for five days to 50% for 15 days, which is deemed to be the theoretical limit. It must however be remembered that forecasts of atmospheric phenomena are probabilistic. Saying that it will rain tomorrow means that there is a high probability that it will rain, but the phenomenon need not necessarily occur. "Serious"weather forecasts usually report these probabilities.

A climate model is a mathematical and computational representation of the atmospheric, oceanic and terrestrial processes that influence the climate on a global or regional scale. These models are used for simulating the behaviour of the climatic system over time, making it possible to study the various dynamics, predicting future tendencies and understanding the potential impacts of climatic changes.

The climate models are based on the physical and chemical laws that regulate the characteristics and behaviour of the atmosphere, oceans and terrestrial surfaces. They include the numerical equations and algorithms that represent the complex interactions between the various components of

the climate system such as temperature, humidity, wind, clouds and energy flows.

There are two main types of climate models:

- Global climate models (GCM): these simulate the climate on a global scale, making it possible to study climate phenomena at planetary level. They consider the dynamics of the atmosphere, of the oceans and of the surfaces of the Earth, subdividing the globe into three-dimensional grids. GCMs are fundamental for understanding climate changes.
- Regional climate models (RCM): These models further refine the spatial resolution, concentrating on specific geographical regions. They can be fed with the results of the global climate models and provide more accurate details on a local scale, permitting a better understanding of the regional impacts of climate changes.

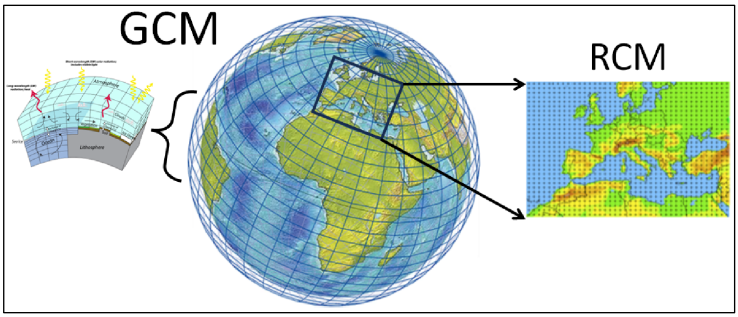


Figure 5. Types of climate models

The modern models are also partly made up of possible scenarios of increased greenhouse gases, CO2 in particular. These models are essential tools for assessing future scenarios and developing strategies for mitigating the effects of climate changes or for adapting to the transformed conditions. Nevertheless, it is important to note that the models are approximations of a complex climatic system and that their accuracy depends on the quality of the data input and precision of the mathematical representations of the processes involved.

Despite some scepticism, today's models are accurate and reliable. This is verified, as for other cases, by comparing the results of the various models with the observations and using statistic methods for assessing their precision. As demonstrated in many studies, the current models pass the comparison brilliantly, and there is no reason therefore for considering that the scenarios traced for the future do not accurately represent the situation.

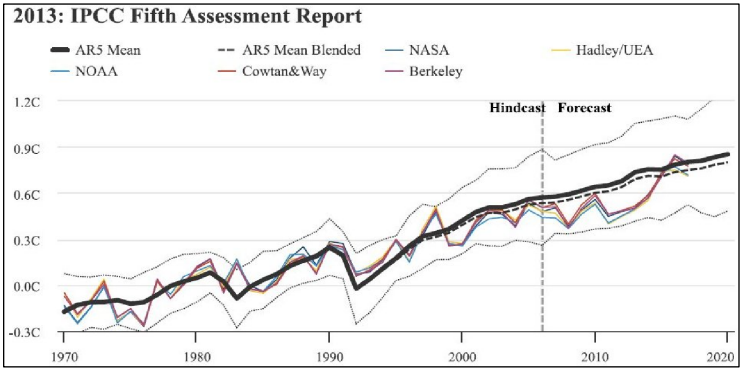


Figure 6. Comparison between models and historical data. The block line is the average temperature increase forecast by the models and the other curves are the historical observations.

Uncertainties obviously exist but this does not take anything away from the general high-level reliability of the estimates on the future evolution of the phenomenon.

Adaptation and mitigation

The IPCC (Intergovernmental Panel on Climate Change) is a UN body that reviews and assesses the most recent scientific, technical and socio-economic information produced at world level for understanding climate changes. The latest assessment report (AR6 Synthesis Report: Climate Change[1]) from 2023 reveals quite a critical situation. For example, as regards temperature trends the models reveal the following situation calculated on the basis of possible scenarios of higher greenhouse gas emissions.

The worst hypothesis, if the trend in emissions does not change much compared to what is happening now, is quite worrying. Intervention is decisively necessary. The possible interventions are classified in two broad categories, mitigation and adaptation.

Mitigation: where attempts are made to render the impacts of climate change less serious, drastically reducing the emission of greenhouse gas (GES) into the atmosphere. Mitigation is obtained by reducing the sources of these gases (for example by increasing the use of renewable energies and creating cleaner mobility systems) or more effectively eliminating the energies produced by fossil fuels such as oil) or upgrading systems that are

[1] https://www.ipcc.ch/report/sixth-assessment-report-cycle/

able to absorb greenhouse gases such as forests, and in any case adopting at every level, from the individual to the global one, virtuous behaviours as regards the use of energy resources of materials whose production greatly affects emissions.

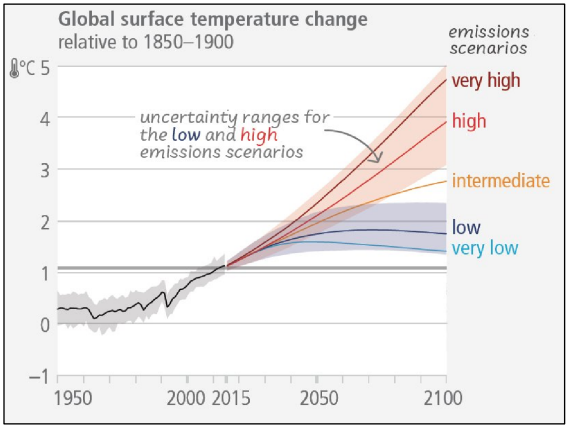


Figure 7. Temperature trend envisaged on the basis of the different scenarios (source: IPCC)

Adaptation, on the other hand, means anticipating the adverse effects of climate change with the adoption of measures, strategies or policies that make it possible to reduce, at least temporarily, the harmful consequences at social and economic level. Examples of adaptation measures include large-scale infrastructure changes such as the construction of defences for protection from rising sea levels, the reduction of food waste by individuals, and the construction of barriers for countering extreme events (heatwaves, storms and hurricanes). In short, adaptation can be understood as the process for adapting to the current and future effects of climate change.

Adaptation measures are obviously not decisive and do not make it possible to solve the global problem but only offer the possibility of reducing harmful effects on a small scale.

2. TOURISM TURNS CLIMATE-SENSITIVE

RODOLFO BAGGIO

The link between tourism and climate is complex and delicate. The analysis and comprehension of this report and of the environmental, social and economic impacts of climate change are essential both for drafting effective adaptation strategies and policies and for developing action plans that provide tourism businesses and destinations with positive responses, attenuating the risks and evolving the offer. The concrete aim is to conserve the natural and cultural resources, maintain if not reinforce the competitiveness of the offer and, above all, effectively improve the quality of life for permanent and temporary citizens.

Tourism and climate

The emissions of greenhouse gases linked to tourism currently constitute about 8% of global emissions (due to transport for the most part), and it is foreseen that they will increase considerably in the coming years. According to UNEP (the United Nations' environmental program), without a decisive ecological transition, *«in 2050 tourism would generate a 154% increase in energy consumption, 131% in greenhouse gas emissions, 152% in water consumption and 251% in the disposal of solid waste»*.

On the other hand, tourism destinations, their competitiveness and their sustainability are particularly sensitive to climatic conditions and therefore particularly affected by the changes in progress and envisaged in the coming decades. These impacts can be classified in four broad categories:

- **Direct climatic impacts**, such as temperature increases, heatwaves, increases in extreme events (hurricanes, storms, droughts), rising sea levels and reduction of winter snow cover.
- **Indirect impacts** that concern the availability of water, loss of biodiversity, degradation of natural beauty, alteration of agricultural production, erosion of coasts and beaches, damage to infrastructures and an increase in contagious illnesses.
- **Impacts of mitigation policies** that seek to reduce greenhouse gas emissions, leading to increases in transport costs that induce tourists to change means of travel and destinations.
- **Indirect impacts on social and economic systems** that involve the future economic growth of some countries.

These impacts are obviously not distributed evenly but depend on the specific geographical, social and economic conditions of the various parts of the planet. As far as Europe is concerned, Figure 8 shows the situation in the worst future scenario (RCP 8.5: rising greenhouse gas emissions).

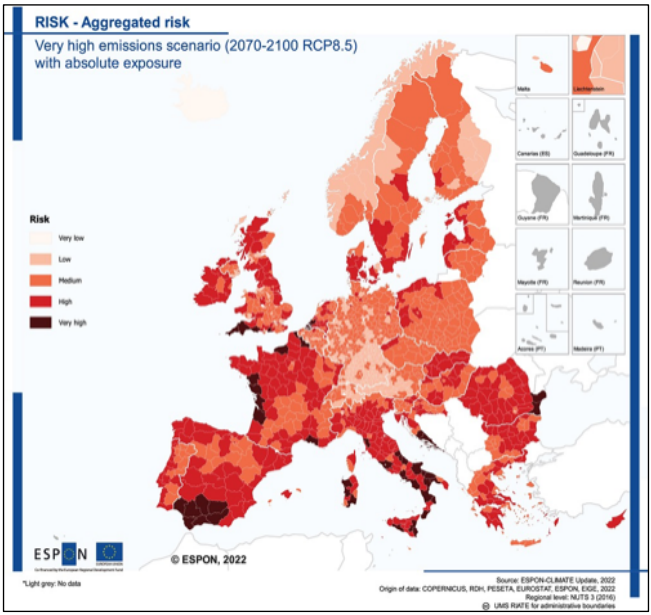


Figure 8. Europe's vulnerability to climate changes calculated by the European ESPON project (from: https://www.espon.eu/spatial-distribution-risk-europe-associated-climate-change)

In greater detail, the most important effects are:

- **Rising temperatures are** making traditional tourism destinations such as cities of art, beaches or skiing localities, less attractive. In Italy for example, there was a 5-degree increase in the Tyrrhenian Sea during the summer, compromising the regeneration of the sea and the quality of the water. The absence of snow in skiing regions required reorganisation of the tourism complexes and could have a considerable impact on the forthcoming Winter Olympics in Cortina (2026).
- **Rising sea levels**, which are threatening the coasts and islands, are important tourism destinations. In Italy, for example, Isola dei Conigli in Lake Garda is accessible on foot because of the drop in the water level. And many localities are recording significant shrinking of beaches.
- **Reduction of snow cover**, that is making skiing localities less attractive, particularly in lower altitude localities.

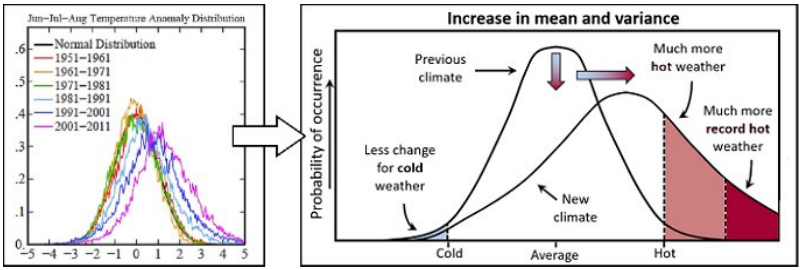


Figure 9. Increased temperatures and consequences for the climate (Adapted from: Hansen, et al., 2012.)[2]

Other impacts linked to climate change that have indirect effects on tourism are:

- **Extreme weather events**, such as storms, hurricanes and heatwaves, are becoming more frequent and intense. This is due to the fact that the distribution of temperatures not only reveals an increase on average but also in variability, leading to increases in conditions in

[2] Hansen, J., Sato, M., & Ruedy, R. (2012). Public perception of climate change and the new climate dice. arXiv preprint arXiv:1204.1286 e IPCC.

these extremes (as Figure 9 shows). These events can give rise to damage to tourism infrastructures and render destinations less safe or, in any case, less appetising for travellers who are increasingly considering climatic conditions as important factors in their travel decisions.

- **Changes in availability of water**, an essential resource for the tourism industry, especially for mountain destinations which attempt to get round the absence of snow in the winter with artificial snow, a source of considerable water consumption.

By combining various indicators that measure the different aspects it is possible to obtain a map of the climate risk for our country. As can be seen, many of the most vulnerable areas are also those in which tourism-linked activities are most intense.

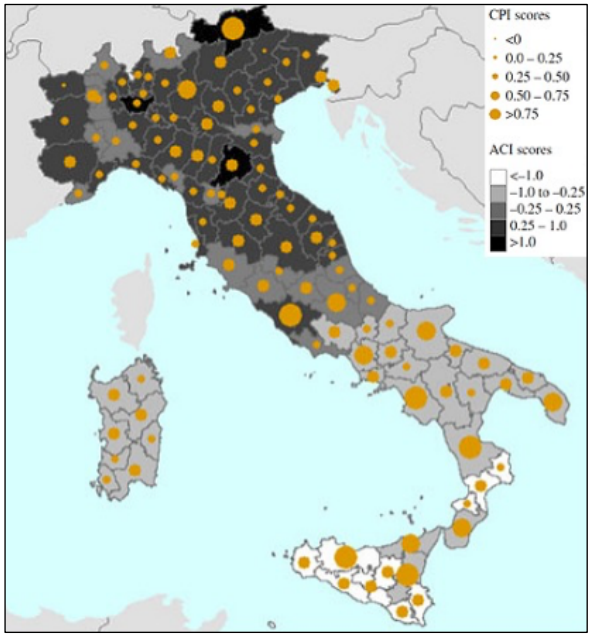


Figure 10. Map of the climate risk for the 2021-2050 period (CPI: potential impact of climate change, ACI: adaptation capacity; adapted from Mysiak et al., 2018)[3]

[3] Mysiak, J., Torresan, S., Bosello, F., Mistry, M., Amadio, M., Marzi, S., Furlan, E. & Sperotto, A. (2018). Climate risk index for Italy. Philosophical Transactions of the Royal Society A, 376(2121), art. 20170305.

Seasonal impacts

The impacts are different for the two main tourism seasons. Where the winter period is concerned it is possible to foresee the following:

- **insufficient snowfall** as a result of higher temperatures, less reliable snow cover and therefore shorter skiing seasons. The average reduction of the snow cover calculated by the climate models has been estimated to be 40-80% by the middle of the century compared to the 1971-2000 period, for zones below 1,500 m. It will be less pronounced at higher altitudes but still considerable.
- **loss of Alpine biodiversity**, such as forests and glaciers which are considered to be tourist attractions;
- **more stress on tourism infrastructures** (transport, ski lifts), with higher costs for maintenance and risk prevention because of the higher possibilities of extreme weather events, contraction of tourist flows because of the greater difficulties of access to mountain destinations and deterioration of the transport systems or other infrastructures.

It should be noted here that the reliability of snow, including artificial snow cover, is the most important factor when choosing a skiing destination. If snow is scarce, skiers tend to book later in order to be able to gauge the real snow conditions and modify resort or dates.

As regards summer tourism, the impacts of climate change can lead to:

- **erosion of coasts and beaches** due to rising sea levels and more frequent storms or floods. This is described well in the work of Furlan et al.[4] who proposes a map of the coastal vulnerabilities. In this case too the zones of greatest tourism intensity seem to be the most impacted;
- **displacement of tourists towards the north**, with growing preference for destinations other than the Mediterranean coasts, especially as regards flows of international tourists because of the exceptional summer temperatures and more frequent heatwaves, aggravated by possible water supply problems;

[4] Furlan, E., Dalla Pozza, P., Michetti, M., Torresan, S., Critto, A., & Marcomini, A. (2021). Development of a Multi-Dimensional Coastal Vulnerability Index: Assessing vulnerability to inundation scenarios in the Italian coast. Science of the Total Environment, 772, art. 144650.

- **regional water shortages** deriving from reduced availability of water resources during the summer, in combination with great demand, particularly in small Mediterranean islands;
- **more frequent conditions of extreme discomfort** especially in urban environments because of changes in concentrations of atmospheric pollution, particularly increases in tropospheric ozone during the summer that influence the health and activities of summer tourists in cities and because of rising numbers of heatwaves.

Figure 11. erosion of coasts and beaches due to rising sea levels and more frequent storms or floods (adapted from Furlan et al, see note 4).

Another important consequence arises for summer tourism in the mountains as regards glaciers, an important niche that has been dramatically impacted by the shrinking of ice as a result of climate change. Tourist sites in the Alps attract more than one million visitors each year. The negative effects include more difficult access to the glaciers, greater danger because of possible increases of avalanches and landslides, or loss of attractiveness for the sites.

The only positive note concerns the distribution of tourist flows in periods other than the traditional ones thanks to improved conditions in spring and autumn which allow places in the Mediterranean South to compensate for the economic losses suffered during the summer season.

Impacts on demand

Climate is a crucial factor for tourists when selecting a destination. When the climate changes, the attractiveness of a place also changes and, probably with a time delay, its perceived image too. The variability of the climate and of weather events affect decision-making with regard to holiday destinations and duration. In general[5]:

- past meteorological conditions influence demand, showing the importance of weather expectations when tourists are making decisions;
- temperature and rainfall differences between the regions of origin and those of destination significantly impact tourism demand: higher temperatures in the destination compared to the region of origin increase overnight stays while precipitations influence demand to a lesser extent and with an opposite effect to that of temperature;
- sensitivity to meteorological conditions varies depending on the seasons, with spring and summer tourism being more sensitive to weather conditions especially for seaside destinations. In the cold seasons, temperature loses importance, but snowfalls are important for winter sports.

It is therefore important to measure the climatic suitability of a tourism destination, considering not only the meteorological data, but also how the conditions are perceived by the tourists. This idea has led to the development of an index entitled Tourism Climatic Index (TCI) which attempts to represent the way in which climatic conditions influence (positively or negatively) the tourist's experience in a certain zone in a specific period.

Various proposals have been made and range from generic ones to specific ones for given situations or areas such as cities, seaside localities or

[5] See for example: Hamilton, J. M., & Lau, M. A. (2006). The role of climate information in tourist destination choice decision making. In Tourism and global environmental change (pp. 229-250). Routledge, o Muñoz, C., Álvarez, A., & Baños, J. F. (2023). Modelling the effect of weather on tourism: does it vary across seasons?, Tourism Geographies, 25(1), 265-286.

winter mountain zones. The TCI was originally proposed in 1985[6] in order to assess the suitability of the climate for tourism and was later reviewed in order to take account of the different tourism activities and their specific climatic requirements.

The TCI index is based on three main parameters: thermal conditions (T), aesthetic factors (A) and physical ones (P) that take account respectively of the perceived temperature, the state of the sky (cloud cover) and rainfall and wind intensity.

The TCI can be adapted to the different activities carried out by visitors in a destination, bearing in mind, when calculating the perceived temperature, of the energy balance between the human body and the surrounding environment, thereby integrating thermal variables (air temperature, solar radiation, humidity and wind intensity) and physiological ones linked to physical activity. This approach provides a more accurate representation of the climatic conditions for tourists.

Economic impacts

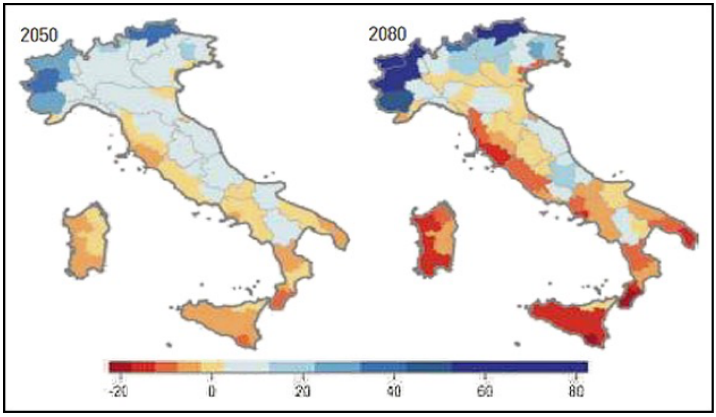


Figure 12. Impact of climate change in % on the per capita GDP compared to the current economic conditions (Adapted from Rochi, 2019)[7]

The economic consequences of climate change can be quite serious; for example, the average fall in proceeds from winter tourism is estimated to be

[6] See Mieczkowski, Z. (1985). The tourism climatic index: a method of evaluating world climates for tourism. The Canadian Geographer, 29, 220-233.
[7] Ronchi, E. (2019). Report on the state of the green economy-2019. Rome: Fondazione per lo sviluppo sostenibile (Foundation for sustainable development).

about 10.2% in 2030 and 10.8% in 2090. More in general, in the most pessimistic case (RCP 8.5) an estimate is shown in the figure above.

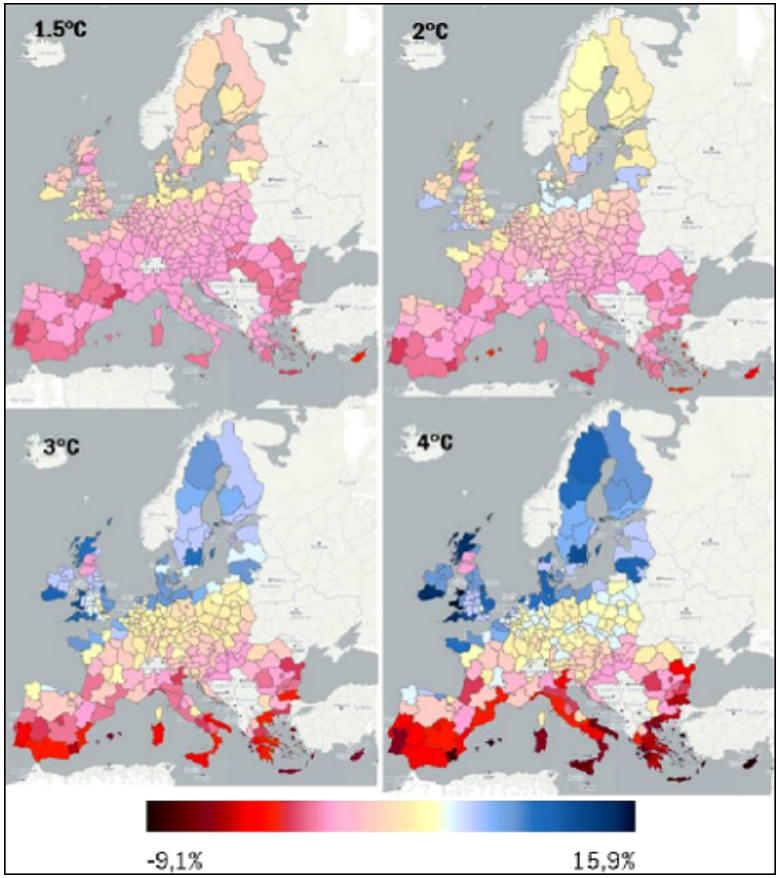


Figure 13. Possible variation in tourist arrivals in Europe in various hypotheses of average heating (from the EU JRC study, see note 8)

According to a European Commission study[8], if we only consider the environmental variable, in the coming years tourists will tend to book holidays in colder localities, resulting in a northward shift in the tourism centre of gravity. In the worst scenario (an average temperature rise of 4 degrees), Ireland would become the country with the highest increase in

[8] Matei, N. A., García-León, D., Dosio, A., Batista, F., Ribeiro Barranco, R., & Ciscar Martinez, J. C. (2023). Regional impact of climate change on European tourism demand (No. JRC131508). European Commission Joint Research Centre.

tourist flows (+9.05%), followed by Lithuania, the UK and Denmark. Bookings for seaside destinations such as Cyprus and Greece would fall on the other hand Arrivals in Italy would fall 1.69%.

Climate change therefore represents a serious threat for the tourism sector, above all in certain destinations. It is therefore necessary to reduce the greenhouse gas emissions and adapt to the effects of climate change.

3. FRESH AIR FOR HOT CITIES AND DESTINATIONS

MARCO ANTONIOLI AND GIUSEPPE GIACCARDI

"Fresh air for hot cities" is the title of a section of Austria's tourism portal. It tells the story of the Austria's collective of architects, the "Breathe Earth Collective"[9] which has been designing new solution for years to bring a breathe of fresh air to cities and tourists during the hot Viennese summers

The first installation was in July 2019, when a building in the form of an Airship was landed in one of the largest artistic and cultural areas in the world: Vienna's Museum Quarter. The Airship is defined by its creators as "the prototype of an urban island of freshness, or coolspot".

But why are these islands of cool necessary in a city like Vienna where there are countless bars and cafés with air-conditioning? Because in these premises it is rare to see plants, a natural element which has a powerful calming and restorative effect. The green of the plants and the freshness they bring cannot be substituted by places with air-conditioning.

The idea of the Breathe Earth Collective – one that is surely of great interest for Italy's great cities of art too – is that cool and relaxing places should be freely and easily accessible to everyone and equally distributed in space. It is from this viewpoint that the collective's recent installations are a coolspot located in the Schlingermarkt in Floridsdorf, a suburban neighbourhood of Vienna, and another right in the city centre in the Esterházypark beside the House of the Sea.

[9] A network of architects and designers who function as a "think and do tank" for experimentation and designing ecosystems that integrate plants, air and architecture.

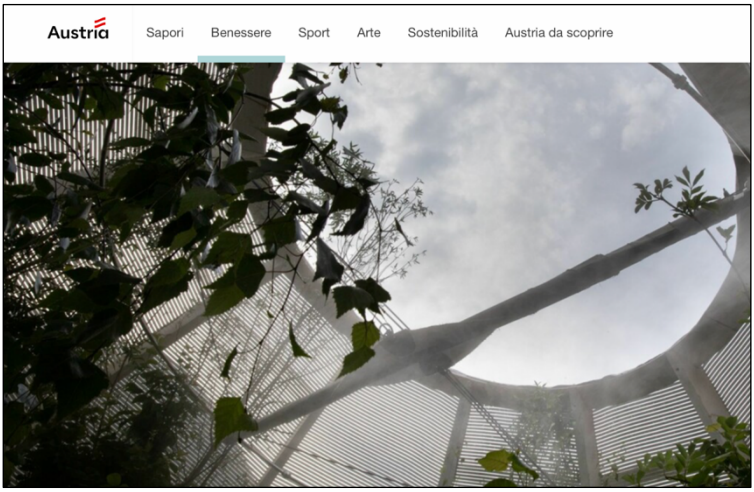


Figure 14. Interior view of the Airship at the Museums Quarter in Vienna (source: https://www.austria.info/it/benessere/citta/aria-fresca-per-le-citta-calde)

What are these coolspots composed of? They are shading elements in wood, seating, plants and trees, water nebulised or in the form of waterfalls, a dream for our art cities baked by heatwaves over 40°C, but structures that are easy to build as the Austrian experience shows.

Confirming a growing awareness of the fact that climate change will impact travel and holiday decisions more and more, Austria is not the only destination that is beginning to equip itself, openly taking care of its own residents and tourists.

In the survey: *Climate change: evoluzione di imprese e destinazioni turistiche in Europa e in Italia* (December 2023), produced by Giaccardi & Associati, we mapped two Italian destinations and eight foreign ones (including Austria) which - on different scales and with different awarenesses - are taking important steps forward towards climate adaptation and which deserve to be illustrated here.

Two cases of climate-sensitive destinations in Italy

A short way from Vienna we encounter the first Italian climate-sensitive macro-destination: the Alpine Convention is an outline agreement signed by all the countries and regions that share the Alpine range. It contains the guiding principles for a sustainable life in the Alps and establishes the legal base for safeguarding the sensitive Alpine ecosystems, regional cultural identities and the heritage and traditions of the Alps.

The Climate Action Plan 2.0[10] of the Alpine Convention was presented in April 2021 and contains a particularly rich and interesting section dedicated to tourism.

Figure 15. The presentation of the Alpine Convention's Climate Action Plan 2.0

As stated in the Plan "tourism is one of the main sources of income in the Alps and 40% of the Alpine municipalities have important tourist activities. Tourist destinations must tackle the challenge in order to align their offer with the new tourist demand for climatically neutral holidays (...). This transformation must also consider the potential impacts of climate change and require intelligent diversification strategies."

In order to go in this direction, the signatories of the Convention have established a specific and shared approach and actions. The approach is one that can guarantee that the distribution of tourist flows does not impact negatively on the destination and on the population that lives in it, and align the development strategies and programs with the requirements of the destinations. The actions envisaged are the development of a common vision for sustainable tourism in the Alps, the sharing of common goals along with monitoring tools and the collection of lacking data regarding the impact of climate change on tourism in the Alps. Finally, the Plan underlines the need for coordination of the tourism strategies at Alpine level in order to promote

[10] https://alpineclimate2050.org/wp-content/uploads/2021/04/ClimateActionPlan2.0_en_fullversion_FINAL.pdf

the transformation of the destinations and give life to training and capacity building pathways for all the stakeholders in the tourism sector.

Continuing westward along the Alpine range, a short distance from the French border and the slopes of Mont Blanc, we come to a second climate-sensitive destination, the Municipality of Courmayeur which – thanks to the "Bando Borghi" of the Italy's PNRR (National Recovery and Resilience Plan) – is implementing the most complex and innovative project at national level by a tourist municipality for adaptation to climate change. The project is entitled "Courmayeur Climate Hub".

What emerges from reading the project is that the Courmayeur community is conscious of the impact of climate change and of how it is necessary to adapt. As they write in the Municipality's portal "(...) The spirit of adaptation is constantly stimulated in an extreme environment. In this way Courmayeur lends itself to becoming a place of cultural and social elaboration of new sustainable practices."

The project has three main goals and ten lines of intervention.

The first goal is to introduce new opportunities for enjoying sustainable and informed tourism/stays in the locality, unconstrained by seasonal rhythms; the second is to redefine and amplify the level of attraction of Courmayeur through new spaces of reference and as hubs of study and resilience to climate change and sustainable ways of living the mountains; the third is to encourage the development of paths for participation and active citizenship through the stakeholder network.

The lines of intervention envisage the recovery and refurbishment of the spaces of the ex Hotel Ange, one of Courmayeur's historical hotels, with a view to making it a real Climate Hub, the creation of a Mountain Library and the establishment of two Courmayeur Climathons – hackathons dedicated to the climate where young people aged 15 and upwards can put themselves to the test with the creation of innovative projects for tackling the environmental challenges in the mountains. Another two lines of intervention are dedicated to training: "Future Mountain Jobs" that aims to involve the students of Courmayeur language high school for three years in a program centred on the development of new occupational figures in the mountain framework and, furthermore, the STEM Camp line that envisages the provision of residential summer camps for the development of new digital skills for young people aged 8-17.

Finally, an intervention line is dedicated to the organisation of a full immersion course during which international experts will tackle the themes of climate change. Corollaries to all this are the development of an integrated

publicity plan and the drafting of an integrated Strategic Plan for sustainable tourism in the high mountains by involving operators and other actors in the territory and with the active contribution of the entire local community (Stakeholder Engagement).

The two Italian cases briefly described above – the Alpine Convention and the Courmayeur Climate Hub – permit a few initial considerations.

In Italy, the awareness of the weight and gravity of the impact of climate change on destinations is still limited and, above all, centred on mountain destinations, probably because the presence/absence of snow is more clearly visible and a more direct perception compared to other less evident impacts of climate change.

Nevertheless those two cases show that it is necessary to start planning from a climate-sensitive viewpoint, in other words one of protection of people – guests and residents – and of tourist activities. The lowest common denominator of these two cases is, not by chance, the creation of joint projects that respect the destinations and, at the same time, the organisation of training courses for all the territorial stakeholders impacted by tourism and climate change.

Eight cases of climate-sensitive destinations in Europe

The debate on climate change and its impact on tourism destinations is high on the agenda in all the main European nations, not only the countries of northern Europe, traditionally more sensitive, but also in Italy's main tourist competitors on the international market such as Spain and Portugal.

In Spain, two big destinations such as Donostia-San Sebastian and Valencia have for some time been centring their tourism strategy, organisation and promotion on offering and creating the perception of being sustainable and resilient.

In the specific case of San Sebastian, the Donostia Green Destination section of its website illustrates how they are working on quality tourism. Amid the information that strikes the eye we can note that 20.3% of the urban area is green: there are over 25 parks and 250,000 trees. This guarantees 21 m2 of green area per inhabitant, twice the level recommended by the World Health Organization. When it comes to getting about, San Sebastian is a city that can be visited on foot or bike: the distances between the main attractions are a maximum of 15-20 minutes on foot and you can count on 80 kilometres of cycle tracks. Other sustainability-related initiatives include: the Zero Plastik Hotels in which single-use plastic has been eliminated completely; a guide for restaurants and agrifood businesses

in order to reduce waste; a manual for rendering the work of tourist guides sustainable for the benefit of all the city users, individual tourists and residents alike.

Valencia, on the other hand, is among the pioneer destinations as regards sustainability and climate, a possible case-study for many Italian destinations with a similar and integrated tourist offer: seaside resort, city of art, gastronomy and venue for major cultural events. In 2019, when no one knew about pandemics and before the subject of climate emergency had begun to appear on the front pages of the newspapers, Valencia was the first destination in the world to measure its carbon footprint.

After constant and consistent urban regeneration work and a rethink about the procedures for making use of its spaces the Spanish city was named the European Green Capital 2024, being able to boast over 2 million m2 of green areas, 120 km2 of orchards surrounding the city, 160 km of cycle tracks and 94 km2 of pedestrian areas.

In order to make Valencia a people-friendly city, work was carried out over the years to implement basic services in order to make them usable by the highest possible number of people. As a result there are filtered drinking water fountains distributed throughout the city, smart pedestrian crossings that are activated when pedestrians approach, hybrid or 100% electric buses, free high-speed public Wi-Fi and 100% green street furniture.

Valencia is also characterised by two great innovations: Valencia Green Routes, an app dedicated to discovering the city's green heritage, and the opportunity for voluntary environmental activity for guests in the city. The latter is promoted on the Visit Valencia portal with the invitation: "Discover the initiatives we are offering you: there are many if you want and if you can collaborate."

Following along the Iberian Peninsula in our search for climate-sensitive destinations we reach Porto. While the above-mentioned Spanish cases illustrate the sustainability and climate change strategies put in place on the own communications channels, Porto adopts a different and more scientific approach with the presentation of an academic paper published in the Journal of Environmental Management by academic staff from the University of Minho, Guimarães, the University of Barcellona and the Paula Frassinetti Research Centre [11]. The article is entitled "Pathways for adapting tourism to climate change in an urban destination – Evidences based on thermal conditions for the Porto Metropolitan Area (Portugal)".

[11] https://www.sciencedirect.com/science/article/abs/pii/S0301479722007344

The focus point of the paper is the integration of bottom-up methodologies for listening to territorial stakeholders and top-down intervention levels by part of the Public Administration in order to implement climatic adaptation policies.

The bottom-up listening stage was realised with the involvement of all the destination stakeholders – citizens, associations, business leaders in various sectors and public decision-makers – and the paper identifies 23 climate adaptation provisions of the Public Administration of businesses in the sector and of tourists.

The Public Administration is in charge of limiting land use, mapping areas at climate risk, calculating the carrying capacity and efficiency-raising and improvement of the local public transport service and of the cycling/pedestrian network.

Tourism businesses, on the other hand, must commit themselves to using renewable energy, carrying out awareness campaigns for more efficient management of resources, and providing ad hoc training paths on climate change and tourism for their own personnel. Finally, tourists can also be agents of change, by travelling in more sustainable ways, choosing to use low-impact means of transport, abandoning the use of cars in all cases possible and, in particular, selecting less travelled urban areas and natural areas in order to avoid burdening the more crowded zones.

While the approach of the Spanish destinations and of Porto are interesting, it is cross the straits of Dover, however, that we encounter the two destinations that are best structured in climate-sensitive terms, i.e. Ireland and Scotland. The websites of the tourism boards of both countries, in fact, have a section dedicated to climate action and make toolkits and guides available for supporting businesses and local tourism bodies in the transition towards Net Zero and publicising the process publicly.

Specifically, Visit Scotland allows you to download a very detailed document about what a destination must do to start its own transition. Item number one is the involvement of tourists in the battle against climate change. With their behaviour, in fact, visitors play a fundamental role in the transition process and therefore advertising and informative campaigns addressed to them become very useful and focus on tourism products and itineraries with low environmental impacts. A second fundamental point for destinations is the measurement of their own climate data – exactly in the same way as they measure figures for arrivals and departures– in order to understand which areas need intervention most. Finally, a requirement for

a real transition is growing collaboration between tourism and all the other economic sectors.

A similar approach is employed by Failte Ireland which makes a "Carbon Calculator for Businesses" available to tourism operators. This is a tool that provides them with data on the carbon footprints of their company and an action plan for reducing emissions. The message that accompanies the initiative is very clear and agreeable: "In the journey to net-zero, you can't manage what you don't measure!" After measuring the carbon footprint it is possible to compare the results of one's own business with the international benchmarks.

Figure 16. The CO2rism of Visit Norway (source: https://business.visitnorway.com)

Developing a system for calculating the relation between tourism and CO2 concentration is also common to destinations other than Ireland. It is the case, for example, with Norway which in its Visit Norway portal declares that calculating CO2 emissions must be part of every destination's marketing plan. Visit Norway has developed an AI tool called "CO2rism" that makes it possible to calculate the CO2 emissions caused by transporting tourists to and inside the country. The calculator is for use by the businesses and operators of the destinations that are interested in learning the emissions generated by the guests they want to attract.

Our brief journey in the climate-sensitive European destinations concludes finally in Ljubljana, capital of Slovenia. Less structured than the previous cases, it is nevertheless representative of how a minimum intervention on a destination portal can make it possible to promote the destination in a climate-sensitive light. On Visit Ljubljana, in fact, there is a section called Green Guidance, a little guide for tourists and travellers on

how to contribute to conserving and developing the city in an attractive, green manner that respects the environment and is characterised by a high quality of life. It indicates three simple points, ones that everyone can follow: conserving nature and the landscape by moving about on foot, by bike or on public transport; protecting the environment and the climate; respecting the culture and traditions, and supporting local producers.

Recapitulation of the evidence

Two Italian destinations, eight European destinations, eight key features of climate-sensitive destinations and 40 climate-sensitive innovation factors (see the table at the end of the chapter).

It is evident from the cases analysed that in many parts of Europe information and climate-adaptation measures are used as a marketing variable and advertising content. On average there is much more attention in Northern Europe to the impact of climate change on the tourism industry. The situation in Italy, on the other hand, is less prepared or adequate especially because it is only the structures in the Alpine range that monitor climate change systematically, probably because of its great impact on shrinking glaciers resulting from the rise in average temperatures, as well as because of the devastations and hydro-ecological disruptions triggered by extreme meteorological events.

At the end of this trip around Europe we can sum up the key concepts that distinguish climate-sensitive destinations in eight point:

1) Measurements and monitoring in order to draw up adequate adaptation plans;

2) An approach that is genuinely green and not just greenwashing[12];

3) Climate adaptation as a new marketing variable[13];

4) Specific integrated advertising;

5) Volunteering by tourists and guests for climate adaptation[14];

[12] In tourism, in fact, the term "green" has already been used for many years but, because of the gravity implicit in the climate data published by the Copernicus Climate Change Service, it can only be concluded that much of what was being passed off as green did not have and does not have any sustainability impact on the structures of the destinations and on the people, tourists and residents.

[13] It is the tourists themselves who are demanding more and better information on the climatic conditions of destinations and on the measures adopted for protecting people in case of extreme events.

[14] Not only do tourists want all the possible information on climate adaptation measures, but they often offer themselves as agents of change in order to contribute with voluntary actions to the Net Zero transition of their own time.

6) Integration of top-down and bottom-up policies[15];
7) Involvement of all the stakeholders[16];
8) Motivating and mobilising private businesses[17].

The adoption of these points implies a decisive change of route for tourism, a necessary change especially for countries like Italy at the centre of the so-called "Mediterranean Hot Spot", and whose environmental and cultural beauty is particularly fragile.

The risk, as confirmed by the January 2014 Copernicus data presented in chapter one, is that the summer heatwaves and the absence of winter snow in fact lead in a relatively brief time to a significant reduction of tourist presence in our country.

[15] It is necessary to work on two integrated levels: necessary on one hand is a level of listening, comparison and emergence of proposals along with all the stakeholders, public and private, on the climate adaptation strategies, and on the other the legislative and executive power must assume adequate responsibility in developing the regulatory structures and implementing the correct and increasingly urgent decisions.
[16] The climate adaptation decisions appear to be more and more urgent but they only have sense and positive effects if taken in liaison with all the parties involved: the Public Authorities, private businesses in all the economic sectors, local residents and guests.
[17] Perhaps it is the most complicated policy to actuate because there is a conflictual preconception between public interest and private interest which must be overcome and channelled towards convergence: the climate adaptation strategies are not simply an urgent and necessary solution as we can see from the data published by various scientific sources but, if participative, provide the most prudent and convenient option for consolidating business enterprise which, instead, is increasingly threatened by climatic extremes.

Destination	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Austria.info	Cold spot	Common Urban Heritage				
Courmayeur	Climate hub	Climathon	Future mountain job	STEM Camp	Integrated Plans	
Convention of the Alps	Shared approach	Shared management of flows	Common vision	Strategic coordination	New skills education	
Donostia-San Sebastian	Green Destination Brand	Green offer networks	Public water quality	San Sebastian waste free	Beaches EMAS e ISO	Decalogue guide tours
Failte Ireland	Climate Action as Priority	Net Zero destination	Carbon Footprint Calculation	Data intelligence		
Visit Ljubljana	Sustainability = Quality	Pact with visitors	Visitors' engagement	Local business support		
Visit Norway	Carbon Footprint Calculation	CO2rism tool	Accountability			
Visit Scotland	Information climate change	Toolkit per Climate Change Action Plan	Destination's journey net zero			
Porto Urban area	Climate change interventions	23 climate adaptive policies				
Visit Valencia	Carbon Footprint Calculation	European Green Capital 2024	Public fountains with filtered water	High standards of public mobility	Green routes app	Green volunteering with tourists

Table 1. Benchmarking the climate-sensitive innovation factors of the destinations

4. TRAVEL PROMISES AND GENTLE NUDGING FOR MORE INFORMED TOURISM

MARTHA FRIEL

The previous chapter illustrates how many destinations are intensifying their efforts to counter climate change and implement adaptation and protective strategies for safeguarding their tourism economies from the negative consequences of evolving climate. It is also crucial, however, to actively involve the tourists themselves, incentivising them to adopt positive behaviours that respect the environment.

As we know, the management of tourist destinations is composed of a series of complex and dynamic activities aimed at the offer, that embrace a broad spectrum of responsibilities. These include the creation, implementation and evaluation of targeted strategies and plans; exploration and analysis of the markets; the production and dissemination of data and information; as well as marketing initiatives for promoting the destinations, defining their position and reinforcing the brand. Also fundamental is the commitment to providing precise information to visitors, with the development of innovative tourism products that can also be instrumental for using resources sustainably and guaranteeing the high quality standards of the products and services offered.

A fundamental role in this path is therefore also played by the tourists who – far from being passive subjects – actually play a fundamental role for ensuring the effectiveness of the measures put in place by the destinations and regions for countering and adapting to climate change. All the more so considering the fact that the goal of many of the actions conceived by the

destinations in order to become climate-sensitive is to encourage positive, proactive and shared responsibility in tourism demand.

In this chapter we therefore want on one hand to investigate some of the trends in the demand, and on the other analyse some tools and strategies implemented by destinations engaged on the front of adaptation to and contrasting climate change that exploit travellers' proactivity. These include codes of conduct studied to induce tourists to make more conscious use of the natural and cultural resources of the tourists, "pledges" made by visitors with their destinations and so-called gentle nudging tools.

Visitors and tourists: from passive subjects to stakeholder in managing the destination

Management of visitors is a crucial aspect of destination management, that aims to encourage positive behaviours and discourage negative ones in order to mitigate or prevent the harmful impacts of tourism on places and their inhabitants.

The measures adopted in order to achieve these goals are typically voluntary, sustained principally by ethical obligation and social pressure. Above all they are manuals and codes of conduct for tourists at their destinations that can be provided to visitors, also quite attractively, by means of information channels and pre-visit publicity as well as on arrival.

Among the most classic are the #enjoyrespect ones, put in place in Florence or Venice in the last decade.

For example, the #EnjoyRespectVenezia campaign launched by the city of Venice in 2017, the International Year of Sustainable Tourism for Development, aims to promote respectable behaviour among visitors that respect the environment, the landscape and the natural and artistic heritage, as well as the identity of Venice and of its inhabitants.

The measures proposed by the campaign are articulated in 12 good practices aimed at responsible visitors, offering a set of recommendations for experiencing Venice in an informed and respectful way. Included among these practices is the discovery of less famous places, and the promotion of the city's hidden treasures, the exploration of the islands of the lagoon and of the Venetian mainland, supporting the local economy by buying typical products and visiting artisan workshops, and sticking to behaviour that preserves the integrity of the monuments and public spaces. Visitors are also advised to plan their visit to the city during less crowded periods and to follow local regulations as regards food consumption, eating and drinking, and differentiated waste disposal for those staying in apartments. Similar

indications are those offered by the #enjoyrespectflorence initiative promoted by the City of Florence and are those shown in Figure 17.

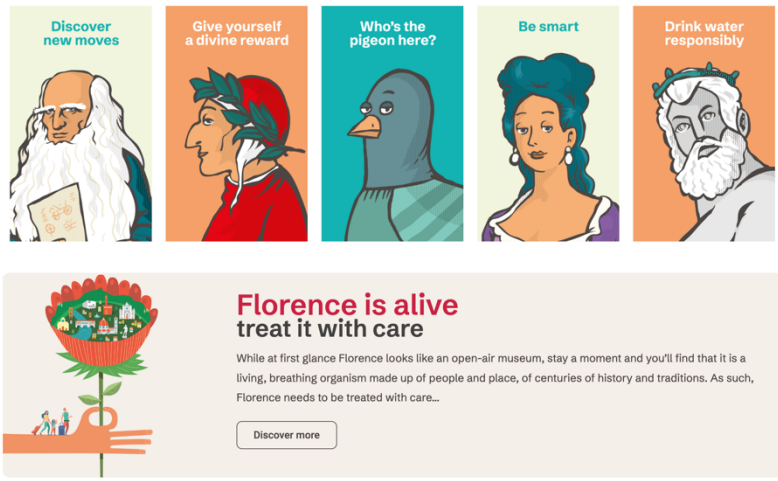


Figure 17. Good practices of #enjoyrespectFirenze (source: https://www.feelflorence.it/it/enjoy-respect)

While various studies have highlighted how codes of conduct can be effective educational tools for reducing tourists' unintended negative behaviour, this type of intervention does not however provide the motivation required for obtaining fully satisfactory results. Furthermore this type of tool does not always engender in the visitor a full and informed knowledge of the "state of health" of the place visited and on its fragile elements.

Furthermore, this approach has been criticised for being more inclined to limit the negative impacts rather than enhancing the tourism experience overall. This last point is fundamental on the other hand: greater commitment towards enriching the experiences of visitors and promoting human wellbeing can in fact not only render the visit more gratifying for tourists but also contribute positively to the wellbeing of the host community, with the creation of a more sustainable balance and benefit between tourists and destinations.

More recently then, many destinations have sought more enticing and engaging way to propose rules of conduct to tourists to a destination that are able to promote more sustainable use of the placers and of their natural and cultural heritage as well as an awareness of the changes induced in the long

term by the negative effects of the tourism on what the destination has to offer.

Proof of change... a pledge to the children of Palau

Palau is an island situated in the western Pacific Ocean. It is composed of a group of islands and is located about 800 kilometres east of the Philippines. Palau is renowned for its crystalline waters, the rich marine ecosystems and unique biodiversity. It is an important tourism destination for enthusiasts of diving and of marine exploration as it offers opportunities for snorkelling among the coral reefs, swimming with sharks and visiting freshwater lakes set in splendid calcareous islands.

Since December 2017, for the first time tourists arriving in Palau find impressed on their passports a promise to sign instead of the entry stamp: a promise to the island's children.

Since then, everyone entering Palau must sign their pledge to them *"to preserve and protect your beautiful and unique island home. I vow to tread lightly, act kindly and explore mindfully"*. (...) "the pledge continues.

The stamp applied to tourists' passports is part of the "Palau Pledge" initiative that also includes the screening of a video during their flight that informs arriving tourists of their onus to be environmentally responsible and a checklist of do's and don'ts distributed on landing. Among the things to avoid are walking on and touching the corals, feeding the sharks or trying to catch wild animals; the things to do include getting information and learning about the local culture and customs, and bringing reusable containers for food and drink; not using certain types of sun creams that can pollute and damage fauna and marine flora, etc.

Then, a fundamental element among the conservation efforts in Palau is the concept of bul, namely the fishing ban. This word indicates a traditional system for managing Palau's resources, mainly used by village chiefs in times past to manage fish stocks. When the village noted a drop in fish numbers off the coast, a temporary ban - or bul - was issued, forbidding all fishing activity in order to allow the marine life to prosper and reproduce. The main goal of this initiative as a whole is to ensure that the young people of Palau will inherit the same uncontaminated resources that have existed in the country for countless generations. In order to guarantee that the Palau Pledge is more than a simple publicity tool, its implementation has also been supported by national policies to reinforce the application of the laws on environmental protection, including patrolling and reporting efforts.

Today, many inhabitants of the island maintain that the Palau Pledge is a small but significant step towards changing the mentality and behaviour of tourists as regards building awareness of the value and fragility of the country's natural and living resources.

Even if it does not specifically mention the problems of climate change, the Palau Pledge constitutes an innovative form of managing visitors as it is able to engage them emotionally and actively in interpreting their role in managing destinations.

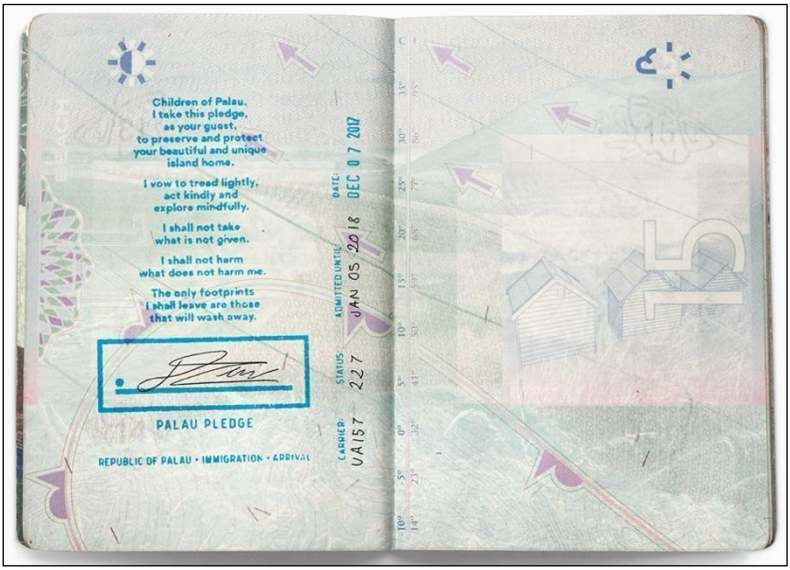


Figure 18. Palau Pledge stamp (source: https://palaupledge.com/)

Unlike the visitor management tool illustrated above, in fact, the "national destination pledges" adopt an innovative approach that recognises visitors as responsible individuals who are able to impact the destination positively through their choices and behaviours. The idea is to transform visitors into agents of change, who are aware of their own actions and of their impact on the destination and on those who live in it.

The act of committing by means of a pledge represents an active response to one of the destination's management actions by visitors who are introduced to their role before arriving at destination. As has been said, attempting to positively influence visitors' behaviour to reduce the negative

impacts of tourism is not a new goal, but the use of specific pledges for destinations is an innovative approach for achieving this scope.

The Palau Pledge is one of the best known examples of a national destination pledge, but it is not unique: other examples are the Icelandic Pledge, the New Zealand Tiaki Promise and the Sustainable Finland Pledge, all tools that aim to stimulate an emotive connection with visitors to facilitate their role as agents of change.

The Icelandic Pledge, launched in June 2017, is perhaps the first and begins with a general commitment to be a responsible tourist, and then follows on with a series of specific commitments regarding the visitors' safety and the environment. The Tiaki Promise (2018), fruit of the collaboration of seven public and private organisations in New Zealand includes pledges to take care of the environment, travel in safety and respect the culture. Finally, the Sustainable Finland Pledge launched internationally in September 2019, includes nine commitments that range from respecting the life of the locals to not abandoning rubbish.

All these pledges therefore share similar objectives as regards mitigation of the negative effects on tourism and improvement of visitors' security, but the way they are implemented varies from one destination to another. The Palau Pledge and the Tiaki Promise, for example, are integrated into the national tourism policy or strategy and therefore act in association with other sustainable tourism initiatives.

In short, the national pledges of the destinations involve the visitors in a deliberate act of commitment, marking a significant deviation from the one-way message used in the codes of conduct. There is evidence that the commitment to change behaviour, verbally, in writing and ideally in the presence of others, increases the probability of successfully inducing changes in the conduct of tourists. This effect was demonstrated by the broad range of questions, and observed both in the short term – immediately after signing the pledge – but also in the long term.

Furthermore, these strategies are also consistent with the evolution of tourist demand that sees growing numbers of people looking for an occasion for personal improvement during their vacation.

The cases just mentioned are only some of the countless examples of tourist pledges[18]. There are in fact various types of tourism pledges such as the global tourism pledges (e.g. the Travel Better Pledge and the Sustainable Tourism Pledge); pledges for islands (such as the Pono Pledge in Hawai'i and

[18] https://single-market-economy.ec.europa.eu/sectors/tourism/eu-tourism-transition/tourism-transition-pathway/commitments/pledges_en

the Maria Island Pledge); pledges for cities and coasts (e.g. the Bend Pledge and the Big Sur Pledge); as well as pledges linked to specific causes (e.g., the Pledge for the Well-being of the Child, and Travellers against Plastic and the Pledge for Ethical Experiences with Elephants).

Then there are promises that range beyond the primary focus on visitors to include tourism businesses and stakeholders (for example, the Climate Action Leaders in Travel Pledge).

However, the pledges prepared for travellers at destination/country level are particularly interesting because of their scale of application and the active involvement of the national tourism bodies and the main implementing party.

Both the pledges of the national destinations and the visitors' codes of conduct have similar goals, but also significant differences. Both aim to influence the behaviour of visitors before the experience itself. However the codes of conduct are usually presented as lists of operational guidelines, while the pledges of the national destinations consist of pledges made in the first person. Furthermore, the codes of conduct provide specific indications about how to behave, while the promises require a personal pledge from the visitors after they have read it. Finally, the codes of conduct are commonly communicated through the text, sometimes with images, while the pledges of the national destinations use a variety of media and social marketing strategies for involving the public in a more dynamic manner.

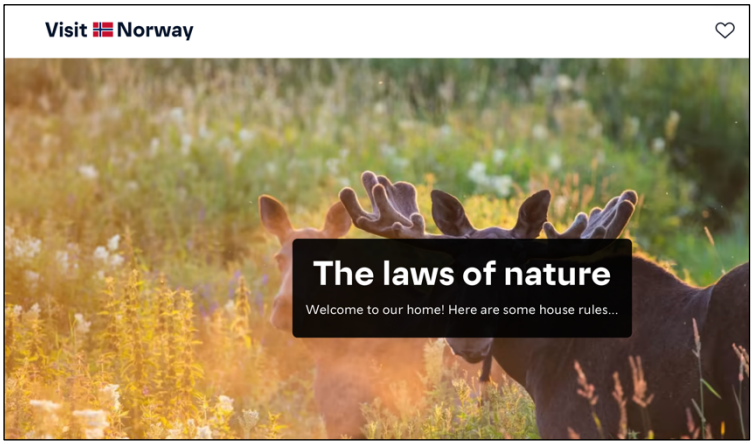


Figure 19. "The laws of nature" section on the Visit Norway site (source: https://www.visitnorway.com/things-to-do/outdoor-activities/the-laws-of-nature/)

Of course as regards the codes of conduct there is no shortage either of cases of virtuous destinations which are able to refresh their communications strategies effectively: this is the case, for example, of Visit Norway which, in 2021, launched a diverting campaign named "Law of Natures", mainly publicised on the social channels of the tourism body.

With five videos starring talking animals, Norway's tourism board sought to impart some useful recommendations about how to behave in nature, in particular when in contact with the country's wild fauna.

This Nordic country which is renowned for its 'allemannsretten, namely the right to stroll and of free access to the countryside, wanted in this way to remind visitors that while this right undoubtedly brings joy and wellbeing it also implies various responsibilities.

The pair of deer, Bjørn and Morten, a reindeer, a walrus, several ducks, a razor shell and a fox, voiced by two famous Norwegian actors, Mari Maurstad and Torjus Tveiten, therefore help tourists to grasp a few simple rules of behaviour so as to have the lowest possible impact on the local nature. The campaign is supported by up-to-date information on Visit Norway's website and by continuous collaborations with destinations and organisations throughout the country.

Figure 20. Climate change section of Visit Greenland (fonte: https://visitgreenland.com/about-greenland/the-guide-to-climate-change-in-greenland/).

Finally, with specific reference to the climate-change information dedicated to tourists, a particularly interesting case comes from Greenland which on the Visit Greenland site provides a highly organised breakdown of the effect of the climate changes on the island, looking at the animal world and the effects on the population and local nature, and finally on the different economic sectors including tourism. This is so as to make tourists aware that "*most of us are familiar with the term 'climate change' and consider*

it to be a reality in today's world in some way. For many of us it is something we only see in news bulletins, with the environmental conditions that set new records in distant countries: "hotter", "wetter", "drier". But in some places climate change is an undeniable fact. One of these places is Greenland."

Beyond the tourist's decision

More and more studies and reports regarding the sector highlight that when making travel decisions sustainability at global level is a priority today: already in 2022 Booking.com's Sustainable Travel Report highlighted that over four travellers out of five believe that it is important to travel sustainably[19] .

In the same report, half of global travellers state that news of climate change has inspired them to make more sustainable travel decisions and that that desire to travel more sustainably has increased. 71% of travellers also declared that they wanted to make a greater effort the following year to travel in a sustainable manner, amounting to a 10% increase over the previous year.

This change of values seems to regard all the demand segments transversally, for example the luxury one in which sustainability is gaining a central position. Recent research by Altiant[20] revealed that the 44% of high-spender consumers in Europe, Asia and North America would be prepared to increase their spending on travel by 10% if that contributed to protecting the environment; 39% of them would even be prepared to spend 10% more.

In Italy too, 64% of Italian tourists consider the environment and sustainability as factors that influence their travel decisions, a figure that rises to 71% among the under 35. Furthermore, 75% of Italians consider that the growth of sustainable tourism is fundamental for the country's ecological transition, while 63% prefer local tourism destinations for promoting tourism in the vicinity and developing Italian localities[21].

These figures, though interesting, must be contextualised in the light of a fundamental reflection that emerged from the Sustainability in Travel 2021 report on the US website, Skift, namely that the future of tourism is revealing itself as a context in which travellers need not necessarily worry about their

[19]https://globalnews.booking.com/download/1161485/booking.comsustainabletravelreport2022final.pdf.
[20] https://skift.com/2021/08/31/the-future-of-luxury-travel-will-be-defined-by-smart-tourism/
[21] https://www2.deloitte.com/content/dam/Deloitte/it/Documents/consumer-business/cs-obiettivo-sostenibilita-turismo-italiano-2022.pdf

environmental impact as sustainability must be integrated already and on a basic feature of the experience itself and of the tourist product offered. As a result, destinations and operators must equip themselves not only to offer sustainable services and products with the adoption of climate-sensitive approaches but also make them easy to identify and use on the demand side.

As has already been illustrated in the previous chapter, from this point of view the experiences have multiplied in recent years and are more and more interesting. Not only, in fact, are destination countries communicating sustainable travel modalities and zero-impact travel solutions in an increasingly accessible manner on their portals, but small tourism districts are also providing themselves with innovative proposals that take account of sustainability and developing proposals that are consistent with changes induced with mutating climate. Switzerland, Ireland, New Zealand and many other destinations, for example, are detailing travel and internal transport modalities for those who want to travel while limiting their emissions.

New climate change destinations between dark and educational tourism

When you type "last chance tourism and climate change" into search engines it is remarkable to see the number and diversity of the results. There is a wealth of proposals in line with the growth of a phenomenon that is increasingly present in the media too, or suggestions of places to visit that are destined to disappear or be compromised by climate change. Last chance tourism is in fact an emerging trend in the tourism sector where some travellers are seeking destinations in which either they can observe the effects of climate change directly or visit natural attractions that are threatened by the progressive loss of habitat or by imminent disappearance.

There are also many lists of destinations suggested by leading guides in the sector. Among the iconic destinations threatened by rising sea levels, shrinking glaciers, and heat changes *Lonely Planet*[22] proposes the Great Barrier Reef in Australia, The Statue of Liberty in New York, The Ilulissat Fjord in Greenland, Venice in Italy, the Galapagos in Ecuador and the Maldives. On the other hand, the twenty proposals listed by the *Rough Guide*[23] in 2021 included the Amazonian Forest in Brazil, Olympia in Greece, the National Glacier Park in Montana, USA, the Galápagos in Ecuador, the Congo basin in Congo, Venice in Italy, the Sundarbans in India and Bangladesh, the

[22] https://www.lonelyplanet.com/articles/climate-change-effects-on-tourism.
[23] https://www.roughguides.com/articles/top-destinations-to-see-before-they-disappear/.

Snows of Kilimanjaro in Tanzania, the Salar de Uyuni in Bolivia, the Patagonian ice fields in Argentina, the Maldives, the Malagasy rain forests, the Komodo Island in Indonesia, the Great Barrier Reef in Australia, the glaciers of the European Alps in Switzerland, the Gates of Hell in Turkmenistan, the Dead Sea in Israel, Jordan and Palestine, the Choquequirao Archaeological Park in Peru, the Bordeaux Vineyards in France, and the Alaska Tundra in the USA.

This type of tourism obviously raises important ethical and environmental questions involving the vicious circle between the survival of destinations and tourist pressure on delicate ecosystems that are already threatened. This is a very topical and controversial debate as on one hand tourism often guarantees the survival of various local economies, and on the other hand, if well managed, can also benefit the acquisition of a greater awareness on the real effects of climate change.

A symbolic case of this type of debate is the one that is dividing the Pond Inlet community in the Canadian Arctic[24]. In 2023 this village of about 1,600 inhabitants, saw the arrival of about 3,000 tourists, each paying about $15,000 to travel on one of the 25 cruise ships docked in the village port. In a place which has one of the highest rates of poverty in the country, the cruise ships provide a crucial source of income for people whose source of subsistence for 4000 years was hunting marine mammals and fishing.

Here, therefore, tourism has become a vital source of income, but also a threat for a traditional lifestyle, and while some inhabitants are concerned about the environmental impacts and the deterioration of climate conditions, others, who depend on tourism economically, continue to strenuously defend the growth in arrivals in an environmental context which, however, is being transformed more and more.

[24] https://www.theguardian.com/world/2024/mar/08/environmental-row-last-chance-tourism-canada-melting-arctic-pond-inlet.

5. TOURISM BUSINESSES AND CLIMATE ADAPTATION

MARCO ANTONIOLI AND GIUSEPPE GIACCARDI

After analysing the cases of climate-sensitive tourism destinations in chapter 3, we will now examine what tourism businesses – large and small – are doing to adapt to climate change. An important observation should be made immediately: the major players in the sector (Booking Holdings, Expedia Group and Marriott International) are already reasoning from a climate-sensitive standpoint.

They have in fact introduced adaptation to climate changes as a real strategic variable in their business plans. For example, when introducing Expedia's company's Climate Action Plan, Aditi Mohapatra, Vice President of Global Social Impact & Sustainability in the Group, writes:

"We see climate action as a business imperative and the way to ensure a resilient and prosperous industry for generations to come. Our travelers are already demanding more sustainable options, and we expect the environmental impact of their choices to only increase in importance to them. We see an opportunity in sustainability to enhance our brand and capture traveler loyalty, get ahead of Net Zero transition expenditures, and reward travel suppliers who do the same."

In addition to the cases of the three major players in the sector, the study, *Climate change: evoluzione di imprese e destinazioni turistiche in Europa e in Italia (evolution of tourism enterprises and destinations in Europe and in Itay)*

(ENIT, December 2023), also investigated the policies of hospitality structures that are already well ahead in adaptation to climate change.

We believe that it is not by chance that all four of these structures are based in climate-sensitive destinations, demonstrating the fact that increased attention by public entities also contributes to increasing the attention of private enterprises and vice versa, thereby creates a virtuous circle whose final result is the climate adaptation of the destination as a whole.

How climate change is faced by two Online Travel Agencies (OTA) and a major hotel group

Before entering into the analysis of the plans and climate change adaptation lessons of Booking Holdings, Expedia Group and Marriott International, it is interesting to look at some figures on their importance for the world of tourism.

Booking Holdings – which includes Booking.com, Priceline, Agoda, Kayak and OpenTable – operates in over 220 counties and offers accommodation in more than 28 million hospitality structures. Over 1 billion nights were booked through the Booking Holdings systems in 2023.

Expedia Group, which includes Expedia, Hotels.com, and Trivago, is present in more than 70 countries and makes over 3 million hospitality structures available.

Finally, Marriott International is a US multinational that manages and franchises more than 7,000 hospitality structures in 131 countries, amounting to a total of over 1.2 million rooms.

The Climate Action Plans of Booking Holdings and Expedia Group contain some very important similarities and some substantial differences. Both companies have the achievement of net zero by 2040, spreading a generic culture of sustainability, and collaborating in decarbonisation as main goals. Furthermore, they are taking action to make all the services offered

Figure 21. The Booking Holdings Climate Action Plan (https://www.sustainability.booking.com/industryinsights/climate-action-plan)

sustainable and to inform their clients correctly about the sustainability levels of what they are purchasing.

Some of Booking Holdings climate change adaptation actions include training programs on climate and sustainability for the staff of all the structures in the platforms managed by the group, and a support for all the private companies in sourcing funds for implementing actions to counter climate change.

Expedia Group, on the other hand, has a Climate Action Plan entitled Open World™ based on three intervention pathways that correspond to the three sustainability pillars: economic (economic development), social (inclusion paths) and environmental (prosperous planet).

Figure 22. Open World™ by Expedia Group (https://www.expediagroup.com/who-we-are/Impact--Sustainability/)

The focal points of the Expedia plan are the inclusion in its business model of the risk assessment and integration factors and of the opportunities arising from climate changes; taking specific actions to reduce the carbon footprint with the development of climate adaptation actions with the direct involvement of businesses, the public and tourism destinations.

It clearly emerges from the cases of Booking Holdings and Expedia Group that the major tourism multinationals can act as drivers of climate adaptation, but direct and real collaboration remains essential with all the stakeholders in the sector, private operators and public administrations in every local context.

After public-private collaborations, another fundamental action is the development of training for company personnel who must always be properly prepared so that they can provide precise information and satisfy the new needs of climate-sensitive travellers.

A step in this direction is Marriott International's "Serve 360" project which pivots around four cardinal points: N (*Nurture Our World*), S (*Sustainable Responsible Operations*), E (*Empower Through Opportunity*,) and

W (*Welcome All and Advance Human Rights*,). In particular, the last two cardinal points, *E* and *W,* specifically move in the direction of training Marriott personnel about topical issues – of which climate change is a significant one – and to include people in the hotel chain's teams with the most varied socio-cultural backgrounds (from gender identity to geographical provenance, and economic conditions).

If policies *E* and *W* specifically concern economic and social sustainability, *N* and *S* focus more on environmental sustainability. It is here, in fact, that we find actions aimed at minimising the environmental impacts by building sustainable hotels through more sustainable allocation of resources.

The vision declared by Marriott and published on its website[25] should also be read in a climate-sensitive light, and touches on such a fundamental concept as the social responsibility of tourism enterprises.

Today, business plays an increasingly critical role in taking on our world's most pressing social, environmental and economic issues. With our size and scale, we have a global responsibility and a unique opportunity to be a force for good. Guided by our 2025 Sustainability and Social Impact Goals, as well as the UN Sustainable Development Goals, we commit to creating positive and sustainable impact wherever we do business.

Some of Marriott's targets to achieve by 2025 are include:

- donating 15 million hours of voluntary work to the communities in which Marriott hotels are located;
- improving the environmental impact and reducing the carbon footprint of every single hotel;
- achieving sustainability certification for 100% of the group hotels;
- applying the metrics for the environmental impacts of every single hotel in a transparent manner.

Another two keywords for climate-sensitive enterprises come into play in these very short-term Marriott goals: volunteering - already encountered when talking about Valencia [26] and to be understood as voluntary activities in the local communities by tourists and residents - and transparency in the disclosure of environmental impact data and the actions for reducing it. Access to this information, which constitutes a real marketing tool has, in fact, assumed greater value and is becoming obligatory.

[25] https://serve360.marriott.com/
[26] See chap. IV

Climate-sensitive hotels

Four hotels, four cases of small-medium climate-sensitive enterprises : the Boutiquehotel Stadthalle in Vienna, 79 rooms just a few steps away from the city's west railway station; Hotel Doolin, 12 rooms and a 300 seat restaurant in the west of Ireland; Hotel Ullensvang, 170 rooms on a Norwegian fjord; Whatley Manor, 23 5-star rooms immersed in the English countryside. Four hotels all characterised by great attention to adaptation to climate changes and to the sustainability of their activities.

The most impressive example is perhaps the Boutiquehotel Stadthalle in Vienna, which also decided to theme every room with one of the targets on the United Nations' Agenda 2030 and which has been a zero impact hospitality structure since 2009. In the words on its website:

Sustainability has always been a very important issue for the guests, employees and partners of Boutiquehotel Stadthalle. That's why it was a no-brainer for us to be a first adopter of eco-friendly business strategies in the hotel industry. Where others only provide lip service, we implement concrete steps in accordance with the UN's Sustainable Development Goals (SDGs).[27]

*Figure 23. Exterior of the Boutiquehotel Stadthalle, Vienna*www.sme-enterprize.com/sustainability-stories/environment/boutiquehotel-stadthalle/)

Some concrete actions that Boutiquehotel Stadthalle has completed are the complete elimination of minibars, with a saving of over 21,000 kg of CO_2/year, the differentiated collection of 100% of waste thanks to the fundamental contribution of specially instructed housekeepers on the floors, 93 m2 of photovoltaic panels, and natural air conditioning with a

[27] https://www.hotelstadthalle.at/en/boutiquehotel/green-heart-vienna.html

ventilation system which conveys fresh air from the garden to the rooms. Furthermore, the breakfast buffet is 100% certified organic.

Also very interesting however is the case of Hotel Doolin in Ireland. The following is declared in their website homepage:

"An overnight stay doesn't have to cost the earth, your wedding doesn't have to be an ecological disaster, you can party without footprint at Hotel Doolin, Ireland's first certified carbon neutral hotel."[28]

Hotel Doolin reduced its water consumption by 59%, it is a 100% *no oil* hotel and it has collected €80,000 for local voluntary organisations. The most original lesson from this small Irish hotel regards an initiative that could inspire all wedding destinations and services: ten trees are planted in the surrounding land for every wedding organised by the hotel.

Thanks to this policy, the number of trees in this Irish destination has already grown by 5,000 units. This is a simple and effective way of contributing to climate adaptation on the occasion of every wedding and of generating new green lungs for the benefit of both guests and local residents.

Turning to Norway, the elements of interest in the Hotel Ullensvang regard the heating and cooling system which uses the fjord where the structure is located as the source of energy . Furthermore, the excess heat generated by fridges and freezers is used to heat the water.

From the climate-sensitive standpoint, Hotel Ullensvang has been awarded Eco-Lighthouse certification (a Norwegian environmental certification system) that explicitly recognises that sustainability is an integral element of the company's strategic decisions, that specific training sessions are organised for the entire staff on sustainability and climate adaptation and that there is absolute transparency regarding the actions taken and results obtained. This commitment level is also shown by the fact that it is possible to download the hotel's Transparency Act from its site. This is a sort of social accountability report on the activities and results obtained.

Finally, there is Whatley Manor in England, characterised by a clear climate-sensitive vision*:*

"To be an environmentally responsible hotel, restaurant and spa. To help achieve a cleaner, safer and healthier world for ourselves, our families and for future generations."[29]

In order to obtain this result some of the actions carried out included a complete review of the hotel's supply chain, the organisation of

[28] https://www.hoteldoolin.ie/
[29] https://www.whatleymanor.com/sustainable-hotel/

environmental education and awareness-building moments for the team, the suppliers and the guests, measurement of their carbon footprints and the drafting of scalable sustainability reports.

Proof that the actions taken starting from 2019 have had a positive effect, in 2023 Earthcheck declared the hotel the first Climate Positive structure in the entire United Kingdom. This hotel is also *"in the front line for an important industrial sector that must take a step forward and accept greater responsibility."*

Figure 24. Exterior of Whatley Manor
(source: https://www.booking.com/hotel/gb/whatley-manor.it.html)

These four examples from different geographical locations and different company sizes are intended to spur the more than 220,000 hospitality businesses that constitute the mainstay of tourism offer in our country to implement concrete climate adaptation actions, actions that can be taken every day and communicated in a correct and transparent manner to their potential clients, to their own guests and to the residents of the destination. The aim here is to reach out to the increasingly pressing demand of climate-sensitive travellers and meet their specific needs.

Recapitulation of the evidence

The two main OTAs at global level, a major international hotel chain and four medium-small hotels located in various parts of the world have in common concrete climate change adaptation policies and real sustainability practices which have become non-deferrable variables in their strategic and marketing plans.

These experiences allow us to identify 28 climate-sensitive evolution factors for tourism businesses as recapitulated in Table 2.

The actions may be small at times but with concrete impacts for creating working climate change adaptation strategies inside companies and, as a consequence, in the destinations too.

The most recurring actions include targeted staff training, and the adoption of a full horizon environmental, economic and social sustainability concept as the basis for any company decision and the transparency of the policy, practices and information.

Furthermore, the hospitality structures engage the end-clients themselves, and these participate consciously in protecting and safeguarding their surroundings thereby amplifying the results of the climate adaptation practices.

Finally, all companies can play absolute leading roles for spreading an awareness of the climate conditions of the destination and for supplementing adaptation actions which have value for the guests and for residents at the level of awareness-creation, promotion of ecological products and use of air-conditioning systems with low or zero environmental impact.

Finally, seven key concepts emerge from the analysis of these seven cases that characterise climate-sensitive businesses:

1) Public-private collaboration
2) Involvement of local communities in the climate-adaptation actions
3) Transparency of actions and results[30]
4) Real full-spectrum sustainability[31]
5) Push towards destinations to operate in climate-sensitive ways[32]
6) Involvement of tourists in volunteering activities
7) Limitation and reduction of fossil sources[33]

Creating climate-sensitive businesses is urgent, possible and useful. Guests, the structure's personnel, suppliers, partners and destinations in fact recognise the value of businesses that put good sustainability practices

[30] Through the drafting of social accountability reports that explicitly set out what is being done for climate adaptation for the benefit or guests and residents.
[31] A business is truly sustainable only at the moment in which the three sustainability pillars are in equilibrium: environmental, economic and social.
[32] Climate sensitive companies can constitute a powerful stimulus to make destinations start working from a climate-sensitive standpoint. In fact, the actions that businesses can take are more easily created and generate unquestionable benefits for the entire destination.
[33] Tourism enterprises can become carbon neutral by adopting heating and cooling systems with low or zero environmental impact.

for sustainability at the centre-stage. These are good practices therefore that contribute towards increasing the perceived and real value of the organisation and, beyond it, of the destination too.

Destination	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Booking Holdings	Climate Action Plan	Target Net Zero by 2040	Training for collaborators	All the services are more sustainable	Sport to businesses in Climate change
Expedia Group	Climate change strategy om 3 axes	Target Net Zero by 2040	Climate risks integrated in the business model	Reduction of carbon footprint with clients	
Marriot International	Vision with sustainability values and goals	Strategy in 4 climate-sensitive cardinal points	2025 sustainability goals	100% of group hotels with sustainability certification	Annual Serve 360 reports for each hotel
Boutiquehotel Stadthalle, Austria	First hotel aligned with the UNO 2030 Agenda	Net Zero since 2009	Sustainability practices with guests and collaborators		
Hotel Doolin, Ireland	Vision with high sustainability	First no carbon and no oil certificate since 2017	Guest water consumption reduced by 59%	10 trees planted for every wedding event	Support for voluntary sector
Hotel Ullensvang, Norway	Fan-coil system for heat and no carbon cooling	Eco-Lighthouse certification	Transparent Act social accountability report		
Whatley Manor, United Kingdom	Climate-sensitive vision	Strategy with focus on sustainable practices	Circular economy and local community policy		

Table 2. Benchmarking of the climate-sensitive innovation factors of the businesses

6. FESTIVALS, ARCHAEOLOGY AND MUSEUMS: REFLECTIONS ON CULTURAL TOURISM

MARTHA FRIEL AND ANDREA PORTA

For decades and even centuries by now Italy's cultural heritage and activities have been the main drivers of tourism and the distinctive elements of the Italy brand abroad, but is climate change threatening this heritage and its attractive capacity in some way? And if yes, how are the institutions and cultural institutions responding?

The international recognition of Italy's tangible and intangible culture plays a fundamental role for the country's tourism economy. This has been underlined for decades by studies of the sector that show that over one third of the tourism from foreign visitors to Italy is concentrated in cultural destinations. According to the data produced by the Bank of Italy, about 40% of the spending of foreigners visiting Italy for holidays is concentrated in the cities of art[34].

The uniqueness of the old city centres – large and small – the exhibitions, the festivals, the UNESCO heritage sites, the programming of Italian cultural institutions – from the Venice Biennale to La Scala Milan – in fact attract a huge international public every year drawn not only by the cultural extractors and by their programs but also by that "creative atmosphere" generated around them and which is an integral components of Italy's soft power abroad.

[34] The Bank of Italy's international tourism surveys are available here: https://www.bancaditalia.it/pubblicazioni/indagine-turismo-internazionale/index.html.

If, therefore, there is no doubt that the cultural world constitutes a fundamental element for Italian tourism, in the context of this work it is interesting to investigate its role from another viewpoint and pose some questions: If the cultural heritage and activities have been the main drivers of tourism in Italy and the distinctive elements of the Italy brand abroad for decades and indeed for centuries by now, is climate change threatening this heritage and its attractive capacity in some way? If so, how and what are the consequences? Furthermore, it is also interesting to investigate how the Italian cultural system is taking action to promote climate-sensitive tourism and what the most innovative and virtuous practices implemented are. This should also be done considering the undoubted potential of the arts and cultural institutions for guiding climate action.

Starting from several cases at national level, the paragraphs that follow seek, therefore, to analyse the relationship between the cultural sector and climate change on three main levels: (i) the impact of the changes on Italy's cultural heritage and on cultural tourism, (ii) the development of strategies and practices for artistic and cultural production and communication that reduce their environmental impact, (iii) the role of the cultural sector in guiding climate action.

The impact of climate change on Italy's cultural heritage and on cultural tourism

In July 2023, one of the international tourists discovering the Italian peninsula was Karl Lauterbach, the German health minister. Travelling around Emilia-Romagna, Tuscany and Lazio, he shared his experiences on social media. During a Saharan heatwave he spoke of the exhaustion he experienced because of it when visiting Bologna and Rome, and voiced his concern about the impact of climate change on the future of tourism in Italy and Southern Europe. While he also expressed his appreciation in his tweets for the coolness of the churches he visited – to the point of suggesting keeping them open as shelters during heatwaves – and for the pleasant relief he found in the Galleria Borghese, his remarks and his selfies in front of a scorching Trevi Fountain did not fail to trigger a debate and a certain institutional embarrassment which was soon quickly forgotten.

Without meaning to be polemical, mentioning here this little episode that hit the summer headlines especially because of the institutional role of the protagonist gives us pause for reflection on the travel experience of millions of international tourists who, from regions less accustomed to high

temperatures, visit Italian destinations and cultural sites in the hottest months of the year.

Such a reflection is urgent tor three reasons: to let those who tour for cultural reasons to have the most enjoyable experience possible, and especially one that is the least threatening healthwise, to identify strategies for promoting visits to the cities of art and cultural sites in different months of the year, with adjustment of the organisation of the demand and identification of overtourism protection strategies; to identify potential criticalities posed by climate change on the management of cultural sites and museums, also in relation to the quantity and quality of tourism that they receive.

This is because there is also a risk that the seasonal displacement of the flows triggered by climate change might contribute towards creating further or different overtourism phenomena that would be hard to manage as regards organisation of services, infrastructures, the carrying capacity of the venues, and compatibility with the daily life of residents.

There is no doubt that some markets have traditionally visited the Peninsula during the spring and autumn, a phenomenon that is especially true for cultural tourism, but the trend is notably on the rise and more visible than in the past, as witnessed by the "no vacancies" phenomena recorded in 2022 and 2023 in November and December in cities like Naples and sites such as Pompeii.

The effects of climate change on Italian cultural attractors do not appear only at the level of the flows and tourism development, but also of protection and management.

Events that strike rapidly like fires and floods, or increasing progressively such as erosion of metals or stress from freezing/thawing, pose new problems for the conservation of the tangible and intangible heritage.

Heavy rains can cause floods that damage the structures of churches, *palazzi*, monuments and libraries while rising sea levels threaten coastal sites such as historical ports, archaeological sites, or monuments on cliffs … and even entire cities like Venice. In just a few hours in 2018 the storm, Vaia, felled an entire wood that covered the southern slope of Mount Armentera, part of the ArteNatura itinerary of Arte Sella, an extremely popular open-air museum in Borgo Valsugana, in Trentino, with damage and destruction to over half the works. The 2023 floods that ravaged Emilia-Romagna damaged museums, libraries, archives, parks and gardens, monuments and archaeological sites. And this is only taking into consideration the most recent events that happened suddenly.

Then there are the effects of climate changes that trigger phenomena of degradation that accumulate with the passage of time. The consequences of these can also include the loss of traditional practices that are part of the intangible heritage, with fallout effects on the tangible heritage too.

Looking abroad now, one of the most recent cases brought to the attention of the broader public is that of Petra in Jordan, threatened by the sudden floods and by the intense temperature variations which have accelerated the erosion of the famous sandstone rock faces. In an attempt to protect the site from these events that are not only putting Petra itself at risk but also the million visitors who visit every year, and the local communities for whom this tourism is a primary source of sustenance, Petra's custodians are returning to ancient solutions such as the use of terracing systems and small interlinked dams for managing the flooding and facilitating agriculture.

These systems, rooted in ancient practices that were abandoned after the fall of the Nabataean kingdom, are now receiving attention and are being recovered for the protection of Petra from climatic threats.[35]

The inclusion by UNESCO of the art of the "drywall" in the list of the Intangible Cultural Heritage constitutes a significant example of promotion and recovery of a traditional practice because of its utility for containing landslides, floods and desertification, for promoting biodiversity and for creating microclimatic conditions that are beneficial to farming activities. The disappearance or alteration of this intangible cultural heritage, in fact, could in turn have further negative impacts and give rise to new challenges in terms of the protection, development and management of the territory and its assets.

Furthermore, when it comes to protection, climate change and sudden temperature variations – more and more evident in various areas of the country – put the climate monitoring and condition maintenance systems under stress. Museum institutions are particularly impacted by these phenomena as they are required to tackle the external climate variations that can increase the risk of irreversible damage to works of art because of the excessive humidity or dryness of the air. The cultural institutions therefore find themselves being required to adapt their environmental control systems to the changing climate and meteorological conditions and to support the cost in terms of research, development and commissioning.

[35] In this regard, see Andrew Curry's article, "The world's historic sites face climate change. Can Petra lead the way?", published in April 2024 in *National Geographic*.

And so, facing a picture as serious as the one just described, how are the Italian cultural institutions reacting? What strategies for adapting and combating climate change are they putting in place?

Some interesting examples are provided by the Italian UNESCO sites to which Chapter 7 of this work is dedicated: other experiences, on the other hand, are reported by museums and by festivals – for all intents and purposes genuine light cultural institutions in the country which are increasingly promoting themselves today as proper laboratories of innovation for decarbonising in the culture and of cultural tourism sectors.

From the museums to the festivals: strategies for mitigation and climate adaptation in Italian locations and cultural events

If there is no doubt that more and more cultural operators are very aware today of their potential role in climate action, it is not always possible to pass from awareness to action, as also shown by a report published in 2022 by NEMO – The Network of European Museum Organisations.[36] Though the study only covered museums, of the 578 European organisations interviewed, many revealed that they had still not taken concrete action for the climate and decarbonisation.

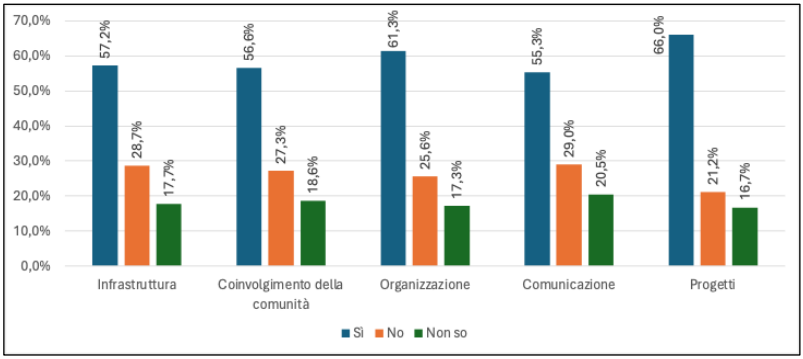


Figure 25 - Areas in which the museum takes climate action/applies sustainable methods (source: NEMO, 2022)

[36] The Network of European Museum Organisations, Museums in the climate crisis, 2022, https://www.ne-mo.org/fileadmin/Dateien/public/Publications/NEMO_Report_Museums_in_the_climate_crisis_11.2022.pdf

There are many obstacles and they range from a shortage of specific professionals, to regulatory and organisational aspects, to the difficulty of finding appropriate partners and suppliers, and much more

Without claiming to be exhaustive, the key points in an ideal list of things to do could be summed up as follows:

1. *Training and research*. Managing processes and projects linked to decarbonisation requires adequate knowledge and skills and, at its base, an awareness by part of the organising structures that it is necessary to recruit personnel with this knowledge and these skills.

For this reason, more and more institutions at international level are creating ad hoc training paths for their employees. Numerous cases abroad can be mentioned as examples, including Amgueddfa Cymru –Museum Wales, a body funded by the Welsh government that comprises seven museums in the country including the National Museum Cardiff and the St. Fagans National Museum of History. In September 2019 the organisation committed itself to reducing its own carbon footprint in the arc of ten years. With this goal in mind, it implemented among other things a carbon literacy policy for over 100 members of its own personnel to provide them with a greater understanding of climate change-linked questions and promote the knowledge necessary for implementing actions aimed at reducing emissions.

In Italy, on the other hand, it is necessary to mention CHANGE, a training program for cultural operators conceived by Fondazione Santagata per l'Economia della Cultura and funded by the Fondazione Compagnia di San Paolo, designed to guide the cultural and creative industries sector towards a sustainable transition thanks to the sharing of good practices, to analysing study cases and to job shadowing activities.

The progress of people and projects cannot be achieved without continuous research activities and many institutions are collaborating with environmental experts, conservation and restoration institutions (for which Italy can boast of ones of internationally recognised excellence), universities and other parties interested in developing plans for managing the climate risk and for implementing mitigation and adaptation strategies. Sometimes these collaborations also materialise in participation in competitions to receive funding for specific research projects and in the creation of groups that promote the mobilisation of the resources required for tackling this joint challenge.

2. *Adaptations and eco-sustainable practices*. Cultural institutions and events can implement practices for the sustainable management of their spaces and activities by means of direct intervention in the structures, the adoption of more energy-efficient processes, responsible management of water resources, the promotion of sustainability for personnel and visitors, the use of eco-friendly suppliers and much more. What's more, there are plenty of examples both in Italy and abroad, from MUSE in Trento, a zero-emissions museum right from its birth to the experience of the Galleria Nazionale d'Arte Moderna e Contemporanea in Rome. This was the first museum in Italy to appoint an Energy Manager (2018) and to obtain ISO 50001 certification for its energy management system. Another example is the work carried out at Pompei with the installation of invisible solar panels that can produce enough energy to illuminate the frescos.

It is also interesting to look at the reuse and circular economy practices put in place by museums, galleries and cultural spaces, supported at times by innovative enterprises and start-ups which have been able to create new products and services for supporting the cultural sector along the decarbonisation pathway: NonSiButtaViaNiente or Spazio META are two interesting examples of entities that actively promote practices for recycling waste from the arts and culture production chain.

There are also examples of ecological initiatives and decarbonisation processes in the performing arts and festival world. These include Festa Teatro Eco Logico, the most important Italian theatre festival without the use of electric power which is held every year on the island of Stromboli, or Suoni Controvento, a festival in Umbria that uses carbon offsets. The mapping of these experiences is also important given the size of the Italian festival scene. Taking a look at the figures for this widespread sector, the TrovaFestival portal has mapped almost 1,600 cultural festivals including those dedicated to theatre, dance, music, books and literature and much more.

3. *Informed digitisation*. In recent decades, museums and cultural institutions have adopted a vast range of digital technologies for enriching the visitor's experience, supporting strategies for involving the public and launching processes for digitising their collections. Notwithstanding the benefits of digitisation for facilitating access to culture and supporting conservation and restoration activities, recent studies have also highlighted the negative environmental impact of such actions because of the very intense energy consumption of digital technologies.

A significant example of this is the British Museum which, by adopting new strategies for involving the public with the creation and sale of non-fungible tokens (NFT) ended up generating a considerable environmental impact to the point of attracting attention to itself in The Art Newspaper, in an article in April 2022 entitled *"The British Museum's NFT project has sent its carbon footprint soaring". Since the London Museum began selling digital versions of works from its collection last September, it has emitted enough carbon to power an average US home for at least 57 years.*[37]

It is therefore crucial when evaluating the adoption of digitalisation strategies to include an assessment of the carbon footprint associated with such strategies and weigh up the advantages in terms of accessibility, conservation or public involvement.

So there is no shortage of strategies for reducing carbon emissions and they can be integrated into all the stages of digitisation projects, for example by investing in hardware and infrastructures with high energy efficiency, employing highly eco-friendly developers who can render websites more efficient, adopting cloud-based solutions for minimising the environmental impact of data centres, and promoting the use of renewable energy and carbon-offsetting projects.

The world of culture and climate action

In parallel with reflections on the impacts of climate change on cultural tourism and the adaptation strategies of the institutions and destinations, it must not be forgotten that the world of culture has also taken on a crucial role today in guiding climate action and sensitising the public – resident or temporary – on the theme of environmental sustainability.

This means the role that art and culture play in critically stimulating society through the production of works of art and cultural content, a fundamental role as pointed out by important reports in the sector and in academic studies.[38]

Today a great many cultural institutions and organisations in Italy in Europe and around the world are engaged on this front and to such an extent as to make it difficult to fully map and list them all. Italian museums,

[37] Bendor Grosvenor, "The British Museum's NFT project has sent its carbon footprint soaring", in The Art Newspaper, 5 April 2022, https://www.theartnewspaper.com/2022/04/05/nfts-send-carbon-footprints-soaring-british-museum.

[38] See, for example, Andrew Potts "The Role of Culture in Climate Resilient Development", UCLG Committee on Culture Reports, no10, and Climate Heritage Network (Working Group 5), Barcelona, 5 November 2021,

galleries and cultural festivals have been zealously engaged in recent years in bringing the broad public's attention to the urgency of acquiring an awareness of the effects of climate change, even of great significance and on an international scale. This is the case with exhibition projects such as "Everybody Talks About the Weather" curated by Dieter Roelstraete for Fondazione Prada in Venice or with the 2023 Architecture Biennale which, like "The Laboratory of the Future", tackled the themes of climate change through the contribution of various national pavilions, including the German and Swiss ones, and many others.

Figure 26. Everybody Talks About the Weather" curated by Dieter Roelstraete for Fondazione Prada, Venice

It is not just exhibitions however that contribute to the debate on climate and sustainability, but also permanent cultural spaces and museums. Then there is the "Museo della Bora" in Trieste, a "museum project" that is unique of its kind: it celebrates the role of the "Bora" wind, and of all the winds, for life on earth, and illustrates the climate of the past through the objects and documents in its collections, and involves various generations in this story.

And, as already mentioned, there are also festivals, a widespread and absolutely particular system in the Italian cultural offer. Among these, many are also dedicated to sustainability or promote climate change awareness projects or, for example, investigate the relationship between humanity and

the environment: Scena Natura (Bologna), an event inspired and dedicated to nature, its influence on our creativity, the exploration of the links and interactions between people and the natural world; SiciliAmbiente (San Vito lo Capo), a film festival dedicated to the themes of the environment and sustainability; and Big Blue Festival (Portoscuso), three days dedicated to the sea with all its nuances; and Teatro a Pedali (Turin), the only Italian festival powered by the public's pedalling are some we can mention.

7. FROM THE DOLOMITES TO THE AEOLIAN ISLES STRATEGIES AND GOOD PRACTISE FROM UNESCO DESIGNATIONS

PAOLA BORRIONE AND IRENE PINTO

It is accepted today that the conservation of cultural assets depends to a considerable extent on the external environmental conditions determined by climate change. Rising temperatures, rising sea levels, heatwaves and extreme weather events are only some of the risk factors for the good health of historical buildings, monuments and works of art.

Even if the spotlights have been turned onto the subject at both academic and institutional level starting from the nineties, it is only in the last decade that the impact of climate change on the cultural heritage has been discussed with greater constancy, awareness and critical sense. This chapter focuses specifically on studying the impact on UNESCO sites, on the associated demand for cultural tourism and on the possible strategies for adapting the offer.

Climate change and cultural heritage: from the scientific literature and institutional actions

Archaeological sites, monuments and art collections, in other words the material cultural heritage, confer a sense of identity and of "aesthetic well-

being" to local communities[39]. These assets are subject to continuous interactions with the surrounding environment, and with the passage of time suffer from deterioration processes which at times are accelerated and aggravated by climate change.[40] As already discussed in the previous chapter, in addition to this are extreme weather events such as droughts, floods and landslides, whose frequency and intensity are on the rise and which have unavoidable repercussions for the cultural heritage. Temperature swings, precipitation, atmospheric humidity, intensity of the wind, rising sea levels, desertification and interaction between climate change and atmospheric pollution have been identified by UNESCO as threats to the cultural heritage. It is this that triggered the appeal from ICOMOS Climate Change and Heritage Working Group (2019)[41] to dedicate growing attention to these aspects and increase research into them.

In the wake of these studies, on 21 December 2023 Italy approved its National Climate Change Adaptation Plan (PNACC)[42], comprising 361 actions for tackling the impact of global warming. The plan, though deemed far too weak by various environmental organisations, aims to reduce the vulnerability of the natural, social and economic systems and to increase the country's resilience. In the framework of the protection and management of the cultural heritage the plan identifies the climatic parameters that cause the deterioration, and concentrates on protective and preventive strategies. In parallel, it tackles the direct and indirect impacts of climate change on the tourism industry and sets up a series of strategies for managing variations in tourist flows, moderating the vulnerability of destinations and safeguarding the natural resources.

[39] See for example Cassar, M. (2009), "Sustainable heritage: Challenges and strategies for the twenty-first century", APT Bulletin: Journal of Preservation Technology, vol. 40, n. 1, pp. 3–11; Phillips, H. (2015). The capacity to adapt to climate change at heritage sites—The development of a conceptual framework. Environmental Science & Policy, 47, 118-125.
[40] Bertolin, C. (2019), "Preservation of cultural heritage and resources threatened by climate change", Geosciences, vol. 9, n. 6, p. 250.
[41] ICOMOS Climate Change and Heritage Working Group. (2019), The future of our pasts: Engaging cultural heritage in climate action. Outline of Climate Change and Cultural Heritage. Retrieved from https://indd.adobe.com/view/a9a551e3-3b23-4127-99fd-a7a80d91a29e
[42] Ministry for the Environment and Energy Security (2023, December). National Plan for Adaptation to Climate Changes Retrieved from https://va.mite.gov.it/it-IT/Oggetti/Documentazione/7726/11206.

Climate challenges and heritage: why analyse the UNESCO World Heritage Sites?

A significant case of vulnerability and adaptation to climate change is provided by UNESCO's World Heritage Sites (WHS). If on one hand, in fact, designating a site as a world heritage one increases its attractiveness and visibility[43], leading to a growth in tourism in the interested area, it can sometimes also lead to overtourism phenomena that can provoke damage at social, economic and environmental levels. On the other hand 60% of the WHS are exposed to geological risks such as earthquakes, landslides, volcanic eruptions or tsunami. In reality the listed world heritage sites are therefore cases that in other disciplines would be defined as "intersectional", i.e. in which different magnitudes of tourism and of climate change are superimposed, accentuating the scale of their fragility. They are in fact located at the crossroads of a cultural heritage of universal value that needs to be preserved and appreciated, of tourist pressure that is often very high, and of a situation of accentuated climate change. This is especially true in Italy where many of the UNESCO-designated sites are located in areas at extreme risk or that will be heavily impacted by the changes in progress.

Some studies have thoroughly examined the impending threats and supplied the managerial implications[44]. This has also been done by a growing number of UNESCO designated World Heritage sites, by means of associated Management Plans[45]. The latter, in fact, often include risk analyses, many of which are linked to natural disasters, and include lines of action for improving the prevention and management of such risks.

Given these premises we deemed it appropriate to carry out a study of the links between climate change and cultural heritage, as well as the various adaptation strategies of the Sites.

As we have already discussed in the previous chapters, Italy's historical-artistic culture and heritage constitute an incredible magnet for attracting tourists. In this context, the 59 Italian UNESCO-designated world heritage sites (as at May 2024) play a fundamental role as leading attractors. It is no

[43]Pachrová, S., Janoušková, E., & Ryšková, J. (2018). Disparities in tourism demand of UNESCO destinations. Amfiteatru Economic, 20(12), 1040-1054.
[44] Sesana, E., Gagnon, A. S., Ciantelli, C., Cassar, J., & Hughes, J. J. (2021). Climate change impacts on cultural heritage: A literature review. Wiley Interdisciplinary Reviews: Climate Change, 12(4), e710.
[45] https://whc.unesco.org/en/list/

coincidence that the Tourism Ministry earmarked 75 million euros for 2024/2025 for works in municipalities included in UNESCO sites and Creative Cities.

Their context, characterised by the need to adopt measures for protection and risk prevention, along with the considerable tourist pressure they are subjected to, therefore offers an ideal framework for understanding the operating dynamics of a cultural destination in response to climate change.

In turn, the impacts of climate change on the cultural heritage of a place generate a series of consequences for the tourism sector, influencing both the supply and the demand. What emerges from the literature, for example, is that the tourism sector can assume an active role in the mitigation of climate changes[46], by means of policies and practices that promote environmental sustainability and cautious management of the resources linked to the tourism sector. If a growing trend can be noted on the supply side towards adapting material assets to climate change, on the demand side it is appropriate to consider that such change can sometimes alter the attractiveness and enjoyability of the destinations[47], including those that until now have been at the centre of tourist interest. Increasing temperatures or rainfall, for example, condition the decisions of travellers who might avoid "high risk" destinations, generating negative impacts on the local communities for whom cultural tourism is the main source of income[48] also because of the positive impact of the designation on tourist flows.

The 59 Italian UNESCO sites between climate change and sustainable tourism

A specific analysis was carried out to determine if and how Italian World Heritage sites are identifying the strategies for protecting the heritage from climate change and, at the same time, those for adapting to the new needs

[46] Peeters, P., Çakmak, E., & Guiver, J. (2024). Current issues in tourism: Mitigating climate change in sustainable tourism research. Tourism Management, 100, 104820.
[47] See for example Markham, A., Osipova, E., Lafrenz Samuels, K., & Caldas, A. (2016). World heritage and tourism in a changing climate. UNESCO Publishing; Sesana, E., Gagnon, A. S., Ciantelli, C., Cassar, J., & Hughes, J. J. (2021). Climate change impacts on cultural heritage: A literature review. Wiley Interdisciplinary Reviews: Climate Change, 12(4), e710.
[48] See for example Aygün Oğur, A., & Baycan, T. (2023). Assessing climate change impacts on tourism demand in Turkey. Environment, Development and Sustainability, 25(3), 2905-2935; Gössling, S., Scott, D., Hall, C. M., Ceron, J. P., & Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. Annals of tourism research, 39(1), 36-58; Liu, T. M. (2016). The influence of climate change on tourism demand in Taiwan national parks. Tourism Management Perspectives, 20, 269-275.

that are emerging on the demand side. The methodology adopted, based on an in-depth study of the scientific literature on climate change and its impacts of the demand and supply of cultural tourism, with a particular focus on UNESCO Sites includes: cataloguing the 59 Sites and an analysis of the respective Management Plans where available; an online questionnaire addressed to the site managers of the 59 Italian sites; and, finally, follow-up interviews with the site managers of the six Sites selected as study cases.

What emerges above all from the cataloguing of the 59 Sites is their geographical distribution: 24 Sites are located in Northern Italy, 13 in the Centre, 16 in the South or Islands and 6 in mixed areas that include different parts of Italy and/or foreign territories. For example, the *Lombards in Italy* site includes 5 regions located across the North (Lombardy and Friuli-Venezia Giulia), Centre (Umbria) and South (Campania and Puglia). Other sites, such as the *Rhaetian Railway*, include a territorial area that also embraces part of Switzerland. As regards the site types, 53 are classified as cultural heritage and 6 as natural heritage. According to a proposed more specific categorisation, it has emerged that the categories into which most of the sites fall are, in order, historical town centres, monuments, and archaeological areas. Of the 59 Italian sites, 48 have Management Plans available online. The analysis of the Plans allowed us to study the relationship each site has with climate change, tourism and also any sustainable tourism practices.

From the analysis of the plans to real and proper sustainable practices

The analysis of the plans revealed that the theme of "climate change" was mentioned in 25 Management Plans, i.e. in 52% of the total, but only 38% of them (18) proposed specific improvements linked to the challenges posed by it. "Tourism" emerges as a significant concern in the Management Plans, and is mentioned in 92% of cases on the supply side (44 Plans) and 73% on the demand side (35 Plans). "Sustainable tourism" was mentioned in 73% of the cases (35 Plans) but only 52% (25 Plans) propose mitigation and adaptation strategies.

We subdivided the results of the analyses on the basis of four geographical macro areas: North, Centre, South/Islands and Mixed (sites that involve several areas and/or foreign territories): No significant differences emerged between the different areas as regards mentioning climate change. In the same way, there were no significant differences as regards the presence of remedial, adaptation or mitigation strategies, with similar percentages in the various zones: 32% in the North, 30% in the

Centre and 27% in the South. Of the "mixed" sites, two plans include remedial strategies in this context.

The tourism offer is a subject that is covered in all the Plans of the Central and Mixed area sites. The percentage remains high in the areas of the North (91%) and slightly lower in the areas of the South (83%). Mentioning tourism demand is less even: if all the Plans of the sites in the Centre include a dedicated section, this is only the case in 59% of the Plans for the sites in the North. Two of the "mixed" sites mention tourism demand.

The different geographical zones reveal marked differences as regards sustainable tourism: 33% in the Plans in the South, 70% in the Centre and 82% in the North. When it comes to the presence of sustainable tourism strategies, the percentage in the South remains unchanged, while in the South and North it drops to 60% and 55% respectively. Of the Mixed Sites, all four mention sustainable tourism, and three out of four include proper strategies.

Breaking down the Plans into four time clusters, 8 Plans were published between 2004 and 2008, 12 between 2009 and 2013, 12 between 2014 and 2018, and 16 between 2019 and 2023. Several significant trends appear when the data that emerged from the Plans are analysed on the basis of the different clusters. Initially climate change was treated in a marginal manner, reaching the lowest point in the second phase (in which it was mentioned in only 33% of the Plans), but rose in importance in the third and fourth periods where it hit 69%. Nevertheless this result cannot be deemed to be sufficient considering the current context, marked by the consequences of the climate crisis in every ambit. In addition to this is the fact that only some of the Plans that mention climate change dig more deeply into the theme or propose mitigation and/or adaptation strategies. In the most recent period of reference, in fact, only 56% of the plans present such strategies.

As regards tourism, the majority of the Plans treat it from the point of view of the offer, reaching 100% in the two intermediate periods and remaining over 81% in the two periods of reference. In the framework of the demand, growth can be observed from the first to the third period (from 75% to 92%). However, surprisingly, a drop is recorded in the last period, suggesting lower interest from the Sites because of the changed needs of the demand, deriving in turn from the impacts of climate change and of the pandemic.

Sustainable tourism, present in 88% of the Plans in the first phase, was then set aside until the third phase (where it drops to 58%), to then rise again to 88% in the last phase. However in most cases the subject is only treated superficially, while only 56% of the more recent Plans go further into

possible strategies for improving sustainable tourism, down 63% compared to the first stage.

	% Plans that mention "climate change"	% Plans that mention "climate change" and include proposals for improvement	% Plans that mention "tourism" - offer	% Plans that mention "tourism" - demand	% Plans that mention "sustainable tourism"	% Plans that mention "sustainable tourism" and include proposals for improvement
2004-2008	38%	25%	88%	75%	88%	63%
2009-2013	33%	25%	100%	75%	58%	42%
2014-2018	58%	33%	100%	92%	58%	50%
2019-2023	69%	56%	81%	56%	88%	56%
TOTAL	**52%**	**38%**	**92%**	**73%**	**73%**	**52%**

Table 3. Analysis of the Management plans by time cluster

In short, growing attention by the Sites to climate change emerges from the analysis by time cluster. These results reflect a growing awareness of the consequences of climate change, but also scarce attention to changes in the tourism demand, especially in the more recent Plans. Furthermore, there are no sufficient studies relating to sustainable tourism, crucial for combating the increasingly grave impacts of climate change on the Sites and on the changed needs of the demand.

The replies to the questionnaires sent to the managers of the Italian UNESCO Site were then analysed. It emerged from the results that 61% of the participants highlighted the impacts of climate change on environmental sustainability, such as rising sea levels and changing rainfall models for example. 44% reported damage to the cultural heritage caused by sudden events such as fires or floods, 41% perceived a progressive threat to the conservation of the cultural and natural heritage, while a reduction of diversity emerged from 14% of respondents. Other cases illustrated specific problems such as a slight increase in hailstorms in the *Colline del Prosecco di Conegliano e Valdobbiadene*, or phenomena such as coastal erosion, islands of heat and the rise in the salt wedge that influences *Venice and its lagoon* with direct consequences on the environmental sustainability of the site. In the case of the *Serial site of the Lombards* and of the *City of Vicenza*, increases in temperatures and heatwaves were also reported, along with floods and intense rains that threaten the standards of conservation of the monuments.

When it comes to the initiatives already put in place or at the planning stage, 57% of participants reported the presence of monitoring activities

that often make use of technological warning systems. 51% mention planning measures, such as the inclusion of preventive measures in the Management Plans. Furthermore, 43% actively involve the public in building awareness on these issues. As regards the actions in operation, 43% are concentrated on energy efficiency and structural upgrading, while 17% are dedicated to decarbonisation of production activities and another 17% offer specific personnel training.

78% of respondents affirm that their site actively involves local actors, including local institutions, in tackling climate change. 53% connect to local networks, while 42% involve national institutions and 25% collaborate with small and medium enterprises. Nevertheless 53% of participants affirm that they do not participate in network activities with other UNESCO sites or cultural organisations to tackle the challenges of climate change. Finally, 62% of respondents declared that the site pays for its own actions from internal funds and they do not make use of specific financing channels, while 71% access competitions or public national contributions to support their activities. Almost 92% of respondents indicated that the site does not have a plan for developing their personnel's skills for tackling the impacts of climate change.

63% of sites have not yet noted changes in tourism demand deriving from climate change while 20% have noted greater interest of tourists in sustainability and 17% reported variations in the periods of higher influx. As regards the forecasts of change, 39% do nor envisage significant variations in demand in the medium-short term as a result of climate change, while 42% expect greater interest in sustainability and 31% envisage changes in the periods of greatest influx. 44% of participants affirm that the impacts of climate change on the Site and associated measures for combating it are not communicated directly to visitors. Among those who have, 25% use informative campaigns to raise awareness on the subject, 25% provide practical indications to visitors and 28% organise cultural activities focused on the theme. Most of the measures and of the impacts (76%) are communicated by means of the Site's official web page or via social media channels.

57% of participants indicate that their Site is not considering the impacts of climate change on the revision of their own tourism offer. Of the remaining 43%, almost half of the respondents affirm that the Site adopts practices for the sustainable management of tourism flows, and various participants also highlighted the presence of new tourism activities that highlight the Site's resilience to climate change and of preventive conservation programs that offer an additional tourism experience.

Vulnerability and resilience of the UNESCO Sites: six study cases

An in-depth and contextualised vision of six UNESCO Sites is offered by means of investigative interviews with the site managers of six selected cases: *Porto Venere – the Cinque Terre and the Islands of di Palmaria, Tino, Tinetto*; *The Dolomites*; *Florence City Centre*; *Pompei, Ercolano and Torre Annunziata – The archaeological areas*; *The wine lands of Piedmont: Langhe – Roero e Monferrato*; *Aeolian Islands – Lipari, Vulcano, Salina, Stromboli, Filicudi, Alicudi and Panarea.* The study cases were selected on the basis of several factors. In the first place, their different geographical locations. The Sites are in fact situated in a variety of areas in Italian territory. In second place, we took account of the different types of destination represented by each site, including both historical and archaeological sites and natural landscapes. In addition to being representative of the most important categories of Italy's World Heritage Sites, the selected cases also overlap with some of the country' most important tourism products at the level of arrivals and presences: the cities of art, the mountains, seaside resorts and wine and food tourism.

Finally, we considered the different management models currently in place for each Site, and these include associations, local government and ministries, foundations and a park. This heterogeneity of the selected cases made it possible for us to examine how different structures and institutions tackle the challenges of climate change in the context of Italy's UNESCO heritage.

Porto Venere – the Cinque Terre and the Islands of di Palmaria, Tino, Tinetto (1997)

Site type: Cultural Sire, Cultural Landscape
Destination type: Nature and old towns
Body responsible Cinque Terre National Park

Figure 27. Porto Venere - Cinque Terre and Palmaria, Tino, Tinetto Islands

Porto Venere - Le Cinque Terre and the island of Palmaria, Tino and Tinetto is a site that is notoriously afflicted by overtourism and at

the same time hosts proximity tourism, and national and international tourism. Though there are still no specific figures available regarding the changes in tourism demand in relation to climate change, the Cinque Terre National Park is currently undertaking an in-depth analysis of tourist flows as part of a study of the carrying capacity of the UNESCO site. In any case, it is envisaged that in the short/medium term variations could occur in the periods of major influx as a probable consequence of climate change.

As regards the impacts of climate change on the Site, reports were made of impacts on environmental sustainability and damage to the cultural heritage associated with events that occur suddenly. At the moment, no initiatives have been taken to adapt the tourism offer to the impacts of climate change.

Thanks to European projects currently in progress, the Park is preparing three lines of action for analysing and intervening on the risks deriving from climate change. These projects include the detailed analysis of the specific risks, the development of advanced digital instruments for reinforcing the resilience of the territory and participation at workshops for the creation of the first Climate Change Adaptation Plan. It is interesting to underline that such initiatives come to be supported by extraordinary funding from the European projects and not funds from the body's ordinary revenues. The Park works actively to adapt the Site to climate change in collaboration with local networks and institutions, as well as small and medium enterprises.

At present the park does not have any direct relationship with its visitors and tourist operators in the territory, but some initiatives are planned for creating awareness in the community.

The Dolomites (2009)

Site type: Natural site
Destination type: Nature
Body responsible Fondazione Dolomiti

The *Dolomites* site encapsulates some of the typical peculiarities of the Natural sites. In particular, the territorial tourism promotion

Figure 28. Dolomites

bodies are faced with a perpetually mutating panorama. Furthermore, given the great extension of the Site, the Fondazione Dolomiti reports a general difficulty in tracing the changes in the tourism macro trends. Nevertheless, it highlights a tendency towards the deseasonalisation of tourist flows, characterised by prolonged summers and busier autumns, suggesting a transformation of the traditional tourist flow models. In general, an increase is observed in the frequency of exceptional climatic events in the nine Dolomitic Systems, with floods on a vast scale and other events of significance that directly impact the values behind the Site's recognition by UNESCO in some areas.

The impacts are mainly perceived in the receptive structures, such as the 66 high-altitude mountain refuges which are implementing climate change adaptation strategies. In terms of strategies and plans for mitigation, monitoring or readjustment of the tourism offer, the Foundation adopts an organisational system based on Functional Networks, with workshops dedicated to the protected areas and to sustainable tourism. Collaboration is in progress with bodies for the promotion of sustainable tourism in the territory so as to guarantee responsible notification of climate events and of the behaviours in the changing natural environment. The differentiated management of tourism enjoyment is fundamental, with tailor-made strategies for the specific needs of the single areas in order to contain the traffic and promote places of peace and tranquillity. Furthermore, the target is the implementation of strategies for adaptation to climate change by means of publicity and training, with the active involvement of the mountain refuges in this process.

The relationship with visitors is characterised by targeted communication activities, promoting the awareness and responsibility of tourists towards the territory by means of the "Promotion of Sustainable Tourism" table. Social publicity campaigns such as "Vivere in rifugio" ("Living in refuges") differentiate between the mountain hut experience and that, for example, in a high altitude hotel.

As regards Fondazione Dolomiti's relationship with tourism operators in the territory, a direct channel is maintained with the refugees, the main accommodation structures in the Site. Collaboration is also maintained with the DMOs (Destination Management Organisations) in order to guarantee coherent and effective communication on a national scale. Furthermore, training activities are organised for hospitality operators, to transmit concepts to them that are linked to heritage and sustainability.

Florence City Centre (1982)

Site type: Cultural site
Destination type: Old city centres
Body responsible The Florence Municipality's Office for World Heritage and Relations with UNESCO

Figure 29. Florence Historical City Centre

Florence's old city centre attracts millions of visitors every year. However it seems to date that climate change has had no significant impact on tourism demand. Nevertheless, a trend towards an increase in tourism all year round can be noted, indicating a progressive weakening of the distinction between high and low season. As regards the Site itself, the impacts of environmental sustainability and damage to the cultural heritage associated with events that occur suddenly are mentioned. However, at present Florence Municipality's Office for World Heritage and Relations with UNESCO has not reported specific evidence of damage caused by climate change.

In order to tackle the challenges of climate change and guarantee sustainable management of the tourism offer in the centre of Florence, various strategies and projects have been implemented that aim to reduce the environmental impact of tourism, promote sustainability and protect the city's cultural heritage. First of all, sustainable mobility projects have been launched, including the extension of cycle lanes and the introduction of eco-friendly means of transport such as electric buses and taxis. Pedestrianisation of the city centre and a fruitful distribution of urban green areas are also other key actions aimed at reducing atmospheric and noise pollution and improving the quality of life for residents and visitors. There are also strategies being implemented that envisage booking entry into monuments in order to better distribute visitors over the day, and controlling accesses in order to avoid excessive overcrowding in certain areas. Another fundamental aim is to decentralise tourist flows; this is pursued by promoting less renowned places and developing Florence's hinterland attractions such as the Medici villas and gardens. This has been achieved by means of projects such as Fit Florence and Firenze Green Way

whose aim is to promote forms of sustainable tourism and rediscover less visited places.

At the same time, actions have been taken to tackle emergency situations, such as the plan for reducing the hydro geological and flooding risk from the River Arno and the project for protecting the municipal museums and cultural heritage in emergency situations.

Initiatives are ongoing in order to counter the effects of climate change aimed at more aware management of urban waste (such as the "Firenze città circolare/Florence circular city" project), increasing urban greenery and implementing sustainable infrastructures and mobility.

Furthermore, strategic projects have been launched such as "Spazi di Confine/Border spaces" and "Firenze Forma Continua/Florence Continuous Form", that aim to redistribute tourist flows by means of greater information on the site and its places of interest. These thematic projects are concentrated on the exploitation of the religious heritage and on the creation of thematic itineraries in the city centre.

Finally, work is in progress on developing a Risk Management Plan for integration into the existing Management Plan. This plan will be centred on protecting the attributes that endow the Site with its universal value, with identification of the climatic and environmental threats and the development of strategies for preserving these attributes.

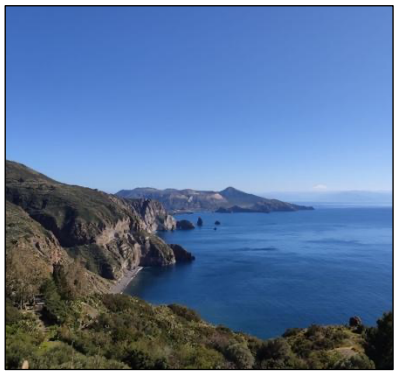
In short, the strategies implemented include diversification of the tourism offer, infrastructural and mobility interventions, protection of the cultural heritage in case of emergency and the planning of specific measures for countering the effects of climate change, all with a view to guaranteeing the long-term sustainability and protection of the tourist site.

The relationship with visitors in the context of Florence's historical centre is based on various activities that target environmental education. In particular, awareness activities are organised in the primary schools and include guided visits to places of interest and discussions that focus on the United Nations' Sustainable Development Goals, thereby promoting greater awareness among the young of themes linked with environmental sustainability. Another highlighted aspect is communicating the importance of the River Arno. Attempts are made by means of guided visits along the river and other activities to underline the crucial role of this water course in the City's history and life, as well as to create awareness of the current challenges linked to its state and the risks such as floods that derive from climate change. A tangible example of this communication is the Flight project which focused its 2022 edition on the theme of climate change. By means of luminous visual installations scattered around the city, the project

sought to involve visitors and residents, creating awareness of the effects of climate change and on the need to adopt more sustainable behaviours.

As regards collaboration with tourism operators, Florence's World Heritage Office reports a constant commitment towards establishing relations with different associations of tourist guides. These collaborations are not limited to the mere supply of tourist information, but actively involve the guides in continuous training activities. This allows them to stay up to date as regards changes on the territory, and on the environmental history and challenges in such a way as to offer visitors a more complete and informed narrative. The relationship with operators who manage large tourist groups daily, such as cruise agencies, is more complex however, given the diversity of users.

Aeolian Islands – Lipari, Vulcano, Salina, Stromboli, Filicudi, Alicudi and Panarea (2000)



Site type: Natural site
Destination type: Nature, old towns, sea
Body responsible: Municipality of Lipari

The *Aeolian Islands – Lipari, Vulcano, Salina, Stromboli, Filicudi, Alicudi and Panarea*, listed by UNESCO since 2000 as a natural site, constitute an extraordinary natural jewel, combining old towns, marine landscapes, and volcanic activity. Despite the challenges linked to climate change, the tourism demand for the Aeolian Islands is in constant growth, especially during the summer months, putting the entire system under pressure. This pressure, caused above all by "touch and go" tourism that tends to overload the limited spaces of the individual islands, contributes to rendering the management of essential services more complex, including supplying water and managing waste. The Aeolian Islands manifest clear fragilities, due to their volcanic conformation and to the related hydro-geological criticalities. These fragilities worsen during the increasingly

frequent extreme weather events, underlining the need for adaptation and mitigation strategies.

With this in mind, the Municipality of Lipari, the body responsible for the Site, has developed strategies and projects for mitigating the impacts of climate change and guaranteeing the sustainable growth of tourism in the Islands. This Municipality appointed Fondazione Santagata to draft a Strategic Plan for Sustainable Tourism in the Aeolian Islands, approved in March 2024, aimed at: innovating the tourism offer in line with the sustainable development of the territory, improving the well-being of the local community in relation both to current climate changes and to changes in the demand. A daily tourism management and control activity was also initiated in order to limit the negative impacts on the quality of life of residents and on the environment.

Figure 30. Aeolian Islands – Lipari, Vulcano, Salina, Stromboli, Filicudi, Alicudi and Panarea

In the course of drawing up the Strategic Plan, the Municipality actively involved the local tourism operators. In particular, a series of encounters were organised for the co-involvement of the operators in the sector who are active in the islands and hear their needs. In fact, the Plan includes the promotion of a constant and collaborative relationship between and with the tourism operators in the islands in order to encourage the transition towards a sustainable tourism model.

Though no direct awareness projects have been implemented to date with regard to the Site's relationship with tourists, they are envisaged in the Strategic Plan. This casts a light on the growing environmental awareness in the tourism management of the Aeolian Islands.

The wine lands of Piedmont: Langhe – Roero and Monferrato

Site type: Natural and cultural site
Site type: Nature, old towns
Body responsible: Association for the heritage of the Wine Landscapes of Langhe-Roero and Monferrato

Figure 31. The Vineyard Landscapes of Piedmont: Langhe - Roero and Monferrato

In the Site *The wine landscapes of Piedmont: Langhe – Roero and Monferrato*, listed by UNESCO as part of the world heritage in 2014 a

series of changes in tourism demand were observed as a result of climate change. In general, deseasonalisation of tourist flows was recorded, with a change in the traditional seasonal peaks. To be specific, while the traditional peaks were in September, October and November, visitors are now also attracted in June, July and August. In addition to rising temperatures – the main cause of the deseasonalisation of tourism flows – it can also be attributed to other factors. First of all, the impact of the pandemic and resulting requirement for social distancing. Furthermore, this trend can be attributed to the growing numbers of foreign visitors during what was once considered to be their low season, attracted by the "relaxing" hill resorts, by a refined cuisine and by peaceful landscapes. Monferrato, moreover, recorded greater growth than the Langhe where the concentration of tourists has reached excessive levels today.

As regards the impacts of climate change on the Site, no significant difficulties caused by heatwaves have been recorded yet. Some areas in the site, such as Monferrato, are less impacted by climate change thanks to their great biodiversity. However moving the vines towards higher altitudes can be observed in the Langhe because of the difficulties encountered in maintaining the quality of the wine. This movement inevitably leads to a reduction of wooded areas.

The Site has implemented strategies for adjusting the tourism offer to the changing needs of travellers. For example, actions are being developed for involving the community and for compensating that involve the tourists, such as the possibility of guided visits with the *trifulau* (truffle hunters) associated with replanting in the truffle woods as these are progressively uprooted to make way for vineyards, threatening the biodiversity and also the hydro-geological stability of the hills.

At present, while no significant variations have been observed yet in the geographical breakdown of visitors, work is in progress to determine what the emerging trends are and adapt to the behaviours of tourists arriving from other countries including the United States, but also the Netherlands, Sweden and Norway in which the behaviour of the younger generations is more attentive to climate change. Several considerations have emerged thanks to the organisation of a focus group in which tourists from Northern Europe were interviewed. For example, even if the Site is less famous than Tuscany, it is appreciated by foreign tourists for the atmosphere of well-being that it offers. The hospitality is deemed to be high-level and guests particularly appreciate the combination of nature with the possibility of enjoying a fine glass of wine.

The Site invests various resources in training in order to better understand the markets. For example, a change has been recognised in the booking behaviours of visitors, passing from a minimum stay of three nights to longer ones, even up to four or five nights. To tackle these new needs, the Site, along with the Tourism Body, is investing considerably in personnel training and in adapting the service offered.

As regards the challenges that the Site is required to tackle because of climate change, the operators in the sector are still not properly prepared for tackling them. Even though projects are being implemented at institutional level for monitoring environmental conditions such as temperature and rainfall, there is no effective coordination nor are there concrete measures such as, for example, the collection of rainwater or adequate logistical infrastructures. There is an evident need for a change in the paradigm towards collective and sustainable management of the territory. Concrete actions are proposed including the appropriateness of adopting the GSTC assessment for the destination, actions for compensating the impact such as planting trees or projects for cleaning the woods that involve work schemes for the unemployed. Furthermore, the Site is considering collaborations with the Università Cattolica for a research doctorate focusing on the role of *community builder*. In addition to this, there is a reflection today on ethical questions, such as the balance between the conservation of local identity and the reception and integration of immigrants into the locality, especially in a context of pressure on the property market. In Monferrato, an important artistic initiative involves 60 galleries, artists and cultural operators, with a view to leaving a significant mark on the land. To attract young people there is a proposal to use art as a means for interpreting and getting the best from the territory, offering residencies to emerging artists. An initial subject for these residencies will actually be climate change, encouraging artistic production and a critical dialogue on sustainability.

The Site also maintains a direct relationship with tourism operators in the territory, involving them continuously in the drafting and implementation of effective solutions for countering climate change.

Conclusion

In conclusion, the analysis of the Italian UNESCO sites and the specific studies carried out have highlighted the need for and the urgency of implementing projects and strategies aimed at tackling the impacts of climate change on the Sites and promoting sustainable tourism practices. The complexity of the challenges and the urgent need for lasting solutions

for improving the resilience of the cultural and natural Sites in the face of the unstoppable environmental transformations has emerged with clarity from the in-depth study of the six emblematic sites .

In this context, the physical protection of the Sites themselves becomes essential, but it is also necessary to re-adapt the tourism offer in order to tackle the changing needs induced by climate change. This approach, orientated towards shrewd management of the cultural resources, not only preserves their value and their integrity, but also favours more meaningful and sustainable tourism experiences.

It is evident that to achieve these objectives active and collaborative involvement of all the interested parties is necessary. Local governments, residential communities, tourism operators and international institutions must work together to develop and implement policies and practices that guarantee the long-term conservation and sustainable enjoyment of these cultural treasures.

In an age characterised by increasingly rapid and devastating climate changes, protecting and preserving our cultural heritage is a priority for the current and future generations. It is only by means of a concrete and collective commitment that we can hope to guarantee a lasting equilibrium between conservation of our heritage and responsible enjoyment of it, thereby contributing to a wide-ranging understanding of the strategies required for tackling the challenges of climate change and promoting sustainable and resilient cultural tourism.

8. CONCLUSIONS: A NEW CUSTOMER CARE MODEL

ELENA DI RACO

The sustainability of tourism is the result of a process of joint construction of the value of the destinations that completes itself in the relationship between supply and demand. The study of the effects of climate change and of the management and governance solutions that destinations can adopt in order to avoid having to face a progressive decline in competitiveness, highlights the reinforced link between environmental sustainability and social responsibility.

First of all, on the part of the **offer system** of the tourism localities which, when building the destination brand, draft and set out a pact with the tourists, guaranteeing for them the protection of the natural resources, the landscapes, the cultural resources, the know-how, the heritage of memories and traditions, of the authenticity of local products and of the experience that new guests are looking for in their stay.

At the same time, on the other hand, **tourists** who select their destinations ensure (all the more so today) that their own footprint is the lightest, that their stay is distinguished by attention to the territory, that local itineraries are privileged, that the actors involved are in the shortest supply chain, that the authenticity of the experience is the sign of a positive economic return for the host society, and that they do not clash with the peak season of the chosen holiday destination but rather appreciate its authenticity through the relationship with the residents at the moments in which they return to their daily routines.

Finally, therefore, in the relationship between environmental sustainability and social responsibility we actually find that **the people** at the centre of this relationship between tourist and destination, between enterprise and holiday, between guest and resident, are taken in their individuality and also collectively, when they experience the territory together from different points of view.

However, it is necessary to reinforce the bond of trust with new elements where there are factors that are not immediately controllable – such as climate change and temperature rises that make a satisfactory experience difficult.

What we need for the management of these criticalities is a new model of customer care, one that we called co-marketing partnerships in the nineties and that today is more firmly linked to the value inherent in the trademark, in the brand, and not linked to specific marketing actions as was previously the case.

Also and above all after the pandemic in recent years, in fact, tourists have become flexible when it comes to departure dates, the type of accommodation, and even the type of experience they want from their holiday, all quickly and with no penalties.

This means that the first reaction ascertained by the academic community to the effects of climate change is the cancellation of bookings, with an immediate rush towards destinations that are cooler, perhaps only in the imagination, behaviours that are the opposite, again, to those ascertained in the literature of the deniers or those most attentive to their own environmental footprints. And this different attention to sustainability changes between the various generations.

Looking towards the future, in a sustainable approach, we cannot then do other than orient ourselves towards GenZ, the young travellers who are more likely to return and who add more value to the destinations with the discovery of new, less-famous travel destinations and attainment of personal cultural benefits from contributing to the local communities they visit.

It emerges from the figures analysed by ETC, Skift, McKinsey and Booking that this is a segment that has a common interest in prioritising and seeking tourism operators who subscribe to social and environmental standards, underlining a preference for sustainable travel practices. The preoccupations regarding climate change, the impact of tourism on local communities and the balance between responsible travel and work, highlight the **growing importance of the social and environmental considerations in travel decisions**.

Some changes in terms of sustainability brought by Gen Z travellers include travel by road or train instead of flying, and purchasing from locally-owned businesses, guaranteeing that the money will be spent within the local community rather than with foreign-owned companies, carrying out in-depth research into providers of tourism in order to guarantee that their sustainability services are reliable, or doing voluntary work in local projects or work on community-led initiatives in order to support the environment.

It is estimated that even in economic terms the global spending power of this market segment is 143 billion dollars and amounts to about 40% of all the consumers. In fact, Millennial and Gen Z consumers will account for 45% of the sales of luxury goods by 2025. Furthermore, 70% of American millennial and Gen Z travellers state that they have sought experiences that family members and friends probably don't but had thought of. In China this figure actually reaches 90%.

Finally they are great supporters of the digital transition and this makes a substantial and operational contribution to environmental sustainability. We can therefore conclude that though the sustainability challenge is enormous, we can win it by filling out these concepts with operating options that are concrete but also strategic, and with a vision for tomorrow in which sustainable practices are no longer a goal but a habit.

It is necessary, however, for the concept of our destinations to get past seasonality and climate difficulties to become inclusive all year round as they specialise on those tourism products that are not based on and do not promise coolness in summer or natural snow in winter, but which at the product's heart have the daily life and habits of the inhabitants, nature in all its manifestations, and the specific and unique tangible and intangible culture of a locality.

This means a model that does not counter authenticity with management, nor satisfaction with storytelling, but which, in a society increasingly oriented to enjoying the experience by means of augmented and virtual reality imposes **management** on the "real" authenticity (with the aid of the most modern technological and scientific solutions), **control** – based on responsible, sustainable and regenerative systems – and the **narrative** which, starting from the canvas of local memories, explodes by means of tools artificial and generative intelligence.

9. POSTSCRIPT

MARIA ELENA ROSSI

The specific nature of tourism clearly emerges from the picture illustrated in this precious study of the scenarios we, as tourism professionals, will have to tackle in the coming decades in the light of climate change.

In particular, the multidisciplinarity that distinguishes the offer, the multiplicity of actors who contribute to its development – citizens, communities, enterprises, destination managers and aggregators, tourists – and, finally, the fundamental impact that contemporary publicity and the new media can act to encourage a change of the paradigm to tackle in the coming years for the preservation of our planet from the environmental, social and economic standpoints and to guarantee a future for the next generations.

There is no one single path for tackling the theme of sustainable development. Such a complex theme can be approached in the form of a matrix with several entrances, with a systemic and evolving logic, in compliance with the specific cultural components and during the development of each destination. The ability to define new tourism objectives and measurement parameters therefore becomes fundamental.

Concluding this work, I would like to focus attention on three elements that should be at the basis of the future of the tourism industry with a view to sustainability.

- Vision and strategic planning
- Innovation
- The human factor and the development of new skills

In the planning framework, the Tourism Ministry has presented the 2023-2027 Strategic Tourism Plan, a broad-ranging picture of vision and analysis that provides an overall view of the Italian tourism industry with specific attention to sustainability and the digital transformation, in line with the guidelines of the Transition Pathway for Tourism and NextGenerationEU. The Plan emphasises the importance of all types of tourism, and not just travel for leisure but also the convention business, the fair sector, health and wellness tourism, and major events, just to mention the more important in terms of environmental, economic and social impact. The second pillar of the Plan explores the interconnections with other sectors and industries such as infrastructures, transport, culture, agriculture and *Made in Italy*, which are strongly linked to the development of tourism and the Italian GDP. I mention the Strategic Tourism Plan as it is of crucial importance in any tourism ecosystem, and all the more so in Italy, to share the vision and strategy with all the stakeholders with a common awareness in order to determine the goals, the roadmap, the processes for monitoring the activities and for continuous updating and improvement. Shared strategic planning is the key to success of any transformation process and, specifically, in a crucial phase of genuine reframing such as the one we are experiencing. If we share the idea of reformulating our approach, of developing new paradigms towards sustainable development, also in the light of the scientific evidence on climate change, it is necessary to create a cooperative environment that favours such a transformation and where co-creation is possible, all the more so thanks to the new technologies. The digital transformation, in fact, allows us to improve the models of governance, of measurement and of sharing based on shared data and values.

For a country like Italy, with its long tradition of hospitality for tourists, a real innovation derives from an evolution of the vision, from a new mindset, from the development of new governance processes and, of course, from the drive towards the creation and more informed enjoyment of new tourism products and experiences. In this context, digitalisation is fundamental for both the destinations and private sector together, in order to innovate and improve the product and to be able to obtain the best from it in a highly competitive and continually evolving digital ecosystem, also in the light of the development of generative AI. The Destination Management Systems developed by many Italian regions constitute an excellent example in this direction.

In a recent survey conducted by ENIT in February 2024 on 700 hotel businesses and 600 catering companies, it clearly emerged that the priority

in terms of skills is the need to concentrate on digitalisation and sustainability. The results of our survey confirm the overall need to keep the pressure on training as the principal pillar of the digital transformation and of the strategic reformulation for sustainability, as the human factor will remain at the centre of quality tourism if we are able to accompany the change with continuous training and the development of newer and newer skills.

Vision, human factor and innovation must proceed in step in order to tackle the challenges that we have begun to set out.

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Maria Elena Rossi
The Marketing and Promotion Director of ENIT, she coordinates the development, implementation and monitoring of the marketing plan for tourism in Italy, at national and international level, operating through the 28 foreign offices in 21 markets, in liaison with the Italian Regions and the stakeholders in the sector. Before her ENIT experience, she was Director General of the regional body for tourism and agriculture of the Piedmont Region and had various experiences at national and international level in marketing and tourism.

Special thanks for her professional collaboration are due to Maddalena Penna, a young analyst and economist in Studio Giaccardi & Associati.

The impact of climate change on tourism is not only a question of resilience, i.e. "reacting by regaining psychological balance through the mobilisation of internal resources" (Treccani).
In fact, this first book of the ENIT research project "Tourism turns Climate-Sensitive" explains that the effects of climate change require new responses and a change in the travel and holiday paradigm. This is amply demonstrated by the contents of this publication, with the scientific approach required by the complexity of the phenomenon, the in-depth studies carried out on the vulnerability of our country's great historical and cultural heritage, first and foremost the 59 UNESCO sites, and the consequent change in management methods; the evolution of the business model of destinations and companies which, not by chance, are already moving from initial resilience to strategic innovation, especially in services, motivated by the new behaviour of "climate-conscious travellers" and based on unprecedented choices and investments; the gradual change in the attitudes of travellers themselves, who are becoming "gently nudged", i.e. more responsible, because they are devoted to their destination. They are becoming more responsible because they want to protect the precious asset of their holidays and their affection for places that are often fragile because of their human footprint.

ENIT
ENIT promotes the image of Italian tourism abroad; it implements promotional strategies at national and international level; it identifies, organises, promotes and markets Italian tourism and cultural services; it promotes the Italian brand in the tourism sector; it promotes the marketing of food and wine, typical and handicraft products in Italy and abroad; it carries out and organises consultancy and assistance activities and services for the State, the Regions and the Autonomous Provinces of Trento and Bolzano. ENIT initiated and financed the research "Climate-sensitive Travellers - Construction of a model to measure the impact of the climate emergency on tourism, for new 'climate-sensitive' intervention models", from which the present book stems.

FONDAZIONE SANTAGATA
The Santagata Foundation, active in research, support and knowledge transfer projects, works on four main thematic strands: models for the management of cultural heritage, with a focus on the economic development of territories and UNESCO programmes; contemporary cultural production and cultural innovation, with a focus on emerging markets and new professions; tourism linked to tangible and intangible cultural heritage, creative industries and production districts; sustainable development, with a focus on UNESCO programmes and the relationship between cultural heritage, nature and sustainability. All Fondazione Santagata projects are available at www.fondazionesantagata.it

STUDIO GIACCARDI E ASSOCIATI
Founded in 1999, Studio Giaccardi & Associati - Consulenti di Direzione e Data Analyst specialises in strategy, socio-economic research and data intelligence, coaching. In 25 years it has produced over 330 research plans to support as many development projects for companies, destinations and territories. Studio Giaccardi works in several Italian regions - most recently Emilia-Romagna, Apulia, Piedmont, Sardinia and Veneto - serving public institutions, companies, infrastructure and service providers, universities and research centres, business associations and chambers of commerce. It has also collaborated and is collaborating with ENIT on research projects on international cultural tourism (2018-19), innovation in business and destination services (2022) and climate adaptation (2023-24). The "Tourism Dossier", which can be downloaded from www.giaccardiassociati.it, documents the whole experience on a case-by-case basis.

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