



TOWARDS A SYSTEM OF TOURISM INDICATORS OF SUSTAINABILITY FOR
THE CANARY ISLANDS. LESSONS FROM INSTO-UNWTO

HACIA UN SISTEMA DE INDICADORES DE SOSTENIBILIDAD TURÍSTICA EN
CANARIAS. LECCIONES DESDE LA RED INSTO-UNWTO

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Abstract

The Canary Islands registered record arrivals in recent pre-pandemic years. However, quantitative growth has positive and negative socio-cultural, economical, and environmental impacts. To control, and eventually mitigate these impacts, they are measured as indicators. These destination tools contribute to monitoring sustainability, managing tourism activity, and promoting evidence-based decision-making in the long-term. The aim of this master dissertation is to develop a system of indicators of tourism sustainability adapted to the Canary Islands with the support of previous experiences within the International Network of Sustainable Tourism Observatories of the World Tourism Organisation (INSTO-UNWTO) and other main international systems of tourism sustainability indicators. The major results include a system of indicators and real data of key issues related to tourism sustainability. The indicators have been applied by some international members on different territorial scales, even if there is still a lack of quantifications about waste, water, and climate effects in tourism. The International Network of Sustainable Tourism can indeed be seen as a model to follow, but needs to improve towards better indicators on sustainability, particularly at the local destination scale.

Key Words: sustainability, system of indicators, tourism, Canary Islands, tourism observatories, INSTO

Resumen

Canarias registró llegadas récord en los años previos a la pandemia. Sin embargo, el crecimiento cuantitativo tiene impactos socioculturales, económicos y ambientales. Tanto positivos, como negativos. Para controlar y eventualmente mitigar los impactos, se miden como indicadores. Estas herramientas contribuyen a monitorear la sostenibilidad y a gestionar la actividad turística en el destino, basándose en evidencias a largo plazo. El objetivo del Trabajo Fin de Máster es desarrollar un sistema de indicadores turísticos de sostenibilidad, adaptado a Canarias, apoyándose en las experiencias previas de la Red Internacional de Observatorios de Turismo Sostenible de la Organización Mundial del Turismo (INSTO-OMT), y otros principales organismos internacionales. Los principales resultados incluyen un sistema de indicadores y datos reales relacionados con problemas claves del turismo sostenible, indicadores que han sido aplicados por algunos miembros internacionales a diferentes escalas. Sin embargo, todavía hay una falta de cuantificaciones sobre residuos, agua y los efectos climáticos en el turismo. Por ello, la Red Internacional de Turismo Sostenible puede verse como un modelo a seguir, pero necesita mejorar en indicades de sostenibilidad, sobre todo a escala local de destino.

Palabras clave: sostenibilidad, sistema de indicadores, turismo, Islas Canarias, observatorios de turismo, INSTO

1. Introduction

The COVID-19 pandemic influence impactfully on the fragile tourism and the hospitality industry (Kaushal & Srivastava, 2021; Zenker & Kock, 2020). The pandemic has highlighted the fragility of tourism to external events. Tourism growth influences the economic, socio-cultural, and environmental dimensions, but these dimensions also influence tourism development.

During the COVID-19 crisis it has been predicted a more sustainable tourism for the recovery period (Marek, 2021). In fact, the claim for a more sustainable and monitored tourism development was evident before the pandemic. But we are still far away from the accomplishment of this objective. In this framework the importance of tourism in the Canary Islands has been highlighted. The social, cultural, and economic impacts of tourism affect the attraction of tourists. Indicators aid to analyse these impacts in destinations. They help to gain knowledge from the comparison of different periods and contexts. Developing a system of indicators is indeed a key decision-making instrument that aims to provide valuable information on the impacts to create guidelines of public and private action in tourism.

Considering the large amount of indicator systems, it is not necessary to create new ones, but as the Federal Environmental Agency (2002) claimed in more general context, it is more useful to prove the existing indicator systems. Although, we consider that the main problem of the available indicators is that they mostly not provide measures for tourism sustainability and many of these indicators, like the SDGs, remain relatively vague (Biermann et al., 2017). To confirm this, the author of this master dissertation makes a first step in this direction by first, applying the SDGs to the mandatory issues. Then, before the competitive analysis of the indicators used by INSTO-member, the author does secondary research about available international indicator systems. As a last step the indicators will be applied to the Canary Islands to develop a system of indicators of tourism sustainability adapted to them.

The paper is organised as follows. It consists of nine different parts. After the introduction about the current situation, the general objective will be discussed. In addition to the research question, a few additional guiding questions are defined. Then, we take a closer look at the background of our studies. The impacts of tourism which make it necessary to provide a previous debate on indicators on sustainability. We have a closer look on the International Network of Sustainable Tourism Observatories (INSTO). The implications of the Canary Islands of this membership will be analysed in the following step and the main data in the

Canary Islands shown. The fourth section devotes the main concepts for better understanding. We centre on international systems of tourism indicators, like the Indicators of Sustainable Development for Tourism elaborated by UNWTO and WEF, the SDGs, ETIS, EUROSTAT and Certifications. The evident-based decision-making in the public sector and the scale of measurement is treated. Subsequently, the fifth section describes the mixed method used in the methodology. The sixth step includes results and discussion, identifying the indicators used by main INSTO Observatories. Thereafter we indeed apply some indicators for micro-destinations and develop a system of indicators for the Canary Islands. Finally, we provide some conclusions, limitations, and further research possible. Post-hoc we describe the references used. There are four annexes at the end. Annex 1 shows the INSTO-UNWTO members. For the third annex we choose some of them with the most relevant and reliable information. Annex 2 relates the mandatory issues to the Sustainable Development Goals. In the last we apply and actualize the indicators to the Canary Islands.

2. Objectives

The main objective of this research is to provide tools to develop a system of indicators of tourism sustainability adapted to the Canary Islands with the support of previous experiences within the International Network of Sustainable Tourism Observatories of the World Tourism Organisation (INSTO-UNWTO) and other main international systems of tourism sustainability indicators.

The general objective mentioned above can be spitted into several specific objectives. First, we must identify the most relevant systems of tourism sustainability indicators within INSTO-UNWTO and the main international systems of tourism sustainability indicators. Second, we compare and evaluate existing systems of tourism indicators for sustainable development. Then we analyse how the indicators that are being proposed by the Tourism Observatory of the Canary Islands can be improved with the support of these international experiences. Finally, we propose a system of tourism sustainability indicators for the Canary Islands applied to micro-destinations if possible and relevant.

3. Background

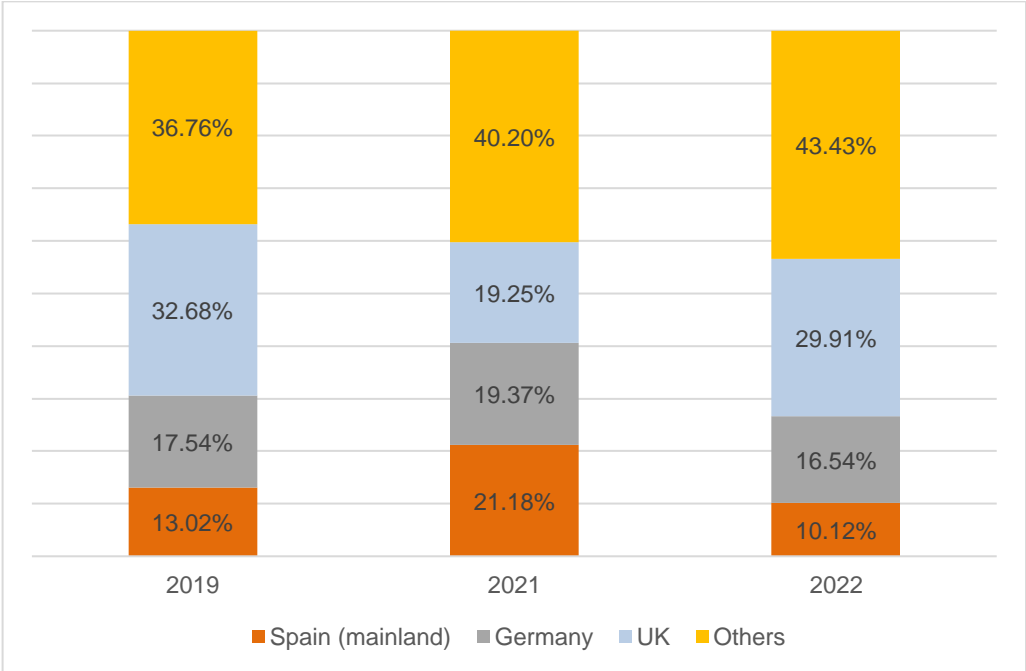
3.1. Impacts of tourism

The tourism sector can be influenced easily from the ecosystem, as seen in the pandemic. Therefore, we will have to analyse the impacts generated by tourism, but also the impacts influencing tourism itself. First, we will analyse the socio-cultural impacts. Second, the environmental and finally the economic impacts.

This paper treats with the problem of impacts of tourism, putting in danger tourism activities and the whole ecosystem. One of them are the socio-cultural impacts. Tourism is a social fact (Di-Bella, 2000) that affects all facets of life, both in origin and destination. Also, Urry (2001) announces that the experiences during our leisure trip may be different from those faced in everyday life. And yet, when we *leave*, we see the environment with interest and curiosity, for example exotic places for some tourists. Therefore, for visitors, tourism is a break within everyday life (Graburn, 2004), seen as a ritual, with rules, repetitive and with a symbolic dimension. It is a response to the stress of everyday life with the temporary suspension of taboos, a partial and aestheticized look at an extraordinary space and time. Consequently, we will have a certain look on the main outbound countries.

Following the latest data from January to March 2022, the main outbound countries are the United Kingdom, with 29.91% of the tourists, Germany with 16.54%, and Spain (mainland), with 10.12% of arrivals (ISTAC). These shares are in line with the figures before the pandemic.

Figure 1. Evolution of tourist arrivals by countries of residence



Source: Frontur - ISTAC

In between these tourists and locals, there are only a few points of contact. They are of transitory and superficial nature, marked by *typism* and unbalanced (Wijngaarden, 2016). Residents and tourists meet during their stay at the destination and during the exchange of information in places of equality. These contact points are often disbalanced by the economic

interest of the local community from tourists and the tourism expectation, preconceptions, and the partial and aestheticized look (Bal, 1991). Finally, this can lead to the loss of authenticity of locals and a transformation of the culture. The core of a sustainable tourism product has been described as authenticity, defined as a social process, a struggle imposing its version of history and showing it. The term authenticity, introduced by MacCannell in 1973, was treated as a main subject by various authors (Brown, 1996; Bruner, 1996; Cohen, 1988; Hughes, 1995; Selwyn, 1996).

In the following we analyse how tourism changes the culture of locals. There are cultural changes as a cause of tourism and changes for the incorporation in the market. Some alterations to prepare tourism for the market are *spectacularization*, *patrimonialisation* and problematic services, like crime (Zaiden, 2016; Xie, 2015). One of the mentioned variations is *spectacularization* which is marked by stereotypes, with more superficial communication and less interesting in content (Casas, 2011). An example are canons of authenticity that Manrique imposes on popular architecture, eventually converted into a product of *spectacularity*. As in many cases, the culture of the destination is themed for the tourist as a tourism product, less than history (Islands, 2012). Another variation is the process of *patrimonialisation*. Defined as the set of cultural, natural, material, and immaterial elements, inherited from the past or created in the present that a group recognizes as its identity (Romagnoli, 2019). The process starts with selection, includes exclusion of other possibilities, ordination, and interpretation by different groups of interest. Patrimonial elements are those that have been considered heritage, worthy of being conserved, and exhibited by a small part of society to value a partial version of the value (Romagnoli, 2019). To summarize, the changes to prepare tourism for the market are necessary to mitigate. Specifically, *spectacularization*, *patrimonialisation* and problematic services, like crime (Zaiden, 2016; Xie, 2015). To mitigate these effects, it is crucial to understand the nature of communities, the importance of their authenticity, and transformation of their culture in relation to tourism.

Sociocultural structures change considerably by tourism influences. Many countries specialised in tourism activities have been affected in a greater extent (Dogan, 1989). Transformation of culture arises because of tourism development and can promote the transformation of productive activities. Such as the abandonment of traditional activities and greater dependence on the sector, demographic changes or migration and changes in the pace of life, particularly gentrification (Cocola-Gant, 2018). Gentrification is the physical and economic process by which an urban space is restructured to achieve capitalist valorisation (Smith, 1982). This means that transformation can cause the expulsion of the popular classes and the colonisation of their places by social classes with greater purchasing power.

Touristification describes tourist overcrowding with more tourist consumption than local consumption. This is in turn a cause and effect of gentrification (Novy, 2018). Another problem related to tourism affluence is xenophobia, the rejection of the strange. According to the *Doxey Index*, there are different stages in contact with tourists. The first is called euphoria, in which tourists are welcomed by locals with few measures of control. In the second stage, it becomes a commercial form, called apathy, until it becomes through anger, which is the relief of the tourism industry with the establishment of infrastructures, antagonism. In the last Index, visitors are seen as the cause of the problem that leads to the deterioration of the destinations' image (Doxey, 1975). Xenophobia may lead to *tourismphobia*, as in cases like Barcelona. There have been numerous studies about the reasons, and it is often linked to the concept of *overtourism*. This concept can be described as the difference of the perceived and expected congestion (Simancas & Peñarrubia, 2019). The image of the Canary Islands in the issuing countries pictured by Tourism of Tenerife is idyllic, with deserted beaches. But the reality in high season are often overcrowded beaches. Another problem is indeed the large number of tourist establishments located on only 1.76% of the total surface in 2014 (Simancas & Peñarrubia, 2019). This makes *tourismphobia* one of the issues to study, necessary to define indicators previously and to take measures to minimise the rejection of residents. In this context, control systems with indicators have been established to measure the quality of life through the analysis of the perceptions of the local and resident population, considering the carrying capacity (Cooke, K., 1982; Kim, 2002). Tourism product is not limited to the establishment, but also includes the surroundings and the population of the destination. As a result, residents' perception should be considered and must be measured to prevent *tourismphobia*.

And yet taking into consideration the source of income, quality of life, community structure, demonstration effect, problematic services, acculturation, status and community pride, Zaiden (2016, p.109) points out a major understanding of other cultures, promoting peace through "cross-cultural tourist interaction".

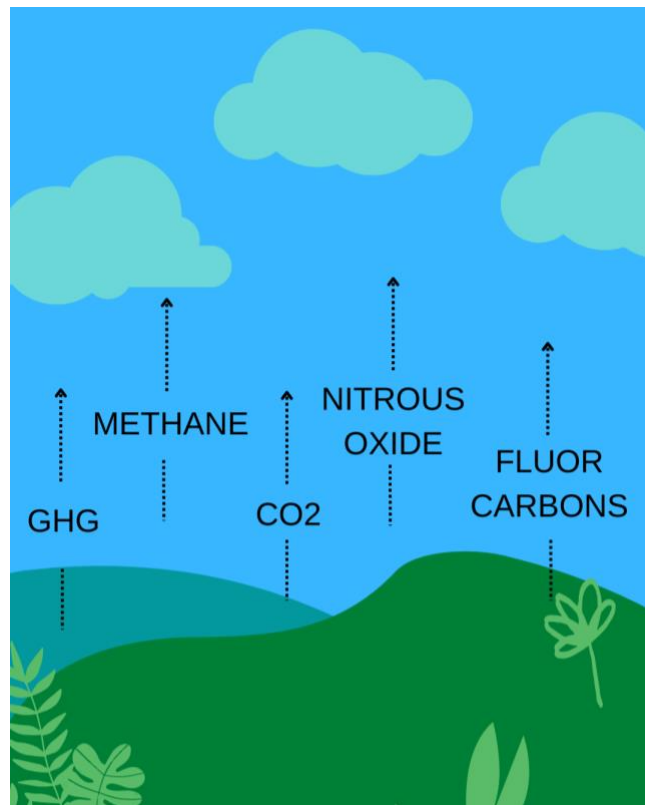
To conclude, we agree that tourism is a social fact (Di-Bella, 2000) that affects all facets of life, both in origin and destination. Also, we follow Rátz' (2000) conclusion that the global benefits of tourism are stronger and more positive than socio-cultural impacts and also Gjerald (2005) points out that socio-cultural impacts outweigh the total cost caused by tourism. But in our consideration, this is only possible if there are relevant indicators within a control system to mitigate the effects of tourism in long terms.

In the following we will analyse the environmental impacts, including the invisible burden, the role of common pool resources, the climate change and some positive environmental impacts

caused by tourism. Environmental impacts can be invisible burdens that often “outpace revenue growth tourism year on year” (Epler et al., 2019, p.21). Epler et al. (2019) outlines that the invisible burdens are the impacts “unaccounted for destination costs to provide local infrastructure and the protection of eco and socio-cultural systems for tourists and local people” (Epler et al., 2019, p.7). There are some invisible burdens typically unaccounted for, such as the solid waste generation, energy, water, and waste water which are some of the main issues of INSTO-UNWTO. Other impacts are the extinction of wild species, dispersion of diseases and changes in the perception of the environment (Gössling, 2002). Likewise, it should be noted that non-tourists are indirectly affected by the environmental impacts (Briassoulis, 2002), produced by both, residents, and visitors. This makes the invisible burden difficult to measure. A main problem is the level of depletion of local ownership of land and resources (Epler et al., 2019), as the tourism product is a common pool resource, which can be under private or public property. The common pool resources are “natural and human constructed resources characterised by *subtractibility* and *nonexcludability*” (Briassoulis, 2002, p. 1066). This means that the consumption of one person prejudices the use of another, but exclusion is impossible. An example are the streets if there are queues. The background tourism elements (BTEs) generate the tourism demand (Jafari, 1982), being the cause and result of tourist affluence. BTEs are an essential part of tourism products and difficult to measure only for tourism products because they are used by visitors and non-visitors, so it cannot be protected adequately. In relation to the common pool resources there are some problems mentioned, as that the existence of CPRs may lead to degradation (Briassoulis, 2002). The “underutilization or abandonment of facilities creates economic inefficiencies, at least in the long run” (Briassoulis, 2002, p.1073). This can even lead to irreversible, environmental damage. Hence, it is crucial that the CPRs are well analysed in each destination.

Furthermore, the environmental impacts can be resumed according to the issues of INSTO. Some of them are energy, solid waste, water and waste water and climate change. Themes putting in danger the BTEs. Islands are affected in greater extent, as a cause of their insularity, with the lack of drinking water, distance to the mainland and stronger effects of natural catastrophes as wizards (Epler et al., 2019). Epler et al. (2019) claims that there are a lot more risks. Examples are the lack of land-use planning, protection of non-renewable natural resources, financing to manage protected areas used for tourism, and lack of human capacity. The non-renewable resources still account for over 80% of global energy consumption (WEF, 2018). The climate change is indeed provoked by GHG, CO₂, methane, nitrous oxide, and fluorocarbons such as HFCs, PFC and SF₆ (ISTAS).

Figure 2. Factors of climate change



Source: Elaboration with Canva, data ISTAS

The main problems of climate change are the health risks associated (Ballester et al., 2006). Some of them are changes in morbidity and mortality as a cause of the alternation of temperature. Another health effect described by Ballester et al. (2006) is related to extreme weather events. Examples are tornadoes, storms, hurricanes, extreme rainfalls, and an increasing air pollution. Moreover, there are infectious transmitters from food and water. The global temperature is increasing, even if in some places it rises and in others it drops. Other climate change risks are the sea level rise, high intensity storms, flooding, fires, and desertification (Epler et al., 2019). Climate change is a problem in common with all sectors, affecting everyone. But to change something, we must measure on a very small scale to act easier.

However, we must emphasise that not all the impacts that take place in the destinations are negative. The development of infrastructure supposes an improvement in the lives of the residents by using them. The problem would appear when there is excessive exploitation that leads to an increase in prices, which implies a reduction in usage by residents since their willingness to pay is much lower than that of tourists (Briassoulis, 2002). The current trend towards more sustainable tourism can be used as an advantage. In summary, we should have a special eye on the invisible burden to mitigate the environmental effects. Although we should

also consider the socio-cultural effects already mentioned and the economic impacts, treated in the following.

As a last point, we will centre on the economic impacts in tourism. First, we will see the different methods of measuring the economic impacts of tourism. Then, we will centre on the invisible burden in relation to these impacts. Finally, we centre on the scale of measure. Tourism is a critical sector of the international economy (United Nations Conference on Trade and Development, 2020), and produces crucial economic impacts. In 2019, the tourism sector accounted about 300 million jobs globally and 29 per cent of the world's services exports (UNWTO, 2019). During the pandemic, the importance of tourism has indeed been noticed. Since the economy in many destinations, like the Canary Islands, depends on tourism.

The Tourism Satellite Account (TSA) is a method of measuring the direct contributions of tourism consumption to a national economy (Frechtling, 2009), including visitors, defined as tourists and excursionists. The TSA is centred on accounts and tables, based on the principle of national accounting that allows to measure the economic magnitude of tourism, from a perspective of demand and supply. Therefore, it delimits the tourist offer, including direct and indirect impacts. Direct effects of tourism refer to the impacts produced by the direct contact between tourist and host, like the money paid for the accommodation in the destination. Indirect impacts are produced by the suppliers, for example agricultural products used in hotels. "Intersectoral linkages worsen the [indirect] impact of a decline in tourism" (United Nations Conference on Trade and Development, 2020, p.14), specifically, the drop of tourist arrivals has direct, but also indirect negative impacts. In addition, the "increased tourism expenditure from inbound markets has direct, indirect, and induced effects on a host destination, leading to increased production, income, and employment" (Dwyer et al., 2000, p.325). An example for induced effects is the money spent by the employees in tourism accommodations. Dwyer et al. (2000) points out that the Computable General Equilibrium (CGE) model is more appropriate to measure impacts than the input-output modelling. There are strong links between the tourism sector and other sectors. For example, the growth of tourism "will lead to an increase in demand for a range of goods and services such as transport, accommodation, and food" (Dwyer et al., 2000, p.338). It is possible to apply this point of view, as the data necessary to apply the CGE models, are already available for many destinations. After analysing the different methods of measuring, we centre on the invisible burden and the scale of measuring on economic impacts.

Epler et al. (2019) is taking into account socio-cultural, environmental, but also the economic risks. The environmental impacts, like natural catastrophes or pandemics interrupt tourism

visitation, parts of the invisible burden. Following Epler et al. (2019), tourism decision-making is often based on international scale, instead of national or regional scale. Therefore, it is necessary to identify the economic value of each tourist. In this context it is crucial to measure the impact on the local municipal budget by analysing the tourist expenditure in the destination, by taking into consideration possible externalities. The development of local, small-scale, and ideally more sustainable experiences can contribute to economic growth, without necessarily increasing numbers of arrivals (Oklevik et al., 2019). Quality instead of quantity for long-term economic growth. Consequently, economic impacts produced by tourism are mostly positive, but can produce dependence shown in the pandemic and make it necessary to establish systems of control. Thereupon, it is necessary to measure on a small scale to obtain relevant data.

3.2. Previous debate on indicators of tourism sustainability

Considering the amount of indicator systems, in this paper, we consider that it is not necessary to create new ones, but to analyse the existing indicator systems (Federal Environmental Agency, 2002). Consequently, we review previous research about indicators, sustainability, their applications, and their weaknesses.

On priority, there has been a lot of research done about economic factors (WTO, 2004; EUROSTAT, 1999), but mostly the systems of indicators are more theoretical and less methodological (Becker et al., 1996; Alpenforschungsinstitut, 2000). There are some applications already done. An example is the Guidebook developed by the WTO (2004), now the UNWTO. There are a lot of indicators elaborated and a few systems of indicators of sustainability, such as the Guidebook and the following reports, too.

Indicators of sustainability in tourism were already analysed in 2001 in the *Environmental Signals* (European Environment Agency, 2001), by considering the positive economic impacts, measured by the GDP and the possible negative environmental impacts, as air emissions and water consumption (European Environment Agency, 2001). Relevant indicators of sustainability should be developed but are expressed by Sherma & Tribe (2008) as often stakeholder driven. These circumstances make it necessary to develop unconventional indicators described by them. Sustainability can be described as a matter of perception, and as a main problem to react, related to the number of tourists received in a specific area. These matters are called by Blázquez-Salom et al (2021) *overtourism* and *undertourism*.

The sustainable development of a specific area is not concrete yet. On a communal scale, there has not been an operationalisation and implementation strategy (Birkmann, 1999). To obtain reliable and useful information, indicators must be applied on a smaller area. As tourism

areas are even tinier than municipalities, but tourism is multidisciplinary, it is necessary to investigate them separately to get to know the impact in these areas. Indicators effectively support sustainable development of the regions and cities, necessary for spacial development in long-terms (Birkmann, 1999). Bertocchi et al. (2020) promotes regionalization of national indicators, by developing a practical tool for measuring and monitoring the regions sustainable development. He uses the Tourism & Travel Competitiveness Index framework as a starting point and develops regional sustainability indicators for the 281 NUTS-2 European regions. After realizing the prior research related to indicators of sustainable development and the ideal scale, we concentrate on the relation to the policymakers of this region.

Surely, indicators provide decision-makers and the public with the information necessary for the design and monitoring of an adequate environment policy for the European Union (EUROSTAT, 1999). Eurostat changed the usual approach of asking politicians which indicators they want for policy purposes. Alternatively, they approach to identify the most relevant indicators by asking the scientific and environmental community to identify the most important issues for each policy field. Eurostat (1999) pretends to fill in gaps of knowledge and to provide comparisons between Member States that up to now were not possible. This constitutes the basis for further discussion and methodological developments and gives added value to the results of many research projects. There is the need to find a balance between academic and professional perspectives. An example is given by Moniche & Gallego (2022) with the Andalusia System of Sustainable Tourism Development Indicators (SISTA). Policymakers often have difficulties to measure the efficiency of plans and strategies. SISTA serve as a reference for destination working on measures and provide practical applications and theoretical approaches by including all stakeholders in the process.

In summary, there has indeed been a lot of prior research in common with the result of the need to measure and monitor. Although it is still necessary to elaborate and apply a system of indicators of sustainability in common with implications and the collaboration of all stakeholders.

3.3. International Network of Sustainable Tourism Observatories (INSTO)

Special attention has been paid in this paper to the network INSTO. INSTO is the most important international network of sustainable tourism observatories, and the Canary Islands joined the network in 2020. INSTO is short for the UNWTO International Network of Sustainable Tourism Observatories. The network of tourism observatories monitors the tourism performance and impact, timely and regular. Accordingly, they better understand the resource use and promote responsible management of tourism (UNWTO, 2016). Their reports

help to understand the economic, environmental, and social impact of tourism at the destination level. It is crucial to guarantee a long-term commitment and sustainable growth of the tourism sector by measuring and monitoring. In particular, it is supported by an evidence-based management of tourism (UNWTO, 2016).

There are eight observatories in China, five in Spain, five in Indonesia, three in Portugal, one in Greece, one in Mexico, one in Brazil, one in Croatia, one in the United States, one in Italy, one in Panama, one in Guatemala, one in Argentina, one in Australia, and one in Canada. This makes a total of 31 observatories since the establishment in 2004 (UNWTO, 2022). INSTO-members (Annex 1.) in our focus have published their reports, including quantitative and relevant indicators which can be applied to the Canary Islands, as they can support crucial applications to the matter. Often used indicator systems by members are ETIS and the indicators proposed by the (UN)WTO in the Guidebook in 2004 (Annex 4.). In some cases, these indicators are compared with the Sustainable Development Goals. We established a linkage to these goals which are not directly applied to tourism, although they are nowadays highly relevant. To link them we compare the other members' elaboration to our own election. The implication of the membership of the Canary Islands to the most important international network of sustainable tourism observatories will be studied in the succeeding.

3.4. Implications for the Canary Islands of INSTO membership

The general implications to be part of the network described by the UNWTO (2016), includes continued support and regular monitoring of the impacts. The members can use the tools and resources provided but have flexibility to add further ones. To be a INSTO member means to communicate, collaborate, and exchange information and experiences with other observatories with the purpose to create healthy places for both visitors and host communities, resilient for future generations by using the key issues proposed by the UNWTO.

The objective of this membership is providing “policy makers, planners and tourism managers and other relevant stakeholders with key tools to strengthen institutional capacities to support the formulation and implementation of sustainable tourism policies, strategies, plans and management processes” (UNWTO, 2016, p.1). Participation of the private and public sector is crucial to guarantee participation and relevance of themes like risks, costs, impacts limits and opportunities with continuity, in particular a long-term commitment (UNWTO, 2016).

This framework helps the Canary Islands to elaborate their proper application, to coordinate existing initiatives, and helps institutions related to tourism monitoring and intelligence in the Canary Islands to promote synergies among them (Tourism Observatory Canary Islands, 2020). The four pillars of the Observatory Board are the Vice Ministry, ISTAC, Promotur and

the Universities of La Laguna and Las Palmas de Gran Canaria. They must approve the annual plan and assign tasks. The Canary Islands Tourism Council includes the main stakeholders from the public and private sector of every island to propose the annual objectives. Afterwards, these objectives are considered by the Observatory Board, and finally approved by the Vice Ministry of Tourism (Tourism Observatory Canary Islands, 2020).

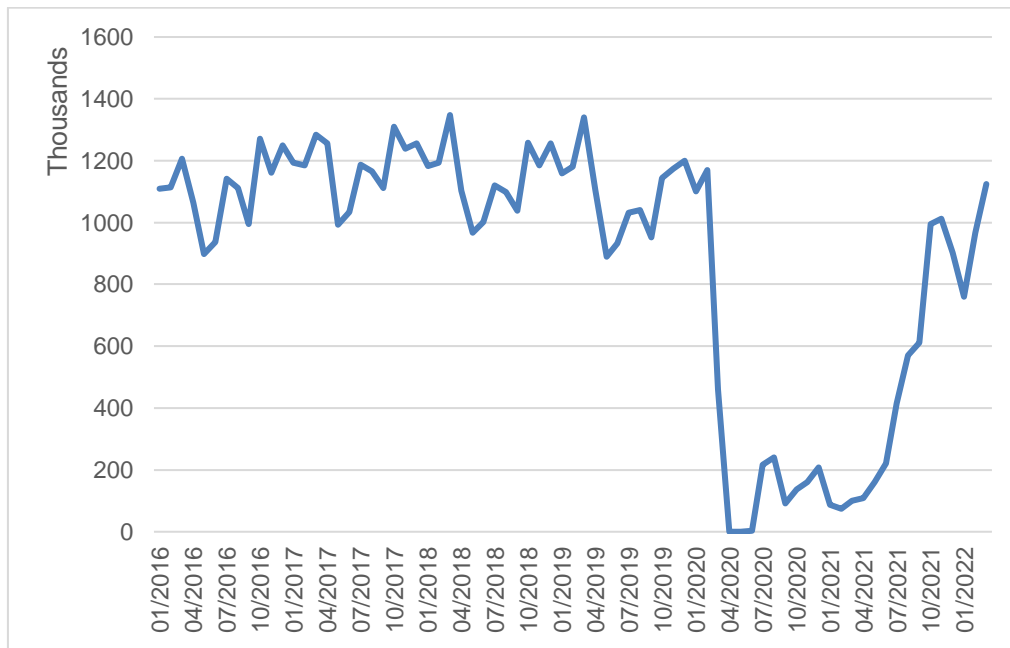
The implications for the Canary Islands of their membership are the need of development of a strong organisational base and establishments of contacts with other members of UNWTO-INSTO. Furthermore, they need to create frequently a list of reports, including the monitoring of the mandatory issue areas with the use of indicators of sustainable tourism development. The continued support and regular monitoring therefore do help the decision making and collaboration, not only between the stakeholders in the Canary Islands, but also between the INSTO-UNWTO members.

3.5. Recent evolution of tourism in the Canary Islands

The pandemic situation has affected and still affects the region. There were no tourist arrivals since April 2020, a so-called tourism zero. The main economic indicators decreased in 2020. Even statistical activities stopped, and for this reason, there is no data available for the tourist arrivals in April and June 2020 (Figure 3.).

Tourism in the Canary Islands is a driving force of the economy because of tourism expenditure and generation of employment. We analyse the year 2019, the last pre-pandemic year, to show the economic force of tourism. *Impactur* (2020) provides the following data for the year 2019. The tourism sector contributed with 15,597 million € to the GDP of the Canary Islands, which supposes 33% of the contribution to the global GDP. The survey of tourist expenditure from the ISTAC supply important data for 2019, too. According to this survey, there is a total of approximately 15 billion € of tourist expenditure, and tourists stay an average of 7.35 days, with an average expenditure per tourist of 139.22€. Furthermore, this provides to combat the high unemployment rate of around 20% (ISTAC) in 2019, with 310,956 jobs linked to tourism activities in the prospective year (2019). This entails a local tourism employment in 2019 of 36.5%, in comparison with Spain of 12.9% (IMPACTUR, 2020).

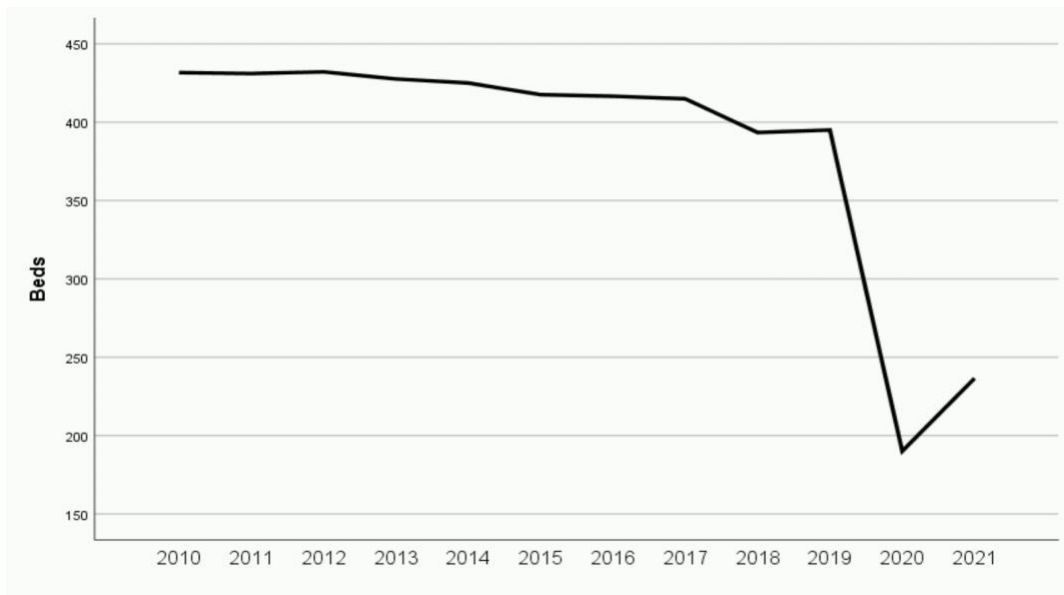
Figure 3. Evolution of international tourist arrivals (excluded Spain)



Source: FRONTUR – ISTAC

Even if tourism beds are available, tourist arrivals and total tourist expenditure recovered slightly in 2021, we still observe a notable difference to pre-pandemic numbers.

Figure 4. Evolution of available tourism beds in the Canary Islands (2010 - March 2022) (in thousands)

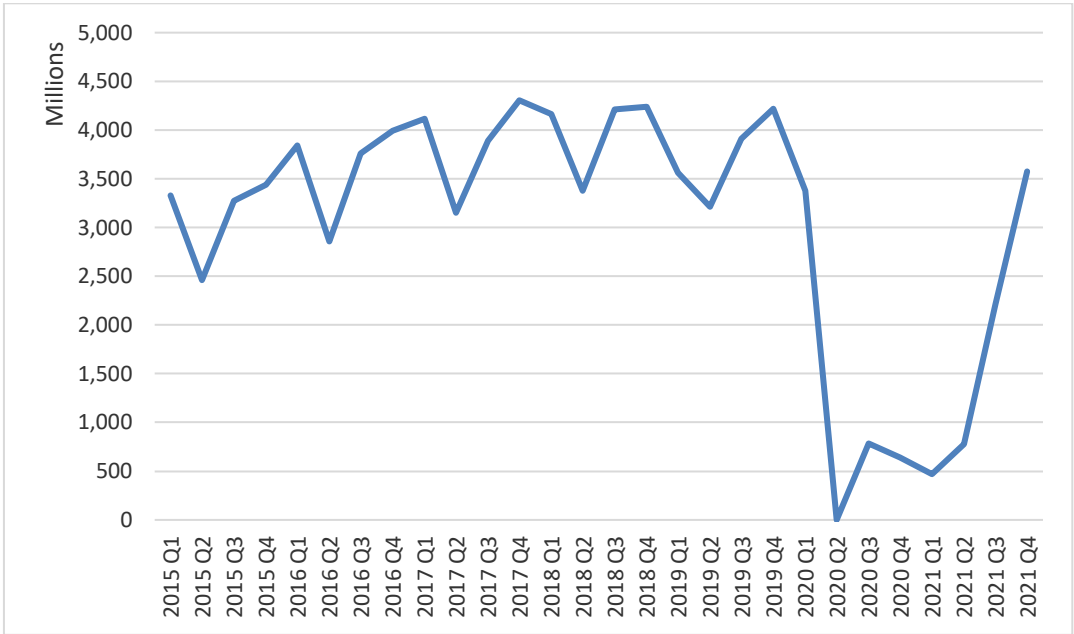


Source: Survey of tourism establishments – ISTAC

Our main subject studied to obtain a reliable indicator about the economic growth is the tourist expenditure, necessary to separate in between the amount destined to origin and destination.

Tourist expenditure “refers to the amount paid for the acquisition of consumption goods and services, as well as valuables, for own use or to give away, for and during tourism trips” (United Nations, 2010, p.31). Tourist arrivals and expenditures almost reached pre-pandemic values. We can observe that the Canary Islands have almost no seasonality. Although they have a bit less total expenditure in the second quarter.

Figure 5. Evolution of total tourist expenditure



Source: Accommodation survey

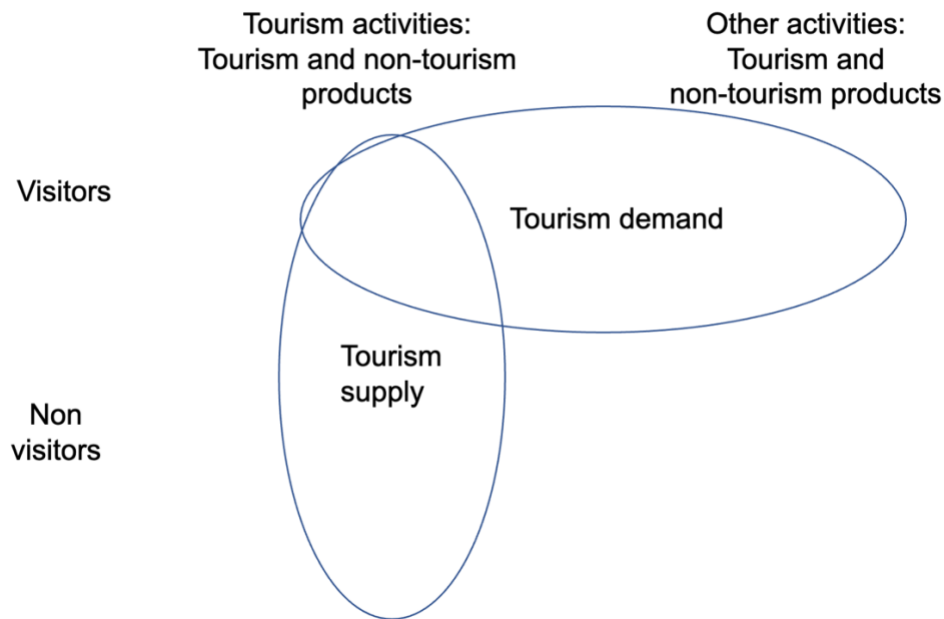
These indicators display the importance of tourism in the Canary Islands, but the measuring is often complex on account of activities characterised or not as tourism which are used by visitors, but also by non-visitors.

4. Theoretical and conceptual framework

4.1. Main concepts and approaches

Tourism consumption can be seen from different points of views, the tourism demand or supply (Hernández, 2011). Even if they have activities and products in common, there are differences. So, in the following we will define tourism supply and demand. We take into consideration that according to the point of view of supply the activities characterised as tourism are offered to visitors and non-visitors, as pointed out in the following figure. To the contrary the tourism demand includes products, identified or not as tourism.

Figure 6. Tourism demand and supply



Source: Adapted from Hernández, M., 2011

An example for tourism supply which include tourism activities consumed by visitors and non-visitors is food and beverage. The characteristic products of tourism are those in which “tourism expenditure on the product should represent a significant share of the supply of the product in the economy. This criterion implies that the supply of a tourism characteristic product would cease to exist in meaningful quantity in the absence of visitors” (United Nations, 2010, p. 40). The tourism characteristic activities possess a principal tourism product. The total tourism internal demand is the sum of internal tourism consumption, tourism gross fixed capital formation and tourism collective consumption (United Nations, 2010) important to take into account by scanning impacts of tourism.

The definition makes it possible to draw indicators to measure the tourism impact and assist decision makers. Succeeding, we will define sustainability, indicators and finally indicators of sustainability. It is necessary to value growth to enhance the sustainability of tourism, defined by the UNEP and UNWTO (2005, p. 12) as which “takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities.” For the enhancement of local products, a well-coordinated promotion on national, regional, and local scale based on common objectives is crucial. Even though there is a lot of money spent in marketing, it is better to spend, for example, on the distribution between residents to manage the invisible burden (Epler et al., 2019). It is indispensable to make development sustainable, to ensure that it meets the needs

of the present, without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply but limitations. But these limits are not absolute and can be surmounted. They are imposed by the present state of technology, the social organisation on environmental resources and by the ability of the biosphere to absorb the effects of human activities (WCED, 1987). Sustainability is a concept and therefore has its limitations, but it can be concluded in this paper, as a concept which take into account present and future generations and environment.

Considering that we analyse indicators of sustainability, we define indicators which are measurements, possible to be compared. Especially mentioned as building blocks for a local system of indicators of sustainability (Birkmann, 1999). Indicators are not seen in an isolated way, but as a connection in between the data, the information and the “Leitbild” (Birkmann, 1999, p. 120), translated as a model to follow inherent in human beings. On one hand, data includes the humans and their interaction with the surroundings. On the other hand, we can see the model to follow, including aims and standards. The missing piece of connection is the system of indicators, measuring the abstract aims to apply and measure them with data. Therefore, indicators of sustainability are measurements possible to be compared with the focus on the current and future economic, social, and environmental impacts addressing the needs of all implicated stakeholders.

4.2. International systems of tourism indicators

We examine the different types of indicators and the international systems of indicators obtainable which are ETIS, SDGs, EUROSTAT, indicators provided by certification bodies, and the *Indicators of Sustainable Development* by the World Economic Forum and the UNWTO.

Depending on the utility for decision-makers, different kinds of indicators are applicable. While the most directly useful may be those that help to predict problems, following the Guidebook (WTO, 2004) several other genres exist. Proactive indicators include the one just mentioned and the early warning indicators. There are also indicators measuring the current state of industry, but most indicators react on stresses on the system or measure actions in the past. These are measures of the impact of tourism development on the biophysical and socio-economic environments, of management effort and measures of management effect, results, or performance (WTO, 2004).

The first system of indicators for measuring the evolution towards sustainability was implemented in Rio de Janeiro by the United Nations in 1992, developed already on different

scales and only the beginning of more organisations improving indicator systems (Torres-Delgado & Saarinen, 2014; UNWTO, 2004). But afterwards there have been elaborated more systems of indicators, mostly in different scales, related to tourism and sustainable development.

The new guidebook (WTO, 2004), elaborated by the UNWTO describes over 40 major sustainability issues, indicators, and measurement techniques. These are the *Indicators of Sustainable Development for Tourism* elaborated by UNWTO. Examples of elaboration range from the management of natural resources, like waste, water, and energy to the satisfaction of tourists and host communities. These issues are the base for the elaboration of the reports of the tourism observatories INSTO-UNWTO.

In 2015, the United Nation elaborated the *Sustainable Development Goals (SDGs)* as a call to action to ensure that by 2030 all people enjoy their human rights, as peace and prosperity (WHO, 2016). The countries have committed to prioritise progress with 17 goals, 169 targets and 330 indicators for those who are furthest behind (Hák et al., 2016).

In 2013, the European Commission launched the *European Tourism Indicator System (ETIS)*. The aim is to use a comparable basis to help destinations to monitor and measure their sustainable tourism performance. Therefore, the monitoring of the results is based on self-assessment, observations, data collection and analysis by each destination. ETIS includes 27 core indicators and 40 optional indicators, subdivided in the categories of destination management, economic value, environmental, social and cultural impact. The system of indicators has already been implemented in 100 destinations (European Commission, 2016).

The 60 indicators presented by EUROSTAT here have been selected based on responses to the second survey among the Scientific Advisory Groups (SAG). The multitude of sustainable metrics have been organised in air pollution, climate change, loss of biodiversity, marine environmental and coastal zones, ozone layer deletion, resource depletion, dispersion of toxic substances, urban environmental problems, waste and water pollution and water resources (EUROSTAT, 1999; Initiative et al., 2010), some of them are repeated in other systems of indicators of sustainable development. But there is a lack of understanding of the relation between different systems and their effectiveness (Initiative et al., 2010).

Furthermore, despite the rapid growing ecolabels market lately, it is unclear how the trend will be going forward. Gallastegui (2002) accounts for the encouragement of labelling programs including the environmentally friendly consumption patterns. He also includes the importance

of all stakeholders, the productive structures, and the government to increase the environmental standards of the products and services in the economy. Some examples for certifications are ISO 9001, ISO 14001 and OHSAS 18001 (Qi et al., 2013). Chaplin & Wyton (2014) points out the gap between what consumers say and what they really do, the so-called value-action gap. Certifications help to create more transparency for easier decision making.

The indicators by the World Economic Forum (WEF), included in the *Tourism Competitiveness Report* are subdivided into four subindexes, 14 pillars and 90 individual indicators (Calderwood & Soshkin, 2019). The four subindexes are as followed:

1. *Enabling Environment*
2. *Travel & Tourism Policy and Conditions*
3. *Infrastructure*
4. *Natural and Cultural Resources*

Indicators of competitiveness enable sustainable development and even serve as a benchmarking tool for policymakers. Tourism competitiveness delivers quality, innovation, and attraction to visitors with the purpose of gaining market shares by taking into account the efficiency and sustainability of the use of resources (Dupeyras & MacCallum, 2013).

The point in common with the systems of indicators of sustainability is to provide destinations tools to monitor sustainability and manage tourism activity evidence based in the long-term. Many systems of indicators do not connect directly to the tourism sector or are only applied to the European region.

4.3. Evident-based decision-making in the public and private sector

Indicators transform problems and opportunities, tangible, and objective through observable variables (Manning, 1999). Similarly, Butler (1999. p.16) considers that without measures or indicators, the use of the term “sustainable tourism” is meaningless. In the following we will bring the importance of the implication of the public and private sector closer. Hunter & Green (1995) identify the problem of implementing sustainable tourism principles and policies in real contexts. The European Tourism Indicator System (ETIS), commented by Font et al. (2021), is a scheme funded by the European Commission to address the evidence gap in tourism policy making, crucial to effective decision making. This gap can be closed by taking into consideration the public and private sector in decision making.

Another point considered is the performance measurement, the monitoring and advising on the implementation of sustainable development plans, policies, and management actions (UNEP & WTO, 2005). Monitoring these indicators of crisis may permit to minimize the impact

and even offer an opportunity to protect the tourism (De Sausmarez, 2009). The benefit of monitoring will be for all stakeholders, and has implications for both, the public and private sector.

Nevertheless, the stakeholders only can collaborate with effective communication. Stevenson et al. (2008) points out that policy making includes low status, lack of clarity, uncertainty, lack of consensus, congruence and complexity. His findings indicate that policymaking is essential in a social process and communication and negotiation crucial for change on a wider range (Stevenson et al., 2008). The implication and collaboration of all stakeholders is crucial, from the elaboration of indicators to their application.

4.4. Scale of measurement

In the following we will analyse the scale of measurement. First, we will have a look at the need for inclusion and the lack of implementation till now. Then, we centre on the discussion of different authors defining smaller scales to measure.

As already mentioned, tourism is a social fact (Di-Bella, 2000) that affects all facets of life, both in origin and destination. Specifically, the tourist gaze (Urry, 2001) affects tourist neceli, adjoining non-tourist zones and generating areas. As mentioned, tourism affects the whole destination. Therefore, the impacts are difficult to measure and a further limitation indispensable. Until now, “existing models have largely been developed through a fragmented case-study approach and have not yet achieved a sufficiently integrated conceptual basis for a comprehensive understanding of the spatial characteristics of destination regions” (Dredge, 1999, p. 772). The definition of the levels of spatial analysis for tourism is vague, as evidenced by the fact that the tourist destinations, as such, still not have a satisfactory and widely accepted definition (Hernández, 2017).

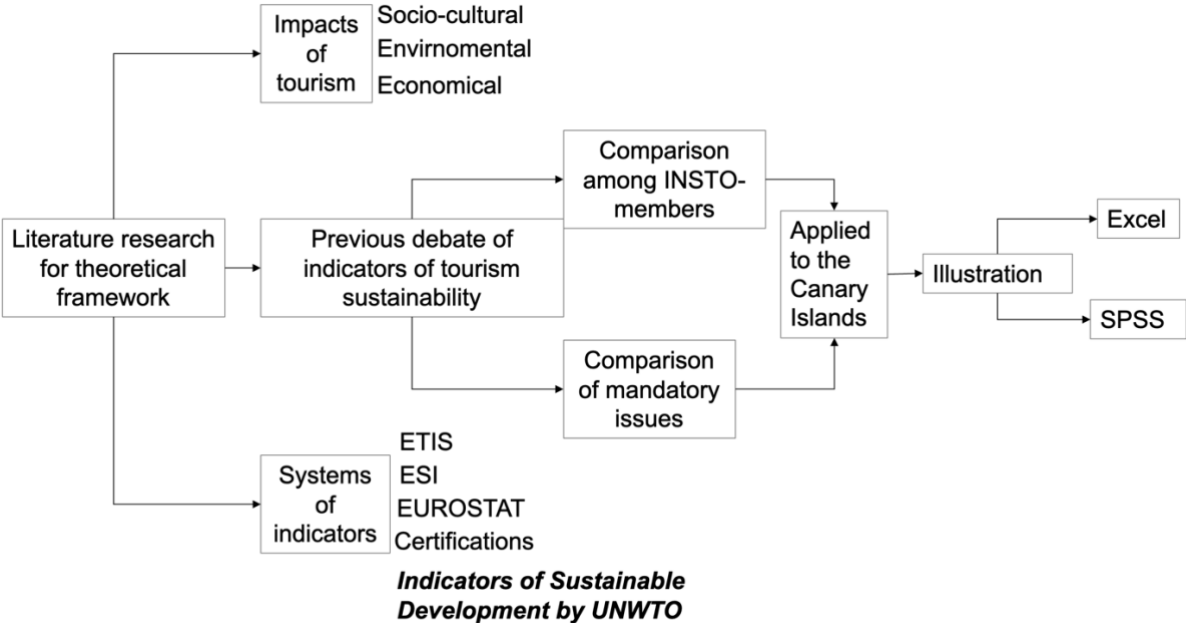
There have been some recent studies to define and include these scales to support decisions made by local and regional tourism administrations. The scales used by Ivars-Baidel et al. (2021) are the regional and municipal scales. The tourism investigation is often done at subnational level because administrative borders are used to implement tourism policies and to collect statistical information (Hernández-Martín et al., 2016). However, tourist destinations may only be a small part of municipalities or enclose one then more area. The multidisciplinary nature of tourism leads to a lack of information in general, but on micro-destination scale information is nearly non-existent. Some papers are trading indicators of sustainability in tourism, providing statistical information, like Hernández-Martín et al. (2016), or Hernández-Martín & Mendoza-Jiménez (2017).

In summary, in some cases, it will be necessary to analyse micro-destinations, as tourism areas are not limited to one municipality and indicators can vary in different areas of a destination. Examples of data which can be used, are retrieved by the accommodation survey, as ADR, RevPAR, and the occupancy rate. Furthermore, we have indeed on disposal data on municipal level of water and waste in Arona. In the framework of this paper, we tried to obtain micro-data of the statistical enterprise of the Canary Islands for further research which arrived recently and will be included in further research. Summarising, it will be necessary to consider micro-destinations, as tourism areas are not limited to one municipality and indicators can vary in each destination.

5. Methodology

The methodology of this research follows three main steps. The first one is a secondary literature research to get to know about the different indicators of sustainability used in tourism, the second step leads to the different indicators available by INSTO and the last one is related to the application, of the different indicators found, to the Canary Islands.

Figure 7. Outline of the methodology of this paper



Source: Own elaboration

This paper begins to draw on a mixed-methods approach, combining qualitative methods (content analysis, review of existing contributions) with quantitative methods (survey results, indicators). This leads to more consistent results and a holistic integration of insights. As well as a higher potential for credible and trustworthy conclusions (Tashakkori & Teddlie, 2010).

5.1. Secondary research: available indicators

The secondary research takes the *Journal of Sustainable Tourism* and *Annals of Tourism Research*, highly approved journals, in special account. We put special emphasis on sources by the UNWTO, European Commission and Impactur. The study leads to a critical and comparative analysis of international systems of indicators of sustainability in tourism. Some of the main indicators described in this paper are ETIS, ESI, SDGs, EUROSTAT, certifications, and the *Indicators of Sustainable Development by UNWTO*.

We relate the mandatory issues described in the Guidebook (WTO, 2004) to the Sustainable Development Goals, linking tourism and global sustainability matters. Hence, it is also necessary to know about the current context to prove the importance of indicators in a multidisciplinary sector, such as tourism.

5.2. Indicators available by INSTO-members

The main problem is the lack of public and private participation. Therefore, we choose the well-thought indicators elaborated by the UNWTO. These indicators were applied by tourism observatories all over the world in the frame of the *International Network of Sustainable Tourism - World Tourism Organisation (INSTO-UNWTO)*. We chose the members with the most reliable and exact data, possible to compare and open for the public. After the recollection of relevant data, it is certain to ordinate and value the indicators used.

The key issues are as followed (UNWTO, 2016; UNWTO, 2022):

1. *Tourism Seasonality*
2. *Employment*
3. *Destination Economic Benefits*
4. *Energy Management*
5. *Water Management*
6. *Waste water (Sewage) Management*
7. *Solid Waste Management*
8. *Climate Action*
9. *Accessibility*
10. *Local Satisfaction*
11. *Governance*

Before we compare the different indicators used by the INSTO-members, we contrast the mandatory key issues with the Sustainable Development Goals 2030. In a further step we will apply, to the Canary Islands, the most important and relevant indicators found.

5.3. Application of the different indicators to the Canary Islands

We obtain the findings through ISTAC, Impactur, INE, and the proper network of INSTO (Annex 4.). These sources are the most reliable and objective way to receive information for the scale used in this paper. We also actualise the indicators included in the recent INSTO report. The actualized data is based on the preliminary report from 2020, the progress report of 2021 and 2022, even the last two are not published yet. We evaluate the results with a comparison with the use of excel to illustrate them via the Statistical Package for the Social Sciences (SPSS) and Excel.

At this point it is convenient to refer to the figure that represents the Statistical Institute of the Canary Islands (ISTAC), the main body within the statistical system of the Community and an official regional research centre. Special help has been provided from *Promotur* to use the microdata from ISTAC to extract the average expenditure per tourist and day. This data is one of the most important indicators to measure the value of the tourist arrival for the local economy. It can be divided in expenditure realised in the country of origin, and in the destination itself.

The specific steps to convert the microdata of ISTAC in the published data of the expenditure per tourist and day are the following:

1. COMPUTE GASTO_VIAJE_GRUPO= COSTE_VUELOS_EUROS + COSTE_ALOJ_EUROS + GASTO_EUROS (which refers to others). EXECUTE.
2. COMPUTE GASTO_VIAJE_GRUPO_PERS = GASTO_VIAJE_GRUPO/ ((PERSONAS_16_64) + (PERSONAS_65_O_MAS)).
3. COMPUTE GASTO_VIAJE_GRUPO_PERS_DIA = (GASTO_VIAJE_GRUPO_PERS/ NOCHES). EXECUTE.

Source: Meeting with *Promotur*

Besides, to illustrate the information recollected, we use SPSS and Excel. We extract information from data published by secondary sources as the National Statistics Institute (INE), the ISTAC, and reports of *Promotur* and *Impactur*. To conclude, in this paper we centred in its majority on secondary sources, as there are a lot of systems already. Although they still need improvement. Thus, we present our results post-hoc.

6. Results and discussion

First, we analyse the indicators used by the main INSTO Observatories and their most important characteristics. In a second step, we apply some indicators on micro-destinations.

Last, we establish a system of indicators for the Canary Islands. This can provide a model to follow for other destinations.

6.1. Indicators used by main INSTO Observatories

The members of INSTO-OMT chosen for this paper, provide the most reliable and exact data, possible to compare, and open for the public. The selected indicators are suitable, complete, and allow us therefore to answer questions adequately. Furthermore, they are applicable to the Canary Islands, useful for decision making, quantifiable and organised following the issues given by the UNWTO. In a further step we confirm the availability of these indicators (Annex 3.).

The Tourism Observatory in Canary Islands, Spain, our main case of study, is one of the INSTO members with information about water and waste in tourism (Tourism Observatory Canary Islands, 2020). In the tourism activity report of Barcelona, the economic impacts are widely described, but there is missing water, waste, and other environmental indicators, as in Guanajuato, Mexico (Tourism Observatory State of Guanajuato, 2019). Barcelona, Spain is sorted by city, region, and destination (province). If not specified, they treat *Barcelona destination* (Tourism Observatory Barcelona, 2020). Also, Buenos Aires, Argentina provides in his report different time ranks and spatial zones, its municipalities (Tourism Observatory City of Buenos Aires, 2019). South Tyrol, Italy included strategic plans in its preliminary report to solve problems (STOST, 2018). Thompson-Okanagan, Canada key issues are related to the SDGs. On one hand, The Sustainable Tourism Observatory Thompson Okanagan (2019) proposes many possible indicators, but only a few of them are measured. On the other hand, Sonoma, California provides few, but relevant information about most issues. Adriatic Croatia provides only one quantitative indicator per issue with its reference (CROSTO, 2019). South West Australia indeed elaborated a survey about effects of COVID-19 (ASWTO, 2021). Also, the Sustainable Tourism Observatory Navarre provides detailed information about the pandemic framework with the report of 2020 (Tourism Observatory Navarre, 2020). Furthermore, California gives much information about climate change in relation to the 2017s fire (Sustainable Tourism Observatory Sonoma, 2018).

The chosen tourism observatories do provide reliable information open for the public. Even if there are only for some observatories recent reports published and therefore difficult to compare. For instance, Buenos Aires, Barcelona and in some cases the Canary Islands provide information on municipality scale. In the following, we analyse the mandatory key issues, comparing the different observatories, to extract indicators applied to the Canary Islands and patterns in common.

1. *Tourism Seasonality*

The occupancy, RevPAR and ADR are higher in summer, during vacations and during special events.

2. *Employment*

The ratio of tourism in employment, of the studied cases, oscillated around 7.1%, in 2014, in Navarre (Tourism Observatory Navarre, 2019) and around 36.5% (2019) (IMPACTUR, 2020) in the Canary Islands. There are many destinations with high seasonality, partial contracts, and a higher unemployment rate in off season.

3. *Destination Economic Benefits*

The occupancy average rate ranges between 18.7% (2018), in Adriatic Croatia (CROSTO, 2019), to 66% (2017), in Kelowna, Canada. The contribution of tourism to the GDP scale from Navarre in 2014, with 3.1% (Tourism Observatory Navarre, 2019), to 35%, in the Canary Islands, in 2019 (Tourism Observatory Canary Islands, 2020).

4. *Energy Management*

Energy consumption of the tourism sector is difficult to compare, as there are different indicators for tourism used. Although it can be observed that transport is the sector with the highest consumption. Specifically, Navarre points out that transport was 39.2%, in 2019 (Navarre Energy Budget, 2020). In the Canary Islands it even raised to 75.1%, in 2019 (Tourism Observatory Canary Islands, 2020), due to the insularity of the archipelago. In fact, it is only possible to reach the Islands by boat or by plain.

5. *Water Management*

The water consumption in relation to the total is measured with 12%, in the Canary Islands (Tourism Observatory Canary Islands, 2020), in comparison with the focal area Adriatic Croatia, with 28% (CROSTO, 2019). In South Tyrol, the water consumption per tourist and per night, compared to the general population water consumption per resident and night, supposes 8% (2015) of the province's total potable water consumption. It is measured by accommodation facilities in South Tyrol in 2015 (ASTAT, 2018a).

6. *Waste water (Sewage) Management*

An important indicator quantified is the percentage of waste water receiving treatment. In Navarre, state 2020, 92.14% of the population's water is covered by two-step water treatment.

Meanwhile, 5.58% are covered by three-step treatment and only 2.04% by one-step treatment (Tourism Observatory Navarre, 2020).

7. Solid Waste Management

South Tyrol, Navarre and the Canary Islands do have some accountancies about solid waste management. The mixed waste generation was 63,912 tons in 2018 in the Canary Islands (Diaz-Farina et al., 2020). In South Tyrol, in 2017, it raised to 32,436 tons (APPA). But, in further researches it would be adequate to portray solid waste consumption in relation to the total, to compare the ratio of different destinations.

8. Climate Action

Climate action has been treated in most cases by mentioning the areas under protection and in some reports referring to the total of CO₂ emissions. So, there are for example 46 provincial parks in the Thompson Cariboo parks planning area (Sustainable Tourism Observatory Thompson Okanagan, 2019). Additionally, there are seven national parks in South Tyrol (STOST, 2020).

9. Accessibility

There are several plans to implement accessibility and inclusiveness policies, like the Strategic Tourism Plan 2018-2025 (Tourism Observatory Navarre, 2019). The reports indeed mention indicators to measure the accessibility of establishments. An example is Australia with a minimum of 50% of natural attractions, accommodations with a minimum of 80% and visitor centres with a 100% of adaptation (ASWTO, 2020).

10. Local Satisfaction

There has been a lot of research done about the ratio of tourists to locals, satisfaction of locals, effects of visitation peaks and the percentage of people wanting more, same, or less tourists. The ratio of tourists to locals was 0.18 in 2000 in the Canary Island (WTO, 2004).

11. Governance

To apply the mentioned issues, different sectors and stakeholders must cooperate. Some examples mentioned are from the ASWTO (2020), both the Shires (AMR and City of Busselton), and non-profit organisations collaborate to achieve better energy management practices. Also, Navarre and the Canary Islands mention the collaboration of INSTO as a tool of the mandatory issue of governance (Tourism Observatory Navarre, 2019; Tourism Observatory Canary Islands, 2020). To measure governance, we can observe the satisfaction

of tourists. In the Canary Islands, 45% (2008) of tourists are not at all satisfied with the functioning of administrations (ISTAC).

We also apply the SDGs (Annex 2.) to the mandatory key issues. We place special emphasis on the objectives of the Sustainable Development Goals to promote sustained economic growth, higher levels of productivity and technological innovation. The Sustainable Development Goals help governance to achieve sustainable development. Although “many of these targets remain relatively vague” (Biermann et al., 2017, p.26).

We noticed that the goals are quite ambiguous and not directly related to tourism. A specific goal related to culture is missing.

There are different applications of the issues set by the UNWTO, different indicators used and mostly no quantifications about waste, water, and climate effects in tourism. Other observatories have highly relevant indicators, the Canary Islands should apply. Even though they will have to be adapted to every unique destination. The mandatory issues are used as a base in common, but the observatories use mostly different indicators. As they are part of the same network, they should promote more collaboration to enrich their results.

6.2. Some indicators for micro-destinations

We actualize the data to the latest value available, if possible and relevant for micro-destinations or municipalities. In the following we focus on different micro-destinations in Tenerife with available data.

We can observe differences between micro-destinations, for example with the ADR and RevPAR. In 2021, the tourism region Adeje had a Revenue per Room of 74.72€ and the tourism region Puerto de la Cruz 28.26€. In the Canary Islands there has been an average rate of 52.13€ of RevPAR, ascending from 2020 to 2021 in 0.19 points, after a descensus in 0.33 points (2019-20). The occupancy rate behaves similar in the different regions. We highlight with orange the average in the Canary Islands and in yellow the minimum and maximum values (Table 1.). The indicators described, are part of the second mandatory issue, which is called *Destination Economic Benefits*.

Table 1. Evolution of ADR, RevPAR, and occupancy rate in the Canary Islands

		2019	2020	2021
ADR	Canary Islands	85.17	88.44	97.2
	Tenerife	87.94	95.05	99.07
	Adeje (tourist)	109.44	123.21	130.87
	Las Américas - Los Cristianos	86.29	91.35	86.3
	Abona	76.2	85.34	110.4
	Isora	85.98	97.83	96.02
	Puerto de la Cruz (tourist)	53.04	53.87	51.34
RevPAR	Canary Islands	65.96	43.98	52.13
	Tenerife	70.46	47.83	53
	Adeje (tourist)	92.2	62.6	74.72
	Las Américas - Los Cristianos	69.92	45.89	45.81
	Abona	60.68	50.12	60.44
	Isora	66.43	49.09	50.45
	Puerto de la Cruz (tourist)	41.21	28.72	28.26
Occupancy rate per bed	Canary Islands	67.95	42.06	46.43
	Tenerife	70.57	42.04	46.07
	Adeje (tourist)	77.93	45.4	53.33
	Las Américas - Los Cristianos	68.4	39.28	41.08
	Abona	66.64	48.57	52.85
	Isora	73.88	44.07	47.83
	Puerto de la Cruz (tourist)	70.43	45.43	48.58

Source: Accommodation Survey - ISTAC

Another indicator available, for its comparison on a municipal scale, for the issue *Water Management*, is the percentage of consumption made in apartments and hotels. In 2018, 72.52% of the consumption in the accommodation sector is made by hotels, and 27.48% by

apartments (Estévez-Bauluz, 2021). The total volume consumed in tourism was nearly 36 million m³ in 2018. Specifically, the volume of water consumed in hotels was 329.49 litres, and in apartments 282.4 litres per overnight (Estimation from Estévez-Bauluz, 2021). In Arona, the average annual water consumption in apartments therefore exceeds the hotel accommodations in 7.4 points. The data on which Estévez Bauluz (2021) based her research on, were provided by the concessionaire company of the public water supply and sanitation service in the municipality of Arona (Canaragua SA). The sample englobes 3,074 observations which corresponds to 69 accommodation establishments.

For the decision making it is indeed necessary to analyse the micro-destination as there is a difference for decision making in between the average rate of the Canary Islands and its micro-destinations. As the first gives only a general idea. Some indicators are necessary to investigate on a smaller scale to provide relevant information for decision making. This is already applied in a certain way to the Canary Islands and shows the variations in between the micro-destinations.

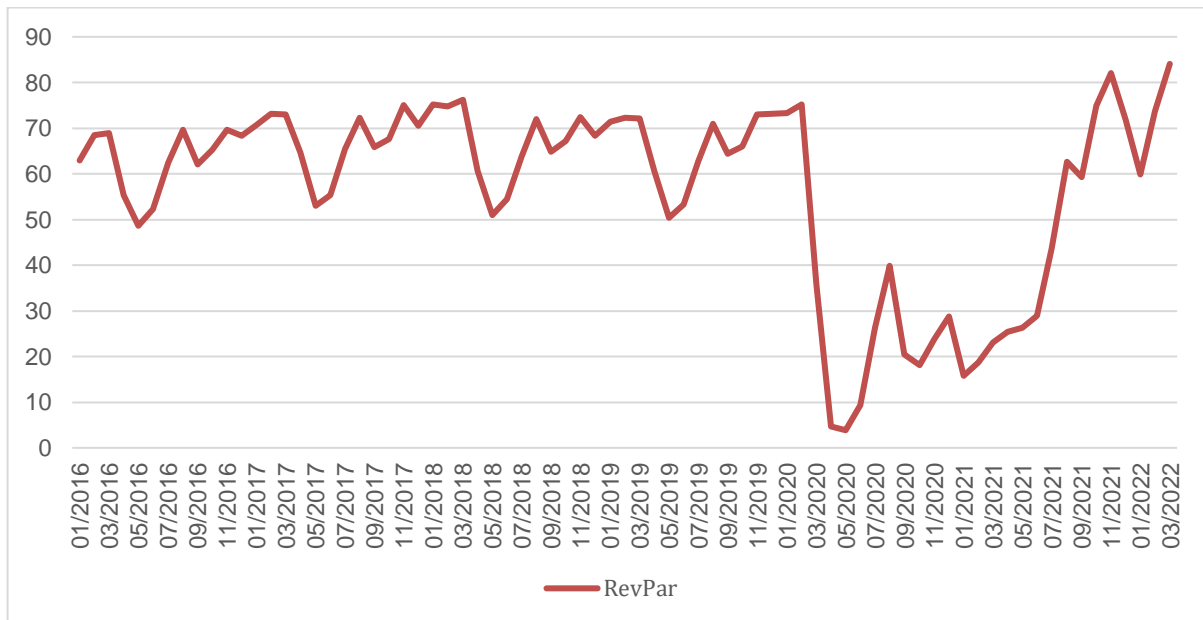
6.3. A system of indicators for the Canary Islands

As a cause of the current situation of the pandemic framework and the recovery of tourism areas, it will be necessary to think about achieving long term economic re-growth. Hence, we use indicators to consider the influence of tourism to destinations. We actualize the data to the latest value available on different scales to the Canary Islands. Also, we indeed do some further research. Therefore, we include indicators quantified by other observatories as in Barcelona, South Tyrol, South West Australia and Adriatic Croatia. Finally, we Include the indicators proposed by the Guidebook elaborated in 2004 by the UNWTO.

1. Seasonality

The Canary Islands provide mild winters with 18°C - 25°C (Tourism Observatory Canary Islands, 2020). This leads to a higher RevPAR and occupancy rate in winter and to a low season in May. In April 2020, the occupancy rate decreased to 3.89 points. We can indeed observe a similar behaviour of RevPAR and the occupancy rate in respect to the seasonality, which is in line with post-pandemic numbers after the beginning of the pandemic. The waves of registered cases and restrictions affected the gradient.

Figure 8. Evolution of RevPAR in tourism accommodations. In €.



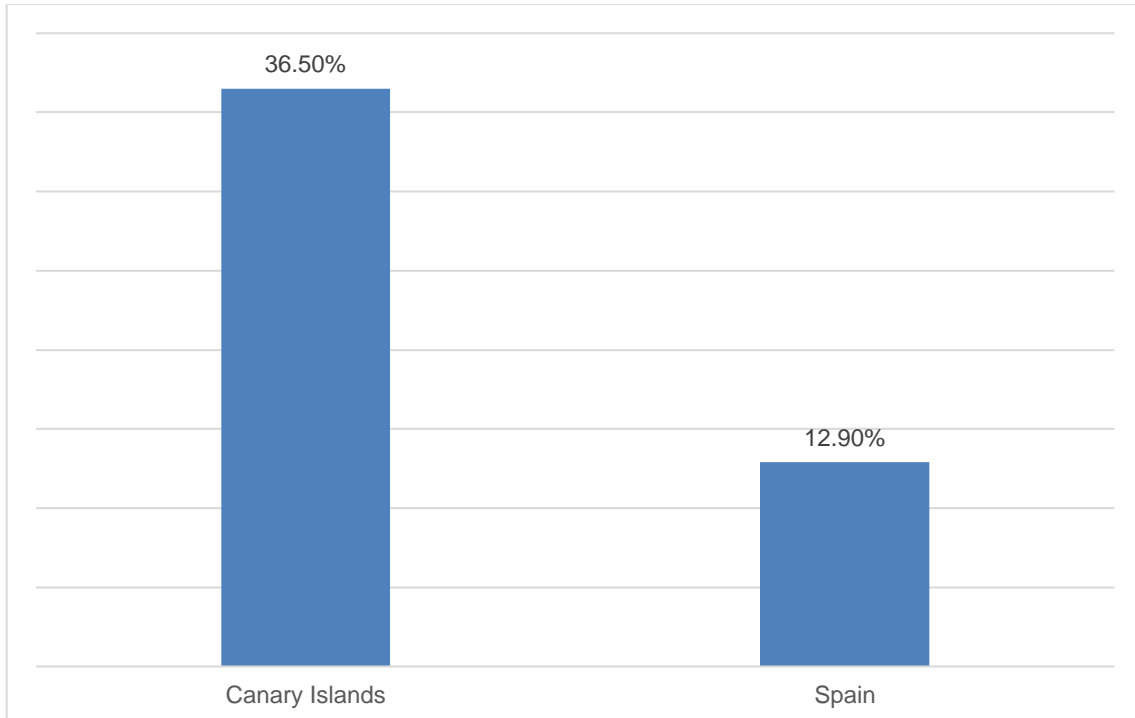
Source: Accommodation Survey - ISTAC

Further research is proposed by the tourism observatory in Barcelona. We calculated the ratio between maximum and minimum monthly overnights for the pre-pandemic year 2019 (ISTAC): 1.39. It has been calculated by dividing 1,482,326 (May 2019) with 1,066,023 (March 2019). Its interpretation will depend on the ratio of other observatories to decide if it is high or low in comparison to them, which will be calculated in some further research.

2. Employment

Tourism in the Canary Islands for employment is the most important sector, but the archipelago has a high unemployment rate. The unemployment rate in the Canary Islands in the first quarter 2022 (ISTAC) ascended to 20.3, among the highest in Spain and even Europe. Although tourism professionals represent 36.5% of the total employment rate, and local employment from tourism was 36.5%, in 2019, with respective 12.9%, in Spain.

Figure 9. Tourism employment in the Canary Islands and Spain. 2019



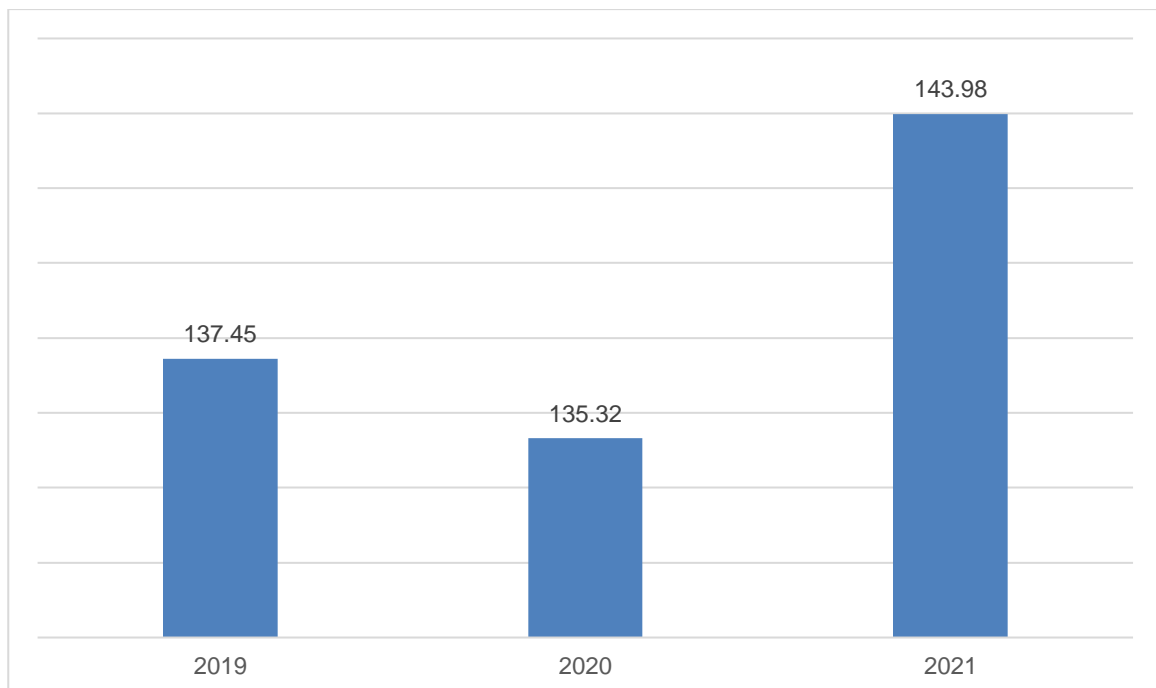
Source: IMPACTUR, 2020

To understand the quality of employment, we centre on the studies required for employment in tourism. 36.84% of the employers require bachelor studies and 3.29% master studies. Another job requirement, with 39.41%, are language skills.

3. Destination economic benefits

The tourist expenditure per tourist extended from 1,122.58€ in 2019, over 1,169.81 in 2020, to 1,205.98€ in 2021 (EGT, 2019). The tourist expenditure per tourist and per day of their tourism stay decreased from 137.45€, in 2019, to 135.31€, in 2020. In 2021 it climbed up again to reach 143.98€. The tourism GDP, in 2020, in the Canary Islands was 33%, and in Spain 12.4% (IMPACTUR, 2020).

Figure 10. Evolution of average tourist expenditure per day



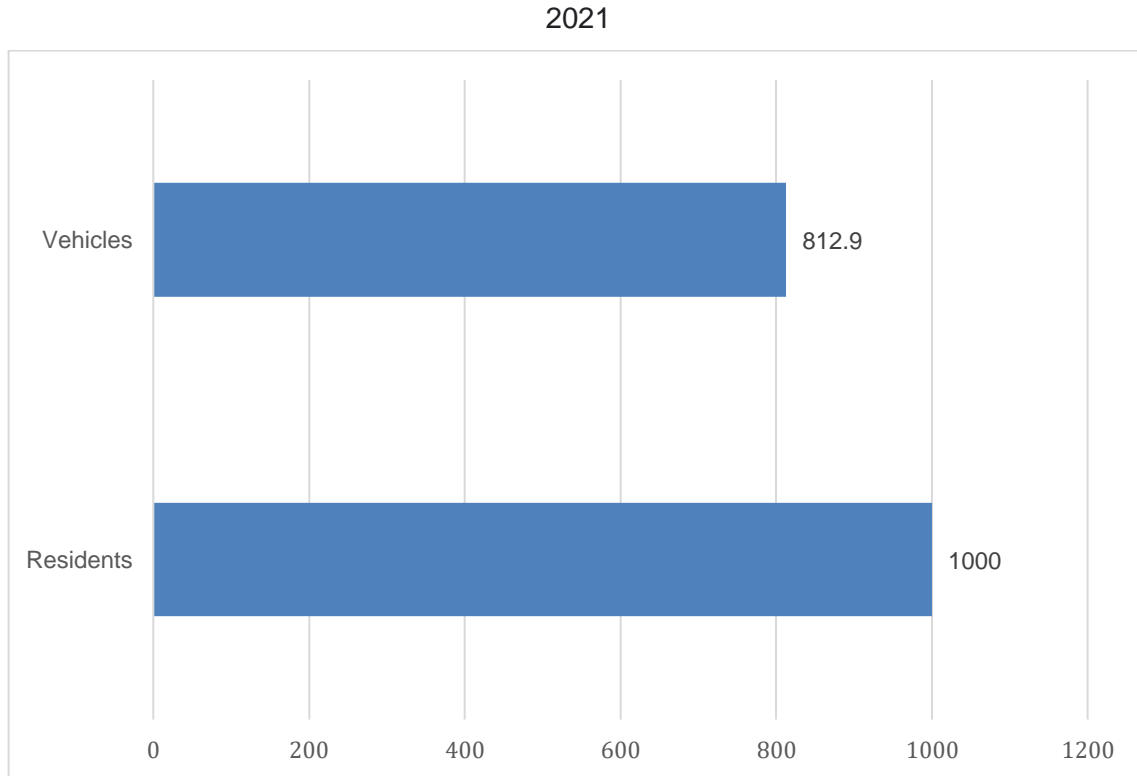
Source: EGT-ISTAC

Further research includes variations of expenditure per tourist and day, which decreased in 1.56 points in 2019-20. It returned to climb up 6.41 points in 2020-21 (EGT-ISTAC). The amount of tourism investment was 38.9 million 2021 (Gobierno de Canarias, 2021).

4. Energy management

The renewable energies share a total of 16.96% produced in 2020 (Anuario Energético de Canarias, 2020). A problem in the Canary Islands are the 812.9 vehicles for 1,000 residents in 2021 (ISTAC), because of the lack of parking lots and the congestion of public roads. Also, there are only a few electric vehicles. In March 2022, 6,378 electric vehicles were circulated. This supposes only a 0.36% in comparison to the total (DGT - ISTAC).

Figure 11. Fleet of vehicles in circulation for every 1,000 inhabitants of the Canary Islands.



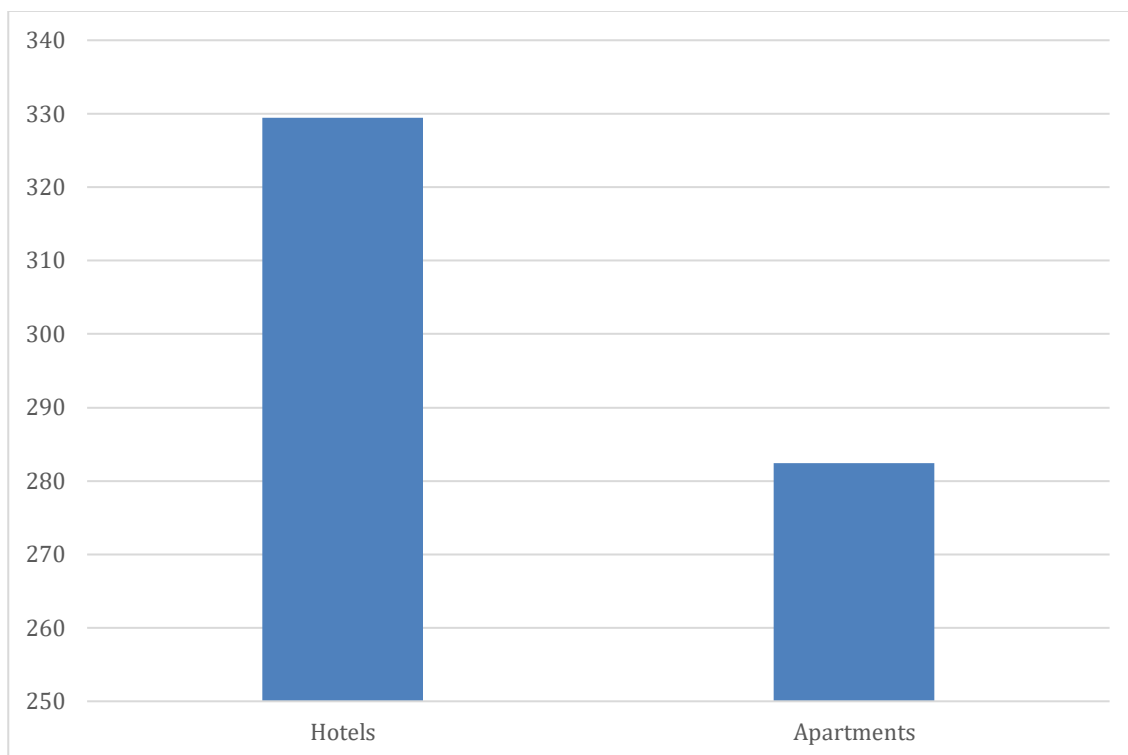
Source: ISTAC

Further research shows that tourism consumes between two and three times more energy and water per capita (Gobierno de Canarias, 2022). In the Canary Islands, for electric vehicles, are 249,765 recharging points linked (in homes, workplaces, and public thoroughfares), 5,692 support points (shopping centres, car parks) and 1,700 emergency points (service stations) (Gobierno de Canarias, 2022).

5. Water management

The Canary Islands are one of the observatories with quantitative data available for water management in tourism. 72.52% of the consumption in the accommodation sector is made by hotels and 27.48% by apartments in 2018 (Estévez-Bauluz, 2021). Specifically, 329.49 litres per overnight are indeed consumed in hotels, and 282.4 litres per overnight are consumed in apartments (Estévez-Bauluz, 2021).

Figure 12. Water consumption in accommodation in litres per overnight. 2018



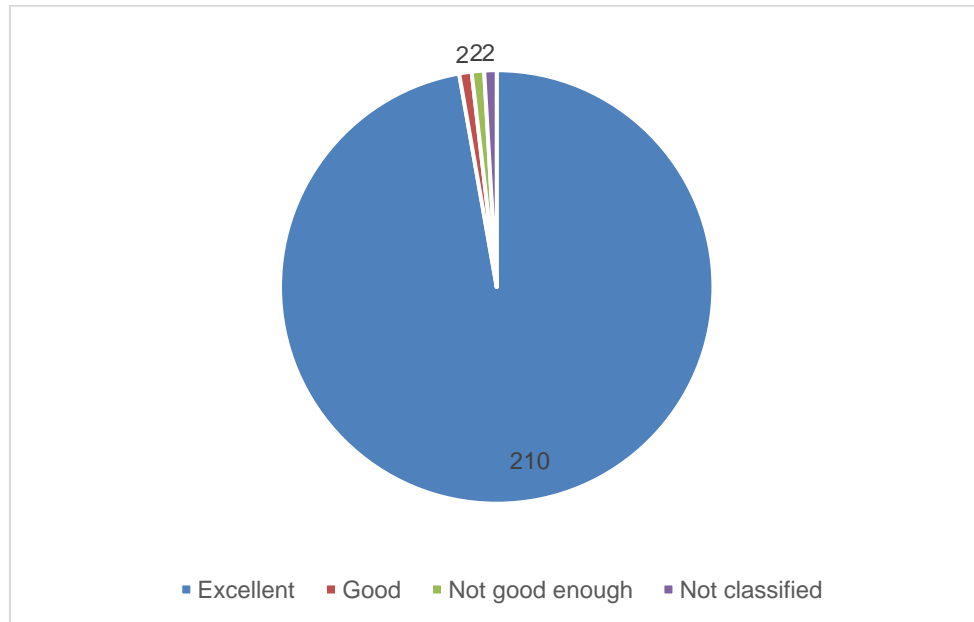
Source: Estévez-Bauluz, 2021

The highest proportion of newsletters with results about water suitable for consumption (with the denomination *Water suitable for consumption* and *Water suitable for consumption with no compliance*) by the autonomous communities corresponds to the Region of Murcia 99.78%. Even though it is followed by the Canary Islands with 99.63% (Ministerio de sanidad, 2019).

6. Waste water (sewage) management

20% (2018) of the waste water in the Canary Islands is treated and reused (Tourism observatory of the Canary Islands, 2020). This equals €0.38/m³ for sewage and waste water treatment (INE 2018).

Figure 13. Number of reported pollution or contamination events per annum



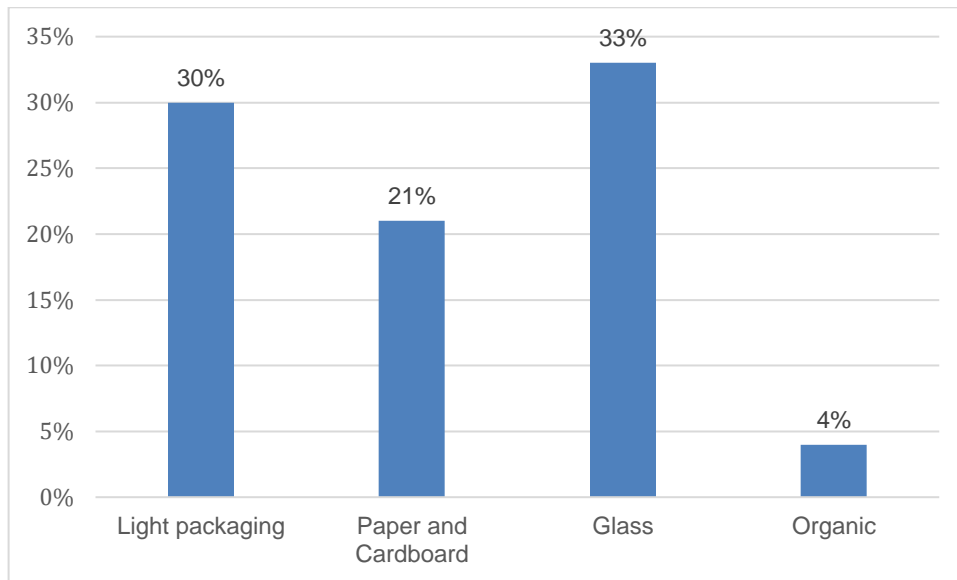
Source: Informe Nacional de Baño, 2019

Further research implies the number of reported pollution or contamination events per annum (by month) in watercourses. Of the total of 216 of receiving effluents, 210 were classified as excellent, two as good, two as not enough and two were not classified (Informe Nacional de Baño, 2019).

7. Solid waste management

An indicator applied on the municipal level is solid waste management. Its application approximates the consumption in the tourism sector. In 2019, the waste generation per resident and day was 1.64kg and the waste generation per tourist and day 2.16kg (PLARES, 2022). Estimated recycling rates are below 10 per cent (2018) of the total of municipal waste (PLARES, 2022).

Figure 14. Estimated recycling rates in Arona



Source: Plares, 2018

Further research includes solid waste production. The tons per tourist and per year were calculated by the multiplication, of the waste generation per resident and day, with 365 days. This means a total of 598.6 kg, which equals 0.66 tons, per tourist and per year, in 2019. In the next step we will calculate the percentage of tourism enterprises sorting different waste.

8. Climate action

The total CO₂ emissions account 13,340 Gigagrams in 2018 (Gobierno de Canarias, 2020). There has been an increase of 49.2 points in gigagrams of CO₂ (1990-2018), maintaining the equivalent since 2017. This is higher than that for mainland Spanish territory, and higher than the increase allocated to Spain in the Kyoto Protocol.

Figure 15. Network of Protected Natural Areas. 2021

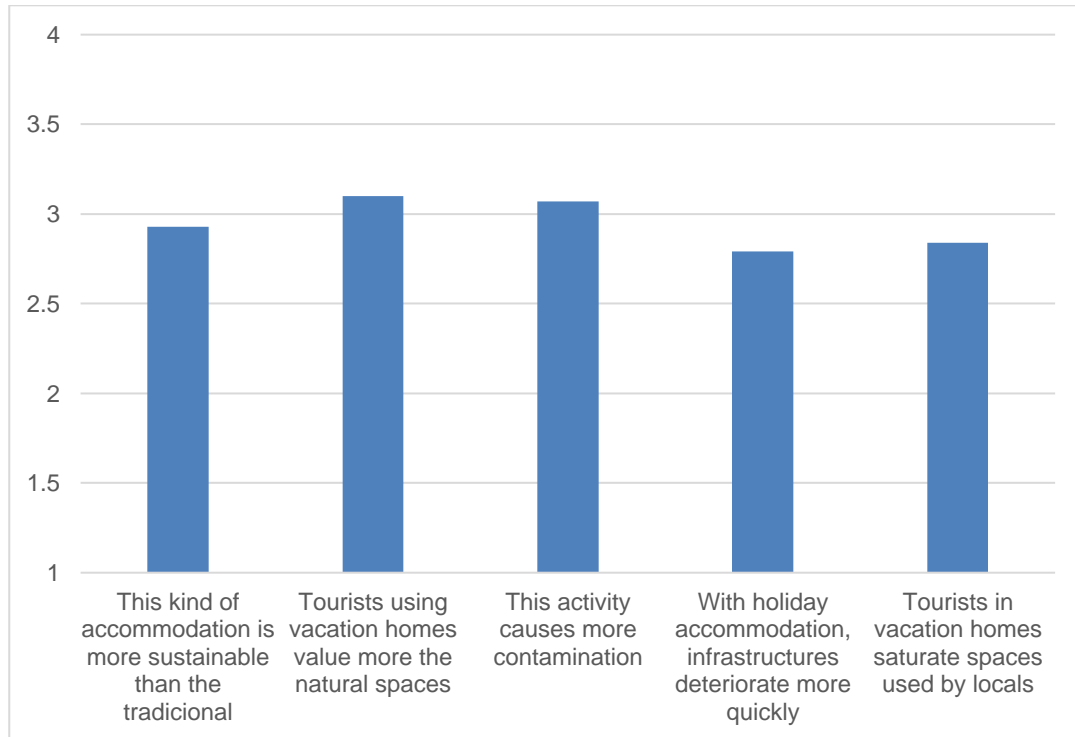


There are climate change and natural disasters risk assessments for new tourist infrastructure and activities. The application of climate change scenarios is generated by AEMET within the National Program for Climate Change to the meteorological risk of fires in the Canary Islands (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).

9. Local satisfaction

The ratio of tourists to locals is calculated in this paper with the database of the ISTAC, by dividing 110,150 arrivals with 2,172,944 residents (2021). In 2021, the ratio was 5.07, while in pre-pandemic years the ratio ascended to 12.24. This has been calculated in the same way, dividing 268,395 arrivals with 2,153,389 residents (2019). 80% of the population agrees that tourism development has been very beneficial for the island and its inhabitants (ISTAC, 2019).

Figure 16. Perception of the environmental impacts of vacation rentals



Source: ISTAC. Holiday homes

The population growth related to tourism growth is described in the following (ISTAC 2018-19):

Arrivals: $((13,146,862 - 13,752,022) / 13,752,022) = - 4.40\%$

Population: $((2,153,389 - 2,127,685) / 2,127,685) = 1.21\%$

It has been calculated first the value of 2019 minus the value in 2018. Second, this result is divided by the value in 2018 to know the rate of variation. The arrivals in pre-pandemic years dropped slightly, while the population was growing.

10. Accessibility

Accessibility is applied in the INSTO reports by the existence of disabilities friendly policy. In fact, the Arona Municipal Council has developed in the last decades accessibility plans. Therefore, this municipality has been recognised as a leading institution in this field. We also found other efforts in Tenerife to turn public buildings, sites of interest and culture, as well as beaches, into accessible places under the support of the *DECRETO 227/1997, 18/09 and the Manual of Accessibility* of the Canary Islands.

In the future, it will be necessary to describe the number of hotels with rooms accessible to persons with disabilities. The most similar measure includes the infrastructure furniture, and the installations accessible to the public. They will be ergonomic and at least adapted in 10% of its units (Sinpromi, 2001).

11. Governance

18.6% of the residents participate in association in the Canary Islands. On one hand, the most related groups to tourism are the group trade unions, professional or business associations. On the other hand, these are cultural, sports, leisure, or carnival. The segments represent 11% and 17%, respectively.

The inclusion level of different groups of stakeholders is crucial for collaboration between all of them, as decision-making of the tourist system of the territory is necessary. A first approximation is established with the *BOC - 2021/259 (21/12/2021)*. It includes a Cooperation Agreement of the Administration Government of the Autonomous Community of the Canary Islands, through the Ministry of Tourism, Industry and Commerce, and the University of Las Palmas de Gran Canaria and La Laguna. This collaboration permits the development of the necessary tasks for the participation of the Canary Islands in the International Network of Sustainable Tourism Observatories of the Organisation World Tourism.

All the mandatory key issues have been quantified. The exception is accessibility, the last mandatory issue included and treated in the recent reports. We actualized the data to the last value available. The pandemic year may not be representative. Therefore, in some cases it is more convenient to include the data of 2019, if the last available is 2020, and the indicator very linked to tourist arrivals.

7. Conclusions

To summarise this work, the individual chapters and their findings, the key questions asked at the beginning and the research question based on them should now be answered. This is followed by the limitation of the work and an outlook. The aim of this paper with the title *Towards a system of tourism indicators of sustainability for the Canary Islands. Lessons from INSTO-UNWTO*, was to develop a system of indicators to be applied to the Canary Islands.

The main results show that the network INSTO-UNWTO is indeed a model to follow, as they apply highly relevant indicators of sustainability in tourism to international destinations. Although they still have some factors to improve. As the members are part of the same network, they should promote more collaboration to enrich their results. The indicators used provide mostly no quantifications about waste, water, and climate effects in tourism and should provide information on a smaller scale for better decision making and more exact results.

Further this system is not only applicable to the Canary Islands, but also to other destinations. Although they will have to be adapted to every unique destination. There will be some further steps taken in the future.

1. Tourism observatories will collaborate and coordinate better. The author is already part of the team in the Canary Islands and in contact with the tourism observatory in South Tyrol to do some further research.
2. The required data with detailed information from the ISTAC about micro-destinations arrived already and will be included in future research to limit tourism territory and to gain specific information of tourism activity in this area. Specifically, for water and waste management in tourism. This can be achieved by having a closer look at micro-destinations to separate the consumption of locals and tourists.
3. Development of empirical research in the form of an open survey will be done. This qualitative method will be quantified post-hoc with the tool GABEK. This tool helps to gain knowledge about opinions, attitudes, and assumptions of a group of subjects (Herdina, 2020).

To culminate and to come back to the initial statement, because of the large amount of indicator systems, it is indeed not necessary to create new ones, but to prove the existing indicator systems (Federal Environmental Agency, 2002). In this paper the author makes a first step in this direction.

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9. Annexes

Annex 1. INSTO-UNWTO members

Observatory	Geographic localization	Website	Utility of the information
The Croatian Sustainable Tourism Observatory	Adriatic Coast - Croatia	http://www.crosto.hr/files/file/CROSTO_Croatia_Annual_Report_2018_FIN.pdf	5
Alentejo Sustainable Tourism Observatory	Alentejo - Portugal	https://www.visitalentejo.pt/pt/	4
Algarve Sustainable Tourism Observatory	Algarve - Portugal	https://www.visitalentejo.pt/pt/	4
Antigua Guatemala Sustainable Tourism Observatory	Antigua Guatemala - Guatemala	https://inguat.gob.gt/index.php	4
Azores Tourism Observatory	Azores - Portugal	https://otacores.com/	4
Observatori del Turisme a Barcelona	Barcelona - España	https://www.observatoriturisme.barcelona/	5
Tourism Observatory of the City of Buenos Aires	Buenos Aires - Argentina	https://turismo.buenosaires.gob.ar/es/observatorio	5
Jiangmen observatory	China	https://tourism4sdgs.org/initiatives/jiangmen-observatory/	1
Yangshuo observatory	China	https://tourism4sdgs.org/initiatives/yangshuo-observatory/	1
Huangshan observatory	China	https://tourism4sdgs.org/initiatives/huangshan-observatory/	1
Xishuangbanna observatory	China		1
Henan Observatory	China		1
Changshu Observatory	China		1
Kanas Observatory	China		1

Zhangjiajie Observatory	China		1
The Aegean Islands Sustainable Tourism Observatory	Aegean islands - Greece	https://destinet.eu/who-who/destinet-users/staegeanobservatory	4
Guanajuato State Tourism Observatory (OTEG)	Guanajuato - México	http://www.observatorioturistico.org/	5
Lombok Tourism Observatory	Lombok - Indonesia		1
Mallorca Sustainable Tourism Observatory	Mallorca - España	https://observatori.fundaciomallorcaturisme.net/en/home/	4
Observatorio Turístico de Guanajuato	Guanajuato - México	http://observatorioturistico.org/	5
Observatorio Turístico de Navarra	Navarra - España	https://www.visitnavarra.es/es/web/turismoprofesional	5
Observatory of the City of Panama	Panama City - Panama	http://www.camturpanama.net/	3
Pangandaran Regency Sustainable Tourism Observatory	Pangandaran - Indonesia	https://www.itb.ac.id/	2
Sanur Tourism Observatory	Sanur - Indonesia	https://www.unud.ac.id/?lang=en	2
Observatorio de Turismo Sao Paulo	Sao Paulo - Brasil	https://observatoriodeturismo.com.br/	4
Sleman Tourism Observatory	Sleman - Indonesia	http://www.pasca.ugm.ac.id/v3.0/id/	2
The Sonoma Sustainable Tourism Observatory	Sonoma - California	https://sonomasustainabletourism.weebly.com/	5

Australia's south west sustainable tourism observatory	South West Australia	https://research.curtin.edu.au/business/our-research/centres-and-institutes/tourism-research-cluster/	5
Sustainable Tourism Observatory of South Tyrol (STOST)	Südtirol - Italia	https://sustainabletourism.eurac.edu/issue-area/	5
Thompson Okanagan Sustainable Tourism Observatory	Thompson Okanagan - Canada	https://www.totabc.org/	5
Toba Lake Tourism Observatory	Toba - Indonesia	https://www.usu.ac.id/id	2

Annex 2. Mandatory key issued in relation to SDGs

Mandatory key issues	SDGs. Mix of different preliminaries and proper judgement (in bold the one mentioned in commun in Preliminary of Canada and the Canary Islands)
Tourism seasonality	8,11,15,16 ; 12 and 13 for sustainable consumption and combat climate change
Employment	1, 4, 5 , 16; 8 and 9 decent work, build resilient infrastructure
Destination Economic Benefits	5,8,9 , 12
Energy Management	7,9,11,12,13
Water Management	6,7,13,14
Waste Water (Sewage) Management	6, 11, 12 , 13,14
Solid Waste Management	11,12,13,15
Climate Action	6,11, 12, 13 , 15
Accessibility	1,9, 10, 11
Local Satisfaction	3, 16; 8 , 9, 11, 12: build resilient infrastructure, cities sustainable and sustainable consumption

Governance	1,3,11,16
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Explanation of SDGs (Ban, 2016):

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation, and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace and justice strong institutions
17. Partnerships for the goals

Annex 3. Comparative analysis of indicators used by INSTO members

1. Tourism Seasonality

Indicator	Canary Islands	Barcelona	South West Australia
Climate: Average temperature	Mild winter with 18°C - 25°C.	2020: 18.7 degrees State Meteorology Agency (AEMET).	The Mediterranean climate provides ample rainfall.

Indicator	Canary Islands	Buenos Aires	South West Australia	Navarre	Sonoma
Tourist arrivals	x	National tourists due to carnival, eastern, vacations and other festivities.	The visitation rate to Margaret River Region fluctuates based on the seasons. Peak: summer months, particularly in Jan.; Off-peak season is in winter, between June and Aug. Visitation slightly increases in July during school-holidays (Annual Progress Report, 2020).	2019: 50,000-225,000. July-Sep. high season, Dec.-Feb. low season. Surveys of occupancy of hotels, rural tourism, campsites, tourist apartments, and hostels from the Spanish Statistics Institute (INE).	The peak season tends to start in May/June and ends in Oct./Nov. (2019).

Indicator	South Tyrol	Navarre Tourism Observatory
Employment in tourism sector	Permanent contracts keep steady, on call contact increased in 2017; more fixed term contracts in summer.	The months in which the most affiliations were registered were November, April, September, and May, contrary to commonly held assumptions that affiliation increases during the summer months (July and Aug. appear at the lower part of the table) (Ministry of Employment and Social Security). 2019: 17,703- 19,178.

Indicator	Buenos Aires	Barcelona	South West Australia
Occupancy rate (difference within a year)	2020: 37.8% average occupancy rate per bed. Occupancy rate in summer (Jan. 2019): 63.3% EOH Subsecretary of Tourism Province of Buenos Aires.	2019: in between approx. 58% and 86% Observatori del Turisme a Barcelona: ciutat i regió.	70%-80% in peak periods in Dec. and Jan. (summer and school holidays), 40% in off-peak periods (STR, 2020).

Indicator	Canary Islands	Barcelona	South Tyrol	Navarre Tourism Observatory
Tourism demand. Night stays	Exceltur, 2018; nearly no seasonality, 9,705- and 10,364-night stays 2016; and less than 8,000 in Abr.-Jun.	2019: 2 and 2.3 Barcelona city: high season in July-Aug., low season Nov.-Feb. Observatori del Turisme a Barcelona: ciutat i regió.	(1950-2016) ISTAT YASTAT The seasonal distribution of the overnights emphasises the traditional peak in the summer months July and Aug. The months characterised by the lowest overnights are November, April and May (ASTAT Online Database, 2018).	2019: 100,000-600,000 overnight stays (Source: Surveys regarding the occupancy of hotels, rural tourism, campsites, tourist apartments, and hostels from the Spanish Statistics Institute (INE).

2. Employment

Indicator	Canary Islands	Barcelona	South Tyrol	South West Australia	Navarre	Sonoma
Ratio of tourism in employment	Tourism professionals represent 36.5% of the total employment in the Canary Islands in 2019 (IMPACTUR, 2020).	12% (2020) Observatori del Turisme a Barcelona: ciutat i regió en base a dades proporcionades per l'Àrea de Desenvolupament Econòmic.	12.87% 2017 (Amt für Arbeitsbeobachtung, ISTAT).	13% Margaret River Region (REMP LAN, 2020b).	2014: 7.1% 19,720 employment in tourism industries (Navarre, 2019).	2016: 8.15% Information from Visit California / Dean Runyan and Associates "California Travel Impacts by County".

Indicator	Canary Islands	Navarre
Social security tourism affiliations	Over the last decade approx. 21% of employment in terms of Social Security affiliates was registered in activities characteristic of tourism (ISTAC, 2021 by TGSS).	2019: 18,762: Information generated from the use of the affiliation file to the different Social Security (SS) regimes, whose management corresponds to the Social Security Treasury and to the Marine Institute (Ministry of Employment and Social Security).

Indicator	Canary Islands	Barcelona	Guanajuato	South Tyrol	South West Australia	Sonoma
Employment in tourism	Local employment from tourism in 2019: 36.5% (Spain: 12.9%) (IMPACTUR, 2020).	Occupied tourism activities in the destination of Barcelona 2020: 24,226 14.2%; in Barcelona city: 10.080 14.7% Observatory of Tourism.	Q3 2019: 176,849 occupied people (GTO).	Employees in the accommodation and food service (AMB) sectors make up about 12% of total employment in South Tyrol.	2019: 330 million jobs (WTTC, 2020) Margaret River Region: 19.5% (TRA, 2018) Employment defined as the number of jobs directly attributable to tourism demand in tourism and non-tourism industries.	54,000 jobs in wine related tourism (2017).

Indicator	Canary Islands	South Tyrol	Thompson - Okana	South West Australia
Total number employed in the tourism sector, by industry	310,956 jobs linked to tourism activities in 2019 (IMPACTUR, 2020) It is the second Autonomous Region in Spain in the number of tourism workers in 2019 (IMPACTUR, 2020).	In 2018, the absolute number of employees working in these sectors in South Tyrol was, on average, 29,233 (AMB).	735,300 jobs 2017 (Destination Canada).	17% others, 12% Retail Trade, 12% Construction, 13% Tourism, 11% Health Care & Social Assistance, 9% Education and Training (REMPPLAN, 2020b).

Indicator	Barcelona	Thompson - Okana
Tourism businesses	Transport of tourism: 42,062, Accommodation services: 24,498, Food and beverage services: 140,317, lease of motor vehicles and machinery: 6,752, Travel agencies, TTOOs: 10,148, others: 49,378; Observatory of Tourism in Barcelona: city and region based on the Barcelona Regional Council - Economic, Tourism and Commerce Development Department, based on data from the Observatory of Labor and Productive Model. 2020. Destination Barcelona is province.	200,000 tourism businesses (Destination Canada estimate. 2016 Annual Report. Destination Canada).

3. Destination Economic Benefits

Indicator	Thompson - Okana	Adriatic Croatia	South West Australia	Navarre
1. Part: Tourist spending/ spending per tourist	Thompson Okanagan region: Average of 3.6 nights and spent \$105 per night. BC travellers stayed 3.0 nights and spent \$90 per night during their trip. Other Canadian travellers stayed 4.9 nights and spent \$123 per night (2015, Snapshot of Tourism in BC).	Survey on expenditures of foreign visitors in Croatia and Croatian citizens abroad (CNB).	International overnight visitors: 73\$ per night 2020; domestic overnight visitors: 164\$ Tourism WA (2020a).	2019: 125 € international tourists. Tourist Expenditure Survey EGATUR. Spanish Statistics Institute (INE).

Indicator	Canary Islands	Buenos Aires	Barcelona	Guanajuato
2. Part: Tourist spending/ spending per tourist	2019: 1,122.58€ expenditure per tourist; 137.45€ expenditure per tourist and day (EGT - ISTAC).	2019: \$ 1,663 international traveller, \$ 1,445 national travellers (Tourism observatory).	Average expense during the stay per person and night (€): 69.9 (2019) Enquesta de perfil i hàbits dels turistes a la Destinació Barcelona 2018-2020.	Dec. 2019: Guanajuato: \$ 1,898.12; Estate: \$ 1,898.12 Sector Guanajuato. (Datatur, Estudio del Perfil del Visitante 2018).

Indicator	Canary Islands	Guanajuato	South Tyrol	Thompson - Okana	Adriatic Croatia	South West Australia	Navarre
GDP	Tourism GDP: 35% (2019).	2019: approx. \$74 mil pesos de derrama económica (MXN). GTO 2019 (Estate): approx. \$12 billion Datatur, Estudio del Perfil del Visitante 2018.	8.2% to the local GDP with direct effects only (ASTAT, 2009a).	\$7.9 billion in 2007 constant dollars.	tourism contributes 10.4% to Croatian GDP (TSA 2011).	2019: Tourism contributes 10.3% to the global GDP (WTTTC, 2020).	The contribution of tourism to the GDP of Navarre in 2014 was 3.1%.

Indicator	Canary Islands	Buenos Aires	Barcelona	Guanajuato	South Tyrol	Navarre
Average stay	Average stay: 7.35 days.	2019: CABA, 3 nights. DG Inteligencia de Mercado y Observatorio (ENTUR).	2019: 2.2, 2020: 1.8 Observatori del Turisme a Barcelona: ciutat i regió.	2019: Estate: 1.31 nights; Guanajuato: 1.26 nights. Datatur, Estudio del Perfil del Visitante 2018.	2017 amounted to 4.44 days (ASTAT Online Database, 2018).	2.22 days (2019) Occupancy Surveys of Hotels, Rural Tourism, Campsites, Tourist Apartments and Hostels. Spanish Statistics Institute (INE).

Indicator	Canary Islands	Barcelona	Adriatic Croatia
Average expenditure per day	139.22 € average expenditure per tourist per day.	Expenses during stay per night: 2020: 68.1€. Survey of profile and habits of tourists in Destination Barcelona 2020. Observatori del Turisme a Barcelona: ciutat i regió.	2018: 79€; Croatian Sustainable Tourism Observatory 2019 Report.

Indicator	Canary Islands	South Tyrol	Thompson - Okana	Navarre	Sonoma
Tourist expenditure in total	15,091,458,289€ tourist expenditure in total.	2012/13 (ranging from Nov. 2012 - Oct. 2013): Average daily expenditure per tourist was € 117.00 (ASTAT).	\$20.8 billion in international tourist expenditures in 2017 (Destination Canada).	2019: 266.48 millions of € total expenditure of international tourists (Tourist Expenditure Survey EGATUR).	2016 brought in \$1.93 billion from direct visitor spending. Information from Visit California / Dean Runyan and Associates "California Travel Impacts by County".

Indicator	Canary Islands	South Tyrol	Thompson - Okana	Adriatic Croatia	South West Australia	Navarre
Overnight stays per year	Approx. 100 million total overnight stays.	32.4 million overnight stays in 2017 (ASTAT, 2018).	Approx. 4 million overnight visits in 2014.	2018: 84.9 million; (Sustainable Observatory, 2019).	Western Australia. 2019: 3.27 million overnight visitors. (Tourism WA 2020b).	2019: 3,278,747 overnight stays (Occupancy Surveys of Hotels, Rural Tourism, Campsites, Tourist Apartments and Hostels. Spanish Statistics Institute (INE)).

Indicator	Barcelona	Guanajuato	South Tyrol	Thompson - Okana	Adriatic Croatia
Occupancy rate	2020: 37.8% average occupancy of beds (Tourism Observatory).	2019: 40% in hotels in Guanajuato GTO; Datatur, Estudio del Perfil del Visitante 2018.	39.9% in 2017 (ASTAT)	Destination BC. 2017: Kamloops: 62%, Kelowna: 66%, Penticton: 57.8%.	2018: 18.7%. Gross annual occupancy rate in commercial accommodation. (Croatian Sustainable Tourism Observatory 2019).

4. Energy Management

Indicator	Canary Islands	South West Australia
Use of alternative resources: Renewable energy produced in respect to the total	16.96% share of renewables in the total energy produced in 2020 (Anuario Energético de Canarias, 2020). Renewable energy share in primary energy utilisation: 2% in 2020.	Proposal to build a renewable energy plant consists of 10MW of wind energy to be derived from three 3.3 MW wind turbines, and up to 2MW of biogas from the dairy farms, which would produce up to 50% of the energy consumed through the grid of the Shire. (AMRCCE, 2018, p. 10), Based on the Shire of Augusta-Margaret River reviews of the Local Energy Action Plan 2006/2007 and AMRCCE Annual Report 2017/2018).

Indicator	Canary Islands	South Tyrol	Navarre
Energy consumption per sectors	Share of energy consumption by economic sectors: services sector, which includes hospitality and tourism services, uses 12.21%. The transport sector (land, air and sea), represents 75.1% of final energy demand).	Accommodation facilities are estimated to account for 8.7% of the province's total electricity consumption (equal to 3,027 million kWh in 2017, ASTAT).	2019 (319,237 TOE): Agriculture: 5.5%, Domestic, trade and services: 16.7%, Industry: 36.1%, Transport: 39.2% (Navarre Energy Budget).

Indicator	Canary Islands	Sonoma
Use of alternative resources	The energy sources with the highest contributions to renewables in the Canary Islands are wind power (50.4%), followed by photovoltaic solar (33%).	Programs Clean Power and EverGreen.

5. Water Management

Indicator	Canary Islands	Adriatic Croatia
Water consumption in relation to total	Tourism sector could absorb 12% of the archipelago's water production, according to an estimate (Gobierno de Canarias, 2015).	2018: Water consumption per tourist night compared to general population water consumption per resident night: 0.28 (Croatian Sustainable Tourism Observatory, 2019).

Indicator	Canary Islands	South West Australia	Navarre
Consumption of tourism per bed and day	Average consumption in tourism reaches 600 litres per bed and day.	Between 2017 and 2019, water consumption per visitor in the Margaret River Region in hotels, motels and guest houses decreased by 7% per annum per guest (and by 14% over the whole period) 0.024 - 0.027 kl water consumption per visitor in hospitality and tourism (Water Corporation Accounts, 2017-2019).	If these tourists consume the same amount of water as the resident population, equivalent consumption would be 54,882 m3 during 2020, 0.3% of the water consumption. At European level, there is an average of approximately 300l per overnight stay in a European hotel. Based on this data, the water consumption in hotels in Pamplona would be 139,927 m3, the equivalent of 0.9% of water consumption. (Navarra, 2020).

Indicator	Canary Islands	South Tyrol	Navarre
Water consumed in tourism in m3	Total volume consumed in tourism was 35,657,309 m3 in 2018.	Tourists are assessed by calculating a population equivalent according to hydraulic engineering standards that link back to available beds in accommodation facilities.	commercial-industrial: approx. 6 million m3.

Indicator	Canary Islands	South Tyrol
Water consumed in accommodation facilities	Hotels: 329.49 litres per overnight. Apartments: 282.4 litres per overnight. 2018.	Accommodation facilities estimated (equal to 83.4 million cubic metres in 2015, ASTAT 2018a).

6. Waste water (Sewage) Management

Indicator	Barcelona	Adriatic Croatia	Navarre
% of waste-water receiving treatment	Waste water treated to at least at a secondary level before discharging (%) 100 (2019, Agencia Catalana del Agua (ACA).	Percentage of sewage from a destination treated to at least secondary level prior to discharge.	Currently, 92.14% of the population are covered by two-step water treatment. Meanwhile, 5.58% are covered by three-step treatment and only 2.04% by one-step treatment. (In general: Navarra, 2020).

Indicator	Canary Islands	South Tyrol	South West Australia
Percentage of water use derived from recycled water in the destination	x	x	Water Corporation (2015) data, up to 28% of treated waste water in the region is recycled each year to irrigate golf courses, woodlands, and public open spaces.

7. Solid Waste Management

Indicator	Canary Islands	South Tyrol	Navarre
Total waste generation	1.2 million tons in 2015.	The total production of waste in South Tyrol in 2017 amounted to 347,900 tons (APPA, 2018).	2020, a total of 283,000 tonnes of solid waste with domestic and commercial origin was generated (total of population).

Indicator	Canary Islands	South Tyrol	Navarre
% of tourism enterprises sorting different of waste	x	x	For 2020, an objective was set for 50% recycling of domestic and commercial waste. 14 of the 16 local entities that manage solid waste in Navarre meet the objective. Local entities with the highest percentages reach recycling proportions of 67-68%. (Navarra, 2020).

Indicator	Canary Islands	South Tyrol
Waste production in accommodation facilities in tons	Mixed waste generation: 63,912 tons 2018 (Diaz-Farina et al., 2020).	2017 amounted to 32,436 tons (APPA).

8. Climate Action

Indicator	Canary Islands	Navarre
Tons of CO2 equivalent of total gases	According to the types of GHG, CO2 is the most abundant; represents 87.58% of the total, followed by methane representing 8.5%.	2019: 16,539t. CO2 Department of Rural Department and the Environment and AENA.

Indicator	Canary Islands	Navarre
Total CO2 emissions	13,340 Gigagrams in 2018 (Inventario GEI, PAIC, 2020).	709,685 t (2019) total population. 2018 (air transport: 13,181t).

Indicator	South Tyrol	South West Australia	Sonoma
Existence, performance of long-term climate change adaptation strategy for the destination	x	City of Busselton Energy Strategy 2020-2025 (ASWTO, 2020).	CleanStart and EverGreen.

Indicator	Canary Islands	South Tyrol	South West Australia
Areas under protection	El Banco del Inventario Natural de Canarias (BIOCAN).	Seven natural parks, 296 biotopes, 44 Natura2000 Sites, 1,259 natural monuments and the Dolomites UNESCO WHS (Provincial Office for Natural Parks).	The Southwest Australian Ecoregion is home to more than 4,000 species of endemic plants and 100 endemic vertebrates (Annual Progress Report, 2020) The region also includes two IUCN category sites, namely the Leeuwin-Naturaliste National Park (191 km ²) and the Ngari Capes Marine Park (1,238 km ²).

Indicator	Navarre	Sonoma
Percentage of tourist infrastructure (hotels, other) located in vulnerable zones.	Buildings in flood zone, not only touristic LIFE NAdapta, 2017.	467 wineries in danger of fires, 1,200 wineries in Napa and Sonoma, approximately six were lost. (Annual Report 2019).

9. Accessibility

Indicator	Canary Islands	South West Australia	Navarre
Share of hotels, public buildings, leisure services and cultural and natural sites with accessible facilities	x	Natural attractions: min 50% of enterprises with accessibility; Man Made attractions: min. 60%, Restaurants: 65%, Accommodations: min. 80%, shops: min 70%, visitor centres: 100% (MRBTA, 2020).	50 accommodation establishments are accessible in Navarre, of which 34% are hotels, and 28% are guest houses (General Board of Tourism, Trade and Consumption, 2020).

Indicator	South West Australia	Navarre
Existence of disabled friendly policy	"Disability Access and Inclusion Plan 2018-2020" (ASWTO, 2020).	Strategic Tourism Plan 2018-2025.

10. Local Satisfaction

Indicator	Canary Islands	Barcelona
% wanting more, same or less tourists	32% would like to increase the number of tourists, 46% in favour of maintaining the number of tourists, 16% in favour of reducing the number of tourists WTO Indicators Exercise for the Canary Islands (2000).	2019: more 69; not more: 27.7 do not respond: 3.3, Tourism perception in Barcelona Region. Barcelona Regional Council.

Indicator	Canary Islands	Barcelona	Adriatic Croatia
Ratio of tourists to locals	18% of foreign tourists/resident population. (Guidebook, 2004. Data from 2000).	Ratio between tourists per day and inhabitants: 2019: 0.06.	2018. Number of tourist nights per 100 residents: 7,087.

Indicator	Canary Islands	Buenos Aires	Barcelona	Adriatic Croatia	South West Australia
Satisfaction of locals	80% of the population agrees that tourism development has been very beneficial for the island and its inhabitants (ISTAC, 2019).	87.8% in 2020 Tourism Observatory.	Residents who consider that tourism beneficial (%) 92.3 Encuesta de perfil y hábitos de los turistas en Destino Barcelona 2018-2020. Observatorio del Turismo en Barcelona: ciudad y region.	76.3% satisfied with tourism.	More than 50% of residents strongly agree that tourism makes an economic contribution to the region. In addition, residents also strongly agree that tourism activities have other positive impacts for the region, including creating more jobs, attracting investment, supporting local businesses (ASWTO, 2020).

Indicator	Barcelona	Sonoma
What do you think is the most negative of tourism? (%)	2019: <i>Overtourism</i> : 23.5%, party: 15%, bad behaviour 10.5% Tourism perception in Barcelona Region. Barcelona Regional Council.	Traffic, congestion on weekends, Ecological impacts, including car pollution, litter and trash, and human presence in natural areas are also of significant concern.

Indicator	Canary Islands	Buenos Aires
Number of immigrants	In 2021, immigrants arriving in the Canary Islands by sea set a new record of 18,021 people, surpassing the previous year (2020) in which 16,461 immigrants arrived to the islands (Ministry of the Interior, 2021).	Out of 10 California farmworkers in 2016 were born abroad, mostly in Mexico. (Sonoma Sustainable tourism observatory. Annual Report 2019).

11. Governance

Indicator	Canary Islands	South West Australia	Navarre
Policy formulation and its execution	x	Part of Australia's value of tourism	Navarre Tourism Strategic Plan 2018-2025

Indicator	Canary Islands	South Tyrol	South West Australia	Navarre
Cooperation between tourism and other sectors, such as renewable energy, water resources, biodiversity and landscape protection, forestry, agriculture	x	x	Meanwhile, both the Shires (AMR and City of Busselton) and non-profit organisations (e.g., Margaret River Regional Environment Centre and Augusta-Margaret River Clean Community Energy) are working together to achieve better energy management practices. (ASWTO, 2020).	Creating a public-private committee/work group in the heart of the Tourism Observatory that acts as a means of participation and proposal of analysis needs and implementing actions in the tourism sector. 2020.

Annex 4. Indicators applied to the Canary Islands

Seasonality. Included:

INDICATOR	WHERE TO FIND	DATA
Clima: Average temperature	Tourism Observatory Canary Islands, 2020	Mild winter with 18°C - 25°C (Tourism Observatory Canary Islands, 2020).
Occupancy rate (difference within a year)	Tourism Observatory Canary Islands, 2020	Less occupancy in between March and May (2021) ISTAC (Accommodation survey).
RevPAR	Tourism Observatory Canary Islands, 2020	During the winter months of 2018-19, the hotel RevPAR in the Canary Islands were between €79 and €86 ISTAC (Accommodation survey).
Tourist arrivals by month	WTO, 2004	2015-2019: less in May (FRONTUR).

Seasonality. Further research:

KEY ISSUES	AVAILABLE	PROPOSED BY	DATA
Expenditure of tourists in peak and low season	NO	STOST, 2018	not available, missing by months.
Ratio between maximum and minimum monthly overnights	YES	Tourism Observatory Barcelona, 2020	ISTAC 2019: 1,482,326 (May 2019) / 1,066,023 (March 2019) = 1.39.
Special events hold in different seasons	NO	Guidebook, 2004	different pages like https://www.tomaticket.es/agenda/?IdLugar=51 , & https://www.holaislascanarias.com/eventos/phe-festival-2022/ , but none in common.

Employment. Included:

INDICATOR	WHERE TO FIND	DATA
Unemployment rate	Tourism Observatory Canary Islands, 2022	High unemployment rate (around 20% in 2018 and 2019), among the highest in Spain and Europe (ISTAC). 20.3 in Q1, 2022.
Ratio of tourism in employment	Tourism Observatory Canary Islands, 2022	Tourism professionals represent 36.5% of the total employment in the Canary Islands in 2019 (IMPACTUR, 2020).
Employment in tourism	Tourism Observatory Canary Islands, 2020	Tourism employment: Local employment from tourism in 2019: 36.5% (Spain:12.9%) (IMPACTUR, 2020).
Total number employed in the tourism sector, by industry	WTO, 2004	310,956 jobs linked to tourism activities in 2019 (IMPACTUR, 2020) Second Autonomous Region in Spain in number of tourism workers in 2019 (IMPACTUR, 2020).

Employment. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
% labour imported (from outside region, from other countries)	NO	WTO, 2004	
Gross salary by sex per capita	NO	Tourism Observatory Barcelona, 2020	
Job creation by tourism	NO	STOST, 2018	2019: Hospitality and tourism 28.85% of employment offers, 12.45% in Spain.
Local average income from tourism compared to cost of living	NO	STOST, 2018	
Income analysis	YES	WTO, 2004	23,081.71€ in 2019 (Adecco, 2020).
Adequate its educational system in language learning.	NO	Tourism Observatory Canary Islands,	required for jobs in general: 39.41% (Adecco, 2020).

		2021	
Studies required for employment	YES	STOST, 2018	in general: 2019: 11.17% (ESO), 15.85% (bachiller), 11.30% + 21.56% (ciclo), 36.84% bachelor, 3.29% (master) (Adecco, 2020).

Destination economic benefits. Included:

INDICATOR	WHERE TO FIND	DATA
Tourist spending/spending per tourist	Tourism Observatory Canary Islands, 2020	(EGT). 2019: 1,122.58€, 2020: 1,169.81, 2021: 1,205.98€.
Innovative companies	Tourism Observatory Canary Islands, 2020	Innovative companies 2017-2019: 15.5% Canary Islands (20.8% Spain) (INE, 2019).
GDP	Observatorio turístico México	Tourism GDP 33% (Spain:12.4%) (IMPACTUR, 2020).
Average stay	Tourism Observatory Canary Islands, 2020	Average stay: 9.54 days (EGT-ISTAC 2021).
Average expenditure per day	Tourism Observatory Canary Islands, 2020	(EGT). 2019: 137.45€, 2020: 135.31€, 143.98€.
RevPAR	Tourism Observatory Canary Islands, 2021	2021: 52.13€, 2020: 28.77€, 2019: 65.96€ (ISTAC).
Occupancy	Tourism Observatory Canary Islands, 2021	2021: 46.43, 2020: 42.06, 2019: 67.95 (ISTAC).

Destination economic benefits. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Percentage of local produce and services sourced by the tourism enterprises (tourism supply chain)	NO	STOST, 2018	Orden HAC/1239/2020 for fomentation use of regional products.

The amount of tourism investment	YES	WTO, 2004	38.9 million 2021 (Gobierno de Canarias, 2021. Comunican. Portal de noticias).
% increase/decrease in expenditures (groceries, transportation, leisure etc.)	YES	WTO, 2004	(EGT). 2019: 137.45€, 2020: 135.31€, 143.98€ 2019-20: -1.56%, 2020-21: 6.41%.

Energy management. Included:

INDICATOR	WHERE TO FIND	DATA
Use of alternative resources: Renewable energy produced in respect to the total	Tourism Observatory Canary Islands, 2021	16.96% share of renewables in the total energy produced in 2020 (Gobierno de Canarias, 2020). Renewable energy share in primary energy utilisation: 2% in 2020.
Cars per capita	Tourism Observatory Canary Islands, 2021	812.9 vehicles for 1,000 residents in 2021 (ISTAC).
Importation of hydrocarbons	Tourism Observatory Canary Islands, 2021; (Gobierno de Canarias, 2020)	3,668,713 Tm of hydrocarbons, including crude oil and finished products: LPG, gasoline, gas oils, fuel oils and kerosene (2020).
Ratio of electric vehicles in relation to total	Tourism Observatory Canary Islands, 2022	6,378 March 2022, which supposes 0.36% (ISTAC/DGT).
Use of alternative resources	WTO, 2004	The energy sources with the highest provides to renewables in the Canary

		Islands are wind power (50.4%), followed by photovoltaic solar (33%) (Tourism Observatory Canary Islands, 2020).
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Energy management. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Consumption per capita	NO	WTO, 2004	consume between 2 and 3 times more energy and water per capita (Gobierno de Canarias, 2022).
Average Annual Change in Electricity Use	NO	ASWTO, 2020	ISTAC, production of electricity in general.
Number, of % of establishments (e.g., hotels) using renewable sources, generating own energy	NO	WTO, 2004	
CO2 emissions from tourism enterprises	NO	STOST, 2018	
Charging stations offered for e-mobility in hotels and public spaces	NO	Progress report Tyrol	249,765 recharging points linked (in homes, workplaces, and public thoroughfares), 5,692 support points (shopping centres, car parks) and 1,700 emergency points (service stations) (Gobierno de Canarias, 2022).

Water management. Included:

INDICATOR	WHERE TO FIND	DATA
% Water losses	Tourism Observatory Canary Islands, 2022	Real water losses of 35% (INE, 2018).
% of consumption made in apartments and hotels	Tourism Observatory Canary Islands, 2021	72.52% of the consumption in the accommodation sector is made by hotels and 27.48% by apartments in 2018 (Estévez-Bauluz, 2021).
Water consumed in accommodation facilities	STOST, 2018	Hotels: 329.49 litres per overnight. Apartments: 282.4 litres per overnight in 2018 (Estévez-Bauluz, 2021).
Total water consumed in the tourism sector (cubic metres) and per guest-night (litres).	Tourism Observatory Canary Islands, 2020	Estimated consumption of 31,769,941 m ³ by hotels and tourist apartments in the Canary Islands (Ruiz-Rosa et al., 2020).
Ratio of production of ground water	Tourism Observatory Canary Islands, 2020	Production of subterranean water: > 50% of total production of water (Tourism Observatory Canary Islands, 2020).
Price	Tourism Observatory Canary Islands, 2021	In 2018, the average cost per m ³ of water supplied was €2.10/m ³ , broken down into €1.72/m ³ for supply.

Water management. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Water consumption of the tourism sector compared to the availability of water, water shortages, water requirements of local users in the destination and further downstream	NO	STOST, 2018	
Estimated minimum water consumption in accommodation facilities	NO	STOST, 2020	

Quality of drinking water	YES	WTO, 2004	Proportion of newsletters with results suitable for consumption of the Canary Islands are 99.63% (Ministerio de sanidad, 2020).
% of water consumed in accommodation facilities	NO	STOST, 2018	apartments and hotels (2018): 35,657,309 m ³ (Tourism observatory Canary Islands, 2021).

Waste water (sewage) management. Included:

INDICATOR	WHERE TO FIND	DATA
% of waste water receiving treatment	Tourism Observatory Canary Islands, 2020	20% of the waste water in the Canary Islands is treated and reused, 2018.
Price per m ³ of sewage water treatment	Tourism Observatory Canary Islands, 2022	€0.38/m ³ for sewage and waste water treatment (INE 2018).

Waste water (sewage) management. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Number of establishments participating in water conservation programmes	NO	WTO, 2004	
Number of reported pollution or contamination events per annum (by month) in watercourses receiving effluents; See also indicators in section on Seawater quality	YES	WTO, 2004	Of a total of 216, 210 excellent, 2 good, 2 not enough, 2 not classified (Informe Nacional de Baño, 2019).
Water contamination caused by tourism enterprises/sites	NO	STOST, 2018	
Percentage of water use derived from	NO	Tourism	

recycled water in the destination		Observatory Canary Islands, 2020	
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Solid waste management. Included:

INDICATOR	WHERE TO FIND	DATA
Total waste generation	Tourism Observatory Canary Islands, 2020	1.2 million tons in 2015.
Recycling rates	Tourism Observatory Canary Islands, 2020	Estimated recycling rates are below 10% of total municipal waste (PLARES, 2018) ARONA: Light packaging: 30%, paper and cardboard: 21%, glass: 33%, organic: 4%. global efficiency Arona: 228, Tenerife global: 252.
Waste production in accommodation facilities in tons	STOST, 2020	Mixed waste generation: 63,912 tons 2018 (Diaz-Farina et al., 2020).
Waste production in food and beverage	Tourism Observatory Canary Islands, 2020	134,539 tons 2018 (Diaz-Farina et al., 2020).
Waste generation per resident and day	Tourism Observatory Canary Islands, 2021	1.64kg/day (PLARES, 2019).
Waste generation per tourist and day	Tourism Observatory Canary Islands, 2021	2.16kg/day (PLARES, 2019).
Tons of Co2 produced	Tourism Observatory Canary Islands, 2021	total 379,321tn CO2/year (PLARES), ARONA: 52,050tn CO2/year.
Waste volume produced by the destination (tonnes) pa / Person years pa (by month) or capita waste generation	Tourism Observatory Canary Islands, 2021	Per capita domestic waste generation in the Canary Islands in 2019 was 577.7 kg per inhabitant, above Spain's national average (483.7 kg per inhabitant) (INE).

Solid waste management. Further research:

KEY ISSUES	AVAILABLE	PROPOSED BY	DATA
Solid waste production per sectors	YES	Tourism Observatory Canary Islands, 2020	83% of waste is generated in activities (services sector is responsible for increases of more than 8% per year) while the remaining 17% are generated by households.
Waste production per tourist night compared to general population waste production per resident night	YES	CROSTO, 2019	1.64kg/day, 2.16kg/day PLARES, 2019.
Solid waste production. Tons per tourist per year	YES	Tourism Observatory Canary Islands, 2020	1.64kg/day x 365 = 598.6 kg / year.
% of tourism enterprises sorting different of waste	NO	Tourism Observatory Canary Islands, 2020	

Climate research. Included:

INDICATOR	WHERE TO FIND	DATA
Tons of CO2 equivalent of total gases/ Population	Tourism Observatory Canary Islands, 2020	7.02 tons of CO2-eq / inhabitant in 2018 (Gobierno de Canarias, 2020).
Total CO2 emissions	Tourism Observatory Canary Islands, 2020	13,340 gigagrams in 2018 (Gobierno de Canarias, 2020).
Increments of CO2 emissions in gigagrams	Tourism Observatory Canary Islands, 2020	49.2% Increase in Gigagrams of CO2 (1990-2018); maintaining the same since 2017 Higher than that for mainland Spanish territory, and higher than the increase allocated to Spain in the Kyoto

		Protocol. Less than in 2005. 17,622 Gg (Inventario energético 2019).
Areas under protection	STOST, 2020	146 natural species protected (Gobierno de Canarias, 2022) https://visor.grafcan.es/visorweb/# (MAPA)

Climate research. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Frequency of extreme climatic events	NO	WTO, 2004	Frequency and magnitude of extreme cases (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).
Percentage of tourist infrastructure (hotels, other) located in vulnerable zones.	NO	WTO, 2004	Areas most likely to experience road closures by detachment of slopes or destruction in infrastructures; with Geographic systems or information (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).
Degree to which key tourist zones are covered by contingency or emergency planning (existence of plan, % area included).	NO	WTO, 2004	reinforcement of coastal defences, adaptation of infrastructures to more intense coastal winds, protection of most sensitive elements of the coastline, etc. (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).
% of tourist area and infrastructure with sea defences (could be classed by level of protection)	NO	WTO, 2004	

CO2 emissions from transport used by tourists, average carbon food print home-destination	NO	STOST, 2018	Study and development of tools that allow the calculation of the carbon footprint of the tourists who visit us, including in the same, both transport and stay (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).
Existence, performance of long-term climate change adaptation strategy for the destination	YES	STOST, 2018	2006: Plan Energético de Canarias (PECAN).
Existence, performance of climate change/ natural disasters risk assessments for new tourist infrastructure and activities	YES	STOST, 2018	Application of climate change scenarios generated by AEMET within the National Program for Climate Change to the meteorological risk of fires in Canary Islands (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).
Number of tourism enterprises involved in climate change mitigation schemes	NO	ASWTO, 2019	These groups have had the Participation of sectoral experts both from the public administration, as organisations companies, unions, etc. (Agencia Canaria de Desarrollo Sostenible y Cambio Climático, 2009).

Local satisfaction. Included:

INDICATOR	WHERE TO FIND	DATA
Ratio of tourists to locals	WTO, 2004	(ARRIVALS/RESIDENTS) ISTAC 2021: (110,150/2,172,944) due to tourism population equivalent 5.07%, 2019: 268,395/2,153,389= 12.46%.
% who are proud of their community and culture	WTO, 2004	Support for tourism development: 83.2% supports continuing to promote tourism (ISTAC, 2019).
Satisfaction of	Tourism	80% of the population agrees that tourism development

locals	Observatory Canary Islands, 2021	has been very beneficial for the island and its inhabitants (ISTAC, 2019).
Perception of Tourism impacts	Tourism Observatory Canary Islands, 2021	Average perception of the impacts of vacation homes in the Canary Islands Accommodation is more sustainable than traditional (2.93 in scale of 1-5) (ISTAC, 2019).
Number of immigrants	WTO, 2004; applied by Tourism Observatory Canary Islands, 2022	In 2021, immigrants arriving in the Canary Islands by sea set a record record of 18,021 people, surpassing the previous year (2020) in which 16,461 arrived immigrants to the islands (Ministry of the Interior, 2021).

Local satisfaction. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Tourism intensity index* Tourism intensity indicates how much an area is exposed to tourism. The tourism intensity index is obtained by dividing the number of overnight stays in all types of accommodation facilities by 365 days and then by the resident population	YES	STOST, 2020	ISTAC 2021: (110,150/2,172,944) by equivalent tourism population 5.07%.
Noise tourist opinion	NO	Tourism Observatory Barcelona, 2020	
Opinion of residents: limits of its capacity to absorb tourism? (%)	NO	Tourism Observatory Barcelona,	

		2020	
What do you think is the most negative of tourism? (%)	NO	Tourism Observatory Barcelona, 2020	Qualitative research, analysis with GABEK.
Effects of visitation peaks (e.g. traffic)	NO	STOST, 2018	
Population growth related to tourism growth	YES	STOST, 2018	ISTAC 2018-19: arrivals: $((1,782,435-1,975,142)/1,975,142)$ = -9.76% population: $((2,153,389-2,127,685)/2,127,685)$ = 1.21%.
Number of tourists per day, per week etc; number per sq km	NO	WTO, 2004	
% of local community who agree that their local culture, its integrity and authenticity are being retained	NO	WTO, 2004	
Number of complaints by residents	NO	WTO, 2004	Regarding holiday homes, there is a slight tendency towards a negative perception of social and economic impacts, and a more positive trend in the cultural and environmental spheres.

Accessibility. Included:

INDICATOR	WHERE TO FIND	DATA
Existence of disabled friendly policy	WTO, 2004; applied by Tourism Observatory Canary Islands, 2020	Yes, Arona Municipal Council has developed in the last decades accessibility plans that have been recognised as a leading institution in this field. We also find other several efforts in Tenerife to turn public buildings, sites of interest and culture, as well as beaches, into accessible places under the support of SIMPROMI, 1600 - DECRETO 227/1997, 18/09, which approves the Regulation of Law 8/1995, of April 6, on accessibility and removal of physical and communication barriers.

Accessibility. Further research:

KEY ISSUES	AVAILABLE	PROPOSED BY	DATA
Existence of disabled access program including e.g., airports, piers, bus stations, sidewalks, public washroom facilities (% meeting standards)	NO	WTO, 2004	
Existence of public transport suitable for mobility of persons with disabilities (#//% transport vehicles)	NO	WTO, 2004	
Number/% of hotels with rooms accessible to persons with disabilities	YES	WTO, 2004	Infrastructure furniture and fixed public access installations will be ergonomic and at least adapted in 10% of its units (Sinpromi, 2001).
% of key sites considered accessible or inaccessible for those with differing levels of mobility or fitness	NO	WTO, 2004	
See exit questionnaire (the same questionnaire can be provided explicitly to	NO	WTO, 2004	

groups of travellers with disabilities to identify their concerns).			
Level of implementation of accessibility and inclusiveness policies	NO	Tourism Observatory Canary Islands, 2020	
Share of hotels, public buildings, leisure services and cultural and natural sites with accessible facilities	NO	Tourism Observatory Canary Islands, 2020	mandatory: 30-60 1 adapted dormitory, 61-100, 2 adapted (DECRETO 227/1997, 18/09).

Governance. Included:

INDICATOR	WHERE TO FIND	DATA
Satisfaction with governance in tourism	Tourism Observatory Canary Islands, 2021	The Tourism area is the most valued in a positive way compared to other services: 62% (2018) ISTAC.
% participation of association	Tourism Observatory Canary Islands, 2021	18.6% participate in some association in the Canary Islands (2018) ISTAC.
Main problems received by residents	Tourism Observatory Canary Islands, 2021	Main problems received by residents in Canary Islands (2021): ISTAC.
Participation of local population in designing and deciding about tourism development plans	STOST, 2018	18.6% in any association in Canary Islands; being the most related to tourism the group trade unions or professional or business associations and cultural, sports, leisure or carnival, which represent 11% and 17%, respectively.

Governance. Further research:

KEY ISSUES	AVAIL ABLE	PROPOSED BY	DATA
Certifications of sustainability for municipalities	NO	STOST, 2018	
Image of the destination (branding, vision, strategic marketing)	NO	STOST, 2018	
Cooperation between tourism and other sectors, such as renewable energy, water resources, biodiversity and landscape protection, forestry, agriculture	NO	STOST, 2018	Different chairs of the Universities imply the public and private sector with the different Chairs, an example is the Chair of Tourism.
Number of municipalities, accommodation facilities and events involved in voluntary certification schemes for sustainability	NO	STOST, 2018	
Credibility of the public administration	NO	Tourism Observatory Canary Islands, 2020	
inclusion level of the different groups of stakeholders in the decision-making of the tourist system of the territory,	NO	Tourism Observatory Canary Islands, 2020	BOC - 2021/259. 12/2021 - 5283 Cooperation Agreement between the Administration Government of the Autonomous Community of the Canary Islands, through the Ministry of Tourism, Industry and Commerce, and the ULPGC for INSTO.