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CLIMATE CHANGE AND TOURISM POLICY IN SPAIN: DIAGNOSIS IN THE SPANISH MEDITERRANEAN COAST

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1. TOURISM AND CLIMATE CHANGE IN SPAIN: THE STATE OF THE ISSUE

Tourism is a strategic sector in the European Union, as has been made apparent in the Treaty of Lisbon (2009) and in the «Madrid Declaration» (2010), where this activity is positioned as one of the priority sectors, with specific strategies for growth and consolidation, reflected in the EU Financial Framework for 2014-2020. Tourism is also included as a specific objective in the COSME Programme for European SMEs.

Since 2011, the European Commission has developed a series of actions aimed at stimulating the competitiveness of the European tourism sector. These actions cover different aspects, from support for cultural tourism and European cultural itineraries, innovation in the tourism industry, the improvement of professional instruction and training, the extension of the tourism season, the socio-economic knowledge base in tourism and information on market trends, the promotion of sustainable development and initiatives with regard to accessible tourism, to the progression towards a «true European brand» for tourism destinations. To achieve this, the need to maximise the potential of the policies and financial instruments of the EU that favour the development of tourism is explicitly indicated. And, together with all these actions, it is necessary to perform an analysis of tourism policy and the issues that will affect how tourism takes place and the manner in which demographic and climate changes will affect tourism. However, there is no specific instrument aimed at the introduction of actions for this purpose.

In the case of Spain, the importance of tourism as an economic sector cannot be denied. According to the report of the World Tourism Organization (2014), Spain holds 3rd place in the world ranking of international tourist arrivals, with more than 60 million international tourist arrivals, behind only France, the world's first-placed destination, and the United States. Altogether, the figures for international tourist arrivals in Spain represent some 10% of world tourism. Furthermore, if total foreign currency revenues are taken as

a reference, Spain holds second place, after the United States, with more than 62 billion dollars. In short, tourism activity is hugely important for the national economy, with a total economic movement of 10% of Spanish GDP (Roselló, 2011).

According to the study *Competitiveness Report 2015*, published by the World Economic Forum (2015), Spain is the *top 10* country that has experienced the most notable improvement since 2011. Both the central government and the governments of the autonomous communities consider tourism a priority in their policies, as can be seen in the efforts to promote and favour this activity, despite the economic difficulties.

There is, therefore, cause for concern regarding the possible effects of the global warming process on this economic activity and on the geographical spaces where it is developed since, if efficient mitigation and adaptation programmes are not designed, the consequences in terms of the generation of wealth and jobs will be considerable. Tourism is the economic activity with the highest level of exposure to the effects of climate change. In risk analysis terms tourism is a highly vulnerable activity with a variable level of exposure depending on the type of tourism present in the geographic space: it is very high, for example, in the case of beach or winter sports resorts or in urban tourism in large cities. The analysis of the spatial factors that allow the development of tourism activity in an area has gained increased importance in the scientific research into tourism. In the current context of globalisation and accelerated economic changes, any alteration in the elements of the physical environment may affect the economic activity of an area. Conserving the regional resources that favour tourism activity in the main destinations around the world is at present a process full of uncertainties owing to the manifest changes affecting global climate conditions.

The tourism sector has been aware of the possible effects of climate change for many years. In addition to the international conferences held on this matter since 2003 under the auspices of the World Tourism Organization (Djerba, Davos, Copenhagen, Cancun, Durban, Doha, Kenya) and the world congresses on specific aspects of the relationship between climate change and tourism, also organised by the WTO (snow and mountain tourism, tourism and air transport), the fight against climate change has also been considered in the plans prepared by the governments of developed countries and in measures implemented by the private sector in the tourism industry itself. There is, therefore, a great deal of knowledge regarding this matter in consonance with the considerable effects that climate change may have on this economic activity and on the regions where it takes place. The real degree of preparedness and the effectiveness of the measures implemented is another matter.

Economic studies, based on the use of models to measure the impact on tourist flows, have pointed to possible changes in tourist activity as a consequence of climate change. Of special cause for concern are the changes in market share of the modes of tourism activity in the regions of the world that may be caused as a result of rising temperatures, and supply and demand models are used that take into account the change in the temperature conditions of the areas analysed. Many authors have conducted research studies with regard to this matter (Scott, Grossling, Hamilton, Dubois) and it is a line that is also apparent in official reports prepared in recent years by the UN and the World Tourism Organization. Thus, for example, Bigano, Hamilton and Tol (2008) have analysed the effects of climate change on tourist activity in the Mediterranean Basin by applying the Hamburg Tourism Model (HTM) and they point to a decline in tourist arrivals for the 2100 horizon in all the

coastal countries of the Mediterranean Basin, reaching percentages of over 40% in many countries in the north of Africa. This loss is not offset by internal travel within each country (domestic tourism) in these North African countries of the Mediterranean and it is only slightly offset in European coastal countries. Spain, in this context, will experience slightly negative effects, since the fall in the number of arrivals will be offset to a great extent by the movements of domestic tourism. In relationship with this, Bujosa and Roselló (2011) have analysed the changes to the tourism season in the Spanish coastal provinces, based on an increase of 1º C in the average temperature for the whole year and for the months of the high season (summer). According to their analysis the warmer coastal provinces (east, southeast and south of the Iberian Peninsula) would be negatively affected by a rise in temperatures, as a result of both an increase in temperatures in the high season and an increase throughout the year. However, the cooler coastal provinces of the northern part of the Peninsula (Cantabrian coast, Galicia) and also Barcelona and Girona, would be positively affected, so that their capacity to attract tourists would increase.

Similar conclusions are reached in the study by Hein, Metzger and Moreno (2009) on the effects of climate change on Spanish tourism, based on the use of the «Tourism Climate Index» which includes various climatic variables (vid. infra). The study shows that the arrival of tourists in Spain will decrease by 14% in 2060 compared with arrivals in 2004, this decrease being greater in the summer season – up to 26% – owing to a loss of comfortable climatic conditions in the Mediterranean area, which is currently the coast that receives the highest numbers of tourists in summer. As in the previous case, it indicates an improvement in climatic conditions in summer on the Cantabrian coast which may offset, by way of the development of an adaptation strategy, the loss of market share on the Mediterranean seaboard. However, the research indicates the need to improve these projections in a global economic context that takes into account the effects of climate change on other economic sectors and likewise incorporates price fluctuations or the impact of a possible change in the timing of the high season on the Mediterranean coast.

Research into the effects of climate change on tourist activity is key to the design and implementation of measures for mitigation and adaptation. In Spain, to date, climate change reduction policies have been tackled in a general manner, without any real knowledge of the effects that global warming may have on tourism areas. Mitigation of the effects of climate change has essentially concentrated on energy matters (the backing of alternative energy sources, sustainable mobility). Climate change and its associated climatic hazards has yet to be integrated in regional planning (regional and local scale), and it is still necessary to determine the structural measures that should be applied in coastal or mountain tourism areas, the application of taxation measures (ecotaxes) for environmental purposes, the planning of water resources taking into account the forecasts of the climatic models, the planning of health services in coastal tourism areas in a scenario conditioned by the more frequent occurrence of extreme temperatures, especially in summer, and the design of effective educational and communication programmes on the consequences of climate change and the connected extreme weather conditions. These are some of the actions that should be included in the design of plans and programmes for action in the light of climate change and which should be based on the integration of policies of different scales and levels (governance of climate change).

The evaluation of specific measures for adaptation to climate change implemented in tourism areas has given rise to very few studies in recent years. In this case, the regional and local scales are key since they offer the ideal scenario for the development of specific proposals for adaptation, with a pronounced socioeconomic and territorial impact. Adaptation programmes implemented in urban areas have been evaluated on an international scale (Barton, 2009; Hunt and Watkiss, 2011) although, in many cases, the measures applied do not bear a direct relationship with tourism activity or they are included in general sustainability projects on a local scale. More attention has been paid to the study of the effects of climate change on basic elements for the development of tourism areas, such as water. In this respect, the general contributions on tourism, climate change and water, carried out by Gossling (2012) and Amelung (2007), are noteworthy, as are those dedicated to the Mediterranean area, the subject of this study (Sauri et al., 2013), which analyse the impact of the reduction of water resources, as forecast in the climatic modelling, on tourism activity in this geographic space and the measures adopted to improve its resilience.

Spain as a whole is especially exposed to possible climate changes owing to its geographical position in the middle latitudes. For Southern Europe, the PESETA 2 report of the JRC - European Commission (2014) points to an annual loss of 1.5 % in the national GDP of these countries as from 2070, in the (optimistic) scenario of a temperature increase of 2 ºC over the course of this century. This rises to over 2.5 % of annual GDP for temperature increases of above 3 ºC. Thus, the calculation of scientific approximations of the climate change process and its effects on economic activities is, henceforth, a necessity. It is therefore essential to know, with the highest possible degree of precision, the real effects of global warming in our latitudes, to understand how this may affect tourism areas and the measures that can be implemented, on different scales, to mitigate its consequences.

2. EXPECTED EFFECTS OF CLIMATE CHANGE ON THE SPANISH MEDITERRANEAN COAST

There are three main processes that may develop in Spain, owing to the effects of global warming, with direct implications on tourism activity: a) an increase in climate extremes (more weather-related risks); b) a reduction in precipitation and in the volume of water available; and c) the loss of climatic comfort in the south and east of the Iberian Peninsula due to an increase in temperatures in the mid-summer months.

Climatic modelling in middle latitudes and, specifically, in the Mediterranean region, points to a series of alterations for the forthcoming decades that bring into doubt the fulfilment of climatic requirements in tourist destinations (Besancenot, 1991):

- An increase in days without rain which, in principle, would increase the possibilities of enjoyment, would be counteracted by the reduction in available water volumes which may endanger supplies in tourism areas.
- Higher temperatures in summer and a humid heat, somewhat unbearable, in coastal areas. A loss, therefore, of a comfortable climate.
- An increase in climate extremes; therefore, a higher level of risk.

The study by the Spanish State Meteorological Agency on «*Climatic projections for the twenty-first century*» (Aemet, 2015), an updating of the projections prepared in 2011, handled three variables (maximum temperature, minimum temperature and precipitation) in the analysis of the modelled evolution of the climate in Spain for the forthcoming decades. The results confirm the data included in previous reports of the State Agency and of the Spanish Climate Change Office. For the Iberian Peninsula as a whole, the increase in maximum temperatures in 2100 is estimated at between 1ºC and 7ºC for different scenarios of gas emissions. In the minimum temperatures the increase is calculated at between 1ºC and 6ºC, and precipitations will be reduced by between 4 and 8% compared to the averages for the 1961-1990 period, with a 10% uncertainty margin.

With regard to climatic comfort in tourism areas of the Mediterranean seaboard the forecast increase in the number of warm days, warm nights and the duration of heatwaves in all the Spanish Mediterranean regions is significant. These are variables that, together with high values of atmospheric humidity, are related with the origin of feelings of discomfort. And this is in addition to the warming of the waters of the western Mediterranean in the warmer months of the year, which has increased in recent years, together with a lengthening of the period of high temperatures (> 25ºC) between June and September. For the Mediterranean Basin as a whole, an absolute increase has been estimated of 0.22ºC per decade, from 1973 to 2008 (Skliris *et al*. 2012). Miro Pérez (2014), based on the use of satellite data belonging to the database of the NOAA/NASA *AVHRR Oceans Pathfinder*, has calculated the temperature increase in the coastal waters close to the Valencian Community, for the 1985-2007 period, estimating an annual increase per decade of 0.26ºC. As Miró Pérez indicates, the most significant aspect of his analysis is that the responsibility for the warming lies especially in the months of spring and early summer (April to June) and, to a lesser extent, in October, thus confirming not only the trend for an increase in seawater temperature in the central months of summer, but the indicated prolongation of the annual period with warm waters off the Spanish Mediterranean coast.

For the purposes of planning and adaptation of the tourism areas of the Mediterranean seaboard in the light of the consequences of climate change, these data regarding the future projection of atmospheric and seawater temperature values mean:

- The possibility of modifying the high-season calendar which could last from June to September inclusive, as well as considering the months of May and October to be very suitable for tourist stays in this geographic area.
- The need to adapt tourist establishments, and residential properties in general, to a climate with a more usual situation of high temperatures and increased humidity, during the day and at night, in order to offset the temperature discomfort which is expected to grow in coastal areas, especially after 2050.
- The obligation to ensure that water supply systems are well designed, on a regional and local scale, in an area with a natural scarcity of resources, where the reduction in precipitation, the increase in its irregularity and the increased evaporation from reservoirs will cause a reduction in available volumes of surface water. This will be more apparent in territories of the centre and south of the Spanish Mediterranean seaboard.

– The need, moreover, to modify, on a local scale, the civil protection and public health protocols, since the risk calendars will change with regard to certain hazards of a climatic nature (storms and heavy rain owing to the presence of warm water in the western Mediterranean during a longer period of the year), as well as the frequency and intensity of appearance of climate extremes (heat waves and their effects on at-risk groups).

3. POLICIES OF MITIGATION AND ADAPTATION TO CLIMATE CHANGE IN THE SPANISH MEDITERRANEAN COAST

The future climate change scenario obliges tourism destinations and the agents involved (public authorities, companies and users) to adapt to the new reality if they wish to maintain current competitiveness. This is a medium- and long-term process for which planning must begin now in order to avoid major economic, social and territorial costs within a few decades. Actions have been developed in recent years in various countries throughout the world, including Spain and some of its Autonomous Communities, for mitigation and for the adaptation of tourist activity in view of climate change. In general, the actions aimed at the fight against climate change have concentrated, above all, on energy matters, and the development of economic (environmental taxes) and territorial (sustainable planning) measures has been less evident.

The official plans for adaptation to climate change with regard to tourism in Spain and its Autonomous Communities are the National Climate Change Adaptation Plan, the state sectoral plans for the tourism sector (e.g. energy efficiency), the autonomous community climate change adaptation plans and the autonomous community tourist policy plans. These are in addition to the actions that have been introduced in recent years, by tourism companies in the private sector, as part of their policies for mitigation of the effects of climate change.

In 2006, the Spanish government, following the example of the other European countries, implemented the National Climate Change Adaptation Plan (Plan Nacional de Adaptación al Cambio Climático, PNACC) at the proposal of the Spanish Climate Change Office and the General Secretariat for the Prevention of Pollution and Climate Change of the Ministry of the Environment, with the following aims:

– To develop regional climatic scenarios for the Spanish geography.
– To develop and apply methods and tools to assess the impacts, vulnerability and adaptation to climate change in different socioeconomic sectors and ecological systems in Spain.
– To include in the Spanish RDI system most relevant needs with regard to assessment of the impacts of climate change.
– To perform a continuous process of information and communication activities regarding the projects of the Nacional Climate Change Adaptation Plan.
– To promote participation by all the agents involved in the different sectors and systems, with the aim of integrating adaptation to climate change in the sector policies.

– To prepare specific reports with the results of the evaluations and projects.
– To prepare regular reports on the monitoring and evaluation of the projects and the full National Adaptation Plan.

For the design of policies and measures for action this Plan was based on the results of the report on «Preliminary Assessment of Climate Change in Spain», prepared at the beginning of the new century and published in 2005 by the Ministry of the Environment. The main instrument of state tourism policy is the National and Integrated Tourism Plan (Plan Nacional e Integral de Turismo), 2012-2015, which is based, according to its own lines of argument, on a general view of the tourism sector, to speak of a new phase, centred on innovation and new management models, in which the diagnosis even points to the health of the clients and their relationship with the environment, but in which there is not a single reference to the possible impact of climate change as a global factor.

The inexistence of references to the topic of climate change in the tourism policy of the country makes it necessary to ascertain whether this concern is present among the governments of Spain's Autonomous Communities, which are responsible for the regulation of tourism. To this end, a review has been performed of the instruments in force with regard to tourism policy in the Autonomous Communities of the Mediterranean, owing to the strategic importance of tourism in the regional structures.

The Autonomous Communities have also developed Plans and Strategies for Adaptation to Climate Change, in which the issue of energy (emissions reduction, alternative energy forms) is foremost among the scheduled actions. In the area of the Mediterranean seaboard, all the Autonomous Communities have developed strategies of this type, which in some cases (Catalonia) are accompanied by the regular preparation of a full report on the state of climate change and its future modelling in the region in question. For the adaptation of tourism activity, a series of actions is contemplated in each region, linked to the promotion of sustainable destinations, incentives for energy and water saving measures in hotels, training actions for personnel and information on sustainability matters for the clients of tourism facilities. In general, these actions seek to diversify the tourism product and to back sustainability as a principle for action in the search for quality of the destinations, rather than specific measures for adaptation to climate change.