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The vulnerability of destinations to climate change: A comparative analysis of contextual socio-political factors

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ABSTRACT

Climate change affects tourism and tourism affects climate change. Thus, both adaptation and mitigation strategies are needed to guarantee the sustainability of destinations. As well as the direct impacts of climate change, the effectiveness of these strategies determines the vulnerability of destinations. This paper compares the Riviera Maya (Mexican Caribbean) and Alt Maresme (Spanish Mediterranean) to identify the contextual socio-political factors that influence the vulnerability of destinations to climate change. Thirty-six semi-structured interviews were conducted with key stakeholders from tourism and the environment, public organizations, NGOs, and different levels of the public administration at both destinations. This research focuses on the perception of risk and agenda setting, the stakeholders' involvement and the limitations of public action. The results show that awareness is greater, climate change is more important to the tourism agenda and private organizations are more involved in the Riviera Maya than in Alt Maresme. Five socio-political aspects are identified and discussed to explain the results: the destination's evolution; the characteristics and evolution of tourism policy; extreme meteorological events as breaking points for policies; the socioeconomic context and the dependence on tourism; and the characteristics of the tourism offer, such as the dependence on natural resources and seasonality.

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Introduction

Climate change (CC) affects the place, time and nature of tourism in some destinations, particularly of beach tourism (IPCC, 2014a). At the same time, the tourism sector is a net contributor to CC, mainly due to transport emissions (UNWTO & UNEP, 2008). Therefore, both adaptation and mitigation actions should be one of the priorities of sustainable tourism (Scott, 2011). Indeed, interest in this issue is increasing in academia (Scott & Becken, 2010) and governments. The World Tourism Organization (UNWTO) organized the first conference on tourism and CC in Djerba in 2003, and the second in Davos in 2007. The Intergovernmental Panel on Climate Change (IPCC) has included a specific chapter on tourism since 2007 (Scott, Hall, & Gössling, 2016).

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If the sustainability of destinations is to be guaranteed, the role of public action and governments in coping with the complex and transversal interaction of tourism and CC must be understood. According to IPCC (2014b), vulnerability is “the propensity or predisposition to be adversely affected.” From a contextual perspective (Füssel, 2009), this research goes beyond the physical characteristics that influence the vulnerability of destinations to CC to highlight the important role that the socio-economic and political dimensions of destinations play in addressing vulnerability to CC (Hall, 2018; Kelly & Adger, 2000; Nicholls, Wong, Burkett, Woodreoffe, & Hay, 2008; Santos-Lacueva, Anton Clavé, & Saladié, 2017a).

The governance of CC in coastal areas has to deal with considerable uncertainty, requires urgent decisions to be made and is playing for high stakes (Funtowicz & Ravetz, 1994). The complexity of the coastal system needs sophisticated institutions to carry out collective approaches that integrate values, narratives and resources of a highly heterogeneous group of actors (Bremer & Glavovic, 2013). Today, management structures are still compartmentalized and uncoordinated (Shipman & Stojanovic, 2007). In this regard, the 5th IPCC Report states “the research of the definition of the role of institutions in coastal adaptation to CC has not been adequately financed” (IPCC, 2013). Coastal institutions are often unable to develop policies that recognize the plurality of meanings of CC for stakeholders, such as the increase in water temperature for recreational users or ecologists. Thus, some scientists claim that human values and aspirations need to have greater weight in sustainability (Castree et al., 2014). In this framework, the local scale needs to be given particular importance within a trans-scalar approach so that specific adaptation measures can be implemented.

Policies are required to deal with CC in tourism destinations. The complexity, and peculiarities of CC and tourism make public action difficult and often prevent adaptation and mitigation strategies from being successful (Dodds & Kelman, 2008; Moyle et al., 2018). Depending on their contextual peculiarities, destinations deal with this problem in different ways. This research aims to identify the contextual socio-political factors that influence the governance and public action dealing with the approach taken to CC in destinations and, consequently, the extent of their vulnerability (Santos-Lacueva et al., 2017a). In particular, we focus on the perception of risk and agenda setting; the involvement of stakeholders; and the limitations of public action.

To this end, we compare two coastal destinations: Riviera Maya (Mexican Caribbean) and Alt Maresme (Spanish Mediterranean). Both regions are vulnerable hotspots in the tourism sector (UNWTO & UNEP, 2008). They are different in various respects: their evolution as destinations; the tourism offer; the socioeconomic standards of the population; and environmental sensitivity and exposure. This comparison between destinations in highly dissimilar contexts highlights the differences (and common patterns) of coping with CC from the perspective of governance and public action.

This paper contributes to the literature on sustainable tourism and CC. Although most research has focused on how CC impacts on tourism supply and demand (IPCC, 2014a; Fang, Yin, & Wu, 2018), this paper contributes to the incipient studies on tourism and CC from the perspective of political studies (Scott & Becken, 2010) by focusing on the important role of policies, stakeholders and governments in addressing the vulnerability of destinations to CC. Belle and Bramwell (2005) pointed out the effect of ideas and values on climate change policy-making in Barbados. Other studies reveal that climate change plays only a minor role in tourism strategies in Mallorca and Malta (Dodds & Kelman, 2008) and in Australia (Moyle et al., 2018). Becken and Hay (2012) assessed policy and practice and pointed out the importance of enforcing the institutional framework. This paper also helps to redress the geographical bias of research that mostly focuses on Western countries (Fang et al., 2018; Scott & Becken, 2010) by including the Riviera Maya.

The paper is divided into six sections: following this introduction (1), the two areas of study are presented (2). Then the methodology (3) and the main results (4) are explained. Finally, the research results are discussed (5) and conclusions are drawn (6).

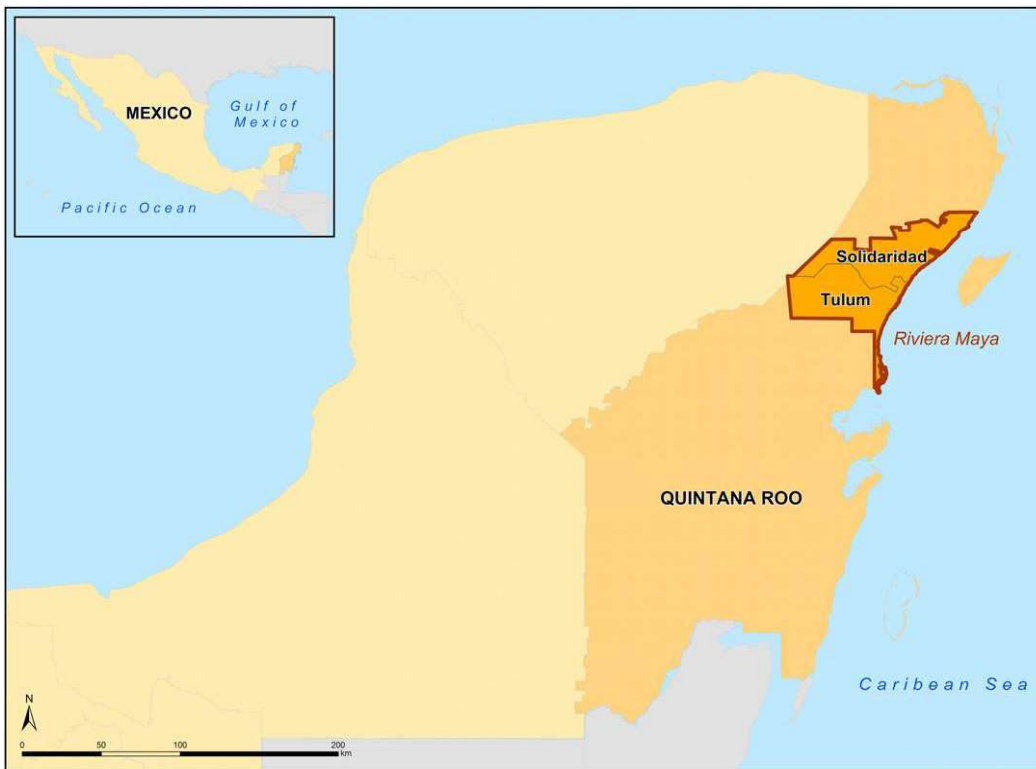


Figure 1. Location map of Riviera Maya. Source: authors.

Study areas

Riviera Maya

Tourism

Tourism is a strategic sector for Mexico's economy. In number of visitors the country ranks 8th in the world (UNWTO, 2017). The Riviera Maya is a 120 km stretch of the Caribbean coast of the State of Quintana Roo (Figure 1). It is made up of two municipalities: Solidaridad and Tulum. Of the various localities in these municipalities, Playa del Carmen, the capital city of Solidaridad, is the main tourist destination.

The Riviera Maya emerged in the middle of the 1980s because of the stagnation of Cancun and the spread of coastal urbanization from Cancun to the south (Dachary, 2008). It offers beaches of white sand, turquoise water and rich ecosystems; protected areas, such as the Mesoamerican Barrier Reef, the Tulum National Park and the Sian Ka'an Biosphere Reserve; underwater caves and cenotes; and living Mayan culture and archeological sites.

In a few years, the Riviera Maya became one of the best known coastal destinations in the world. In 2016, 4.8 million tourists arrived, there were 411 hotels and 45,217 rooms (SEDETUR, 2016). A total of 80.6% rooms were regarded as five-star or special accommodation; 74.4% were in all-inclusive hotels and most rooms (83.5%) were in hotels with more than 100 rooms (Riviera Maya Destination Marketing Office, 2017). Most tourists came from USA, Canada and Mexico (Riviera Maya Destination Marketing Office, 2017).

Vulnerability to climate change

The Riviera Maya's warm and sunny tropical climate is very attractive for tourists. However, the Riviera Maya is also exposed to extreme meteorological events, such as hurricanes and storm

surges, which might be intensified by CC (Government of Quintana Roo, 2013; IMTA & SEMARNAT, 2009; SEMARNAT, INE & CCTA, 2011; SEMARNAT, 2012). Since the advent of tourism in the 1980s, the area has been affected by four hurricanes: Gilbert (1988), Roxanne (1995) Emily (2005) and Wilma (2005).

The offer of pristine beaches sometimes misrepresents the reality of severe erosion areas (Buzinde, Manuel-Navarrete, Kerstetter, & Redclift, 2010), which are now even more prone to degradation because of the effects of CC. Between 2004 and 2012 the Riviera Maya's coastline eroded by 1.2 m/year (SECTUR, 2013). It is more intense in places such as Playa del Carmen (1.7 m/year) or Akumal (1.68 m/year). SECTUR (2013) expects a rise of 3.1 cm/year in sea level for the period 1990–2100 and qualifies the physical vulnerability of Riviera Maya as very high.

Activities such as snorkeling and diving depend heavily on the conservation of natural resources which might also be affected by CC. SECTUR predicts that precipitation in the Riviera Maya will decrease by 14.1–19.0% by 2050 and 15.4–21.9% by 2080. Temperature rises of 1.9–2.0 °C by 2050 and 2.9–3.3 °C by 2080 are also expected (SECTUR, 2013). In fact, it is possible that the deterioration of the Mesoamerican coral reef will be intensified by CC and that it will collapse between 2050 and 2070 (IPCC, 2014c). This deterioration of the Mexican Caribbean reefs is already leading to biodiversity losses. Another impact being intensified by CC is the increase in invasive species such as lion fish (Bozec, Acosta-González, Núñez-Lara, & Arias-González, 2008).

SECTUR (2013) expects that CC will damage urban areas and populations, infrastructures and environment in the Riviera Maya. Impacts on housing, tourism, communications, and energy and water supplies will lead to economic losses. Illnesses such as dengue, cholera, malaria, Zika and chikungunya are also expected to increase (SECTUR, 2013).

Climate policy framework

CC was included for the first time in the National Development Plan 2007–2012. In 2012, Mexico approved its Law of Climate Change, which gives states and municipalities the authority to take adaptation and mitigation actions. The National System of Climate Change (2014) consists of the Inter-Secretarial Commission for Climate Change, the Climate Change Council, the National Institute of Ecology and Climate Change, federal and municipal agents, and the Mexican Congress.

The Quintana Roo Development Plan 2011–2016 considers CC as a priority and includes a specific Green Axis. And for the first time in Mexico the State Program of Action on Climate Change contains a specific section on tourism. The state takes part in the Regional Strategy of the Yucatan Peninsula to reduce emissions due to deforestation and forest degradation (REDD+) and has finished its own strategy that is currently undergoing public consultation.

Municipalities have not drawn up their action plans on climate change yet, although the Government of Solidaridad is working on theirs (Government of Solidaridad, 2017). Figure 2 summarizes the main steps involved in constructing the policy framework in Mexico and Quintana Roo.

Alt Maresme

Tourism

Tourism is also a strategic sector in Spain and is 3rd in the ranking of international tourism arrivals (UNWTO, 2017). A total of 23.4% of arrivals in Spain go to the Autonomous Community of Catalonia (INE, 2018). The Alt Maresme is a coastal tourism destination located in Catalonia (Figure 3).

Catalonia has two main tourism destinations: the city of Barcelona, which has become one of the leading urban destinations in Europe in recent years and which is already suffering problems of mass tourism (Hughes, 2018); and the coastal fringe on either side. The Maresme coastal

MEXICO		QUINTANA ROO	
-Inter-Secretarial Commission for Climate Change	2005		
	2006		
-National Development Plan 2007-2012	2007		
-National Strategy for Climate Change 10-20-40			
	2008		
-Special Programme on Climate Change 2009-2012	2009		
	2010	State Commission on Climate Change	
	2011	-State Development Plan 2011-2016	
-Law of Climate Change	2012	-Technical Advisory Council of Quintana Roo	
		-Law of Climate Change Action	
-National Development Plan 2013-2018	2013	-State Program of Action on Climate Change	
		-Inventory of Greenhouse Gas Emissions	
		-Low Carbon Tourism Initiative	
-Special Programme on Climate Change 2014-2018	2014		
-National System of Climate Change			
	2015	-Regional Commission on Climate Change of Yucatan Peninsula	
-Mexico's Climate Change Mid-Century Strategy	2016		
	2017	-REDD+ (in public consultation)	

Figure 2. Climate change policy hotspots in Mexico and Quintana Roo. Source: authors.

fringe is just to the north of the city of Barcelona. For this reason – and also for marketing purposes – it has been sold in the tourism market as the “Coast of Barcelona” since 2011, to take advantage of the pull of the internationally recognized brand of Barcelona.

The Alt Maresme (Upper Maresme) is the north-eastern part of the Maresme county, located beside the renowned Costa Brava. The Alt Maresme includes four of the most touristic municipalities in the area: Calella, Pineda de Mar, Santa Susanna, and Malgrat de Mar. This 12.5 km strip of coast is mainly dominated by sandy beaches. They are especially wide in Malgrat de Mar, where the mouth of the river Tordera forms a small delta plain.

As a result of Franco's policy to develop mass beach resorts along the Spanish Mediterranean coast, international mass tourism in the Alt Maresme underwent considerable growth in the 1960s, especially in Calella, where the first big hotels were built (Vergés, 2012). The area reached maturity at the turn of the century and in recent years the tourism offer has remained stable, with a total offer of almost 50,000 tourism beds, including hotels, camp sites, and official tourist apartments. This regulated offer of tourist establishments is supplemented by a huge offer of nonregulated second homes that grew in parallel to the growth in tourism during the preceding decades and until the 2008 economic crisis in Spain. Unfortunately, it is difficult to evaluate the actual weight of this type of offer.

The Catalan Agency for Tourism certified the four municipalities as Family Tourism Destinations and the beaches are the main attraction. More than half of the tourists (56.6%) come from outside Spain (mainly from the United Kingdom, France, Germany, and the Netherlands), while the rest come from Barcelona, and other parts of Catalonia and Spain. The occupancy rates in recent years have been around 70% in the case of hotels, and 50% in the case of the camp sites (Diputació de Barcelona, 2017).

Vulnerability to climate change

The area, which includes the southern lobule of the delta of the Tordera river, has an important natural heritage. Historically it has been subjected to different pressures, which nowadays have been intensified by the increasing effects of CC.



Figure 3. Location map of Alt Maresme. Source: authors.

The Tordera river, which used to nourish the sandy areas to the south, is now transporting decreasing amounts of sediment to the coastal area (Jiménez, Valdemoro, & Sánchez-Arcilla, 2002), so most beaches of the Alt Maresme are suffering various degrees of erosion (Institut Cartogràfic i Geològic de Catalunya, 2010). The most affected are the beach of the Punta del Tordera (3.5 m/y), the beach of L'Astilleró (2.7 m/y), the beach of Santa Susanna (1.8 m/y), the beach of Pineda (1.5 m/y) and the beach of La Coma (1.3 m/y). Most of these are located in flood zones with a moderate-high risk of flooding (Institut d'Estudis Catalans, 2016), so flood management is a priority for local managers (City Hall of Malgrat, 2003; Institut Cartogràfic i Geològic de Catalunya, 2010). Jiménez, Valdemoro, Bosom, Sánchez-Arcilla, and Nicholls (2017) point out that the loss of beach space will have consequences on the recreational function of beaches, and that this will be of particular importance in the mouth of the Tordera river, in the municipality of Malgrat de Mar.

CC will also alter the temperature regime and comfort of the area: it will increase the summer dry periods because there will be fewer rainy days in the spring and summer and it will intensify the highest temperatures, heat waves and tropical nights, which will lead to a loss of climatic comfort (Institut d'Estudis Catalans, 2016).

Besides, the intense tourist activity of this destination means that seasonality is considerable, and that water will soon be scarce (Institut d'Estudis Catalans, 2016). Although the management of resources has improved during the last decade, there is a risk that saltwater will enter the Tordera aquifer due to excessive freshwater extraction (not initially caused by CC, but potentially intensified by it). Water consumption by agriculture, households and the conservation of ecological water resources and riparian communities is a strategic line of action of local governments (City Hall of Calella, 2003; City Hall of Malgrat de Mar, 2003; City Hall of Pineda de Mar, 2004).

The area is also experiencing impacts on sea biodiversity. CC is causing the meridionalization of the algal, invertebrate and vertebrate species, proliferation of gelatinous carnivorous (jellyfishes) and increased acidification of seawater (Calvo et al., 2011).

Climate policy framework

EU climate policies guide Spanish, regional and local policies. Spain established the National Climate Commission in 1992, later substituted by the National Climate Council. In the early 2000s, Spain reinforced the administrative structure and then established planning instruments such as the Spanish Strategy for Climate Change and Clean Energy 2007–2020, the National Adaptation Plan and its working programs, and the Roadmap for Diffuse Sectors 2020.

Catalonia created the Catalan Office for Climate Change in 2006, and drew up the Framework Plan for Climate Change Mitigation in Catalonia (2008–2012), the Voluntary Agreement Programme for the reduction in greenhouse gas emissions, and the Catalan Strategy for Adapting to Climate Change 2013–2020. Three reports on climate change have been published, which are very useful for obtaining regional data. The last step was the Law on Climate Change, passed in 2017.

The four municipalities approved their Sustainable Energy Action Plans, encouraged by the EU through the Covenant of Mayors for Climate and Energy (2015), which merged the previous Covenant of Mayors (2008) and Mayors Adapt (2014). The Spanish Government supports local action through the network Cities for Climate, to which Pineda de Mar belongs. Figure 4 summarizes the main steps for building the policy framework in Spain and Catalonia.

Methodology

The information sources were selected bearing in mind the contextual perspective of the research and the need to incorporate non-climatic issues into the analysis of the vulnerability of destinations to CC (Kelly & Adger, 2000; Nicholls et al., 2008). The local scale (Füssel & Klein, 2006), value-based approaches (Huebner, 2012; O'Brien & Wolf, 2010; Romagosa & Pons, 2017) and the involvement of stakeholders (Belle & Bramwell, 2005; Moreno & Becken, 2009) were also needed to highlight the contextual peculiarities that determine the vulnerability of destinations. All these factors are connected to the perception of risk, policy-making and governance, which are also a result of the destination's context (Sidney, 2007; Stevenson, Airey, & Miller, 2009).

First, we made a brief analysis of policy and scientific reports. We obtained a strategic overview by searching for climate change issues in tourism documents and tourism issues in climate change documents, and for the regional information made available about the destinations selected. Then, we interviewed key stakeholders from both destinations. Sixteen semi-structured interviews were conducted in the Riviera Maya (November 2014–January 2015) and 20 in the Alt Maresme (June 2016–January 2017).

The questions were designed to obtain information about risk perception, stakeholders' involvement, and the obstacles to dealing with CC discussed in the literature reviewed. We used both open and closed questions. The closed questions facilitate data analysis and comparison between cases. We used dichotomous questions, multiple-choice questions, rank order questions and scaled questions to give a value from 1 to 5 (see Annex I, Supplemental Material tab online). Responses were examined by combining: (1) quantitative analyses of the closed questions using SPSS; and (2) qualitative analyses of the open questions and free conversations to gain greater insight into the quantitative results.

Before the interview, we provided the respondents with research information, guaranteed them that their answers and conversations would be confidential, and asked their permission

SPAIN		CATALONIA
-National Climate Commission	1992	
	1993	
	1994	
	1995	
	1996	
	1997	
-National Climate Council	1998	
	1999	
	2000	
-Spanish Office for Climate Change	2001	
	2002	
	2003	
-Interministerial Group on Climate Change	2004	
-Commission for the Coordination of Climate Change Policies	2005	-First Report on Climate Change
-Network Cities for Climate		
-National Adaptation Plan (NAP)	2006	-Catalan Office for Climate Change
-First Working Plan of NAP		
-Pineda de Mar joins the network Cities for Climate		
-Spanish Strategy for Climate Change and Clean Energy 2007-2020	2007	
	2008	-Framework Plan for Climate Change Mitigation in Catalonia
-Second Working Plan of NAP	2009	-Calella's Action Plan -Pineda de Mar's Action Plan
	2010	-Voluntary Agreement Programme -Second Report on Climate Change -Malgrat de Mar's Action Plan
	2011	
	2012	-Catalan Strategy for Adapting to Climate Change 2013-2020 -Santa Susanna's Action Plan
	2013	
-Roadmap for Diffuse Sectors 2020	2014	
	2015	
	2016	-Third Report on Climate Change
	2017	-Law on Climate Change

Figure 4. Climate change policy hotspots in Spain and Catalonia. Source: authors.

to audio record. Interviews were in person, held in the towns where the interviewees worked, and lasted between 1 and 2 h. They were conducted in Spanish or Catalan and transcribed in Spanish. The interviews were transcribed and subject to a content analysis after they had been carefully read through several times by several researchers to detect key information and issues that explain and reinforce the results. The quotations chosen for this paper were translated into English. Quotations are cited as Participant RM (Riviera Maya) or AM (Alt Maresme).

We used five criteria to select participants, the most important of which was their role at destination, their position and affiliation. So we selected, for example, professors, directors, managers, and experts from institutions and NGOs (see positions and affiliations in Annex II, Supplemental Material tab online). The four other criteria were proportionality in their policy domain – tourism or environment –, their administrative level, their professional profile – public or non-public administration – and gender (Table 1).

Table 1. Number of participants according to selection criteria.

Criteria		Riviera Maya		Alt Maresme	
Policy domain	Tourism	9		9	
	Environment	7		8	
	Other ¹	0		3	
Professional profile	Public administration	9		12	
	Nonpublic administration	7		8	
Gender	Female	5		10	
	Male	11		10	
Administrative level	Quintana Roo State	6	Catalonia Autonomous Community	5	
	Riviera Maya Destination	4	Barcelona province	4	
	Solidaridad Municipality	4	Alt Maresme destination	4	
	Tulum Municipality	2	Calella Municipality	2	
			Malgrat de Mar Municipality	2	
			Pineda de Mar Municipality	1	
			Santa Susanna Municipality	2	
Total		16	20		

¹Governmental positions, such as mayor, which represent both tourism and the environment.

Results

The perception of risk and agenda setting

We obtained different results about the status of CC and tourism on the agendas of the two destinations. In the Riviera Maya, 75% of stakeholders consider that the authorities are already acting and 25% that authorities should act (45% and 25%, respectively, in the Alt Maresme). In the Alt Maresme, a minority (5%) thinks that it is not necessary to act now, but that it will be necessary in a few years' time. We believe that this is partly due to the fact that the perception of risk is higher in the Riviera Maya than in the Alt Maresme.

The physical features of the destinations mean that CC will affect them with different intensities and have different impacts. Hence, on a scale from 1 to 5, with 1 being the minimum and 5 the maximum, the stakeholders gave the effect that CC will have on tourism in the Riviera Maya a score of 4.1 ($SD \pm 1.4$) and in the Alt Maresme a score of 3.7 ($SD \pm 0.9$). In the Riviera Maya 56% of the respondees qualified their concern with the highest value (5) and 12.5% under 2.5. In the Alt Maresme 15% qualified their concern with a 5 and 15% with a 2.5 or less.

Figure 5 shows how participants rank the three impacts that will affect tourism the most. In both cases, the rise in sea level and extreme meteorological events were the two factors that were most mentioned. They understood that the rise in sea level would intensify the erosion caused by the coastal infrastructures and urbanization disrupting sedimentary processes.

We would first like to point out some dissimilarities. In the Riviera Maya participants are aware of coral bleaching and acidification and in the Alt Maresme they are not. In the Alt Maresme stakeholders spoke of drought and the increase in animal species, mainly jellyfish, which were not mentioned in the Riviera Maya. However, the Riviera Maya is now undergoing a severe problem with sargassum macroalgae, which is preventing tourists from using the beaches for tourist recreation. The proliferation of sargassum is related to the rise in the ocean temperature. This is a recent problem that the authorities do not really know how to cope with (Barreto, 2018 April 25) and participants probably did not mention it because it was incipient during our fieldwork.

We should also take into account that in the Alt Maresme several participants regarded the rise in temperature to be positive. This reflects a belief that it will lead to a longer season and a lack of awareness about the indirect effects. "The rise in temperature is already affecting tourism, but in a positive way, because southern destinations are getting hotter" (Participant AM). "It will not be a problem because people come here to avoid the cold in North Europe. (...) What's more, the hotter it is the more people will drink and the more money we will make. (...) Definitely, people who cannot afford to pay a long trip to the Caribbean will come here because it is cheaper" (Participant AM).

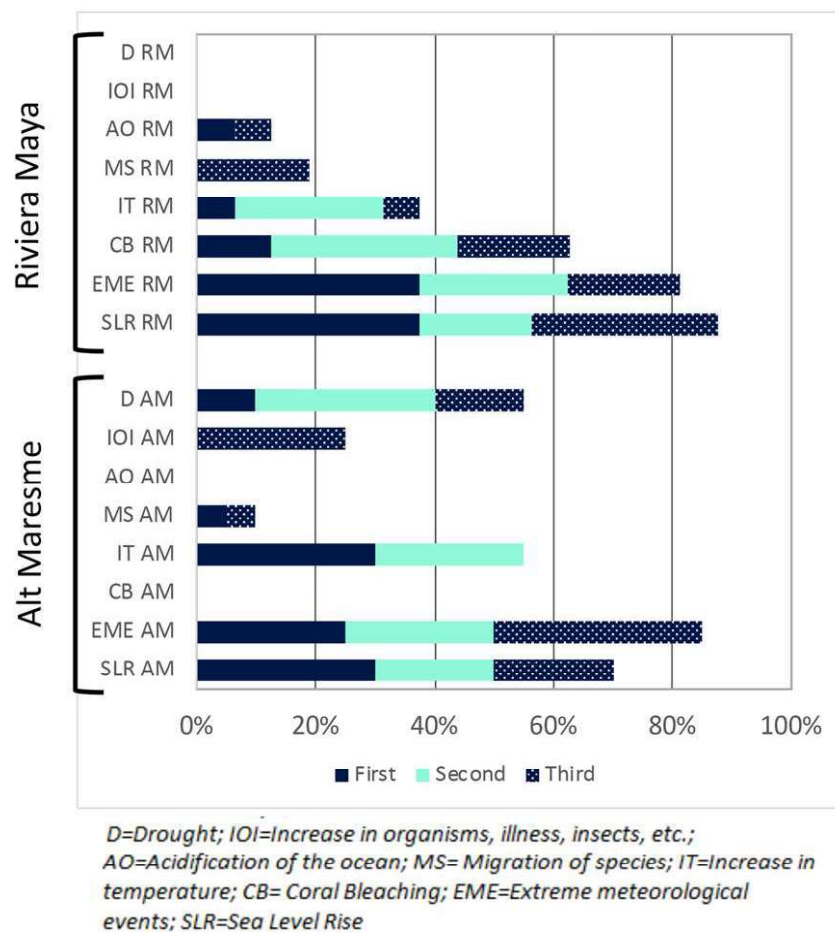


Figure 5. Most important effects of CC on tourism. Percentage of each impact considering all answers.

In fact, “in the Alt Maresme the tourist season has become longer, nearly a month and a half in autumn and a month in spring. It could be profitable, but the policy of beach services and facilities is still the same as when the season was shorter (...). There is a dysfunction.” (Participant AM). In contrast, others think that “there will be new destinations with attractive climates that will compete with us” (Participant AM) and that “the rise in temperature affected last season’s proliferation of jellyfish (...) and, logically, hotter temperatures also have implications for energy consumption because of refrigeration” (Participant AM).

Agenda setting is also affected by the temporal dimension of the problems. This is particularly noticeable in CC because most strategies are based on future projections. There are considerable differences between the two destinations in terms of what is already a problem, what will never be a problem or what will be a problem in some years’ time (Figure 6). This might explain why more measures are being implemented in the Caribbean.

Finally, we observe the perception of the risk that CC will reduce the attractiveness of destinations. In the Riviera Maya 81.3% think that the destination will be less attractive due to CC. More than half the participants agree on the following motives: first, the natural resources will degrade (75%), which will affect the quality of beaches (75%) and the appeal of underwater activities such as diving or snorkeling (68.7%); and second, tourists will have a greater perception of risk because of the higher intensity and frequency of extreme meteorological events (62.5%). In the

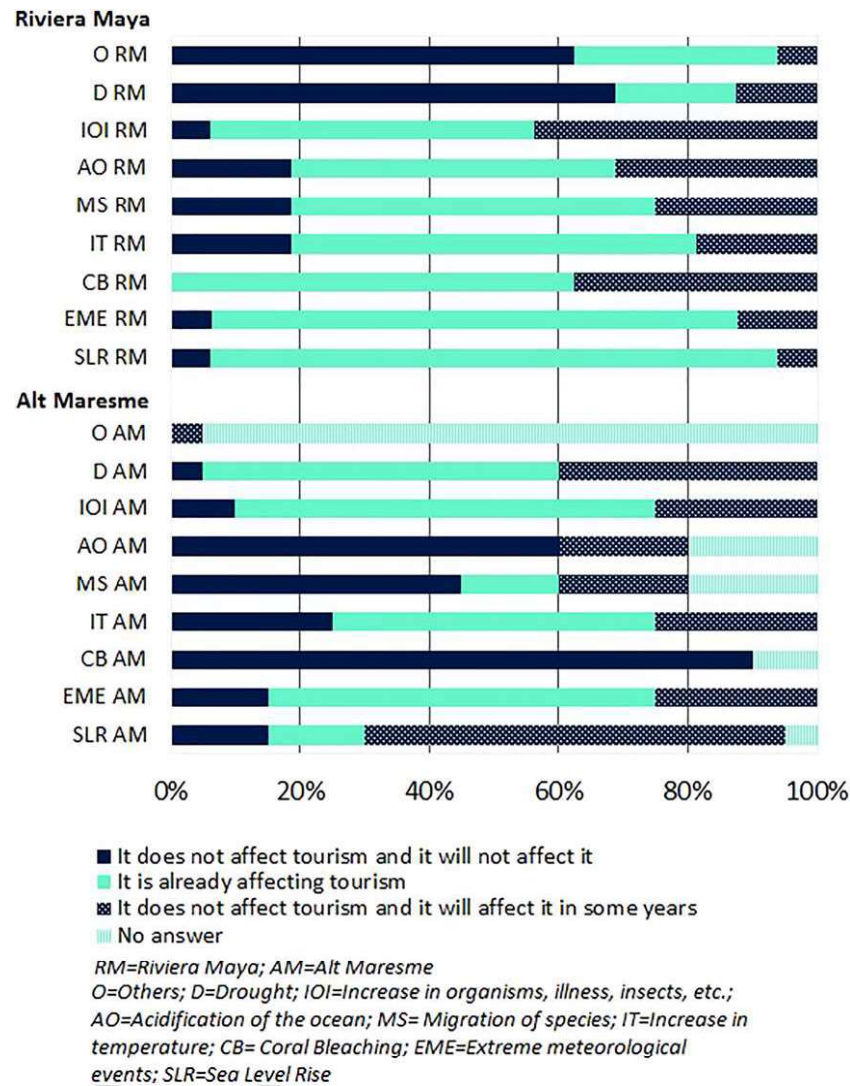


Figure 6. Temporal perception of risk. Percentage of answers.

Alt Maresme, on the other hand, 55% of interviewees consider that CC will not affect the attractiveness of the destination.

A transversal issue: stakeholders and coordination

Stakeholders

We asked participants about the three most important authorities involved in CC adaptation and mitigation in tourism. The answers for adaptation and mitigation were largely similar. The differences between the two destinations are mainly the actors involved. In the Riviera Maya, the state administration and environmental policy domain prevail (Table 2). The three organizations cited as the most important for questions of tourism-related CC in the Riviera Maya are: Amigos de Sian Ka'an, an NGO that promotes environmental protection in Quintana Roo; the Riviera Maya Hotels Partnership (AHRM), an NGO that has represented the hospitality sector since 1992 and has been responsible for the Sustainable Management Programme for Accommodation since

Table 2. Responses to the question “What are the three most important authorities involved in CC adaptation and mitigation of tourism activity?” Percentage of stakeholders mentioned in terms of administrative level, policy domain and type of organization.

		Riviera Maya							Alt Maresme						
		Administrative level							Administrative level						
		M	D	Qr	Me	I	To	M ¹	D	C	S	I	O ²	To	
A	Policy domain	T	0.0	17.0	4.2	4.2	0.0	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		E	8.5	0.0	27.6	12.8	12.8	61.7	2.3	0.0	9.1	6.8	0.0	0.0	18.2
		O ³	6.4	0.0	6.4	0.0	0.0	12.8	47.7	0.0	15.9	9.1	2.3	6.8	81.8
	Type	Pu	12.8	2.1	19.1	14.9	0.0	48.9	50.0	0.0	25.0	15.9	2.3	0.0	93.2
		Pr	2.1	14.9	19.1	2.1	12.8	51.1	0.0	0.0	0.0	0.0	0.0	6.8	6.8
Total			14.9	17.0	38.3	17.0	12.8	100	50.0	0.0	25.0	15.9	2.3	6.8	100
M	Policy domain	T	0.0	15.6	0.0	2.2	0.0	17.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		E	6.7	0.0	33.3	20.0	11.1	71.1	2.4	0.0	7.1	2.4	0.0	0.0	11.9
		O ³	6.7	0.0	4.4	0.0	0.0	11.1	52.4	0.0	19.1	9.5	2.4	4.7	88.1
	Type	Pu	11.1	2.2	15.6	20.0	0.0	48.9	54.8	0.0	26.2	11.9	2.3	0.0	95.2
		Pr	2.2	13.3	22.2	2.2	11.1	51.1	0.0	0.0	0.0	0.0	0.0	4.8	4.8
Total			13.3	15.6	37.8	22.2	11.1	100	54.8	0.0	26.2	11.9	2.4	4.7	100

M = Municipal; D = Destination; QR = Quintana Roo; Me = Mexico; I = International; C = Catalonia; S = Spain; I = International; O = Other; T = Tourism; E = Environment; Pu = Public; Pr = Private; To = Total.

¹In Catalonia municipal administration includes municipalities, counties and provinces.

²The private sector was mentioned in general with no reference to any organization in particular, so it is not possible to classify the territorial level.

³The territorial government was mentioned in general, with no reference to any particular body, so it is not possible to classify the policy domain.

2007; and the Secretariat of Ecology and Environment of Quintana Roo, a governmental authority that includes the Directorate of Climate Change.

In contrast, the Alt Maresme gives more importance to municipal authorities and to public actors. None of the tourism institutions have a name. It is also relevant that 20% of participants in the Alt Maresme were not able to identify a single organization dealing with CC and tourism, and 40% of participants, when asked to identify the three leading stakeholders, only managed to identify two.

In both destinations, it is difficult to determine who is responsible for CC and tourism. Even though the key stakeholders in the Riviera Maya were identified, none of them were regarded as the main actor. In the Alt Maresme, none of the actors mentioned are considered to be responsible for designing the strategies and 30% and 40% think that they just give indirect support to design and implementation. In both destinations, more than half consider themselves to be important to the design of strategies and, in the Riviera Maya, also to implementation. This reflects the transversality of the issue and the need for coordination between stakeholders and policy makers.

Coordination

Tourism and CC are transversal issues that need coordination and coherence across different policy domains and levels of government in order to improve the effectiveness and efficiency of related public actions and strategies (Santos-Lacueva & Velasco González, 2018). We focus on the relationship between the tourism and environmental policy domains. Both destinations reveal a common problem and the need to improve coordination (see Table 3). As one of the Alt Maresme participants stated: “We work on tourism issues, and they work on the environment. This is a problem because they may be doing something on CC and tourism but we do not know because we do not communicate (...). Moreover, town councils act individually not together”.

We also asked participants to rate on a scale of 1 to 5 whether the environmental policy domain takes tourism into account and vice versa. Scores higher than 3 indicate satisfaction

Table 3. Percentage of answers to the question (1) "What do you think about the coordination between the policy areas of environment and tourism?" And (2) "Do you think that this degree of coordination is appropriate?"

Question	Option	Riviera Maya		Alt Maresme	
(1)	Both areas are totally coordinated.	0.0		0.0	
	Both areas are mostly coordinated.	12.5		0.0	
	Both areas are coordinated in some aspects.	81.2		85.0	
	Both areas are not coordinated with each other.	6.2		15.0	
(2)	It works properly ...				
	... we do not need to improve coordination.	37.4	6.2	15.0	0.0
	... but we should improve some aspects.		31.2		15.0
	It does not work properly ...				
	... we should improve some aspects.	62.5	25.0	85.0	45.0
	... we need to improve it a lot.		37.5		40.0

while scores lower than 3 indicate dissatisfaction. In both destinations stakeholders believe that tourism issues should play a greater role in environmental policies rather than the other way around. Nevertheless, the imbalance is larger in the Alt Maresme, where 45% were not satisfied that tourism takes environmental issues into account (that's to say, they gave a score lower than 3), and 25% were satisfied (a score higher than 3). On the other hand, when asked whether the environmental domain considers tourism issues, 25% gave a score lower than 3, and 45% higher than 3.

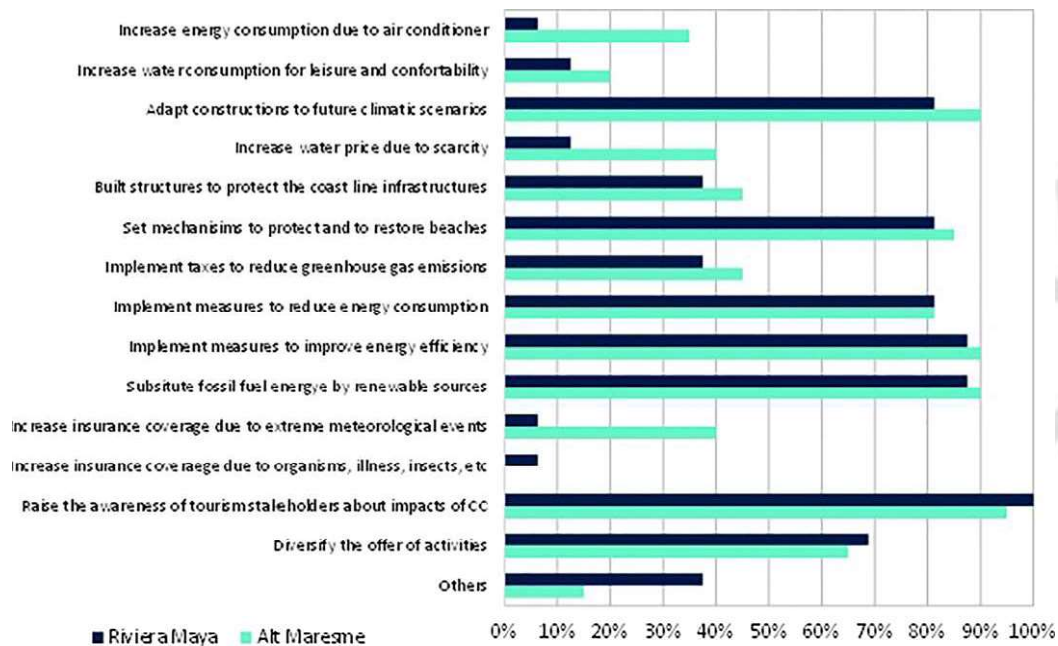
Possible strategies and limitations

Participants agree that it is important that some measures be implemented in their destinations: the awareness of tourism stakeholders needs to be raised, energy efficiency and consumption need to be improved, beaches need to be protected and restored, and constructions need to be adapted to the future climatic scenario (Figure 7). And there is controversy about whether to impose taxes to reduce greenhouse gas emissions or to build structures to protect the coast line.

Sometimes the need to transmit stability in order to attract investments determines public actions: "We have to be optimistic. CC will not affect tourism" (Participant AM). At other times, private interests prevail over public ones and politicians avoid unpopular measures. "We should increase taxes because people only understand when you touch their money (...). But this is not a popular option in the tourism sector" (Participant AM). "Politicians have to believe in it. The problem is that we, as politicians, often do not act to mitigate because we are afraid of losing votes" (Participant AM). "Restaurants and hotels are the most important lobby here, and we should be more restrictive [about waste management] but we are afraid that if we are too restrictive, they will take their business to other towns" (AM).

In the case of the Alt Maresme, seasonality complicates long-term planning. "Of the economic sectors, tourism is the most difficult (...). They are just worried about the next tourism season" (Participant AM). "To be clear, this is about day to day living (...), season to season" (Participant AM).

At other times, possible action is limited because of uncontrolled growth at the destination and the differences in the resources available in the areas for tourists and locals, as the Riviera Maya exemplifies: "Growth in this area has been uncontrolled and we do not have the capacity to manage all the waste water. It is compulsory for hotels to treat water, (...) but the population's waste is the bigger problem" (Participant RM). The Riviera Maya needs more governmental involvement and stricter norms. "If I am honest, the lack of commitment by all stakeholders makes the adaptation process very slow, and this is a risk [for the attractiveness of the destination]" (Participant RM). In fact, some participants explained that they are using "Tulum as a flagship case because it has not yet started its accelerated development and it is a chance to plan according to accepted international standards" (Participant RM).



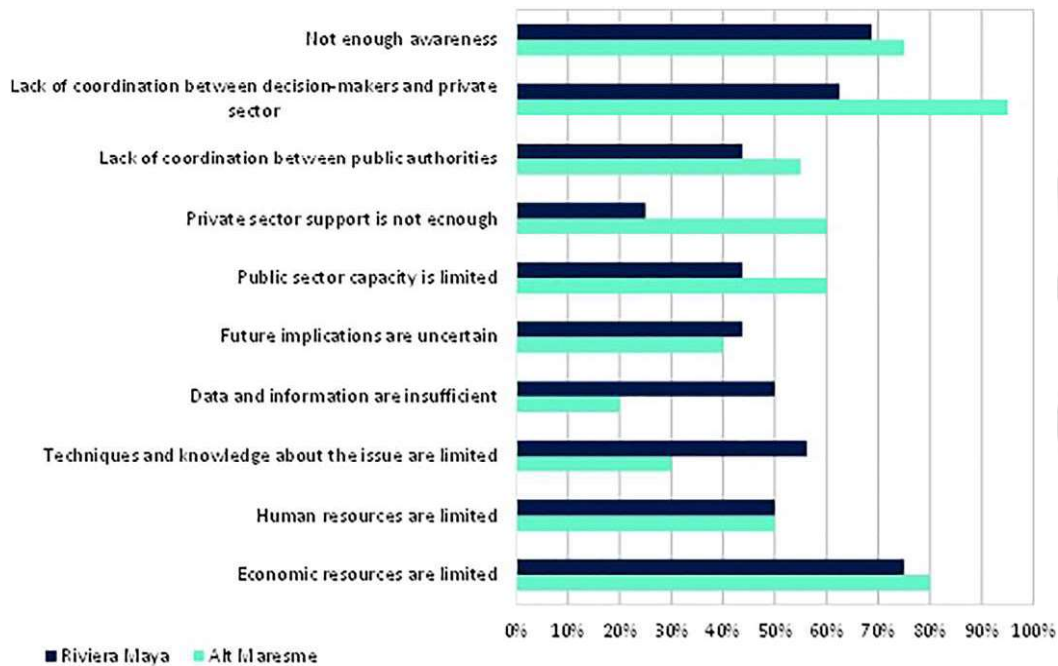
Q5 Figure 7. Agreement to implement measures. Percentage of affirmative answers.

Figure 8 shows other obstacles to successfully dealing with CC when managing tourism. There are various common problems such as limited economic resources, insufficient awareness and lack of coordination between decision makers and the private sector. Nevertheless, socio-economic standards are very different between Spain and Mexico (UNDP, 2018).

Traditionally CC has not been an issue on the agenda of Spanish tourism (Olcina-Cantos & Vera-Rebollo, 2016; Santos-Lacueva & Velasco González, 2018), and there is a lack of awareness in both private and public sectors. "I have to say that it is very difficult to involve the private sector, and for this issue I tell you that they will not get involved. They will ask for solutions, but I do not imagine hotel chains discussing dykes against a rise in sea level (...). They may collaborate with little strategies to improve the aesthetics of the seafront, or promotion activities, but there is no awareness about how this [CC] will affect their business." "As a public administration, we should put this issue on the agenda, and set up a plan to act" (Participant AM).

Because of this lack of awareness, some measures do not always respond to mitigation and adaptation motivations. "The sector invests in efficiency and energy saving and it is supposedly designed to mitigate emissions, but actually it exists for economic reasons and saving" (Participant AM). "Everything related to the reduction of consumption, reutilization... is in favor of CC. But I don't think that they do it because of CC" (Participant AM). Moreover, there is a gap between academia and management. For example, "There is a lot of academic work, but management don't get to hear of it" (Participant AM). "I think that we have a lot to do. We have to start work. In fact, this interview is the first step in thinking about it, because we have a lot to learn and we need a lot of information. In fact, we do not receive this kind of information" (Participant AM).

There are two major differences between the two destinations. The first is that much more is known and more data is available about European destinations than destinations in the Caribbean (Scott & Becken, 2010), which coincides with stakeholders' responses in both locations (Figure 8). Second, previous results about the greater involvement of private stakeholders in the governance of CC and tourism in Riviera Maya than in Alt Maresme (section "Stakeholders") might explain why the answers in the two destinations about the private sector were different.



Q5 Figure 8. Obstacles to dealing with CC. Percentage of affirmative answers.

Discussion

This research shows that the efforts of the two destinations to deal with CC and tourism have three main common problems. First, the nature of CC as a political problem makes difficult the effectiveness of political strategies (Tomkins & Adger, 2005). This research shows local-scale difficulties because of the lack of regional information and expert knowledge. Second, the characteristics of tourism trigger conflicting demands and values that make agreement difficult, for example, on decision-making, choice of strategy and implementation, as has been pointed out, for example, by Kuvan and Akan (2012), Needham, Szuster, Mora, Lesar, and Anders (2017) or Øian, Aas, Skår, Andersen, and Stensland (2017). And finally, there is a lack of awareness in both destinations as has been shown in other cases (i.e. Dodds & Kelman, 2008).

Nevertheless, our comparison reveals a greater presence of tourism-linked CC on the agenda, and more awareness and more involvement of the private sector in the Riviera Maya than in the Alt Maresme. Although the impact of CC is more intense in some destinations, five fundamental socioeconomic and political aspects need to be considered if the vulnerability and sustainability of destinations is to be addressed.

Development and evolution of destinations

How a destination has evolved determines the role of stakeholders and their power relationships (Sanz-Ibañez & Anton Clavé, 2014). The development of both the destinations studied and their organizations might explain differences in the involvement of private and public stakeholders. The Riviera Maya first started to be developed in the mid-1980s due to the success of Cancun. It became an integrated managed destination in 1997 when the Riviera Maya Destination Marketing Office was set up. However, the AHRM has existed since 1992. In contrast, although the state of Quintana Roo was created in 1974, Solidaridad and Tulum, founded only in 1993 and 2008 respectively, have much shorter histories. And they also have to deal with problems derived from rapid, and sometimes uncontrolled, development (Pi-Sunyer & Thomas, 2015).

In the Alt Maresme, local tourism has existed since the beginning of the 20th century, taking advantage of its proximity to and good communications with Barcelona. International mass tourism burst onto the scene in the 1960s because of Franco's policy to promote mass tourism on the Spanish Mediterranean coast and the islands (Velasco González, 2004). The State and public authorities have played a much stronger role than in the Riviera Maya. The regional and local institutions have been involved for longer than tourism organizations. Nevertheless, in the Alt Maresme some hotels are already adopting adaptation and mitigation criteria, as they are in other coastal Spanish destinations studied by Olcina Cantos and Vera-Rebollo (2016). However, the reason they do so is to reduce economic costs and improve brand image, as Dodds and Kelman (2008) have pointed out for Malta and Mallorca.

Characteristics and evolution of tourism policy

The characteristics and evolution of tourism policy are also linked to the development of destinations. Policy path dependency and institutional inertia affect whether issues such as CC are put on the agenda (Santos-Lacueva & Velasco González, 2018). In Spain, tourism policy started in the first half of the 20th century, when sustainability and environmental conservation were not on the international agenda. With the exception of the innovative Plan 2020, which was active from 2008 to 2012, and which included CC challenges and sustainability as transversal criteria (Santos-Lacueva, Anton Clavé, & Saladié, 2017b), tourism policies in Spain have evolved without major changes (Ivars Baidal, 2004; Velasco González, 2004). The conservation of environmental resources has not been a priority since the beginning of coastal tourism in Spain (Velasco González, 2004). In the Alt Maresme, as in other Spanish destinations, development sought quantity not quality, which affected the sustainability of these destinations, now massively urbanized (Vera Rebollo & Ivars Baidal, 2003). The challenge of CC first appeared on the international governmental agendas in the 80s, but it is unlikely that it will be added to the continuing, well-established tourism agenda (Santos-Lacueva & Velasco González, 2018). Even in recent years, when there have been local and private initiatives in the tourism sector, Spanish tourism policies reveal a lack of awareness (Olcina Cantos & Vera-Rebollo, 2016).

In Mexico, the Directorate of Tourism was created in 1958 and the first Tourism Development Plan was drawn up in 1963. Despite the rapid development of tourism, it was not a balanced phenomenon along the coast. Quintana Roo was a marginalized area until the 70s, when both the state and Cancun came into being. The Riviera Maya was developed in the 90s when sustainability and environmental issues were becoming increasingly important on international agendas and social awareness was also rising. In fact, Quintana Roo's Development Plan (1990–1993) differentiated the establishment of the Riviera Maya from the massive offer of Cancun by promoting nature, exclusivity and natural heritage. The presence of its older, next-door neighbor Cancun, which started to suffer the undesirable effects of inappropriate planning earlier (e.g. coastal erosion, lower prices, and insecurity) has made it easier for environmental issues to be added to the agenda. Cancun is present in participants' explanations about what to avoid. In 2014, the Global Sustainable Council designated the Riviera Maya as an Early Adopter destination due to its commitment to sustainability in tourism planning. In 2015, the Riviera Maya's Sustainability Council was set up, consisting of public administrations, NGOs and the private sector. However, this does not mean that serious environmental problems have been eliminated (Córdoba Ordoñez & García de Fuentes, 2003).

Extreme meteorological events: a breaking point for policies

Sanz-Ibañez, Wilson, and Anton Clavé (2017) claim that some moments can act as a catalysis for change in the evolution of destinations. In this respect, hazards such as Hurricane Wilma (2008)

in Riviera Maya might be the breaking point for tourism policies. Wilma was the most violent hurricane recorded in the history of tourism in this destination (IMTA & SEMARNAT, 2009). However, some of the stakeholders interviewed consider that Wilma reinforced the destination because it triggered a greater perception of risk and awareness, and prompted changes to new developments (Lopez, 2014). This can be seen, for example, in the proposals made to the Guide for Planning, Design and Sustainable Construction in the Mexican Caribbean, launched by SEDEUR, Amigos de Sian Ka'an and MARTI in 2012.

In contrast, the Alt Maresme is also exposed to extreme meteorological events but less intensely and less frequently (Institut d'Estudis Catalans, 2016). So, CC is regarded as a gradual, sometimes invisible, phenomenon. Nevertheless, in 2008 the area was battered by the strongest storms recorded in 25 years (Sanchez-Vidal et al. 2012). Further research will determine whether this might modify the political agenda.

Socioeconomic context and dependence on tourism activity

The greater the dependence is on tourism, the greater the political will is to incorporate tourism issues in other policies (such as climate). For the State of Quintana Roo, the Riviera Maya represents 42.8% of all tourists, 42.7% of hotels and 46.3% of rooms (SEDETUR, 2016). Tourism is so crucial to Quintana Roo's economy that just hospitality and catering services accounted for 21.4% of the GDP in 2014 (INEGI, 2016). Tourism in the state brings in 38.5% of foreign currency income for the whole of Mexico (SEDETUR, 2016). So, most policies and decisions take tourism into account.

However, the lack of basic services and poverty in the Riviera Maya makes it difficult for environmental conservation to become a priority. The rapid growth and urbanization associated with tourism and the housing market (Camacho Lomeli, 2015; SEDUVI, 2017; Sosa Ferreira, 2014) make it difficult to plan and manage the region (Murray, 2007; Torres & Momsen 2005; Wilson 2008). Certain challenges need to be risen to: social inequalities, the contrast between luxury and poverty and between urban and rural areas, basic service deficiencies, security in local areas and the still marginalized Mayan inhabitants (Government of Solidaridad, 2016c; Government of Tulum, 2016).

In the Alt Maresme the dependence on tourism is also high, but in the regional and national context this dependence is not as strong as in the Riviera Maya. For example, the Alt Maresme represents 9.8% of the hotel beds in Catalonia, and 5% of all the beds available (IDESCAT, 2017). Catalonia receives 23.4% of all tourists coming to Spain.

The characteristics of the tourism offer: dependence on natural resources threatened by climate change and seasonality

Our results have shown that the greater the dependence is on the natural resources threatened by CC, the greater the perception of risk is and the greater the political will to address environmental sustainability and CC. However, there might also be positive opportunities for tourism (Glantz, 1995).

Moreover, the perception of risk is intensified by this rapid development of tourism in the Riviera Maya, which has intensified the degradation of key natural resources for tourism in recent years (Brenner, Engelbauer, & Job, 2018) and which arguably may be the reason why site stakeholders perceive that conservation and sustainability are a means to preserving income. To respond to this reality, destination planners are presently diversifying the offer with products that do not depend on coastal resources, such as Maya Ka'an, the new Mexican Caribbean destination, launched in 2014, which takes advantage of the natural resources of the Sian Ka'an

Biosphere Reserve and the Mayan culture and legacy. Other strategies include the collaboration of AHRM with the State to inventory the footprint of hotels and the prohibition of nonbiodegradable sun creams by most businesses.

On the other hand, the Alt Maresme is a family coastal destination and it does not depend as much on natural resources as the Riviera Maya. Moreover, the tourism model of the Alt Maresme is more seasonal than Riviera Maya's. Tourism establishments are almost full in July and August, but most of them close in the winter. This reinforces traditional short-term planning in tourism, which is not compatible with long term strategies, such as mitigation and adaptation, and calls into question the sustainability of the destinations (Santos-Lacueva et al., 2017b).

Conclusions

This paper has compared two coastal destinations – Riviera Maya (Mexico) and Alt Maresme (Spain) – with the purpose of identifying the contextual sociopolitical factors that determine the vulnerability of destinations to CC. By carrying out 36 semi-structured interviews with key stakeholders, this research has revealed that the private sector is more aware and more involved in the tourism agenda and that CC has more weight in the Riviera Maya than in the Alt Maresme. Although the impact of CC is greater in the Riviera Maya, five socioeconomic and political factors might explain these results: the destination's evolution and development; the characteristics and evolution of tourism policy; extreme meteorological events that serve as breaking points for policies; the socioeconomic context and the dependence on tourism; and the characteristics of the tourism offer, such as dependence on natural resources and seasonality.

The contribution made by this research is that it identifies and describes five socio-political factors that influence the vulnerability of destinations to climate change. In practice, the greater the understanding of these features is, the more able we will be to design and implement adaptation and mitigation strategies so that tourism destinations will be less vulnerable and more sustainable. Decision-makers and policy-makers should consider these factors so as to detect the advantages and disadvantages of a destination's socio-political context and improve the effectiveness and efficiency of policies.

This paper also contributes to the increasing literature on CC and tourism (Fang et al., 2018), and covers the geographical gap in the Caribbean area and the gap in the research about policies (Scott & Becken, 2010). Whereas the existing literature focuses largely on the physical aspects of CC, this paper reveals the importance of socio-political aspects. It also contributes to the gap in studies on tourism policies by focusing on the governance of climate change and the agenda at tourism destinations (Dredge & Jamal, 2015). In general, the research contributes to the sustainability of tourism and the sustainable development of tourism by pointing out key nonclimatic stressors that determine the success of adaptation and mitigation strategies (Scott, 2011).

As a by-product, the research raised the awareness of the stakeholders interviewed as a consequence of the spread of scientific information. Further research could provide greater insight into each of the five socio-economic and political characteristics detected in this paper. Moreover, future research will analyze how key stakeholders take into account the potential positive impacts of climate change, as Glantz (1995) pointed out.

Disclosure statement

No potential conflict of interest was reported by the authors.

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