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# **Rising temperatures and dwindling water supplies? Perception of climate change among residents of the Spanish Mediterranean tourist areas**

## **Abstract**

In this paper we discuss the results of a survey on the perception of climate change in the 14 “tourist zones” (as defined by the Spanish Statistical Institute, INE) that stretch from the French border to Gibraltar alongside the Spanish Mediterranean coast, including the Balearic Islands. Our sample consisted of 1014 telephone interviews stratified according to the number of tourists staying in each zone. Respondents showed concern for the likely impacts of climate change on jobs and thought that climate change would reduce the economic activity of their areas. Responses were also pessimistic regarding future water availability but agreed with the development of alternative sources such as desalination and water re-use. Household size, educational levels, and employment tended to be the most significant statistical explanatory factors regarding attitudes towards climate change. Respondents in larger households (a variable not tested in the literature as far as we know), respondents with higher education, and respondents working for a wage tended to express more concerns than the rest.

**Key words:** climate change, perception, water, tourism, Mediterranean, Spain.

## **1. Introduction**

The relationships between climate change and tourism are subject of increasing attention in the last years (Amelung et al, 2007; Gössling, 2002; Gössling and Hall, 2006; Hall and Higham, 2005; Schott, 2010; Scott et al, 2012a; Scott et al, 2012b). In terms of GHG emissions it is argued that the sector could be a future major source of GHG mostly because of trends in air travel (Scott et al, 2010). Moreover, the impacts of climate change upon certain tourist activities may be significant especially in areas where these activities have become the backbone of the economy (Jones and Philips, 2011). In the Mediterranean basin, not only average temperatures are expected to increase (JCR, 2009), but also precipitation is projected to decline during the 21<sup>st</sup> century adding extra stresses to water availability (Bates et al, 2008). While the increase in temperature might not have negative impacts on tourist demand in coastal areas directly (Gómez-Martín and Martínez-Ibarra, 2012; Rutty and Scott, 2010), climate change impacts on water resources, on the other hand, may be significant due to likely reductions in precipitation. Should water availability for tourism decrease, tourists could abandon Mediterranean destinations with devastating consequences. For instance, water shortages in Benidorm in the late 1970s caused a drastic decline in the previously important flux of German tourists to this popular Spanish resort (Gil Olcina, 2010).

Climate change constitutes an issue of concern for the public, although the degree of such concern varies among groups who conceptualize climate change in different ways (Buys et al, 2012; Ford et al, 2010; Otto-Banaszak et al, 2011). In reviewing 15 years of research on public opinions at both sides of the Atlantic, Lorenzoni and Pidgeon (2006) found widespread preoccupation at a general level but smaller worries at the personal level where other risks appeared as more pressing. Likewise, there are perceptions stressing moderate impacts felt mostly away from where one lives (Leiserowitz, 2005); attitudes of skepticism (Withmarsh, 2011) and, finally, attitudes reflecting an open

denial of the issue (McCright and Dunlap, 2011). Although evidence seems inconclusive and sometimes contradictory, education, gender, age and political affiliation remain relevant factors in explaining attitudes as are other factors such as the information available or the level of trust in science and scientists (Agho, 2010; Kellstedt et al, 2008; Kvaloy et al, 2012; Leiserowitz, 2005; Poortinga et al, 2011; Tàbara et al, 2010; Tàbara and Miller, 2011; Weber, 2010).

Issues examined in the case of tourism include the likely impacts of climate change on tourist demand as well as factors behind these impacts (Gössling et al, 2012). The awareness of climate change by the tourist industry has been examined, among others, by Dubois and Ceron (2006), Saurí and Llordés (2010), Hoy et al. (2011) or Brouder and Lundmark (2011). Studies using a regional perspective found out that the areas showing a greater awareness of the effects of climate change are also areas, such as the Arctic, the Florida Keys or the ski resorts of Colorado or the Alps, where impacts on tourist-based economies may be felt more acutely (Hamilton and Keimb, 2009; Mozumber et al, 2011). Awareness, however, does not automatically translate into action possibly because of major uncertainties on the specific nature and timing of impacts at local and regional levels (Dubois and Ceron, 2006) and the complex interactions between climate change, and all other factors relevant for tourist related decision making (Gössling and Hall, 2006). Eventually, climate adaptive action may also depend on the type of policy incentives being developed, the options and resources available and the kind of institutional arrangements that will distribute rights and responsibilities derived from the new social-ecological situation (Tàbara et al, 2010).

The paper may contribute to the literature on the perception of climate change in at least three ways. First, it focuses on the perception of the population living in areas where tourism is a key component of the local economy. Second, the study addresses one critical aspect derived from climate change, which is increasing water stress in certain tourist destinations caused by declining precipitation values. Finally it takes as an example a Mediterranean area known for its strong specialization in mass tourism during the last decades with lessons that may be of interest for other tourist areas.

## **2. Tourism, Climate Change and water: relevance for Spain**

In 2011, Spain received 56.9 million tourists, contributing to near 15 percent of the Spanish GDP and providing direct and indirect jobs to almost 13 percent of the Spanish active labor force. The country ranked fourth in the world in terms of visitors, and second in terms of economic gains with some 60 billion dollars or about two thirds of the deficit of the Spanish Balance of Payments (World Travel and Tourism Council, 2011). Thus, in 2011, tourism was the most dynamic sector of the Spanish economy and the only sector able to create new jobs (Exceltur, 2012). About three quarters of Spanish tourism concentrates in beach and coastal resorts, especially along the Mediterranean coast, and in the Balearic and Canary Islands. In these areas, the economic weight of tourism is even more pronounced and, for example, it may represent up to 50 per cent of the regional GDP, and about a third of the labor force in the case of the Balearic Islands.

Tourist activities along the Spanish Mediterranean coast may be exposed to the negative effects of climate change in at least three ways (Amelung and Moreno, 2012; Hein et al, 2009; Olcina, 2012). First, the loss in comfort associated with higher temperatures in summer; second, the increase in atmospheric extremes (especially storm surges destroying beaches and beach related infrastructures), and third, a reduction in precipitation, and therefore of available water supply in rivers and aquifers (Calbó et al,

2010; Lorenzo-LaCruz et al, 2012). Increasingly insufficient and unreliable water resources may threaten the viability of Mediterranean tourist destinations. Nevertheless, high uncertainties surround the occurrence of such scenarios, mostly because they tend to ignore likely changes in adaptation, both purposeful and non-purposeful (Olcina, 2012). For example, it is not clear that increasing temperatures may stop significantly the flow of tourists to the Spanish Mediterranean beaches. The very hot summer of 2003 in most of Europe (one that could be representative of the summers late in the 21<sup>st</sup> century) did not have any effect in beach tourist destinations and the heat was not perceived as a deterrent factor by tourists (Gómez Martín et al, 2013). In many areas, the presence of air conditioning appeared to be crucial for tourist comfort. Regarding water supply, adaptation may involve the use of alternative resources such as desalination, which is already the main source of potable water for the Balearic and the Canary Islands. On the other hand, however, climate change may also have positive effects for tourism, extending the beach season into spring and autumn or increasing the attractiveness of certain tourist areas over potential competitors (Maddison, 2001; Moreno and Amelung, 2009). This too might also increase the pressure on available water resources..

In Spain and according to surveys carried out in 2006 and 2007, a broad majority of citizens (around 70 percent) saw climate change as a very serious problem, compared to 45 percent in Britain or 47 percent in the United States (Pew Research Project 2007; Real Instituto Elcano, 2006). Moreover, a large proportion of respondents thought that climate change could be attributed to human action and that public policy was not doing enough to attack the problem (Fundación BBVA, 2008). According to a survey by an environmental NGO, these views do not appear to have been altered by the current economic crises (Ecologistas en Acción, 2011). However, and as Tàbara (2010, 983) argues, the perception of climate change tends to vary according to scale and the immediacy of concerns. Thus, when asked about the most relevant problems faced by the world, 28.4 percent of respondents in a Spanish survey mentioned climate change. But this figure fell to 6.7 percent when the geographical reference was Spain and to 2.9 percent when the geographical reference was the locality where respondents lived. These results show that the public in general may feel relatively more insulated from the impacts of climate change than it is from other concerns. In this sense, it could be interesting to test whether certain contexts and activities are more conducive to increased perceptions and actions regarding climate change especially in what concerns impacts on available water supplies in tourist areas. Likewise it would be interesting to test also the perception on the effects of potential actions of adaptation to increasing water stress.

As Essex et al. (2004) or Deyà Tortella and Tirado (2011) have already pointed out there is a dearth of scholarship on the importance of water for tourist development. Water shortages, exacerbated by the phenomenon of climate change might, as Essex et al. (2004) warn, deeply disturb the development of a tourist destination. Indeed in the Spanish context, the water-tourism nexus is a key factor, and the Balearic Islands epitomize this problem (Kent et al. 2002; Garcia and Servera 2003; Essex et al. 2004; Deyà Tortella and Tirado 2011). At the same time Essex et al. (2004) point out the little research done on the relations between tourism and the production of water scarcity in destination populations. The inequities between tourists and locals and between different water users might be a source of conflict (Cole 2012). According to Deyà Tortella and Tirado (2011) tourist water demand in Spain is estimated at 440 litres per tourist per day, a figure that may double local water demand Furthermore, the

seasonality of this consumption even puts extra pressure on the system. This consumption varies largely depending on the typology of lodging and land use (Rico-Amorós et al. 2009).

### **3. Materials and Methods**

The study area includes 14 out of the 16 “tourist zones” (as defined by the Spanish Statistical Institute, INE) of Mediterranean Spain (see Map 1). Because of their specific socio-economic and urban dynamics we have not considered the two zones that coincide with the metropolitan areas of Barcelona and Valencia

This area enjoys a fairly typical Mediterranean climate with warm summers ideal for beach tourism. Precipitation tends to decline from North (around 600 mm/year) to South (300 mm/year and less). Subsequently, water resources are often insufficient given the demand of irrigated agriculture and urban and tourist users. In certain areas water demand is satisfied via inter-basin transfers and, increasingly, by desalination plants. Some 28 million tourists stayed in Mediterranean Spain in 2008 (INE, 2010), especially in the large beach resorts of the Costa Brava, Majorca, Costa Blanca and the Costa del Sol. During the last decade and as an important component of the Spanish real estate boom, residential tourism in the form of sprawling settlements, occasionally accompanied by golf courses around the major tourist centers, has become a distinctive feature of this area. Regarding socioeconomic characteristics, there exists a certain but not exaggerated income gradient in which the richest areas in average are located in the North and the Balearic islands where the less affluent are located towards the South. Furthermore, in some of the areas, and very especially in the Balearic Islands, Costa Blanca and Costa del Sol we find large contingents of European immigrants (especially retirees).

Our sample consisted in 1014 telephone surveys carried out in September 2011 in the most important tourist centre of each zone. The number of tourists staying in hotels in each zone in 2008 was used as a stratifying factor (Table 1). However, we acknowledge that some zones might be slightly overrepresented and others slightly underrepresented for different reasons. First, data used did not take into account tourists staying in other type of lodgings. Second tourist flows vary from one year to another (see a recent update on tourists flows for 2012 in table 1). Third, in a few cases there may be a slight mismatch between the total number of tourist and sample numbers of surveys because of technical problems with the telephone calls. These acknowledged limitations notwithstanding we argue that the sample reflects in a very high degree of accuracy the importance of each tourist zone. The survey included 10 questions formulated through statements to which respondents had to show their degree of agreement (or disagreement). We used a five-point Likert scale to codify the answers: “totally agree”, “agree”, “indifferent”, “disagree”, and “totally disagree”, including also the options “no answer” and “prefer not to answer” (see figure 1). Our selection of questions attempted to be consistent with the themes explored in the literature, and, therefore, our questions are similar to questions asked in the surveys by Agho et al (2010) or Mozumbo et al (2011). We assumed that respondents have certain knowledge of climate change (which is, at least partially, corroborated in recent surveys, see, for example *Ecologistas en Acción*, 2011). We acknowledge the limitations of not asking open questions (e.g. what do respondents understand as climate change) and also of associating the statements to negative effects of climate change. These limitations notwithstanding, we argue that

statements were based on scientifically accepted impacts of climate change which we attempted to convey in a neutral way to avoid a bias in the survey.

Besides questions concerning the perception of climate change, we obtained other data concerning:

- Gender (male/female)
- Age of the respondent (open) and age group of household members (0-10, 11-25, 26-60, more than 60 years)
- Household size (number of people living in the same home, open response)
- Employment status (employed, self-employed, student, unemployed, housework, retired)
- Level of education (basic, primary school, secondary school, technical college, university)
- Household income per year (less than 12,000 Euros, 12,000-24,000 Euros, 24,000-48,000 Euros, 48,000-96,000 Euros, and over 96,000 Euros)
- Residence in the municipality (always/not always)
- Location of residence (urban, suburban)

The margin of error for the results of the surveys was  $\pm 3.09\%$  under the assumption of maximum indetermination ( $p=0.5$ ) and a confidence interval of 95.5%.

In addition to data concerning the characteristics of respondents and their perception of climate change, we have also include for comparative purposes the results of a study on the vulnerability of Spanish Mediterranean Coast to water shortcomings induced by climate change (Saurí et al. 2011). In this study, the combination of exposure, sensitivity, impact and adaptive capacity (ESPON Climate, 2011) resulted in specific vulnerabilities for the different tourist areas. In table 2 we present the indexes that (with the exception of exposure) will be used in this comparative analysis.

Together with the descriptive statistical analysis, we also carried out analyses of statistical inference in order to determine the effects of socio-demographic, economic, or geographical variables in the responses to questions. For that purpose factor analysis and Generalized Linear Models were used.

#### **4. Results**

Of the 1014 surveys carried out, 343 were responded by men (33.8 per cent) and 671 by women (66.2 per cent). Over 40 per cent of the interviewees were either employed or self-employed; around one third were retired, and 10 per cent were house-workers. The average age of respondents was 51.72 years, and ages ranged from 18 to 90 years. Concerning the level of education, there were similar proportions of respondents with primary studies, secondary studies and university degrees.

The average household size was 2.92 persons. The sample was roughly divided by half in terms of people living in urban (57.4 per cent) and suburban (41.4 per cent) environments. 43.7 per cent of respondents stated that they had always lived in the same municipality; while for the group of “newcomers” the average years of residence in the municipality was 33.69 years. Finally, over half of the respondents declared annual household incomes below 24,000 Euros.

In table 3 we present a summary of the answers to the questionnaire. Respondents generally agreed (62 per cent) or totally agreed (13 per cent) that climate change would affect their area of residence. However, some tourist zones, such as Costa Tropical, Maresme or Garraf showed higher percentages of scepticism. When asked about the effect of climate change on the decrease of rainfall, respondents who disagreed or totally disagreed were 21.9 per cent of the sample, while slightly more than half agreed or totally agreed with the statement. Again, Costa Tropical presented a higher number of people disagreeing. Respondents from Costa del Sol also manifested a relatively high discrepancy with the statement as well.

When confronted with the statement that climate change would harm tourist-related jobs, 45 per cent of the sample disagreed and 2.1 per cent totally disagreed. Again, Costa Tropical and Maresme showed the highest degree of disagreement. In relation to the effects of climate change in reducing tourist infrastructures, over half of the respondents disagreed. Once more, Costa Tropical, Maresme and Garraf topped the zones in terms of disagreement. Among the most important zones, the Costa Blanca showed the highest discrepancy with the statement. The perception that climate change will affect future urban growth presented a balanced distribution with 42.3 per cent of respondents disagreeing or totally disagreeing with the statement and 43.7 per cent agreeing or totally agreeing. Palma-Calvià, the most important tourist zone of the Balearic Islands, registered the highest percentage of respondents recognising the likely negative effects of climate change on tourist infrastructures. At the opposite side, Costa Tropical, Garraf and Maresme appeared again as the more sceptical zones regarding this statement.

In relation to water availability for the tourist sector, over 70 per cent of respondents considered that climate change would reduce the water resources available in their zones. This question also showed the lowest percentage of respondents answering that they did not know (4.9 per cent). Garraf appeared as the zone more prone to acknowledge the effects of climate change on water availability. Among the larger zones, Costa Blanca, ranked first in acknowledging the difficulties that climate change would create for tourism regarding water availability.

The statement that climate change would reduce economic activity in the tourist zone was controversial (39.8 per cent agreed and 6.9 per cent totally agreed, while 36.5 per cent disagreed and 1.4 per cent totally disagreed). Costa Blanca appears as the zone that most recognized the effects of climate change on economic activities. Respondents in the Costal del Sol also showed considerable support for the statement.

Concerning desalinated water as a technological solution to alleviate diminishing water availability, over 75 per cent of respondents agreed or totally agreed. In Palma-Calvià this figure jumped to 82.9 per cent whereas for Alcúdia, also in Majorca, fell to 55.5 per cent. Some 78.9 per cent of respondents agreed or totally agreed with the statement that reclaimed water could contribute to alleviate diminishing water availability due to climate change. Again in Palma-Calvià this figure was much higher.

When asked if climate change would reduce the quality of life in their area of residence, 53.7 per cent of respondents agreed or totally agreed, and 36.6 per cent disagreed or totally disagreed. Consistent with other answers, respondents in Costa Tropical showed again the highest scepticism.

For each statement we ran a Generalized Linear Models (GLM), using an ordinal logit link function. As covariables in the model we included age and household size, whereas as factors we included gender, permanence in the municipality, employment situation,

educational level, urban model, income, sensitivity, impact, adaptive capacity and vulnerability.

In addition, we carried out a factor analysis rotation (Kaiser's Varimax) that resulted in a reduction from 10 variables to 3 factors. From these results we can argue that questions 3, 4, 5, and 7 are strongly related to the first factor, as is question 10 but with a lower coefficient. Questions 1 and 2 appear to be closely linked to the second factor, while question 6 is also related but with a lower coefficient. The third factor appears to be strongly linked to questions 8 and 9. Thus questions seem to follow three main axes (according to response patterns):

- The first factor (factor 1) represents mostly questions directly related to the impact of climate change on economic development, especially tourism.
- The second factor (factor 2) includes citizen's perceptions about direct impacts of climate change on their area as well as impacts on environmental flows. Therefore, this factor mostly captures socio-environmental questions.
- The third factor (factor 3) was strongly related to the two technological questions (seawater desalination and water re-use).

We ran a General Linear Model following an identity function with each of the three factors resulting from the PCA and the Varimax rotation. The factors and covariables included remained the same. In both cases (for questions and for factors derived from the PCA/Varimax rotation) we ran the models in an iterative way removing one by one in each step the factors/covariables that were not statistically significant. In table 4 we present the parameter estimation for the GLM for each question (Q1 to Q10) and the General Linear Model for factors derived from the PCA/Varimax rotation.

Gender appeared to have a significant effect in question 3 (climate change causing reduced employment in the tourist sector). In answering to this question, male respondents ( $B=-0.274$ ,  $p=.093$ ) tended to be more sceptic than female respondents. On the other hand there was no age effect in the response to any of the questions. Respondents from larger households tended to agree more than those from smaller households with questions 2, 3, 5, 7, and factors 1 and 3. Thus, household size influenced questions regarding the three main axes presented before: economic, socio-environmental and technologic. The employment situation also appeared to give interesting clues for questions 1, 2, 6 and factor 2, all of them related to socio-environmental questions. Self-employed people tended to be more sceptic than the rest, while unemployed people (Q1,  $B=0.688$ ,  $p=.015$ ; Q6= $0.660$ ,  $p=.009$ ; Factor 2,  $B=0.519$ ,  $p=.000$ ) were more aware of the impacts of climate change on their area of residence and on water availability in particular. Education emerged as another relevant and significant variable. In general terms, we observed that higher levels of education resulted in a higher degree of concern for the impacts of climate change. This was clear and significant in questions 1, 6 and factors 2 and 3. Respondents with a university degree, in particular, tended to agree more than the rest of respondents to those questions, spanning over economic, socio-environmental and technological aspects of climate change. For question 4 where educational level was also significant, the relation appeared to be the opposite. In what concerns income we did not find any conclusive effects, despite becoming a significant variable in some of the questions. For factor 1, people with the lowest incomes tended significantly to agree more ( $B=0.502$ ,  $p=.023$ ) in that group of questions than wealthier respondents. Concerning the urban model, respondents from suburban areas did not appear to answer in a significant way differently than respondents from urban cores. Regarding permanence in the



municipality, respondents that had lived always in the same municipality tended to be more sceptical in question 3. However, this relation was not found in other questions.

Finally, we compared the survey results with the vulnerability values obtained in the ESPON study (Saurí et al, 2011). Since the division by tourist zones was problematic to introduce in the statistical analysis due to the low figures of respondents for some areas (e.g. Costa Tropical), we aggregated zones according to the effects and responses to climate change. Thus, respondents from areas with medium sensitivity tended to agree more than those from areas with high sensitivity in questions 1 and 6, but were more sceptical than those from areas with high sensitivity in question 9. On the other hand, respondents from areas where climate change impacts were supposed to be less important tended to be more sceptical with questions 1, 6 and factor 1. Paradoxically, for question 1, respondents from areas with lower vulnerability appeared to agree more with the statement that climate change would affect their area of residence. Eventually, respondents from areas considered to have a higher adaptive capacity (linked to the economic profile of each zone) to climate change, did not respond statistically differently than respondents from areas with lower adaptive capacity.

In sum, the variables that appeared to determine patterns of response in clearer ways were household size, level of education, and employment status. Results concerning geographical areas were less clear, and only the category “impact” attained certain relevance in this case.

## **5. Discussion and Conclusions**

Our results coincide with those in most surveys in that climate change is perceived as an important factor to be taken into account in policies addressing tourism. In our context, respondents perceived that climate change would affect negatively their areas of residence. Respondents showed concern for the likely impacts on jobs, but not so much for the impacts on the tourist infrastructure. However, the statement that climate change would reduce the economic activity of the area gained considerable support. Responses were also quite pessimistic regarding future water availability but agreed that it would be possible or convenient to develop alternative supply sources such as desalination and water re-use. These results are consistent with surveys undertaken in other parts of the world and in different contexts (see, for example, Agho et al, 2010 for Australia) but contrast with other results showing less pessimistic views (Lorenzoni and Pidgeon, 2006). Moreover, perception appears to transcend more “objective” evaluations of the impacts of climate change, in our case, the strong latitudinal gradient concerning vulnerability to decreasing water supplies. Thus, it may result surprising the relatively optimistic view of Costa Tropical, which, according to the analysis undertaken in the ESPON Climate project (Saurí et al, 2011), shows a high vulnerability. Perceptions approaching scepticism, or even open denial, were already pointed out by Withmarsh (2011) or McCright and Dunlap (2011) respectively and therefore may be conditioned by other factors besides actual exposure to actual climate risks and impacts (Tàbara et al, 2009). Inversely, this contrast with the important concerns expressed in the Balearic Islands, which are defined as of medium vulnerability. We have to acknowledge, however, the limits of the comparative analysis between zones due to the low number of surveys for some zones. However, the different perceptions observed according to tourist zones give some hints that could be explored in further research.

Regarding the possible drivers of perception, we found that household size (a question not frequent in surveys and that may be of interest as a proxy for the perceived impact on future generations) was very relevant, followed by educational level, and employment status. Larger households often indicate the presence of children or teenagers, which according to climatic models will likely experience the effects of climate change during the following decades. Respondents (mostly women) may have taken into account this situation when expressing their concerns.

Gender was also an explanatory factor although perhaps not as high as could be expected (see McCright, 2010). This result is consistent with findings in the literature on risk perception (Slovic, 2000) suggesting that women tend to judge risks as larger and more problematic than men expressing perhaps more concerns about human health, including that of future generations. But issues of differential power and living conditions between men and women (with women perhaps more exposed to risks in general than men) may also be relevant (Gustafson, 1998).

Results showing higher concerns by more educated people are also consistent with the literature. For instance, a barometer concerning the perception of environmental issues in Spain (Real Instituto Elcano, 2006) revealed that higher levels of education led to higher concerns concerning pollution and also higher knowledge about the Kyoto Protocol. At the same time, among those who had heard about the Kyoto Protocol, respondents with a university degree assessed more its positive role. The smaller concerns by professionals and self-employed people in contrast with wage-earners is somewhat to be expected since entrepreneurs are more likely to adhere to individualistic values which have been seen as decreasing the perception of climate change (Leiserowitz, 2005; Semeza et al, 2008).

An important caveat that may condition the results of this survey is that about two thirds of respondents were women, and women tend to have more acute perceptions of risks than men (although not necessarily less knowledge of global warming, see McCright, 2010). Also as can be expected, perceptions showed in certain cases important differences with more “objective” analyses of vulnerability to climate change. Regarding comparisons with more general surveys and being cautious about possible bias in our sample we could conclude that perception and awareness of the likely impacts of climate change, in this case the impacts on water availability, is higher in areas with higher dependence of climate related economic activities than in other areas (see also the cases cited above). Perhaps one of the most relevant findings of this survey was the statistical significance attained by the variable “household size”. With all due caution, we hypothesize that respondents in larger households with small children and teenagers could express more concern because of the possible impacts of climate change in (their) future generations. In this sense, the existence of population profiles and zones with a different perception of the effects of climate change opens the possibility to carry out more specific social awareness campaigns on climate change.

The effect of other variables not included in the study remains to be seen. For instance we observe the need to incorporate ideological or political trends as a variable in future studies as it could provide new insights on risk perception. For further research we also believe relevant to incorporate open-ended questions as well as considering other qualitative techniques such as focus groups. While this was beyond the scope of our research it could provide a more nuanced understanding of the perception of climate change and its effects by the population residing in tourist areas.

As usual, what remains to be seen is whether concerns expressed by residents in tourist zones may translate into demands for specific mitigation and adaptation actions to climate change, local or otherwise. In that sense, the use of non-conventional water resources such as desalinated water or treated wastewater appear as an interesting option to ease water supply problems, especially during summer months, when water availability is lower and water demand, exacerbated by tourism, is higher. However, at the same time it might contribute to enhance inequity between users, as its cost is higher than conventional resources. At any rate, taking into account the different options faced by water management facing climate change is a must not only for the tourist industry, but also for the well being of all the local population living in these areas.

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