



Climate Change Impacts on Destination Choice.

A case of Peniche

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Abstract

As climate change gains more concern from global context, the literature in this area is growing rapidly, especially giving more attention to the researches on the relationship between climate change and tourism.

This thesis examines the potential impacts of climate change on destination choice and how these impacts may influence choice of tourists visiting Peniche. Therefore, Peniche, a small coastal city in Portugal, has been chosen as a case study and quantitative method was applied for the research through conducting a questionnaire to the domestic and international tourists visiting Peniche.

The findings show that despite of climate change impacts, the majority of respondents will still travel to Peniche, but not in the peak seasons. The research concludes that as it is expected, climate change will influence destination choice and timing of travel through shifting peak seasons to shoulder seasons. The thesis contributes to the limited climate-related research in Portugal.

Keywords: climate change, coastal tourism, Peniche, destination choice, timing of travel, shifting tourism season.

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List of Abbreviations

EEA – European Environmental Agency

GHG – Greenhouse gas

IPCC – Intergovernmental Panel on Climate Change

OECD - Organisation for Economic Co-operation and Development

UNEP – United Nations Environment Programme

UNWTO – United Nations World Tourism Organization

WMO – World Meteorological Organization

WTTC – World Travel and Tourism Council

CHAPTER 1. INTRODUCTION

1.1 Background to the research

Tourism is one of the largest global economic sectors growing tremendously since 1970s, and contributing to economies both in local and national level. (UNWTO, 2016) According to WTTC (2017), tourism contributed 10.2% of global GDP, and supported 292 million jobs in 2016.

WTO & UNEP (2008) emphasize that “A phenomenon of such magnitude could not remain without consequences for the climate on account of the greenhouse gas emissions generated by trips and stays”. (p. 21)

However, the relationship between tourism and climate change is complex, as tourism is a victim of climate change, and at the same time, a significant contributor to this change. For instance, climate is an important resource for tourism which can influence destination choice and timing of travel, as well as, travel experience, while tourism can contribute to climate change through GHG emissions, and using natural and environmental resources.

Climate is expected to significantly influence the future of tourism sector, as it can dramatically affect the competitiveness and sustainability of tourist destinations.

Furthermore, climate change can reduce the economic value of the tourism sector, through reducing tourism potential and attractiveness of the area, which makes tourism climate-sensitive in a larger extent.

Among all types of tourism, coastal/beach tourism is expected to be more affected by climate change impacts, as this type of tourism significantly depends on climate and weather conditions.

It was found that 1°C increase in temperature, is expected to shift tourist destinations gradually to the north and up to the mountains, which would affect the preferences of 3S (sun, sea and sand) tourists from western and northern Europe. (Alcamo et al., 2007; Giannakopoulos et al., 2011; Hamilton et al., 2005)

Besides, the researches about the Mediterranean, one of the most popular beach tourism destinations worldwide, show that increase in temperature due to climate change is expected to gradually decrease tourism attractiveness during peak season (summer), however, gradual increase is expected during shoulder season (spring and autumn) as a result of more favourable climatic suitability of the area. (Hamilton et al., 2005; Amelung & Viner, 2006; Amelung et al., 2007; Nicholls & Amelung, 2008; Hein et al., 2009; Ruddy & Scott, 2010; Amelung & Moreno, 2012; Amengual et al., 2014).

Moreover, it is predicted that increase in sea surface temperature will lead to the extension of swimming season, while heat waves are projected to increase in frequency which are likely to negatively influence tourist decision regarding holiday destination or the timing of travel or length of stay due to tourist discomfort. (Amelung & Viner, 2006; Alcamo et al., 2007; Nicholls & Amelung, 2008; Dubois & Cauchy, 2014).

Besides, decrease in precipitation level and extension of dry periods are expected to lead to the deficiency of water in tourist regions due to the increased water demand in summer season as water is also used for recreational facilities such as swimming pools or golf courses. (Ehmer & Heymann, 2008).

Moreover, increase in air and water temperature, sea level rise and other impacts of climate change are expected to adjust tourism demand. According to Beritella et al. (2006), climate is used as a descriptive factor for destination marketing, as tourists consider climate conditions of the destinations when booking a travel.

In addition, it is very important for tourists to feel safe during their holidays, therefore, extreme weather events such as heat waves (Scott & Lemieux, 2010) or tropical storms (Becken et al., 2011) can negatively influence tourist's safety. Besides, climate can influence satisfaction and well-being of tourists during the holiday Valls & Sarda (2009), therefore, climate is often advertised as the most important tourist attraction of a destination (Saarinen & Tervo, 2006).

The potential changes to this attraction due to the global warming can negatively influence tourists' destination choice. (Scott & Lemieux, 2010; Hamilton & Tol, 2007) Accordingly, climate change is expected to influence destination choice, as changes in climate patterns of the destinations will push tourists to make changes in their choices and travel to the alternative destinations with more favourable climate conditions.

Besides, Hamilton & Tol (2007) found out that due to the climate change, an attractiveness of domestic climate will increase, which will result in people from these countries choosing domestic holidays instead of taking holidays abroad.

Moreover, strengthening extreme weather events due to the climate change (Nyaupane & Chhetri, 2009) will negatively influence the safety of tourists which can lead to the negative consequences, such as cancellation of trips, or never returning to the same destination.

Taking into consideration all above-mentioned potential impacts of climate change that can influence tourism sector, as well as, economic and social value of tourism, and its important role in sustainable development, WTO & UNEP (2008) stress that tourism is one of the most emerged sectors that needs to be adapted to the potential impacts of climate change and global warming.

1.2 Research purpose, aims and questions

Climate scientists are confident about the significant changes in global climate over the 21st century (Hallett, 2002), and to tackle these changes, there is a need of academic research to raise the awareness about climate change, and to get necessary information for decision-making on adaptation and mitigation strategies (UNWTO, 2003).

A need of research is also agreed by the participants of the first international tourism conference in Djerba, who emphasized that “the reciprocal implications between tourism and climate change” needs to be explored to contribute to the decision-making process. (UNWTO, 2003, p. 14)

The research of climate change and tourism is essential for Portugal, and particularly, for Peniche, as tourism is one of the main economic drivers of the area. Therefore, it is vital important to investigate the potential climate change impacts on tourism which can negatively affect both the tourism supply and tourism demand of the area.

Due to the being located in the cost of ocean, coastal tourism is dominant in Peniche, and as town’s significant economic driver, tourism is vulnerable to climate change.

Climate change is expected to affect not only the tourism potential of the area, through increase in temperature, or sea level rise, but also tourism flows, as due to the climatic changes, tourists can travel to other destinations.

Therefore, with the purpose of to contribute to the climate-related literature in Portugal, which has not been highly researched, and to explore ‘the reciprocal implications’, this thesis aims to explore the potential impacts of climate change on destination choice, and how these impacts can influence choice of tourists visiting Peniche.

Consequently, this thesis will attempt to provide answer to the main question of the study:

- How will climate change affect tourists’ choice of Peniche as a travel destination?

This question will guide the research and will help to achieve the following objectives:

- ✓ Exploring the potential impacts of climate change on destination choice;
- ✓ Evaluating the potential influence of climate change on choice of tourists visiting Peniche;

- ✓ Contributing to the literature on climate change impacts on Portugal's and Peniche's tourism.

1.3 Structure of chapters

Chapter 2: Literature review. This chapter provides background information on coastal tourism, climate change and destination choice. The chapter is divided into two parts. First part reviews the literature on tourism and climate change, presenting the review of the contemporary literature on the relationship between tourism and climate change, followed by the discussion of climate change impacts on coastal areas. First part continues with the review of literature on climate change impacts on coastal tourism, followed by the discussion of tourism and climate change in Portugal.

The second part provides background information on climate change and destination choice. Tourists' destination choice and destination choice process are discussed, followed by a review of the literature on the importance of climate and weather in destination choice. The second part finishes with the discussion of climate change impacts on destination choice which is the core theme of the research.

Chapter 3: Study site and methodology. This chapter is divided into two parts. The first part presents the description of the chosen study site, including its geography and location, followed by the explanation of the tourism sector within the site, as well as the changes in the climate of the area in recent years. The second part discusses the chosen methodology presenting detailed information on the sample method and design of the questionnaire.

Chapter 4: Results. This chapter presents the main findings of the research which has been done through questionnaires conducted to national and international tourists in Peniche. The chapter is divided into four sub-chapters according to the four themes of questionnaire and each sub-chapter presents detailed information about each question using figures and charts.

Chapter 5: Discussion and conclusion. The chapter is divided into two parts. The first part discusses the main empirical findings more in-depth, making comparison to the existed literature. The second part of the chapter presents the summary of the thesis by highlighting the key findings, and presenting the realization of objectives, as well as, mentioning the limitations, and providing recommendations for future research.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

Climate change and its projected impacts has gained significant attention of researchers in recent years. The potential effects of these impacts on tourism industry is among of the topics attracting more attention. Reviewing the literature on this topic, this chapter is divided into two parts.

First part is called “Tourism and climate change” and starts with the review of literature on the relationship between tourism and climate change, discussing the growing interest of academic researchers in this area. The potential impacts of climate change on coastal areas, which are one of the most climate-sensitive areas are discussed, followed by the review of literature about climate change impacts on coastal tourism, mentioning that coastal tourism is one of the most popular tourism types and one of the most vulnerable to climate change. The first part of this chapter ends with the discussion of tourism and climate change in Portugal which is the place of residence of the author and where the research has been done.

The second part of the chapter is called “Climate change and destination choice”, starting with the review of literature about tourist destination choice and destination choice process, followed by the discussion of the importance of climate and weather in destination choice. The part ends with the discussion on climate change impacts on destination choice and the potential response of tourists to a changing climate, followed by a brief conclusion of the chapter.

Part I. Tourism and Climate Change

2.2. Global relationship between tourism and climate change

Earth's climate has changed over the past century. One of the main causes of this change is the greenhouse gas (GHG) emissions from human activities. Global climate change has already led to a wide range of impacts, such as rising sea levels, changes in air and water temperature, extreme events, changes in precipitation, warmer oceans, reduction of snow and ice cover, etc. These impacts have been felt across the world and have led to a wide range of impacts on ecosystems, human health, environment, socio-economic sectors, and particularly on tourism industry. (EEA, 2012)

Scott et al. (2006) point out that the relationship between tourism and climate change gained attention and interest of researchers around the 1950s. This interest was focused mainly on how tourism activities are influenced by climate change impacts. (Moreno & Amelung, 2009)

Researchers argue that tourism is a potential victim of climate change impacts, but simultaneously, it is a significant contributor to climate change. (McKercher et al., 2010; UNWTO, 2009) Thus, there is a bilateral relationship between tourism and climate change, as these two phenomena affect each other.

More specifically, climate and weather are very important factors for success of tourism destinations, that is why tourism is highly sensitive and very vulnerable to climate change impacts, but at the same time, Gössling, (2002) points out that tourism contributes to climate change by increasing water consumption, GHG emissions, etc.

According to World Tourism Organization (WTO) (n.d.), "Climate is an essential resource for tourism, and especially, for the beach, nature and winter sport tourism segments. Changing climate and weather patterns at tourist destinations and tourist generating countries can significantly affect the tourists' comfort and their travel decisions." (Climate Change & Tourism)

The tourism industry itself could be affected by climate change as it can alter the basic attractiveness of destination, including its wildlife and habitats, its vegetation, water level,

etc. (Wall, 1998; Martin, 2005; Scott et al., 2005) In addition, changing climate patterns could also affect the quality, length and timing of the tourist season as they are highly dependent on climatic factors.

Moreno (2010) argues that climate can influence the time of the year when tourists travel, as well as, can define the environmental context that certain tourism interests stem from. For instance, Gomez (2005) argues that climatic conditions can be promoted as the main attraction of the destination. He found out that very strong winds during the whole year can focus tourism sector on wind surfing in Tarifa, Spain.

Furthermore, climate change can influence dramatically the competitiveness and sustainability of tourist destinations, especially, climate-sensitive destinations. Scott & Lemieux (2010) argue that every destination is climate-sensitive to some extent. Thus, the impacts of climate change will differ depending on the location or the adapting capacity of destinations and so on.

Hamilton et al. (2005) argue that climate change can lead to decline of tourism in traditional tourist destinations as climate change is expected to shift attractiveness of this destinations towards higher latitudes and altitudes.

Amelung & Viner (2006) argue that the Mediterranean which is one of the most popular tourist destinations can experience a decrease during peak season due to the increasing temperatures that could make it too hot to travel.

Hein (2007) found out that the tourism flow is expected to decrease by at least 20% by 2080 in Spain, in the result of steady increase in summer temperatures in Europe.

Regarding winter tourism, it is expected that less than half of the ski resorts would be sustained within a few decades in a result of climate change in Switzerland. (Elsasser and Bürki, 2002)

According to Organisation for Economic Co-operation and Development (OECD) (2007), 91% (609 out of 666) of the alpine ski areas including Austria, France, Germany, Italy and Switzerland can be considered naturally snow-reliable areas under present climate conditions, but this can change with a warming of 4°C which would decrease the snow-reliability of these areas to only 33% (202). The remaining 9% (57 out of 666) are already operating under marginal conditions. (OECD, 2007)

Researchers point out that climate change will have critical impacts on beach/island tourism destinations. (Zeppel, 2012; Klint et al., 2012; Buzinde et al., 2010) This is because of the weather and climate being determinant factors in outdoor tourism activities and making these destinations highly vulnerable to the climate change. (Zaninovic & Matzarakis, 2009) For example, Reddy (2011) points out that the Maldives are exceptionally vulnerable to climate change due to the sea level rise which threatens not only tourism in the islands, but also the existence of the islands.

Overall, climate change will have negative impacts globally as Beritella et al. (2006) argue that by 2050 it is expected that the global tourism industry will experience significant impacts of climate change, and this will be more critical for the countries where tourism is an important economic driver.

Despite the negative impacts of climate change, there will be a few positive impacts, for example, increase in temperatures in colder regions will make these regions more favorable for tourism.

According to Tol et al. (2006), climate change would push tourists towards the poles and the mountains for holidays and these regions will benefit from climate change.

Moreover, it is expected to have an increase in tourism growth in countries such as Spain, Greece and Turkey in the autumn and winter months due to the enhanced climatic conditions. (Amelung & Viner, 2006)

Thus, the future climate change scenarios forecast that climate change will alter regional and seasonal tourist flows, thus some regions will be winners, while others will be losers. (Ehmer & Heyman, 2008)

As it can be seen, the researchers have mainly focused investigating climate change impacts on tourism demand (Gössling et al., 2012; Moore, 2010), destination choice (Bigano et al., 2006; Eugenio-Martin & Campos-Soria, 2010) or seasonality (Amelung et al., 2007). More precisely, the researchers of climate change impacts have focused on different factors, including global-based studies (Hamilton et al., 2005; Amelung et al., 2007) or specific country focused studies (Hamilton & Tol, 2007; Jarvis & Ortega, 2010) whereas others have focused on different types of destinations, such as ski resorts (Uhlmann et al., 2009; Morrison & Pickering, 2013) and coastal destinations (Amelung &

Viner, 2006; Moreno & Becken, 2009; Perry, 2006). Thus, academic interest has mainly concentrated just on one side of this relationship.

But the other side of this relationship – contributions of tourism activities to the climate change have been relatively limited, mainly focusing on energy use and greenhouse gas (GHG) emissions. (Becken, 2002; Gössling, 2000)

Regarding the contributions of tourism to climate change, researches show that air travel and aviation fuel have significant contributions to climate change. (Ponater et al., 1999; Olsthoorn, 2001)

Table 2.1

Estimated emissions from global tourism, 2005.

	CO₂ (Mt)
Air transport	515
Car	420
Accommodation	274
Activities	48
Other transport	45
TOTAL	1,302
Total world	26,400
Share (%)	4.9

Note: Estimation includes emissions from same-day visitors. Source: Adapted from WTO & UNEP (2008)

According to WTO & UNEP (2008), tourism is estimated to create about 5% of total carbon emissions, primarily due to transport (mainly by air transport). (Table 2.1)

Unfortunately, according to Intergovernmental Panel on Climate Change (IPCC) (2013), even if we stop GHG emissions today, climate will continue to change for many decades due to the past emissions.

However, researchers address other contributors such as beach-front hotels which can increase beach erosion and at the result can lead to the rising sea levels. (Uyarra et al.,

2005) Thus, on-site tourism activities are also significant contributors to climate change as they can be an accelerator of this change. (Becken, 2004)

Moreover, researches point out that tourists are consuming a large amount of water, energy and other resources at the tourist destinations more than at home. (Williams & Ponsford, 2009) Besides, to provide tourists with comfort and luxury services, tourism accommodation establishments are overusing environmental resources, especially, water resources and this leads to the harmful impacts on natural environment. (Graci & Dodds, 2008)

Taking into consideration all above-mentioned researches regarding climate change and tourism and growing academic interest on this topic, in 2007 UNWTO, UNEP and WMO assembled Second International Conference on Climate Change and Tourism in Davos, Switzerland. The result of this conference is the “Davos Declaration” which states that “Climate is a key resource for tourism and the sector is highly sensitive to the impacts of climate change and global warming, many elements of which are already being felt”. (WTO & UNEP, 2008, p. 13)

This declaration emphasizes that there is a need for urgent action towards adaptation and mitigation policies to cope with climate change impacts.

WTO & UNEP (2008) recommend several actions to mitigate effects of tourism growth on climate change and adapting tourism industry to a changing climate. (Table 2.2)

Table 2.2

Recommendations on mitigating tourism growth effects on climate change.

Lowering energy consumption
Using solar and wind energy
Promoting local products
Using alternative means of transport
Reducing carbon emissions and footprints

Source: Adapted from WTO & UNEP (2008)

Regarding the recommendations for adapting tourism industry to a changing climate, WTO & UNEP (2008) suggest the following:

- Changing operating patterns by diversification of products and services;
- Adapting tourist destinations by modification of economic circuits, new technologies, intensive training efforts and especially, increasing understanding level of all involved people, including the tourists;
- Mitigating global warming by putting into action plans about reducing carbon emissions by using carbon friendly technologies.

Furthermore, Nicholls (1998) suggests that local activities such as limiting tourist access and implementing coastal resource conservation or environmental education programs, can lead to a better management of rising sea levels and erosion in sandy beaches.

Overall, to cope with climate change impacts, it is important for all societies and economic sectors to get involved and work together. Fortunately, several sectors, including tourism have already begun to take measures to adapt to climate change. (Simpson et al., 2008)

Mukogo (2014) argues that due to its rapid growth and being a core driver of global economy, tourism sector has the ability to tackle negative impacts of climate change and can lead the way by adopting green practices and emphasizing sustainable development.

Hence, some researchers argue that the relationship between tourism and climate change is very complex, so it is hard to define the exact impacts of climate change on tourism industry. (Hall & Higham, 2005; Gössling & Hall, 2006). But despite this complexity, there is an undeniable fact that this relationship is very strong as climate and weather are dominant elements in setting limits and regulating tourism. (Wall & Badke, 1994; Abegg et al., 1998).

2.3 Climate change impacts on coastal areas

Throughout history coastal areas have always been centres of human activity due to their rich variety of ecosystems and habitats which provide a range of goods and services critical to human sustenance and well-being, especially food production, raw materials and transportation options. (World Bank, 2017)

Being the heart of major socio-economic activities, coastal zones and especially coastal cities will be affected by a range of climate change impacts. (Nordhaus, 2010) For instance, climate change will have direct impacts on coastal zones such as sea level rise, and indirect impacts including coastal erosion, land loss, obstructed drainage and flooding. (Nicholls et al., 2007; Hunt & Watkiss, 2011; Kamal-Chaoui & Robert, 2009)

According to World Bank (2017), “Coastal areas are particularly vulnerable because exposure to hazards comes both from the sea and from the land, and because of their high socioeconomic and naturalistic value”. (p. 4)

According to the U.S. Agency for International Development (USAID) (2009), “Global climate change already impacts and will continue to impact coastal communities, ecosystems, and many facets of people’s lives in the coastal zone where approximately 2.7 billion people (over 40% of the world's population) live”. (p. 16)

Regarding the literature on the climate change impacts on coastal areas, researches have mainly focused on individual issues, especially on sea level rise. (McGranahan et al., 2007). For instance, according to Kamal-Chaoui & Robert (2009), coastal cities are under the risk of extreme events such as sea level rise and huge storms due to their proximity to the ocean. McGranahan et al. (2007) argue that these extreme events will put population of coastal cities at risk as the density of human populations is extremely high in coastal areas.

According to IPCC (2013), the global mean sea levels will rise by between 9 and 88cm by 2100, implying a rate of increase between two and four times greater than during the 20th century. (Figure 2.1) Regarding the oceans, IPCC (2013) projects that sea level will rise in more than about 95% of the ocean area. Besides, it is predicted that about 70% of the coastal areas globally will experience sea level change.

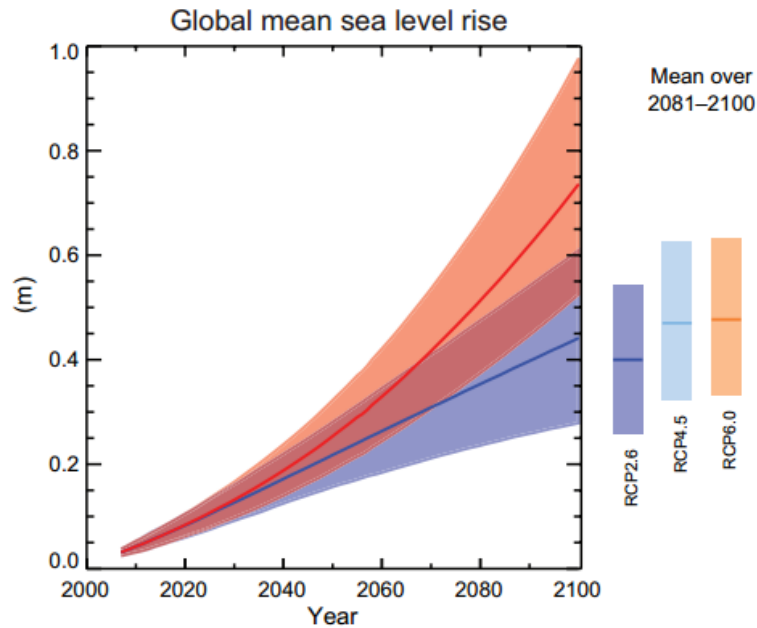


Figure 2.1 Projections of global mean sea level rise over 21th century. Source: Reprinted from IPCC (2013)

Nevertheless, Hunt & Watkiss (2011) argue that coastal areas and cities will be affected not only by sea level rise, but also by its secondary effects. For instance, the research done by Hunt & Watkiss (2011) in major cities found out that Mumbai in India is expected to experience structural instability due to coastal shifting. Besides, Sherbinin et al. (2007) evaluate climate change in Rio de Janeiro in Brazil noting that the city would experience sea level rise, along with coastal erosion and storm surges.

Besides, extreme climate events can lead to the huge amount of land loss (McGranahan et al., 2007), especially, in port cities where the frequency of flooding is expected to increase due to the climate change. (Nicholls et al., 2007) For instance, port cities in developing countries like in India and China, which are experiencing significant growth, as well as, port cities in developed countries like in USA, the Netherlands and Japan, are the focus for these extreme climate events. (Nicholls et al., 2007)

According to Huq et al. (2007), the dangerous locations of many cities put them at risk from floods and heavy storms. For instance, according to researchers, at least 136 major cities globally are located on low lying areas and within proximity to the coast which makes them highly vulnerable to extreme climate events, especially to sea level rise and storm surges. (Nicholls & Lowe, 2004; Sherbinin et al., 2007) Moreover, McGranahan et

al. (2007) point out that nearly 65% of cities with more than 5 million population, are located on low lying coastal areas.

USAID (2009) stresses that climate change impacts on coastal areas can also result in considerable alteration of coastal ecosystems and hazards, as well as, changes in the lifestyle of fishers, coastal resource users and coastal communities.

All above-mentioned reasons emerge adaptation strategies in coastal areas to cope with climate change impacts. According to World Bank (2017), “Adaptation to climate change in the context of coastal areas is defined as a policy process entailing decisions on policy and technological interventions that aim at reducing the vulnerability of the system to climatic changes”. (p. 13)

McLeod et al. (2010) argue that to identify the coastal areas that are under the threat of climate change impacts, it is needed to perform vulnerability assessments by using reliable scientific tools which will help to set up proper development and land use strategies in these areas.

World Bank (2017) argues that it is necessary to examine the sensitivity of coastal areas to the changes, their adaptive capacity and other factors that may influence these components, and after this, certain adaptation options can be suggested which can reduce sensitivity to climate change and can promote the development of adaptive capacity of coastal areas.

For instance, adaptation measures that can help to minimize climate change impacts on coastal zones are *coastal wetland protection and restoration* (acts as buffer against extreme weather events, storm surge, erosion, and floods; limits salt water intrusion), *payment for environmental services* (provides incentives to protect critical habitats that defend against damages from flooding and storm surges as well as coastal erosion), *beach and dune nourishment* (protects shores and restores beaches; serves as a “soft” buffer against flooding, erosion, scour and water damage), *coastal watershed management* (preserves estuaries, which act as storm buffers and protect against coastal groundwater salinization), *integrated coastal management* (provides a comprehensive process that defines goals, priorities, and actions to address coastal issues, including the effects of climate change), etc. (USAID, 2009)

However, according to USAID (2009), even not considering climate change, coastal areas face a wide range of problems, such as water pollution, population growth, habitat change, degradation, etc.

It is expected that climate change will accelerate these changes which means that there is a need of urgent actions for implementing coastal adaptation strategies to reduce the impacts of climate change which is considered to be one of the most important challenges of 21st century.

2.4 Climate change impacts on coastal tourism

Coastal tourism

Coastal tourism is continuously growing along with the intensity and diversity of activities. Researchers address that the coast has had a significant importance for tourism and recreation for many centuries. (Hall, 2001; Miller, 1993; Orams, 1999 and 2007)

Regarding the importance of coastal zones for tourism, it is clear that coastal zones have vital importance for tourism in the form of sandy beaches or spectacular cliffs. According to UNEP (2009), coastal tourism is one the ‘most common’ tourism types based on the unique combination of land and sea resources such as beaches, infrastructure and marine biodiversity.

According to European Commission (1998), coastal destinations are the most popular travel destinations (approximately 63%) for European tourists. Besides, Klein et al. (2004) found out that according to statistical analysis, tourism-related earnings in the USA are highest in countries near the coast.

Hall (2001) defines coastal tourism as “the full range of tourism, leisure, and recreationally oriented activities, that take place in the coastal zone and the offshore waters. These include coastal tourism development (accommodation, restaurants, food industry, and second homes) and the infrastructure supporting coastal development (retail businesses, marinas, and activity suppliers)”. (p. 602) This definition by Hall (2001) is very important as it recognizes various elements involved in tourism sector, from demand to supply.

Mieczkowski (1990) divides coastal zone into four areas that are relevant to tourism – the marine zone, the beach, the shore land and the hinterland. The research considered beach tourism the most important of all four, because of the main tourist activities taking place in the beach. (Mieczkowski, 1990)

According to Moreno & Amelung (2009), although the typical activities include 3S (sun, sand and sea), the development of coastal tourism has led to the diversity of activities which can be divided in shore-based leisure activities and off-shore recreation. The shore-based leisure activities include sunbathing, land-based wildlife watching, nature

appreciation, etc. Diving, underwater photography, cruising, recreational fishing, yacht trips belong to off-shore recreation activities. (Moreno & Amelung, 2009)

Researchers argue that this great diversity of activities is related to socioeconomic factors and population growth in coastal destinations. (Hall, 2001; Orams, 1999)

Nowadays, coastal tourism is the largest segment of the tourism industry and it is expected that this will continue as increasingly urbanized populations in the world, especially, in the US, Europe and Asia seek coastal sun, sand and sea. For instance, California beaches get 567 million visitors annually, while Miami Beach gets 21 million visitors annually. (Bigano et al., 2007)

While the growth of coastal tourism continues, it makes coastal tourism very sensitive and vulnerable to any negative situations, especially, to the potential impacts of global climate change.

Climate change impacts on coastal tourism

Although, all tourism activities are to a certain extent sensitive to weather and climate conditions, outdoor activities in coastal environments among the most weather sensitive ones. Due to the enjoyment and safety of tourist activities in coastal environments being highly dependent on weather and climate conditions, these environments have been identified highly vulnerable to a changing climate. (IPCC, 2007)

Climate change has various direct and indirect impacts on coastal tourism such as sea level rise, flooding, coastal erosion, changes in precipitation, strong winds, rise in temperatures (air and water), extreme weather events, storms, physical damage to infrastructure, environmental changes etc. (WTO & UNEP, 2008)

Sea level rise might affect coastal tourism in different ways, for example, sea level rise can lead to the reduced size of beaches which are vital important for coastal tourism in the form of sunbathing and swimming (Uyarra et al., 2005), as well as can cause damages to the tourist infrastructure on the coast. For instance, 1 m sea level rise would cause damage to the 49-60% of tourist properties, such as loss or damage of 21 airports, inundation of

land in nearly 35 ports in Caribbean resorts, as nearly a third of these resorts are less than 1 m above the high-water mark. (IPCC, 2013)

Moore et al. (2010) argue that coastal erosion which is the result of sea level rise, might cause damage to infrastructure such as hotels, restaurants, roads, etc. It is because in many coastal destinations, hotels, restaurants and other tourism infrastructure have been built very near to the coastline in order to fulfil visitors' preferences for the proximity to the sea. (Moore et al., 2010)

The 4th Assessment Report (AR4) by IPCC (2007) states a very high confidence about the critical impacts of climate change on coastal destinations, including sea level rise and coastal erosion.

The AR4 addresses climate change impacts such as flooding, erosion of beaches, losses of coastal wetlands, damage to infrastructure and facilities that support local communities, etc. All these impacts are related to the sea level rise in coastal destinations and these impacts will lead to the reduced attractiveness of these destinations for tourism. (IPCC, 2007)

According to WTO & UNEP (2008), "the high vulnerability of coastal tourism to climate change often couples with a low adaptive capacity", and the most infrastructure being located very near to the coastline. (p. 6)

Besides, this vulnerability is exacerbated by the increasing manmade pressures such as rising population and development in coastal zones. (Nicholls et al., 2007)

The literature on climate-related studies on coastal tourism has recently gained interest of researchers. For instance, Coombes & Jones (2010) assess the impact of climate change on the UK coast and find out that increase in temperature will result in an increase in visitor numbers, especially sunbathing and relaxing visitors in the UK coast, as they are the most sensitive to increased temperatures, while loss of beach is predicted to have relatively small influence in visitor numbers.

Uyarra et al. (2005) evaluate the significance of environmental attributes in destination choice and tourists' enjoyment in two Caribbean islands. Research shows that one of the islands featured on marine biodiversity and diving activities, while the other one is focused on beach (sunbathing) activities. Uyarra et al. (2005) stress that visitation of both islands is

under a significant threat of climate change, such as coral bleaching and reduced marine biodiversity due to increased sea temperatures in the first island, and reduced beach areas due to sea level rise in the second island.

Thus, climate change will have likely negative impacts on tourism demand in traditional coastal destinations like Caribbean islands, while having positive impacts on Northern coastal destinations, like in the UK. Besides, according to WTO & UNEP (2008), climate change impacts can have some opportunities such as lengthening of shoulder seasons and providing warmer winter seasons for Northern coastal areas, which might reduce seasonality and expand the tourism product.

In addition, Moreno (2010) argues that due to the high vulnerability of coastal zones, all sectors based in these areas are under a threat of climate change, especially, those sectors that depend on the weather and climate for their existence.

Besides, according to Moreno (2010), the availability of fresh water sources in coastal zones may be affected by climate change which may lead to the water deficiency and may increase the competition for fresh water between tourism and other sectors potentially limiting further tourism development.

However, due to the uncertainty of climate change, the impacts may vary according to the location or adaptation capacity of coastal destinations, and the effects of climate change can be overestimated in some cases. For instance, Ruddy & Scott (2010) reassess the claims about the Mediterranean becoming 'too hot' for tourism by 2020 or 2030 due to the climate change impacts and find out that there is no evidence to support that the Mediterranean region as a whole will become 'too hot'. They stress that only the destinations which are already considered 'too hot' under the baseline summer conditions will be 'too hot' by 2011-2035.

Besides, Moreno & Amelung (2009) reassess tourist comfort on Europe's beaches during summer season and find out that with respect to climate change, the Mediterranean will likely remain Europe's prime beach tourism region for at least the next 50 years.

Regarding non-Mediterranean coastal zones, researchers argue that these zones will likely benefit from climate change, however, it seems impossible for these zones to exceed the climate suitability of the Mediterranean. (Moreno & Amelung, 2009)

Being very vulnerable to climate change, it is vital important for coastal zones to implement adaptation strategies. WTO & UNEP (2008) suggest that for adapting coastal zones to climate change impacts, “the strong seasonality of beach tourism has to be taken into consideration, as it can be exacerbated by climate change”.

Adaptation strategies related to sea level rise and its secondary effects for coastal tourism can be (1) minimizing built structures close to the beaches; (2) managing adaptive access points to the beaches; (3) building soft (sand bags, beach nourishment) and hard (seawalls, dikes, floodgates) structures for beach protection; (4) developing risk management plans in tourist accommodation establishments to prevent flooding and extreme climate events, etc. (Dronkers et al., 1990).

Overall, due to the high sensitivity of coastal tourism and recreation to weather conditions, the high level of exposure of coastal zones to climate change and the limited adaptation capacity of coastal destinations, climate change is expected to jeopardize the sustainability of many coastal tourist destinations across the globe. (Moreno, 2010)

2.5 Tourism and climate change in Portugal

Climate change in Portugal

Located in Southern Europe, with many Mediterranean physical and geographic features, Portugal is highly vulnerable to extreme weather events such as high temperatures and heat waves, and in the result of global warming, the frequency and strength of these extreme events are projected to increase. (Beniston et al., 2007; Fischer and Schär, 2010; Nikulin et al., 2011).

Climate change and its impacts in Portugal was first addressed by Aguiar & Santos (1987) who projected double increase in CO₂ concentration which will lead to the lower atmosphere global average temperature of 2.5°C.

The main contributions of Portuguese researchers to the climate-related studies about Portugal has started since the beginning of XXI century, and changes in temperature (Wilbanks et al., 2007; Santos & Miranda, 2006; Andrade et al., 2014; Ramos et al., 2011) and precipitation level (Andrade & Santos, 2013; Costa et al., 2012) have gained their special attention, as these issues will potentially cause the major impacts.

Using different climate scenarios, studies on climate change in Portugal indicate that in summer season temperature will increase from 3°C to 7°C in continental Portugal, especially in Northern and Central regions of the country. Wilbanks et al. (2007) point out that by mid XXI century, the temperature will increase on average of 1.7°C (B2 scenario) and 2.5°C (A2 scenario) in Lisbon.

However, Santos & Miranda (2006) argue that temperature in Lisbon could increase up to 2°C and 4°C by mid XXI century, and up to 5°C and 9°C by the end of the XXI century, according to B2 and A2 scenarios, respectively.

Besides, Ramos et al. (2011) evaluated extreme temperatures over Portugal and found out that both maximum and minimum temperature are expected to increase under different climate scenarios during 2071-2100. For instance, maximum temperature is expected to increase to 3.2°C and 4.7°C in summer under the B2 and A2 scenarios, respectively. In addition, an increase of 2.7°C (B2 scenario) and 4.1°C (A2 scenario) in the minimum temperature in summer is expected.

There are climate contrasts between northern and southern Portugal as northern part is more influenced by the North Atlantic, while the southern part has a more typical Mediterranean climate. Considering these contrasts, Andrade et al. (2014) analysed projections for spatial-temporal distributions of temperatures in Portugal and found out that for the future period (2041-2070), significant warming trends of 2–4°C are expected in both seasonal and daily scales. Besides, an increase in the frequency of occurrence of extreme events is projected over inland Portugal. (Andrade et al., 2014)

Andrade & Santos (2013) explored precipitation projections in Portugal for 2041-2070 and found out that winter mean precipitation level is expected to decrease in total Portugal, except of Northern region.

Besides, Costa et al. (2012) assessed precipitation extremes in Portugal and found out that a significant decrease is expected in total precipitation in Portugal, especially in autumn over north western and southern Portugal during 2071-2100 under A1B and B1 SRES scenarios. In addition, the dry season is expected to extend from summer to spring and autumn due to the dry spell lengths in spring and autumn in Portugal. (Costa et al., 2012)

Regarding the sea level rise in Portugal, Dias & Taborda (1988) project a rise of 0.14 and 0.57m in the mean sea level rise at the end of this century on the Portuguese coast.

Moreover, 36% of the continental Portugal is already affected by desertification and an increase in desertification is projected due to the decrease in precipitation, and increase in average temperature and heat waves. (Santos et al., 2002)

Other serious impact of climate change for Portugal is forest fires which are projected to increase dramatically in the future in case of absence of adaptation measures. (Carvalho et al., 2010)

Potential impacts for coastal tourism in Portugal

All these projected changes in climate, will have direct and indirect effects on the tourism sector of Portugal. Changes in climate patterns will significantly affect the present climate-tourism potential of the area which can lead to the decrease in peak seasons and potential

increase in shoulder seasons. Accordingly, occupancy rates are expected to be distributed through spring, summer and autumn.

EEA (2012) predicts that the Mediterranean region including Portugal will be affected by the impacts of climate change, for instance, temperature rise will be larger than European average, annual precipitation will decrease, biodiversity loss and desertification will increase, summer tourism will decrease, and shoulder season tourism will potentially increase, etc.

Moreover, researchers argue that climate change can lead to a significant decrease in comfort levels in part of the summer tourist season in the Mediterranean. (Amelung & Viner, 2006; Moreno & Amelung, 2009).

Portugal's coastline is approximately 2.830km with sandy beaches, dunes, cliffs and rocky shores. Because of the changes in climate patterns such as temperature and precipitation have a strong effect on tourist destination choice for coastal areas, they are considered to be one of the most vulnerable tourism types in Portugal. Among of the most significant effects of climate change, coastal erosion is likely in the first place for Portugal's coastal tourism.

According to Coelho et al. (2009) and Lopes et al. (2011), beach erosion is considered to be one of the most common impacts of climate change on Portuguese coast as 67% of Portuguese coast is estimated to be at risk of erosion during the next decades, and the Algarve coast is one of the most vulnerable areas. It is also estimated that coastal erosion will increase the risk of inundation and land loss in the Portuguese coast. (Coelho et al., 2009; Lopes et al., 2011)

Beach erosion will lead to other problems such as flooding and storms. For instance, Watkiss et al. (2005) indicate that flood risk is expected to increase which can lead to the damage of coastal infrastructure, loss of property and even life, and can be resulted in loss of tourism and recreation functions in Portuguese coast.

According to Casimiro et al. (2007), in short term climate change can have positive impact on tourism in Cascais, in Lisbon area, such as an increase in the number of favourable months for beach tourism, however, towards end of the century, seasonal demand pattern is expected to change as July and August will probably be less suitable for beach tourism.

Casimiro et al. (2007) point out that in Cascais, reduction of beaches is also expected due to sea level rise and beach erosion.

Besides, tourism in Madeira is under a risk of climate change impacts such as negative impact on thermal comfort of visitors, the risk of natural disasters and infectious diseases, etc. (Santos, 2007)

Adaptation and mitigation strategies

To tackle climate change impacts, Portugal developed and published an assessment on climate change vulnerabilities, impacts and adaptation which is called SIAM project (Climate Change in Portugal: Scenarios, Impacts and Adaptation Measures) in 2002, and it was the first climate change assessment project in Southern Europe. The project involves an assessment for different sectors such as coastal zones, forests, human health, etc. in continental Portugal, Azores and Madeira. (Santos et al., 2002; Santos & Miranda, 2006)

The assessments of the project indicate that Portugal is highly vulnerable to climate change due to its location at the extreme southwestern Europe, and climate change is expected to lead to an increase in extreme events such as heat waves and droughts, a decrease in annual precipitation, and an increase in sea level rise. (Santos et al., 2002)

Considering all above-mentioned impacts, Portugal has developed and implemented several adaptation and mitigation strategies. For instance, the National Strategy for Climate Change (PNAC) was approved in 2001 and 2004 which involved measures for several sectors such as biofuels, energy efficiency, transport, etc. Although, this strategy was implemented with the aim to achieve Kyoto target, the strategy was not successful, and emissions continue to rise. (Carvalho et al., 2014) (Figure 2.2)

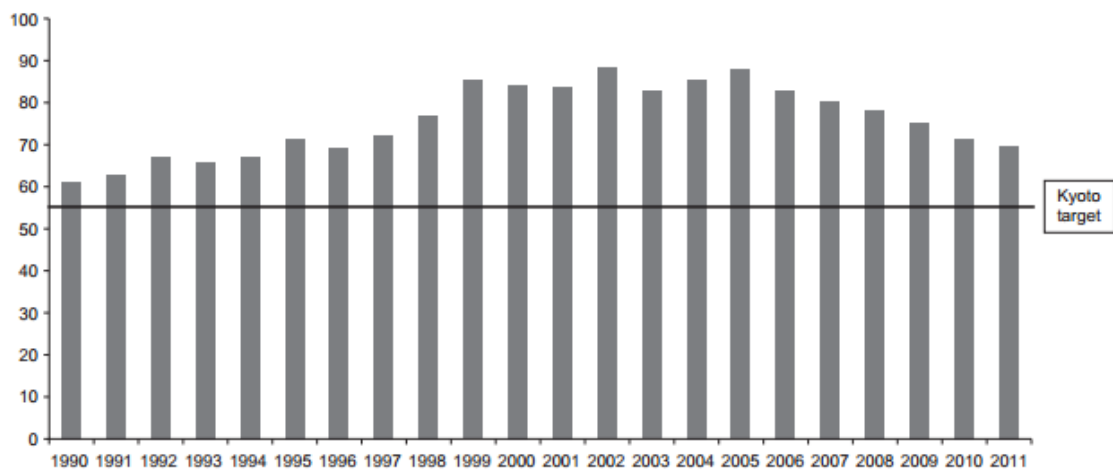


Figure 2.2. Greenhouse Gas emissions (CO₂ equivalent) in Portugal (1990-2011). Source: Reprinted from EEA (2013)

After this unsuccessful strategy, Portuguese government implemented other mitigation strategies under a EU directive which are also resulted to be ineffective to reduce GHG emissions.

Regarding adaptation strategies, in 2010, Portugal approved the National Strategy for Adaptation to Climate Change (ENAAAC) under a EU directive which involves several actions in the areas of coastal zones, water, energy, biodiversity, etc. Nevertheless, this adaptation strategy was also ineffective due to the government change in 2011. (Carvalho et al., 2014)

Several studies criticized the adaptation and mitigation policies of Portuguese government. For instance, Schmidt et al. (2012) criticise that inadequate adaptation strategies and ineffective management of coastal areas, threaten the areas that are already under a risk of erosion and flooding.

Besides, Costa et al. (2011) evaluate projects for agricultural land and forestry in the south of Portugal and criticise that these projects negatively affect the areas through increasing vulnerability to water stress.

Generally, the main reason of failure of all these strategies, is that all are resulted more from EU pressure than the willingness of the government to tackle climate change impacts. For instance, Torres & Pinho (2011) criticise Climate Change National Programme,

indicating that government implemented this program due to the threat of paying for emissions.

To summarise, to adapt to climate change and to mitigate its effects in Portugal, there is a need to develop and implement adequate adaptation and mitigation strategies that will be environmentally sustainable, eco-innovative and cost-effective.

Part II. Climate change and Destination Choice

2.6 Tourist destination choice

Destination choice

Tourist travel decision-making process is complex and comprises a number of elements such as whether to travel, where to travel, when to travel, how long to stay, etc. (Dellaert et al., 1998; Hyde, 2008; Seddighi & Theocharous, 2002; Woodside & Lysonski, 1989; Woodside & McDonald, 1994). Among these elements, *where to travel* is the most important to concern as travel planning starts with the decision of destination choice. Fesenmaier & Jeng (2000) identify five main decision components of travel planning process and stressed that destination choice is the most significant component to decide. In addition, Dellaert et al. (1998) analyse travel planning behaviours and found out that during the travel planning process, destinations are typically selected before other trip components.

Destination choice is a very complex process with multi-faceted decisions and many influencing factors. (Dellaert et al., 1998) It does not consist of single independent choices of different elements, but rather consist of complex decisions in which the choices for different elements are interrelated and evolve in a decision process over time. (Dellaert et al., 1998) The majority of researches on tourists' travel choice address tourist destination-choice as the key element in the travel decision-making process. (Dellaert et al., 1998; Hsu et al., 2009)

Researchers point out that the final destination is selected through a so-called funneling process which means that during the destination choice process, the initial consideration set with a large number of destination alternatives is narrowed down to a relatively smaller number of alternatives in the late consideration set, and then the final destination is chosen from the late consideration set. (Ankomah et al., 1996; Crompton, 1992; Crompton & Ankomah, 1993; Um & Crompton, 1992)

Considering the opinion of the above-mentioned researchers, destination choice can be defined as a process of narrowing down or funneling from a large number of destination options to a smaller, more manageable set from which the final selection is made.

Destination choice has received significant attention of researchers who tried to find out why and how a tourist chooses a particular destination to travel. Researchers examined specific aspects of this choice such as destination loyalty and attachment (Alegre & Cladera, 2006; Hong et al., 2009), behavioural intentions (Lam & Hsu, 2006), destination image (Baloglu & McCleary, 1999; Hong et al., 2006), cognitive distance (Nicolau & Mas, 2006), the role of hedonic experience, novelty and fantasy (Bello & Etzel, 1985; King, 2002), and the effects of destination attributes on destination choice (Ewing & Haider, 1999; Huybers, 2003; Morley, 1994).

However, Lam & Hsu (2006) argue that the complex decision-making process leading to the destination choice had not been well researched, as most of the studies on destination choice mainly focused on determining important destination attributes directly affecting destination choice such as prices and distance (Nicolau & Más, 2006), climate (Hamilton & Lau, 2005), quality and pricing (Goossens, 2000).

In addition, travel motivation has received attention of researchers for decades as being one of the factors affecting people's choice of destination. Travel motivation may vary from one person to another and from one destination to another due to being a dynamic concept. (Uysal & Hagan, 1993)

Crompton (1979) identifies travel motivation with 'push' and 'pull' model, where push motivations are useful to explain 'the desire for travel', while pull motivations explain 'the actual choice of destination'.

Moreover, destination image, food and safety are also important factors affecting destination choice. According to Milman & Pizam (1995), destination image is the visual or mental impression of a place/location held by general public. Ryan (1997) addresses eating to be one of the most enjoyable activities tourists undertake during their holiday. Among these three factors, safety is a major concern for tourists, for instance, Heung et al. (2001) found out that for Hong Kong and Taiwan travellers the safety is the top priority in choosing a destination to travel.

Nevertheless, Goodall (1991) argues that decision makers' preferences play the key role in destination choice, being both intrinsic – reflecting individual likes and dislikes, and extrinsic or socially conditioned. Decrop (1999) describes preference as a special case of attitudes where product alternatives are compared, and one is chosen over the others. He noted that the process of choosing which destinations to visit and which to skip, is the creation of consumption patterns of the tourism product based on tourists' preferences.

Studies on the travellers' preferences used conjoint analysis (stated preference method) which applied in tourism as a technique to describe and forecast tourist choice behaviour (Suh & McAvoy, 2005).

Destination choice process

Destination choice is the core decision in the travel decision-making process (Fesenmaier & Jeng, 2000) and to identify the structure and process of destination choice, researchers use set theory (Crompton, 1992; Narayana & Markin, 1975; Um & Crompton, 1992; Woodside & Lysonski, 1989) which describes destination choice as a multistage process where numerous destination options are reduced in a funnel-like manner (Sirakaya & Woodside, 2005; Um & Crompton, 1992; Woodside & Lysonski, 1989).

Um & Crompton (1992) develop a 3-stage destination choice set model which consists of a composition of awareness set (an initial set), an evoked set (late consideration set) and final destination choice. The evoked set is developed from the awareness set which consists of a large number of destination alternatives from which people seek to best meet their needs. Um & Crompton (1992) stress that the destination should be included in each choice set stage to be selected as a final destination.

Studies found out that whether or not a destination moves from the awareness set to the final choice depends on internal and external factors (Crompton, 1992) which play an important role in the narrowing-down the alternative destinations. (Crompton & Ankomah, 1993; Um & Crompton, 1992).

Sirakaya & Woodside (2005) review tourist decision-making literature and they argue that this model by Um & Crompton (1992) is a simpler destination choice set model which sounds more theoretical and methodological than other models in tourism decision research.

However, some researchers criticize that destination choice studies are mainly theoretical approaches and often lack empirical verification. (Decrop, 2006; Smallman & Moore, 2010)

To summarize, it is clear that destination choice is a complex process consisting different determinants that make the tourist decide whether or not to move a destination to the evoked set (late consideration set) where it can be chosen as a final destination.

2.7 Importance of climate and weather for destination choice

Climate and weather parameters have high importance and can be a determining factor for tourist destination choice, depending on tourist demand for sun, snow conditions, mountains, etc. (UNWTO, 2009) Besides, these parameters can influence the length and quality of tourism seasons. (UNWTO, 2009)

According to Besancenot (1991), climate and weather have played determining role in destination choice for centuries, for instance, wealthy Romans have spent their winters in the South and the summers in the higher altitudes with cool weather. This trend next was replaced with seeking the sun and high temperatures in summer months, for example, Florida and California in USA, and Cuba in 1870s, and Europe (after World War II) became popular summer beach destinations. (Besancenot, 1991)

De Freitas (2001) defines two aspects of climate relevant for tourism. First, the physical aspect which facilitates or complicates tourist activities through rain, wind or snow. For instance, sunbathing will be impossible if there is a rain or wind. Second, the aesthetic aspect of climate such as the quality of light that can affect the appearance of tourist surroundings. (de Freitas, 2001)

Climate and weather are important factors for tourism industry as they influence tourists' destination choice (Becken, 2010), as well as, their activity participation, satisfaction and safety (Becken & Wilson, 2013) in the chosen destination. Becken and Wilson (2013) note that “climate and weather are key ingredients of a destination’s geography as they influence tourist flows and have significant on-site impacts on the tourism resource base”.

Furthermore, climate and weather parameters determine when, where and why tourists travel (Becken & Hay, 2007; Scott et al., 2009), and the quality of the tourism/recreation experience (Gössling et al., 2012; Moreno, 2010).

It is considerable to understand the difference between climate and weather, as climate is defined as “the general weather conditions usually found in a particular place”, while weather is the state of atmosphere with respect to wind, temperature, cloudiness, etc., in one area at a particular time. (Cambridge Dictionary, n.d.)

Thus, while climatic conditions are taken into account by tourists during their destination choice, they experience the actual weather during their holiday in the chosen destination which affects their overall perception of the destination. (Matzarakis, 2001)

The weather conditions tourists experience in the chosen destination are important for many reasons, for example, weather can affect the activities undertaken by tourists, or how enjoyable an experience is and therefore may influence tourists' satisfaction level. Moreover, perhaps one of the most important reasons is tourists' safety which can be affected by heatwaves or extreme wind events.

Tourism industry is very vulnerable to climate as it plays an important role in tourist activities and these activities can be affected by various climatic variables, such as sunshine duration and intensity, air and water temperature, precipitation, wind speed, etc. Therefore, climate and weather may increase or decrease the attractiveness of a tourism destination. (Matzarakis, 2006)

All above-mentioned makes it clear that climate and weather play an important role on the process of destination choice and the timing of holiday, as well as, on choosing daily recreation activities to participate in while on holiday. Thus, weather and climate are both a push and a pull factor influencing the motivation to go on holiday and to choose travel destination.

Regarding studies, Lohmann & Kaim (1999) argue that the importance of weather and climate for destination choice decision-making has not been highly researched and there is a lack of empirical evidence. The researchers assessed the importance of destination characteristics on destination choice of German citizens using a representative survey. The results show that weather and bio-climate are ranked third and eight respectively for all destinations. Besides, researchers found out that despite the weather and climate being an important factor in decision-making of German citizens, destinations are also chosen in likely bad weather conditions. (Lohmann & Kaim, 1999)

The importance of destination characteristics in decision-making is also investigated by Hu & Ritchie (1993), who review a series of studies from 1970s. They examined the image of Hawaii, Australia, Greece, France and China using a survey of Canadian citizens and found that "natural beauty and climate" have significant importance in destination choice and defining destinations' attractiveness. Besides, they found out that climate is the second

most important factor for the group of tourists choosing “recreational” holiday, while climate is in the 12th place for the group of tourists taking “educational” holiday. Comparing the images of countries, Hu & Ritchie (1993) found out that Hawaii has the most attractive climate.

Moreover, Lise & Tol (2002) examine the role of expected weather in destination choice and tourism demand using climate data. They research the holiday travel patterns of tourists from a range of OECD countries, suggesting that tourists from different climates have the same climate preferences for holidays. For instance, they found out that Southern France and California are preferred by everyone due to their climate, regardless of the home climate of tourists.

Bigano et al. (2006) include African and Asian countries along with OECD countries to their study and they also found out that Southern France is preferred by tourists from both hot and cold countries.

Besides, Gössling et al. (2005) carried out a survey in Zanzibar, where tourists were asked to rate the importance of climate for choosing Zanzibar as travel destination. More than a half of respondents rated climate very important for their choice while just a small share of respondents (17%) stated that climate was not important at all for choosing Zanzibar.

Obviously, climate and weather are one of the most important natural assets of tourist destinations which play a significant role in tourists' destination choice. Thus, being heavily dependent on climate and weather patterns, tourist destination choice is sensitive to any change in these patterns, particularly, to the impacts of climate change.

2.8 Climate change impacts on coastal destination choice

A review of the literature shows that climate is very important for tourism, as it affects the seasonality of tourism, destination choice of tourists, as well as, what activities they choose to take part, and their overall satisfaction and how safe they feel in the chosen destination. (Morabito et al., 2004; Becken, 2005; Kyriakidis & Felton, 2008; Richins & Scarinci, 2009; Gössling et al., 2012).

Thus, being a key determining factor, any negative change in climate/weather will influence tourists' destination choice. As discussed in the previous sections, coastal tourist destinations are under a risk of various climate change impacts, such as sea level rise, coastal erosion, rising sea and air temperature, extreme weather events, etc., which will also lead to a damage of infrastructure on the coast, including hotels, restaurants, roads, etc. In the result, it is expected to have negative impacts on destination choice, for instance, it can influence the safety of tourists through extreme events and heat waves.

An analysis of existing literature demonstrates that the impacts of climate change on destination choice has been limitedly explored. Accordingly, researchers have made attempts to understand the effects of climate change in the form of increasing temperatures or changes in precipitation, on tourist choices of a travel destination and time of travel. For instance, Maddison (2001) studied travel patterns of British tourists in order to identify optimal temperatures for holiday and found out that British tourists prefer the maximum of 30.7°C for daytime temperature and even a small increase in this temperature will lead to decrease in the number of visits. In addition, he found out that greater rainfall will prevent tourists from travelling.

Moreover, Lise & Tol (2002) analyzed travel patterns of tourists from OECD countries using factor and regression analysis and found out that the preferred average temperature for OECD tourists is 21°C in the peak season in their destinations.

Both Maddison (2001) and Lise & Tol (2002) conclude that under a scenario of climate change, it is expected that tourists will shift to other destinations or change the time of travel from peak seasons to shoulder seasons.

Besides, Moreno (2010) explored climate change effect on destination choice in the Mediterranean and found out that even favorable climatic conditions would be found in northern European countries, it would have relatively small effect on destination choice of

tourists from these countries, as 72,4% of respondents would still choose the Mediterranean for their beach holidays.

However, exploring climate change impacts on the Mediterranean, Perry (2000) found out that the main impact is expected to be a 'doughnut' due to increased temperatures which would shape demand pattern. So, it is predicted, that there will be more tourists visiting the Mediterranean in the shoulder seasons than in the summer seasons.

Besides, Gable (1997) explored climate change impacts on Caribbean coastal areas and found out that demand will decrease due to the beach loss.

In their study, Viner & Agnew (1999) found out that currently warm destinations such as Eastern Mediterranean are expected to become less preferable by tourists due to increased temperature and humidity.

Besides, Uyarra et al. (2005) argue that climate change will affect the tourist destination choice and visitation level of coastal destinations, for instance, they evaluated the importance of environmental attributes in destination choice and tourists' enjoyment in Caribbean islands which feature on beach activities, and found out that the visitation level will decrease due to the reduced beach areas as a result of sea level rise.

Moreover, Uyarra et al. (2005) explored the effect of sea level rise on tourists' destination choice and they found out that in case of beaches 'largely disappeared', 80% of tourists would not be willing to revisit Barbados for the same price.

Besides, Moreno & Becken (2009) argue that extreme climate events may affect the natural assets of destinations and so, can prevent tourists from choosing these destinations to travel. In the result, this can potentially reduce the attractiveness of the destinations. (Moreno & Becken, 2009)

However, Yu et al. (2009) argue that certain destinations with extended warmer seasons due to climate change, such as high latitude regions, may benefit from climate change impacts by enhanced conditions for tourism.

Besides, as a result of climate change, higher temperatures predicted not only in summer, so the beach season is expected to be prolonged in spring and autumn. Thus, in the result of promoting shoulder seasons for travelling, tourists are expected to travel on shoulder season, instead of peak season due to changed weather conditions. (ToPDAd, 2015).

Moreover, Hamilton & Tol (2007) found out that due to climate change impacts, international arrivals are expected first decrease in Germany, Ireland and the UK as in most of Western Europe due to the increase in domestic tourism as a result of better climatic conditions, but within time, international arrivals will increase again because of the visits from rich tropical countries.

Hall & Higham (2005) argue that climate change can affect destination choice process in a number of different ways, for instance, climate change can impact tourists' perceptions of climatic appeal and image of the destinations, as well as, the possibility of activities they can participate in during their holidays. Overall, climate change impacts will not mean that people will stop travelling, but they will change their travel preferences in both choosing destination and timing of their holiday.

As Lise & Tol (2002) argue that "Although very responsive, tourists probably do not care much about climate change. They substitute one destination for another, or one travel date for another." (p. 447)

IPCC AR4 (2007) reports that changes in global climate is predicted to make some regions more attractive for tourism (e.g. the Baltic in summer), while others less attractive (e.g. the Mediterranean in summer). As climate is identified to be an important factor in destination choice, climate change impacts are anticipated to shift tourist demand through spatial and seasonal redistribution. Besides, tourist destinations with better climatic resources enjoy competitive advantage as tourists prefer to choose these destinations for their holidays. Therefore, climate change can negatively influence competitive advantage of tourist destinations due to becoming less preferable by tourists in choosing travel destination. The review of literature shows that climate change impacts are expected to influence destination choice in a number of ways, for instance, (1) tourists can choose domestic tourism destinations instead of international tourism destinations as the climatic conditions become more favorable in the destination of origin (Hamilton & Tol, 2007); (2) tourists are expected to choose different destinations to travel (Uyarra et al., 2005); (3) tourists can choose the same destination for travel but in different time (ToPDAd, 2015); (4) tourists do not make any changes on their destination choice (Moreno, 2010)

All above-mentioned literature review demonstrates that there are some knowledge gaps that need to be filled in: (1) literature mainly focused on climate change impacts on tourism demand, visitation level and international arrivals, and there are likely limited

studies which have explored climate change impacts on destination choice; (2) studies on climate change impacts on coastal destination choice have limitedly been explored; (3) studies on climate change impacts on destination choice in Portugal, and, particularly, in Peniche do not likely exist. This thesis addresses these knowledge gaps aiming to contribute to the literature. Thesis is exploring the potential impacts of climate change on tourists' coastal destination choice in Peniche, a small coastal destination in Portugal.

2.9 Conclusion

The chapter reviewed the literature on several issues of climate change and tourism relationship, discussing first the key points of this relationship, next expanding the topic to coastal areas and coastal tourism. The main impacts of climate change in Portugal are discussed, reviewing implemented adaptation and mitigation strategies in the country which aimed to cope with climate change impacts.

The chapter next discussed tourist destination choice, presenting destination choice process, and demonstrating the importance of climate and weather on this process. The potential impacts of climate change on destination choice and how tourists respond to these changes, are discussed, pointing out knowledge gaps in this issue at the end of the chapter.

CHAPTER 3. STUDY SITE & METHODOLOGY

3.1 Introduction

This chapter provides a description of the study site of the research and used methodology. Accordingly, the chapter is divided into two parts. First part provides detailed information about study site's location and geography, as well as, its tourism and accommodation industry.

The part finishes with the discussion of climate change in study site presenting observed and projected changes in the climate of the study area.

Second part describes chosen methodology in all details presenting sampling method for the respondents, discussion of the research process and data collection methods, followed by the description of the design of the questionnaire. The chapter ends with a brief conclusion.

Part I. Study Site

3.2 Location and geography

Peniche is a coastal town located in the Central region of Portugal, covering an area of 77,55 km² and is in 80 km from capital – Lisbon. It is located on the west coast of Portugal and the east coast of Atlantic Ocean, and it is Europe's westernmost city. (Figure 3.1)

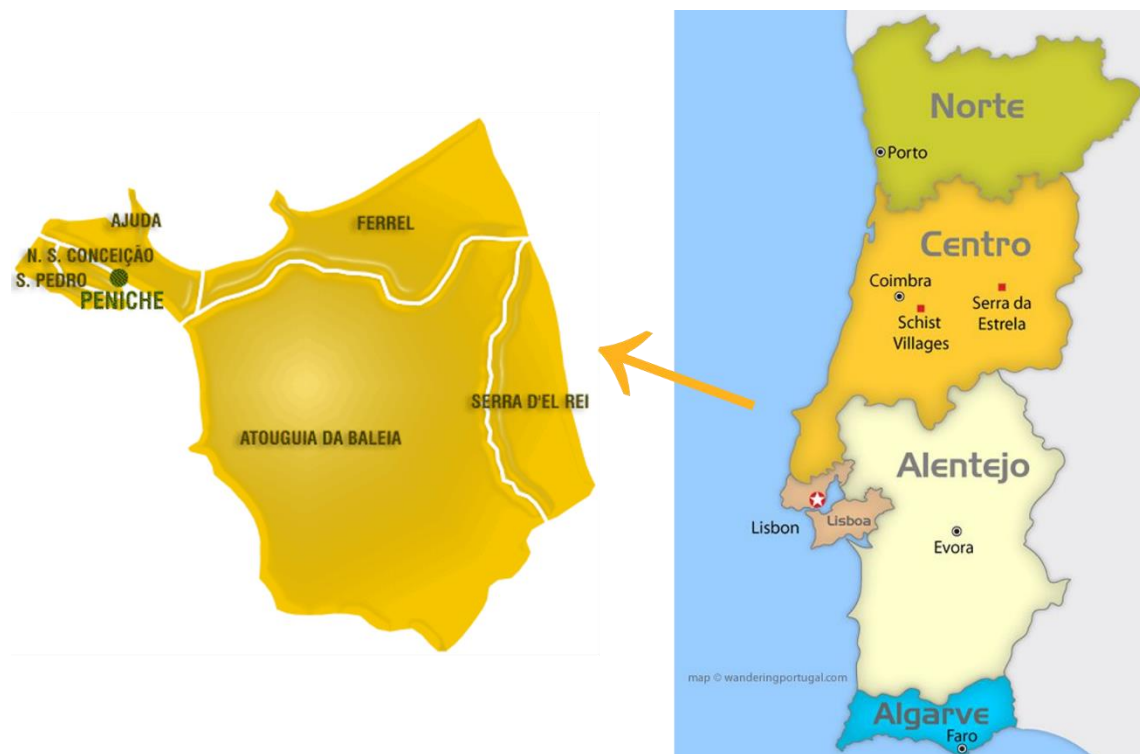


Figure 3.1 Location of Peniche. Source: Adapted from Google

According to the legend, the town was founded by a group of Lusitanians who took refuge in the area, escaping retaliation by Julius Caesar's hosts. (Baleal Surf Camp, n.d.) Peniche peninsula has a history of over 20 million years since "the geological evolution of the inferior Jurassic of Portugal" (Municipality of Peniche, n.d.) when the Iberian Peninsula was very close to the northern part of the American continent. Besides, being located on a rocky peninsula, Peniche is considered by scientists as "a unique worldwide example of the Toarcian turnover during the Early Jurassic extinction". (Polytechnic Institute of Leiria, n.d.)

Until the Middle Ages, Peniche was an island, but starting from twelfth century, a narrow strip of land was created to form a link between Peniche and continental Portugal, and this process finished in sixteenth century. (Calado, 1994) (Figure 3.2)

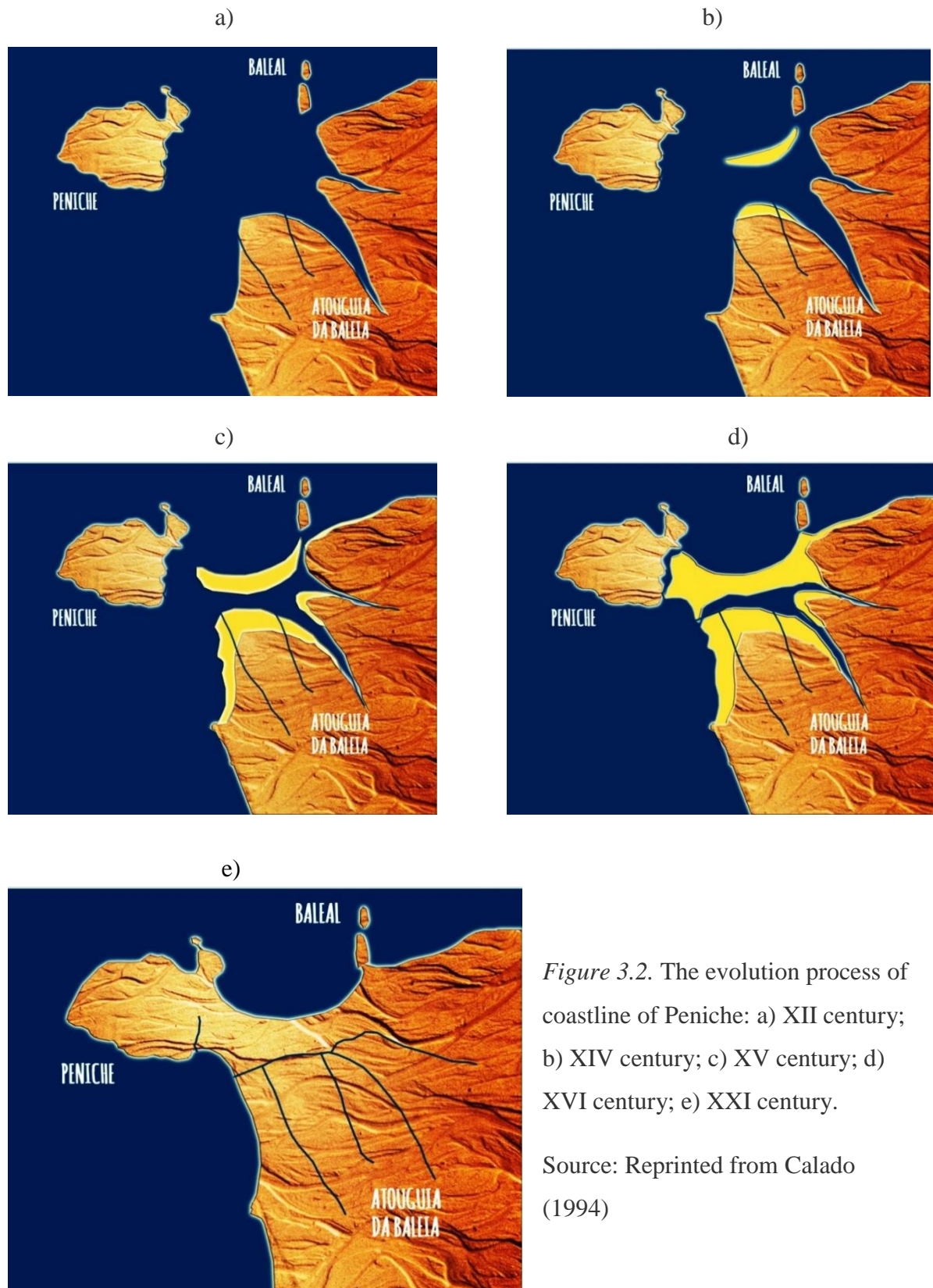


Figure 3.2. The evolution process of coastline of Peniche: a) XII century; b) XIV century; c) XV century; d) XVI century; e) XXI century.

Source: Reprinted from Calado (1994)

Now Peniche is a part of Iberian Peninsula and is located on a 'Tombolo' (tiny peninsula) with approximately 10km perimeter. Being a peninsular mountain and stretching into the sea, Peniche is called 'the Gibraltar of Portugal' and its extreme point is Cabo Carvoeiro. (Tuckey, 1815) The geomorphological specificity of Peniche is oscillating between the reality of island/peninsula. With rare and exotic geological formations, sculpted by the sea, the coast of Peniche is formed by imposing cliffs and magnificent beaches.

3.3 Tourism and accommodation

Peniche is known for its natural beauty and an amazing landscape, and it is one of the largest ports of traditional fishing in Portugal and a major Atlantic hub for maritime tourism activities. Although, coastal tourism (mainly beach and sun) is dominant in the area, Peniche is also featured with a rich fish and seafood gastronomy and various craftworks, such as ‘trimmed lace’. (Municipality of Peniche, n.d.)

Peniche presents a diversity of tourist resources “from the magnificent beaches of the entire coast, perfect to practicing water sports, to the majestic cultural patrimony, with outstanding blockhouses and religious monuments”. (Municipality of Peniche, n.d.)

Tourism is one of the main economic drivers of the city and the beaches play a major role in attracting tourists to the area. The magnificent beaches attract not only sea-sun-sand tourists, but also surfers and bodyboarders from all over the world due to its perfect waves. Peniche peninsula juts out into the Atlantic Ocean and its beaches face different directions (north and south) which makes it always possible to find a perfect wave due to the consistent swells. (Peniche Portugal - Tourism Guide, n.d.)

Therefore, Peniche is developed into a surfing destination for surf lovers as it has some of the best surfing waves in Western Europe and it is not surprising that Peniche is called ‘Capital of Waves’.

Besides, Supertubos beach hosts one of the main world surf championships, called Rip Curl Pro Portugal which is the part of the World Surf League Tour, and the beach is chosen as one of the ‘Portugal’s 7 Wonders’. Under the good weather conditions, perfect tube waves are formed and can reach up to 3 m high. (Peniche Portugal - Tourism Guide, n.d.)

Moreover, a boat ride away from Peniche, there are barren and rocky Berlenga Islands. The Berlenga Grande is the largest island which is the oldest nature reserve of Portugal and is featured with translucent waters, astonishing landscape, scenic coastline and the spectacular São João Baptista fort.

The general climate of Peniche is warm and temperate, with pleasant, dry and almost cloudless summer and with cool, rainy and windy winter. The average temperature is 15.3°C. The warmest month of the year is August with an average temperature of 18.9°C,

while the lowest temperature is seen on January with an average of 11.4°C throughout the year. (Figure 3.3)

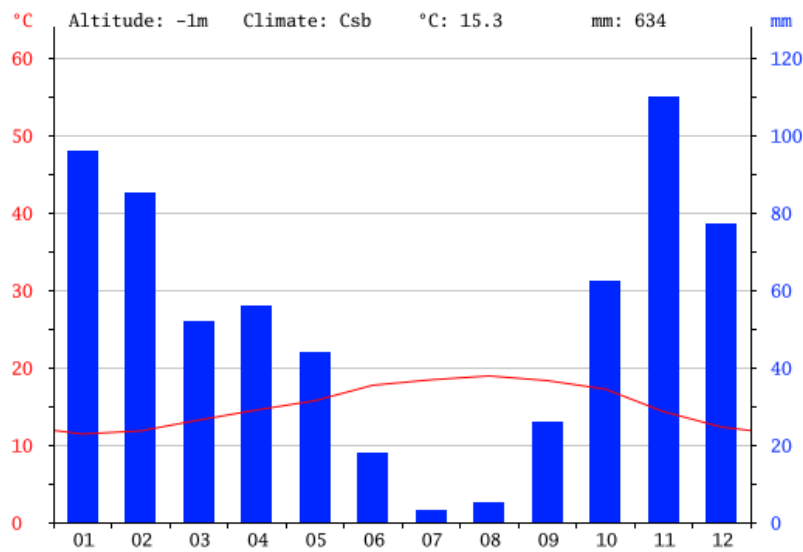


Figure 3.3 An average temperature and precipitation level throughout the year. Source: Reprinted from Climate Data (n.d.)

The average annual rainfall is 634mm and July is the driest month of the year with 3mm precipitation. Winter is much rainier than summer and November is the wettest month with an average of 110mm precipitation. (Figure 5)

Considering the climatic data, the middle of June till the middle of September is the best time to visit Peniche and to participate in several tourist activities.

Every year thousands of domestic and international tourists visit Peniche to enjoy its natural beauty and amazing beaches. The figure below shows the number of domestic and international tourists visiting Peniche between 2005 and 2015 years. As it can be seen, in 2013, there was a significant drop in the total number of tourists, but starting from 2014, a slight increase is observed in the total tourist numbers. (Nacional Statistics Institute of Portugal, n.d.) According to the available data, the majority of international tourists were from Europe between 2014 and 2015, 16611 and 22613 tourists, respectively. (Nacional Statistics Institute of Portugal, n.d.)



Figure 3.4 The number of domestic and international tourists. Note: Tourist numbers for 2011 are not available. Source: Adapted from Nacional Statistics Institute of Portugal (n.d.)

In Peniche the local accommodation has a very large weight driven in recent years by the platforms like Airbnb, for example. According the National Registry of Local Accommodation (RNAL-Registo Nacional do Alojamento Local) in Peniche, there are 468 registered local accommodation establishments (hostels, private apartments, private villas) corresponding to a capacity of 2719 beds accommodating 3774 people. (Turismo de Portugal, 2017)

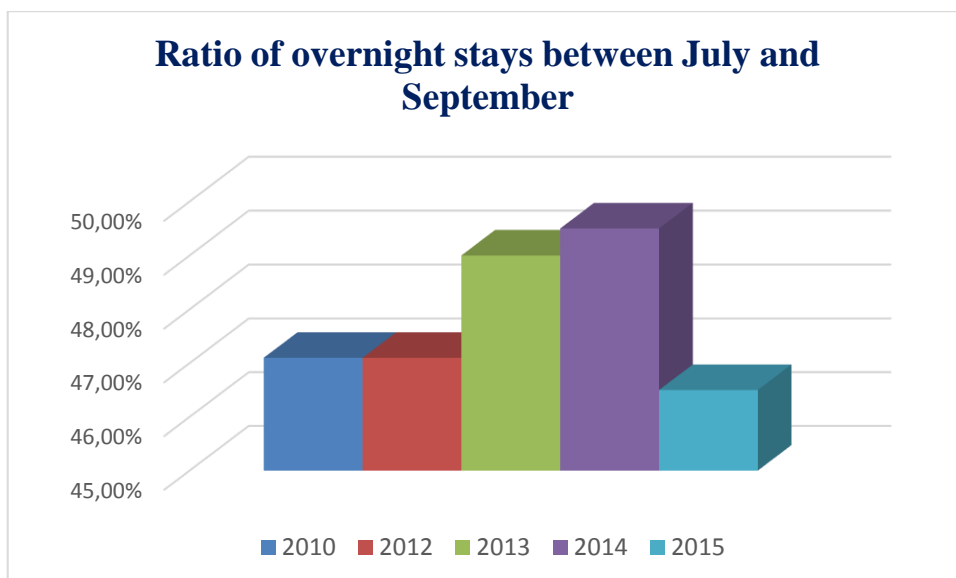


Figure 3.5 Ratio of overnight stays between July and Septemb. Note: The numbers for 2011 are not available. Source: Adapted from Nacional Statistics Institute of Portugal (n.d.)

According to the Figure 3.5, the ratio of overnight stays was maximum in 2013 and 2014 with a significant drop in 2015.

Overall, along with the fishing and agriculture, tourism plays a significant role in Peniche's economy and its people's daily life.

3.4 Climate change in Peniche

Observed climate changes in Peniche

There are very few studies that investigated climate of Peniche and its predicted future changes. For instance, climate change in Peniche is explored in the study done by Vasconcelos et al. (2012) who aimed to represent the west tourism region coast of Portugal, taking the climate trends around Peniche as an example.

The results of the study show that the minimum air temperature is observed to have a significant average increase of 0.2°C /per decade, while the mean air temperature shows an average increase of 0.03°C /per decade during 1941-2001. Vasconcelos et al. (2012)

Besides, Vasconcelos et al. (2012) calculated the sea surface temperature in Peniche through the analysis of 136 monthly average over the period of 1996-2007. The analysis shows that the annual sea surface temperature slightly decreased during the last decade.

However, analysis of the summer period (June-July-August) individually, show a slight increase in the sea surface temperature (Figure 3.6) during the same period. The higher increase in the sea surface temperature is observed in August, 2004, and June and July of 2006. (Vasconcelos et al., 2012)

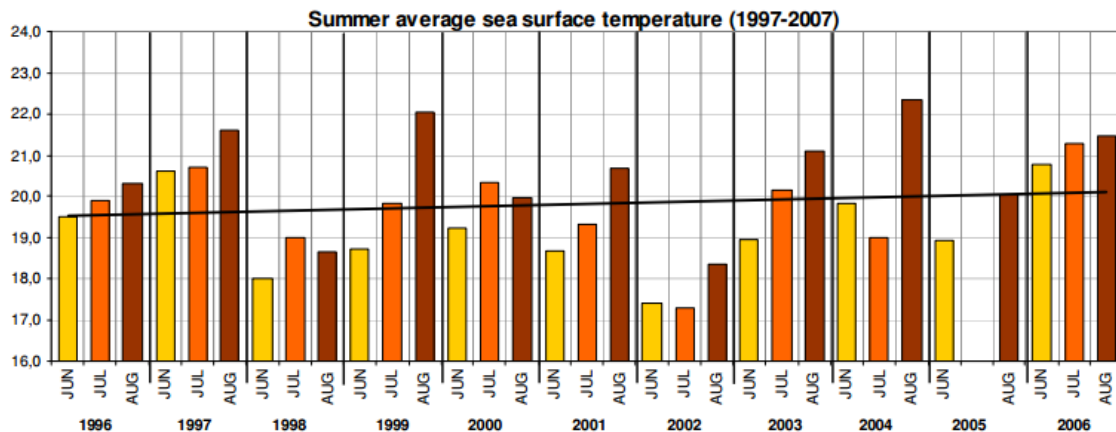


Figure 3.6 Observed changes in the summer average sea surface temperature. Source: Reprinted from Vasconcelos et al. (2012).

Regarding the precipitation level, the analysis of the monthly precipitation (Figure 3.7) in Peniche shows a slight decrease in precipitation during 1991-2006 in relation to the

average of the climatological normal of 1961-1990, 576,3mm and 609,0mm respectively. (Vasconcelos et al., 2012)

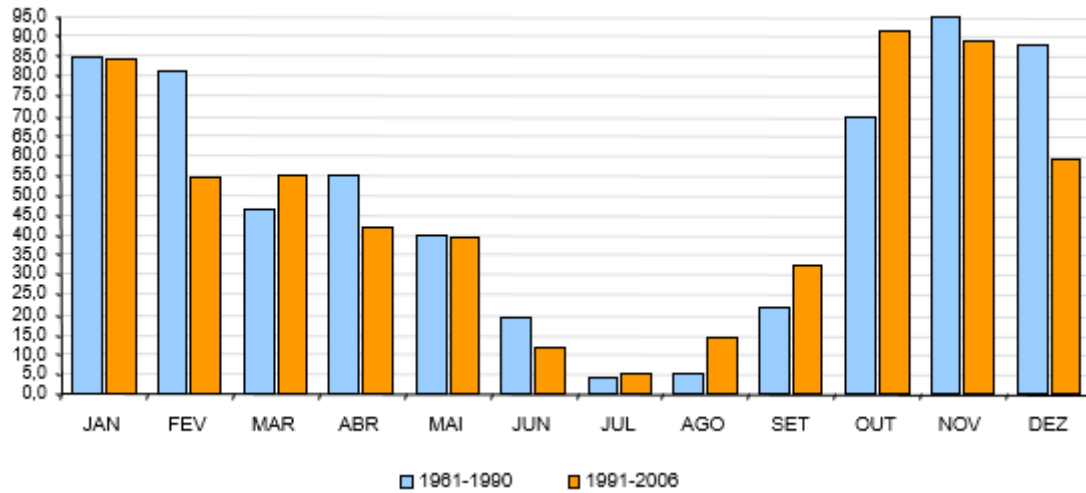


Figure 3.7 Observed changes in the monthly precipitation pattern. Source: Reprinted from Vasconcelos et al. (2012).

Future projections of climate change impacts in Peniche

Regarding the future projections, there is no climate data about Peniche individually, but exists a data for the West coast of Portugal which includes Peniche.

Comparison of the observed average temperature of West coast of Portugal during 1971-2000 years with the average temperature under a RCP4.5 climate change scenario shows a slight increase in both maximum and minimum average temperature during 2071-2100. For instance, the maximum average temperature will increase from 20.6°C to 22.5°C in August and the minimum average temperature will increase from 9.5°C to 10.7°C in January during 2071-2100. (Figure 3.8)

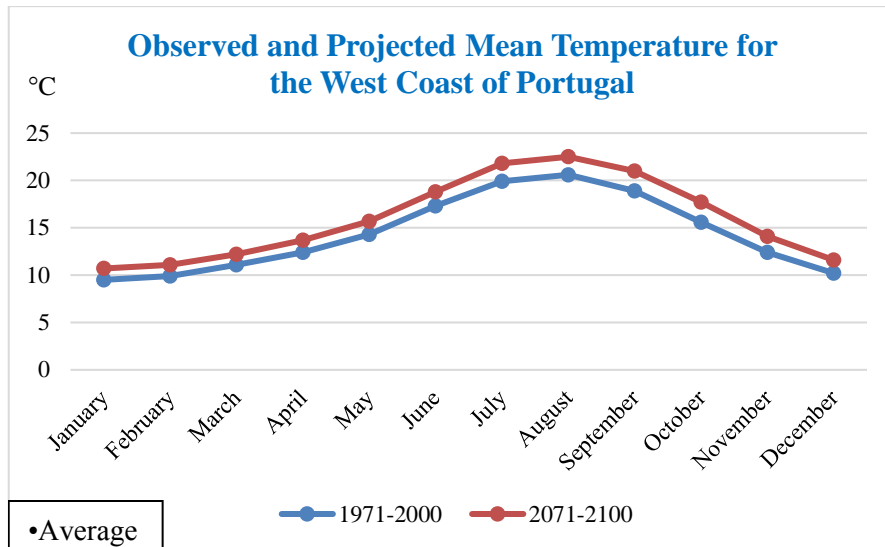


Figure 3.8 Observed and projected mean temperature for the West coast of Portugal. Note: Projected mean temperature is under a RCP4.5 scenario. Source: Adapted from Portal do Clima (2015)

Furthermore, the future predictions for precipitation level on the west coast of Portugal show an increase in the precipitation level in January, February and December during 2071-2100. Besides, the wettest month of the year will be December with an average of 143mm in comparison with 133.7mm during 1971-2000. However, there will be a slight decrease in the precipitation level during the rest 9 months. For instance, during 1971-2000, precipitation level for the driest month of the year (July) was 6.1mm, while it is projected to have 5.4mm precipitation level during 2071-2100. (Figure 3.9)

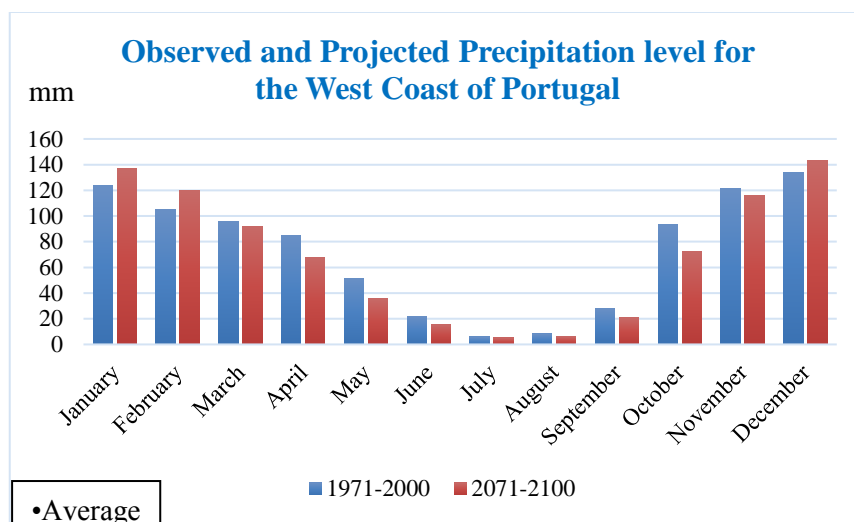


Figure 3.9 Observed and projected precipitation level for the West coast of Portugal. Note: Projected precipitation level is under a RCP4.5 scenario. Source: Adapted from Portal do Clima (2015)

All these predictions forecast hotter and drier summers and wetter winters in the west coast which is likely to affect the tourism of the area. Located in the coast and featuring with coastal tourism, Peniche is highly vulnerable any kind of changes in temperature or precipitation level.

Part II. Methodology

3.5 Sample method

Peniche is chosen because of its location – proximity to the ocean and focus on tourism as a main economic driver, thus making Peniche, and particularly city's tourism sector highly vulnerable to climate change. Quantitative method, particularly questionnaire, was chosen for this research, as it lets to collect more information from the respondents in a short period of time. Survey was carried out in Peniche, particularly, in three tourist accommodations, during May-July 2017. After pre-testing of questionnaire, some corrections have been made.

Being small coastal city, Peniche has quite enough type of tourist accommodations, including hotels, hostels, B&Bs, guest houses, etc. According to the Nacional Statistics Institute of Portugal (2016), there are 28 tourist accommodation establishments in total. Questionnaire was carried out in Hotel MH Peniche, Hotel Soleil Peniche, and Surfers Lodge Peniche, located in Peniche, Baleal and Ferrel, respectively.

The respondents were chosen by their willingness to participate in the questionnaire, thus convenience sampling was used for this research, which is also known as availability sampling. This sampling method selects targets who are available or willing to participate in a survey. (Saunders et al., 2012)

134 questionnaires in total were filled in by tourists, and are appropriate for analyse. 46 questionnaires have been collected from Hotel Soleil Peniche, 52 from Hotel MH Peniche and 36 from Surfers Lodge Peniche, yielding response rates of 34,3%, 38,8% and 26,9% respectively for each tourist accommodation.

Considering ethical side of survey, questionnaire starts with the short information about the purpose of questionnaire. All respondents were also informed that all the information collected for the research will remain confidential and be used just for this thesis. In order to get truthful information as far as possible, each questionnaire was filled in anonymously and just by the willingness of the respondents.

3.6 Design of questionnaire

Questionnaire is designed of different topics with the aim to get more in-depth information from respondents. So, questionnaire is divided into four parts. The first three parts consist of 9 questions in total, and the fourth part consist issues about tourist profile.

To analyse the level of understanding of climate change issues, respondents were asked several questions in the first part. First question asks respondents to rank several climate change issues, in the second question, respondents were asked who must deal with climate change impacts, the third question is about several methods to minimise climate change impacts, and the last question of the first part asks respondents if they are doing anything to reduce climate change impacts.

In the second part of questionnaire, respondents were asked questions about climate change impacts on coastal destinations, such as the most important impacts of climate change on coastal destinations, and if climate change has already affected tourism in Peniche.

The third part concentrates on questions about climate change impacts on destination choice to see how climate change will impact destination choice of tourists visiting Peniche.

The last part of questionnaire is called 'Tourist profile' which consist of information about respondents, such as age, gender, country of residence, level of education, etc.

All collected data were coded in the form of themes and passed to Microsoft Excel manually. Next step was transferring all data from Microsoft Excel to SPSS program.

3.7 Conclusion

The first part of the chapter has presented detailed information about study area, describing the location and geography of the area which make it vulnerable to climate change, following by the description of its tourism and accommodation industry, mentioning the importance of tourism for the area's and its people's future.

The observed and projected changes in the climate of the area are presented through several figures, providing an insight into the potential effects of changing climate for area's tourism sector.

The second part has presented a description of the used methodology providing the justification of chosen method, followed by the process of designing the questionnaire.

CHAPTER 4. RESULTS

4.1 Introduction

This chapter demonstrates all results of the research conducted in Peniche, Portugal. All sub-chapters are named according to the four themes of questionnaire presenting the findings of each of them. First sub-chapter provides brief profile of respondents, such as age, gender, education level or professional activity, followed by the results of climate change awareness of respondents through several figures and charts.

Third sub-chapter reveals the results of climate change impacts on coastal destinations, displaying results with figures. The last sub-chapter presents results of climate change impacts on destination choice through three questions using figures and charts. The chapter ends with a short conclusion.

4.2 Tourist profile

The main reason of analysing tourist profile part of the questionnaire is to verify if there is any aspect of the tourist's profile that can influence his/her respond to the questions.

Design of the questionnaire has been kept as short as possible and consists of 9 questions in order not to make respondents feel bored and make them answer to the questions as truthful as possible. In the result, a total of 134 questionnaires were distributed and returned fully filled in by respondents.

Questionnaire was carried out in three hotels – Hotel Soleil Peniche (46 questionnaires – 34,3%), Hotel MH Peniche (52 questionnaires – 38,8%) and Surfers Lodge Peniche (36 questionnaires – 26,9%).

Table 4.1

Tourist profile.

Tourist profile	Number	Percentage
Gender		
Male	76	56,7%
Female	58	43,3%
Age		
18-29	36	26,9%
30-44	57	42,5%
45-64	32	23,9%
65+	9	6,7%
First-time visitor	76	56,7%
Return visitor	58	43,3%
Main purpose of visit		
Meeting family/friends	3	2,2%
Holidays, leisure and recreation	45	33,6%
Beach	27	20,1%
Wave sports	52	38,8%
Nature	4	3%
Business	3	2,2%
Educational level		
Primary education	4	3%
High school	48	35,8%
Higher education	82	61,2%
Professional activity		
Employee	62	46,3%
Freelancer/Entrepreneur	31	23,1%
Retired	11	8,2%
Student	16	11,9%
Unemployed	14	10,4%

Table 4.1 reports demographic characteristics of the respondents. The gender distribution of the samples was 56,7% male and 43,3% female. The respondents are grouped in four age groups. The range of respondents' ages are between 18 and over 65, with the largest number of respondents falling in the 30-44 age group (42,5%).

The majority of the respondents (61,2%) have higher education and most of the respondents are employees (46,3%).

43,3% of the respondents are the return visitors, while 56,7% are the first-time visitors. The reason of this question is to explore if there is any difference between first time and return visitors to respond to the questionnaire.

Regarding the “Main purpose of visit”, analysis shows that, most of the respondents visit Peniche for wave sports (38,8%), followed by holidays, leisure and recreation tourists with 33,6%.

Regarding the length of the trips, most of the respondents visit Peniche for 2-5 days (61,2%), followed by trips for 6-9 days (34,3%) and 10-15 days (4,5%).

The questionnaire is filled in by the respondents from 22 counties. (Figure 4.1) The majority of respondents are international tourists (88,8%), and 11,2% are from Portugal presenting domestic tourists. Most of respondents are from European countries, and the rest are from 17 different countries, including USA, Canada, Russia, Australia, etc. Thus, respondents present 4 continents (Europe, Asia, America and Australia).

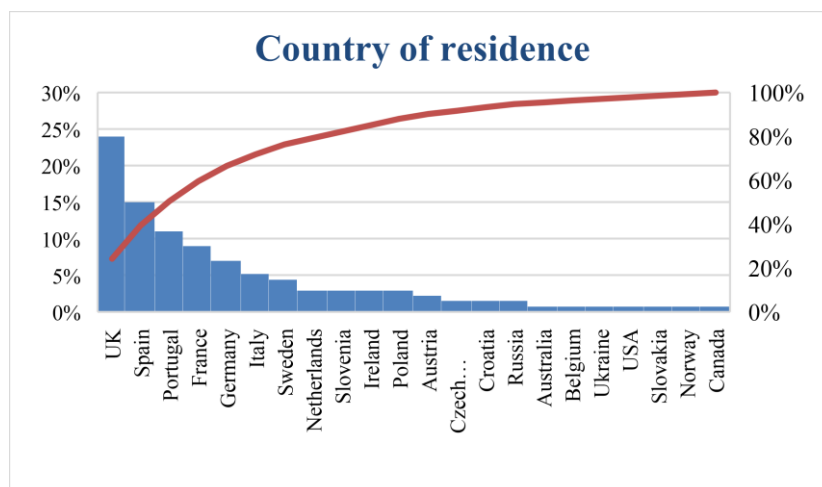


Figure 4.1 Country of residence.

4.3 Climate change awareness

To evaluate the climate change understanding level of respondents, they were first asked to rank several issues of climate change from ‘strongly disagree’ to ‘strongly agree’.

The figure below shows that more than a half of respondents (52,2%) are aware of climate change and its impacts. To better understand what is perceived to be the cause of climate change, the tourists were asked to rate to what extend they agree with climate change being caused by human activities and to what extend by natural processes. Almost half of the respondents (45,5%) ‘agree’ that climate change is caused by human activities, while 48,5% ‘agree’ that climate change is a natural phenomenon.

Besides, almost half of the respondents think that climate change affects human life, while more than a half of them think that climate change affects natural environment.

Moreover, half of the respondents think that climate change is a serious problem and the majority of the respondents (68,7%) declared that they are concerned about the effects of climate change. All of the answers were displayed below based upon the elements that were rated as ‘strongly agree’ and ‘agree’. (Figure 4.2)

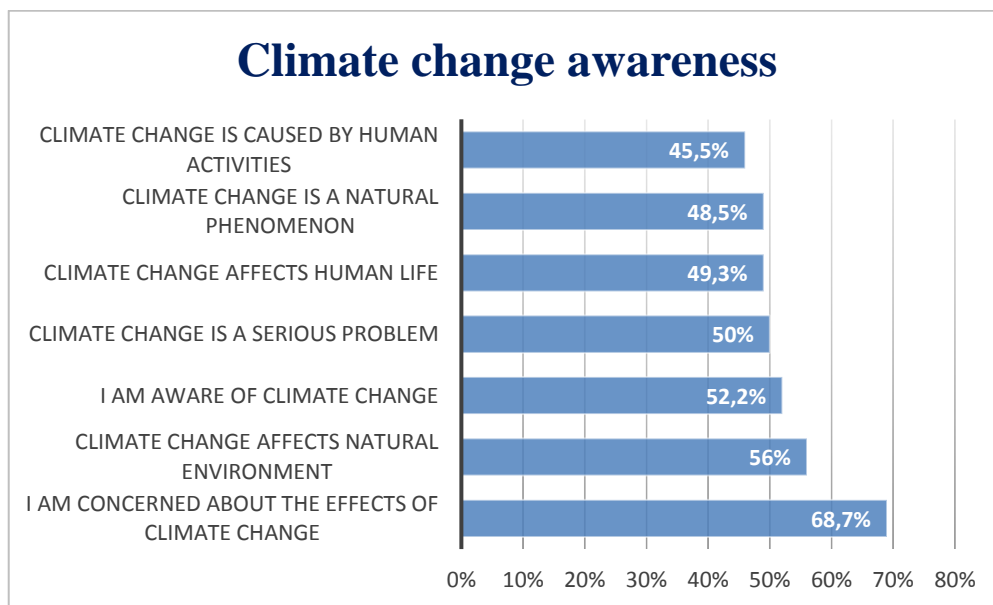


Figure 4.2 Climate change awareness.

Regarding the concerns about climate change versus respondents' ages, the table below shows that respondents of 30-44 age group are more concerned about climate change effects, while respondents with over 65 years are less concerned about changes in global climate. (Figure 4.3)

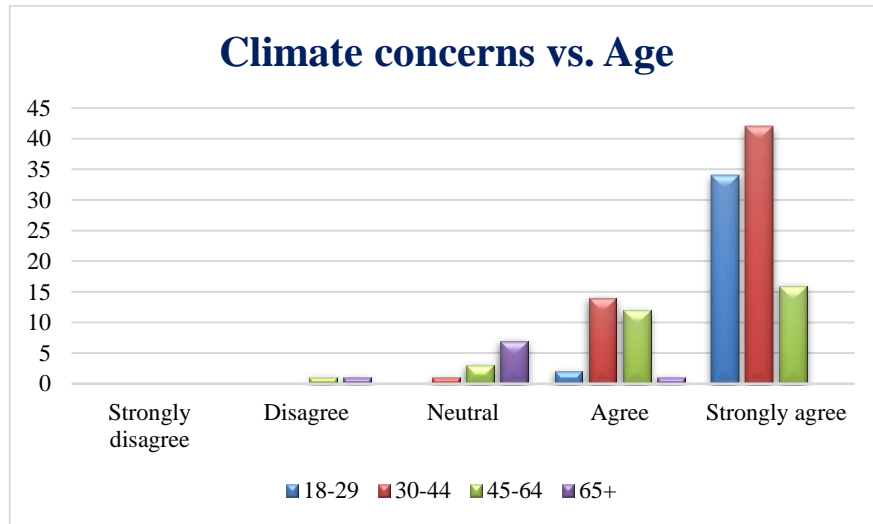


Figure 4.3 Climate concerns versus Age

The next question is about to define who is responsible for solving climate change impacts which gives respondents four options such as tourists, tourism enterprises, government and all above-mentioned. The question is multiple choice which lets respondents choose more than one option. All the answers were graphed below showing how many time each option was chosen by respondents. (Figure 4.4)

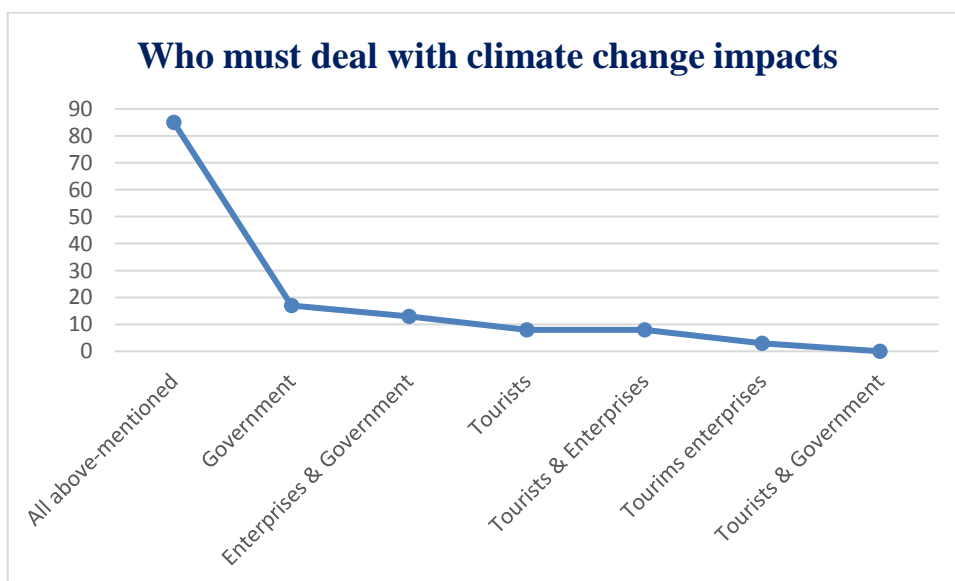


Figure 4.4 Responsibility to tackle climate change.

The results show that the majority of respondents think that tourists, tourism enterprises and government should work together to deal with climate change impacts as they chose ‘all above-mentioned’ option 85 times.

However, some of the respondents think that government should solve climate change problems (17 times), while other part think that tourism enterprises and government should solve problems together (13 times).

Besides, some of the respondents think that tourists are responsible for climate change impacts and they should deal with it alone (8 times). However, other part think that tourists and tourism enterprises should cooperate to deal with climate change impacts (8 times). Only the small share of respondents think that tourism enterprises should solve problems alone (3 times), while nobody thinks that tourists and government should work together. (Figure 4.4)

In the third question, respondents were asked to rank from ‘not important’ to ‘very important’ the issues that can minimise climate change impacts. The figure below demonstrates answers of ‘very important’ and ‘important’. As it can be seen, reducing water usage is the most important issue that can minimise climate change impacts. The least important issue for respondents is turning off lights/electrical appliances when not used. (Figure 4.5)

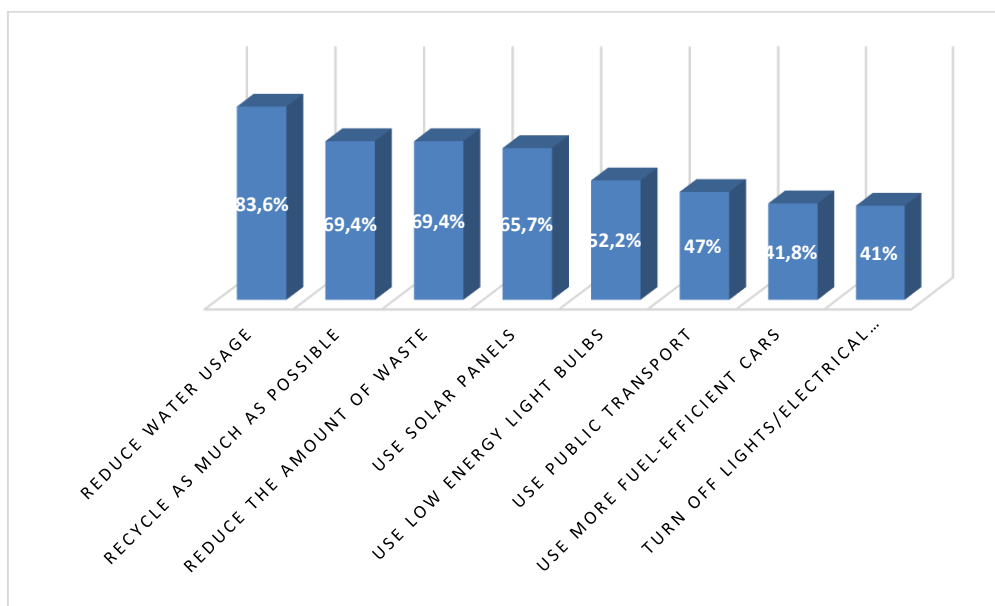


Figure 4.5 Actions that people can do to minimise climate change impacts.

The last question of this part asks respondents if they are willing to do anything to reduce climate change impacts. (Figure 4.6) Fortunately, the majority of respondents (55,2%; n=74) said that they have already made some efforts to adopt their lifestyle to a changing climate. 20,9% of respondents (n=28) said that they are willing to do everything they can, while 17,2% (n=23) said that they do not know what they can do to minimize climate change impacts. 3,7% said that they will do something if everyone else does, and only 3% said that they are not willing to do anything.

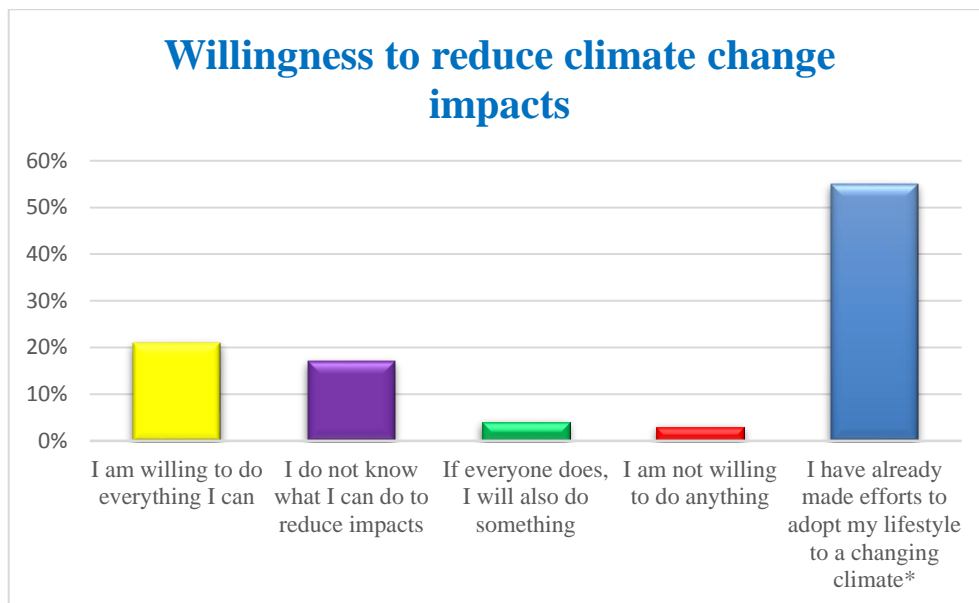


Figure 4.6 Willingness of respondents to reduce climate change impacts.

The last option of this question asks respondents to give an example about what they are doing to minimise climate change impacts and just 12 of 134 respondents (around 9%) give some examples, such as recycling, reducing the amount of waste and using low energy light bulbs.

4.4 Climate change impacts on coastal destinations

This part consists of two questions of climate change impacts on coastal destinations. In the first question, respondents were asked to rank the most important implications of climate change on coastal destinations from ‘not important’ to ‘very important’. (Figure 4.7)

Results show that for respondents, ‘coastal/beach erosion’ is the most important impact (77,6%) of climate change for coastal destinations, while ‘sea level rise’ is the second most important (67,2%) climate change impact. In the opinion of respondents, the least important impact of climate change is ‘extreme weather events’ (36,6%). All the answers are shown below based upon the elements that were rated as ‘very important’ and ‘important’.

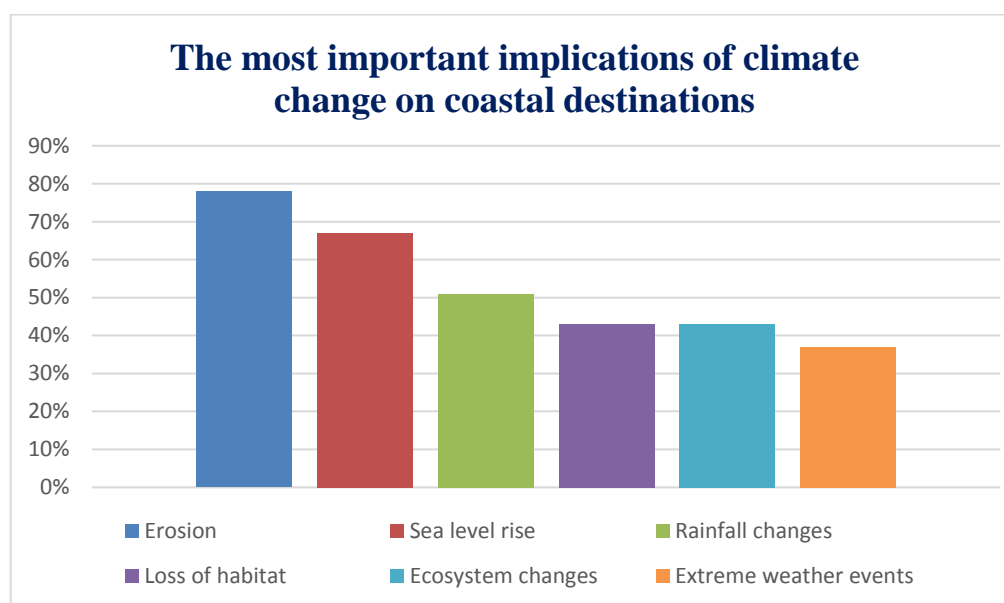


Figure 4.7 Implications of climate change on coastal destinations.

The second question asked respondents if they believe that climate change has already affected tourism in Peniche. The figure below shows that most of the respondents are not sure (38,1%) if climate change has already affected tourism in Peniche or no, while 32,1% of respondents (n=43) chose the option ‘Yes’ believing that tourism in Peniche has already been affected by climate change. (Figure 4.8)

Besides, 6,7% think that climate change has not affected tourism yet, while 23,1% of respondents (n=31) believe that climate change will affect tourism in Peniche in the future.

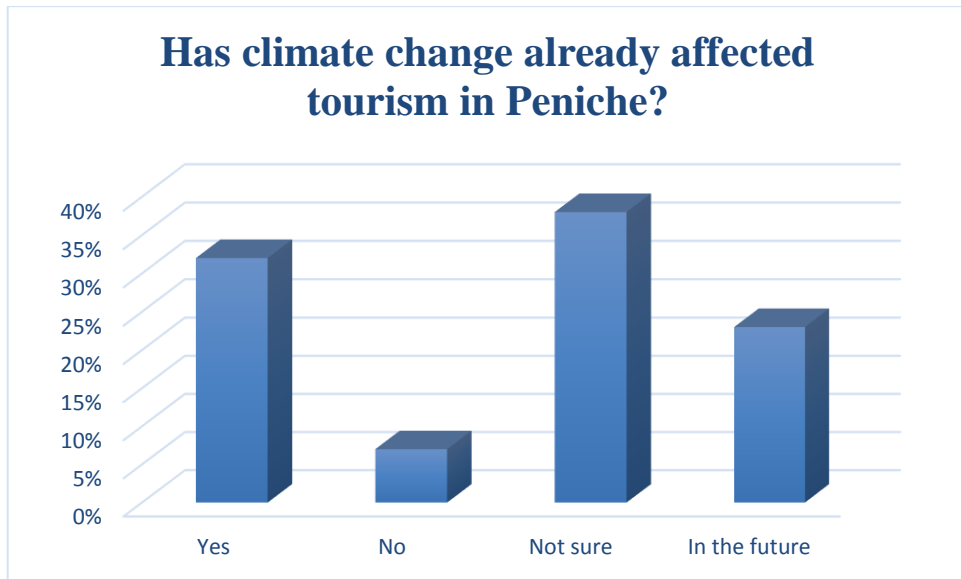


Figure 4.8 The recent climate change impacts on tourism in Peniche.

4.5 Climate change impacts on destination choice

To evaluate climate change impacts on destination choice, in this part respondents were asked several questions. For instance, to explore why tourists choose particular destinations for their holidays, first question asked respondents to rank the most important elements for their destination choice from 'not important' to 'very important'. (Figure 4.9)

The results show that the three most important elements for destination choice are the beach facilities of the destination, the quality of its natural setting and its climate or expected weather.

Therefore, 'Beach facilities/amenities' and 'Quality of the area's natural setting' are the most important elements for respondents with 70,1% each of them. 'Climate or expected weather' is the third important element for the respondents with 69,4%.

Besides, results show that the rest of the elements are 'important' for destination choice, such as 'Cultural and historical attractions' (61,2%); 'Uniqueness of local people's way of life' (58,2%); 'The image of the location' (49,3%); 'Price of accommodation' (45,5%); 'Price of transport (flights, buses, etc.)' (44%); 'Safety & security', (43,3%) and 'Cuisine' (43,3%), while just 'Travel distance/time' is 'moderately important' for destination choice (35,1%).

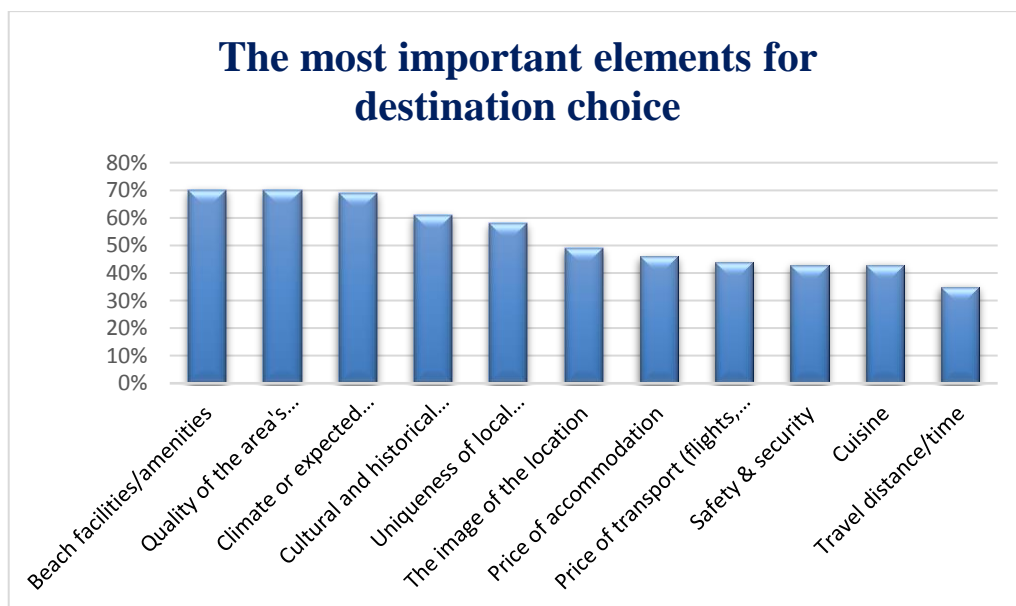


Figure 4.9 The most important elements for destination choice.

Regarding the importance of climate or expected weather in destination choice, 69,4% of respondents (n=93) said it is ‘very important’ for them, while for 25,4% of respondents (n=34) it is ‘important’ and for 5,2% (n=7) it is ‘moderately important’. Nobody chose the options ‘little importance’ or ‘not important’, which shows that climate or expected weather is one of the most important elements that tourists consider when they choose travel destination. (Figure 4.10)

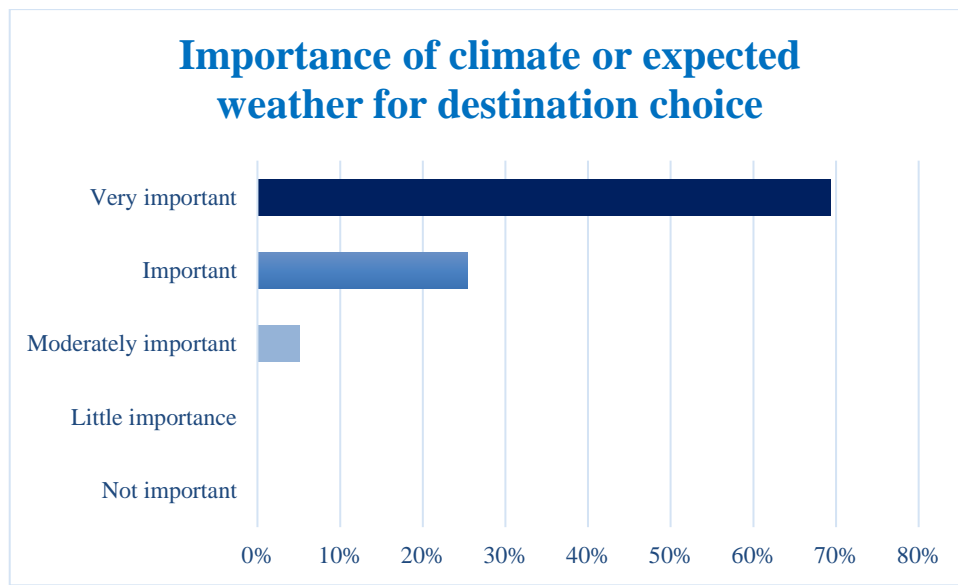


Figure 4.10 Importance of climate or expected weather for destination choice.

The second question is multiple choice where respondents were asked to define the most important weather parameters for beach tourism in their opinion. (Figure 4.11) Sunshine is the most chosen (60 times) weather parameter for coastal/beach tourism, while temperature is in the second place (is chosen 57 times). The figure below displays all answers showing how many time each option was chosen by respondents.

Moreover, considering the majority of respondents (38,8%) who chose Peniche for wave sports, wind is chosen 18 times by respondents to be one of the important weather parameters for them.

Besides, results reveal that humidity and rain are the least important weather paraments for costal/beach tourism.

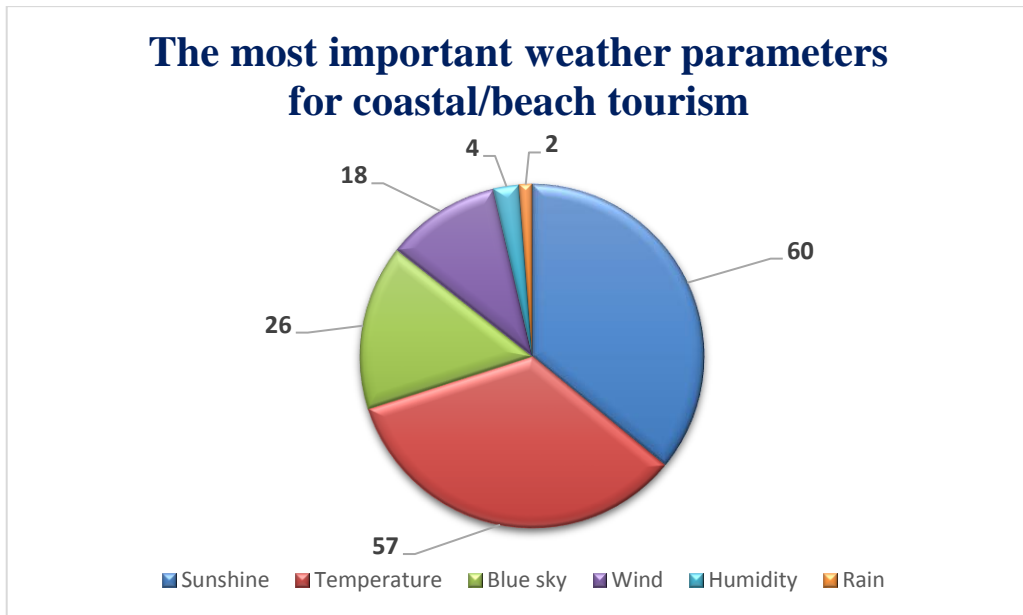


Figure 4.11 The most important weather parameters for coastal/beach tourism.

The last question of this part asked respondents to choose the possible impacts of negative changes in previous-mentioned weather parameters in choosing Peniche as their travel destination. As it is seen from the figure below, 23,1% of respondents will not change destination and will still travel to Peniche, however, the majority of respondents (43,3%) will travel to Peniche in different dates. The rest of respondents (33,6%) said they will choose different destination. (Figure 4.12)

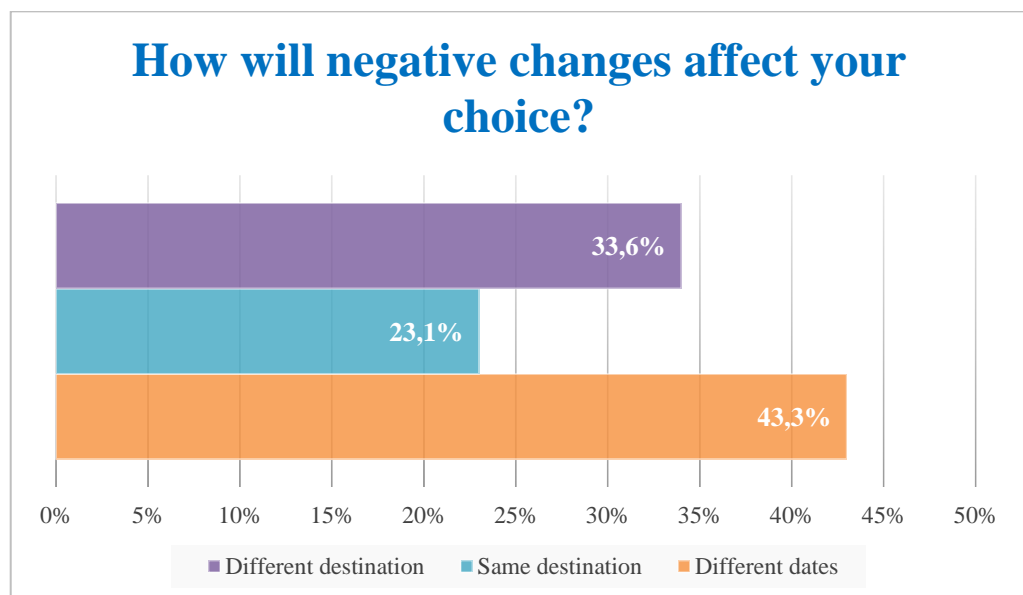


Figure 4.12 Impacts of negative changes in weather patterns on destination choice.

While comparing destination choice and first-time or return visitors, it is obvious from the figure below that the majority of both first-time and return visitors will choose different dates to visit Peniche in their next holidays. (Figure 4.13)

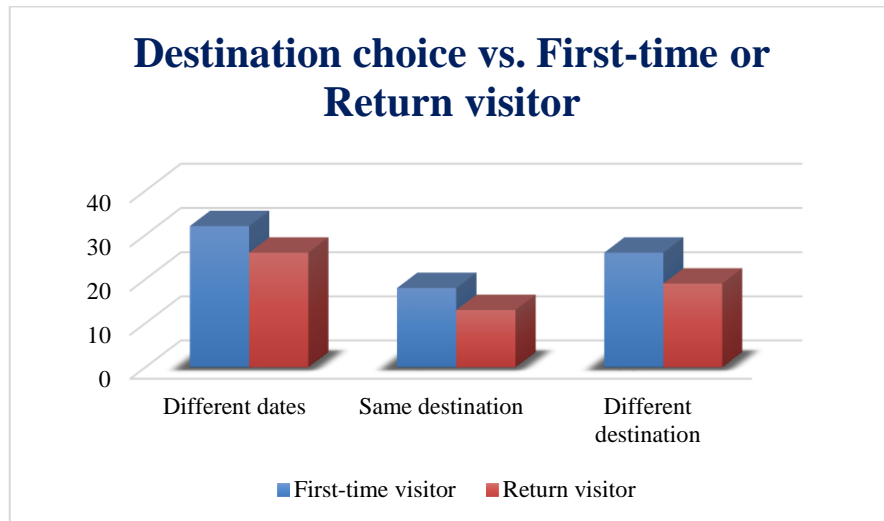


Figure 4.13 Destination choice vs. First-time or Return visitor

4.6 Conclusion

The chapter has revealed all answers of the research in this chapter, presenting the content and detailed information about each question from questionnaire using several figures and charts.

Results has revealed that more than half of the respondents are aware of climate change, while the majority think that reducing water usage can significantly help to reduce climate change impacts along with recycling and reducing the waste.

Besides, being very concerned about the impacts of climate change on coastal destinations, respondents declared uncertainty about the recent effects of climate change in Peniche.

In addition, climate or expected weather was listed as the third important element for tourists' destination choice, while sunshine and temperature are chosen to be the most important weather parameters for coastal/beach tourism. Even under a scenario of climate change, most of the respondents declared that they will return to Peniche again, but not in the peak seasons.

CHAPTER 5. DISCUSSION & CONCLUSION

5.1 Introduction

This thesis has explored the potential impacts of climate change on destination choice and how it will influence choice of tourists visiting Peniche. The previous chapter presented all results driven from the questionnaire which was conducted to domestic and international tourists visiting Peniche.

This chapter is divided into two parts, and first part provides in-depth discussion of the results, presenting all empirical findings, followed by the comparison of results to the literature. The second part summarizes the thesis by highlighting the key findings of the study, presenting how the objectives were achieved, and mentioning the limitations, followed by several recommendations for future research.

Part I. Discussion

5.2 Empirical findings

An increasing concern of climate change and its potential effects on many sectors, including tourism, gains more attention of governments, businesses, and particularly academic research. This thesis has explored the potential impacts of climate change on tourist destination choice and potential response of tourists visiting Peniche, to these impacts.

The study site is very dependent on tourism sector as its one of the main economic drivers of the area. Therefore, any negative change in climate of the area, will likely influence not only tourism, but also economy and livelihood of the city.

This section discusses in-depth the main empirical findings of the thesis. Regarding the awareness level of tourists, the results have revealed that most of the respondents are aware of climate change, however, regarding the cause of climate change, almost half of the respondents think that it is a natural phenomenon and put all responsibility for climate change on the nature. Despite of this, being very concerned about climate change effects on both human life and natural environment, respondents agree that climate change is a serious problem.

In addition, while comparing concerns about climate change with respondents' ages, results revealed that while 30-44 age group are the most concerned about a changing climate, respondents with over 65 years are the less concerned group.

In relation to the responsibility to deal with climate change impacts, respondents declared that everyone is equally responsible for tackling climate change impacts regardless of being tourist, tourism enterprise or government, and all should work together in planning and implementing adaptation and mitigation strategies.

Accordingly, respondents emphasize that reducing water usage, recycling, and reducing waste are the most effective actions that people can do to minimize climate change impacts.

Besides, fortunately, the majority have stated that they have already adopted their lifestyle to a changing climate through recycling, reducing waste, using low energy light bulbs, etc. While the rest of respondents state the willingness to do everything to reduce impacts, only a small share is not willing to do anything and do not feel any responsibility for climate change thinking that others have to deal with impacts of climate change.

Respondents have emphasized that coastal destinations are under a great risk of climate change impacts, and erosion and sea level rise are the most important impacts which can influence tourists' destination choice in a negative way. However, extreme weather events seem to have the least influence on destination choice.

Nevertheless, tourists are uncertain about the recent effects of climate change on tourism sector in Peniche, thinking that climate change will impact Peniche in the future.

Moreover, results have revealed that among the most important elements of destination choice, beaches, natural settings, and climate or expected weather of the destination are the most important elements. Therefore, these three elements appear to be pull factors for travelling and choosing particular destination. Accordingly, climate or expected weather is one of the most important elements that tourists consider when they choose travel destination. Therefore, negative changes in these patterns will reduce the attractiveness of destinations, and accordingly, will influence tourists' destination choice.

While choosing destination for beach holidays, sunshine and temperature are the most important weather parameters that tourists consider.

Regarding the choice of Peniche as a travel destination under the impacts of climate change, the majority will still travel to Peniche, but not in the peak seasons. This result also confirmed while making comparison of destination choice with first-time or return visitors, which revealed that both first-time and return visitors will prefer spring or autumn to spend their holidays in Peniche.

Obviously, climate change will not significantly affect tourists' choice of Peniche as a travel destination, however, climate change will influence the timing of travel to Peniche, shifting from the peak seasons to the shoulder seasons.

5.3 Comparison to the literature

While comparing the findings of this thesis to the existing literature on climate change, tourism, and destination choice, similar results were found. For instance, evaluating the awareness level of respondents, this thesis found out that the majority are aware of climate change and half of the respondents (50%) consider climate change as a serious problem. The similar results were found in the study done by Masud et al. (2016) who found out that most of the respondents are aware of climate change and 70% consider it as a serious problem.

Besides, respondents were asked to rank the most important elements for destination choice, and 'climate or expected weather' were ranked as the third most important one. Besides, the majority (69.4%) ranked 'climate or expected weather' to be 'very important' for their choice. This is the similar result to the study done by Moreno (2010), who found out that 'climate' is either 'very important' or 'important for the majority (76.5%) of respondents. However, Moreno (2010) found out that 'climate' is in the first place of destination attributes for respondents.

Moreover, in this study, sunshine and temperature were the most selected weather parameters to be important for beach tourism, while Moreno (2010) found out that 'absence of rain' is the most important weather variable for beach tourism, followed by 'comfortable temperature'.

Finally, the results of this thesis have revealed that even in the case of negative changes in climate and weather parameters, most of the respondents (43.3%) will still travel to Peniche, but not in the peak seasons. However, in the study done by Moreno (2010), it was found that 'unfavourable weather' conditions in Mediterranean will negatively influence booking a trip, as almost 39% of respondents will choose different destination.

However, Moreno (2010) found out that in case of 'ideal weather' to be found in the Mediterranean and in northern European countries, tourists from northern Europe will still choose the Mediterranean for beach holidays. Therefore, it is obvious that despite of climate change not having significant effect on tourists' choice regarding Peniche, any negative changes will make the Mediterranean less appealing for travelling and will significantly influence destination choice.

Part II. Conclusion

5.4 Key findings

The key findings that were identified by the study, are highlighted in this section.

- Tourists are very concerned about climate change impacts

The respondents are aware of climate change, considering it very serious problem affecting both human life and natural environment. Despite of thinking that climate change is a natural phenomenon, tourists are very concerned about the impacts of climate change.

- Everyone is responsible for tackling climate change

The respondents agree that everyone is equally responsible for tackling climate change impacts, and tourists, tourism enterprises and government should work together to adapt to climate change and to minimize its impacts as far as possible.

- Reducing water usage can help to minimize climate change impacts on a large scale

Among the issues which can help to minimize impacts, reducing water usage is in the first place, followed by recycling, and reducing waste. Respondents believe that these actions can be very effective to mitigate potential impacts.

- The willingness to reduce climate change impacts is quite high

Part of the respondents are willing to reduce climate change, despite of not having enough information about 'what they can do'. However, the majority already adopted their lifestyle to climate change impacts and doing all possible actions to minimize impacts.

- Coastal destinations are under a high risk of erosion and sea level rise

Coastal destinations are projected to be affected by various impacts of climate change, and erosion and sea level rise are considered to be the most important impacts, while extreme weather events are considered the less important impacts of climate change.

- There is a high uncertainty about the recent impacts of climate change on tourism in Peniche

Being a coastal destination, Peniche is under a risk of various climate change impacts. However, it is uncertain if climate change has already affected the tourism of the city or it will affect in the future.

- Climate or expected weather is a significant element to consider for destination choice

Although, beaches and natural settings of destinations are the most two important elements for destination choice, climate or expected weather is the third important element of destination choice. Due to the changes in global climate, climate of the destinations is expected to have more importance for tourists while deciding where to travel.

- Tourists will visit Peniche in shoulder seasons

Climate change will not influence choices of tourists visiting Peniche, as they will still travel to Peniche. However, climate change will influence the timing of travel, as respondents declared that they will visit Peniche not in the peak seasons due to the changes in weather and climate patterns.

5.5 Realization of objectives

The three objectives of the thesis are achieved and presented in this section. The first objective of the study was to explore the potential impacts of climate change on destination choice. The review of literature has revealed that climate change is expected to affect destination choice in different ways, as tourists can respond to these changes differently. For instance, under a climate change scenario, tourists can change travel destination, or they can still choose the same destination. Besides, tourists can choose the same destination, but change time of travel. Moreover, if favourable weather will be found in home countries or surroundings, tourists will choose domestic destinations for their holidays instead of international destinations.

The second objective was to evaluate the potential influence of climate change on choice of tourists visiting Peniche. The findings of this study have revealed that climate change will not significantly affect tourists' choice, as they will still choose Peniche as their travel destination. However, it is expected that climate change will influence the timing of travel, as tourists are expected to visit Peniche in shoulder seasons, due to the changes in climate and weather patterns of the city.

The third objective was to contribute to the literature on climate change impacts on tourism in Portugal and Peniche. As the review of the literature showed that climate change and tourism in Portugal has not been highly researched, the findings of this research contribute to the knowledge of climate change impacts on coastal zones, and particularly, on coastal tourism destinations which rely on tourism as the main economic driver.

Additionally, this research can serve as a good example for other coastal cities of Portugal to investigate the potential impacts of a changing climate, and to respond to these changes in an adequate way while continue to attract more tourists to the destination. Finally, the results of the research can help decision-makers to set up appropriate mitigation and adaptation strategies to deal with the potential climate change impacts.

5.6 Limitations to the research

This thesis has some limitations that may have influenced the discussed data. The sample size of questionnaire was limited due to the available time of research and because of the tourists who were willing to participate in the survey and fill in the questionnaire. Besides, despite of the large number of tourist accommodations in Peniche, questionnaire was carried out just in three of them.

Although, the objectives of the research were achieved, a larger sample size would let the research benefit from a better representation of climate change impacts on destination choice, and related response of tourists travelling to Peniche.

5.7 Recommendations for future research

The research has focused on Peniche, a small coastal city of Portugal. Therefore, it is first recommended to carry out similar studies on other coastal cities of Portugal, as this may provide more information on how different parts of Portuguese coast may be impacted by a changing climate. Besides, it may ensure the comparison of tourists' responses to a changing climate and how these changes may influence tourists' destination choice.

This research applied questionnaire only to the limited number of tourists and only in three tourist accommodations. Thus, next recommendation would be to conduct questionnaire to more tourists in more tourist accommodations to better analyse their response to climate change impacts. Besides, questionnaire was carried out during May-July 2017, therefore it is recommended to include August also which is the hottest month of the year and would help to identify if there would be any difference in the choice of tourists visiting Peniche.

The questionnaire has been kept as short as possible due to getting truthful information from respondents as far as possible. Thus, the last recommendation would be to add more detailed questions, such as the favourable and unfavourable weather conditions, or preferred temperatures for beach tourists.

5.8 Conclusion

The thesis has explored potential impacts of climate change on tourist destination choice and how these impacts will influence tourists' choice of Peniche as a travel destination. Despite of existence of wide range of researches about impacts of climate change on tourism, this topic has been limitedly explored in the context of Portugal, and particularly Peniche. Therefore, this thesis is important due to making contribution to the literature of climate change impacts on Portugal's and Peniche's tourism.

Besides, this study can be an example to be applied to other coastal destinations of Portugal to investigate potential impacts of climate change. Moreover, this thesis makes contribution to the literature on climate change and destination choice, which has not been highly explored.

Overall, despite of wide range of climate change impacts, fortunately, tourists will still choose Peniche to travel, but in the shoulder seasons, as it is perceived that during peak seasons climate and weather patterns will probably be unsuitable for travelling.

Therefore, it is evident that climate change will not significantly influence destination choice, as tourists will not look for alternative destinations. However, climate change will shift the timing of travel from peak to shoulder seasons, which can lead to spreading tourism season throughout the year, and therefore, resolving seasonality problem of Peniche's tourism. Thus, it is recommended to adapt to these changes through implementing appropriate adaptation and mitigation strategies, promoting shoulder seasons, or promoting other types of tourism and different activities that tourists can choose during peak seasons.

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APPENDIX A



QUESTIONNAIRE

This questionnaire will remain Confidential and Anonymous. All data received will be used only for a Dissertation Research which subject is climate change and tourist's behaviour. Please answer truthfully, as your results cannot be identified. It will take approximately 10 minutes to fill it in. Thank you for your cooperation!

1. Climate Change issues

1.1 Please rank from strongly disagree to strongly agree each option

Options	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I am aware of Climate Change					
Climate change is caused by human activities					
Climate change is a natural phenomenon					
Climate Change is a serious problem					
Climate Change affects human life					
Climate Change affects natural environment					
I am concerned about the effects of climate change					

1.2 Who do you think must deal with Climate Change impacts? (*You can choose more than one option*)

Tourists	
Tourism enterprises	
Government	
All above-mentioned	

1.3 What do you think people can do to minimise Climate Change impacts?

Options	Not important	Little importance	Moderately important	Important	Very important
Recycle as much as possible					
Use low energy light bulbs					
Use solar panels					
Use public transport					
Use more fuel-efficient cars					
Turn off lights/electrical appliances when not used					
Reduce the amount of waste					
Reduce water usage					

1.4 Are you willing to do anything to reduce Climate Change impacts?

I am willing to do everything I can	
I do not know what I can do to reduce impacts	
If everyone does, I will also do something	
I am not willing to do anything	
I have already made efforts to adopt my lifestyle to a changing climate*	

*Any example.....

2. Climate change impacts on coastal destinations

2.1 Please rank the most important implications of climate change on coastal destinations

Implications	Not important	Little importance	Moderately important	Important	Very important
Sea level rise					
Erosion					
Rainfall changes					
Loss of habitat					
Ecosystem changes					
Extreme weather events					

2.2 Do you believe climate change has already affected tourism in Peniche (Portugal)?

Yes	
No	
Not sure	
It will affect in the future	

3. Climate change impacts on tourist destination choice

3.1 Please rank the most important elements for destination choice (Leave the space blank if you have no opinion)

Elements	Not important	Little importance	Moderately important	Important	Very important
Climate or expected weather					
Safety and security					
Cuisine					
Quality of the area's natural setting					
The image of the location					
Cultural and historical attractions					
Beach facilities/amenities					
Uniqueness of local people's way of life					
Price of accommodation					
Price of transport (flights, buses, etc.)					
Travel distance/time					

3.2 In your opinion, what are the most important weather parameters for coastal/beach tourism?

(You can choose more than one option)

Sunshine	
Blue sky	
Temperature	
Humidity	
Rain	
Wind	

3.3 How will negative changes in previous-mentioned weather parameters affect your choice of Peniche as travel destination?

I will visit the same destination, but on different dates	
I will not change destination	
I will choose a different destination	

4. Tourist Profile

4.1 Main purpose of visit

Meeting family/friends	
Holidays, leisure and recreation	
Beach	
Wave sports	
Nature	
Business	
Other (what?):	

4.2 Please choose one of the options below

First time visitor	
Return visitor	

4.3 How long is your trip/holiday

4.4 Age: _____ years

4.5. Country: _____

4.6. Gender: F M

4.7. Level of education:

- No education Primary
 High school Higher Education Other. Indicate which: _____

4.8. Professional activity

- Employee Freelancer / Entrepreneur Retired
 Student Unemployed Other. Indicate which: _____