



**Republic of Bulgaria**

**Advisory Services on a National Climate Change  
Adaptation Strategy and Action Plan**

***Appendix 6:  
Assessment of the  
Tourism Sector***

*August 17, 2018*

## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>(Project number P160511)</b>	
Country Manager:	Antony Thompson
Practice Manager:	Ruxandra Maria Floroiu
(Co-)Task Team Leaders:	Philippe Ambrosi, Eolina Petrova Milova
Project Coordinator:	Robert Bakx

This report was produced by Maria Vodenska (local expert) and Stefan Gössling (international expert) under the supervision of Louise Twining-Ward (the World Bank) and managed by the project's core team led by Philippe Ambrosi (Senior Environmental Economist, Task Team Leader) and Eolina Petrova Milova (Senior Operations Officer, Co-Task Team Leader), and Robert Bakx (Climate Change Adaptation Expert and Resident Project Coordinator), supported by Dimitar Nachev and Adelina Dotzinska (Team Assistants), Svetlana Aleksandrova (Economist), and Yeni Katsarska (Institutional Expert). The peer review of the report by Shaun Mann and Stephen Ling was managed by Ruxandra Maria Floroiu (all from the World Bank)

### **DISCLAIMERS**

This report was produced by the World Bank team to provide advisory support to the Ministry of Environment and Water (MoEW) in Bulgaria. The findings, interpretations and conclusions expressed in this report do not necessarily reflect the views of the Executive Directors of the World Bank or of the Government of Bulgaria or its MoEW.

### **ACKNOWLEDGEMENTS**

The team would also like to thank the Government of Bulgaria, in particular Ms. Atanaska Nikolova (Deputy Minister of Environment and Water), Ms. Boriana Kamenova (Director of the MoEW's Climate Change Policy Directorate) and Ms. Veronika Dacheva (Expert in the MoEW's Climate Change Policy Directorate), and other experts in government institutions; as well as the members of the National Expert Council and the National Coordination Council on Climate Change, and furthermore the participants of the Inception Workshop, the Stakeholders Consultation Meetings, the Sector Consultation Sessions, the National Stakeholders Consultation Workshop, and the Sector Prioritization Sessions, for their excellent cooperation and support in spoken and written form; and express appreciation for the comments and suggestions as well as the open exchange of ideas. The contribution of Antony Thompson (Country Manager) in the preparation and negotiation of the Advisory Program is also acknowledged here.

## Table of Contents

Abbreviations and Acronyms .....	vii
Glossary .....	x
Executive Summary.....	1
Introduction – Climate change in Bulgaria.....	6
Chapter 1. Risk and Vulnerability Assessment and Analysis.....	9
1.1. Tourism Sector Characteristics and Trends .....	9
1.1.1. Context .....	9
1.1.2. Economic overview.....	9
1.1.3. Tourism Demand.....	10
1.1.4. Tourism Supply .....	13
1.1.5. Access.....	15
1.1.6. Organization .....	15
1.2. Past and Present Weather Events and their Consequences and Response Actions in the Tourism Sector in Bulgaria.....	16
1.3. Tourism-related Climate Change Risks and Vulnerabilities.....	19
1.3.1. Summer tourism .....	22
1.3.2. Winter tourism.....	24
1.3.3. Water shortage in Bulgarian resorts .....	25
1.3.4. Power cuts .....	26
1.3.5. General findings and conclusions.....	26
1.4. Conclusions.....	27
Chapter 2. Baseline – Policy Context .....	28
2.1. State of Awareness and Understanding of Future Consequences of Climate Change, and Knowledge Gaps in the Tourism Sector .....	28
2.1.1. Academic research .....	28
2.1.2. State of awareness and understanding.....	29
2.1.3. Knowledge gaps .....	29
2.2. Experience with CCA and Tourism in Other (EU) Countries .....	30
2.2.1. Summer tourism destinations .....	31
2.2.2. Winter tourism destinations.....	33
2.3. EU CCA Legal Framework and Policies in the Sector .....	35
2.3.1. Global policies in brief.....	35
2.3.2. EU policies .....	36
2.3.3. National and transnational adaptation policies in Europe .....	38
2.4. Bulgarian CCA legal framework and policies in the sector.....	38
2.5. Institutional Framework and Stakeholder Community in Bulgaria .....	41
2.5.1. Governmental institutions .....	41

## *Climate Change Adaptation – Assessment of the Tourism Sector*

2.5.2. Non-governmental organizations .....	42
2.6. Financial and Human Resources in Bulgaria .....	44
2.6.1. Budget financial resources .....	44
2.6.2. Other financial resources .....	45
2.6.3. Human resources .....	47
2.7. Sector Participation in CCA Specific International Cooperation or Information Exchange..	47
2.7.1. The development of the European Union Strategy for the Danube Region (2011) .....	47
2.7.2. 2017 - International Year of Sustainable Tourism for Development .....	48
2.8. Bulgarian Sector Specific Ongoing and Foreseen CCA-related Actions.....	48
2.9. Gaps and Barriers Hindering Adequate Response to CCA Action; Interface with Climate Change Mitigation.....	49
2.9.1. General issues.....	49
2.9.2. Gaps and barriers in Bulgaria.....	51
2.10. Conclusions .....	52
Chapter 3. Adaptation Options .....	54
3.1. Identified Adaptation Options.....	54
3.1.1. Development of a sectoral climate change policy .....	54
3.1.2. Provision of a comprehensive legal framework .....	55
3.1.3. Awareness raising on climate change and its impacts on the sector .....	56
3.1.4. Development of monitoring indicators.....	56
3.1.5. Strengthening the sector knowledge base.....	57
3.1.6. Regional and sub-sectoral assessment of adaptive capacity.....	58
3.1.7. Capacity-building .....	58
3.1.8. Specific adaptation measures .....	59
3.2. Experience with Selecting Adaptation Options in the Sector in Other (EU) Countries.....	64
3.2.1. Summer tourism adaptation options.....	64
3.2.2. Winter ski tourism adaptation options.....	65
3.3. Adaptation Options Assessed.....	67
3.3.1. Time .....	67
3.3.2. Budget .....	67
3.3.3. Cost-benefit analysis .....	68
3.3.4. Efforts.....	70
3.3.5. Indicators for measurement.....	70
3.3.6. Institutional arrangements .....	70
3.3.7. Consequences of no adaptation/maladaptation .....	71
3.4. Cross-cutting Issues, Trade-offs, and Synergies of Adaptation Options .....	71
3.5. Priority Setting Approach .....	74

## *Climate Change Adaptation – Assessment of the Tourism Sector*

3.6. Conclusions .....	81
References .....	83
Annex 1. Potential Climate Change Impacts on the Tourism Sector in Bulgaria .....	88
Annex 2. Climate Change Adaptation Options in Detail .....	89
Annex 3. Cost-benefit Analysis.....	97
1. General Description .....	97
1.1. Description of the methodology .....	97
1.2. Data collection procedure.....	98
1.3. Model specifications - assumptions and limitations.....	98
2. Results of the Regression Analysis.....	99
3. Results of the Cost-benefit Analysis.....	100
4. Conclusions.....	101
Annex 4. Miscellaneous Tourism Sector Information.....	102
Projections of future tourism development in Bulgaria (WTTC 2016) .....	102
Behavioral Pattern of International Tourists Related to their Accommodation Choice .....	103
Bansko Resort - Ski Pass Prices .....	104
Sofia Airport – Press Release .....	105
Bulgaria’s Ranking in the Global Climate Risk Index, 2016 .....	106
Municipalities at Risk of Dry Spells in Bulgaria, 2011 .....	107
Sunny Beach - Press Release .....	108
Municipalities in Water Stress in Bulgaria, 2015 .....	109
Physical map of Bulgaria.....	110
Annex 5. Tourism Sector Adaptation Practice in Selected EU Countries.....	111
Cyprus.....	111
Switzerland .....	112
France’s Adaptation Measures Towards Winter Tourism .....	113
Austria .....	114
Artificial Snow.....	115
Annex 6. Interviewed Companies in the Tourism Sector.....	116
Annex 7. Climate Change Adaptation Options Development.....	117
Required Steps .....	117
Adaptation preparedness in Bulgaria.....	118
A Portfolio of Climate Change Adaptations Utilized by Tourism.....	120
Main CCA Options in the Ski Industry .....	121
Annex 8. Cross-cutting Aspects .....	123
Cross-cutting Issues with the Forestry Sector.....	123
Cross-cutting Issues with the Urban Environment Sector .....	124

## *Climate Change Adaptation – Assessment of the Tourism Sector*

Annex 9. Prioritization of Adaptation Options.....	125
Criteria for Choosing Adaptation Options and their Prioritization.....	125
Climate Change Indicators .....	127

### **List of Figures**

Figure 1. Simplified Illustration of Impacts of Climate Change and Identified Adaptation Options.....	5
Figure 2. Average year temperature for 1961–1990 (A); Pessimistic climate scenario for average year temperature for 2080 (B).....	6
Figure 3. Precipitation per year for 1961–1990 (A); Precipitation per year for 2080, according to the pessimistic Scenario (B).....	7
Figure 4. General concept of WGII AR5 .....	8
Figure 5. Economic importance of tourism in Bulgaria .....	10
Figure 6. International arrivals by purpose of visit (percentage).....	10
Figure 7. International arrivals in all accommodation establishments (1985–2015).....	11
Figure 8. Tourism seasonality in Bulgaria (2016).....	12
Figure 9. Average yearly occupancy of all accommodation establishments (percentage) 1990–2015 .	13
Figure 10. Tourism types distribution .....	14
Figure 11. Miziya under water .....	16
Figure 12. Tornado in Sozopol.....	16
Figure 13. Identified flood-prone territories.....	17
Figure 14. Factors for tourists' destination choice.....	20
Figure 15. Weather events' impact .....	22
Figure 16. Snow cover forecast for the winter ski season in Bulgaria .....	24
Figure 17. Structure and main actors in implementing the Bulgarian tourism protection policy.....	39
Figure 18. Structure and main actors in implementing the Bulgarian climate change policy .....	41
Figure 19. Tourism regions in Bulgaria.....	44
Figure 20. The official conference poster.....	49
Figure 21. Municipalities at risk of dry spells in Bulgaria, 2011 .....	107
Figure 22. Municipalities in water stress in Bulgaria .....	109
Figure 23. Physical map of Bulgaria .....	110

### **List of Tables**

Table 1. Forecast of certain tourism indicators in Bulgaria.....	11
Table 2. Weather events in Bulgaria .....	19
Table 3. Climate change adaptation – potential direct risks and opportunities for the tourism sector..	20
Table 4. Types of preferred alternative entertainment (percentage).....	60

## *Climate Change Adaptation – Assessment of the Tourism Sector*

Table 5. Priority, time and budget for tourism sector adaptation actions in Bulgaria .....	63
Table 6. Benefits of adaptation measures in the Tourism sector under different climate scenarios until 2050 (in € million).....	69
Table 7. Matrix of interdependencies .....	73
Table 8. A Hypothetical Adaptation Portfolio Evaluation Matrix for a Destination with Growing Water Supply Shortages.....	75
Table 9. Expert judgement on the prioritization of proposed CCA options (vertical) .....	77
Table 10. Expert judgement on the prioritization of proposed CCA options (horizontal) .....	78
Table 11. Adaptation options in Bulgaria assessed by various criteria .....	80
Table 12. Potential climate change impacts on the tourism sector in Bulgaria .....	88
Table 13. Adaptation options presented in detail .....	89
Table 14. Expected sector effects from climate change in the tourism sector until 2050 without adaptation measures – baseline scenario (in € million).....	100
Table 15. Benefits of adaptation measures in the Tourism sector under different climate scenarios until 2050 (in € million).....	101
Table 16. Ski Pass Prices from March 15, 2017 till April 17, 2017.....	104
Table 17. Family Cards from December 3, 2016 till April 17, 2017 (included) .....	104
Table 18. The climate risk index for 2014: the most affected countries .....	106
Table 19. A Portfolio of Climate Change Adaptations Utilized by Tourism Stakeholders.....	120
Table 20. Potential criteria for choosing adaptation options .....	125
Table 21. Overview of available approaches for prioritization in adaptation .....	125

## **List of Boxes**

Box 1. Finland.....	30
Box 2. United Kingdom .....	31
Box 3. Tourism sector adaptation steps in Croatia.....	31
Box 4. Switzerland .....	33
Box 5. Examples of shut down of ski resorts .....	34
Box 6. OP ‘Regions in Growth’ .....	45
Box 7. OP ‘Environment’ .....	46
Box 8. Climate Action Coalition .....	49
Box 9. Adaptation in coastal areas and marine environment in Italy .....	64
Box 10. Adapting to heat waves in Italy .....	65
Box 11. Adaptation to climate change in the Italian Alps.....	65

## **Abbreviations and Acronyms**

ABTTA	Association of Bulgarian Tour operators and Travel Agents
AHP	Analytic Hierarchy Process
AR5	Assessment Report 5
BAAT	Bulgarian Association for Alternative Tourism
BAHA	Balkan Alliance of Hotel Associations
BAS	Bulgarian Academy of Sciences
BATA	Bulgarian Association of Travel Agents
BB	Bed and Breakfast
BHRA	Bulgarian Hotelier and Restaurant Association
BTCH	Bulgarian Tourist Chamber
CBA	Cost-Benefit Analysis
CC	Climate Change
CCA	Climate Change Adaptation
CCP	Climate Change Policy
CCRA	Climate Change Risk Assessment
CEA	Cost-effectiveness Analysis
CoM	Council of Ministers
CRI	Climate Risk Index
CS	Computer Simulation
DG CAA	Directorate General “Civil Aviation Administration”
DMO	Destination Management Organization
DMS	Destination Management System
EAP	Environment Action Programme
ECTAA	European Travel Agents’ and Tour Operators’ Association
EEA	European Environment Agency
EMAS	Eco-Management and Audit Scheme
EMEPA	Enterprise for Management of Environment Protection Activities
EMIS	Environment Management Information Systems
EP	Environmental Policy
EU ETS	European Union Emissions Trading System
EU	European Union
EuroGites	European Federation of Rural Tourism
ExAAA	Executive Agency Automobile Administration
ExAEMDR	Executive Agency for Exploration and Maintenance of the Danube River



## *Climate Change Adaptation – Assessment of the Tourism Sector*

ExAMA	Executive Agency Maritime Administration
ExARA	Executive Agency Railway Administration
ExEA	Executive Environment Agency
ExFA	Executive Forest Agency
FB	Full Board
FYR of Macedonia	Former Yugoslav Republic of Macedonia
GC	Golf Course
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographical Information System
GPS	Global Positioning System
HB	Half Board
HOTREC	Hotels, Restaurants and Cafes in Europe
IATA	International Air Transport Association
ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management
IHRA	International Hotelier and Restaurant Association in Bulgaria (Сдружение на ИАТА агенциите в България)
IPCC	Intergovernmental Panel on Climate Change
LBS	Location based Services
MAFF	Ministry of Agriculture, Food and Forestry
MC	Ministry of Culture
MCA	Multi-criteria Analysis
MEc	Ministry of Economy
MEн	Ministry of Energy
MEx	Ministry of Exterior
MF	Ministry of Finance
MH	Ministry of Health
MI	Ministry of Interior
MoEW	Ministry of Environment and Water
MJ	Ministry of Justice
MT	Ministry of Tourism
MRDPW	Ministry of Regional Development and Public Works
MTITC	Ministry of Transport, Information Technology and Communications

## *Climate Change Adaptation – Assessment of the Tourism Sector*

NAP	National Adaptation Plan
NAS	National Adaptation Strategy
NCCAS	National Climate Change Adaptation Strategy
NECCC	National Expert Council on Climate Change
NGO	Non-Governmental Organization
NIMH	National Institute for Meteorology and Hydrology
NPV	Net Present Value
NSI	National Statistical Institute
NSSTDB	National Strategy for Sustainable Tourism Development in Bulgaria
NTC	National Tourist Council
NTEF	National Trust EcoFund
OECD	Organization for Economic Co-operation and Development
ONERC	National Observatory for the Effects of Global Warming (Observatoire National sur les Effets du Réchauffement Climatique)
OP	Operational Programme
OTRM	Organization for Tourism Regions Management
RDM	Robust Decision Making
ROA	Real Options Analysis
SDGs	Sustainable Development Goals
SIAB	Association of International Air Transport Association Accredited Agencies
SOER	European Environment – State and Outlook
SWOT	Strengths, Weaknesses, Opportunities and Threats
TCI	Tourism Climatic Index
TIS	Tourism Information System
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	United Nations World Tourism Organization
VFR	Visiting Friends and Relatives
WCOCFS	Weather, Climate and Ocean Changes Forecasting System
WGII	Working Group II
WMO	World Meteorological Organization
WTO	World Tourism Organization
WTTC	World Travel and Tourism Council

## Glossary<sup>1</sup>

**Climate change** refers to a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

**Global warming** refers to the gradual increase, observed or projected, in global surface temperature, as one of the consequences of radiative forcing caused by anthropogenic emissions.

**Adaptation** is the process of adjustment to actual or expected adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

**Mitigation (of climate change)** is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs).

**Vulnerability** to climate change is the degree to which any system is susceptible to and unable to cope with, the negative impacts that climate change imposes upon it. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

**Resilience** is the opposite of vulnerability and is defined as the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

**Risk** is the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur.

---

<sup>1</sup> Definitions are based on WGII AR5 (IPCC 2014).

## Executive Summary

1. International tourism in Bulgaria generates an estimated US\$2.4 billion, and the tourism sector employs 11.1 percent of the national workforce (in 2015). The major market for tourism is the European Union (EU), and the main tourism product is coastal summer tourism in the Dobrich, Burgas and Varna regions of the Black Sea. About 95 percent of all revenues from international tourism originate from seaside resorts, where arrivals peak in July and August. Winter tourism is less relevant for the national economy and caters mostly to domestic tourism.
2. Weather and climate have considerable importance for tourism. Climate is a key factor defining a destination's attractiveness, also influencing the timing of holidays, as well as tourist activity choices and expenditures. On holidays, weather conditions in the destination determine trip satisfaction. Adverse weather experiences, including heat waves, cold spells, heavy rainfall, storms, or changes in natural tourism assets, such as lack of snow, can all have negative repercussions for tourist perceptions of a destination and willingness to return.
3. Due to its spatially concentrated, weather-dependent, and highly seasonal character, tourism in Bulgaria is vulnerable to climate change. Extreme events that have been observed in the past are expected to become more frequent under scenarios of climate change, including heat waves, intense rainfall events, coastal flooding, and storms. In the short- to medium-term future, ski areas are likely to become economically unviable; in the long-term future, summer temperatures are expected to exceed biophysically acceptable threshold levels, while sea level rise and flooding will cause the loss of coastal areas. Climate change may also become indirectly relevant for tourism, for instance where fresh-water availability becomes more restricted. Climate change thus poses various short- and longer-term threats to tourism in Bulgaria, even though warmer temperatures earlier and later in the year may make the country more attractive in the shoulder season.
4. There is considerable growth potential for tourism in Bulgaria. However, the sector's current mainstays, beach and winter tourism, are increasingly questioned by climate change. Summer tourism faces a prospect of temperatures increasing beyond optimum levels, as well as heat waves and other extreme weather events such as intense periods of rainfall with associated flooding and landslides. Tornadoes have been observed increasingly often. Winter tourism is already suffering from higher temperatures, and there is a risk that it will become increasingly unviable in the future. Risks are potentially exacerbated by resource scarcity (in particular fresh water) and a growing energy demand, for example for air-conditioning.
5. The main risks related to expected climate change and extreme weather events faced by the Bulgarian tourism sector can be summarized as (see also *Table 3*):
  - Lower number of tourists;
  - Shorter winter season;
  - Shorter average stay;
  - Health problems with tourists;
  - Poorer conditions for outdoor recreation;
  - Damage of tourist infrastructure and superstructure; and
  - Poorer access to tourist destinations.

6. The opportunities can be seen in:

- Longer summer and shoulder seasons;
- Development of new tourism products in mountain resorts;
- Attracting new perspective tourism markets; and
- Less need for heating energy in winter and shoulder seasons.

7. Tourism's climate change vulnerability is embedded in considerable uncertainties. For instance, it is inadequately understood how travelers react to extreme events such as heat waves, storms, or heavy rainfall events, as well as longer-term changes in average temperatures. It can be expected that extreme events influence decision making, though this will depend on individual perceptions. Higher temperatures at the beach may not necessarily deter tourists. They may not necessarily know this well in advance to change travel plans and, if it is too hot to stay on the beach, restaurants, coffee shops, and bars and perhaps other indoor types of activities may benefit causing more local spending, not less. *In situ* adaptive responses to extreme events may include spatial substitution, a focus on different activities, or the early cancellation of holidays. *Ex post* responses may include demand shifts to different destinations or changes in the timing of holidays. Whether Bulgaria can become more attractive for summer tourists earlier and later in the year will depend on the flexibility of tourists, as, for instance, families are bound to school holidays. It is also worth noting that the need for adaptation in tourism will depend on carbon emission pathways, that is as to whether or not the international community engages in far-reaching mitigation.

8. To adapt to climate change and its potential consequences, to reduce the overall vulnerability of the sector, and to increase its economic viability and resilience, it is recommended that Bulgaria engages in several measures. A starting point for this process would be a sectoral climate change policy for tourism, developed in cooperation of the Ministry of Tourism with other relevant ministries and government organizations, and in collaboration with the private sector. This first step towards a more systematic adaptation process, which also addresses funding opportunities, should be taken immediately and has to be in compliance with the general Climate Change Adaptation (CCA) policy of the Bulgarian Government. Its strengthening should include development of insurance and risk management programs, creation of cross-sectoral policy frameworks, and economic incentive mechanisms for the implementation of various adaptation options.

9. Recommended specific sectoral adaptation actions are the following:

***(i) Awareness building, to highlight the importance of climate change, its potential impact on tourism and other economic sectors, and opportunities to mitigate the contribution of human activities to climate change***

10. To achieve this objective a national database (online portal) containing CCA-specific information needs to be established and further dissemination of CCA knowledge should be organized to reach local tourism entrepreneurs (through various media, printed and Internet materials, films and video materials, and development and conduction of awareness raising seminars for the tourism business sector). Climate change education should be introduced in curricula of schools and universities.

***(ii) The collection of data to improve the basis for management, including arrivals by transport mode and tourist type, as well as national differences in the timing of holidays, length-of-stay, spending, and flexibility in these parameters***

11. Further monitoring systems and tools have to be developed and implemented. They will help stakeholders to be informed on a regular basis about climate change, its impact on tourism and the effect of adaptation activities. Based on this information, stakeholders will be able to review their action plans and adjust them to any observed changes. Two groups of indicators are to be developed:

- 1) Tourism indicators sensitive to climate change; and
- 2) Climate change indicators relevant for the tourism sector.

***(iii) The knowledge base about climate changes and possible adaptation measures can be strengthened in three directions:***

- 1) Collection of tourism-related data on climate change in the country (two sets of monitoring indicators) and development and improvement of a monitoring and evaluation system;
- 2) Developing, financing and implementing climate change research projects and programs related to tourism and their impacts on tourism development and the publication of their findings and results; and
- 3) Dissemination, among various professional bodies, of the above publications and dissemination of developed specific adaptation measures to relevant stakeholders

***(iv) Assessment and building of the climate change adaptive capacity of various stakeholder groups.***

12. While the potential range of climate change impacts in the tourism sector is broadly understood, there is a more limited understanding of the adaptive capacity of destination communities. Preliminary research of the Bulgarian tourism sector's adaptive capacity shows its considerably low level of preparedness. There is a need to:

- 1) Assess the adaptive capacity of the tourist sector and its sub-sectors to climate change. This includes the development of assessment tools for each stakeholder group; and
- 2) Build adaptive capacity through training, knowledge dissemination actions, introduction of subsidies, grants, and other financial programs for relevant capacity building of all stakeholders and of special programs and courses in colleges and universities. Of high importance is the need to improve coordination, information sharing and communication between responsible public institutions.

***(v) The development of new activities and tourism products that are 'weather proof' (short term) as well as 'climate proof' (longer term), opening new markets for Bulgaria, are a priority***

13. To reduce the vulnerability of the sector, there is thus a need to diversify the tourism sector while simultaneously reducing its energy intensity and resource dependency. New tourism products may for instance include culinary, wine, wellness or cultural tourism. Tourism

businesses can also expect an extended summer season, with opportunities to attract visitors particularly in early summer and early autumn. Management for reduced resource use, technological innovations, and legislation for new tourist sites and infrastructure can make a major contribution to reducing vulnerabilities. To achieve this, the Bulgarian tourism industry, as a whole and the individual economic units in it must develop strategies and implement legislation. Only then can a more important economic role of tourism be secured even under scenarios of decarbonization and climate change.

14. Specific adaptation measures can be grouped in several directions:

1. Development of adaptation measures for summer tourism;
2. Development of adaptation measures for winter tourism;
3. Development of new tourism types (products, destinations);
4. Identification of new tourist sectors (segmentation);
5. Development and implementation of new marketing strategies and approaches;
6. Development of sub-sector (enterprise) - level resource management innovations.

15. It must be noted that there are mainly two types of adaptation options to be implemented – actions/responses that are market and private sector based, and those needed by the public sector. A mechanism needs to be developed for these two major stakeholder groups to coordinate among them, communicating knowledge and collaborating in implementation of measures, thus gaining maximum benefit for the sector. The leading role in this highly important issue should be with the MT.

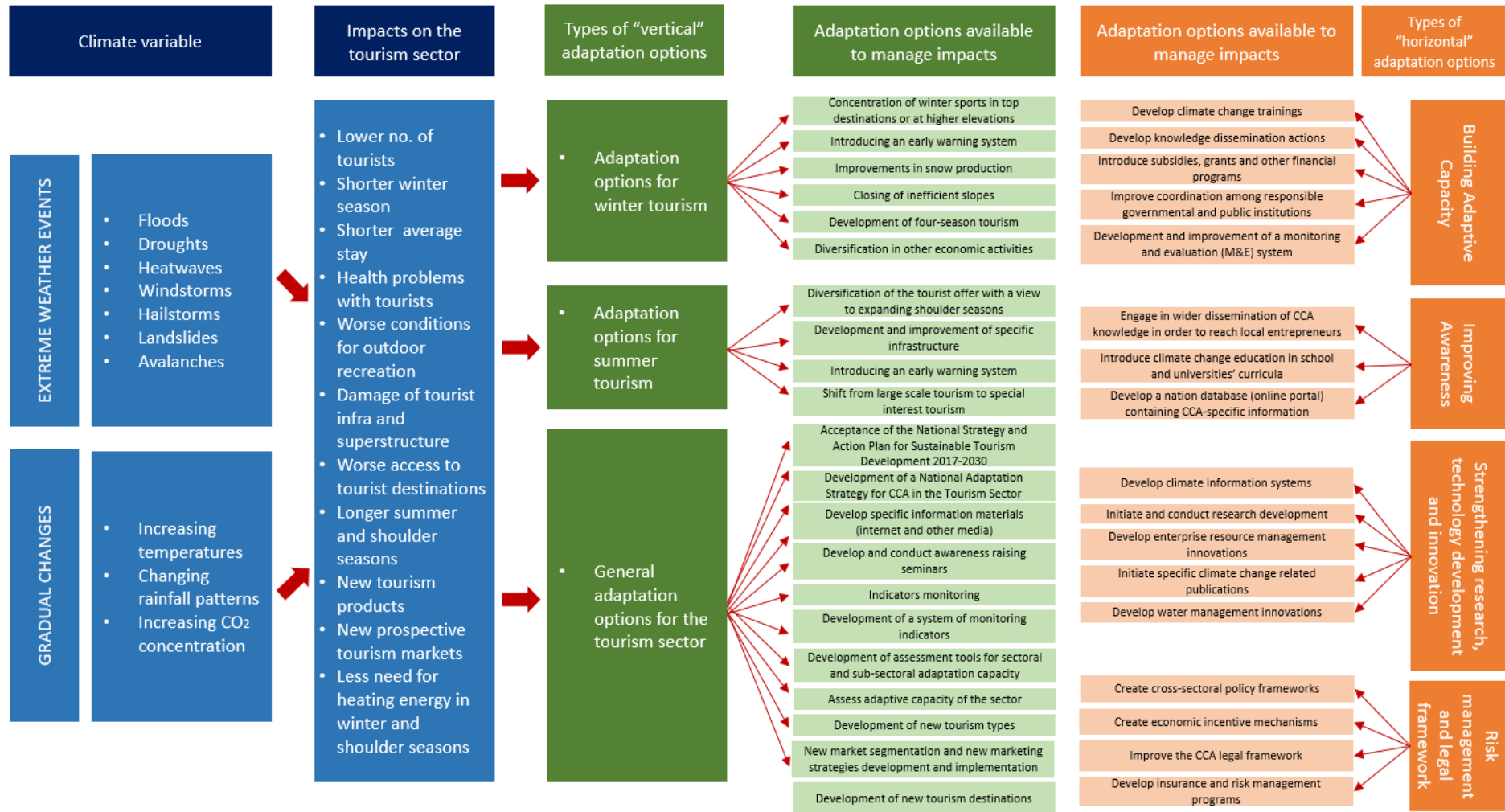
16. All adaptation options recommended for Bulgarian tourism can be initialized as soon as the National Adaptation Strategy (NAS) and Action Plan are adopted. The high levels of climate model uncertainty results in the large range of adaptation costs estimates. The costs to be paid by the state are related mostly to addressing the problems of water and energy shortages, which are cross-cutting issues for all economic sectors.

17. At this stage, the costs of adaptation in Bulgaria are difficult to assess although at the beginning of the process they are likely to be modest. Most of the adaptation options that were identified include the development of policies and strategies and of legal and regulatory documents, which is to be carried out in and by the public administration. Furthermore, there is a need for the development of training, educational materials, and indicators, and of creating a knowledge base which will require limited investments. Awareness raising, adaptive capacity assessment, and development (education and training delivery) will come with greater costs. Adaptation that will require serious investments includes the development of new inland tourism destinations. New infrastructure, new hotels, restaurants, entertainment facilities, and so on will need to be created over time, based on demand, to be realized through private investments, focused on attracting new market segments and developing new products.

18. If these efforts are successful, tourism growth will result in increased energy consumption. The sector needs to consider opportunities to conserve power and increase the share of renewable energy sources and engage in offsetting to reduce vulnerabilities. These mitigation efforts represent an additional cost for the sector that should be considered in planning for a low-carbon future.

## Climate Change Adaptation – Sector Assessment for Tourism

**Figure 1. Simplified Illustration of Impacts of Climate Change and Identified Adaptation Options**



Source: World Bank design.



## Introduction – Climate change in Bulgaria

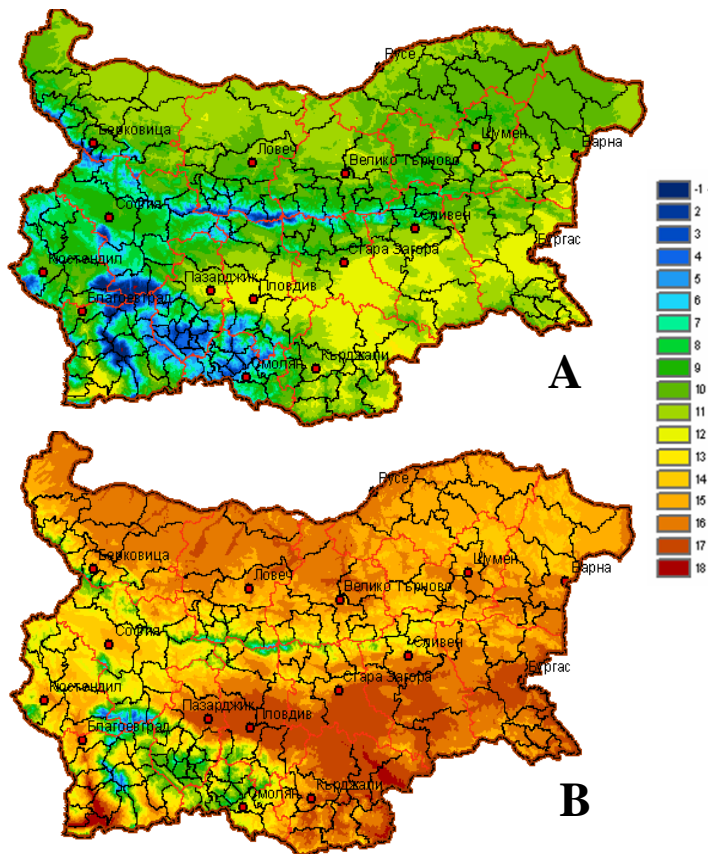
19. Bulgaria is situated in one of the regions that is particularly vulnerable to climate change (mainly through temperature increase and extreme precipitation) and to the increased frequency of climate change-related extreme events, such as droughts and floods. The risks inflicted by climate change-related events may lead to loss of human life or cause considerable damage, affecting economic growth and prosperity, both nationally and trans-boundary.

20. Consensus exists in the scientific community that climate change is likely to increase the frequency and magnitude of extreme weather events. Over the past decades, in Bulgaria this frequency has increased significantly. The most common hydrometeorological and natural hazards are extreme precipitation and temperatures, storms, floods, wildfires, landslides, and droughts. The number of deaths and victims due to natural hazards is considerable, indicating weather and climate vulnerability. The vulnerability of Bulgaria's population and businesses to the impacts of climate change is accelerated by a relatively high degree of poverty in the most affected areas, the continuing concentration of the country's population in several industrial and urban regions, and various consequences of the transition from a state-controlled economy to a free-market economy. A growing body of evidence suggests that economic losses from climate- and weather-related disasters have also been rising.

21. Scientific projections indicate that global temperature will rise between 1.8°C and 4°C by 2100, with the temperature increase in Europe expected to be even higher than the estimated global average.

22. Research conducted by the Department of Meteorology, National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences (NIMH-BAS), projects an increase in annual air temperature in Bulgaria of between 0.7°C and 1.8°C by 2020. Even warmer temperatures are expected by 2050 and 2080, with projected increases of between 1.6°C and 3.1°C and between 2.9°C and 4.1°C, respectively. Generally, the temperature increase is expected to be more significant during the summer season (from July to September).

**Figure 2. Average year temperature for 1961–1990 (A); Pessimistic climate scenario for average year temperature for 2080 (B)**



Source: NIMH-BAS.

23. With regard to the expected changes in rainfall patterns, a reduction in precipitation is likely, leading to a significant reduction of the total water reserves in the country. In this regard, projections suggest a decrease in precipitation by approximately 10 percent by 2020, 15 percent by 2050, and up to 30–40 percent by 2080. In most climate change scenarios, rainfall during the winter months is likely to increase by the end of the century, but a significant decrease in rainfall during the summer months is expected to offset this increase.

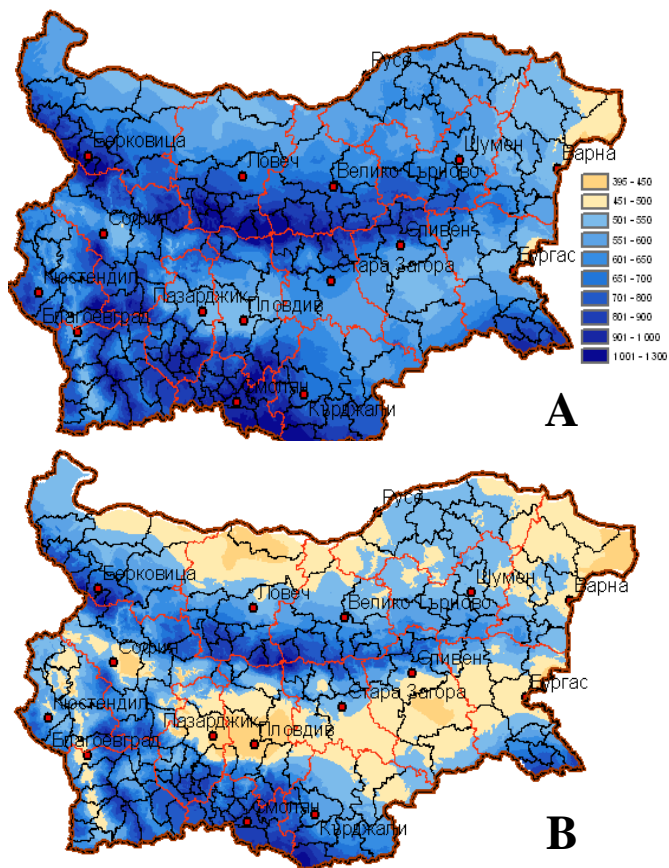
24. According to the available climate change scenarios for Bulgaria, there is a trend toward increased frequency of extreme events and disasters, as demonstrated by frequent occurrences of heavy rainfalls, heat and cold waves, floods and droughts, hurricane winds, forest fires, and landslides.

25. Biodiversity, land and aquatic ecosystems, as well as water resources, agriculture, and forestry sectors are expected to be affected by the anticipated changes. These changes would furthermore affect society and its citizens as well as the economy as a whole.

26. Climate change impacts do not affect all people and territories equally due to different levels of exposure, existing vulnerabilities, and adaptive capacities to cope. The risk is greater for the segments of the society and businesses that are less prepared and more vulnerable.

27. **This report aims to inform on vulnerabilities to the Bulgarian tourism sector and identification of adequate climate change adaptation options.** The report is part of a set of nine sectoral assessment reports considered under the climate adaptation support program for Bulgaria, which will form the baseline for the National Climate Change Adaptation Strategy and Action Plan (NCCAS). The report follows the general logic and structure as proposed for all sectors and is divided into three parts: (a) part one of the report (Chapter 1) focuses on the climate change risks and vulnerabilities' assessment; (b) part two comprises a gap analysis of the policy, legal and institutional context (Chapter 2); and (c) part three focuses on the identification and prioritization of adaptation options (Chapter 3). This sector assessment was carried out during March – November 2017, as a combination of quantitative and above all, qualitative analysis. Several workshops have been organized as part of an ongoing consultation process, bringing in the wealth of expertise of various stakeholders.

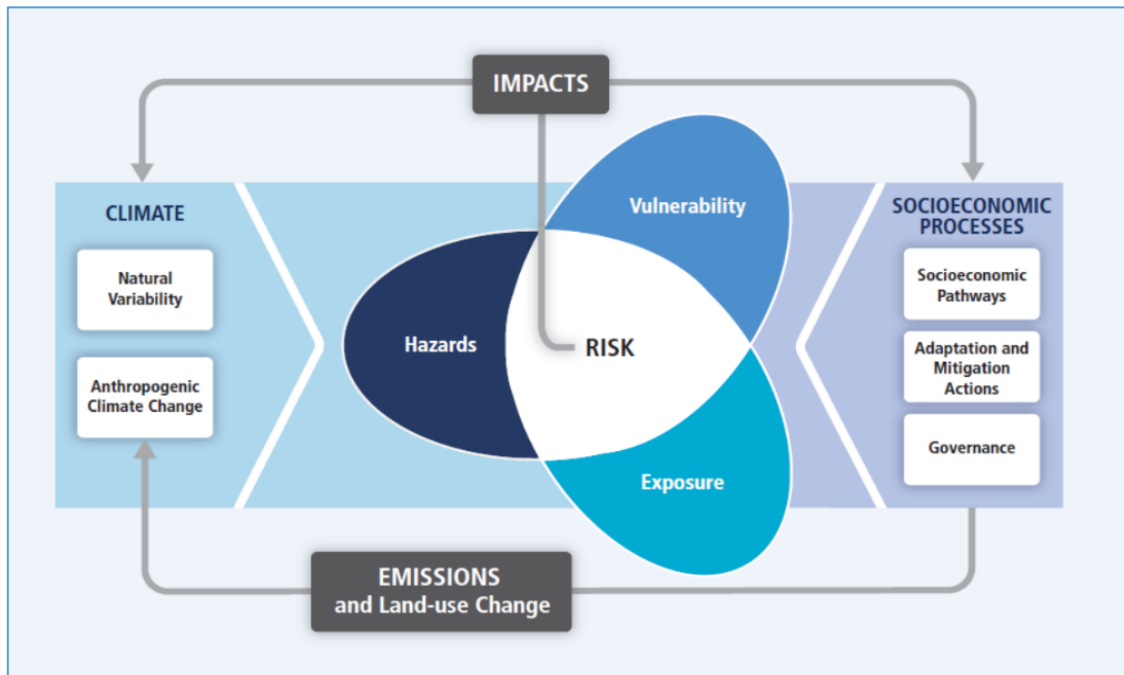
**Figure 3. Precipitation per year for 1961–1990 (A); Precipitation per year for 2080, according to the pessimistic Scenario (B)**



Source: NIMH-BAS.

28. The report uses the terms and definitions of risk, vulnerability and adaptation options as introduced by Working Group II (WGII), Assessment Report 5 (AR5) (IPCC 2014). Risk of climate-related impacts results from the interaction of climate-related hazards with vulnerability and exposure. Changes in both the climate system (left side in *Figure 4*) and socio-economic processes, including adaptation and mitigation (right side in *Figure 4*) are drivers of hazards, exposure, and vulnerability. This understanding reveals the importance of the adaptation options. When they are properly identified and implemented on time, vulnerability, hazards and/or exposures will be reduced, thus mitigating risk.

*Figure 4. General concept of WGII AR5*



Source: IPCC 2014.

## **Chapter 1. Risk and Vulnerability Assessment and Analysis**

29. This chapter provides contextual information about Bulgaria's tourism sector and its climatic dependency and vulnerability. It starts by exploring the sector characteristics and then looks at the past and present weather-related events and their impact on the sector. The last part of the chapter examines sector vulnerabilities under scenarios of climate change. The chapter concludes with the identification of the highest priority areas for action.

### **1.1. Tourism Sector Characteristics and Trends**

#### **1.1.1. Context**

30. Tourism is a critical economic driver for Bulgaria with a substantial contribution to the country's gross domestic product (GDP) and employment. Tourism roots in Bulgaria go back to the end of the 19th century with the development of beaches in the Varna area and related facilities, the establishment of the Borovets mountain resort, and the founding of the Bulgarian Tourist Union. The boom in international tourism took place in the 1960s, when Bulgaria appeared on the international market as a typical sun, sand, and sea destination, complemented by a significant increase in domestic social (subsidized) tourism. In less than 30 years (between 1963 and 1990) the number of international visitors rose from 414,000 to 10.3 million. Tourist numbers (transit excluded) rose from 233,000 to 5.2 million (Kazachka and Marinov 2003). The accelerated development of international tourism was strongly fostered by the central government. This resulted in the enviable position of Bulgaria in the international market – in 1980 with 2.9 million visitors (transit excluded) it ranked 15 in the world with a market share of 1.9 percent (World Tourism Organization 1993).

31. The growth rates decreased after the mid-1970s, nevertheless the quantitative peak in tourism development was reached at the end of the 1980s. In 1988, the accommodation capacity was nearly 600,000 beds. The number of overnights reached 60 million (one third of them by international visitors). Nearly 150,000 people were employed in tourism (one third of them all year-round). The receipts from international tourism in the balance of payments were estimated at US\$ 470 million.

#### **1.1.2. Economic overview**

32. **According to the World Travel and Tourism Council (WTTC 2016), the tourism sector's total contribution to GDP from the accommodation and the food service activities has decreased from 13 percent in 1989 (before the transition period) to 12.1 percent in 2016.**<sup>2</sup> Tourism is the main engine of economic growth in Bulgaria, forming 20.5 percent of the country's GDP, 19.2 percent is from the services sector, including **accommodation and food service activities (forming 12.1 percent)**, another 12.1 percent comes from public administration and defense, compulsory social security, education, human health, and social work activities<sup>3</sup>. All other sectors contribute less to GDP than tourism.

33. **The tourism sector's employment contribution** has increased from 5 percent in 1998 to 11.1 percent in 2015 (*Figure 5*). According to WTTC (2017), in 2017, it dropped to 10.6 percent

---

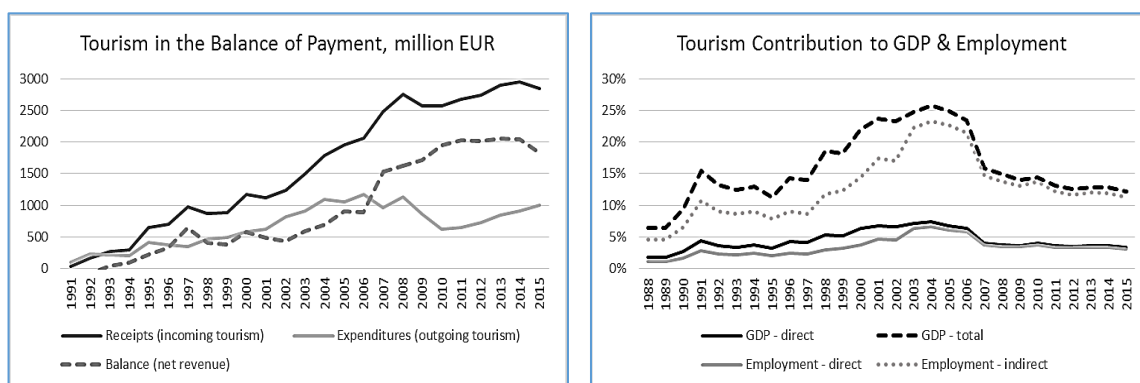
<sup>2</sup> National Statistical Institute (NSI) 2017 <http://www.nsi.bg/en/content/5484/gdp-production-approach-%E2%80%93-total-economy>

<sup>3</sup> NSI 2017. <http://www.nsi.bg/en/content/5484/gdp-production-approach-%E2%80%93-total-economy>.

and the total tourism contribution to GDP is only 4.9 percent. This puts Bulgaria ahead of the Czech Republic, Slovakia, and Romania, but behind Croatia, Greece and Albania. The big drop in 2006 is due to the change in the methodology used for calculating the contribution to GDP, introduced by the NSI in 2005. In 2015, the revenue from incoming tourism was €2.4 billion, the expenditures for outgoing tourism were less than €1 billion resulting in net tourism revenues of €1.8 billion.<sup>4</sup> Thus, **tourism contributed to 39.7 percent of the export of services and 10.4 percent of the total export of Bulgaria in 2015**. The projections of future tourism development are given by WTTC (2016): see *Annex 4* (Projections of Future Tourism Development in Bulgaria).

34. The latest unofficial data about tourism in Bulgaria show that revenues from nights spent at Bulgaria's accommodation establishments in December 2017 totaled BGN 44.3 million, which is 6.6 percent higher than in December 2016. Revenues increased both from foreigners (by 11.9 percent) and Bulgarians (by 3.2 percent)<sup>5</sup>.

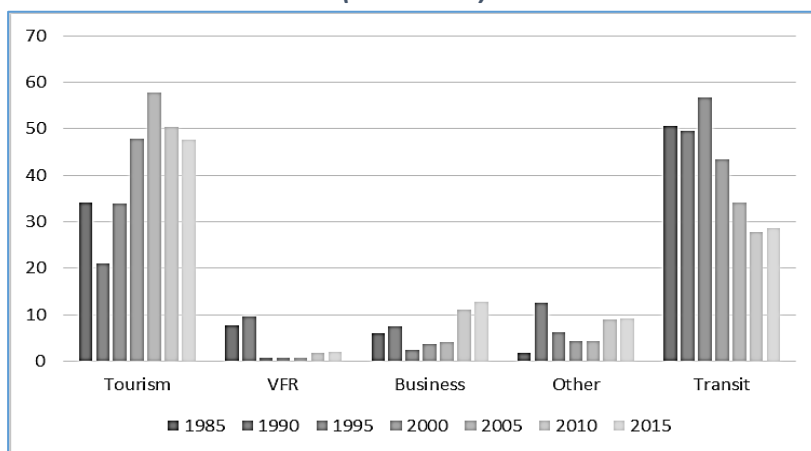
**Figure 5. Economic importance of tourism in Bulgaria**



Source: Left - Bulgarian National Bank; Right - WTTC

### 1.1.3. Tourism Demand

**Figure 6. International arrivals by purpose of visit (percentage) (1985-2015)**



Source: NSI, 2015.

35. **Tourism to Bulgaria is dominated by holiday and transit visitors, with just a small number of business and visiting friends and relatives (VFR) visitors (Figure 6).** In 2016, international visitors reached 10.6 million of which 5.1 million were on holiday for recreational purposes. Domestic tourists are estimated at 3.4 million, which tends to increase in

<sup>4</sup> Bulgarian National Bank (2016) Balance of payments.

<sup>5</sup> <http://www.bta.bg/en/c/ES/id/1743413>

the future due to more frequent trips (Vodenska and Assenova 2011).

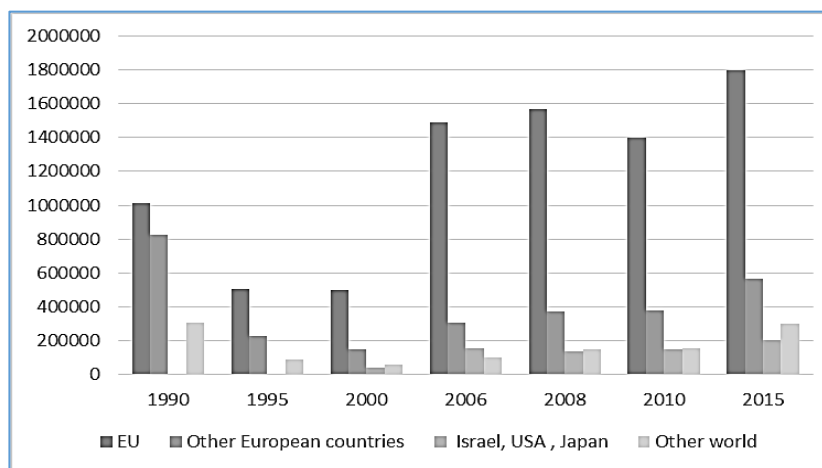
36. The updated National Strategy for Sustainable Tourism Development in the Republic of Bulgaria 2014–2030, approved in January 2018 forecasts the following growth in various tourism indicators<sup>6</sup> (*Table 1*):

*Table 1. Forecast of certain tourism indicators in Bulgaria*

Indicator	Unit of measurement	Value 2016	Value 2030
Average monthly number of nights (general)	thousands	2,099.0	3,007.4
Average monthly number of nights (Bulgarians)	thousands	752.9	1,138.9
Average monthly number of nights (international visitors)	thousands	1,345.9	1,868.5
Tourism contribution to Bulgarian economy	percentage	12.8	17.5
Average stay (general)	number of nights	3.50	3.65
Average stay (Bulgarians)	number of nights	2.37	2.50
Average stay (international visitors)	number of nights	4.77	5.00
Average yearly occupancy of accommodation establishments (calculated for a 365-days period)	number of days	77	96
	percentage	21.2	26.4
Tourism contribution to general employment	percentage	11.9	17.1
Seasonal workplaces in the tourism industry	percentage	20.7	15.0

37. **The major market for Bulgarian tourism is the European Union (EU)** (*Figure 7*). Other markets are other European countries, Israel, the United States, and Japan and the rest of the world. Since 2000, the top five international tourist markets for Bulgaria were Romania, Greece, Germany, the Former Yugoslav Republic of Macedonia (FYR of Macedonia) and the Russian Federation.

*Figure 7. International arrivals in all accommodation establishments (1985–2015)*



Source: NSI 2015.

The Romanian and German markets were motivated primarily for low-cost packaged seaside and ski tourism, whereas visitors from Greece and FYR of Macedonia came for other reasons – VFR, business, shopping, and so on.

38. **It is important to note that Bulgaria tends to attract lower-middle-income and older visitors.** In 2016, the median age of the Bulgarian population was 42.4 years and the age of domestic tourists is tending to rise in the future. Anecdotal evidence suggests that international

<sup>6</sup> [http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/nsurtb\\_2014-2030.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/nsurtb_2014-2030.pdf)

tourists are tending to get even older. This is caused mainly by the fact that the Bulgarian tourist product is predominantly lower cost and attracts both pensioners and people from the lower-than-average socio-economic status.<sup>7</sup> All this is making visitors more vulnerable to climate related risks (high summer temperatures and extremely warm days are not comfortable for elderly people) (Gössling et al. 2012). Budget tourists are also more susceptible to cost changes, which can be expected because of mitigation policies (taxes or duties on fossil fuels) (Scott et al. 2016).

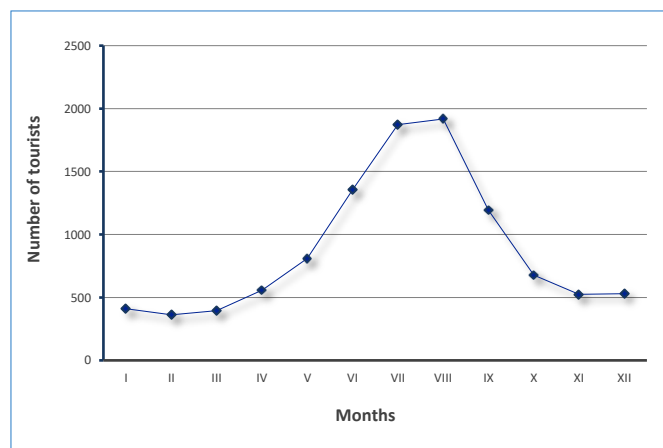
39. More than 90 percent of international tourists stay in commercial accommodations on the coast or in mountain resorts for the winter season. It has to be noted that the official NSI statistics encompass only accommodation establishments with more than 10 beds thus leaving out a substantial portion of the categorized accommodation, such as. private rooms and guest houses. The data from the nine officially declared resorts in Bulgaria – seven sea side and two mountain resorts – show that 95.2 percent of the revenues come from the seaside resorts.<sup>8</sup> The behavioral pattern related to accommodation choices is given in *Annex 4* (Behavioral Pattern of International Tourists Related to their Accommodation Choice).

40. **The average stay is 4.66 nights**, which has continuously declined from 5.14 nights in 2011. Bulgarian statistics for 2016 show that the revenue per night spent is BGN 48.8 for all tourists and BGN 55.2 for international tourists.<sup>8</sup> Both indicators have been increasing over time but are still not satisfactory. The low average stay is due to the great percentage of transit travelers and the reason for the relatively low daily expenditure is the lack of quality additional services in tourism offers.

41. **Seasonality** is quite pronounced with the highest number of international arrivals and overnights in July and August (*Figure 8*).

42. Tourism statistics cover only eight resorts in Bulgaria (two mountain and six seaside). For 2016 91.6 percent of the revenue generated in the seaside resorts came from international visitors – BGN 378.8 per visitor. The average spending by Bulgarians at the seaside resorts was BGN 182.8 per person. In mountain resorts, international visitors were 41.2 percent

*Figure 8. Tourism seasonality in Bulgaria (2016)*



Source: NSI 2015.

of all arrivals and they spent BGN 176.6 per visitor (Bulgarians – BGN 63 per visitor). The lower tourist spending in mountain resorts indicates fewer spending opportunities there (shopping and entertainment). It can be concluded that international tourists prefer the seaside, while Bulgarian tourists go to winter mountain resorts more and do not prefer the higher class

<sup>7</sup> Bulgarian National Bank (2016) Balance of Payments.

<http://bnb.bg/Statistics/StExternalSector/StBalancePayments/StSearchAnalytical/index.htm>

<sup>8</sup> NSI, <http://www.nsi.bg/en/content/7074/annual-data>

(and more expensive) seaside resorts but go to smaller seaside villages and towns on the southern Black Sea coast.

#### **1.1.4. Tourism Supply**

43. **The number of hotels more than doubled from 634 in 2000 to 1,526 in 2007.** The year 2007 marks a record increase in the number of built hotels in Bulgaria – the growth was driven by the market changes in the country and the new possibility to possess more than one piece of real estate. The period also coincides with the initial accumulation of capital in Bulgaria. After 2007 the market changed to the construction of simpler and smaller accommodation establishments – family hotels, guest houses, and so on.

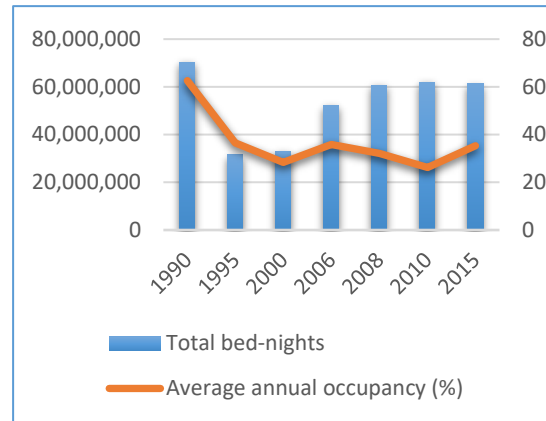
44. There are currently (2016) **3,331 accommodation properties with a total bed capacity of 328,264** in accommodation establishments with over 10 beds. A total of 30.2 percent of all accommodation is one and two star, 29.2 percent is three star and 40.6 percent (mostly in sea and mountain resorts) is four and five star. Results for revenue per bed per night indicate that Bulgarian resorts receive low spending tourists. Despite the high percentage of tourists staying in four and five-star hotels they spend little money on accommodation in the country because these costs are paid beforehand to the international tour operators in their countries. The accommodation costs in the offered tourist packages abroad do not reflect the high accommodation category to the full extent.

45. **Yearly occupancy is quite low** – it has dropped from 60 percent in 1990 to 30 percent in 2010 – **Figure 9**. One of the reasons for this is the sharp increase in the overall number of beds. In 2016 the occupancy was 41 percent (NSI 2017) so a potential upward trend since 2010 can be anticipated.

46. **The tourism supply is highly spatially concentrated.** More than two thirds of the total bed capacity are concentrated on the Black Sea coast, in the Burgas and Varna regions – 135,368 beds (2016).<sup>9</sup> More than two thirds of international arrivals in 2016 are registered in seaside (1,858,133) and mountain (279,501) resorts. This fact puts a high strain on the infrastructure in these areas.

47. **The typical tourist summer package** consists of three to seven nights in a seaside accommodation, including BB (bed and breakfast), HB (half board – usually breakfast and dinner), or FB (full board – three meals), free-of-charge beach parasols, and/or chaise-longues, sometimes free-of-charge parking place. Very popular in Bulgaria are the all-inclusive packages where free domestic drinks and food are offered in all establishments around the clock. All tourism facilities and entertainments are also free of charge. The policy of the Ministry of

**Figure 9. Average yearly occupancy of all accommodation establishments (percentage) 1990–2015**



Source: NSI, 2015

<sup>9</sup> NSI, <http://www.nsi.bg/en/content/7074/annual-data>

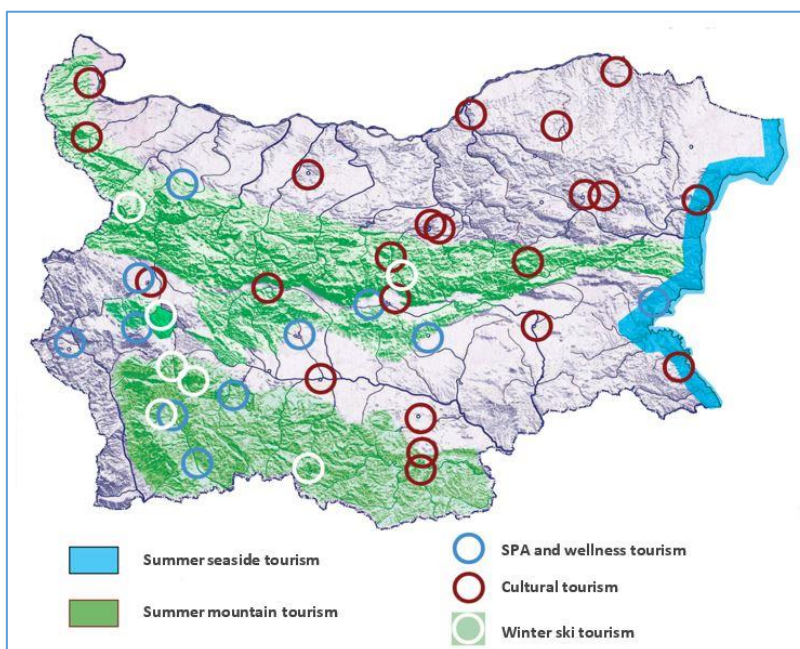


Tourism (MT) will be directed toward attracting more solvent tourists and offering high quality tourist products. **The typical winter package** also includes accommodation plus BB, HB, or FB, free-of-charge ski-equipment, cloak and changing rooms, free parking spaces, and sometimes a ski-instructor. The all-inclusive concept is the same as for the summer packages. A major revenue source is the ski passes which vary from BGN 10 per day in Bansko in the shoulder season to BGN 39 for half a day in Pamporovo (during the season). There are different prices for adults, students and those aged 65+, as well as for half day up to 13 days (BGN 600 in Pamporovo). There are also individual seasonal passes for about BGN 1500 and family seasonal passes in Bansko in the range of BGN 3,000 to BGN 7,000<sup>10</sup> (see *Tables 16* and *17* within *Annex 4* [Bansko Resort - Ski Pass Prices]).

48. **Tourism in Bulgaria is dominated by seaside resorts in coastal municipalities, with a limited number of internationally recognized ski resorts (three) and spas (four) and two municipalities of the largest cities (Sofia and Plovdiv) with developed business and cultural tourism.** These resorts concentrate around 90 percent of tourism development (measured by various indicators). The eight national resorts, announced in 2005, generate almost 60 percent of the total number of bed nights and the total revenue and 78 percent of the bed nights by international visitors.<sup>9</sup>

49. Other tourism products include spa (balneology), wellness tourism, nature-based tourism (hiking, stationary mountain recreation, fishing, hunting, and so on) and some forms of cultural tourism (heritage tourism, wine and culinary tourism, religious, and so on) all of which are more popular with the domestic market than with international tourists (*Figure 10*).

*Figure 10. Tourism types distribution*



*Source: Author's vision.*

<sup>10</sup> [www.borovets-bg.com](http://www.borovets-bg.com), [www.banskoski.com/bg/prices-ski-card](http://www.banskoski.com/bg/prices-ski-card), <https://pamporovo.me/services/winter/ski-zone-rates/>

#### **1.1.5. Access**

50. There is no data about the way international visitors arrive in Bulgaria. Estimates suggest that most tourists (mass tourism) fly in by plane. There are several major airports in the biggest Bulgarian cities – Sofia and, Plovdiv in the inner parts of the country and Varna and Burgas at the seaside. Bulgarian media inform that the number of passengers handled at Sofia airport in March 2017 increased by 52 percent compared with March 2016<sup>11</sup> (*Annex 4* [Sofia Airport – Press Release]). While the reasons for this growth in arrivals are unclear, data from the Ministry of Transport show that the number of arrivals by air (both international and domestic) increased from 3.2 million in 2010 to 3.9 million in 2015.<sup>12</sup> This growth can be attributed to the newly launched flights by Wizz Air and Ryan Air, discounts offered by Bulgaria Air, and an early start of the 2016/2017 skiing season. Next are the arrivals by land (car and bus). The main transportation challenges faced here are that the road network is not well developed and, that some of the main highways are still under construction. The only completely ready highway connects the capital Sofia with the sea city of Burgas at the southern Black Sea side. The general condition of the rest of the road network in Bulgaria is quite poor.

#### **1.1.6. Organization**

51. **Tourism is planned and managed by the MT that is responsible for elaborating and implementing the state tourism policies in country, creating the legal framework for tourism operations and development, coordinating with other state authorities in the field of tourism, national marketing and promotion, and so on. It is supported in all these tasks by the National Tourist Council (NTC)** with representatives of the tourism-related ministries and institutions; national, regional, local, and branch tourist associations; associations of air, land, and water carriers; and nationally represented associations of consumers in the Republic of Bulgaria. The tourism private sector is well organized – there are many professional associations: of the hotel and restaurant sectors, intermediaries, tour guides, alternative tourism (Bulgarian Association for Alternative Tourism [BAAT]), regional tourism organizations, and so on. This matter is presented in more detail in sub-chapter 2.5 Institutional Framework and Stakeholder Community in Bulgaria.

52. **The current opportunities and challenges of tourism in Bulgaria can be summarized as follows:**

- **Challenges.** Seasonal (summer) and geographical (Black Sea coast) concentration, two predominant tourism types, with international tourists being mostly interested in sun, sand and sea products, cheap tourist packages, dominance of ‘price-conscious’ tourists, and low accommodation occupancy.
- **Opportunities.** Development of new tourism types, products, and destinations (underdeveloped available resources), development of new marketing strategy with new market segmentation and new target segments, and spending optimization in existing tourist markets (Gössling et al. 2015).

---

<sup>11</sup> Bulgarian Telegraph Agency, <http://www.bta.bg/en/c/DF/id/1559926>

<sup>12</sup> NSI (2016) Transport statistics

## **1.2. Past and Present Weather Events and their Consequences and Response Actions in the Tourism Sector in Bulgaria**

53. **Bulgaria’s tourism industry is highly weather-driven and extremely seasonal.** Particularly vulnerable are the two most developed tourism types – a rainy summer will affect beach tourism and occupancy rates at seaside resorts, whereas a lack of snow can have a severe impact on the revenues from ski tourism.<sup>13</sup>

54. **Bulgaria is also vulnerable to climate change-related risks stemming from extreme events such as heat waves, extreme rainfall events, and coastal flooding** (Kreft et al. 2016). These are events that cannot be foreseen, and that can significantly affect tourist activities, will have repercussions for short-term travel behavior (day trips and short breaks), earlier departures (visitors returning home), and longer-term destination choice.

55. In recent years, Bulgaria has been subject to more frequent extreme weather events such as storms, including tornadoes, and associated phenomena such as prolonged and intense rainfall leading to floods. Extreme weather also included hail events and heat waves. According to the environmental group Germanwatch’s Global Climate Risk Index (CRI) Bulgaria was among the countries most affected by extreme weather events in 2014 – the country ranked sixth after Serbia, Afghanistan, Bosnia and Herzegovina, the Philippines, and Pakistan<sup>14</sup> (see **Table 18** within **Annex 4** [Bulgaria’s Ranking in the Global Climate Risk Index, 2016]). Some of these events caused unfavorable phenomena such as avalanches, landslides, and coastal erosion which are endangering tourism activities in various parts of the country.

**Figure 11. Miziya under water** **Figure 12. Tornado in Sozopol**



Source: BGNES



Source: standartnews.com

56. **Tornadoes are increasingly frequent at the Bulgarian seashore, endangering the tourism sector and the tourism resorts.** As an example, in the summer of 2014 a tornado struck Bulgaria's Black Sea resort city of Sozopol, while simultaneous floods were ‘drowning’ the country (**Figure**

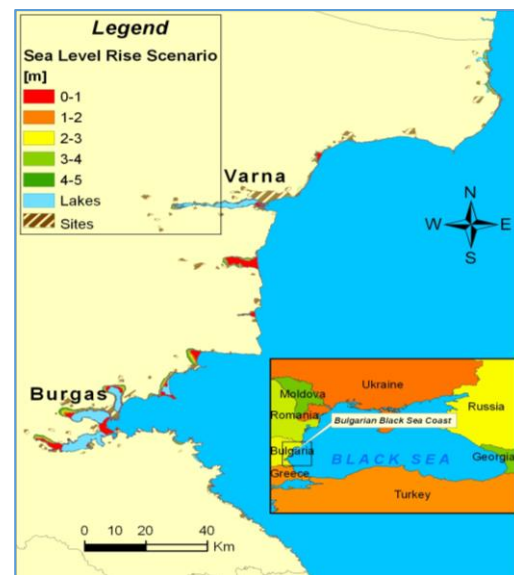
**11** and **Figure 12**). The number of tornadoes in Bulgaria in the last 10 to 15 years has significantly increased (Bocheva and Simeonov 2015). During 2001–2014, a total of 55 tornadoes were observed within 48 days, most often around Sofia and along the Black Sea coast. However, the average frequency of tornadoes in Bulgaria is lower, at 3.9 events per year. Most tornadoes (91 percent) occur between April and September; with further concentration in June and July. Waterspouts, that is vortex phenomena occurring over water, have been observed mostly between June and September, that is in the main tourist season. However, as phenomena over sea, they have limited implications for tourism.

<sup>13</sup> Risk and Vulnerability Analysis and Assessment of the Bulgarian Economic Sectors to Climate Change, 2014

<sup>14</sup> <https://germanwatch.org/en/download/13503.pdf>

57. In the winter and spring (mid-May) of 2015 Bulgaria was again hit by more than 10 severe floods all over the country<sup>15</sup> which mostly affected the northern parts of the country. Its northeastern regions, where several of the main Bulgarian seaside resorts are situated – Zlatni Pyasatsi and Albena, Kamchiya – were particularly affected. In Varna’s Asparuhovo neighborhood, 13 people died in the floods that hit on June 20 and the entire region suffered damages worth millions of Bulgarian leva, including damages to tourist buildings in the region (Palazov 2016) (*Figure 13*). The European Commission is set to grant an aid package worth €6.3 million (US\$6.8 million) to Bulgaria following natural disasters that occurred in the winter of 2015<sup>15</sup>.

*Figure 13. Identified flood-prone territories*



Source: Palazov 2016.

58. A longer-term issue that increases the risk of coastal flooding is the sea level rise which is caused by the general climate changes in the world (for example glacier melting, increased precipitation, and so on). Worldwide, the rate of sea level rise has accelerated to more than 3 mm per year since the 1990s (IPCC 2014). As the Black Sea is an inland sea, the mean values of average sea level rise are lower and have been estimated in the last few decades to vary between 1.5 mm per year and 3 mm per year (Kubryakov et al. 2016). An analysis by Allenbach et al. (2015) showed that sea level rise will have highly significant impacts on the Black Sea beaches, as for a 0.5 m sea level rise 56 percent of all beaches are projected to retreat by 50 percent of their maximum width. For a 0.82 m sea level rise (the high Intergovernmental Panel for Climate Change [IPCC] estimate for 2081–2100) about 41 percent are projected to retreat by their entire maximum width, whereas for a 1 m sea level rise about 51 percent of all Black Sea beaches are projected to retreat by (drowned or shifted landward by) their entire maximum width, if the high mean of the model ensemble projections is used. A long-term future scenario shows that a 1 m sea level rise would affect Varna Bay, Kamchiya River resort, Burgas town, Sunny beach resort (*Figure 13*), Pomorie town, and the coastline between Albena resort and Kranevo village. About 20 percent of the Bulgarian coast (83 km of 412 km) have been identified as flood-prone territories vulnerable to sea level rise (Rutty and Scott 2010). There is already evidence (Pevchev and Dimitrov 2012) of increased erosion, storm surges, and flooding in low-lying areas.

59. Furthermore, these problems have been exacerbated due to the rapidly growing coastal population pressure, leading to poorly planned development of the hazard-prone areas. Coastal zones potentially vulnerable to the impacts of sea level rise along the Bulgarian coast are firths, lagoons, sandy beaches and dunes often being also under subsidence processes (Palazov 2016).

60. Related to increased rainfalls and floods (caused by climate changes) are the **landslides**

<sup>15</sup> <http://floodlist.com/tag/bulgaria>

characteristic for Northern Bulgaria and the mountain regions. Landslides are unevenly distributed in Bulgaria mostly along the Danube shoreline. Landslides also occur along the northern Black Sea coast with potentially highly significant implications for tourism facilities, infrastructure and buildings. As an example, a vast landslide destroyed the panoramic road from Varna to the Zlatni Pyassatzi resort and at present, there is no direct connection between the city and the resort. Some hotels were left without any access and some even slid down to the seashore and are now out of use.<sup>16</sup> In 2017 (cutting date December 31, 2017) 2,137 landslides were recorded in Bulgaria,<sup>17</sup> more than half of them in the Danube region (1,113) followed by the inner parts of the country (644). The least (380) were registered along the seaside. In 2017, 15 new landslides have been registered and processes in 50 registered landslide regions have been activated, one of them blocking the road to the winter ski resort of Pamporovo and another one hitting the seaside resort of Zlatni Pyassatzi.

61. **Two heat waves** have been observed in 2007 and 2011, with temperatures reaching absolute maximum values of 38°C–40°C, and lasting for a week in 2007.<sup>18</sup> Similar temperatures were measured in the summer of 2015.<sup>19</sup> Temperatures such as these are well above the optimal temperature range for beach tourism (Rutty and Scott 2010).

62. **The danger of avalanches in Bulgaria's mountain region is high.** Yet, there are no official statistics of avalanches in Bulgaria. Likewise, snowfall data are not complete, unavailable for selected meteorological stations, and in many cases, not covering the years beyond 2010. For this winter season, the average snow cover for selected meteorological stations was as follows: November 2016 - 5 cm, December 2016 - 4.8 cm, January 2017 - 21 cm, February 2017 - 9.9 cm, March 2017 - 1.7 cm. The statistics for winter ski resorts are not available.<sup>19</sup>

63. In Bulgaria, **rockfalls** occur primarily on steep or vertical mountain slopes which have specific lithological structures and physical properties of the constituent rocks. The risk areas are especially the marginal escarpments of northeast Bulgaria's plateaus (including the Black Sea coast), the East Rhodope Mountains, the high mountain zones of the Rila and Rhodope massif, and the Western Stara Planina. All these are popular tourism areas and rockfalls present a real threat to tourists and tourism buildings and infrastructure (roads are often blocked).

64. The impact of these events on tourism is insufficiently understood. Most of the damages were registered in urban areas (Sofia and Varna). The tourist sector (both public and private) have not undertaken any preventive actions against extreme weather events. The measures taken are predominantly reactive (mostly infra- and superstructure repair works).

---

<sup>16</sup> <http://www.climatechangepost.com/bulgaria/avalanches-and-landslides/>.

<sup>17</sup> Data submitted by MoEW, January 2018

<sup>18</sup> <http://www.euro.who.int/en/countries/bulgaria/news2/news/2011/07/heat-waves-in-bulgaria>

<sup>19</sup> <http://www.stringmeteo.com/synop/>

*Table 2. Weather events in Bulgaria*

Event	Frequency	Regional relevance
<b>Rainfall including</b>	High	Across the country
- <b>floods and</b>	High	Across the country (parts of the seaside)
- <b>landslides</b>	High	Northern Black Sea coast, mountain regions
<b>Storms and tornadoes</b>	Medium	Black Sea region
<b>Heat waves</b>	Medium	Southern Black Sea coast, South Bulgaria
<b>Avalanches</b>	High	Rila, Pirin, Vitosha mountains
<b>Rockfalls</b>	Low	Mountain regions

### 1.3. Tourism-related Climate Change Risks and Vulnerabilities

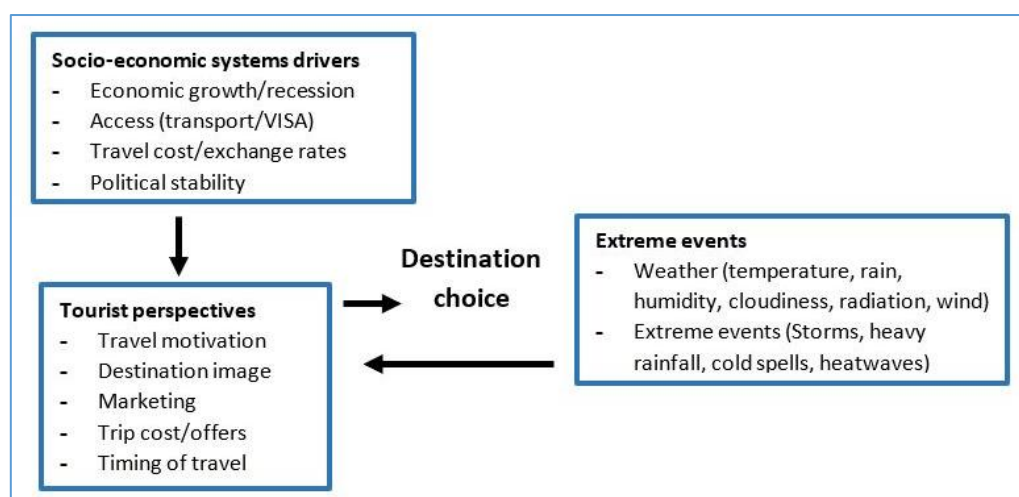
65. **The climate change risks for the tourism sector in Bulgaria were analyzed in detail in 2014 and published by the Bulgarian Ministry of Environment and Water (MoEW).<sup>20</sup> A brief summary of the main findings and results together with some new facts are presented in the following paragraphs.**

66. Evidence exists that climate change will have considerable negative consequences for the tourism sector in Southern Europe, where more than half of the EU’s capacity for tourist accommodation is concentrated. The expected impacts of climate change include reduced overnight stays in this part of the continent by 1 percent to 4 percent for the different scenarios, in which average temperatures will increase by 4.1°C to 5.4°C by 2030, with a concomitant increase in the number of overnight stays by 15 percent to 25 percent for the rest of the continent.

67. However, such scenarios should be considered with caution, as tourist responses to short-term extreme events (such as heat waves, storms, or rainfall) and long-term changes (temperature increases) are insufficiently understood. This is illustrated in **Figure 14**. Tourist decision making depends on travel motivations, which may be unrelated to the physical environment and weather (cultural tourism, VFR). Likewise, the destination image is only partially shaped by the understanding of its climate, while marketing, offers, or the timing of travel also have an influence on decision making. The destination choice is also influenced by wider socio-economic conditions (for example access or political stability).

<sup>20</sup> Risk and Vulnerability Analysis and Assessment of the Bulgarian Economic Sectors to Climate Change, 2014

*Figure 14. Factors for tourists' destination choice*



Source: Authors' vision.

68. The potential direct risks and opportunities that normally come with weather events can be summarized for the tourism sector in Bulgaria as shown in **Table 3**.

*Table 3. Climate change adaptation – potential direct risks and opportunities for the tourism sector*

	Risks	Opportunities
<b>Higher temperature (including heat spells and heat waves)</b>	• Lower number of tourists in midsummer season	• Prolonged summer season (in spring and autumn months) – for seaside tourism
	• Health problems with tourists in midsummer season – heat and solar strokes, high blood pressure, and so on	• Prolonged shoulder seasons – for all tourism types
	• Need for more cooling systems in summer – higher energy consumption	• Less need for heating energy in winter and shoulder seasons
	• Higher water needs – water shortage	-
	• Shorter average stay	-
	• Avalanches in winter	-
<b>Lower temperatures (including cold spells and cold waves)</b>	• Health problems with tourists – frost bites in winter	-
	• Lower number of tourists in all other seasons	-
	• Shorter average stay	-
<b>More precipitation and humidity</b>	• Lower number of tourists	• Increase in agricultural produce
	• Shorter summer and shoulder seasons	-
	• Shorter average stay	-
	• Landslides	-
	• Damage of tourist infrastructure	-
	• Worse conditions for any outdoor recreation activities	-
	• Avalanches in winter	-

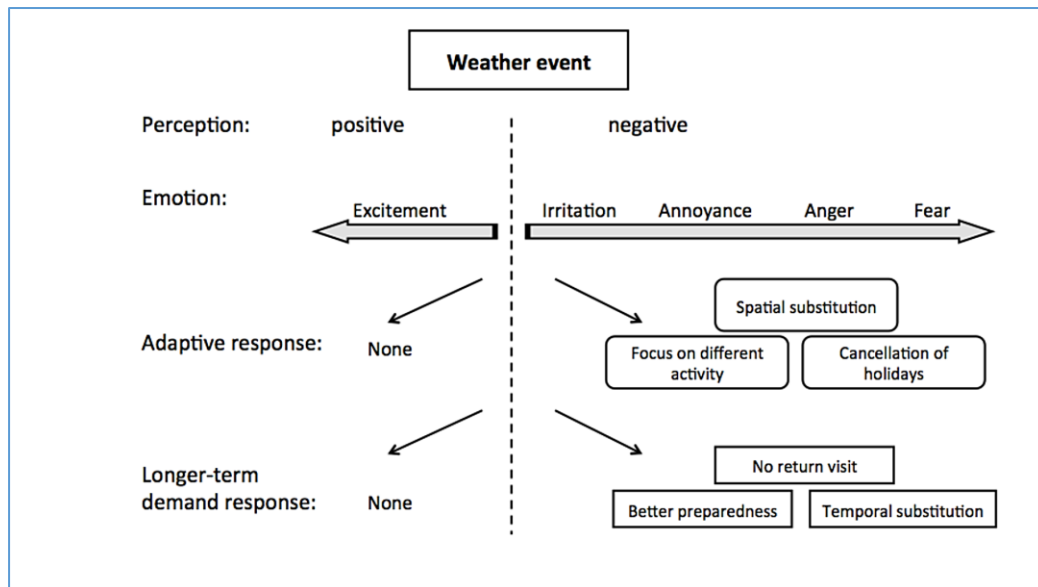
*Climate Change Adaptation – Assessment of the Tourism Sector*

	Risks	Opportunities
<b>Droughts</b>	• Water shortage for tourists' needs	-
	• Shorter average stay	-
	• Lower number of tourists	-
<b>Increase of winds and storms</b>	• Lower number of tourists	-
	• Health problems with tourists	-
	• Shorter average stay	-
	• Damage of tourist infrastructure	-
<b>Water shortage</b>	• Lower number of tourists	-
	• Shorter average stay	-
	• Shorter tourist season	-
<b>Energy shortage</b>	• Shorter average stay	-
	• Shorter tourist season	-
	• Lower number of tourists	-
<b>Short snow cover</b>	• Lower number of tourists	• Longer shoulder seasons
	• Shorter average stay	• Development of new tourism products in mountain resorts
	• Shorter tourist season	-
<b>Floods</b>	• Shorter average stay	-
	• Shorter tourist season	-
	• Lower number of tourists	-
	• Damage of tourist infrastructure	-
	• Worse access to tourism destinations	-
<b>Avalanches</b>	• Shorter average stay	-
	• Lower number of tourists	-
	• Damage of tourist infrastructure	-
	• Worse access to tourism destinations	-
<b>Landslides</b>	• Damage of tourist infra and superstructure	-
	• Worse access to tourism destinations	-
	• Lower number of tourists	-

69. Extreme events and weather patterns can influence perceptions and may lead to the cancellation of already booked holidays. More often, extreme events will occur without warning. As shown in *Figure 15*, this may cause positive or negative emotions (Gössling, Steiger, and Abegg 2016). Adaptive responses can include the cancellation of holidays (leaving the destination), spatial substitution (moving to another location), or the focus on different activities within the destination. Negative experiences can also influence longer-term demand responses, though this does not necessarily mean that tourists will not return. It can be expected that they would be better prepared for any extreme events or would change their visiting patterns – shift to a different time of the year. Extreme events are consequently only one of the many aspects guiding tourist behavior.



*Figure 15. Weather events' impact*



Source: Gössling, Steiger, and Abegg 2016.

### 1.3.1. Summer tourism

70. Summer is the most popular time to engage in coastal tourism and recreation in the Mediterranean region of southeast Europe where Bulgaria is situated. European statistics show that August is the most popular month for travel to southeast Europe (World Tourism Organization 1993). The concern is that with rising temperatures and associated biophysical stress (temperatures above 40°C and high humidity), a share of tourists can be expected to shift their vacation to the shoulder season. This is an option specifically interesting for travelers without children at school. High temperatures put older travelers and young children at a higher risk of heat exhaustion. Resorts may consequently become less attractive in summer. Climate change scenarios for Bulgaria show that by 2020, June will be almost as warm as July and/or August currently are.<sup>21</sup>

71. An indirect effect of climate change related to summer tourism is that without mitigation and adaptation, coastal erosion linked to sea level rise can endanger recreation and tourism activities in coastal destinations. There are also flood risks that can seriously damage tourism resorts, buildings, and infrastructure along the sea coast.

72. The analysis of trends, in the annual distribution of international tourist visits and nights spent by foreigners and Bulgarians, shows a significant extension of the summer tourist season since 2000, mainly at the expense of the spring months. For domestic tourists, the increase is expected to start from February. And while the autumn visits and overnight stays by foreigners almost do not increase, the number of overnight stays, registered by Bulgarians in autumn and winter (including December) show a significant increase.

73. **It can be expected that climate change in Bulgaria in the summer will create preconditions for substantial extension of the tourist season.** In fact, all countries bordering the Black Sea (Bulgaria, Romania, Ukraine, Russia, and Georgia) could expect beneficial

<sup>21</sup> Risk and Vulnerability Analysis and Assessment of the Bulgarian Economic Sectors to Climate Change, 2014

effects in the shoulder summer tourist season.

74. For the most part, tourism is unlikely to develop ‘differently’ because of climate change until 2030, unless there are heat waves or other extreme weather events, which affect short-term behavior (mostly day tourism, which paradoxically may increase beach tourism, for cooling down in the sea). However, there may be daily changes, more tourists in the morning and evening, fewer in the middle of the day. Air-conditioning requirements in hotels may increase. In the longer-term future, after periods of consecutive ‘hot’ summers (exceeding 35°C for prolonged periods of time), it is possible that a considerable share of elderly travelers reconsiders their destination choice or timing of the visit (see *Figure 19* within *Annex 4* [Municipalities at Risk of Dry Spells in Bulgaria, 2011]).

75. **Nevertheless, these conditions could lead to a reduction of some traditional tourist markets** from western and northern Europe with a growing share of elderly population who cannot endure the high summer temperatures. Furthermore, the prospects of spending the summer holidays in their home countries are expected to become more attractive. The U.K. Vulnerability Assessment Report concludes that “*warmer temperatures may encourage ... increased numbers of visitors to the U.K.’s national parks, beaches and open spaces. It may affect peoples’ choice of travel destination, both in displacing U.K. foreign travel and encouraging tourists from overseas*” (ASC 2016). This may lead to a certain decrease of summer tourists from the United Kingdom to Bulgaria.

76. Threats for summer tourism in Bulgaria lie in the indirect impacts of climate change resulting in water shortages. **According to estimates (Gössling 2015), direct and indirect use of tourism varies between 4,600 liters and 12,000 liters per guest night, with direct water use for gardens and pools often exceeding hundreds of liters per guest night. This is a quantity several times greater than that used by locals and can contribute to local water scarcity.** Water shortages in Bulgaria have also been observed in flood-prone areas, because of limited water distribution systems that are also insufficiently maintained. In summer, water shortages can result out of limited rainfall. Water-related problems already exist, as in competing destinations such as Cyprus, Turkey, and Greece. Cyprus in particular has already experienced water supply and electricity disruptions in summer (Sofroniou and Bishop 2014). Water shortages in Bulgarian resorts, mainly in coastal areas, have been reported in Bulgarian media.<sup>22</sup> (see also *Annex 4* [Sunny Beach – Press Release] and [Municipalities in Water Stress in Bulgaria, 2005]).

77. Additional stress on water supply is exerted by the existing golf courses (GCs) along the Black Sea – it is known that their maintenance requires a lot of water which even now is scarce in these regions. There are three (GCs) along the Black Sea coast and they are all situated to the north of Varna – Black Sea Rama GC, Thracian Cliffs GC, and Lighthouse GC. Another GC (Pirin Golf GC) is near the winter ski resort of Bansko in the Rila Mountain and two others are situated near the capital Sofia – St. Sofia GC and Pravets GC.<sup>23</sup> The specific water situation in these areas is unclear, but it is likely that the GCs contribute significantly to water consumption (Gössling, Hall, and Scott 2015).

<sup>22</sup> [www.property.bg/.../Bulgaria's\\_seaside\\_hotels\\_expect\\_water\\_s](http://www.property.bg/.../Bulgaria's_seaside_hotels_expect_water_s)

<sup>23</sup> The golf courses in Bulgaria, <http://www.golfcoursesinbulgaria.com>

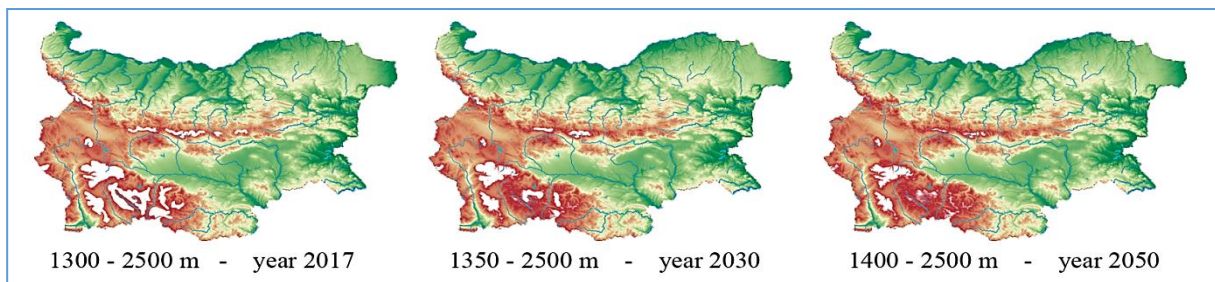
### **1.3.2. Winter tourism**

78. Higher temperatures have a significant effect on snow and ice. Higher winter temperatures mean higher snow lines, thinner ice on lakes, and shorter duration of snowfall. Global warming directly endangers the duration of the winter season around the world, the quality of the experience of tourists, and the variety of sports and other winter activities (Scott, Hall, and Stefan 2012). Globally, the permanent late-summer snow line in mountainous regions has risen by about 200 m, compared to the 1960s (David Suzuki Foundation 2009). Particularly low-lying ski resorts and other activities related to winter tourism are already affected by climate change, with potential direct negative impacts on local communities that depend on the jobs and revenue generated by this type of tourism. In scenarios of unmitigated climate change, more than half of the ski season in the world may disappear, with a few exceptions in the highest mountain resorts (David Suzuki Foundation 2009).

79. Even with snow cannons now being employed in most ski areas, many resorts will see a falling number of skiable days, which will question their financial viability. In the winter of 2014, Bulgaria's mountain resort of Chepelare (situated at an altitude of 1,232 m) failed to register any profit because of the high cost of snowmaking. The lack of snow resulted in a decrease of tourist numbers. In a negative cycle of events, this prompted the resort to reduce ski pass prices to a minimum.

80. Climate projections for Bulgaria indicate a continuous decline in winter snowfall and earlier melting of snow. Rainfall events can affect snow quality and the perceptions of holiday makers. This will have a substantial negative impact on **ski resorts**, especially those in lower mountain regions (**Figure 16** – for legend see **Figure 21** in **Annex 4** [Physical Map of Bulgaria]).

**Figure 16. Snow cover forecast for the winter ski season in Bulgaria**



Source: Adapted from *Risk and Vulnerability Analysis and Assessment in the Sphere of Tourism*, in: *National Climate Change Risk and Vulnerability Assessment for the Sectors of the Bulgarian Economy, 2014*.

81. A 2009 study of Borovets resort within the Climate Change and Variability: Impact on Central and Eastern Europe (CLAVIER) project (Jacob and Horanvi 2009) shows that in principle, the resort will have enough snow for skiers in the future (the ski tracks are completely covered by snow with no barren places on them), although there is a steady declining trend in the number of snow days and snow thickness (most pronounced at an altitude of 2,500 m). Risks are however, implied in year-to-year variability and by 2020–2050, periods of two to six consecutive years of poor snow conditions are expected.

82. **While the economic impact of these developments on the regional and local economy may be modest up to 2030, any year can potentially incur substantial losses.** In the long run, effects are likely to be largely negative, depending on global mitigation efforts, specific

snow conditions, marketing policies, and tourist demand responses. The worst possible scenario is a cycle of ‘bad’ winters that will force hotels to give up operations.

**83. The analysis of the dynamics of international visits and overnight stays registered by foreigners and Bulgarians confirms the pessimistic forecast for Bulgarian winter tourism.**

Both with international visits and nights spent by foreigners a positive upward trend during the period from October to February can be noted. The number of nights spent by Bulgarians shows a significant increase during this period but does not reach the values of the main tourist season. However, overall guest nights are projected to grow; hence, they may strengthen the business situation as a whole. It may even be easier for businesses to maintain operations at a steady level than to plan for a second, very short peak. The risk here is probably more embedded in the insecurity of the situation (potentially very little snow).

84. Projections of climate change suggest that winter tourism will be far more significantly affected than other types of tourism in Bulgaria. This would have largely negative outcomes for local communities depending on the jobs and the revenues generated by winter tourism.

**1.3.3. Water shortage in Bulgarian resorts**

**85. Tourism contributes to high water demand in water scarce areas** Water shortages are not uncommon in Bulgaria, because of limited precipitation, as well as technical problems associated with pipe maintenance and leakage. The problem was identified two decades ago (Knight, Velev and Staneva 1995), but very modest steps have been sporadically taken to alleviate it in separate regions of the country.

86. Water shortages and the inability to provide the required amounts for the needs of all sectors lead to the occurrence, and sometimes, deepening of conflicts over water (especially with agriculture). The seasonal nature of coastal tourism and its geographic concentration (especially around the Mediterranean basin, where water is already scarce) creates considerable pressure at the regional and local levels. Peak water consumption in tourism coincides with that of agriculture, population, the energy sector and nature. It also coincides with summer droughts, which are expected to become more severe under scenarios of climate change.

87. A significant problem is the inefficient use of water resources. For instance, an estimated 10 percent of all water is lost because of insufficient maintenance of pipelines and an equally large share is used for irrigation of gardens, specifically lawns. The total industry consumption is nearly twice as high as in advanced industrial countries. Agriculture, the major user of fresh water, relies on inefficient irrigation systems.<sup>24</sup>

**88. In mountain regions, climate change will lead to an earlier melting of an increasingly smaller amount of snow and ice, thus putting water supplies at risk during extended periods of the year.**

---

<sup>24</sup> Bulgaria’s wastewater mission, [www.waterworld.com/articles/wwi/print/...4/.../bulgaria-s-wastewater-mission.html](http://www.waterworld.com/articles/wwi/print/...4/.../bulgaria-s-wastewater-mission.html)

#### **1.3.4. Power cuts**

89. **Power cuts (blackouts because of overconsumption and the breaking down of the grid) in Bulgarian seaside resorts were reported for the first time in the summer of 2010,<sup>25</sup> because of electricity demand for air-conditioning exceeding production.** The example cited in the article illustrates how increasing temperatures lead to adaptation strategies that may for different reasons not be sustainable.

#### **1.3.5. General findings and conclusions**

90. Findings support the following conclusions:

- The tourism product of Bulgaria is heavily dependent on beach summer tourism (predominantly international tourists), and to a much smaller degree, on skiing (predominantly domestic tourists).
- Most tourism is concentrated in the Black Sea coast, where climate change is expected to contribute to an increase in already high summer temperatures, weather extremes including intense rainfall and tornadoes, and associated problems such as flooding and landslides.
- Summer temperatures are already exceeding optimum beach temperatures and are projected to further increase under scenarios of climate change. This may result in shifts in beach tourism markets in the longer term. The assessments also need to consider adaptation (for example, air-conditioning and shading), non-weather parameters (opportunities for holiday making outside the main season), or the likelihood of extreme weather events. A distinction also needs to be made between day visitors and tourists. Particularly, domestic tourists may become more interested in beach tourism earlier and later in the year, while international tourists may avoid very hot summers.
- The expected decrease in summer, spring, and autumn rainfall may support an extended summer season, while the winter season can be expected to continue to shrink. Extreme weather events can have an impact on short-term adaptive tourist behavior and longer-term demand.
- **The winter tourist season** may become economically unviable, at least in locations at lower altitudes.
- **Overall seasonality will decrease.** This can imply opportunities for more stable employment opportunities and more balanced, higher accommodation occupancy, but would require additional marketing efforts to attract international tourists earlier and later in the year.
- Water availability can be expected to decline by 15 – 30 percent in eastern Bulgaria, and 10 percent in the rest of the country,<sup>26</sup> which will put pressure on agriculture, tourism, and other water-dependent sectors. This calls for water management addressing leakage (maintenance of pipe systems) and opportunities to reduce water use (Gössling, Hall, and Scott 2015).
- Given opportunities for employment creation in tourism, investments should be made in the training of staff and improving service quality.

---

<sup>25</sup> <http://www.balkaninsight.com/en/article/power-cuts-hit-bulgarian-tourism>

<sup>26</sup> Risk and Vulnerability Analysis and Assessment of the Bulgarian Economic Sectors to Climate Change, 2014

91. **Given the considerable risks for the viability of winter products and expected high summer temperatures, diversification of tourism products is an important strategy to reduce vulnerabilities and increase destination attractiveness.**

92. **Investments in snowmaking in winter resorts are risky, because of the projected changes in winter precipitation and temperature increases.** This may lead to a significant reduction in the number of skiable days, a lack of water availability for snowmaking, and an overall increase in the cost of skiing that the market is unlikely to be prepared to pay for.

93. The above findings and conclusions are presented in summary in *Annex I*.

#### **1.4. Conclusions**

94. There is considerable growth potential for tourism in Bulgaria as illustrated by important tourism indicators forecasts. However, the sector's current mainstays, beach and winter tourism, are increasingly questioned by climate change. Summer tourism faces a prospect of temperatures increasing beyond optimum levels, as well as heat waves and other extreme weather events such as intense periods of rainfall with associated flooding and landslides. Tornadoes have been observed increasingly often. Winter tourism is already suffering from higher temperatures and there is a risk that it will become increasingly unviable in the future. Risks are potentially exacerbated by resource scarcity (particularly fresh water) and a growing energy demand, for example for air-conditioning.

95. As an EU Member State, Bulgaria also falls under the Intended Nationally Determined Contribution of the EU and its member states to reduce emissions of greenhouse gases (GHGs) at least by 40 percent by 2030, compared to 1990. This goal will have to be achieved during 2021–2030 (UNFCCC 2015) and implies that any activity that increases energy consumption represents a barrier to achieving the EU target. Growth in tourism will result in an increase in energy use and the sector needs to consider opportunities to reduce energy use, increase the share of renewable energy sources, and engage in offsetting to reduce vulnerabilities. These mitigation efforts represent an additional cost for the sector that should be considered in planning for a low-carbon future.

96. To reduce the vulnerability of the sector, there is thus a need to diversify the tourism sector while simultaneously reducing its energy intensity and resource dependency. New tourism products may, for instance, include culinary-, wine-, wellness-, or cultural tourism. Tourism businesses can also expect an extended summer season, with opportunities to attract visitors particularly in early summer and early autumn. Management for reduced resource use, technological innovations, and legislation for new tourist sites and infrastructure can make a major contribution to reducing vulnerabilities related to mitigation and future climate change. To achieve this, the Bulgarian tourism industry, as a whole, and the individual economic units within it must develop strategies and implement legislation. Only then can a more important economic role of tourism be secured even under scenarios of decarbonization and climate change.

## **Chapter 2. Baseline – Policy Context**

97. This chapter explores the state of knowledge about the consequences of climate change. It also identifies current knowledge gaps with respect to the tourism sector. The chapter starts by exploring the sector awareness and understanding worldwide then looks at the experience with CCA in tourism in other EU countries including an analysis of the present legal framework and policies in the EU. The second part of the chapter examines sector awareness, understanding, the legal framework and policies toward climate change in Bulgaria, its related institutional framework and stakeholder community, financial and human resources, as well as present and foreseen CCA-related actions in the country. The chapter concludes with the identification of the gaps and barriers hindering adequate response to CCA action in Bulgaria.

### **2.1. State of Awareness and Understanding of Future Consequences of Climate Change, and Knowledge Gaps in the Tourism Sector**

#### **2.1.1. Academic research**

98. **Relationships of tourism with weather and climate have been discussed for more than half a century** (Scott, Hall, and Gössling 2012). Early research focused on the central role of climate in tourism demand. Publications on the interrelationship of climate change and tourism were first published in the late 1980s. Scott, Wall, and McBoyle (2005) attribute this to a lack of interest among tourism researchers and the insufficiently understood anthropogenic causes of climate change. Interest grew consistently since the 1990s as discussions on the contribution of tourism to GHG emissions and adaptation increased (Kaján and Saarinen 2013).

99. The year 2000 and beyond saw a considerable further increase in tourism and climate research. Scott et al. (2012) regard this period as the turning point for tourism and climate research. Following this point the need for collaborative efforts in research and knowledge dissemination was recognized. International conferences focusing on tourism and climate research themes were organized, and particularly over the past decade, there has been considerable growth in the number of articles discussing aspects of tourism and climate change. Despite this, a wide range of interrelationships, for example regarding tourist demand responses, remain insufficiently understood (Gössling et al. 2012).

100. At this time, concerns were also raised about tourism as a contributor to climate change. The sector is responsible for about 5 percent of global CO<sub>2</sub> emissions (UNWTO, UNEP, and WMO 2008), with air transport accounting for 40 percent, car transport 32 percent, accommodation 21 percent, activities 4 percent, and other transport 3 percent. Notably, including the warming effects of non-CO<sub>2</sub> emissions emitted by aircraft, the overall contribution of tourism to global warming is estimated to be higher, in the order of 8 percent (Scott, Peeters, and Gössling 2010). The impacts of climate change on tourism can be both direct and indirect, including the following (UNWTO and UNEP 2008):

- An increasing cost of insurance, heating, and cooling
- Changes in the length and quality of vacation because of altered destination environments that affect their attractiveness (for example, loss of glaciers)
- Impacts on tourism infrastructure
- Impacts on economic and political stability

101. In response to climate change, tourism managers, destination managers, policy makers, and governments have been urged to contribute to mitigation and devise strategies to adapt to the changing climate (OECD and UNEP 2011).

### **2.1.2. State of awareness and understanding**

102. **Many governments, political and nongovernmental institutions, and organizations in recent years turned their attention to climate change and its impacts on all spheres of human life and activities.**<sup>27</sup>

103. All stakeholders acknowledge the fast pace of climate change, and its impacts on the natural environment and economic activities. The United Nations World Tourism Organization (UNWTO) states that for tourism, climate change is not a future event, but a situation that already affects the sector and certain destinations, in particular, mountain regions and coastal destinations (UNWTO 2008). Changing demand patterns and tourist flows will affect tourism businesses and host communities, and have knock-on effects on related sectors, such as agriculture, and construction.

104. The awareness in the tourism sector towards climate change impacts is relatively high. Since the first International Conference on Climate Change and Tourism, convened by the UNWTO in Djerba, Tunisia in 2003, a growing body of knowledge has been generated addressing the complex relationship between the tourism sector and climate change.

105. There is now a wide recognition of the urgent need for the tourism industry, national governments, and international organizations to develop and implement strategies to face climate change, while simultaneously mitigating tourism's contribution to climate change. A recent World Bank report (2010) puts forward three main requirements for the climate policy act now, act together, act differently. This is a solid approach for all economic sectors, including tourism.

106. There is very scarce information on the tourist business sector awareness and understanding of climate change as a whole. In-depth research has been done sporadically and no general conclusions have been drawn.

### **2.1.3. Knowledge gaps**

107. **Despite the significant growth of publications on tourism and climate change there are considerable gaps regarding the knowledge of climate change adaptation and mitigation.** The EU's 2013 Strategy on Adaptation to Climate Change (EEA 2017) identifies four key areas where knowledge gaps exist: (1) information on damage and adaptation costs and benefits, (2) regional- and local-level analyses and risk assessments, (3) frameworks, models and tools to support decision making, and (4) means of monitoring and evaluating past adaptation efforts.

108. Some of the most important knowledge gaps concerning climate change and tourism are related to (World Bank 2010):

- Climate change science – knowledge is evolving and constantly refined;

---

<sup>27</sup> Stern Review



- Roles and Responsibilities – who is responsible for the implementation of existing and diverse adaptation and mitigation activities (strategies, plans, and so on);
- The cost of mitigation efforts and the cost of delaying them;
- Priorities – immediate actions required and long-term mitigation goals;
- Information gaps;
- The financing gap – where all needed money will come from;
- Right tools and technologies to be implemented;
- Overcoming behavioral and institutional inertia.

109. Despite the numerous documents created and published, the various fora (conferences, round tables, and so on) organized proving the state of high awareness, and the full understanding by academicians, politicians, and experts of future consequences of climate change in general and particularly for the tourism sector, there are still some substantial knowledge gaps in the sector, which must be addressed. Nevertheless, there is broad consensus that mitigation efforts need to begin immediately, while adaptation strategies should be implemented parallel to the generation of new insights.

## **2.2. Experience with CCA and Tourism in Other (EU) Countries**

110. **Many EU countries have already taken serious steps regarding climate change and adaptation activities in the tourism sector. This sub-chapter explores the CCA-tourism experience of other EU countries with similar climatic conditions to Bulgaria. Several benchmarking examples in summer and winter tourism are analyzed.**

111. Although the public governance of CCA gained increasing attention among both policy makers and researchers in recent years, it is still largely unclear how governments aim to implement mitigation and adaptation policies in tourism and other economic sectors. There are four major challenges that are key in the context of climate adaptation policy making. These are: (1) how to better integrate adaptation policies horizontally across policy sectors, (2) how to integrate vertically across jurisdictional levels, (3) how to integrate diverse and changing knowledge and science, and (4) how to involve non-state stakeholders in adaptation policy making (UNDP 2004). In many countries, governments employ a variety of institutional innovations (governance approaches) to address these four challenges. The review shows that most of these approaches are restricted to soft, voluntary policy measures that often address more than one of the four challenges at a time. National Adaptation Strategies (NASs) usually mark the centerpiece of adaptation governance. (see **Boxes 1** and **2**) (EEA 2014).

### **Box 1. Finland**

Finland's Ministry for Agriculture and Forestry was the first in Europe to adopt a **Strategy for Adaptation** to Climate Change. The aim of this strategy is to increase the adaptive capacity of the Finnish society. The strategy identifies climate impacts and adaptation measures in 15 sectors with a time horizon to 2080.

The following action areas were identified as priorities through 2015: (1) mainstreaming climate change impacts and adaptation into sectoral policies, (2) addressing long-term investments, (3) coping with extreme weather events, (4) improving observation systems, (5) strengthening the research and development base, and (6) international cooperation.

**Box 2. United Kingdom**

In the United Kingdom, adaptation has been legally regulated through the **Climate Change Act** of 2008. This act requires a United Kingdom-wide Climate Change Risk Assessment (CCRA) that must take place every five years. Among other things, the law provides the mandate giving Her Majesty's Government and the Welsh Government the power to require 'bodies with functions of a public nature' and 'statutory undertakers' (for example, water and energy utilities) to report on their adaptation efforts to address the risks posed by climate change to their work. The United Kingdom is also legally committed to significantly reduce emissions of GHGs.

**2.2.1. Summer tourism destinations**

*Croatia*

112. Like Bulgaria, Croatia considers tourism as one of the priority sectors for CCA, especially for summer tourism. A report on Adaptation in Croatia (Peleikis, Grätz, and Brnada 2014) concludes that hotter daytime temperatures along the Adriatic coast, the main tourist region in Croatia, could have serious consequences for arrivals, and thus many local communities, given the important role of tourism for the national economy. Warmer temperatures can lead to a variety of changes in coastal and inland ecosystems – see **Box 3**. Although currently there are no sectoral strategies in place that address climate adaptation issues, activities in the field already show a degree of practical adaptation in certain sectors, one of them coastal zone management, with a direct relation to tourism.

113. In 2012, Croatia ratified the Protocol on Integrated Coastal Zone Management (ICZM) in the Mediterranean, committing to the development of a national ICZM strategy with action plans and programs in line with the joint regional framework. The national strategy includes vulnerability and hazard assessments of coastal zones, as well as planning for prevention, mitigation, and adaptation measures to address the effects of natural disasters, particularly climate change.

**Box 3. Tourism sector adaptation steps in Croatia**

- ✓ Continue to focus on 'climate-proofing' tourism in Croatia – including expanding the tourist season and enhancing the service capacities and products
- ✓ Encourage measures to increase energy efficiency and improve the ability to keep buildings cool during the hottest months
- ✓ Ensure that information on the tourism industry, provided by government-funded research, is user-friendly and can be easily accessed by the public and stakeholders
- ✓ Develop better information for decision makers (including government and investors) about future climate change and its likely effect on the sector-related natural systems
- ✓ Develop the capacity to simulate the impacts of climate change on tourism and assess the impacts on the local and national economies

### *Cyprus*

114. Although Cyprus has not yet developed an official CCA strategy, research shows that the following adaptation measures should be implemented to reflect the observed and projected impacts of climate change in Cyprus (Zachariadis 2012):

- For water resources, enhancement of ecosystem storage capacity, water management and efficient water use, protection of surface and groundwater quality, implementation of appropriate water pricing to reflect scarcity, and environmental costs.
- For coastal zones, research on sea level rise and on coastal areas prone to erosion risk (an inventory must be prepared). Guidelines for sustainable tourism and adaptation to climate change must be developed and public awareness must be raised.
- Shift from large-scale/coastal tourism to special interest tourism is a necessity.
- The tourism industry should rapidly act to combat the emerging competitiveness from other destinations in Europe, which will be favored by climate change. Climate change may even be beneficial for the Mediterranean tourism industry if it levels-out demand, reducing the summer peak, while increasing occupancy in the shoulder seasons. In the absence of such adjustments, the Mediterranean tourism industry will be among the main losers.
- The tourism industry should make investments in infrastructure/technologies to upgrade facilities to face increased temperature and water shortage and take measures to counteract possible weather extremes and flooding;

115. The author continues to analyze the role of public and private entities in implementing the adaptation measures (see *Annex 5* [Cyprus]).

### *Greece*

116. The report by the Bank of Greece (2014) recommends developing special and alternative forms of tourism, together with a redefinition of the peak season for sun and sea tourism that can help the Greek industry overcome the observed reduction in international arrivals in mid-summer due to very high air temperatures. This can be achieved through product enhancement, improved services, a focus on intensive rather than extensive development (by seeking, for instance, to increase visitor per capita spending rather than increase the total number of arrivals), and by reducing Greek tourism's pronounced seasonality. More specifically, four adaptation measures were examined: beach stabilization, artificial beach nourishment, construction of seawalls/breakwaters, and coastal protection systems using rockfills, and beach drainage. So far, the trend of decreasing international arrivals has not been proved,<sup>28</sup> which indicates that there is no risk that summers in the Mediterranean will become too hot, which is essentially what Scott and Ruddy outlined in their 2010 paper.

---

<sup>28</sup> <http://www.tradingeconomics.com/greece/tourist-arrivals>.

### **2.2.2. Winter tourism destinations**

#### *Slovenia*

117. The greatest CCA challenge in tourism must be tackled by winter sports, which has already been greatly affected by variations in the current climate. In a study conducted by Ogrin et al. (2011) the following conclusions were made:

- Low and medium-lying (800 m to 1,500 m) tourist ski resorts will have to expand their range of services during the winter to provide their guests with the possibility of pursuing other activities if conditions are less appropriate for skiing.
- Appropriate plans must be made to increase the share of slopes that can rely on snow-making to take advantage of colder periods for preparing a snow base.
- Plans to expand ski slopes must observe the micro-climatic conditions to a greater extent, while slope management must take advantage of meteorological forecasts more actively.
- The adequacy of additional investments in ski infrastructure in those resorts where climate change will shorten an already short ski season must be reconsidered.
- Ski resorts will be able to compensate for the shortening of the winter season at least partly by attracting tourists to the mountainous regions during the summer, which will require the development of an appropriate range of services.

118. Slovenian ski resorts are even more vulnerable in comparison to other ski resorts in the Alps, because they lie at lower elevations. Only one of them lies above 2,000 m and only two above 1,600 m. In the long run, Ogrin et al. (2011) conclude, this means that winter tourism will need to focus on other activities, such as spa tourism (water parks, swimming pools, and relaxation centers). They will also need to focus on the summer season and on transitional periods as well.

#### *Switzerland*

119. Although Switzerland is not an EU country, the importance of winter ski tourism is similar to that in Bulgaria, calling for a brief analysis of CCA approaches in this country. It is generally assumed that all cantons can implement and apply their own adaptation policy (Matasci and Altamirano-Cabrera 2012) (see **Box 4**).

120. Focused on 2030, a large number of possible adaptation measures has been proposed for Switzerland (see **Annex 5** [Switzerland]).

#### **Box 4. Switzerland**

In Switzerland, in March 2012, the first part of the **Adaptation Strategy** to climate change was adopted by the Federal Council. This strategy defines objectives, challenges, and action areas. The first part of the adaptation strategy highlights adaptation needs with regard to water management, natural hazards, agriculture, forestry, energy, tourism, biodiversity, health, and spatial development. For these sectors, a total of 48 fields of action are set out, adaptation goals and principles are formulated, and bases for implementation are outlined by which these goals can be achieved. In addition, interfaces between the sectors are described. This should enable the best possible use of existing synergies in efforts to adapt to climate change, avoiding or resolving conflicts between objectives.

*France*

121. In the national strategy of France<sup>29</sup> the following adaptation measures are recommended:

- Diversification of activities and revenue sources in winter (excluding skiing)
- Development of four-season tourism, to reduce dependency on snow
- Diversification of activities in seaside resorts

122. Promising development models for the Swiss and French tourism industries are the concentration of winter sports in most popular destinations, the promotion of wellness-centers in the mountain region, and the diversification of attractions offered for summer recreation. These adaptation measures illustrate that adaptation takes place in a dynamic context, where minimizing the cost of damage caused by climate change goes hand in hand with the search for innovative business opportunities (see *Annex 5* [France's Adaptation Measures Toward Winter Tourism]).

**Box 5. Examples of shut down of ski resorts**

The city council of Abondance in the French Alps – its name a reminder of the generous snowfall it once enjoyed – has decided to shut down the ski station that has been its economic *raison d'être* for more than 40 years. The reason: not enough snow. Abondance (at 930 m) falls in the altitude range climate scientists say, that has seen the most dramatic drop in snowfall in recent generations. Whether this shut down is due to climate change or not is disputed. Other factors, such as incomplete investments (€5.3 million in a mixed chairlift/telecabine without snowmaking on the pistes below) may be far more important.

There are 20 other low-lying Haute Savoie resorts that some say are on the brink of closure. A report by the Organisation for Economic Cooperation and Development (OECD) suggests that the number of ski resorts in the department will fall from 37 to 18 if poor conditions continue.

An example of successful adaptation to failing winters is Gschwender Horn in Immenstadt, Bavaria. At the beginning of the 1990s, after a series of snow-deficient winters, the municipality, together with the Allianz Umweltstiftung, decided to withdraw from the non-profitable ski operation. The facilities (two ski lifts and a transportable children's lift) were dismantled, the ski runs (approximately 40 ha) were re-naturalized. Today, the area is used for summer and winter tourism, namely hiking, mountain biking, snowshoeing, and ski touring.

*Source: Abegg et al. 2007.*

*Austria*

123. The Austrian Adaptation Strategy<sup>30</sup> defines 14 possible areas of action, where tourism is in the fourth place after agriculture, forestry, and water resources and management. The main adaptation areas of tourism are given in *Annex 5* (Austria). Despite the lack of specific data about tourism adaptation measures in the strategy, research publications (Steiger and Abegg 2012) show that the impact of climate change can be moderated through snowmaking, but it was also shown that there exist considerable differences in adaptation opportunities between ski areas. Beyond a 2°C warming, snowmaking becomes unviable.

<sup>29</sup> ONERC (Observatoire National sur les Effets du Réchauffement Climatique) (2007/2009).

<sup>30</sup> The Austrian Strategy for Adaptation to Climate Change (2012), Vienna

*Italy*

124. Several adaptation strategies exist and are already extensively used in the Italian Alps to mitigate the impacts of climate change, particularly in the tourism sector. The developments are triggered both by the severe threats to winter tourism, and by the economic value of this sector (Carraro and Sgobbi 2008). So, for instance, the lack of snow can be counteracted by snowmaking, using ski slopes and infrastructures located at higher altitudes more intensively, or migrating the existing infrastructures to higher altitudes. The strategy most widely adopted in Italy is snowmaking by 77 percent of Italian ski resorts. Diversifying offers to capture different market segments can be an important strategy for the Italian Alps. Behavioral strategies are however unlikely to fully compensate for the significant reduction in winter tourism expected because of climate change, because winter tourism represents the largest source of income in the Alps.

125. Apart from the adoption of technical adaptation measures, adaptation to climate change also includes the development of new business models that can lead to winter revenue diversification, including both snow-related and non-snow-related offers (health tourism, congress tourism, other sports and popular activities, and so on). Product diversification strategies are however unlikely to fully compensate for the significant reduction in winter tourism expected as a consequence of climate change, because winter tourism represents the largest source of income in the Alps.

126. The extensive range of tourist destinations, partly independent of the weather, together with the possibility to attract tourists from regions whose climates will be worse affected, mean that the effects of climate change on Italy should be manageable, according to the authors.

### **2.3. EU CCA Legal Framework and Policies in the Sector**

127. **The tourism sector is not among the main priorities of the EU CCA legal framework and policies. Directions and initiatives in this regard can be found in various documents related to GHG emissions, transport, agriculture, water supply, and so on. This sub-chapter gives an overview of relevant policies at different governance levels.**

128. Climate change action has increasingly become an integrated part of economic analyses and a prominent element of risk assessments by public and private bodies. For example, the most recent Global Risks Report of the World Economic Forum<sup>31</sup> indicates that the most impactful risk (that is, the risk with the greatest potential damage) for the years to come is a failure in climate change mitigation and adaptation.

#### **2.3.1. Global policies in brief**

129. In December 2015, the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement, which includes the long-term objectives of keeping the increase in global average temperature well below 2°C above pre-industrial levels and of pursuing efforts to limit the increase to 1.5°C above pre-industrial levels, because this would significantly reduce risks and the impacts of climate change.<sup>32</sup> In

---

<sup>31</sup> <https://www.weforum.org/events/world-economic-forum-annual-meeting-2016>

<sup>32</sup> UN Framework Convention on Climate Change, <http://unfccc.int/2860.php>

2015, the Sendai Framework for Disaster Risk Reduction was adopted.<sup>33</sup> The framework acknowledges climate change as one of the drivers of disaster risk. The 2030 agenda for sustainable development has 17 overarching Sustainable Development Goals and within each is a range of targets, and the challenges to address the effects of climate change are explicitly acknowledged.

### **2.3.2. EU policies**

130. The EU policies do not focus on the tourism sector itself but incorporate the sector in most of their relevant documents. One of the most recent of these documents is the *EU 7th Environment Action Programme (EAP) 'Living well, within the limits of our planet'*.<sup>34</sup> In it the EU formulates a vision of the future up to 2050: a low-carbon society; a green, circular economy; and resilient ecosystems as the basis for citizens' well-being. Achieving this 2050 vision requires a focus on actions in three key areas:

- Protecting the natural capital that supports economic prosperity and human well-being
- Stimulating resource-efficient, low-carbon economic and social development
- Safeguarding people from environmental health risks

131. The 7th EAP explicitly mentions that action to mitigate and adapt to climate change will increase the resilience of the EU's economy and society, while stimulating innovation and protecting the EU's natural resources. According to the European Environment Agency (EEA) report *'The European environment — state and outlook 2015'* (SOER),<sup>35</sup> the implementation of environment and climate policies during the last 40 years has delivered substantial benefits for the functioning of Europe's ecosystems and for the health and living standards of its citizens.<sup>36</sup> Reduced pollution, nature protection, and better waste management have all contributed to this. However, SOER 2015 also highlights that substantial challenges remain in each of the above-mentioned three areas.

132. The European Commission adopted an EU Adaptation Strategy in April 2013, which has been welcomed by the Member States. The role of the EU can be especially useful to enhance solidarity among Member States and ensure that disadvantaged regions and those most affected by climate change can take the necessary measures to adapt. Transforming key systems such as the transport, energy, housing, and food systems will be needed to achieve the 7th EAP vision for 2050.

133. The EU Strategy on adaptation to climate change aims at making Europe more climate-resilient. Taking a coherent approach by complementing the activities of Member States, it supports action by promoting greater coordination and information sharing and by ensuring that adaptation considerations are addressed in all relevant EU policies. The Strategy focuses on the following three key objectives:

- **Promoting action by Member States.** The European Commission will encourage all the Member States to adopt comprehensive adaptation strategies and will provide

---

<sup>33</sup> [http://ec.europa.eu/echo/partnerships/relation/european-and-international-cooperation/sendai-framework-disaster-risk-reduction\\_en](http://ec.europa.eu/echo/partnerships/relation/european-and-international-cooperation/sendai-framework-disaster-risk-reduction_en)

<sup>34</sup> <http://ec.europa.eu/environment/action-programme/>

<sup>35</sup> [www.eea.europa.eu/soer](http://www.eea.europa.eu/soer)

<sup>36</sup> [www.eea.europa.eu/publications/trends-and-projections-in-europe-2015](http://www.eea.europa.eu/publications/trends-and-projections-in-europe-2015)

funding to help them build their adaptation capacities and act. It will also support adaptation in cities by launching a voluntary commitment based on the Covenant of Mayors Initiative.

- **‘Climate-proofing’ action at the EU level** by further promoting adaptation in key vulnerable sectors such as agriculture, fisheries, and by implementing a cohesion policy, have the objective of ensuring that Europe's infrastructure is made more resilient, and promoting the use of insurance against natural and anthropogenic disasters.
- **Better informed decision making** by addressing gaps in knowledge about adaptation and further developing the European Climate Adaptation Platform (Climate-ADAPT) as the 'one-stop shop' for adaptation information in Europe.

134. Other relevant EU initiatives are the Covenant of Mayors Initiative on Climate Change Adaptation set up to engage cities in acting to adapt to climate change. Cities signing up for the initiative commit to contributing to the overall aim of the EU Adaptation Strategy by developing a comprehensive local adaptation strategy and/or integrating adaptation to climate change into relevant existing plans. In October 2015, the Mayors Adapt Initiative was officially merged with the Covenant of Mayors to create the new Covenant of Mayors for Climate and Energy. The new covenant addresses both mitigation and adaptation. Mayors Adapt – and likewise the new integrated covenant – aims to increase support for local activities, provide a platform for greater engagement and networking by cities, and raise public awareness about adaptation and the measures needed. More than 120 European cities or provinces have already committed, and the European Commission is aiming to have at least 200 cities committed to the initiative by the end of 2017.

135. The European Commission has set up a package to advance action on adaptation to climate change: first, the EU Strategy on adaptation to climate change sets out a framework and mechanisms for taking the EU's preparedness for current and future climate impacts to a new level; in a related measure, the European Commission adopted a Green Paper on insurance in the context of natural and anthropogenic disasters. This public consultation launches a wide debate on the adequacy and availability of existing insurance options.

136. In 2013, the European Commission adopted the EU Strategy on adaptation to climate change,<sup>37</sup> which encourages all the Member States to adopt comprehensive adaptation strategies, promotes action in cities (through the Covenant of Mayors for Climate and Energy), aims to mainstream adaptation into relevant EU policies and programs, provides funding for adaptation actions, and enhances research and information sharing (for example, through the European Climate Adaptation Platform [Climate-ADAPT]). In 2018, the European Commission will present the evaluation of the EU Strategy and will propose a review, if needed. The report will assess the progress made by the Member States, including an adaptation preparedness scoreboard, the progress in mainstreaming at the EU level, and new knowledge and policy demands. The European Multiannual Financial Framework (2014–2020) includes the objective that a minimum of 20 percent of the EU budget (as much as €80 billion) is climate-related expenditure (including mitigation and adaptation). Since 2015, the Member States must report on their risk assessments and risk management capabilities, including climate and

---

<sup>37</sup> [https://ec.europa.eu/clima/sites/clima/files/docs/eu\\_strategy\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/eu_strategy_en.pdf)



weather-related risks, to the European Commission every three years.

137. Climate-ADAPT, the European Climate Adaptation Platform, aims to support Europe in adapting to climate change and helps users access and share information on, for example, current and future vulnerability of regions and sectors, national and transnational adaptation strategies, case studies, potential adaptation options, and tools that support adaptation planning.

138. Horizon 2020, the EU Framework Programme for Research and Innovation, aims to dedicate 35 percent of funds to climate-related research, including adaptation. The program addresses knowledge gaps such as those identified in the EU Adaptation Strategy, including the development and testing of decision-making support tools, monitoring systems for adaptation, resilient infrastructures, and the integration of CCA in sectoral research. There is no special tourism section or approach, but research results can be adapted to CCA in the tourism sector.

### **2.3.3. National and transnational adaptation policies in Europe**

139. **This section provides a brief overview of adaptation actions undertaken at the level of individual EU Member States. It is based on the 2014 EEA report on national adaptation processes (EEA 2014), reporting in 2015 by all 28 Member States under Article 15 of the Monitoring Mechanism Regulation, and the sixth UNFCCC National Communications of the EU Member States.**

140. Over the last five years, there has been a steady increase in national adaptation strategies and plans. By September 2016, 23 EEA member countries (of which 20 are EU Member States) had adopted a NAS and 12 (of which nine are Member States) had developed a National Adaptation Plan (NAP). More than half of the European countries have made progress in identifying and assessing adaptation options. Adaptation is most often implemented by applying 'soft' measures (for example, providing information and/or training). The water, agriculture and forestry sectors are reported to be the most advanced in implementing portfolios of adaptation measures at all administration levels. Several countries have also developed national health strategies and action plans. Only a few EEA member countries (14) have started to monitor and report on their progress in adaptation strategies, policies, and actions at the national level and even fewer have started an evaluation of their effectiveness.<sup>38</sup> Transnational cooperation (for example, on strategies and knowledge sharing) in adaptation to climate change has increased, and the importance of adaptation as a cross-cutting policy area is recognized.

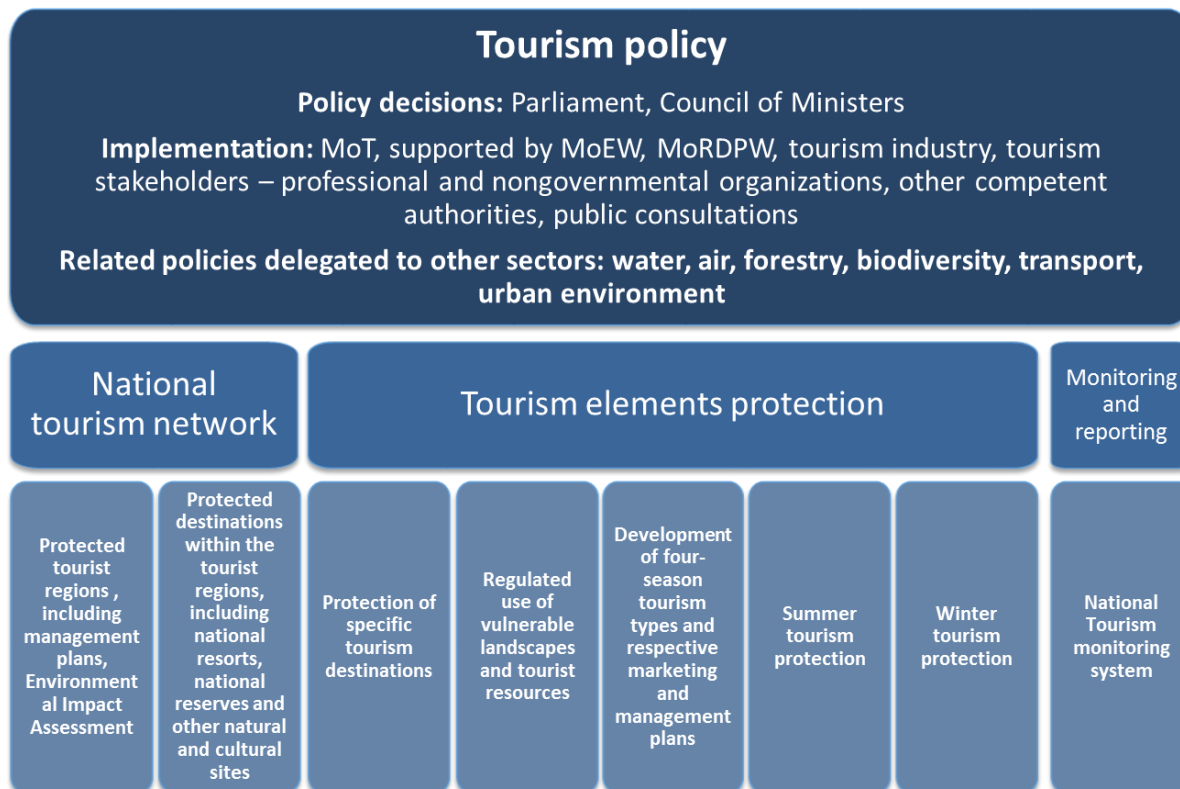
## **2.4. Bulgarian CCA legal framework and policies in the sector**

141. This sub-chapter concentrates on the main tourism development strategies and plans because there is no explicit CCA policy or strategy developed for this sector. The focus will be on the Tourism Act, the National Strategy for Sustainable Tourism Development in the Republic of Bulgaria 2014–2030 and the Strategic Plan for the Development of Cultural Tourism in Bulgaria, discussing the ways in which they account for or are supportive of CCA in the sector.

---

<sup>38</sup> [www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016](http://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016)

*Figure 17. Structure and main actors in implementing the Bulgarian tourism protection policy*



Source: World Bank design.

142. The most important regulatory document concerning Bulgarian tourism is the **Tourism Act**.<sup>39</sup> It was supplemented and amended many times and the present act is effective as of March 26, 2013. *“This Act regulates the social relations associated with the implementation of governance and control in tourism, the interaction of the State and municipalities in the implementation of activities related to tourism, as well as the participation of not-for-profit legal entities and natural persons in the said activities”* (Article 1). In Article 2, the purpose of the act is outlined in five major fields: (1) ensuring conditions for development of tourism as a sector of priority importance, (2) introducing uniform criteria for performance of tourism activities, (3) ensuring protection of the consumers of the tourist product, (4) defining the rights and duties of persons concerned with tourism, (5) regulating control over tourism activities and the quality of the tourist product.

143. As can be seen from the formulated purposes and from the content analysis of the act, so far, the state does not envisage any regulations or other administrative measures concerning climate change impacts on tourism or any relevant adaptation actions. These are envisioned only in the Climate Change Mitigation Act, which also includes regulations on adaptation.

144. The current Tourism Act in its Article 5 states that the state’s tourism policy is determined by the Council of Ministers that, upon a proposal by the Minister of Tourism, approves the National Strategy for Sustainable Tourism Development as well as strategies for the development of various tourism types. The development of a NSSTD is the responsibility of the Minister of Tourism as stated in Article 6. The Act also considers and includes references

<sup>39</sup> <http://www.lex.bg/laws/ldoc/2135845281>

to most of the environment protection legislation, including the EU environment/climate change acquis, climate change adaptation, Climate Change Mitigation Act, and, if possible before the adoption date, references to NCCAS, and NCCAS Action Plan (if yet adopted).

145. Another important tourism sector document is the **National Strategy for Sustainable Tourism Development in Bulgaria 2014–2030**,<sup>40</sup> adopted by the Council of Ministers on February 2, 2018 (Resolution No 65).<sup>41</sup> In the updated **National Strategy for Sustainable Tourism Development in Bulgaria 2017–2030**, climate change and its potential impact on tourism are given a considerable level of attention. Climate change is addressed in the following sections of the strategy:

- a. ‘Ecological factors’
- b. SWOT analysis under Opportunities and Threats
- c. Goal and the Strategic Objectives of the Strategy
- d. Strategy Introductory Section.

In the criteria for destination management, a special criterion for climate change is included.

146. CCA measures have been included in the attached Action Plan.<sup>42</sup> More specifically, these include measure 1.1.4.1. ‘Cooperation for the development of the National CCA strategy for the Tourism sector’, duration until the end of 2019. The leading organization is the MoEW, partner organization to the MT. No budget is allocated for the Ministry of Tourism. Bulgaria was the first European country to develop a **National Strategy and an Action Plan for Ecotourism Development** (2002).<sup>43</sup> The Strategy’s scope was 10 years, but it was not renewed in 2012. Among its main aims were: cultural and natural heritage preservation and conservation as well as regional and local economic development. The Action Plan had six priority areas with 36 different actions. It must be noted that under these documents **12 zones for ecotourism in Bulgaria were defined in which** many ecotourism products (for example, eco-paths) were developed. Some of these eco-paths are still used and visited by international and domestic visitors. There is no follow-up of the document and only a limited number of its provisions are considered in the 2014–2030 strategy.

147. Over the years, some documents regarding tourism development in Bulgaria were developed, with unfortunately no follow-up after their expiry date, and they are not part of the actual legal framework for the country’s tourism policy. Nevertheless, some issues discussed in these documents are of relevance for some of the CCA options in the tourism sector.

148. The **Strategic Plan for the Development of Cultural Tourism in Bulgaria**<sup>44</sup> was the result of a Bulgarian-Italian cooperation and its development started in 2005. After three years of intense activity, the strategic plan was completed. The aims of the plan include “*tourist de-seasonality, increase of the length of stay, enhancement of the competitive advantages of Bulgaria, compared to the other regional competitors, and capturing new trends of tourist demand*”. Although there is no mention of climate change and its effects on tourism activities

---

<sup>40</sup> [http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/nsurtb\\_2014-2030.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/nsurtb_2014-2030.pdf)

<sup>41</sup> [http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-02/rms\\_65.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-02/rms_65.pdf)

<sup>42</sup> [http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/plan\\_nsurtb\\_2017-2020.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2018-01/plan_nsurtb_2017-2020.pdf)

<sup>43</sup> [http://www.gorabg-magazine.info/old/ecotur\\_05\\_04.html](http://www.gorabg-magazine.info/old/ecotur_05_04.html)

<sup>44</sup> [www.tmbulgaria.com/.../Bulgaria...strategic-cultural-tourism-development-plan/.../ind](http://www.tmbulgaria.com/.../Bulgaria...strategic-cultural-tourism-development-plan/.../ind)

the earlier mentioned objectives are in unison with the aims of CCA in the sector and can be used for the development of specific CCA actions. There is no follow up of the document and only a minor number of its provisions is considered in the 2014–2030 strategy.

149. The **Climate Change Restriction Act** adopted in 2014 plays an important role as a general framework concerning all necessary changes in legislation and national strategic documents.

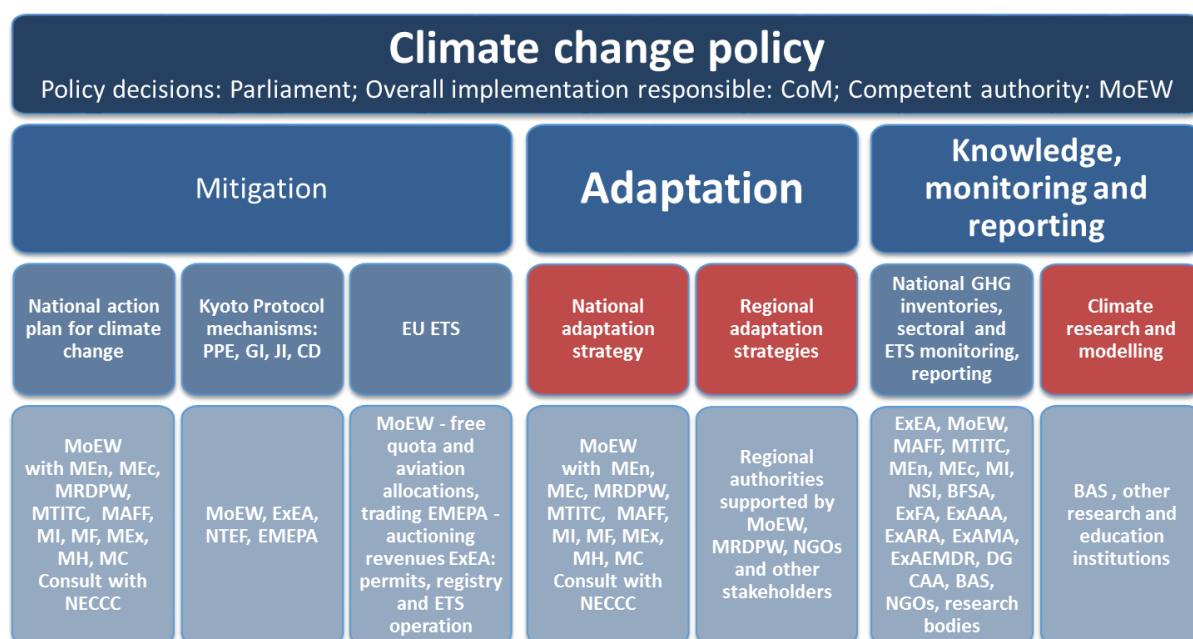
## 2.5. Institutional Framework and Stakeholder Community in Bulgaria

150. **In this sub-chapter, the institutional framework (the MT and NTC) and the stakeholder community (professional tourism associations, nongovernmental organizations [NGOs], municipalities, other regional structures, Organizations for Tourist Regions Management [OTRMs], and so on) will be discussed.**

### 2.5.1. Governmental institutions

151. The major institution responsible for tourism development in Bulgaria is **the MT**. It was first established in 2014. Before that tourism was in the domain of various ministries of economy, culture, energy and economy, and so on. The strategic goal of the MT is to strengthen the competitiveness and efficiency of the tourism sector in Bulgaria through the optimal use of available natural and anthropogenic resources, in line with market requirements and consumer expectations for sustainable tourism development.<sup>45</sup> The ministry is also responsible for any new documents (plans, strategies, and so on. concerning tourism development in general and its various aspects, including CCA actions in the sector). Opposed to socialist times the ministry is not directly involved in the running of hotel businesses – it only creates the framework for their operation.

*Figure 18. Structure and main actors in implementing the Bulgarian climate change policy*



*Note: All abbreviations used in this figure could be found within the Abbreviations and Acronyms section.*

*Source: World Bank design.*

<sup>45</sup> Ministry of Tourism, <http://www.tourism.government.bg/en/>

152. **The NTC** is a governmental consultative body under the authority of the Minister of Tourism. It was created under the Tourism Law in 1998 and aims to assist in the implementation of the national tourism policy. The members of the NTC are representatives of the tourism-related ministries and institutions, national, regional, local and branch tourist associations, associations of air, land and water carriers, and nationally represented associations of the consumers in the Republic of Bulgaria. The consultative tasks and activities of the NTC mainly include tasks and responsibilities related to the marketing policy and advertising activities in the field of tourism, as well as consultations on draft regulations of the MT and issues related to tourist infrastructure, foreign investments in tourism, fulfillment of charter programs, and consumer rights.

### **2.5.2. Non-governmental organizations**

153. The National Tourism Board represents the common interest of tourism associations (professional, regional, and product organizations), municipalities, investors in the field of the tourism industry, and all tourism-related economic branches. The Board is a constructive partner interacting with all state institutions related to the formation of the national tourism policy, strategy, and the legal regulation of the development of the tourism industry in Bulgaria. The Board is the biggest legal subject registered for the public benefit in the non-governmental sector in the area of tourism. The National Tourism Board formulates problems related to increasing the competitiveness of the Bulgarian tourist product, related to regional development, infrastructure, concessions, new tourist products' promotion, development of new markets, education and training of staff, and development of a network of tourist bureaus abroad.

154. One of the major tourism associations having a direct relation to sustainable tourism is **BAAT**.<sup>46</sup> This is a non-profit public benefit organization established in 1998. BAAT unifies over 100 members: national and regional tourist councils, nature parks directorates, tour operators for specialized tourism, family hotels, guesthouses, and individual businesses. BAAT is a member of the European Federation of Rural Tourism (EuroGites) representing rural tourism in Bulgaria and the official representative of ECEAT in Bulgaria. Its mission is stated as *“to encourage and support partnerships for the sustainable development of alternative forms of tourism at a regional and local level in order to preserve our natural, cultural and historical heritage and help Bulgaria become a better place for living and doing business.”*

155. **The Association of Bulgarian Tour operators and Travel Agents (ABTTA)**<sup>47</sup> is a non-profit corporation that consolidates 96 of the biggest and most respected Bulgarian travel agencies – representatives of air ticketing and tourism intermediary businesses. The association was established in 1996 as the Association of International Air Transport Association (IATA) Accredited Agencies in Bulgaria (SIAB) and in September 2006 was renamed as Association of Bulgarian Tour Operators and Travel Agents (ABTTA). Nowadays association members handle more than 70 percent of the common market share of regular air transport sales, thus forming a great part of Bulgarian tourism. The main aim of ABTTA is to actively support the sustainable development of the Bulgarian tourism industry by improving tourism's legal and

---

<sup>46</sup> BAAT, <http://www.baatbg.org/>

<sup>47</sup> ABTTA, <http://www.abtta.com/>

business environment, by enhancing the interaction between the business and the state, and by encouraging the professional growth of Bulgarian tourist agencies toward achieving a modern, competitive, and attractive vision of the Bulgarian tourist destination. As the sole representative of Bulgaria in the European Travel Agents' and Tour Operators' Association (ECTAA), ABTTA presents the balanced interests of the whole Bulgarian tourist sector in front of the European Commission, the European Parliament, and the other EU institutions.

156. **The Bulgarian Hotelier and Restaurant Association (BHRA)**<sup>48</sup> was established in 1993 as a non-profit organization. Its main objective is to sustain the development of hotel and restaurant business, as well as to support private enterprise and the tourism sector in Bulgaria as a whole. The BHRA is a member of International Hotelier and Restaurant Association (IHRA), Hotels, Restaurants & Cafes in Europe (HOTREC) and the Balkan Alliance of Hotel Associations (BAHA).

157. **The Bulgarian Association of Travel Agents (BATA)**<sup>49</sup> is a non-governmental, non-profit organization, established in 1992 to represent and protect the economic rights and interests of tour operators and travel agents and support and encourage their economic activities. At present the association has more than 250 members. They generate 75 percent of the incoming tourism and 70 percent of the outgoing tourism of Bulgaria. Its mission is to consolidate and encourage the professionalism of tourist companies, structure and promote Bulgaria's tourist products, and provide favorable conditions for cooperation between tourist companies toward achievement of sustainable development of the Bulgarian tourism industry.

158. **The Bulgarian Tourist Chamber (BTCH)**<sup>50</sup> was founded in 1990 in Sofia and is the first NGO in tourism. In 2010, the chamber was registered as a non-profit association in public benefit. Members of the chamber are Bulgarian and foreign legal and physical persons, national and regional non-profit associations, and individual members – trainers and experts in tourism. The BTCH operates for the sustainable development of tourism, the preparation and implementation of international and national projects, and the development of operational programs (OP) under the structural funds of the EU. As a representative organization of employers in tourism, the BTCH signs framework agreements with the trade unions, initiates the adoption of up-to-date work-force organization and management methods, and participates in work groups and expert committees. The chamber assists the increased quality, diversity and specificity of the Bulgarian tourism product, which is underlain by providing well-trained personnel in tourism companies, vocational education, and training of managerial and executive staff in the tourism industry.

159. **The Association of Bulgarian tour guides** was created in 2002 with an ideal purpose. Currently it unifies over 450 professional tour guides who are fluent in 20 languages.

160. There are also several **Regional Tourism Associations and Regional Tourism Councils** in Bulgaria – in Sofia, Burgas, Varna, the Rhodope Mountains, and so on. They were generally established around 1998 for public benefit. Their purpose is to support and encourage the development of tourism in the respective region and alone or in cooperation with other

---

<sup>48</sup> BHRA, <http://www.bhra-bg.org/>

<sup>49</sup> BATA, <http://en.batabg.org/>

<sup>50</sup> BTCH, [www.btch.org/](http://www.btch.org/)

organizations develop it as a tourist destination.

161. Other stakeholders in Bulgaria are all **municipalities** in which tourism is or can be developed. According to the Tourism Act municipalities are granted various rights in tourism management, for example categorization of one- and two- star accommodation establishments.

162. A new and a very important tourism stakeholder can be the network of **OTRMs** which is currently established. In 2015, the Minister of Tourism approved nine tourism regions (destinations) in Bulgaria (**Figure 19**). Each of them will have its own management body. So far three of them have been constituted.

As a **conclusion** to this section it can be suggested that the most important institutions and stakeholders which can have a substantial impact on the approval and the adoption of CCA actions in the tourism sector in Bulgaria are the following:

- On the national level. The MT, the BAAT, and the national intermediaries' (mainly tour operators') associations (ABTTA and BATA)
- On the regional level. The OTRMs, regional tourism associations, and municipalities

163. The availability/lack of climate change/CCA knowledge/expertise/capacity of the above institutions is discussed in Chapter 3.

164. It can be concluded that the tourism sector in Bulgaria is highly organized. However, the implementation of various policies and strategies is hindered by the high fragmentation of the industry and the domination of small and medium size enterprises in its structure.

## 2.6. Financial and Human Resources in Bulgaria

### 2.6.1. Budget financial resources

165. The financial resources allocated to the MT in Bulgaria for 2017 are BGN 16.8 million,<sup>51</sup> which is less than 1 percent of the total budget expenses of the country. Of this sum, BGN 14.5 million is designated for the program called 'Policy for sustainable tourism development'. Of this sum, 87 percent (BGN 12.6 million) is designated for the budget program 'Development of the national tourism promotion and the international cooperation in the field of tourism'.<sup>52</sup> That means national marketing, promotion, participation in international tourism fairs and exhibitions. The remaining BGN 1.8 million is meant for the budget program 'Policy and regulation improvement in the tourism sector'. It is quite clear that this sum (equaling US\$988,000) is not sufficient for all current policy and regulation improvements (for example,

**Figure 19. Tourism regions in Bulgaria**



Source: Ministry of Tourism

<sup>51</sup> 2017 State Budget Act of the Republic of Bulgaria.

<sup>52</sup> MT,

[http://www.tourism.government.bg/sites/tourism.government.bg/files/uploads/byudzhet\\_na\\_ministerstvo\\_na\\_turizma\\_za\\_2017\\_g.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/uploads/byudzhet_na_ministerstvo_na_turizma_za_2017_g.pdf).

categorization regulations) and no funds can be allocated for the necessary research of climate change and their impact on tourism, as well as for the development and implementation of various (even the simplest) adaptation measures. This view is reflected in the Action Plan to the newly adopted NSSTD (2018). The ministry cannot provide financial support to the private sector. Instead the MT has published, on its site, a Guide to the EU Funds 2014–2050 (MT 2015) to be used by the tourism industry. These opportunities are discussed in the following section.

### **2.6.2. Other financial resources**

166. A good opportunity for financing any measures related to CCA (not only in the tourism sector) is presented by the EU structural funds.<sup>53</sup> In the current programming period from 2014 to 2020 the European Commission has allocated over 20 percent of their budget to action on climate change, including adaptation measures. Out of the 12 OPs 2014–2020 there are several that can finance climate change research and adaptation in the tourism sector:

167. In the OP ‘**Regions in Growth**’<sup>54</sup> the sixth priority axis is ‘Regional Tourism’ which focuses mainly on the unexplored potential of cultural tourism. It is suggested that the development of this type of tourism can help alleviate the weight of the highly seasonal and climate-sensitive summer seaside and winter ski tourism. On the other hand, this will simultaneously diversify the Bulgarian tourism product in general and address climate change in particular (see **Box 6**). For this priority axis, a total of €85.6 million has been reserved.

#### **Box 6. OP ‘Regions in Growth’**

Priority axis 6 ‘Regional Tourism’ will support the conservation, protection, promotion and development of the cultural heritage in Bulgaria regions. Its main focus will be to valorize the unexplored potential of the cultural tourism in the regions. This will be achieved by using the strengths of Bulgaria as a well-developed sea, spa and ski destination and targeting the huge potential that the country must valorize its rich cultural heritage.

The activities under priority axis ‘Regional tourism’ of OP ‘Regions in Growth’ 2014–2020 are result oriented toward the realization of the main strategic objectives laid down in the Strategy for Sustainable Tourism Development in Bulgaria with Horizon 2030, which will result in adequate realization of the unused potential of the cultural tourism and in its sustainable development, taking into account the advantages of the diversity, uniqueness, and authenticity of the resources to achieve a balance between the development of the cultural tourism and the conservation of the resources. Priority axis ‘Regional tourism’ will also contribute to the sub-priority ‘Environment and protection of natural richness and cultural and historical heritage’ which is part of priority 3 ‘Connectivity and green economy for sustainable growth’ of the Partnership Agreement.

With a view to establishing comprehensive tourism products for the supported cultural heritage sites of national and world importance, integrated projects will be supported involving integrated solutions not only for the preservation and conservation of the heritage site, but also for its promotion and development, which attract significant numbers of tourists. For this purpose, the grant support will be combined with financial instruments at the project level and the project evaluation will be carried out based on a business plan.

<sup>53</sup> <https://www.eufunds.bg/en/>

<sup>54</sup> <https://www.eufunds.bg/en/programming-period-2014-2020/operational-programmes-2014-2020/operational-programme-regions-in-growth-2014-2020/item/13778-operational-programme-regions-in-growth-2014-2020>



168. Another OP which can offer possible solutions to some events endangering tourism in the country (floods and landslides – mostly on the northern Black Sea side) is the OP ‘**Environment**’<sup>55</sup> – priority axis 4 ‘Flood and Landslides Risk Prevention and Management’ including the operation ‘Implementation of Measures for Landslides Risk Prevention and Management’. In the OP text an explicit connection with the EU Strategy on Adaptation to Climate Change is made (see **Box 7**). The sum allocated for this measure is €66.8 million and will be provided by the Cohesion Fund of the EU. Beneficiaries can be legal entities (for example MoEW and its structures, municipalities, companies, various consortia, research institutions, and so on), which must enter a project tender to MoEW for receiving financial aid for their implementation.

**Box 7. OP ‘Environment’**

OP ‘Environment’ 2014–2020 will contribute to achieving the objectives of the EU Strategy on Adaptation to Climate Change through implementation of the measures under the priority axes for example through planning, designing, and establishing a real-time National Water Management System and measures related to flood risk prevention and management solutions, aiming at fortifying the river banks, including an ecosystem-based approach. In addition, the implementation of measures under priority axis 4 will contribute to the improvement of cooperation between the EU Member states and will facilitate the coordination in the field of civil protection to improve the effectiveness of the systems for prevention, preparedness and response in case of natural and anthropogenic disasters (in accordance with Decision 1313/2013/EU on a Union Civil Protection Mechanism). The supported measures will also complement the specific measures in the identified areas of actions related to the improvement in a short-term perspective of the prevention of disasters, as set out in the Commission Communication COM 2009(82) on a Community approach on the prevention of natural and anthropogenic disasters. Moreover, the objectives related to the adaptation to climate change will be addressed through the Guidelines on Mainstreaming of Environmental Policy (EP) and Climate Change Policy (CCP).

169. Another OP offering similar opportunities is the OP ‘**Rural Development**’<sup>56</sup> although, it must be noted that this program is mostly oriented toward agriculture and forestry. It can be used to develop new tourism products and destinations which may be less sensitive to climate changes, for example, wine and culinary tourism, summer mountain tourism, etc.

170. In addition to the above mentioned, opportunities for financing CCA research, development and application can be found in the **transborder cooperation programs 2014–2020** funded by the EU – with Serbia, Turkey, FYR of Macedonia, Romania, the Danube Transnational Programme, Interreg Balkan-Mediterranean, Interreg Europe, and The Black Sea cross border cooperation.<sup>57</sup> Tourism, particularly sustainable tourism, is explicitly given as a priority axis in the programs with Greece (‘Sustainable and Adaptable to Climate Tourism’), Serbia (‘Sustainable Tourism’), FYR of Macedonia and Turkey (‘Sustainable tourism and Environment’). In the Balkan-Mediterranean program the ‘Environment’ priority axis is

<sup>55</sup> <https://www.eufunds.bg/en/programming-period-2014-2020/operational-programmes-2014-2020/operational-programme-environment-2014-2020/item/13780-operational-programme-environment-2014-2020>

<sup>56</sup> <https://www.eufunds.bg/en/programming-period-2014-2020/operational-programmes-2014-2020/programme-rural-development-2014-2020/item/13784-programme-rural-development-2014-2020>

<sup>57</sup> <http://www.mrrb.government.bg/infrastruktura-i-programi/programi-za-teritorialno-sutrudnichestvo-2014-2020/>

emphasized and in Interreg Europe ‘Environment’ and ‘Resource Effectiveness’ are interrelated. These programs can be used for the development of trans-border sustainable tourism products and destinations with an emphasis on environmental protection and preservation.

171. It can be concluded that financial resources for CCA in the tourism sector in Bulgaria can be found mainly from external sources – the EU-funded OPs and other related projects.

### **2.6.3. Human resources**

172. In 2016 98,000 people were directly employed in the tourism sector at managerial and operational levels. This number is 5.9 percent higher than those employed in 2015. This represents 3.2 percent of all employees in the country (2016).<sup>58</sup> In the same year 338,500 jobs were related directly or indirectly to tourism, representing 11.2 percent of all employees.

173. At present, there are 14 institutions of higher education officially accredited by the government in the professional field 3.9 Tourism,<sup>59</sup> which provides educational services and prepares students in professional bachelor’s degrees, university bachelor’s degrees and master’s degree level (this three-level system was launched in 1997 in compliance with the European educational degrees) (Vodenska and Mileva 2017). Among them there are four colleges (two private and two public) and the rest are universities – four of them are private. More than 8,000 students are enrolled in tourism and tourism-related programs. Only some universities in Bulgaria (University of Economics - Varna, Sofia University, University of National and World Economy - Sofia, Southwest University - Blagoevgrad, International Business School - Botevgrad) provide PhD programs in tourism, economy of tourism and geography of tourism and recreation.

## **2.7. Sector Participation in CCA Specific International Cooperation or Information Exchange**

174. There is little information so far about the Bulgarian tourism sector participation in climate change and CCA specific international cooperation or information exchange. Such activities have taken place exclusively at a national (governmental) level and not particularly in the tourism sector.

175. Two important events in which Bulgaria (including the MT) took part can be pointed out in this context.

### **2.7.1. The development of the European Union Strategy for the Danube Region (2011)<sup>60</sup>**

176. The Danube region covers eight EU Member States (Germany, Austria, Hungary, Czech Republic, Slovakia, Slovenia, Bulgaria, Romania, and Croatia) and five non-EU Member States (Serbia, Bosnia and Herzegovina, Montenegro, Ukraine, and Moldova).

177. The region is facing several challenges among which environmental threats (water pollution, floods, and **climate change**) are listed in the first place.

---

<sup>58</sup> [http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2017-10/prilozhenie\\_1.pdf](http://www.tourism.government.bg/sites/tourism.government.bg/files/documents/2017-10/prilozhenie_1.pdf)

<sup>59</sup> <http://rsvu.mon.bg/rsvu3/#UniFilterPlace>:

<sup>60</sup> European Union Strategy for the Danube Region, <https://www.danube-region.eu>

178. The strategy is divided into 11 priority areas, supporting the four main pillars of the Strategy. The following are related to climate change and/or CCA:

- A) Connecting the Danube region to
  - i) Promote culture and tourism, people to people contacts
- B) Protecting the environment in the Danube region to
  - i) Manage environmental risks
  - ii) Preserve biodiversity, landscapes, and the quality of air and soils

### **2.7.2. 2017 - International Year of Sustainable Tourism for Development<sup>61</sup>**

179. The United Nations General Assembly declared 2017 as the International Year of Sustainable Tourism for Development, recalling the potential of tourism to advance the universal 2030 Agenda for Sustainable Development and the 17 SDGs.

180. The International Year aims to support a change in policies, business practices and consumer behavior toward a more sustainable tourism sector than can contribute effectively to the SDGs. The promotion of the role of tourism in 2017 will be in five major fields: 1. Inclusive and sustainable economic growth; 2. Social inclusion, employment and reduction of poverty; 3. **Efficient use of resources and protection of the environment and fight against climate change**; 4. Cultural values, diversity, and cultural heritage; 5. Mutual understanding, peace and security. The World Tourism Organization (WTO) is authorized to facilitate the organization and conduct of the International Year in collaboration with governments, the relevant organizations of the United Nations system, international and regional organizations and other interested parties.

## **2.8. Bulgarian Sector Specific Ongoing and Foreseen CCA-related Actions**

181. Publications and Internet research and personal interviews among Bulgarian tourism institutions and enterprises (*Annex 6*), revealed only one CCA-related action in which a Bulgarian tourism organization took part. This was a conference held in the National Palace of Culture on December 3, 2015. The organizer of the conference was the **Climate Action Coalition** (2005)<sup>62</sup> (see also *Box 8*) in partnership with the World Wildlife Fund and the MoEW. The tourism sector was represented by the BAAT. The title of the conference was ‘**Climate change – the Challenges before Bulgarian Nature and Tourism**’ and it was conducted in the framework of the 11th edition of the Challenge Days in Bulgaria.<sup>63</sup> The main goal of the conference was to introduce to Bulgarian society the importance of the climate change in view of the United Nations Climate Change Conference in Paris November 30 to December 11, 2015.<sup>64</sup> The three main conference topics were tourism, sport, and protected areas. The theme of the tourism panel was ‘Climate change - risk or opportunities for tourism development and management’. There was no follow-up of the conference, however, discussions pointed at climate changes in Bulgaria and their implications for tourism development in the country.

<sup>61</sup> [www.tourism4development2017.org](http://www.tourism4development2017.org)

<sup>62</sup> <http://www.ngobg.info/en/organizations/6416.html>

<sup>63</sup> <http://www.360mag.bg/posts/56512>

<sup>64</sup> <http://www.un.org/sustainabledevelopment/cop21/>

**Box 8. Climate Action Coalition**

The Climate Action Coalition founded in 2005 is an informal group of organizations and citizens acting against the threats of anthropogenic climate change by the application of policies and solutions for this problem solution. Its members include NGOs, civil initiative groups, academic institutions, media, representatives of the business and various branch organizations.

It organizes various events – campaigns, film-shows, exhibitions, discussions and seminars aimed at better understanding the problems caused by climate change in the country as well as raising more serious civil activity and commitment to those issues.

At the political level the coalition elaborates on proposals and stands concerning climate change related strategies, laws, and plans. It also takes part in international events, campaigns and initiatives.

*Figure 20. The official conference poster*



*Source: Climate Action Coalition Archives.*

182. Major organizations outside the tourism sector actively participating in CCA-related actions in Bulgaria and abroad, are the MoEW and the National Trust EcoFund.<sup>65</sup> On March 30 and 31, 2017, a representative of the EcoFund attended the conference organized in Vienna by the Austrian Government and Kommunalkredit Public Consulting titled ‘Beyond Paris: Financing and Implementing Climate Change Commitments’.<sup>66</sup>

## **2.9. Gaps and Barriers Hindering Adequate Response to CCA Action; Interface with Climate Change Mitigation**

### **2.9.1. General issues**

183. Barriers to adaptation are not simply the inverse of success factors. A lack of resources (for example time, money, and equipment) and uncertainties are viewed by European countries as the most important barriers.<sup>67</sup> Uncertainties are a common feature across all levels of advancement in policy making. Policy making can benefit from embedding processes that focus on learning from experiences, reviewing progress and policy objectives, and encouraging innovative experimentation. To further support adaptation in European countries, **more**

<sup>65</sup> <https://ecofund-bg.org/>

<sup>66</sup> [http://alumni.boku.ac.at/dl/sONuJkJMLLJqx4KJK/Agenda\\_Austrian\\_Climate\\_Change\\_Workshop\\_2017\\_draft.pdf](http://alumni.boku.ac.at/dl/sONuJkJMLLJqx4KJK/Agenda_Austrian_Climate_Change_Workshop_2017_draft.pdf)

<sup>67</sup> [https://ec.europa.eu/clima/sites/clima/files/docs/eu\\_strategy\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/eu_strategy_en.pdf)

**information** is needed on the costs and benefits of adaptation and the costs of inaction, as well as on the risks and uncertainties, vulnerabilities at local level, and the availability of data for monitoring and evaluation purposes.<sup>68</sup> The planning and implementation of adaptation is a dynamic process that must allow for flexible adjustments to new conditions (for example, further consequences of climate change, new research results).

184. Adaptation to climate change is a complex task characterized by a wide range of challenges. In this case the ‘precautionary principle’ can be applied in full – in other words, ‘prevention is better than cure’.<sup>69</sup> Finding a proper way to deal with **uncertainties** is undoubtedly a key challenge for the planning and implementation of any adaptation measure. Above all, uncertainty emerges from global and regional scenarios of climate change. Climate scenarios are always merely approximations of reality and can never account for all influencing factors. Despite this, climate scenarios represent an essential basis for the understanding of climate change and its potential effects. In addition to uncertainties linked to climate models, there are also uncertainties regarding future developments in GHG emissions. This issue is dependent on many factors, such as population growth, economic growth, trends in energy prices, and changes in land use, and global mitigation efforts.

185. Another challenge in adaptation results from the fact that adaptation is a **cross-cutting issue**. Interdependencies also arise between the various levels and areas for action, such that benefits in one area can lead to undesirable consequences in another. A lack of cooperation and coordination between the different areas for action, actors, and decision-making levels can cause conflicts and potential synergies (including those of a financial nature) could possibly not be used. Therefore, a cross-sectoral perspective and the integration of adaptation in diverse policy areas should be pursued.

186. The third challenge arises from the inevitably close relationship between **climate change mitigation** and **adaptation**; the two issues should thus be considered together. **Climate change mitigation** refers to efforts to reduce or prevent emission of GHGs. **Mitigation** can mean using new technologies and renewable energies, making older equipment more energy efficient, or **changing** management practices or consumer behavior.<sup>70</sup> Adaptation is the principal way to deal with the **impacts** of a changing climate. It involves taking practical actions to manage risks from climate **impacts**, protect communities, and strengthen the resilience of the economy.<sup>71</sup> It can be said that **mitigation issues and actions precede adaptation measures**. Successful mitigation can reduce the need for and cost of adaptation. Adaptation cannot replace climate change mitigation; however, achievements in mitigation efforts can help reduce the costs of adaptation. In the planning of adaptation measures, actions that simultaneously pursue the objectives of mitigating climate change should be prioritized. In turn, in the planning of mitigation measures, those that would be robust in a wide range of plausible future developments should be favored. Further in this report it is stated that all these challenges cannot be used as an argument for inaction. It is essential that every person involved in the adaptation processes share a common understanding and the same level of knowledge and are

---

<sup>68</sup> UK Climate Change Risk Assessment 2017 Evidence Report

<sup>69</sup> <http://www.businessdictionary.com/definition/precautionary-principle.html>

<sup>70</sup> [web.unep.org/climatechange/mitigation](http://web.unep.org/climatechange/mitigation)

<sup>71</sup> [www.environment.gov.au/climate-change/adaptation](http://www.environment.gov.au/climate-change/adaptation)

willing to proactively deal with open questions regarding planning and implementation. Furthermore, a cooperative approach and close collaboration between science, practice, and decision makers are a prerequisite for successful adaptation.

### **2.9.2. Gaps and barriers in Bulgaria**

187. Bulgaria is facing challenges in the implementation of CCA actions including the tackling of numerous gaps and barriers hindering the adequate response to climate change. Most of the identified gaps and barriers are general for the whole economic and natural environment and concern all economic sectors, not only tourism.

- **Lack of information about climate change and its impact on tourism and the contribution made by tourism to global warming.** This is the greatest gap. In Bulgaria, there is no academic interest in this field and there are no publications. Indicators are not defined, and measurements are scarce and not sector specific.
- **Lack or very low awareness of the negative impacts and the opportunities presented to the sector by climate change.** This is true for almost all stakeholders in the sector – public authorities at national, regional, and local levels, tourism NGOs (except for BAAT), the private tourist sector –including accommodation, catering, transport, tour operators, and so on, and the local community. Municipalities and their citizens are investing large sums into building more winter ski infrastructure in low altitude areas, apparently without awareness of projections of future climate conditions.
- **Low level of infrastructure development.** In general, and particularly in the tourism sector, in the inner sides of the country and in some SPA and cultural tourism sites. On the other hand, the extensive construction of hotels and other buildings, as well as the overdeveloped infrastructure in most seaside and ski resorts present a barrier for sustainable tourism in general and for CCA measures in particular.
- **The highly-fragmented tourism industry** also can prevent adoption of new technologies and CCA measures in the tourism sector.
- **Lack of tourism personnel** who understand the issue and who are trained and educated to act accordingly. This gap is relatively easy to tackle by introducing educational and interpretation programs and courses in the existing tourism educational institutions in the country. For the already employed awareness raising programs and training materials can be developed and presented before members of various tourism associations and DMOs.
- **The level of uncertainty** about future climate change is also quite high in Bulgaria (one of the reasons being the lack of relevant information and of relevant mechanisms for getting hold of it).
- **Lack of sufficient financial resources** is an important barrier for bridging the above-mentioned gaps in the country. As already pointed out in sub-chapter 2.6, the most reliable financial sources in this field can be expected to come from EU sources and funds.
- **The lack of a legal framework** regarding climate change and adaptation measures in general and for various economic sectors and social fields, despite the existing more general Climate Change Mitigation Act. Administrative measures and control can be very effective in CCA in the tourism sector. The cross-cutting issues are like those identified in

international publications. A multitude of them concern various sectors and are related to various levels of authority and political action.

188. Maybe the most important barrier hindering adequate response to CCA action in tourism in Bulgaria is the fact that **the sector itself has other priorities** than climate change mitigation and adaptation. Such priorities are mostly short term, to ensure better economic results from tourism at national, regional and private sector levels. However, it must be pointed out that the sector is well organized and has a good private-public collaboration.

## 2.10. Conclusions

189. Worldwide the awareness in the tourism sector towards climate change impacts is relatively high. Since the first International Conference on Climate Change and Tourism, convened by the UNWTO in Tunisia in 2003, a growing body of knowledge has been generated addressing the complex relationship between the tourism sector and climate change.

190. Despite the numerous documents created and published, the various fora (conferences, round tables, and so on) organized proved a state of high awareness, and full understanding by academics, politicians, and experts of the future consequences of climate change in general and particularly for the tourism sector. However, substantial knowledge gaps in the sector, which must be addressed, have remained.

191. The EU policies do not focus on the tourism sector itself but incorporate the sector in most of their relevant documents. Nevertheless, many EU countries have already taken serious steps regarding climate change and adaptation activities in the tourism sector. Among them are Croatia, Cyprus and Greece (regarding summer seaside tourism) and Slovenia, France, Austria and Italy (regarding winter ski tourism).

192. Over the last five years, there has been a steady increase in national adaptation strategies and plans. By September 2016, 23 EEA member countries (of which 20 are EU Member States) had adopted a NAS and 12 (of which nine are Member States) had developed a National Adaptation Plan (NAP). More than half of the European countries have made progress in identifying and assessing adaptation options. Adaptation is most often implemented by applying 'soft' measures (for example, providing information and/or training). The water, agriculture, and forestry sectors are reported to be the most advanced in implementing portfolios of adaptation measures at all administration levels. Several countries have also developed national health strategies and action plans. Only a few EEA member countries (14) have started to monitor and report on their progress in adaptation strategies, policies, and actions at the national level and even fewer have started an evaluation of their effectiveness (EEA 2016).<sup>72</sup> Transnational cooperation (for example, on strategies and knowledge sharing) in adaptation to climate change has increased, and the importance of adaptation as a cross-cutting policy area is recognized.

193. In Bulgaria, no explicit CCA policy or strategy for the tourism sector has been developed. The legal framework, so far, consists of the Tourism Act and the National Strategy for Sustainable Tourism Development of the Republic of Bulgaria 2014–2030.

---

<sup>72</sup> [www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016](http://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016)

## *Climate Change Adaptation – Assessment of the Tourism Sector*

194. The framework for CCA actions in Bulgaria's tourism sector includes governmental institutions (the MT and NTC) and the stakeholder community (professional tourism associations, NGOs, municipalities, other regional structures, Organizations for Tourist Regions Management [OTRMs], and so on. It can be concluded that the tourism sector in Bulgaria is highly organized. However, the implementation of various policies and strategies is hindered by the high fragmentation of the industry and the domination of small and medium size enterprises in its structure.

195. A major restriction for implementing CCA actions by the MT is the Ministry's lack of budget. Other financial options are offered by the EU Structural Funds. Several OPs can finance climate change research and adaptation in the tourism sector. It can be concluded that financial resources for CCA in the tourism sector in Bulgaria can be found mainly from external sources – the EU-funded OPs and related possibilities. On the other hand, human resources in the tourism industry present no restriction for CCA actions in the sector despite the fact that the current preparedness to participate in and contribute to such activities is quite restricted due a lack of formal education and specific training in climate change and its impacts on the tourism sector.

196. Little information is available about the Bulgarian tourism sector's participation in climate change and CCA specific international cooperation or information exchange. Such activities have apparently taken place exclusively at a national (governmental) level and not specific in the tourism sector.

197. Bulgaria is facing challenges in the implementation of CCA actions including the tackling of numerous gaps and barriers hindering the adequate response to climate change. Most of the identified gaps and barriers are general for the whole economic and natural environment and concern all economic sectors, not only tourism. Among the more important ones are the uncertainties in climate change, the lack of understanding of all cross-cutting issues, the role of mitigation in adaptation measures, and so on. More specific gaps and barriers in Bulgaria's tourism sector are: lack of information, lack of legal framework, lack of financial resources, low awareness in the sector, low level of preparedness (infrastructure and personnel), and the high fragmentation of the sector.

198. However, it must be pointed out that the sector is well-organized and has a good private-public collaboration.



## Chapter 3. Adaptation Options

199. **This chapter identifies a set of actions that can be implemented in the short-, medium- and longer-term to assist with adaptation to climate change in Bulgaria, also considering the experience of other EU countries. The adaptation options and performance indicators are assessed. The chapter concludes with suggestions for priority setting and recommendations for adaptation in the Bulgarian tourism sector. It must be noted that the adaptation options in this chapter are non-binding recommendations.**

200. The UNFCCC from 1992 recommends that parties should, “formulate, implement, spread and regularly update national and, if necessary regional policy and measures for adequate adaptation to climate change”.<sup>73</sup> The Paris Agreement of 2015<sup>74</sup> also stresses the significance of CCA. In the EU Strategy for Adaptation to Climate Change,<sup>75</sup> Member States are advised to consider adaptation measures at all levels: local, regional, national, and to prepare country-level adaptation strategies (also see *Annex 7* [Required Steps]). In the current programming period, from 2014 to 2020 the European Commission has allocated over 20 percent of their budget to action on climate change, including adaptation measures. This testifies to the importance that the international community attaches to adaptation to climate change as a tool to mitigate the effects of climate change and possibly benefit from opportunities to ensure sustainability of national economies. Mitigation and adaptation are completely interrelated. The less the international community achieves in terms of mitigation, the greater will be the demand for adaptation. In a scenario of global warming exceeding 2°C –the international policy goal– many adaptive opportunities will no longer be viable.

### 3.1. Identified Adaptation Options

201. **Most European countries have called for the mainstreaming of adaptation into sectoral and cross-sectoral policies and focus particularly on soft adaptation policies, such as awareness-raising (EEA 2014). The present report recommends that the adaptation process starts with such soft measures.** After the adoption of a National Adaptation Strategy and Action Plan it will be easier to adapt national measures into sectoral adaptation policies. Based on the previous analysis in Chapters 1 and 2 the adaptation options for the tourism sector in Bulgaria are discussed in the following sections.

#### 3.1.1. Development of a sectoral climate change policy

CLIMATE CHANGE ADAPTATION OPTIONS	
<b>I. Development of a Sectoral Climate Change Policy</b>	
1.	Acceptance of the National Strategy and Action Plan for Sustainable Tourism Development in Bulgaria 2017–2030
2.	Development of the NAS and Action Plan for CCA in the tourism sector identifying who is responsible for the actions included in it and setting feasible deadlines for their implementation

<sup>73</sup> <https://unfccc.int/resource/docs/convkp/conveng.pdf>

<sup>74</sup> [eur-lex.europa.eu/content/paris-agreement/paris-agreement.html?locale=bg](http://eur-lex.europa.eu/content/paris-agreement/paris-agreement.html?locale=bg)

<sup>75</sup> [https://ec.europa.eu/clima/sites/clima/files/docs/eu\\_strategy\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/eu_strategy_en.pdf)

### **3.1.2. Provision of a comprehensive legal framework**

202. Climate change is not just a challenge for governments; it is also a critical risk for the tourism industry and their involvement in adaptation and mitigation is essential, as their operations are and will be affected principally. The responsibility lies with the MT which in collaboration with all other relevant ministries and government organizations will consult with and provide guidance to the private sector as well as to coordinate CCA actions. This can include both regulatory documents in which adaptation measures implemented by the private sector are compulsory, or there can be various tax concessions for the companies implementing recommended adaptation measures. This will help all stakeholder groups in developing, implementing, evaluating and updating any tourism adaptation plans and/or initiatives in which they will be involved.

203. The EEA outlines the following key areas in setting the national adaptation policy process – public and policy awareness of the need for adaptation; knowledge generation and use; planning adaptation; coordination of adaptation; stakeholder involvement; implementation of adaptation; transnational cooperation; monitoring, reporting and evaluation. Different countries have different approaches to policy making so the best way is to take the best international practices and incorporate them in the tourism adaptation policy process and implementation.

204. The main implementing organization of the Climate Change Adaptation Strategy in regard of the tourism sector, is the **MT**. It is recommended that the Strategy development and the coordination of the formal processes involving the development of the CCP and the legal framework for all adaptation actions and measures within the sector is supervised by the MT.

205. These activities can be further enhanced by information seminars for the **national professional organizations** in the tourism sector: tour operators and travel agencies' associations (ABTTA and BATA), hoteliers' and restaurateurs' association (BHRA), tour guides' association, special interest associations (for example BAAT), and so on. The **OTRMs** will play a crucial role in monitoring climate change effects on tourism locally (in the destinations) so they will need a special kind of training in monitoring, reporting and interpreting the identified indicators. It is suggested that while the MT will be responsible for general political and legal issues, the specific work on implementation and monitoring of adaptation measures should be carried out locally by the OTRMs and the existing regional tourism associations (considering the different climatic conditions, types of tourism and indicators to be monitored).

## **CLIMATE CHANGE ADAPTATION OPTIONS**

### **II. Provision of a comprehensive legal framework**

- 3.** Improve the CCA legal framework
- 4.** Develop insurance and risk management programs
- 5.** Create cross-sectoral policy frameworks
- 6.** Create economic incentive mechanisms for the implementation of various adaptation options

### **3.1.3. Awareness raising on climate change and its impacts on the sector**

206. This activity should cover all tourism stakeholders (at this stage mainly on the supply side) – government and non-government organizations, tourism private sector, tourism associations and organizations, municipalities, OTRMs, local population, and so on. Communication tools for the awareness raising process must be developed and implemented for each stakeholder group.

207. Studies that have examined the climate change risk appraisal among policymakers and tourism practitioners have consistently found low awareness of climate change and little evidence of long-term strategic planning in anticipation of future changes in climate. The tourism sector has also figured less prominently than some other economic sectors in government climate change assessments and is not explicitly addressed in many adaptation frameworks. The same situation was established in Bulgaria by a study conducted in 2015 (Kerezieva 2016) (see *Annex 7* [Adaptation preparedness in Bulgaria]).

208. Awareness of CCA among local tourism operators has generally been found to be relatively low in the implementation of mitigation measures. Consequently, there is a real need for effective communication of the climate change science. Scientists need to work better with NGOs and the government to develop tools that the private sector can use to mitigate and adapt at the business level and at the regional and local scale. The South West Climate Change Impacts Partnership (2007) in England developed an outreach brochure that explained to tourism business owners, how climate change affects their business and provides a checklist for planning for climate change impacts. Similar regionally specific initiatives, perhaps in conjunction with CCA workshops, can be highly valuable in many other tourism destinations (Simpson et al. 2008).

## **CLIMATE CHANGE ADAPTATION OPTIONS**

### **III. Awareness raising on climate change and its impacts on the sector**

- 7.** Develop a national database (online portal) containing CCA specific information
- 8.** Engage in wider dissemination of CCA knowledge to reach local tourism entrepreneurs
- 9.** Introduce climate change education in schools' and universities' curricula
- 10.** Develop an outreach brochure and other materials (including internet and other media) explaining tourism business owners how climate change affects their business, and provide a checklist for planning for climate change impacts
- 11.** Develop a film and/or video material illustrating climate change effects on tourism in other countries and some implemented adaptation measures
- 12.** Develop an awareness raising seminar for the tourism business (supply side) and conduct nine seminars in the nine tourist regions
- 13.** Develop an awareness raising seminar for the tourism business (intermediaries) and conduct it in key cities with a high concentration of travel agencies

### **3.1.4. Development of monitoring indicators**

209. Monitoring systems and tools will help stakeholders be informed on a regular basis about climate change, its impact on tourism and the effect of adaptation activities. Based on this information, stakeholders will be able to review their action plans and adjust them to any

observed changes. Two groups of indicators can be distinguished (see table below).

210. Any new indicators must be measurable or easily accessible, and the necessary organization and procedure for their gathering, processing and monitoring must be created. The responsible authorities and/or bodies for the task must be identified and legal documents binding them to the activities must be developed and duly adopted. The indicators should be determined centrally (by the MT) to ensure compatibility and comparability of results. The results obtained should serve for monitoring the effects of climate change in the tourist regions and for adjusting the implemented CCA activities. Also, they will be used by the OTRMs in the decision process of developing new tourism products within the regions.

CLIMATE CHANGE ADAPTATION OPTIONS	
<b>IV. Development of monitoring indicators</b>	
14.	Tourism indicators sensitive to climate change
15.	Climate change indicators relevant for the tourism sector

### **3.1.5. Strengthening the sector knowledge base**

211. This adaptation option would in the first place bring about better-informed decision making and policy making and better knowledge on effective adaptation. This can include:

212. **Decision making and policy making support tools and assessments, including on the costs and benefits of impacts and adaptation.** There is a need to develop tools and decision-making frameworks that can effectively inform and support adaptation policies and strategies, particularly at the relevant scales and at aggregated levels (municipal, national). Such tools can include information and communication technology (ICT) and other instruments, along with economic analyses.

213. **Knowledge on effective adaptation.** An enlarged pool of adaptation and mitigation case studies is needed to transfer knowledge on topics such as the identification of adaptation options and criteria for their selection, decision-making frameworks and the integration of adaptation within routine planning, cost-efficient combinations of measures, as well as more general issues of governance and timing (also see *Annex 7* [Required Steps]).

CLIMATE CHANGE ADAPTATION OPTIONS	
<b>V. Strengthening the sector knowledge base</b>	
16.	Develop, finance and implement climate change research projects and programs related to tourism and their impacts on tourism development (supply and intermediary sectors, tourists);
17.	Initiate the collection of tourism related data on climate change in the country (two sets of monitoring indicators)
18.	Initiate various types of publications with findings and results from the above activities and disseminate these among professional bodies
19.	Develop and improve a monitoring and evaluation system
20.	Disseminate developed specific adaptation measures to relevant stakeholders (see VIII. Specific adaptation measures)

### **3.1.6. Regional and sub-sectoral assessment of adaptive capacity**

214. While the potential range of climate change impacts in the tourism sector is broadly understood, there is a more limited understanding of the adaptive capacity of **destination communities**. The adaptive capacity of the **tourism industry** in Bulgaria **and its subsectors** should thus be assessed. The UNWTO (UNWTO, UNEP, and WMO 2008) has determined the sub-sectoral adaptive capacity as high for tourists, medium for the intermediary subsector (tour operators, travel agents, transportation providers -airlines, railways), and low for destinations in general, i.e., hotels, resorts, attraction operators, and local communities. For Bulgaria, a preliminary research of the sector's adaptive capacity has been conducted (see *Annex 7* [Adaptation preparedness in Bulgaria]) showing its considerably low level.

CLIMATE CHANGE ADAPTATION OPTIONS	
<b>VI. Regional and sub-sectoral assessment of adaptive capacity</b>	
<b>21.</b>	Develop assessment tools for adaptive capacity
<b>22.</b>	Conduct adaptive capacity assessments in the nine tourist regions
<b>23.</b>	Conduct adaptive capacity assessments for the tourism sub-sectors – supply sector (hoteliers, restaurateurs, transportation companies) and intermediary sector (travel agencies, tour operators, and travel agents)

### **3.1.7. Capacity-building**

215. The scientific community (in close cooperation with the government and NGOs) must develop **appropriate tools** for the induction of the private sector (tour operators, hotel and restaurant businesses, and so on) to the problems of climate change and its effects on Bulgarian tourism and the possible adaptation and mitigation actions. Further **education and training courses** and programs are to be developed and introduced for the proper implementation of these actions at a business level and at a regional and local scale.

216. Steps should be taken to introduce special programs in **universities and colleges** focusing on climate change impacts on tourism, adaptation actions and their management at different levels. This activity should involve the Ministry of Education and Science which can recommend the action to the educational institutions, as well as through a direct dialogue between the MT and leading university tourism departments. Master of Sc programs are most suitable for this purpose because they can bring together specialists from various backgrounds. Also, special courses and subjects in this regard can be introduced in the tourism bachelor's programs of all educational institutions.

CLIMATE CHANGE ADAPTATION OPTIONS	
<b>VII. Capacity-building</b>	
<b>24.</b>	Develop climate change training
<b>25.</b>	Develop knowledge dissemination actions
<b>26.</b>	Introduce subsidies, grants, and other financial programs for relevant capacity building of all stakeholders
<b>27.</b>	Introduce special programs and courses in colleges and universities
<b>28.</b>	Improve coordination, information, and communication between the responsible governmental and public institutions

### *3.1.8. Specific adaptation measures*

CLIMATE CHANGE ADAPTATION OPTIONS
<b>VIII. Specific adaptation measures</b>
29. Develop adaptation measures for summer tourism
30. Develop adaptation measures for winter tourism
31. Develop new tourism types (products, destinations)
32. Identify new tourist sectors (segmentation)
33. Develop and implement new marketing strategies and approaches
34. Develop sub-sector (enterprise)-level resource management innovations

217. Following (or parallel to) the above six steps, some specific adaptation measures must be developed and implemented without delay, including the development of **new products, new destinations, new packages of higher quality, new market segmentation, and new marketing policies.**

#### *Summer tourism*

218. In the Eastern Bulgarian seaside region, for example, the likely reduction of tourism during the hotter midsummer months may be compensated for by promoting changes in the temporal pattern of seaside tourism, for example, by encouraging visitors during the cooler months (this can be done by the MT through its marketing campaigns and by Bulgarian tour operators who after being introduced to the risks created by climate change for tourism in midsummer and grasping the opportunity for longer shoulder seasons and greater revenues in spring and autumn will create and offer new attractive tourist packages with considerable discounts. If the tourist period is extended to May and September, the negative impacts of the heat of July and August can largely be offset, resulting in minor overall changes in the arrivals by the year 2030. Notably, this also requires a re-thinking of growth scenarios and associated plans for infrastructure developments, which are often modeled on peak demand. Additional hotels, for instance, may have a greater risk of low occupancy rates, while existing capacity could increase average occupancy rates in a scenario of growing arrival numbers in the shoulder season.

219. Climatic conditions will improve across Europe during the current shoulder seasons (spring and autumn), prolonging the beach season. At the same time, competition among tourist seaside regions during shoulder seasons will increase. One strategy that can be implemented by the participating private sector operators is to offer higher quality services and diversified tourism packages (with the development of more additional services and products) with greater flexibility. Another adaptation measure can be the identification of new segments in the existing markets.

220. A mitigation measure which can be successfully introduced in summer resorts is the usage of emissions-free transport – bicycles, electric carts, and so on.

221. Specific vertical adaptation actions can include improved water management and more efficient water use, protection of surface and groundwater quality, implementation of appropriate water pricing to reflect scarcity and environmental costs, an early warning system

(at first in the national resorts) for extreme weather events, shift from large scale/coastal tourism to special interest tourism, investment in infrastructure/technologies to upgrade facilities to face increased temperature and water/energy shortages, diversification of activities and attractions in seaside resorts offered for shoulder summer seasons, and changes in land planning and the legal framework governing construction with a view to reducing the risk of flooding.

222. Other long-term adaptation options are: (1) the strengthening of entrepreneurship, (2) the development and improvement of general and specific infrastructure, (3) improving the knowledge and skills of human resources, (4) reducing the seasonality of seaside tourism, (5) expanding tourism development opportunities to all regions of Bulgaria based on the specificity and potential of each region, and (6) undertaking destination-specific actions geared towards maximizing the ‘local experience’ offered.

#### *Winter ski-tourism*

223. Tourists may adapt to altered climatic conditions by changing the timing of their holiday, the destination (snow security), or by giving up skiing altogether.<sup>76</sup>

224. Besides **technical adaptation** strategies to increase snow reliability (for example **snow making** or **slope development**) another prospective adaptation strategy is to develop an **all-year tourism product**. In such a scenario, most skiing areas would see a rise in summer overnight stays due to improved climatic conditions. Even if such a strategy is successful, it is however, likely that losses in winter would outweigh an increase in the summer season. Further improvements in the relative attractiveness of these regions are needed, otherwise they are in danger of facing a decline in overnight stays and tourism revenues. Stakeholders must differentiate their tourism offers and to strengthen seasonal diversification.

225. For Bulgarian winter ski tourism, snow-making is not a feasible adaptation strategy, because Bulgaria faces growing water shortages and very high energy costs. Snow making is energy and water intensive. Where fossil fuel is used to generate this energy, it will speed up global warming, further aggravating winter sports conditions. Snow making can be implemented in limited areas and will undoubtedly lead to higher prices and lower competitiveness. An alternative would be to work with operators on the introduction of new products and services (SPA and wellness, hiking, climbing, special well-being programs, and so on) which will increase overnight stays and revenue generation outside the winter season, thus compensating for the inevitable decrease in winter-skiing holidays. A research conducted in 2008 in Borovets ski-resort (Mochurova, Kaloyanov, and Mishev 2012) shows, there are various types of preferences for alternative entertainment when there is no snow (*Table 4*).

*Table 4. Types of preferred alternative entertainment (percentage)*

	Entertainment in the resort	Other types of sport	Shopping	Wellness programs	City breaks	Excursions to other places	Entertainment in special programs	Others
<b>International tourists</b>	52.4	41.5	23.6	17.4	12.6	7.1	3.4	4.5
<b>Domestic tourists</b>	54.0	16.9	26.8	5.2	0.9	22.5	1.9	4.7

<sup>76</sup> Xavier Font & Ann Hindley (2017) Understanding tourists’ reactance to the threat of a loss of freedom to travel due to climate change: a new alternative approach to encouraging nuanced behavioural change, *Journal of Sustainable Tourism*, 25:1, 26-42, DOI: 10.1080/09669582.2016.1165235

226. Bearing in mind that more than half of the winter ski resort visitors are domestic tourists, research should also assess national preferences.

227. A lack of snow can be counteracted by snowmaking, using ski slopes and infrastructure located at higher altitudes more intensively, or migrating the existing infrastructure to higher altitudes; diversifying the offers to capture a different segment of the tourism industry (for example business travel, spas and wellness); developing north-facing slopes; tree planting to protect slopes; and introducing an early warning system for extreme weather events in winter resorts.

228. Other long-term adaptation options are the following:

- Diversification of activities and revenue sources in winter (excluding skiing), for example promotion of wellness-centers in the mountain region
- Development of four-seasons tourism, to reduce dependency on snow
- Concentration of winter sports in top destinations
- Regional co-ordination of investments
- Broadening of the basis for financing beyond cable-car businesses (for example co-operation with communities)
- Shift to slopes in less climate-sensitive regions (for example higher elevations)
- Closing of inefficient slopes
- Improvements in snow production
- Diversification into other economic activities than tourism

#### *New tourism types (products) and destinations*

229. One tourism adaptation strategy which cannot be implemented in the short run, but which will have the greatest impact not only on CCA but on many other aspects of tourism development in Bulgaria (for example seasonality and territorial imbalance) is the overall diversification of Bulgarian tourism in two interrelated directions – (a) new tourism products and (b) new tourism destinations.

230. New tourism products can be developed in Bulgaria, but so far only isolated attempts for their development have been made. Among these are various types of **cultural tourism** (historic, archaeological, special route tourism); wine and culinary tourism; special events (festivals, competitions, and so on) tourism; religious tourism.

231. **SPA tourism** is another important alternative segment, as part of the priority tourist product – health tourism, defined in the National Strategy for Sustainable Tourism Development in the Republic of Bulgaria 2014-2030, updated in 2017. Bulgaria holds the second place in Europe by the number of its mineral springs –over 1,600.<sup>77</sup> The hottest geyser in Europe –103°C– is in Bulgaria in the town of Sapareva banya at the feet of the Rila Mountain. At present this tourism type is in the fifth place in the Bulgarian tourism offer and generates 11 percent of all tourism revenues. There are enormous opportunities for the development of existing and new SPA destinations, the main obstacles for their development being legal

---

<sup>77</sup> <https://fakti.bg/bulgaria/209213-na-vtoro-masto-v-evropa-sme-po-broi-mineralni-izvori>



(ownership) issues and the outdated infrastructure. A national program for mineral waters utilization was initiated by the MoEW and the MT (2014) with a budget of BGN 3.5 million and is administered by the National EcoTrust Fund. The program implementation started in 2017 and its objective is to enable municipalities to update and develop their balneological and tourism potential. From the website of the NTEF<sup>78</sup> it can be seen that by decision of the NTEF Managing Board of January 24, 2017 are approved for funding under the pilot scheme Investment Program Mineral Waters (IPMW) projects of 9 municipalities, namely: Razlog, Polski Trambesh, Velingrad, Bourgas, Sapareva Banya, Septemvri, Panagyurishte, Mineralni bani and Berkovitz. At this stage of the project implementation it cannot be said what is the effectiveness of the public spending and what will be the overall benefits (economic and social). Besides traditional SPA tourism products, programs for **wellness and wellbeing tourism** is an area that can be further exploited by the private sector and promoted by tourism offices in many Bulgarian destinations in the interior of country. These tourism types can be developed in new and existing mountain destinations at lower altitudes which are most likely to suffer from future climate changes. Bulgaria is known for its unspoiled nature and for the purity of its rivers and lakes. Another relevant segment is **rural tourism**, with various options to develop organic or local food products.

232. **New tourism destinations** may be identified in the inner parts of Bulgaria outside traditional seaside and winter mountain tourism destinations. This can be considered a task of the newly constituted OTRMs whose objective will be tourism developments outside the most popular resorts in places with underdeveloped conditions and resources within the nine tourist regions in the country. This can be financed by public-private partnerships with the municipalities in the region and from various national and international programs (for example the EU OPs). The OTRMs, together with local authorities should initiate actions ensuring the efficient use of resources, including land, water reserves, and energy, and replace fossil fuel consuming vehicles at the local level with more eco-friendly means of transportation (for example electric vehicles, bicycles, public transportation). Moreover, production and use of local inputs with a smaller environmental footprint need to be strengthened, which would also serve the purpose of diversifying the tourism product. Local businesses, directly or indirectly involved with tourism, can be encouraged to improve their environmental performance. Local governments and public service providers can also play a role in this process by offering incentives, encouraging social responsibility, and supporting innovation.

#### *New tourist segment identification and development*

233. Efforts should be made to attract new tourism market segments, particularly elderly and retired people, and more affluent visitors. Elderly people will visit destinations with less extreme climate conditions (that is, not seaside and high mountain resorts) and will make their visits outside pronounced peak tourist seasons, thus helping prolong the season, fight seasonal employment, and develop new tourism products and destinations. More affluent visitors will spend more, and hence compensate for the decline in overall tourist numbers and revenues in summer and in winter. For ensuring the second option though, certain efforts in improving tourism services and tourism products in general must be made.

---

<sup>78</sup> [www.ecofund-bg.org](http://www.ecofund-bg.org)

## *Climate Change Adaptation – Assessment of the Tourism Sector*

234. The implementation of these adaptation measures lies mainly in the domain of the tourism industry; all previously mentioned actions (I–VI) will need to be discussed with private sector bodies, associations, and chambers of tourism and commerce. Some actions could be implemented through **private-public partnerships** – municipalities and OTRMs can provide information about climate change (by monitoring the relevant indicators, doing or sponsoring research, and so on) and based on this develop various adaptation actions, which in turn can be financed by the private sector. Thus, they can collaborate and unite their efforts in achieving joint objectives and goals at the local level. The EU offers a variety of opportunities for funding various tourism projects related to new products and new destinations development<sup>79</sup> (see sub-chapter 2.6).

*Table 5* summarizes the framework of the tourism adaptation options in Bulgaria.

*Table 5. Priority, time and budget for tourism sector adaptation actions in Bulgaria*

Action	Priority	Time horizon	Estimated costs	Budget – sources	Executing body
Tourism Adaptation Policy development	High	2020	None	-	MT
Legal Framework development	High	2020	None	-	MT, Ministry of Justice (MJ), Ministry of Finance (MF)
Awareness raising - Communication campaign development - Awareness raising implementation	High	2020-2025	Medium	State budget and EU programs	MT
Monitoring Indicators development	High	2022	None	-	Scientific institutions, universities
Knowledge base	High	2018-2030	Medium	State budget and EU programs	Scientific institutions, universities, OTRMs, government organizations, NSI, professional organizations, NGOs
Capacity building - Adaptive capacity assessment - Capacity development (training, education)	High	2018-2030	Medium	State budget and EU programs	MT, OTRMs, municipalities, professional organizations, NGOs
Specific adaptation measures	High	2019-2030	High	EU programs and private financing	Private sector, professional organizations, NGOs, OTRMs, municipalities, MT

*Source: Author’s vision.*

235. All above adaptation actions are recommended to be included in the National Strategy and Action Plan on CCA in the Tourism sector whose development is foreseen in the Action Plan of the updated Strategy for Sustainable Tourism Development in Bulgaria 2017–2030. In the new Strategy the adaptation actions can be specified and their parameters such as time, budget, costs, benefits, and so on, can be determined.

<sup>79</sup> *Guide on EU funding for the tourism sector - European Commission*,  
<https://ec.europa.eu/docsroom/documents/18164/attachments/1/translations/en/renditions/native>

### **3.2. Experience with Selecting Adaptation Options in the Sector in Other (EU) Countries**

236. **The process of adopting NASs and NAPs in Europe was started in 2005 by Finland. At present, almost all the EEA countries have already developed NAS and/or NAP (excluding Bulgaria).**<sup>80</sup> Implementing adaptation is still at an early stage across Europe. Out of 30, 13 countries report that they are in the implementation or monitoring and evaluation stages of the adaptation policy process. Most adaptation responses have been reported to be implemented at the national level and in the water sector.

#### **3.2.1. Summer tourism adaptation options**

237. In **Italy**, specific economic evaluation of adaptation strategies along the Italian coasts is nearly inexistent, except for very specific problems such as dykes to protect the city of Venice. Carraro and Sgobbi (2008) calculated that the cost of climate change in Venice by 2030 for the tourism sector (decline in tourist numbers) will be €35-43 million. Following the 2003 heat waves, several cities in Italy (for example Bologna, Rome, Milan, Turin), adopted an early warning system (Heat Health Warning Systems [HHWS]) like the one implemented in the United States.

#### **Box 9. Adaptation in coastal areas and marine environment in Italy**

Several strategies are already being extensively used to protect coastal zones from sea level rise, increased erosion and other climate change impacts. These include technical measures (such as dykes) as well as behavioral strategies (for example, changing location of recreational facilities), managerial interventions (for example changing agricultural practices in areas prone to floods), and political decisions (for example land use planning).

*Source: Carraro and Sgobbi 2008.*

238. In **Cyprus**, various adaptation options have been identified (Zachariadis 2012): improved water management and more efficient water use, protection of surface and groundwater quality, implementation of appropriate water pricing to reflect scarcity and environmental costs, development of guidelines for sustainable tourism and adaptation to climate change and public awareness-raising, shift from large scale/coastal tourism to special interest tourism, and investments in infrastructure/technologies to upgrade facilities to face increased temperature and water shortages.

239. **France** suggests diversification of activities and attractions in seaside resorts offered for shoulder summer seasons.<sup>81</sup>

240. A cost-benefit analysis (CBA) conducted by the **Greek National Bank** (Bank of Greece 2014) predicts higher operating costs for tourism businesses because of greater energy needs, new infrastructure construction, and so on. On the other hand, mitigation can reduce operating costs by making operations more energy efficient which can help compensate for losses. The following six operational areas of intervention have been identified so far: (1) strengthening of entrepreneurship, (2) development and improvement of general and specific

<sup>80</sup> Climate ADAPT – Sharing adaptation information across Europe, <http://climate-adapt.eea.europa.eu/countries-regions/countries>, accessed on May 3, 2017

<sup>81</sup> ONERC (2007/2009)

infrastructure, (3) improving the knowledge and skills of human resources, (4) reducing the seasonality of Greek tourism, (5) expanding the opportunities for tourism development to all regions of Greece based on the specificity and potential of each region, and (6) undertaking concrete destination-specific actions geared toward maximizing the ‘local experience’ offered. The policies and actions for Greece’s islands mainly involve the comprehensive management of coastal areas, combined with changes in land planning and in the legal framework governing construction with a view to reducing the risk of flooding, and so on.

**Box 10. Adapting to heat waves in Italy**

The benefit of an adaptation strategy in this context could be estimated by multiplying the value of an avoided death by the estimated number of lives saved owing to the adaptation strategy. The costs of heat waves for Italy, in the absence of any adaptation strategy, are estimated at €281 million for 2020 in Rome alone. Following the 2003 heat waves, several cities in Italy (for example Bologna, Rome, Milan, Turin) adopted an early warning system (HHWS) like the one implemented in the United States.

*Source: Carraro and Sgobbi 2008.*

**3.2.2. Winter ski tourism adaptation options**

241. The main available management and technological solutions for winter tourism in **Italy** are: developing north-facing slopes, extending and improving the existing ski areas to higher elevations, slope development, tree planting to protect slopes and snowmaking. Snowmaking is the most common and widespread adaptation strategy: about 77 percent of the Italian ski areas have snowmaking technology. Diversifying the offer to capture a different segment of tourism industry (for example business travel, spas and wellness) has also been identified as a strategy for the Italian Alps.

**Box 11. Adaptation to climate change in the Italian Alps**

Lack of snow can be counteracted by snowmaking, using ski slopes and infrastructures located at higher altitudes more intensively, or migrating the existing infrastructures to higher altitudes. Diversifying the offers to capture a different segment of tourism industry (for example business travel, spas and wellness) can also be a winning strategy for the Italian Alps.

*Source: Carraro and Sgobbi 2008.*

242. In the record-warm winter of 2006/2007, some low-altitude ski areas in **Austria** were unable to offer a continuous skiing season from December to April, despite being equipped with snow making technology. There are both environmental and economic constraints to an expansion of snowmaking, which can offer only limited and increasingly expensive protection from climate change impacts (Kovats et al. 2014; Steiger and Stötter 2013). Declining and/or ageing populations in source countries are a more immediate threat than climate change to winter tourism in the Austrian Alps in the first half of the 21st century, after which the effect of rising temperatures will dominate. Despite the lack of specific data about tourism adaptation measures in the **Austrian** Adaptation Strategy, research publications (Steiger and Abegg 2012) show that variation in temperatures and snowfall can to some extent be balanced with snowmaking.

243. In **Slovenia** (Ogrin et al. 2011) low and medium-lying ski resorts will have to diversify their offer providing guests with other possibilities besides skiing.

244. Promising development models for the **Swiss** ski tourism industry are the concentration of winter sports in top destinations, the promotion of wellness-centers in the mountain region, and the diversification of attractions offered for summer recreation (Matasci and Altamirano-Cabrera 2012).

245. In the national strategy of **France**<sup>82</sup> the following adaptation measures are recommended:

- Diversification of activities and revenue sources in winter (excluding skiing), for example promotion of wellness-centers in the mountain region
- Development of four-season tourism, to reduce dependency on snow
- Concentration of winter sports in top destinations

246. It can be concluded that in many countries the tourism sector has adapted its operations to climate change. As *Table 19* (A Portfolio of Climate Change Adaptations Utilized by Tourism) illustrates, a diverse range of technological, managerial, policy, and behavioral adaptations are currently in use by various tourism stakeholders to deal with climate variability at the destination level. Climate adaptations are rarely undertaken in isolation, but commonly involve multiple adaptations that are very specific to the destination climate and its tourism products. The location-specific nature of climate adaptation will eventually create a complex mix of adaptations being practiced in the tourism sector across the globe.<sup>83</sup>

247. Scott and McBoyle (2017) outlined the main CCA options for the ski industry. They are (for more details see *Annex 7* [Main Climate Change Adaptation Options in the Ski Industry]) snowmaking, slope development and various operational practices, cloud seeding, revenue diversification, marketing incentives, and indoor ski slopes. Various government levels – local, state, and national must to concentrate on improved climate forecasting and government policy development. Radunsky (2011) adds the need for:

- Regional co-ordination of investments
- Broadening of the basis for financing beyond cable-car businesses (for example co-operation with communities)
- Shift to slopes in less climate-sensitive regions (for example higher elevations)
- Closing of inefficient slopes
- Improvements in snow production – which have been significant in the past
- Diversification into other tourism activities apart from skiing, that are not dependent on the availability of snow
- Diversification into alternate economic activities other than tourism

---

<sup>82</sup> ONERC (2007/2009)

<sup>83</sup> Climate Change and Tourism – Responding to Global Challenges,  
<http://sdt.unwto.org/sites/all/files/docpdf/climate2008.pdf>

### **3.3. Adaptation Options Assessed**

248. **In this sub-chapter, the identified options are assessed by various criteria – time, budget, benefits, efforts, indicators for measurement, institutional arrangements, and consequences. The results of all assessments are compared in Table 11.**

#### **3.3.1. Time**

249. The adaptation options recommended for Bulgarian tourism can be initialized as soon as the NAS and Action Plan are adopted. Given that the NAS and the NAP are not expected to be ready until the end of 2018, all other legislative steps are expected to be taken over one or two years. Parallel to that, communication, educational and awareness raising strategies can be developed within 2018.

250. The full implementation of these strategies will take longer – about two to four years (until 2022 approximately). The tourism industry will need more time to understand the new realities and to adapt to them, meaning that specific adaptation actions in the sector can be expected to begin not earlier than 2020 and first results be monitored and evaluated by 2025–2050. In this period, data should be continuously collected, monitored, and evaluated (see *Table 11*).

#### **3.3.2. Budget**

251. There are not many economic assessments of the cost of adaptation for the tourism sector. Most of these are related to winter ski tourism and mainly related to the production and use of snow which mostly concerns private tourism suppliers. Mathis et al. (2003) conclude that the extension of ski areas to high elevations in all Switzerland would cost €25-30 million. Investment costs for snow-making in France were €60 million in the winter season 2003–2004, and in Switzerland, these amounted to €19,000-32,000 per kilometer. It is further stated that the production of snow in 2007 was estimated at €1-5 per cubic meter (according to the Association of Austrian Cableways [Agrawala and Fankhauser 2008]) and €3-5/m<sup>3</sup> or €136,000 per hectare (CIPRA 2004). Bosselo et al. (2010) have calculated that the maintenance costs for snow making in Switzerland amounted to approximately 8.5 percent of the income of winter resorts.

252. This kind of adaptation is not necessarily sustainable in the longer term, because of energy and water requirements. Such externalities have not been taken into account until now, and their inclusion will increase costs significantly. In such a case, it would be advisable not to encourage Bulgarian winter mountain resorts and enterprises to invest heavily in snow making or to move facilities further uphill.

253. There are major differences between the Member States, with the greatest coastal zone losses projected to occur in France, the United Kingdom and the Netherlands if no additional adaptation occurs.<sup>84</sup> The expected annual damage in the EU is estimated to rise from approximately €4–5 billion per year (currently) to €32 billion per year by the middle of the century (RCP4.5 for 2°C of warming) without additional adaptation (median ensemble results, combined effects of socio-economic and climate change, current values, undiscounted), based on the LISFLOOD model (120) from IMPACT2C (Roudier et al. 2016). The large range of this

---

<sup>84</sup> <http://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016>.

estimate is a result of the high levels of climate model uncertainty. It is noted that around half of the increase reported is attributable to climate change. Analysis at the country level suggests high climate-related costs in France, Germany, Italy, Romania, and the United Kingdom, and damage costs rising significantly in coming years.

254. The costs to be paid by the state are mostly related to addressing the problems of water and energy shortages. Such infrastructure investments must be done either from the state's budget or again by the utilization of various international funds. The government must find these financial means because water and energy shortage are cross-cutting issues for all sectors.

255. It is difficult to assess the cost of various adaptation activities in Bulgaria, even though in the period until 2030 these are likely to be modest since they will include mostly policy making and other legislative measures. Most of the options identified include the development of policies and strategies in the ministries, various legal and regulatory documents, training and educational materials, indicator development, and the creation of a knowledge base which will require limited investments – the institutions, the people, the infrastructure and the resources are already in place. Awareness raising, adaptive capacity assessment, and capacity development (education and training) will require more investments – at medium level. Adaptation that will require serious investments includes the development of new inland destinations. These require new infrastructure, new hotels, restaurants, entertainment and amusement facilities, and so on. This initiative though has to be supported by the state and for example, people who want to work in this field should be given some incentives by the government, for example no taxes for the first 5 years. These activities can also be supported by EU funds, for example the OP for Rural Regions Development. In comparison, development of new tourism products and programs is not expected to require many investments – efforts just must be redirected (see *Table 11*).

256. Following a detailed economic evaluation of all costs for CCA in the sector the relevant funds can be provided by the state budget. Some actions can be financed by EU funds. Potential sources of financing are also public expenditures, the Global Environment Facility, foreign direct investments, insurances, etc. Project-based public support constitutes the most important financing mechanism for implementing adaptation, followed by an explicit budgetary allocation, insurance mechanisms, public-private partnerships, and EU funds.

### **3.3.3. Cost-benefit analysis**

257. Benefits from all identified adaptation options are very high and very important (see *Table 11*). It can be said that to some extent indicator development and adaptive capacity assessment may produce medium benefits because they are not measures that will directly contribute to tourism adaptation to climate change, but their implementation will be highly instrumental in achieving other adaptation measures. These adaptation practices will bring benefits to all tourism stakeholders both at the supply and demand side, as well as for the local communities and for the Bulgarian community as a whole.

258. With these considerations in mind, a quantitative assessment of adaptation options is presented in this section. Considering the high value-added of the tourism industry and its importance for the Bulgarian economy, such an evaluation could be instrumental in further informing the decision-making process.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

259. The CBA for the sector (further explained in *Annex 3*) focuses on the assessment of soft adaptation measures. The benefits gained as a result of their implementation are best exemplified through the quantification of saved costs in main performance indicators (total tourism revenues; total revenues of Winter resorts [overnights only]; total revenues of Summer resorts [overnights only]; and others. Considering the complex impact of the adaptation options on the Tourism, these were not separately quantified in the current CBA. The net present value (NPV) in *Table 6* illustrates the monetary value of avoided losses as a result of implemented adaptation measures, while the cost effectiveness quantifies the benefits achieved in relation to the required investments/costs.<sup>85</sup>

*Table 6. Benefits of adaptation measures in the Tourism sector under different climate scenarios until 2050 (in € million)*

Climate scenarios	NPV (€ million)	Cost-effectiveness (Benefit/Cost ratio)
<b>Realistic scenario +2°C</b>	107.72	16.46
<b>Optimistic scenario +2°C</b>	134.49	20.30
<b>Pessimistic scenario +2°C</b>	80.95	12.62
<b>Realistic scenario +4°C</b>	143.80	21.64
<b>Optimistic scenario +4°C</b>	178.99	26.69
<b>Pessimistic scenario +4°C</b>	108.61	16.59

260. The projection shows that on average, under the +2°C realistic scenario, the total cash flow in NPV is €107.7 million, and €143.8 million under the realistic scenario at +4°C. Under the optimistic scenario, the projected cash flow in NPV is €134.5 million under the +2°C scenario and €179.0 million – under the +4°C scenario. Even under the pessimistic scenario, the future cash flow in NPV is projected at €81.0 million at +2°C and €108.6 million at +4°C.

261. Within the current analysis, the cost-effectiveness of the adaptation measures is used to quantify the effect of investments under each scenario.<sup>86</sup> Under the +2°C realistic scenario, the benefit/cost ratio is €16.46 (that is, the benefits achieved per Euro spent), and €21.64 under the +4°C realistic scenario. The benefit is higher at +4°C temperature rise. In that case, the benefit is €26.69 per one Euro of investment under the optimistic scenario and €16.59 per one Euro of investment under the pessimistic scenario.

262. The CBA shows that the NPV is positive in all scenarios, which is an evidence that investments are economically efficient, and the cost/benefit ratio indicates sustainable return of investment. Implementation of adaptation measures in the tourism sector will contribute to avoiding future damage and will have a positive return on investment for both the public and private sector. The implementation of selected adaptation options is economically justified. The

<sup>85</sup> The NPV of an adaptation option is given by the present value of the estimated benefits and costs. If NPV is more than zero, this indicates that the investment is efficient and incremental benefits of adaptation exceed the incremental resource costs. If NPV is <0 or B/C is <1, then the adaptation measures add no net benefit to the Tourism sector. If NPV is >0 or B/C is >1, then it adds positive benefits. The positive value of NPV confirms that investments for adaptation are efficient.

The benefit-cost ratio (B/C) is the ratio of the present value of benefits to the present value of costs. When the B/C ratio is more than one, the present value of the option's benefits is larger than the present value of its costs.

<sup>86</sup> The cost-effectiveness refers to all measures.



expected tourism revenues as a result of all adaptation measures will be higher during the summer-tourism season and lower during the winter-tourism season.

#### **3.3.4. Efforts**

263. The implementation of all identified adaptation options will require substantial efforts by the whole sector – tourism institutions and industry, as well as by other organizations such as researchers, educational institutions, municipalities, and so on. The degree of efforts is high (see **Table 11**) with the exception of adaptation measures where there is some work already done – Tourism CCP and legal framework development and indicator and knowledge base development (mainly in research institutions outside the tourism sector).

#### **3.3.5. Indicators for measurement**

264. Indicator-based assessments of climate change vulnerability and risk are of particular interest to policy makers, as they are usually based on readily available (statistical) data and results that can be communicated effectively using graphical and map-based techniques. Two main groups of indicators can be used – (1) climate change indicators relevant for tourism development and (2) tourism-based indicators (see **Annex 9** [Climate Change Indicators]). Indicators are best measured at a local level and this should be the task of the newly formed OTRMs in the tourism regions of Bulgaria. The indicators should be determined centrally (by the MT) so that there would be compatibility of all results and they could be compared. The operation should be included in the OTRMs' budget. The results obtained should serve for monitoring the effects of climate change in the tourist regions and for adjusting the implemented CCA activities.

#### **3.3.6. Institutional arrangements**

265. As stated, the main institutions involved in the adaptation options identified will be all tourism stakeholders. The main role is to be played by the MT which, together with the Ministries of Environment and Water, Justice, and Finance, will be responsible for the general climate change and tourism adaptation policies, strategies, and regulatory documentation. The second tier of stakeholders to inform and coordinate with the ministry are the national and regional tourism associations and organizations, the OTRMs, and municipalities. They are responsible for implementing the CCA policy at the regional and local levels (except for the national NGOs). An effective and efficient communication network or platform among all institutions should be created for the better coordination both horizontally (among various institutions and economic sectors) and vertically (between various territorial levels (national, regional, and local)).

266. It should be noted that there are mainly two types of adaptation options to be implemented – actions/responses that are market and private sector based and those under the remit of the public sector. A mechanism needs to be developed for these two major stakeholder groups to inform each other, to communicate knowledge and collaborate in various measures to be undertaken, and to coordinate activities for maximum benefit. This issue is very important and the leading role in this lies with the MT.

267. Another important point is that some actions that might be required on a seasonal (month to month) level might fall to the municipalities and local administrations at specific

destinations. Therefore, having these organizations fully integrated and prepared will be important. Furthermore, the MT is trying to establish the DMOs responsible for the overall tourism management and development in Bulgaria's nine tourist regions. These can play an important role in establishing the sector's CCA coordination.

268. Additionally, all national seaside and mountain tourist resorts have, for now, been identified as 'hot spots' that will potentially be affected most by climate change. This requires putting in place, for instance municipal protocols to prepare for climate change and its possible impacts on the area, including on how to communicate about extreme weather warnings. In this respect, municipalities must develop a plan on how to act in the case of an extreme event, which is to be communicated to the tourism resorts.

### **3.3.7. Consequences of no adaptation/maladaptation**

269. **Economic costs can potentially be high, even for modest levels of climate change, and these costs rise significantly under scenarios of greater levels of warming.** The projected damage from climate change is highest in Southern Europe. However, estimates of the projected economic impacts of climate change in Europe consider only some sectors and show considerable uncertainty. The EEA has provided an estimate of the overall annual economic losses from climate extremes by country in 2015 (2015 Euro value) (EEA 2016). The total value for Bulgaria is estimated at €2,361 million, of which only 5 percent was insured. This corresponds to €288 per capita, or €21,393 per square kilometer. Among the 33 countries monitored by the EEA Bulgaria holds the 24th place in losses across all sectors of the economy, 26th place per square kilometer and 32nd place in losses per capita.

270. If no adaptation in the tourism sector is implemented, this will have negative consequences especially for the winter tourism sector – the expected snow cover decrease will affect not only the existence and functioning of tourism resorts and their revenues, but also ecosystem functioning and communities in the mountains, particularly those whose economic life is strongly dependent on tourism. Maladaptation can reinforce negative impacts on tourism – the intended enlargement of ski facilities in some regions (for example Rila and Pirin) will, for instance, enhance problems even more and can have disastrous economic and environmental effects.

## **3.4. Cross-cutting Issues, Trade-offs, and Synergies of Adaptation Options**

271. **The impacts of climate change could negatively affect the country's sustainable development in diverse ways, including water resources, forestry, energy, transportation, health, agriculture, and biodiversity – all of which can influence the tourism sector. The water, agriculture, forestry, and biodiversity sectors have strong interdependencies with tourism, and are also related to changing land-use patterns and population change.**<sup>87</sup>

272. Consequently, the process of adaptation in the tourism sector cannot be undertaken in isolation and needs to be placed within the broader context of a country's sustainable development policies and strategies and consider impacts and adaptations in other sectors.

---

<sup>87</sup> Climate change is a complex system and will interact with other socio-economic developments, including the ageing of the population and increasing urbanization across Europe, projected decreases in population size in Eastern Europe, and a narrowing economic gap between eastern and western parts of Europe.

273. In addition, further knowledge is needed on spillover effects of impacts and adaptation at regional and global levels.<sup>88</sup> As a cross-cutting theme, there is a need for enhanced communication, shared learning, and co-creation of knowledge.

274. CCA strategies, policies and actions, including the mainstreaming of them into other policies, are progressing at all governance levels (transnational, national, and local) in the EU.<sup>89</sup> Bulgaria needs to become a part of this process by:

- Enhancing its policy coherence across EU environmental and sectoral policies;
- Introducing effective and efficient action across all levels of governance, through multi-level governance and transnational cooperation platforms;
- Enhancing flexible ‘adaptive management’ approaches;
- Combining technological solutions;
- Ecosystem-based approaches and ‘soft’ measures; and
- Involving the private sector.

275. Tourism is a highly diverse economic sector and the perspectives of many local, national and, where applicable, international stakeholders should be sought. The stakeholders can be divided into two groups – (1) those directly involved in the tourism sector (MT, local governments, tourism industry representatives, tourism labor representatives, local businesses), and those whose livelihoods are affected by tourism (local communities), and (2) those in other sectors (i) that might be affected by tourism adaptations (for example, transportation, energy, or agriculture), (ii) whose adaptations might affect tourism (for example, insurance industry, health sector), or (iii) that have other relevant expertise (for example universities, NGOs).

276. In the analytical process of tourism adaptation actions in Bulgaria the following main cross-cutting issues were identified:

277. **Using scarce water resources more efficiently.** In Bulgaria that will mean, in the first place, decreasing the **water loss** due to outdated and broken water conduits across the country. According to the Bulgarian Water Association at least 50 percent of the drinking water in Bulgaria is wasted, with some areas losing as much as 80 percent of their potable water. In recent years there has been a trend toward reduction of leakage, but so far Bulgaria is far behind in comparison to other European countries. In other EU countries, a 20 percent leakage rate is considered critical, requiring immediate action. The problem could be addressed by modernization of the water supply system, the reduction of water theft and the optimization of pressure in water supply systems.<sup>90</sup> Immediate measures need to be taken along the Black Sea coast where water is quite scarce and where decreasing precipitation levels have been observed. The growing demand for water will increase its cost and the likelihood of conflicts with other water users.

278. Another cross-cutting issue with very high importance for the tourism sector is the GHG emissions of **road transportation** contributing to climate change. One of the declared

---

<sup>88</sup> Climate change, impacts and vulnerability in Europe 2016 THAL17001ENN.pdf

<sup>89</sup> National adaptation policy processes in European countries — 2014. pdf, [www.eea.europa.eu/publications/national-adaptation-policy-processes](http://www.eea.europa.eu/publications/national-adaptation-policy-processes)

<sup>90</sup> <http://www.bwa-bg.com>.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

major tasks of the Bulgarian Government is to complete the country’s highway network. For now, Bulgaria still relies heavily on road transport and there is no mention of new technologies or fuels being introduced. GHG emissions management is of very low priority in the country policy. A possible mitigation measure recommended for the tourism sector in Bulgaria is the introduction of alternative means of transportation for tourists – bicycles in towns and resorts, or the introduction of electric, hybrid, or gas-based cars and busses.

279. Other cross-cutting issues can be observed between **tourism and forestry** (see *Annex 8* [Cross-cutting Issues with the Forestry Sector]), **tourism and urban environment** (see *Annex 8* [Cross-cutting Issues with the Urban Environment Sector]), **tourism and ecosystems**, **tourism and human health** (in this case the health of tourists), and **tourism and agriculture** (bio- and eco-products tourism offers and consumption). All adaptation activities in these sectors will have positive side effects for tourism.

280. A major cross-cutting issue with a strong effect on tourism is the **ageing population** in all the EU countries. For more than 10 years many EU countries have developed various mechanisms and social programs to provide vacations for elderly and retired people, which can ensure a prolonged tourism season and employment in various destinations (Quinn, Griffin, and Stacey 2008).

281. A summary of how climate change effects in other sectors affect the tourism sector positively or negatively is given in *Table 7*.

*Table 7. Matrix of interdependencies*

Affecting →	TOURISM SECTOR	
CC effect in ... (see below) ↑	Positively	Negatively
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>• New food types produced and offered to tourists</li> </ul>	<ul style="list-style-type: none"> <li>• Food production</li> </ul>
<b>Biodiversity and Ecosystems</b>	<ul style="list-style-type: none"> <li>• Opportunities for new tourism products</li> <li>• Opportunities for new destinations development</li> </ul>	<ul style="list-style-type: none"> <li>• Changing weather patterns</li> <li>• The loss of regulating ecosystem services (protection from erosion, avalanches) can lead to the loss of some assets (for example snow, shorelines)</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• Longer average stay</li> <li>• Higher innovation rate</li> </ul>	<ul style="list-style-type: none"> <li>• Slower growth in arrivals</li> </ul>
<b>Forestry</b>	<ul style="list-style-type: none"> <li>• New tourism products (berries, mushrooms)</li> <li>• New forests as buffer zones (water storage, carbon sequestration)</li> </ul>	<ul style="list-style-type: none"> <li>• Worse tourism conditions</li> </ul>
<b>Human Health</b>	<ul style="list-style-type: none"> <li>• New tourism products – SPA, wellness, wellbeing</li> </ul>	<ul style="list-style-type: none"> <li>• Biophysical thresholds (for example temperatures)</li> <li>• Fewer active and sports tourism products</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>• Better access to (new) tourism destinations and attractions</li> </ul>	<ul style="list-style-type: none"> <li>• Growing emissions of GHGs</li> <li>• Impacts on infrastructure</li> </ul>

Affecting →		TOURISM SECTOR	
CC effect in ... (see below) ↑	Positively	Negatively	
Urban Environment	<ul style="list-style-type: none"> <li>• More attractive under scenario of extreme weather events</li> </ul>	<ul style="list-style-type: none"> <li>• Shorter average stay</li> </ul>	
Water	<ul style="list-style-type: none"> <li>• Saving water reduces vulnerabilities, allow to cater to greater number of tourists</li> <li>• Longer average stay</li> </ul>	<ul style="list-style-type: none"> <li>• Costly to increase water availability (for example desalination)</li> </ul>	

*Note: The above Matrix of sectoral interdependencies reflects how climate change effects in one sector affect the Tourism sector positively or negatively.*

### 3.5. Priority Setting Approach

282. **Many views about priorities in CCA strategies and actions have been published in official reports and in scientific papers.** For example, UNEP (2008) developed the following priorities for tourism CCA activities:

1) *Adapt now.* It is imperative to commence the process of adaptation without any unnecessary delay. Climate change will accelerate. Therefore, further adaptation to current risks can yield immediate benefits.

2) *Create conditions to enable adaptation.* Numerous barriers exist to impede adaptation, including: competing priorities for scarce resources, lack of knowledge, weak institutions, degraded natural resources, inadequate infrastructure, insufficient financial resources, and poor governance. Enabling the process of adaptation is one of the most important adaptations that governments can make.

3) *Integrate adaptation with development.* The objectives of CCA and development are strongly complementary and so to be effective adaptation processes must engage policy-makers from ministries responsible for development, finance, land and water management, and public health (tourism should be added here because of its dependence and interrelation with the above-mentioned sectors).

4) *Increase awareness and knowledge.* Knowledge is highlighted as a critical constraint on adaptation and the generation and communication of new information for managing climate risks is emphasized as high priorities.

5) *Strengthen institutions.* It is evident that key functions for managing climate risks and undertaking adaptation are inadequate or absent due to weak institutions. Thus, strengthening institutions or in some cases revitalizing traditional institutions and ways of making decisions are essential for facilitating adaptation.

6) *Protect natural resources.* Natural resources, that are in a degraded state, are more vulnerable to climate change and, therefore, rehabilitating and protecting natural resources such as wetlands, fisheries, biodiversity, forests, and beaches are critical for adaptation strategies.

7) *Provide financial assistance.* Limited financial resources are commonly cited as a major adaptation barrier and innovative solutions will need to be sought to obtain financing from both internal and external multiple sources.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

8) *Involve those at risk.* Involving stakeholders at potential risk (the intended beneficiaries of adaptation) to increase effectiveness of adaptation processes, and to demonstrate the importance of participatory approaches to adaptation.

9) *Use place-specific strategies.* Adaptation is location based, and the local context will determine what specific approaches and initiatives will be most effective.

Another approach to prioritization of adaptation activities is given in the same publication.

*Step 1 – Getting the right people involved in a participatory process*

*Step 2 – Screening for vulnerability: identifying current and potential risks*

*Step 3 – Assessment of adaptive capacity*

*Step 4 – Identifying adaptation options*

*Step 5 – Evaluate adaptation options and select course of action*

*Step 6 – Implementation*

*Step 7 – Monitor and evaluate adaptations*

**Table 8. A Hypothetical Adaptation Portfolio Evaluation Matrix for a Destination with Growing Water Supply Shortages**

Adaptation options	Selected Evaluation Criteria* (1 – Low, 5 – High)					Evaluation score
	Affordability	Effectiveness	Acceptability to Local Stakeholders	Ease to Implement	Capacity to Sustain	
Water conservation programs at resorts	5	3	5	5	5	23
Fee structure for water use	3	5	1	2	4	15
Close GC and curtail other high water uses during dry season	2	3	2	1	3	11
Limit new tourism development	2	4	3	2	3	14
Mandatory onsite water collection and storage systems	4	5	5	3	4	21
Construct desalination plant	1	5	5	3	2	16

\* - all criteria considered equally important and no weighting factors are applied

283. In summary, the approaches and considerations presented so far are systematized in **Annex 9** (Criteria for Choosing Adaptation Options and their Prioritization).

284. Taking into consideration the above it can be suggested that all options identified for CCA in the Bulgarian tourism sector are of very high priority. The identified adaptation measures can be divided into five main domains: (1) political and legal, (2) awareness and

communication, (3) knowledge base development (incl. indicators development), (4) capacity building, (5) specific adaptation measures. Their priority and implementation sequence (urgency) can be assessed based on multi-criteria comparison (*Table 11*).

285. A promising and feasible way of enhancing CCA measures implementation in general and in the tourism sector particularly, in the sense of shorter time periods and less costs needed, is the usage of ICT. Fuchs and Höpken (2005) observed that there is only an inadequate use of information for decision making, and the potential for ICT in supporting tourism information management and managerial decision making is largely unexplored and unexploited.

286. The literature (Ali and Frew 2014) reveals several key ICT-based tools/applications that can be used for identifying damaged areas at the destination; measuring changes in indicators; identifying indicators; measuring indicators; determining climate, weather and ocean change; tourist statistics; providing information to the local community and the tourists; identifying market segments; producing realistic images of what proposed developments would look like; scenario testing and modelling.

287. The most frequently used ICT tools for sustainable tourism development and CCA are Computer Simulation (CS), Destination Management Systems (DMS), Economic Impact Analysis Software, Environment Management Information Systems (EMIS), Geographical Information Systems (GIS), Global Positioning System (GPS), Tourism Information System (TIS) and Information Management of Weather, Climate, and Ocean Changes (Weather, Climate and Ocean Changes Forecasting System [WCOCFS]). One ICT based tool/application which can aid at the destination level is location-based services (LBS) which can be used to push messages to all stakeholders at the destination to create awareness.

288. Identification of CCA options is an important step in the process of establishing resilience to climate change. However, it is not realistic to expect that all identified adaptation options can be implemented simultaneously. Therefore, adaptation options are normally scored to establish a priority order for their implementation. In the framework of this report, following EU guidance,<sup>91</sup> the adaptation options, specifically identified for the tourism sector, have been prioritized.

289. In support of the priority setting a prioritization meeting was organized in Sofia in October 2017, inviting a variety of stakeholders from the sector. The meeting used a basic version of the multi-criteria analysis (MCA) approach. MCA is an approach as well as a set of techniques, that aims at providing an overall ordering of options, ranging from the most preferred to the least preferred. It represents a way of looking at complex problems that are characterized by a mix of monetary and non-monetary objectives. MCA breaks down options into more manageable pieces by using a set of criteria. The two groups of criteria used for the analysis were those of ‘Net Benefits’, further broken down into economic, social, and environmental benefits, and ‘Implementation Risks’, further broken down into financial, social, institutional, technical, and technological risks. This approach allows data and judgements to focus on the separate pieces that are then reassembled to present a coherent overall picture.

---

<sup>91</sup> <http://climate-adapt.eea.europa.eu/knowledge/tools/adaptation-support-tool/step-4/prioritise-and-select>

## *Climate Change Adaptation – Assessment of the Tourism Sector*

290. In carrying out the MCA (that is ‘scoring the different adaptation options’), the meeting benefited from the presence of stakeholders with professional knowledge and experience in the sector. Nevertheless, this priority setting effort must be considered as indicative and tentative, for three main reasons. First, the effort was carried out at an early stage in the process of developing a strategic view and planning of sector specific CCA. Second, not all those who were invited to the prioritization meeting used this invitation to attend. And third, a broader understanding of underlying information and notions at the side of the stakeholders would be beneficial to allow them to make more founded scores. A repeated invitation to the stakeholders’ community, through the MoEW – as part of the process of collecting comment on the final draft version of this report, did not provide enough additional scores. Therefore, the current priority list only serves as a ‘first feel’ about the main direction of the actions to be taken first.

291. At a later stage, further attention should be paid to the priority setting process, both for this sector and across all economic sectors that play a role in the planning of Bulgaria’s CCA actions.

292. The five main priority adaptation options that stakeholders tentatively and indicatively identified for the tourism sector are:

- 1) Accept the National Strategy and Action Plan for Sustainable Tourism Development in Bulgaria 2017–2030;
- 2) Develop the NAS and Action Plan for CCA in the tourism sector;
- 3) Improve the CCA legal framework;
- 4) Develop a set of tourism indicators sensitive to the climate change; and
- 5) Engage in wider dissemination of CCA knowledge to reach local tourism entrepreneurs.

293. Complementary to the stakeholders’ prioritization contributions, the World Bank experts responsible for this report assessed the proposed adaptation options for the tourism sector and provided their professional judgement on their priority order. **Table 9** and **Table 10** reflect this judgement.

*Table 9. Expert judgement on the prioritization of proposed CCA options (vertical)*

Adaptation Option Priority	Justification
<b>1. Development of a National Adaptation Strategy for CCA in the Tourism Sector</b>	This will provide guidance to the private sector and coordinate CCA actions in the tourism industry in general. It can include both regulatory documents in which adaptation measures implemented by the private sector are compulsory, or there can be various tax concessions for companies implementing recommended adaptation measures. This may help all stakeholder groups in developing, implementing, evaluating, and updating any tourism adaptation plans and/or initiatives in which they will be involved.



## *Climate Change Adaptation – Assessment of the Tourism Sector*

Adaptation Option Priority	Justification
<b>2. Development of a system of monitoring indicators and indicators monitoring</b>	Monitoring systems and tools will help stakeholders to be and remain informed about climate change on a regular basis, including about its impacts on tourism, and the effect of adaptation activities. Based on this information, stakeholders will be able to review their action plans and adjust them to observed changes.
<b>3. Tourism industry's adaptive capacity and awareness raising and development</b>	<p>Studies that examined climate change risk appraisal among policy makers and tourism practitioners consistently found low awareness of and low adaptive capacity to climate change.</p> <p>While the potential range of climate change impacts in the tourism sector is broadly understood, there is a more limited understanding of its adaptive capacity. The UNWTO (UNWTO, UNEP, and WMO 2008) has determined the sub-sectoral adaptive capacity as high for tourists, medium for the intermediary subsector (tour operators, travel agents, transportation providers [airlines, railways]), and low for destinations in general, that is, hotels, resorts, attraction operators, and local communities. For Bulgaria, a preliminary research of the Bulgarian tourism sector's adaptive capacity has been conducted showing its considerably low level of preparedness.</p> <p>Appropriate tools for the induction of the private sector (tour operators, hotel and restaurant businesses, and so on) to the problems of climate change and its effects on Bulgarian tourism and the possible adaptation and mitigation actions must be developed and implemented.</p>
<b>4. Development of four-season tourism across the country</b>	The development of four-season tourism in all tourist destinations will make the tourism industry less vulnerable to negative impacts of climate change. The tourism sector will be ready and prepared for all types of climate and weather conditions at all times.
<b>5. New market segmentation and new marketing strategies development and implementation</b>	The identification of new segments in the existing and new tourist markets will help further diversify Bulgarian tourist portfolio and offer higher-quality services and diversified tourism packages (with the development of more additional services and products) with greater flexibility, not depending so heavily on climate and current weather conditions.

*Table 10. Expert judgement on the prioritization of proposed CCA options (horizontal)*

Adaptation Option Priority	Justification
<b>1. Improve the CCA legal framework</b>	Most European countries have called for the mainstreaming of adaptation into sectoral and cross-sectoral policies (EEA 2014). It is recommended that the adaptation process starts with such soft measures. After the adoption of an NAS and Action Plan it will be easier to adapt national measures into sectoral adaptation policies.
<b>2. Development and improvement of a monitoring and evaluation (M&amp;E) system</b>	Monitoring systems and tools will gather information on a regular basis about climate change, its impact on the economy, and evaluate the effects of adaptation activities. Based on this information, stakeholders will be able to review their action plans and adjust them to any observed changes.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

Adaptation Option Priority	Justification
<b>3. Develop a national database (online portal) containing CCA specific information</b>	This will help all stakeholders from various economic sectors to be informed about climate change on a regular basis as well as about its impact on the economy, and to evaluate the effect of adaptation activities. There is a need to develop tools and decision-making frameworks that can effectively inform and support adaptation policies and strategies, particularly at relevant scales and at aggregated levels (municipal, national). Such tools can include information and communication technology (ICT) and other instruments, along with economic analyses.
<b>4. Create cross-sectoral policy frameworks and improve coordination among responsible government and public institutions</b>	It is essential to bind all sectoral policies in a general framework in which all adaptation options and measures are mainstreamed and complement each other. Any contradictory options, policies or measures must be avoided. This responsibility lies mainly with the MoEW which, in coordination with all other relevant ministries, must supervise the implementation of the National CCA Strategy across the national economy.
<b>5. Introduce subsidies, grants, and other financial programs</b>	To stimulate and enhance the implementation of all adaptation options, including awareness and adaptive capacity raising, development and implementation of monitoring and evaluation systems, scientific research and development of the knowledge base for all economic sectors, it is highly recommended that these are subsidized through various financial instruments.

294. In summary, the adaptation options identified for the Bulgarian tourism sector mainly encompass soft and fundamental measures to form the national basis for the development of future, more specific and more detailed, adaptation options which will have to be regionally and temporally distributed across the country.

295. Below the various adaptation options assessed by some criteria can be seen (*Table 11*):

## Climate Change Adaptation – Assessment of the Tourism Sector

**Table 11. Adaptation options in Bulgaria assessed by various criteria**

Adaptation options	Criteria						
	Time (years)	Budget	Benefits	Efforts	Measurement indicators (outputs)	Institutions involved	Consequences no adaptation/maladaptation
<b>Tourism CCP development</b>	1	#	###	##	NAS and NAP; constitution of a climate change and tourism adaptation body	MoEW, MT	###
<b>Legal framework development</b>	1-2	#	###	##	Law for CCA in tourism	MT, MJ, MF	###
<b>Awareness raising/communication campaign</b>	2-3	##	###	###	Number of seminars conducted; organizations covered; number of participants; communication activities conducted – number of media and press releases	MT, tourism associations, OTRMs, and municipalities	###
<b>Indicators development</b>	1-2	#	##	##	Indicators developed, adopted and disseminated	MT, research institutions, climate change and tourism experts	###
<b>Knowledge base</b>	2-5	#	###	##	Climate change in tourism database created	MT, tourism associations, OTRMs, and municipalities	###
<b>Adaptive capacity assessment</b>	1-2	##	##	###	Report on the tourism sector adaptive capacity needs	MT, tourism associations, OTRMs, research institutions, tourism experts, and municipalities	##
<b>Capacity development (training and education)</b>	2-4	##	###	###	Number of seminars held; organizations covered; number of participants; training and communication tools developed; Number of Climate Change Tourism Adaptation courses and programs in higher institutions (number of students enrolled)	MT, tourism associations, OTRMs, educational institutions, tourism experts, and municipalities	###
<b>Specific adaptation measures</b>	2-13	###	###	###	Adaptation measures discussed, adopted and implemented; Number of EU and otherwise funded tourism adaptation projects; favorable tourism statistics	MT, tourism associations, OTRMs, private sector – tourism operators, tourism services suppliers, and municipalities	###

*Source: Author's vision.*

*Note: # = low, ## = medium, ### = high degree*

### **3.6. Conclusions**

296. The report highlights the importance of various measures to initiate a CCA in the economically important tourism sector in Bulgaria. These include:

#### *Awareness building*

297. Climate change is a reality and already affects tourism. In Bulgaria, this includes weather extremes, declining snow reliability, and storms, with repercussions for tourist arrivals and behavior, and holiday satisfaction. It is important that more stakeholders become aware of the challenges implied in climate change, as well as adaptation risks and opportunities. The mainstreaming of information about climate change vulnerabilities and the sector's contribution to climate change is of great significance to increase the overall level of preparedness.

#### *Data collection and statistics*

298. To manage the tourism system, it is necessary to understand markets and tourist demand responses in adverse situations. Data should be collected on arrivals and transport modes used, market shares, length of stay, spending, and flexibility in these parameters between countries and tourist types. It is equally important to understand how tourists react to extreme events, as analogues for the future in which such events may become more frequent and intense. Collected data can be analyzed to better manage existing tourism products and develop new ones, increase length of stay and spending, and encourage holidays during the shoulder season.

#### *Innovation*

299. To preemptively engage with adaptation, attempts should be made to diversify the tourism product in Bulgaria. This may include new products and activities, the development of new regional destinations for tourism, marketing attempts focused on the increasingly more attractive shoulder season, length-of-stay, and spending opportunities. Together, these measures contribute to a more stable tourism product that is less susceptible to extreme events and longer-term changes in climate. It may also be desirable to explore low-carbon tourism pathways to reduce the sector's contribution to climate change, in wider accordance with the Paris Agreement.

#### *Governance*

300. The challenge of climate change can only be with the cooperation of the public and private sectors. The MT, in cooperation with other ministries and government bodies, has a key role in initiating the process of developing a sectoral CCP for tourism, which emphasizes awareness building, data collection, and innovation. By taking the lead in the development of policies toward this goal, the MT should coordinate a process focused on policy definition, as well as grant acquisition and funding opportunities. This process should begin immediately.

301. It should be noted that the proposed adaptation measures are developed in the right direction but, overall, they cannot be implemented within the timeline set in the analysis. This is caused, in terms of financial resources, by the lack of funds for these measures in the MT's budget, but also by the wide range of expertise needed to prepare a sectoral strategy for CCA in the tourism sector. Underlying reasons are a low level of awareness and interest in CCA in the sector, a lack of scientific sectoral research on the topic, the lack of developed strategic sectoral documents, and so on. This puts the sector in a different starting position where it comes

## *Climate Change Adaptation – Assessment of the Tourism Sector*

to taking action to prepare and implement CCA measures.

302. It would be most suitable to specify and evaluate the CCA measures, proposed in this report, in a National Strategy and Action Plan on CCA in the Tourism Sector. The National Strategy on CCA and Action Plan in the Tourism Sector should be prepared by an external contractor in a public procurement procedure.

303. It should be borne in mind that, unlike for the tourism sector, other sector assessment reports include adaptation measures that can be supported by already active OPs which eases the process of implementing these actions.

304. To support any CCA step forward in the sector, funding is required. This calls for allocation of such funds in the budget of the MT. The 2018 budget has already been approved. Therefore, funds can be envisioned starting from the 2019 budget, following a detailed overview of funding opportunities of some of the actions by external donor programs. The lack of funds in the MT is elaborated in more detail in Section 2.6.1.

305. It should also be borne in mind that the adaptation options set out in this Sectoral Assessment should not be considered binding, as the Activities within the National Climate Change Adaptation Strategy and Action Plan (based on the proposed options in this Sectoral Assessment) are specified in more detail.

## References

- Abegg, B., S. Agrawala, F. Crick & A. de Montfalcon. 2007: Climate change impacts and adaptation in winter tourism. In: Agrawala, S. (ed.): *Climate Change in the European Alps. Adapting Winter Tourism and Natural Hazards Management*. Paris: 25–60.
- Allenbach, K., Herold Ch., Giuliani G., Lehmann A. 2015. “Black Sea Beaches Vulnerability to Sea Level Rise.” *Environmental Science and Policy* 46: 95–109.
- Ali, A., and A. J. Frew. 2014. “Technology Innovation and Applications in Sustainable Destination Development.” *Information Technology and Tourism* 14 (4): 265–290.
- ASC (Adaptation Sub-Committee). 2016. *UK Climate Change Risk Assessment 2017 Synthesis Report: Priorities for The Next Five Years*. Adaptation Sub-Committee of the Committee on Climate Change, London.
- Bocheva, Liliya, and Petio Simeonov. 2015. “Climatological Analysis of Tornado Events in Bulgaria During the Period 2001–2014.” European Conference on Severe Storms 2015, Wiener Neustadt, September 14–18.
- Bank of Greece. 2014. *Greek Tourism and Climate Change: Adaptation Policies and New Growth Strategy*. A Report. [www.bankofgreece.gr/BogEkdoseis/CCISC\\_Tourism\\_and\\_climate\\_change\\_FwCh1.pdf](http://www.bankofgreece.gr/BogEkdoseis/CCISC_Tourism_and_climate_change_FwCh1.pdf)
- Bosello F, Eboli F, Pierfederici R (2012) Assessing the economic impacts of climate change: An uploaded CGE point of view. In: Carraro C (ed). *Nota di Lavoro*. Fondazione Eni Enrico Mattei: Milano, Italy
- Carraro, C., and A. Sgobbi. 2008. *Climate Change Impacts and Adaptation Strategies in Italy. An Economic Assessment*. Fondazione Eni Enrico Mattei, Venice
- Commission Internationale pour la Protection des Alpes (CIPRA). 2004. *Innevamento e nelle Alpi – una relazione specifica*. [www.cipra.org/it/alpmedia](http://www.cipra.org/it/alpmedia)
- David Suzuki Foundation. 2009. *On Thin Ice: Winter Sports and Climate Change*.
- EEA (European Environment Agency). 2014. *National Adaptation Policy Processes in European Countries*. Publication Office of the European Union. [www.eea.europa.eu/publications/national-adaptation-policy-processes](http://www.eea.europa.eu/publications/national-adaptation-policy-processes).
- . 2016. *Economic Losses from Climate Extremes*. <http://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment>, last accessed on May 3, 2017
- . 2017. *Climate Change, Impacts, and Vulnerability in Europe 2016*. An Indicator-based Report, 419.
- Font, Xavier, and Ann Hindley. 2017. “Understanding Tourists’ Reactance to the Threat of a Loss of Freedom to Travel due to Climate Change: a new Alternative Approach to Encouraging Nuanced Behavioural Change.” *Journal of Sustainable Tourism* 25:1, 26–42, DOI: 10.1080/09669582.2016.1165235

## *Climate Change Adaptation – Assessment of the Tourism Sector*

- Fuchs, M., and W. Höpken. 2005. "Towards @Destination: a DEA-based Decision Support Framework." In *Information and Communication Technologies in Tourism 2005* edited by A.J. Frew, 57–66 . New York: Springer.
- Gössling, Stefan, Daniel Scott, C. Michael Hall, Jean-Paul Ceron, and Ghislan Dubois. 2012. "Consumer Behaviour and Demand Response of Tourists to Climate Change." *Annals of Tourism Research* 39 (1): 36–58.
- Gössling, S. 2015. New Key Performance Indicators for Water Management in Tourism. *Tourism Management* (46): 233–244. doi:10.1016/j.tourman.2014.06.018.
- Gössling, Stefan, Amata Ring, Larry Dwyer, Ann-Christin Andersson, and C. Michael Hall. 2015. "Optimizing or Maximizing? A Challenge to Sustainable Tourism." *Journal of Sustainable Tourism*, <http://dx.doi.org/10.1080/09669582.2015.1085869>.
- Gössling, Stefan, C. Michael Hall, and Daniel Scott. 2015. *Tourism and Water*. Bristol: Channel View Publications.
- Gössling, Stefan, R. Steiger, and B. Abegg. 2016. "It was Raining All the Time!: Ex Post Tourist Weather Perceptions." *Atmosphere* 7 (10). <http://dx.doi.org/10.3390/atmos7010010>.
- Hagemann, Harald. 2015. "Capitalist development, innovations, business cycles and unemployment: Joseph Alois Schumpeter and Emil Hans Lederer," *Journal of Evolutionary Economics*, Springer, vol. 25(1), pages 117-131, January. I
- PCC (Intergovernmental Panel on Climate Change). 2014. *Fifth Assessment Report: Summary for Policymakers*. <https://www.ipcc.ch/report/ar5/syr/>
- Jacob D., and A. Horanyi. 2009. Mathematical Problems in Meteorological Modelling, Climate Change and Variability: Impact on Central and Eastern Europe, CLAVIER Newsletter, 4-5-6, 6FP.
- Kaján, E., and J. Saarinen. 2013. "Tourism, Climate Change and Adaptation: A Review." *Current Issues in Tourism* 16 (2), 67–195.
- Kazachka, D. and V. Marinov. 2003. "Der Tourismus in Bulgarien während der Übergangsperiode." In: *Geographie der Freizeit und des Tourismus: Bilanz und Ausblick*, edited by Christoph Becker, Hans Hopfinger, and Albert Steinecke, 604–616. Oldenburg Verlag.
- Kerezieva, M. 2016. "Comparative Assessment of Adaptation Preparedness of Company and State Policy to Climate Changes in Agriculture and Tourism." *Economic Alternatives* (2): 201–209.
- Kreft, S., David Eckstein, Lukas Dorsch, and Livia Fisher, L. 2016. "Global Climate Risk Index 2016: Who Suffers Most from Extreme Weather Events? Weather-related Loss Events in 2014 and 1995 to 2014." <https://germanwatch.org/en/download/13503.pdf>
- Knight, C.G., S.B. Velev, and M.P. Staneva. 1995. "The Emerging Water Crisis in Bulgaria." *GeoJournal* (35): 415. doi:10.1007/BF00824348.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

- Kubryakov, A., Stanichny S.V., Volkov D.L. 2016. “Effects of the Basin Dynamics on Sea Level Rise in the Black Sea.” *Ocean Science*. doi:10.5194/os-2016-69, 2016, <http://www.ocean-sci-discuss.net/os-2016-69/os-2016-69.pdf>
- Matasci, Cecilia, and J.-C. Altamirano-Cabrera. 2012. *Climate Change and Tourism in Switzerland: a Survey on Impacts, Vulnerability and Possible Adaptation Measures*. Swiss Federal Institute of Technology, Lausanne, Switzerland.
- Mathis et al. 2003. Assessment Methods in Physical Geography cited in: Martijn van der Heide, C., and Wim Heijman. Editors. 2013. *The Economic Value of Landscapes*. Routledge Studies in Ecological Economics.
- Mochurova, M., T. Kaloyanov, and P. Mishev. 2012. “Impacts of Climate Change on Winter Tourism in Borovets”. *Икономически изследвания* 2:98–126. <https://www.ceeol.com/search/article-detail?id=139104>.
- National Climate Change Risk and Vulnerability Assessment for the Sectors of the Bulgarian Economy. 2014.
- OECD (Organisation for Economic Co-operation and Development) and UNEP (United Nations Environment Programme). 2011. *Climate Change and Tourism Policy in OECD Countries*. Paris, France: OECD and UNEP.
- Ogrin, M., D. Ogrin, N. Rodman, M. Močnik, R. Vengar, A. Smolej, and G. Bunčič. 2011. “Climate Change and the Future of Winter Tourism in Slovenia.” *Hrvatski geografski glasnik* 73 (1): 215–228.
- Palazov, A. 2016. “Flood-prone Low-lying Territories along the Bulgarian Black Sea Coast.” In: *Vignettes: Key Concepts in Geomorphology*, <http://serc.carleton.edu/31891>, March 15, 2017.
- Peychev, Veselin, and Dimitar Dimitrov. 2012. *Oceanology*, Varna, <http://www.io-bas.bg/downloads/Books/Okeanologia-new.pdf>
- Pröbstl, U. 2006, *Kunstschnee und Umwelt. Entwicklung und Auswirkungen der technischen Beschneigung*, Wien
- Quinn, B., K. A. Griffin, J. Stacey. 2008. “Poverty, Social Exclusion and Holidaying.” *Combat Poverty Agency Working Paper Series* 08/01, <https://books.google.bg/books?isbn=1905485549>
- Radunsky, Klaus., and Umweltbundesamt Wien. 2011. *Meeting the Challenges of Climate Change to Tourism in Austria*.
- Roudier, P., Andersson, J.C.M., Donnelly, C., Feyen L., Greuell W. *Climatic Change* (2016) 135: 341. doi:10.1007/s10584-015-1570-4
- Rutty, Michelle, and Daniel Scott. 2010. “Will the Mediterranean Become ‘Too Hot’ for Tourism? A Reassessment.” *Tourism and Hospitality Planning and Development* 7 (3): 267–281.



## *Climate Change Adaptation – Assessment of the Tourism Sector*

- Scott, D., C. Michael Hall, and Stefan Gössling. 2012. *Tourism and Climate Change: Impacts, Adaptation and Mitigation*. London: Routledge.
- Scott, D., G. Wall, and G. McBoyle. 2005. “The Evolution of the Climate Change Issue in the Tourism Sector.” In *Tourism, Recreation and Climate Change*, edited by C.M. Hall and J. Higham. Clevedon, UK: Channel View Publications.
- Scott, Daniel., Paul Peeters, and Stefan Gössling. 2010. “Can Tourism Deliver its ‘Aspirational’ Emission Reduction Targets?” *Journal of Sustainable Tourism* 18 (3): 393–408.
- Scott, Daniel, Stefan Gössling, C. Michael Hall, and Paul Peeters. 2016. “Can Tourism be Part of the Decarbonized Global Economy? The Policy Costs and Risks of Carbon Reduction Strategies.” *Journal of Sustainable Tourism* 24 (1): 52–72.
- Simpson, M.C., Gössling, S., Scott, D., Hall, C.M. and Gladin, E. 2008. *Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices*. Paris, France: UNEP, University of Oxford, UNWTO, WMO.
- Sofroniou, Anastasia, and Steven Bishop. 2014. “Water Scarcity in Cyprus: A Review and Call for Integrated Policy.” *Water* 2014 (6): 2898–2928; doi:10.3390/w6102898, [www.mdpi.com/journal/water](http://www.mdpi.com/journal/water).
- Steiger, R., and B. Abegg. 2012. *Climate Change Impacts on Austrian Ski Areas*. Institute of Mountain Research, [http://www.zobodat.at/pdf/IGF-Forschungsberichte\\_4\\_0288-0297.pdf](http://www.zobodat.at/pdf/IGF-Forschungsberichte_4_0288-0297.pdf), (accessed March 29, 2017)
- Steiger, R., and J. Stötter. 2013. “Climate Change Impact Assessment of Ski Tourism in Tyrol.” *Tourism Geographies* 15(4), p. 577-600. doi: 10.1080/14616688.2012.
- Teich, M.; Lardelli, C.; Bebi, P.; Gallati, D.; Kytzia, S.; Pohl, M.; Pütz, M.; Rixen, C.; 2007: Klimawandel und Wintertourismus: Ökonomische und ökologische Auswirkungen von technischer Beschneiung. Kurzfassung. Eidg. Forschungsanstalt für Wald, Schnee und Landschaft WSL, Birmensdorf.
- UNDP. 2004. *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*, Cambridge University Press, [http://www.cakex.org/sites/default/files/ALL\\_UNDP.pdf](http://www.cakex.org/sites/default/files/ALL_UNDP.pdf)
- UNFCCC (United Nations Framework Convention on Climate Change). 2015. “Intended Nationally Determined Contribution of the EU and its member states.” Submission by Latvia and the European Commission on behalf of the European Union and its member states.
- UNWTO, and UNEP. 2008. *Climate Change and Tourism: Responding to Global Challenges*. United Nations World Tourism Organization (UNWTO), United Nations Environment Programme (UNEP), and World Meteorological Organization (WMO), UNWTO: Madrid, Spain.
- Vodenska, M., and M. Assenova. 2011. *Introduction to Tourism*. MATKOM.
- Vodenska, M., and S. Mileva. 2017. “Sixty Years of Tourism Higher Education in Bulgaria.” *European Journal for Tourism Research*, Vol. 2 (in print).

## *Climate Change Adaptation – Assessment of the Tourism Sector*

- World Bank. 2010. *Changing the Climate for Development, World Development Report, Overview*, <http://siteresources.worldbank.org/INTWDRS/Resources/477365-1327504426766/8389626-1327510418796/Overview.pdf><sup>1</sup>
- World Tourism Organization. 1993. *Yearbook of Tourism Statistics*, Vol. I, 45 Ed.
- .2008. Sustainable development of tourism (climate change), <http://sdt.unwto.org/en/content/climate-change-tourism>
- WTTC (World Travel and Tourism Council). 2016. *Bulgaria: Travel and Tourism Economic Impact 2016*.
- . 2017. *Bulgaria: Travel and Tourism Economic Impact 2017*.
- Zachariadis, Th. 2012. “Climate Change in Cyprus: Impacts and Adaptation Policies.” *Cyprus Economic Policy Review* 6 (1): 21–37

## Annex 1. Potential Climate Change Impacts on the Tourism Sector in Bulgaria

Table 12. Potential climate change impacts on the tourism sector in Bulgaria

Affected Tourism Sector aspects	High temp		Low temp		Prolonged rainfall		Drought		Water table rise		Sea level rise		Specific effects of climate change relevant for tourism						Extreme Weather Events											
													Water shortage		Energy shortage		Short snow cover		Electric storms		Fogs		Floods		Avalanches		Land-slides		Storms	
	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P
Number of summer tourists and overnights	H	M	L	L	H	L	L	L			H	L	H	H	H	M	-	-					H	M	-	-	H	H	H	L
Number of winter tourists and overnights	H	M	H	M	H	M	H	H			-	-	H	L	H	M	H	H					-	-	H	H	M	M	M	L
Number of tourists and overnights in shoulder seasons	H	H	H	L	H	M	H	M			M	L	M	H	M	H	H	H					M	L	L	L	L	L	L	L
Seasonality	H	H	H	M	M	M	H	M			M	L	H	H	H	M	H	H					M	M	H	M	H	M	H	L
Inbound tourist markets	H	H	L	L	L	L	L	L			M	L	H	M	H	M	H	H					H	M	H	M	H	L	H	L
Number of beds in winter resorts	H	H	H	L	H	L	H	H			-	-	M	M	H	M	H	H					-	-	H	M	H	M	H	L
Number of beds in summer resorts	H	H	H	L	H	L	H	L			H	L	H	H	H	H	-	-					H	L	-	-	H	H	H	L
Number of beds in other resorts	H	H	H	L	H	L	H	H			-	-	H	L	H	L	-	-					H	M	-	-	H	M	H	L
Revenues - summer tourism	H	H	L	L	H	L	H	H			M	L	H	H	H	H	-	-					H	M	-	-	H	H	H	M
Revenues - winter tourism	H	H	H	M	H	L	H	H			-	-	H	L	H	L	H	H					-	-	H	M	H	L	H	L
Revenues - shoulder season	H	H	H	M	H	L	H	H			-	-	H	L	H	L	-	-					H	L	-	-	H	L	H	L
Average stay - summer	H	H	M	L	H	L	H	H			L	L	H	H	H	M	-	-					H	M	-	-	H	M	H	L
Average stay - winter	H	M	H	M	H	L	H	H			-	-	H	L	H	M	H	M					L	L	H	M	H	M	H	L
Average stay - shoulder season	L	H	M	M	H	L	H	M			L	L	H	L	H	L	M	L					H	M	H	L	H	M	H	L
Occupancy (%) winter	M	M	H	M	H	L	H	H			-	-	H	L	H	M	H	H					L	L	M	M	L	M	L	L
Occupancy (%) summer	H	H	M	L	H	L	H	H			L	L	H	H	H	H	-	-					M	L	-	-	H	L	H	L
Occupancy (%) shoulder season	H	L	M	L	H	L	H	H			L	L	H	M	H	L	-	-					L	L	-	-	H	L	H	L
Tourism employment	M	H	M	L	M	L	H	H			L	L	L	H	L	M	M	H					L	L	L	M	L	L	L	L
Tourism infrastructure	L	H	M	M	M	M	L	H			H	L	L	H	L	M	L	H					H	M	M	M	H	H	H	M

Legend: D = damage; P = probability of occurrence by 2050 at latest; U = unknown; H = high; M = medium; L = low  
■ = negative impact; ■ = positive impact; blank = neutral impact

## Annex 2. Climate Change Adaptation Options in Detail

Table 13. Adaptation options presented in detail

CLIMATE CHANGE ADAPTATION OPTIONS				
<b>I. Adaptive Governance</b>				
<b>1. ADAPT THE LEGAL FRAMEWORK TO MAKE IT INSTRUMENTAL FOR ADDRESSING CLIMATE CHANGE IMPACTS</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	The review of the legislative framework (subchapter 2.4) shows that it needs revision to become instrumental for addressing climate change impact. Although at national level some legislative and strategic documents consider climate change, the main document in the tourism sector, the Tourism Act, does not address the dynamics of understanding climate change and its impacts. Furthermore, roles and responsibilities for CCA have not yet been clarified. Subsector regulations do not have specific climate change related provisions.			
<b>Option's relevance</b>				
Economic	Ecologic	Social		
+++	+++	+++		
Opportunities that arise	When the legislation is oriented toward preventive climate change risk management, this saves financial resources for post-event recovery.			
Cross-cutting relevance	YES	Some legislative documents are intersectoral.		
Risks addressed	All risks			
<b>2. CREATE CROSS-SECTORAL POLICY FRAMEWORKS</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	It is essential to bind all sectoral policies in a general framework in which all adaptation options and measures are mainstreamed and complement each other. Any contradictory options, policies or measures must be avoided. This responsibility lies mainly with the MoEW which, in coordination with all other relevant ministries, must supervise the implementation of the National CCA Strategy across the national economy.			
<b>Option's relevance</b>				
Economic	Ecologic	Social		
+++	+++	+++		
Opportunities that arise	Many efforts as well as resources (financial, human, organizational, and so on) in the separate sectors will be saved.			
Cross-cutting relevance	YES	CCA management affects all human activities and the environment.		
Risks addressed	All risks			
<b>3. CLARIFY THE ROLES AND RESPONSIBILITIES OF THE INSTITUTIONS REGARDING CLIMATE CHANGE ADAPTATION</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	Unlike other institutional responsibilities, CCA has appeared only recently. This adaptation option requires the establishment of a management concept for climate change adaptation, for example a clear hierarchical structure and established institutional roles.			
<b>Option's relevance</b>				
Economic	Ecologic	Social		
+++	+++	+++		
Opportunities that arise	This option will allow an appropriate response, not only in case of extreme weather events, but whenever climate change-related measures are implemented.			
Cross-cutting relevance	YES	Roles and responsibilities regarding CCA cannot and should not be considered separately from the other activities of the institutions.		
Risks addressed	All risks			

## *Climate Change Adaptation – Assessment of the Tourism Sector*

### **4. DEVELOP FINANCIAL TOOLS (CREDIT, SUBSIDIES, AND PUBLIC INVESTMENT) FOR SUSTAINABLE MANAGEMENT OF CLIMATE CHANGE**

Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	To stimulate and enhance the implementation of all adaptation options including awareness and adaptive capacity raising, development and implementation of monitoring and evaluation systems, scientific research and development of the knowledge base for all economic sectors, it is highly recommended that these are subsidized through various financial instruments. The lack of sufficient funding is one of the main reasons for the weaknesses of all sectors and for the tourism sector in particular.			
<b>Option's relevance</b>				
Economic    Ecologic    Social				
	+++	+++	+++	
Opportunities that arise	When financing is secured, it creates opportunities for improvement of the infrastructure and new jobs as well.			
Cross-cutting relevance	YES	All CCA activities.		
Risks addressed	Risk to infrastructure: better operation and maintenance.			

### **5. DEVELOP INSURANCE AND RISK MANAGEMENT PROGRAMS**

Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	Establishment of a national fund for assistance in case of natural disasters will allow better management of the consequences.			
<b>Option's relevance</b>				
Economic    Ecologic    Social				
	+++	+++	+++	
Opportunities that arise	If a fund is available, damage will be recovered faster.			
Cross-cutting relevance	YES	Human well-being and life, buildings, roads, and so on.		
Risks addressed	Risk to infrastructure and services.			

## **II. Research and Technology development and innovations**

### **6. MAXIMIZE THE USE OF RESEARCH AND EDUCATION INSTITUTIONS**

Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	The analyses in this report show that Bulgaria does not use the research capacity. Among other weaknesses of such approach, it does not allow a learning-based approach to be applied. Researchers will bring up-to date knowledge in the process, especially in the dynamic field of climate change understanding. The following research contribution would enhance the overall quality of the actions of national institutions): <ul style="list-style-type: none"> <li>• Improved understanding of climate change and higher response rates.</li> <li>• Policies and regulation elaboration.</li> <li>• Developing models to support monitoring networks and decision making.</li> <li>• Development of eco-efficient technologies in line with the principles of a circular economy.</li> </ul> Funds should be allocated to well-targeted research activities.			
<b>Option's relevance</b>				
Economic    Ecologic    Social				
	+++	+++	+++	
Opportunities that arise	Research achievements bring novelty. When implemented, a number of side benefits will arise, including social and environmental. In many cases this has also a preventive or mitigating role in climate change.			
Cross-cutting relevance	YES	Social – better lifestyle (e.g. new appliances); Financial – less costs (e.g. more efficient technologies); Environmental – less resources used, less pollution.		
Risks addressed	All risks			

## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>7. DEVELOPMENT OF A SYSTEM OF MONITORING CLIMATE CHANGE AND MONITORING INDICATORS</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	Monitoring systems and tools will help stakeholders be informed on a regular basis about climate change, its impact on tourism, and the effect of adaptation activities. Based on this information, stakeholders will be able to review their action plans and adjust them to any observed changes.			
<b>Option's relevance</b>				
Economic	Ecologic	Social		
+++	+++	+++		
Opportunities that arise	Stakeholders will be able to review their action plans and adjust them to any observed changes.			
Cross-cutting relevance	YES	Database could be used by different stakeholders for analysis and decision making		
Risks addressed	All risks			
<b>8. ESTABLISH DYNAMIC PUBLICLY AVAILABLE DATABASE SUPPORTING CLIMATE CHANGE DECISION MAKING</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	<p>This measure will help stakeholders from various economic sectors to be informed on a regular basis about climate change and its impact on the economy, and to evaluate the effect of adaptation activities. There is a need to develop tools and decision-making frameworks that can effectively inform and support adaptation policies and strategies, particularly at relevant scales and aggregated levels (municipal, national). Such tools can include information and communication technology (ICT) and other instruments, along with economic analyses. Currently, data monitoring is carried out by different institutions, like the NIMH, RBDs, water operators, and others. Data collection is difficult, and in some cases, the information must be paid for. Not all parameters are measured and monitored. The way indicators are monitored, and data are processed, is not unified, which creates uncertainty. This option is about development of a publicly available GIS database with information about:</p> <ul style="list-style-type: none"> <li>• Historical data on climate and extreme weather events</li> <li>• Register of infrastructure</li> <li>• Real time monitoring of water resources, weather data, infrastructure indicators, and so on</li> </ul>			
<b>Option's relevance</b>				
Economic	Ecologic	Social		
+++	+++	+++		
Opportunities that arise	Storing data in one place in a unified format will reduce the risk of mistakes and wrong interpretations. Making data publicly available will allow different stakeholders to use it and researchers to prepare more comprehensive studies.			
Cross-cutting relevance	YES	Database could be used by different stakeholders for analysis and decision making.		
Risks addressed	All risks			

III. Improving awareness and building adaptive capacity				
9. IMPROVING AWARENESS: CCA AWARENESS RAISING CAMPAIGNS, EDUCATION AND TRAINING				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	<p>Citizens and stakeholders should be informed about vulnerabilities and risks, associated with climate change. They should be further informed about the measures they can take to proactively adapt to climate change. This option requires stimulation of public self-mobilization and action, and mobilization of local knowledge and resources. Awareness campaigns can address groups of people in a region affected by a particular climate threat. This option requires development and implementation of public education and training programmes. Special courses and programs can be introduced in schools and universities.</p> <p>Studies that have examined climate change risk appraisal among policy makers and tourism practitioners have consistently found low awareness of and low adaptive capacity to climate change.</p> <p>Appropriate tools for the induction of the private sector (tour operators, hotel and restaurant businesses, and so on) to the problems of climate change and its effects on the Bulgarian tourism sector and the possible adaptation and mitigation actions must be developed and implemented.</p> <p>Development and conducting of training seminars in the tourist regions for which specific education and training materials must be developed.</p>			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	This option creates great opportunities. Behavioral change is a powerful factor. It can also contribute to preventing or at least mitigating climate change.			
Cross-cutting relevance	YES	Social – behavioral change; Environmental – protection and mitigation; Financial – less damages from natural hazards, meaning less funds needed for recovery.		
Risks addressed	All risks			

10. DEVELOP A METHODOLOGY FOR ASSESSMENT OF THE ADAPTIVE AND RISK MITIGATION CAPACITY OF THE TOURISM SECTOR				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	<p>While the potential range of climate change impacts in the tourism sector is broadly understood, there is a more limited understanding of the tourism industry's adaptive capacity. The UNWTO (UNWTO, UNEP, and WMO 2008) has determined the sub-sectoral adaptive capacity as high for tourists, medium for the intermediary subsector (tour operators, travel agents, transportation providers [airlines, railways]), and low for destinations in general, that is, hotels, resorts, attraction operators, and local communities. For Bulgaria, a preliminary research of the Bulgarian tourism sector's adaptive capacity has been conducted showing its considerably low level of preparedness.</p>			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Wider understanding of climate change and the need for adaptation actions. Informed choice of adaptation measures in specific destinations.			
Cross-cutting relevance	YES	Climate change management affects all human activities and the environment.		
Risks addressed	All risks			

## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>11. DEVELOPMENT OF THE ADAPTIVE CAPACITY IN THE TOURISM SECTOR</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	<p><b>Decision making and policy making support tools and assessments, including on the costs and benefits of impacts and adaptation.</b> There is a need to develop tools and decision-making frameworks that can effectively inform and support adaptation policies and strategies, particularly at the relevant scales and at aggregated levels (municipal, national). Such tools can include information and communication technology (ICT) and other instruments, along with economic analyses. Develop specific information materials (Internet and other media).</p> <p><b>Knowledge on effective adaptation.</b> An enlarged pool of adaptation and mitigation case studies is needed to transfer knowledge on topics such as the identification of adaptation options and criteria for their selection, decision making frameworks and the integration of adaptation within routine planning, cost-efficient combinations of measures as well as more general issues of governance and timing.</p>			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Better-informed decision making and policy making and better knowledge on effective adaptation.			
Cross-cutting relevance	YES	At regional and local levels, it will affect all sectors since the local authorities have to deal with CCA of all types		
Risks addressed	All risks			

### IV. Specific tourism related adaptation options

<b>12. DEVELOP AND APPLY ADAPTIVE WATER PRICING</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	<p>Water tariff levels and the water tariff structure can both contribute to environmental sustainability if it is used to manage demand (to encourage a more rational and efficient use of the resource) and to recoup the costs of the damage born by the environment (that is, negative impacts on ecosystems, including pollution).</p> <p>Some countries have already applied tariffs, which are believed to contribute to more efficient water use. Examples are two-component tariff structures with a fixed part (uniform flat rate) and a variable part (increasing block rate), applied in Belgium, Portugal, Spain, Italy.</p>			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	More revenues collected by water operators, would allow infrastructure improvement investments			
Cross-cutting relevance	YES	Efficient water use means also efficient energy use.		
Risks addressed	Risk to services (less water will be used, higher availability in nature)			



## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>13. PROMOTE SYNERGY OF WATER AND ENERGY SAVINGS AND EFFICIENT USE</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	Several EU documents prompt the interrelation of water and energy. In pumping water supply or irrigation systems, the more water is delivered, the more energy is used. At household level, some appliances like dishwashing or washing machines use both water and energy. This option requires all systems to be analyzed regarding their eco-efficiency. The life cycle assessment approach has proven to be the most comprehensive one. Once such analyses are done, options for each system should be further suggested and financially assessed.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	The synergy between water and energy efficiency will lead to environmental benefits (less CO <sub>2</sub> emissions, less water wasted), to financial benefits (less water or energy used, less finances spent) and to social benefits (enhanced living comfort).			
Cross-cutting relevance	YES	This option will impact mostly the urban sector.		
Risks addressed	Mostly the risk to infrastructure, but also the risk to services (when water efficient infrastructure and appliances, higher probability for sufficient water in drought periods).			
<b>14. DEVELOPMENT OF FOUR-SEASON TOURISM ACROSS THE COUNTRY</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	The development of four-season tourism in all tourist destinations will make the tourism industry less vulnerable to negative climate change impacts. The year round, the tourism sector will be ready and prepared for all types of climate and weather conditions.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	More uniform utilization of all existing infra- and superstructures (both general and specialized). Increased tourist numbers, decreased tourist season, greater competitiveness.			
Cross-cutting relevance	YES	This will ease the seasonal tension caused by tourist activities on all other sectors.		
Risks addressed	All risks			
<b>15. NEW MARKET SEGMENTATION AND NEW MARKETING STRATEGIES DEVELOPMENT AND IMPLEMENTATION</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	The identification of new segments in the existing and new tourist markets will help further diversify the Bulgarian tourist portfolio and offer higher-quality services and diversified tourism packages (with the development of more additional services and products) with greater flexibility, not depending so heavily on climate and current weather conditions.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Attraction of new market segments, increase of tourist numbers, higher quality tourism development.			
Cross-cutting relevance	YES	All sectors will benefit from the new arrivals to the country.		
Risks addressed	All risks			

## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>16. DEVELOPMENT OF A NATIONAL ADAPTATION STRATEGY FOR CCA IN THE TOURISM SECTOR</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	This will provide guidance to the private industry and coordinate CCA actions in the tourism sector in general. This can include both regulatory documents in which adaptation measures implemented by the private sector are compulsory, or there can be various tax concessions for the companies implementing recommended adaptation measures. This will help all stakeholder groups in developing, implementing, evaluating, and updating any tourism adaptation plans and/or initiatives in which they will be involved.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Implementation of CCA actions related to the tourism sector will be justified into a normative document and thus become obligatory for all tourism stakeholders, including the private sector.			
Cross-cutting relevance	YES	The new Strategy will support CCA actions in all sectors.		
Risks addressed	All risks			
<b>17. DEVELOPMENT OF NEW TOURISM TYPES AND DESTINATIONS</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	Among the new tourism types various types of cultural tourism (historic, archaeological, special route tourism) can be considered; wine and culinary tourism; special events (festivals, competitions, and so on) tourism; religious tourism, as well as SPA and wellness tourism and so on. New tourism destinations may be identified in the inner parts of Bulgaria outside traditional seaside and winter mountain tourism destinations. This can be considered a task of the newly constituted OTRMs whose objective will be tourism developments outside the most popular resorts in places with underdeveloped conditions and resources within the nine tourist regions in the country.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Ensuring better use of local resources including, nature, human capital, infrastructure, etc. Better territorial distribution of tourism costs and benefits. Less impact on already developed tourism destinations in the mountains and at the seaside.			
Cross-cutting relevance	YES	Better distribution of resources utilization in all sectors.		
Risks addressed	All risks			
<b>18. SHIFT FROM LARGE-SCALE TOURISM TO SPECIAL INTEREST TOURISM</b>				
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism
	X	X	X	X
Description	By the development of new tourist products and destinations a more general objective of the Bulgarian tourism evolution can be accomplished – the country will be able to reposition itself from a strictly seasonal destination with predominantly large-scale mass tourism types (seaside summer tourism and mountain winter ski-tourism) to a boutique destination offering a high-quality portfolio of special interest tourism characterized by smaller but higher-class tourists.			
<b>Option's relevance</b>				
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>		
+++	+++	+++		
Opportunities that arise	Less impact on general and specific infrastructure, better adaptation capacity to climate changes.			
Cross-cutting relevance	YES	All sectors will feel the difference.		
Risks addressed	All risks			

## *Climate Change Adaptation – Assessment of the Tourism Sector*

<b>19. INTRODUCTION OF AN EARLY WARNING SYSTEM IN TOURISM RESORTS AND DESTINATIONS</b>						
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism		
	X	X	X	X		
Description	In all important tourism resorts and destinations an early warning system for expected or imminent extreme weather conditions (extreme rains, tornadoes, heat waves, floods, etc.) and their consequences (landslides, avalanches and others) is to be introduced. Both tourists and personnel must be informed about its functioning and the actions they must undertake when such an occasion arises.					
<b>Option's relevance</b>						
<table border="1"> <tr> <td><b>Economic</b></td> <td><b>Ecologic</b></td> <td><b>Social</b></td> </tr> <tr> <td style="text-align: center;">+++</td> <td style="text-align: center;">+++</td> <td style="text-align: center;">+++</td> </tr> </table>					<b>Economic</b>	<b>Ecologic</b>
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>				
+++	+++	+++				
Opportunities that arise	Less damage on the super- and infrastructure, less negative impacts on humans and their health.					
Cross-cutting relevance	YES	All sectors present in the resorts and the destinations will benefit from the warning system.				
Risks addressed	All risks					

<b>20. BETTER MANAGEMENT OF WINTER TOURISM INFRASTRUCTURE</b>						
Relevant to:	Tourist season	Tourist numbers	Summer tourism	Winter tourism		
	X	X	X	X		
Description	This includes some technical actions such as: <ul style="list-style-type: none"> <li>• closing of inefficient slopes</li> <li>• improvements and any other managerial changes (for example, abolishment) in snow production</li> <li>• concentration of winter ski tourism only in top destinations</li> <li>• moving winter ski tourism and sports to higher elevations with enough snow</li> </ul>					
<b>Option's relevance</b>						
<table border="1"> <tr> <td><b>Economic</b></td> <td><b>Ecologic</b></td> <td><b>Social</b></td> </tr> <tr> <td style="text-align: center;">+++</td> <td style="text-align: center;">+++</td> <td style="text-align: center;">+++</td> </tr> </table>					<b>Economic</b>	<b>Ecologic</b>
<b>Economic</b>	<b>Ecologic</b>	<b>Social</b>				
+++	+++	+++				
Opportunities that arise	Diversification in other tourist and leisure activities. Diversification in other economic activities.					
Cross-cutting relevance	YES	Opportunities for better resources utilization in all sectors.				
Risks addressed	All risks					

## **Annex 3. Cost-benefit Analysis**

### **1. General Description**

The tourism sector is one of the important sectors where climate change can have large impacts, affecting numbers of tourists and, consequently, the revenues and employment they generate. The conceptual framework of the cost-benefit-analysis (CBA) was developed based on climate change affecting tourism.

The purpose of this section is to:

- Estimate the parameters of a relationship between key performance indicators and climate change indicators for the tourism sector (temperature +2°C and +4°C rise, and precipitation changes). It is considered that climatic drivers associated with the impact assessment are average temperature and average precipitation.
- Develop a CBA model – appraising the costs and benefits of adaptation actions, thus measuring the efficiency of investments. It quantifies the anticipated costs and benefits of adaptation options with the aim of comparing them and determining whether the benefits outweigh the costs. Benefits are the advantages or positive effects of adaptation measures. Costs are the resources required to deliver adaptation measures. The effects are expressed as a decrease in costs because of measures taken.

#### **1.1. Description of the methodology**

Climate effects were evaluated in an integrated assessment model, which combines a regression (or sensitivity) analysis with CBA, that is, assesses the value of the costs and benefits of each adaptation action - giving a net present value (NPV) - and compares the costs (investment expenditure) and benefits (costs avoided). Costs and benefits are expressed in monetary terms and a discount rate is used to determine the NPV<sup>92</sup> of the adaptation measures.

The regression analysis - as a technique to assess adaptation measures under uncertainty - identifies those factors that have most influence on main sectoral indicators.<sup>93</sup> The effect can be positive or negative. Positive impact for example results in increased numbers of tourist days while a reduction in the number of tourist days is a negative impact.

Regression analysis was used to determine the effect of climatic variables on the performance of the tourism indicators. This function is normally used when both the dependent and the explanatory variables are linear. The dependent variables are the main sectoral indicators where the independent variables are climatic (temperature and precipitation). Linear extrapolation of the key indicators was accounted aiming at identifying how the sector would develop under each scenario. Extrapolation quantified each individual indicator.

---

<sup>92</sup> The NPV of an adaptation option is given by the present value of the estimated benefits net of costs. If NPV is more than zero, this indicates that the investment is efficient and incremental benefits of adaptation exceed the incremental resource costs. If NPV is <0 or B/C is <1, then the adaptation measures add no net benefit to the Tourism sector. If NPV is >0 or B/C is >1, then it adds positive benefits and. The positive value of NPV confirms that investments for adaptation are efficient. The benefit-cost ratio (B/C) is the ratio of the present value of benefits to the present value of costs. When the B/C ratio is more than one, the present value of the option's benefits is larger than the present value of its costs.

<sup>93</sup> The regression is linear; the dependent and the explanatory variables are linear.

## *Climate Change Adaptation – Assessment of the Tourism Sector*

The estimation of the negative and positive effects of climatic change was developed according to distinct scenarios at +2°C and +4°C temperature rise by 2050. These main scenarios are divided into sub-scenarios: optimistic, realistic, and pessimistic. The sub-scenarios are considered in the context of efficient and effective implementation of the proposed climate change adaptation measures.

The projected effects of adaptation measures are expressed as a logarithmic function, which is a tool to measure the effects of investments that would be gradually made until 2050.

An assessment was carried out of the NPV and the benefits until 2050, holding all other aspects constant. The monetary value of the effects was discounted by 4.5 percent for public funding and by 8 percent for private funding.

The benefits are defined as the positive effect of the implementation of climate change adaptation measures in the tourism sector.

### **1.2. Data collection procedure**

The primary data used for the CBA was obtained from the Action Plan that is part of the draft proposal for a National Climate Change Adaptation Strategy and Action Plan for Bulgaria, and from official statistical data.

The correlation determined whether there is a relationship between the performance indicators and climate factors. The relationship indicates which indicators are significantly dependent on climate change. Estimation of the correlation coefficient (dependence between each sectoral indicator and climate change factors [temperature and precipitation]) is used to stand out and select the critical variables (variables, which are highly sensitive to climate factors).

### **1.3. Model specifications - assumptions and limitations**

A number of assumptions were made when preparing and carrying out the CBA.

- It is assumed that the tourism performance indicators depend on climate factors (temperature and precipitation).
- An assumption that limits the quantitative approach is that most of sectoral performance indicators change as a result of the shift in temperature and precipitation. In reality, there is a range of other factors (human actions, management, macroeconomic development, demand of tourism services, national and European policies, tourist preferences, and others) that may contribute to impacting the performance indicators. The influence of these factors is difficult to be filtered and calculated. Therefore, statistic dependency between climate change factors and performance indicators is not explicitly expressed.
- The possible effects of implementing adaptation measures mainly refer to winter and summer tourism. Other types of tourism (spa, rural, cultural, and other) are not considered because of a lack of official statistical data. The projected trend value of each sector indicator is based on historical data (2008–2015).
- Climate projections (temperature and precipitation) were applied to historical variances experienced in Bulgaria (1991–2015). The observations are from monthly weather variables: monthly temperature (maximum, minimum, and average) and precipitation (maximum, minimum, and average). The effects of the adaptation measures on the

## *Climate Change Adaptation – Assessment of the Tourism Sector*

sector performance indicators stem from an expert assessment and from predictions of climate factors.

- The probability of extreme events, such as floods, landslides, droughts, water shortage, short snow cover, and other, is not accounted for, but they are indirectly included, by considering that the change in the climatic indicators is a factor for extreme events.
- A baseline scenario is used to evaluate the development trend of the performance indicators under the +2°C and +4°C temperature rise scenarios. The baseline scenario reflects a continuation of current policies and plans, that is, a future in which no new measures are taken to address climate change.
- In this sector assessment report adaptation options include management, planning, public awareness, decision-making, policies, and others. The assumption is that these ‘soft’ measures will have positive effects and that the sum total of effects of adaptation measures is presented aggregately. Therefore, the adaptation options have been divided into two groups: general measures (such as *developing sectoral climate change policies, raising awareness on climate change, strengthening the sector’s knowledge base, adapting existing tourism, and others*) and specific measures (*developing climate change training, improving monitoring, and others*).
- The data refer to the main resorts in Bulgaria.<sup>94</sup> Statistical information is scarce for other tourist settlements and types of tourism. Therefore, the calculated impacts of climate change on tourism is limited to the main tourist resorts.
- Additionally, there is no data for snow cover, for snow making costs, and for water demand which all depend on the weather conditions.

## **2. Results of the Regression Analysis**

The correlation indicates the relationships between climate change factors and performance indicators. Average stay, tourism revenues, number of nights (winter and summer resorts), tourism revenues in winter resorts, tourism revenues in summer resorts, and number of beds are sensitive to climate change factors, but as a whole their statistic dependency is not significant, because the dynamics of sectoral performance indicators is associated with other economic and social variables rather than with climate factors.

There is a significant dependency between climate factors and tourism performance indicators.

The cumulative sector effects presented in **Table 14** illustrate the difference between the baseline scenario (that is, without implementing selected adaptation options), and the +2°C and +4°C temperature rise scenarios until 2050.

---

<sup>94</sup> Summer resorts: Albena, Golden Sand, Ekenite, Duni, Sunny Beach, Konstantin and Elena, Primorsko. Winter resorts: Pamporovo, Borovetz

## *Climate Change Adaptation – Assessment of the Tourism Sector*

**Table 14. Expected sector effects from climate change in the tourism sector until 2050 without adaptation measures – baseline scenario (in € million)**

Performance Indicators	2°C scenario	4°C scenario
<b>Total tourism revenues</b>	23,057.74	46,115.48
<b>Total revenues (overnights only) - Winter resorts</b>	160.81	321.63
<b>Total revenues (overnights only) - Summer resorts</b>	6,473.14	12,946.28

Based on correlation, it can be concluded that air temperature is an extremely good predictor for changes in the number of international tourists and the average stay of Bulgarian and international visitors.

The baseline scenario shows that the number of nights spent by international visitors in beach resorts generally increases in parallel with higher temperatures in both scenario (+2°C and +4°C temperature rise) to 2050. An upward trend of the indicator “percent of nights spent by international visitors” demonstrates a positive effect of increased temperature. On the other hand, overnight stays in winter resorts will decrease because of temperature rise. Total revenues from nights in winter resorts are projected to decrease by €160.8 million at +2°C and €321.6 million at +4°C. However, total revenues from nights in summer tourism are projected to grow by €6.4 billion at +2°C and €12.9 billion at +4°C. The expected increase in temperature may result in shifts in summer tourism in the longer term. Total revenues will increase by €23.0 billion at +2°C and €46.1 billion at +4°C until 2050.

Conditions for summer tourism are expected to improve when temperatures rise. The beach season will be prolonged to spring and autumn. Moreover, air temperature increase causes an exponential increase in the number of tourists. In accordance with the model’s predictions, if summer air temperature increases by 2°C and 4°C until 2050, that would increase the number of tourists and the number of overnight stays. The negative effects of the climate change on winter tourism are thus balanced by the positive effects of summer tourism. Winter tourism will be most negatively affected by climate change. Therefore, the focus of adaptation measures would best be on winter tourism. Additionally, winter tourism is concentrated in specific areas in Bulgaria, where it is a major source of income and a structurally determining sector for the economy. Negative climate manifestations in these areas may cause shocks to the local and regional economies (municipalities, resorts, and settlements).

Although the CBA model has important limitations, it indicates that rise of temperature will not threaten tourist demand in the short term, but in the longer-term average tourist stay will decrease in winter resorts and summer tourism revenues are expected to grow.

### **3. Results of the Cost-benefit Analysis**

The CBA for the sector focuses on the assessment of soft adaptation measures. The benefits gained as a result of their implementation are best exemplified through the quantification of saved costs in main performance indicators (total tourism revenues; total revenues of Winter resorts [overnights only]; total revenues of Summer resorts [overnights only]; and others. Considering the complex impact of the adaptation options on the Tourism, these were not separately quantified in the current CBA. The net present value (NPV) in **Table 15** illustrates the monetary value of avoided losses as a result of implemented adaptation measures, while the

## *Climate Change Adaptation – Assessment of the Tourism Sector*

cost effectiveness quantifies the benefits achieved in relation to the required investments/costs.<sup>95</sup>

**Table 15. Benefits of adaptation measures in the Tourism sector under different climate scenarios until 2050 (in € million)**

Climate scenarios	NPV (€ million)	Cost-effectiveness (Benefit/Cost ratio)
<b>Realistic scenario +2°C</b>	107.72	16.46
<b>Optimistic scenario +2°C</b>	134.49	20.30
<b>Pessimistic scenario +2°C</b>	80.95	12.62
<b>Realistic scenario +4°C</b>	143.80	21.64
<b>Optimistic scenario +4°C</b>	178.99	26.69
<b>Pessimistic scenario +4°C</b>	108.61	16.59

The projection shows that on average, under the +2°C realistic scenario, the total cash flow in NPV is €107.7 million, and €143.8 million under the realistic scenario at +4°C. Under the optimistic scenario, the projected cash flow in NPV is €134.5 million under the +2°C scenario and €179.0 million – under the +4°C scenario. Even under the pessimistic scenario, the future cash flow in NPV is projected at €81.0 million at +2°C and €108.6 million at +4°C.

Within the current analysis, the cost-effectiveness of the adaptation measures is used to quantify the effect of investments under each scenario.<sup>96</sup> Under the +2°C realistic scenario, the benefit/cost ratio is €16.46 (that is, the benefits achieved per Euro spent), and €21.64 under the +4°C realistic scenario. The benefit is higher at +4°C temperature rise. In that case, the benefit is €26.69 per one Euro of investment under the optimistic scenario and €16.59 per one Euro of investment under the pessimistic scenario.

## **4. Conclusions**

The CBA shows that the NPV is positive in all scenarios, which is an evidence that investments are economically efficient, and the cost/benefit ratio indicates sustainable return of investment. Implementation of adaptation measures in the tourism sector will contribute to avoiding future damage and will have a positive return on investment for both the public and private sector. The implementation of selected adaptation options is economically justified. The expected tourism revenues as a result of all adaptation measures will be higher during the summer-tourism season and lower during the winter-tourism season.

<sup>95</sup> The NPV of an adaptation option is given by the present value of the estimated benefits and costs. If NPV is more than zero, this indicates that the investment is efficient and incremental benefits of adaptation exceed the incremental resource costs. If NPV is <0 or B/C is <1, then the adaptation measures add no net benefit to the Tourism sector. If NPV is >0 or B/C is >1, then it adds positive benefits. The positive value of NPV confirms that investments for adaptation are efficient. The benefit-cost ratio (B/C) is the ratio of the present value of benefits to the present value of costs. When the B/C ratio is more than one, the present value of the option's benefits is larger than the present value of its costs.

<sup>96</sup> The cost-effectiveness refers to all measures.



## **Annex 4. Miscellaneous Tourism Sector Information**

### **Projections of future tourism development in Bulgaria (WTTC 2016)**

The total contribution to GDP and to overall employment is expected to reach over 16 percent and foreign visitors exports are expected to reach 14 percent. Leisure travel spending (inbound and domestic) generated 74.1 percent of direct travel and tourism GDP in 2016 (BGN 6,729.1 million) compared to 25.9 percent for business travel spending (BGN 2,348 million). Leisure travel spending is expected to grow by 2.0 percent in 2017 to BGN 6,861.1 million and rise by 4.8 percent per year to BGN 10,952 million in 2027. Business travel spending is expected to grow by 14.0 percent in 2017 to BGN 2,675.9 million and rise by 4.9 percent to BGN 4,324.1 million in 2027. Domestic travel spending generated 23.3 percent of direct travel and tourism GDP in 2016 compared to 76.7 percent for visitor exports (that is foreign visitor spending or international tourism receipts). Domestic travel spending is expected to grow by 2.9 percent in 2017 to BGN 2,175.9 million and rise by 3.4 percent per year to BGN 3,052 million in 2027. Visitor exports are expected to grow by 5.7 percent in 2017 to BGN 7,361.2 million and rise by 5.2 percent per year to BGN 12,224.1 million in 2027.

## **Behavioral Pattern of International Tourists Related to their Accommodation Choice**

In 2016, the total number of nights spent in any type of accommodation was 25.2 million and the share of nights spent in hotels (over 90 percent) identify the main characteristics of the behavioral pattern in type of accommodation preferred. Tourists from the foreign market traditionally stay in hotels because it dominates in the Sofia region and the seaside and winter mountain resorts, which were overbuilt with hotels in 2003–2009 (international overnights in 2016 was 16.2 million).

## Bansko Resort - Ski Pass Prices

*Table 16. Ski Pass Prices from March 15, 2017 till April 17, 2017*

	ADULTS pass (BGN)	STUDENTS (BGN)	CHILDREN 7-12 YEARS (BGN)	CHILDREN UP TO 7 YEARS (BGN)
Drag 'First station'-1 day	10	10	10	1
Gondola lift pass (up-down)	22	20	16	1
S-day card (from 12:30 p.m.)	38	34	27	1
1 day	46	42	32	1
2 days	90	81	56	2
3 days	136	122	79	3
4 days	179	162	96	4
5 days	224	202	112	5
6 days	272	245	132	6
9 days	400	360	176	9
13 days	560	504	260	13
Ski pass 'Bansko Twenty'	800	750	700	20
Seasonal Ski pass	1,500	1,400	1,300	100

*Table 17. Family Cards from December 3, 2016 till April 17, 2017 (included)*

CARD TYPE	PRICE (BGN)
Family season card /2 parents and 1 kid (up to age 16)	3,000
Family season card /2 parents and 2 kids (up to age 16)	4,000
Family season card /2 parents and 3 kids (up to age 16)	5,000
Family season card /2 parents and 4 kids (up to age 16)	6,000
Family season card /2 parents and 5 kids (up to age 16)	7,000

## **Sofia Airport – Press Release**

### ***“Sofia Airport Handled 500,000 Passengers in March”<sup>97</sup>***

*April 18, 2017 / 12:55*

*Sofia, April 18 (BTA) - As many as 515,857 passengers were handled by Sofia Airport in March 2017, increasing by 52 percent compared with March 2016, the airport management said on Tuesday.*

*International and domestic flight passengers went up by 53 percent and 60 percent, respectively. The increase of domestic flight passengers is mostly due to the discounts, offered by Bulgaria Air, and the daily services from Sofia to Varna, launched by Wizz Air.*

*Charter flight passengers handled by Sofia Airport rose by 46 percent year-on-year owing to the extended skiing season.*

*A total of 4,663 airplane landings and takeoffs were performed at the airport during the month in review, going up by 26 percent, year-on-year.*

*The monthly amount of cargo and mail processed by Sofia Airport dropped by 11 percent to 1,743 tonnes.*

*The summer schedule of the Sofia Airport offers convenient flights with 25 carriers to 68 airports in Europe and the Middle East.*

*A new regular service is launched to Catania, Sicily and as of the end of June there will be regular flights to Bratislava.*

*As of May, low-cost companies will offer flights to two of the most preferred destinations, Amsterdam and Frankfurt.”*

---

<sup>97</sup> <http://www.bta.bg/en/c/DF/id/1559926>.

## Bulgaria’s Ranking in the Global Climate Risk Index, 2016

*Table 18. The climate risk index for 2014: the most affected countries*

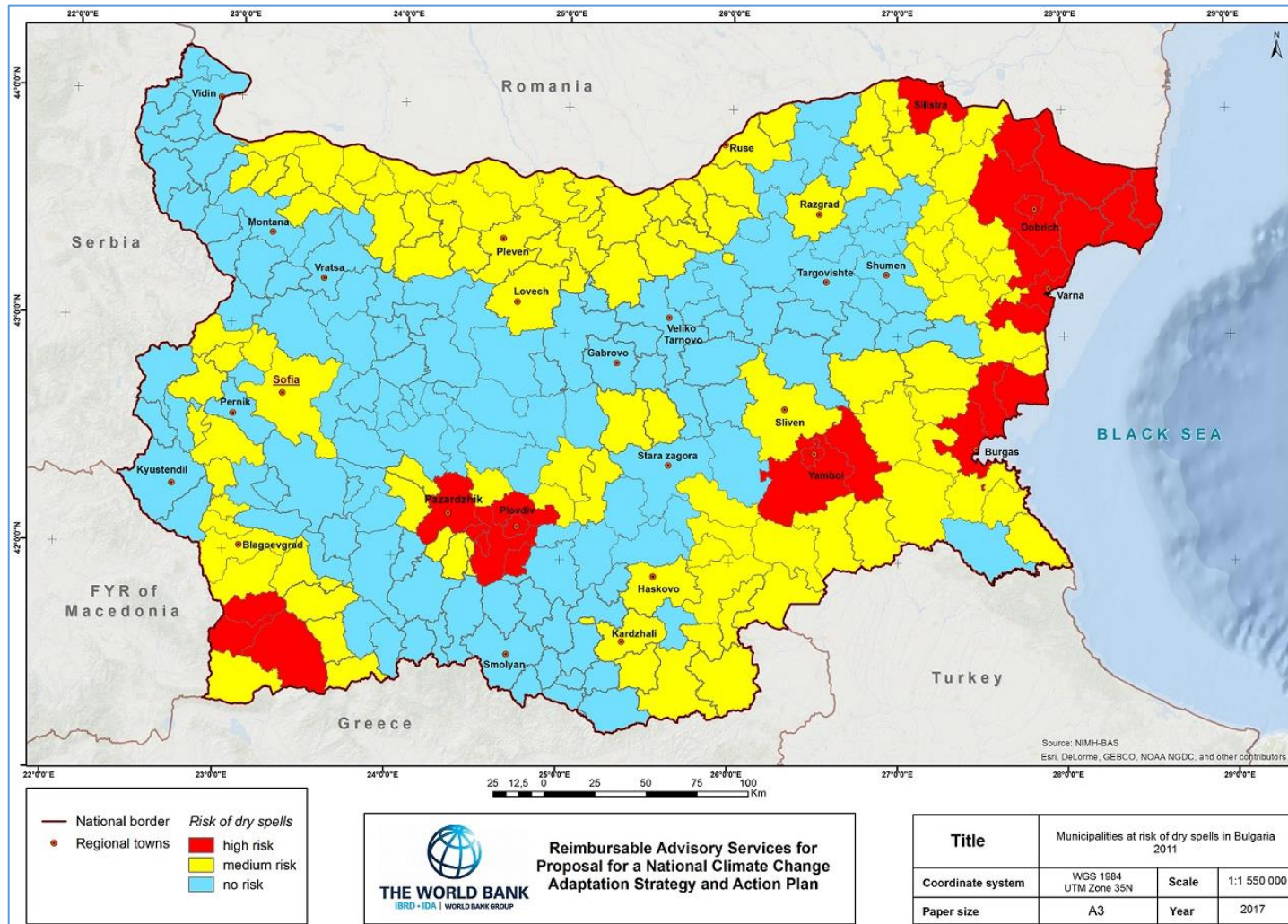
Ranking 2014 (2013)	Country	CRI score	Death toll	Death per 100 000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Human Development Index 2014
1 (93)	Serbia	8.17	59	0.8236	3300.307	3.4435	77
2 (15)	Islamic Republic of Afghanistan	10.67	434	1.3875	337.085	0.5543	169
3 (89)	Bosnia and Herzegovina	11.50	26	0.6717	3584.776	9.3617	86
4 (1)	Philippines	12.50	328	0.3299	3312.686	0.4777	117
5 (6)	Pakistan	12.67	1227	0.6590	2220.527	0.2511	146
6 (77)	Bulgaria	13.83	31	0.4304	2383.604	1.8463	58
7 (143)	Nepal	15.83	533	1.8962	143.101	0.2131	145
8 (109)	Burundi	16.00	80	0.8695	73.382	0.8727	180
8 (33)	Bolivia	16.00	47	0.4162	449.454	0.6395	113
10 (3)	India	16.17	1863	0.1460	36950.507	0.4986	135

Source: <https://germanwatch.org/en/download/13503.pdf>

This ranking is due to the “heavy floods ... in eastern Bulgaria in June 2014, killing at least a dozen people and badly affecting agriculture and the tourism sector.” “Furthermore, a severe hailstorm on July 8, 2014 caused a lot of damage in the Bulgarian capital, Sofia.” Out of these, it was the fourth in terms of ‘absolute losses’ in US dollars, estimated at US\$2,383 billion, and the third in ‘losses per unit GDP percent’ (after Bosnia and Herzegovina, and Serbia). According to the CRI for 1995–2014 Bulgaria is ranked 64th in the world out of around 200 countries (several countries may hold one and the same ranking positions). Snowfall, floods, and landslides hit the country in January – February 2015.

Municipalities at Risk of Dry Spells in Bulgaria, 2011

Figure 21. Municipalities at risk of dry spells in Bulgaria, 2011



Source: World Bank design based on data from NIMH-BAS.

## **Sunny Beach - Press Release**

### ***“Nesebar Mayor Saved Sunny Beach from Water Crisis”<sup>98</sup>***

*Standard News. Online edition – August 14, 2005*

*“The problem with the potable water in the southern Black Sea resort town of Nesebar, as well as in the resorts of Sunny Beach and Sveti Vlas, is already resolved. The solution has been found in no time thanks to Nesebar Mayor Nikolay Trifonov. He traveled over 400 km and had talks with the representatives of all relevant institutions to find the solution to this crucial problem. He practically saved the resorts from a severe water crisis.*

*The reason for this crisis situation just in the height of the season was the high consumption of potable water and the low pressure in the water-supply pipeline. The Nesebar Municipality and the local Water Supply and Sewerage Company found a technical solution to the problem and tackled the possible crisis.*

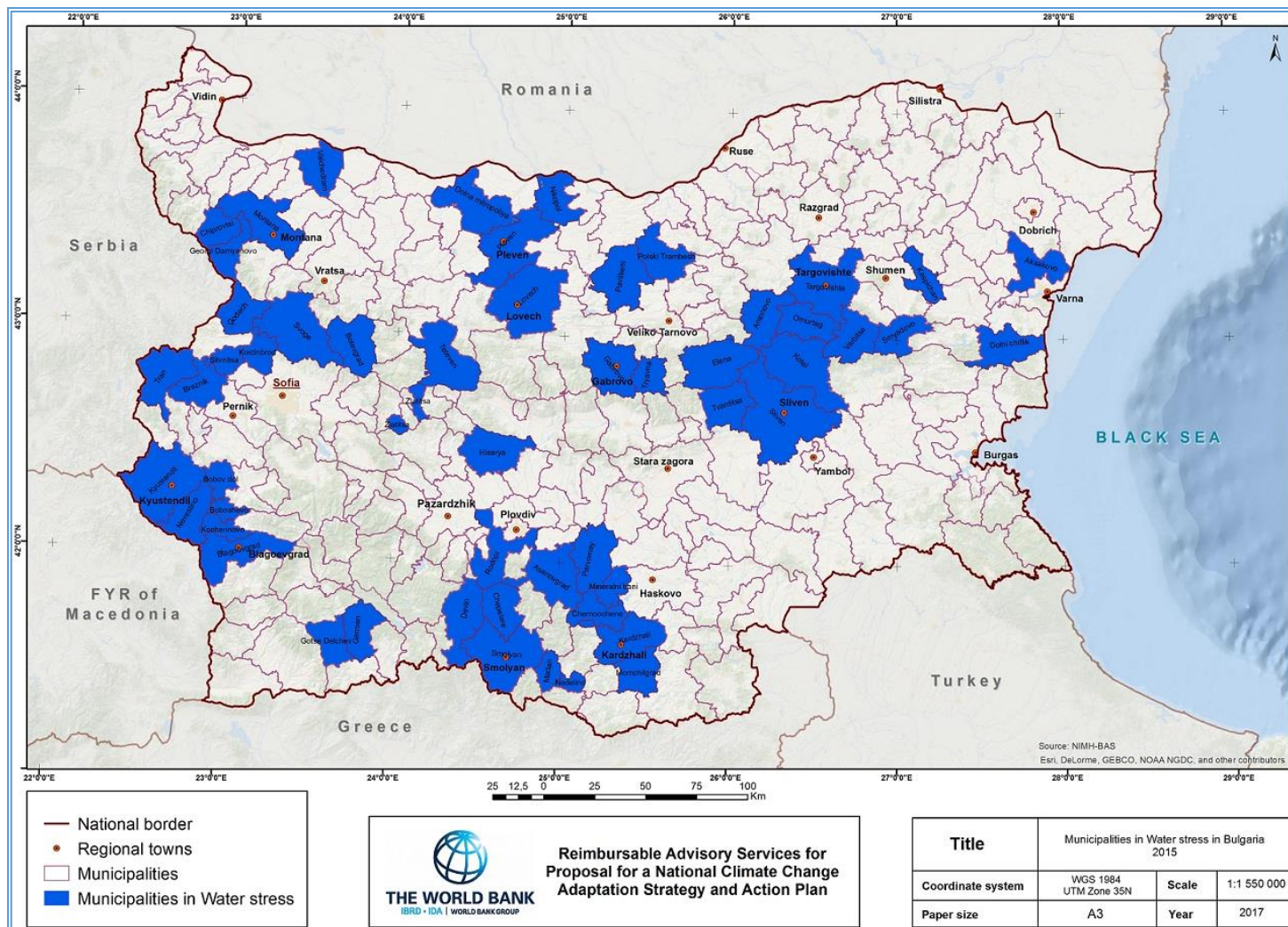
*Now, the pressure is sufficiently high, and the tourists are not complaining anymore.”*

---

<sup>98</sup> [paper.standartnews.com/archive/2005/.../bulgaria/s4526\\_2.htm](http://paper.standartnews.com/archive/2005/.../bulgaria/s4526_2.htm).

## Municipalities in Water Stress in Bulgaria, 2015

Figure 22. Municipalities in water stress in Bulgaria

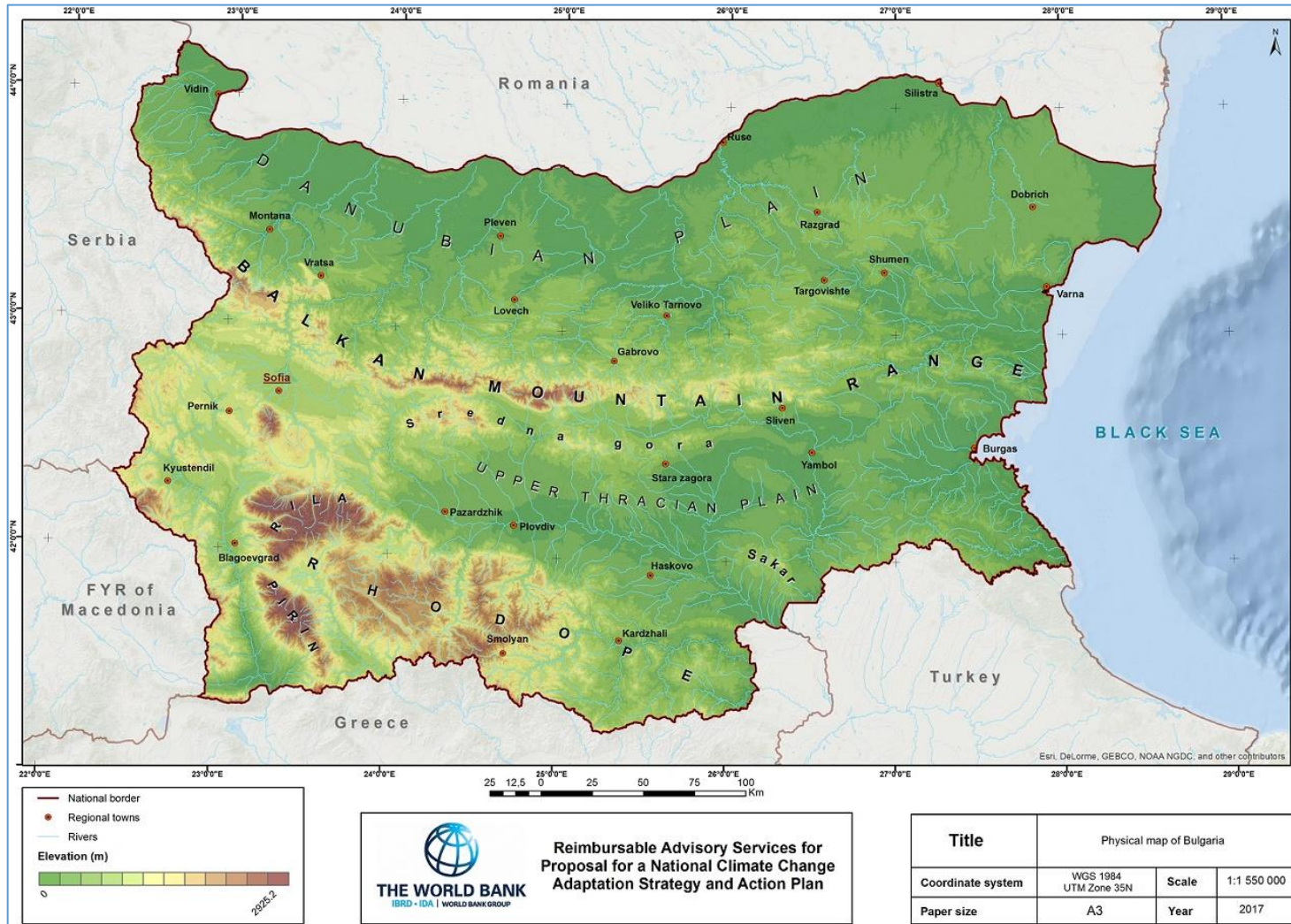


Source: World Bank design based on data from NIMH-BAS.



Physical map of Bulgaria

Figure 23. Physical map of Bulgaria



## **Annex 5. Tourism Sector Adaptation Practice in Selected EU Countries**

### **Cyprus**

Apart from public sector costs, many adaptation measures will require expenditures from the private sector such as farmers, home owners and enterprises. Still, private adaptation measures may prove to be inadequate due to insufficient information or unavailability of private funds, particularly if climate change induced events are abrupt or irreversible (for example prolonged heat waves, storms or floods). In this case government intervention and increased public spending will be necessary to alleviate the damages. This underlines the need for authorities to install proper monitoring mechanisms and early warning systems to inform citizens (for example home owners and enterprises in coastal areas) about future risks.

To make access to capital easier for the private sector, the government may consider providing economic incentives for CCA investments in vulnerable sectors (in the form of direct grants, aid, or guarantees for specialized private insurance schemes).

Finally, the importance of pricing policies should not be underestimated. Proper pricing of water and energy as well as charges for unsustainable use of resources (such as congestion charging) can become a key priority for mitigating climate change impacts. If prices incorporate the costs of natural resource scarcity and the costs of environmental degradation caused by using these resources, this can have a double positive effect.

First, it will discourage the use of these resources. The price elasticity of water, electricity, or fuel use is low but is not zero; consumers adapt to higher prices, particularly in the medium and long term. In this way it will become easier for consumers to adapt to a future arid climate.

Second, it can provide the much-needed public revenues which can finance investments in adaptation measures. For example, national funds from participation of industries in the EU Emissions Trading System will partly be used for promoting renewable energy investments; a similar approach can be applied for revenues coming from other pricing schemes. According to the OECD, environmental and natural resource taxes and charges are among the most promising measures to improve public finances without being detrimental to economic growth (Hagemann 2015). Policy makers in Cyprus should seriously consider including such charges in future policy measures.

## Switzerland

- Promoting research, innovation, and diversification of tourism offers:
  - Diversification of the offer, with the development of new tourism activities
  - Development of wellness activities
  - Revalorization and popularization of the summer season
- Further developing and securing snow sport activities:
  - Elaboration of a general concept for artificial snowmaking to optimize planning
  - Upward spatial development of ski resorts
  - Creation of accumulation lakes and targeted artificial snowing of slopes
  - Investment in water security
  - Extension of retention lakes for water storage
- Improving natural hazard management: Systematic and subsequent monitoring of areas at risk.
- Risk reduction through organizational measures.
- Clear positioning and targeted marketing:
  - Common development of a strategy among regions
  - Specialization on specific segments
  - Communication on climate-friendly tourism
  - Communication on snow security when this exists
  - Marketing of regional strength, making use of the ‘summer freshness potential’
- Awareness rising among the population.

## **France's Adaptation Measures Towards Winter Tourism**

The winter tourism industry in France has responded to the implications of observed changes and a range of technological and behavioral adaptation measures have been put into practice. Artificial snowmaking remains the dominant adaptation strategy. Other measures include grooming of ski slopes, moving ski areas to higher altitudes and glaciers, protecting against glacier melt with white plastic sheets, diversification of tourism revenues, and the use of insurance and weather derivatives. In addition, withdrawal from ski tourism at lower elevations may be necessary (see **Box 5**). Swiss Banks, for example, now only provide very restricted loans to ski areas at altitudes below 1,500 m.

The strategy also states that adaptation measures also have costs, as well as limits. Snow-making has proven cost-effective, but such estimates are based only on the direct financial costs to ski operations and do not include the potential externalities of such practices on water consumption, energy demand, landscape, or ecology. Furthermore, snow-making costs will increase nonlinearly as temperatures increase and if ambient temperatures increase beyond a certain threshold snowmaking will simply not be viable. Likewise, grooming of ski slopes can reduce the minimum snow-depth required for ski operations by 10 cm or 20 cm. However, no amount of grooming can overcome significant declines or the total absence of snow cover. Insurance, meanwhile, can reduce the financial losses from occasional instances of snow-deficient winters, but cannot protect against systemic long-term trends toward warmer winters.

An opportunity is seen in the fact that climate change will cause shifts in offer and demand as well as shifts in the regions of origin of guests. Some touristic destinations will lose in attractiveness, others will profit from new opportunities. By adjusting their offer, tourist destinations may develop new core competencies and new guest groups may be attracted.

## **Austria**

The main adaptation areas of tourism in Austria include the following:

- Increase in annual mean temperatures (year-round tourism)
- Changes in precipitation and its seasonal distribution: a decrease in the frequency of precipitation during summer months and an increase in winter months
- Decrease in snowfall in lower and middle elevations; reduced certainty of snow
- Decrease in ice and frost days
- Increase in the number of days without continuous snow cover in the mountain
- Thawing of permafrost can lead to instability in infrastructural facilities and to risk of rock falls
- Glacial retreat affects the landscape
- Possible increased pressure on glaciers due to worsening conditions in ski areas at lower elevations
- Increase in water temperatures (longer season for swimming outdoors)
- Possible adverse effects on water quality in lakes (for example, due to algae) at higher temperatures
- Relative climatic advantage of Alpine region in summer in comparison to Mediterranean destinations
- More severe heat waves and an increase in the number of hot days (over 30°C) in summer (for example, city tourism – escape from urban regions into the surrounding areas)
- Loss of biodiversity (flora and fauna) resulting in a change in the natural scenery

## **Artificial Snow**

Operation and maintenance costs of artificial snow are quite high: producing 1 m<sup>3</sup> of snow requires €3 to €5 (Bosello *et al.* 2012), while installing artificial snow-making equipment costs around €25,000-100,000 per hectare (in Austria) or €650,000 per kilometer (in Switzerland). Operation and maintenance costs are as high as 8.5 percent of profits. Moreover, artificial snow requires significant water resources and it is estimated that 30 cm of snow cover requires 1,000-1,200 cubic meters of water per hectare (Probstl 2006).

### *Austria – artificial snow-making concerns*

Currently, about 10–20 percent of the annual turnover is spent for snowmaking, marking it as an important cost factor. It is questionable, whether ski areas are able to cope with greatly increasing costs and/or if the customer is willing to pay for it. A further reduction of the ski area supply is very likely, where small- to medium-size ski areas need to cease operation, which in turn could negatively influence demand, if reasonably priced ski areas in vicinity to agglomerations (day-trips) vanish. Apart from the economic perspective, ecological concerns arise from the projected increase of snow production: Though water is not consumed but rather temporally stored on the ski slopes in the winter season and redistributed to the system in spring, water for snowmaking needs to be stored in ponds and lakes over the course of the summer season to be readily available for use in autumn. In rather dry regions in the Alps conflicts of water usage might arise, especially where high tourism intensity (higher per capita water consumption) accompanies intense irrigation agriculture. Last but not least, energy consumption is a major concern. As snowmaking is less energy efficient at higher temperatures (Teich *et al.* 2007), the increases of energy use are likely to be greater than the required growth rates for snowmaking. Such an increase of energy consumption contradicts climate change mitigation goals.

## **Annex 6. Interviewed Companies in the Tourism Sector**

### **List of Incoming Bulgarian Tourist Operating Companies Interviewed in Relation with Climate Change Awareness for the Tourism Sector in the Country**

- Bon Tour – BG – official representative of Biblio Globus
- Go to Holiday Ltd. – official representative of Anex tour;
- Tez Tour Incoming Ltd.
- Nessebar In Ltd.
- Teddy-Com Ltd.
- Aventura Bulgaria Ltd.
- Go Balkans Ltd.
- Princess Tours Ltd.;
- Astral Holidays International – official representative of BCD Travel, Thomas Cook Group and Neckermann;
- Holiday Shop – official representative of CORAL, NOVA TURAS, VEZIR
- Doubletree Varna Ltd.
- Travelux Ltd.
- Homecare Holidays Ltd.
- Golden Sport Tour Ltd.
- Dertour

## **Annex 7. Climate Change Adaptation Options Development**

### **Required Steps**

Climate change has been identified as a known risk, but little information exists to evaluate the types and severity of climate change impacts on the tourism sector – substantial investment in information and science may be required.

To implement this option, the following steps must be taken (related to other sectors as well):

- Creation of a relevant database
- Monitoring the climate system
- Detecting climate change and attributing causes
- Operational climate prediction on seasonal-to decadal timescales
- Assessing the impacts of, and supporting adaptation to, climate variability and change
- Research to improve the understanding, modelling and prediction of the climate system
- Meeting the requirements of the UNFCCC and other international conventions and agreements



## **Adaptation preparedness in Bulgaria**

Before proposing any adaptation measures for the tourism sector in Bulgaria it is worth discussing the sector adaptation preparedness and outline the reasons revealed by the situation analysis. The situation analysis is made based on the results of a study (Kerezieva M. (2016) conducted in 2015 regarding two main groups of stakeholders – tourism industry and government institutions. The study results show that generally adaptation preparedness is alarmingly low in tourism. Even though most of company representatives declare that they are already facing the negative consequences of climate change in their businesses, and that they demonstrate high motivation for implementation of adaptation practices, the presence of various barriers prevents them from moving from the planning to the implementation phase of the selected adaptation strategy. On the other hand, state institutions are currently focused on an initial phase of research and planning of adaptation measures and currently are unable to support Bulgarian businesses in their efforts to adapt to climate change. Bulgaria lags most of the European countries such as Austria, Belgium, Germany, Malta, the Netherlands, Spain, Switzerland and the United Kingdom, which are quite advanced in their CCA policies. This delay puts the competitiveness of the tourist sectors under the risk of climate change threats.

At present, however, there is no explicit policy on CCA in Bulgaria, a NAS has not been prepared yet and the measures taken are single. It would be useful to research whether the business is already vulnerable to the impacts of climate change, if there is any motivation for adaptation and in which directions businesses need support from the state.

The study showed that even though there are some official publications on the existence of climate changes in Bulgaria and there are analyses containing advice on adaptation measures that are recommended in the tourism sector, representatives of companies are not familiar with these documents.<sup>99</sup> Their low awareness hampers the objective of making the right management decisions based on official information. The lack of awareness could lead to weaker competencies to choose and implement efficient adaptation measures. According to the survey, a significant majority of respondents take management decisions based on intuition. They admit that there is a general lack of know-how on CCA in the company and do not believe that the employees are ready to deal with changes in the organizational or production process due to climate change. Despite this negative picture, in most cases staff trainings on adaptation practices have not been conducted in the company yet.

The adaptation preparedness of the state institutions from the tourism sector is as low as 0.18 points (in the agriculture sector it is 0.40).<sup>100</sup> At the company level the preparedness is higher than at the state level. This is particularly alarming given that adaptation strategies were requested by the European Commission by the end of 2017. Coordination between the head responsible institutions and tourism departments is obviously lacking. As shown in Chapter 2 adaptation is not placed among the priorities in the Strategy for Sustainable Tourism.<sup>101</sup> Activities from the next stage of identification of alternative measures for adaptation have not yet taken place. In all existing documents on climate change, the issue of adaptation to climate

---

<sup>99</sup> BAS–National Institute of Meteorology and Hydrology, 2010, Climate changes, <http://meteorology.meteo.bg/bro6ura.pdf>

<sup>100</sup> See <sup>1</sup>

<sup>101</sup> Ministry of the Economy and Energy, 2014, Strategy for Sustainable Development of Tourism in Bulgaria 2014 – 2030, Last accessed at: <http://www.strategy.bg/>

changes was ignored because a central place was given to the issue of **limiting** climate change. A positive step was the adoption of the law on limiting climate change, in which the responsible institutions were named. However, the law still does not describe mechanisms to accelerate the process of adaptation. In contrast to the inadequate commitment of the state in matters relating to adaptation to climate change, the study showed a high degree of awareness of the problem and a strong motivation to take adaptation measures by companies in the tourism sector.

According to the results of this study, almost 100 percent of the private sector respondents have realized and felt the effects of climate change in their businesses. Barriers in the reorganization of administrative and production activities to adapt to the new climatic conditions puts them in a difficult situation. Due to various reasons and despite the high motivation, their adaptation preparedness is low. The main problems identified are related to insufficient information awareness, lack of competences to manage the adaptation process, and difficult access to financial resources to cover the transaction costs of change. Analysis of the link between the preparedness to adapt at the state level and preparedness to adapt at the company level, showed that the state does not consider the difficulties companies face and does not take measures to support the private sector to more easily adapt to climate change. This lack of commitment on behalf of the state is contrary to one of the main recommendations contained in the European Adaptation Strategy, namely that the state should intervene and tackle the effects of climate change to which businesses fail to adapt autonomously. The main risk associated with the low adaptive capacity both at the state and company levels, is that the Bulgarian tourist business may lose some competitive position compared to other tourist countries.

It can be argued that the highest adaptation preparedness at present can be observed among tourists – they are very sensitive to any changes, including climate ones, and given the enormous tourism supply available both at home and abroad are very quick to change their travel patterns temporarily or permanently.

## A Portfolio of Climate Change Adaptations Utilized by Tourism

*Table 19. A Portfolio of Climate Change Adaptations Utilized by Tourism Stakeholders*

Type of adaptation	Tourism operators/businesses	Tourism industry associations	Governments and communities	Financial sector (investors/insurance)
<b>Technical</b>	<ul style="list-style-type: none"> <li>• Snowmaking</li> <li>• Slope contouring</li> <li>• Rainwater collection and water recycling systems</li> <li>• Cyclone-proof building design and structure</li> </ul>	<ul style="list-style-type: none"> <li>• Enable access to early warning equipment (for example radios) to tourism operators</li> <li>• Develop websites with practical information on adaptation measures</li> </ul>	<ul style="list-style-type: none"> <li>• Reservoirs, and desalination plants</li> <li>• Fee structures for water consumption</li> <li>• Weather forecasting and early warning systems</li> </ul>	<ul style="list-style-type: none"> <li>• Require advanced building design or material (fire resistant) standards for insurance</li> <li>• Provide information material to customers</li> </ul>
<b>Managerial</b>	<ul style="list-style-type: none"> <li>• Water conservation plans</li> <li>• Low season closures</li> <li>• Product and market diversification</li> <li>• Regional diversification in business operations</li> <li>• Redirect clients away from affected destinations</li> </ul>	<ul style="list-style-type: none"> <li>• Snow condition reports through the media</li> <li>• Use of short-term seasonal forecasts for the planning of marketing activities</li> <li>• Training programs on CCA</li> <li>• Encourage environmental management with firms (for example through certification)</li> </ul>	<ul style="list-style-type: none"> <li>• Impact management plans</li> <li>• Convention/ event interruption insurance</li> <li>• Business subsidies (for example, insurance or energy costs)</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust insurance premiums or not renew insurance policies</li> <li>• Restrict lending to high risk business operations</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>• Hurricane interruption guarantees</li> <li>• Comply with regulation (for example, building code)</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinated political lobbying for GHG emission reductions and adaptation mainstreaming</li> <li>• Seek funding to implement adaptation projects</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal management plans and set back requirements</li> <li>• Building design standards (for example, for hurricane force winds)</li> </ul>	<ul style="list-style-type: none"> <li>• Consideration of climate change in credit risk and project finance assessments</li> </ul>
<b>Research</b>	<ul style="list-style-type: none"> <li>• Site location (for example, north facing slopes, higher elevations for ski areas, and high snow fall areas)</li> </ul>	<ul style="list-style-type: none"> <li>• Assess awareness of businesses and tourists and knowledge gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring programs (for example, predict avalanche risk, beach water quality)</li> </ul>	<ul style="list-style-type: none"> <li>• Extreme event risk exposure</li> </ul>
<b>Education</b>	<ul style="list-style-type: none"> <li>• Water conservation education for employees and guests</li> </ul>	<ul style="list-style-type: none"> <li>• Public education campaign</li> </ul>	<ul style="list-style-type: none"> <li>• Water conservation campaigns</li> <li>• Campaigns on the dangers of ultraviolet radiation</li> </ul>	<ul style="list-style-type: none"> <li>• Educate/inform potential and existing customers</li> </ul>
<b>Behavioral</b>	<ul style="list-style-type: none"> <li>• Real-time webcams of snow conditions</li> <li>• GHG emission offset programs</li> </ul>	<ul style="list-style-type: none"> <li>• GHG emission offset programs</li> <li>• Water conservation initiatives</li> </ul>	<ul style="list-style-type: none"> <li>• Extreme event recovery marketing</li> </ul>	<ul style="list-style-type: none"> <li>• Good practice in-house</li> </ul>

Source: Adapted from UNWTO, UNEP, and WMO 2008.

## **Main CCA Options in the Ski Industry<sup>102</sup>**

### *Ski area operators*

**Snowmaking, slope development, and operational practices.** Contouring or smoothing ski slopes (that is, grooming slopes in the summer season to remove rocks or shrub vegetation) reduce the snow depth required to operate and represent a cost-saving strategy for snowmaking. Land contouring can also be used to capture snowmelt and replenish snowmaking reservoirs throughout the winter. Strategic planting or retention of tree cover can capture moving snow ('snow farming') and partially shade ski slopes, reducing snowmelt and snowmaking requirements). Increasing the intensity of use at a ski area by raising lift capacity or limiting slope availability to concentrate snowmaking resources, is a strategy to reduce operating costs, but increased utilization levels will prove effective only if skier satisfaction can be maintained. Artificial, non-snow ski surfaces were first developed in the 1970s. These surfaces have improved to an extent that they now provide reasonable gliding and edging properties that do not damage ski equipment. Although the technology is little used currently, there may be niche applications on ski slopes in the future, for example as a surface in high traffic ski areas (for example under tow bars) or on small training slopes, snowboarding parks, and snow tube-toboggan runs.

**Cloud seeding** is a weather modification technology that has been used to produce additional precipitation, mainly for agricultural purposes. Some ski areas in North America and Australia have also employed this technology to generate additional snowfall.

### *Revenue diversification*

Over the past three decades, many ski areas in North America have diversified their operations beyond traditional ski activities to include the provision of skiing and snowboarding lessons, accommodation and retail sales. Many ski resorts have made substantial investments to provide alternate activities for non-skiing visitors (for example, snowmobiling, skating, dog sled-rides, indoor pools, health and wellness spas, fitness centers, squash and tennis, games rooms, restaurants, and retail stores).

### *Marketing incentives*

Ski companies have already begun to experiment with incentives or guarantees to overcome skiers' reluctance to book a ski holiday because of uncertain snow conditions.

In the winter of 1999–2000, for example, the American Skiing Company promised visitors to its six New England region ski resorts a 25 percent reduction on their next vacation if the ski area failed to open 70 percent of their ski runs during the Christmas-New Year holiday period.

### *Indoor ski slopes*

The first known indoor skiing slope, the 'Casablanca Dome', opened in Belgium in 1986 and since then, many technological advances have been incorporated into the more than 50 indoor ski domes operating globally in 2005. Most ski domes are in Europe and Japan, with the largest facility now operating in Dubai.

---

<sup>102</sup> Climate change adaptation in the ski industry, Mitig Adapt Strat Glob Change (2007) 12:1411–1431 DOI 10.1007/s11027-006-9071-4

*Other Adaptation Measures*

In its conclusion, the 2011 report identified two primary objectives in respect of a strategic planning for Greek tourism: the need to extend the tourism season (reducing the pronounced seasonality of Greek tourism) and the need to geographically diversify Greece's tourism product to a larger part of the country. The achievement of these objectives requires that steps be taken to identify and market Greece's many, still unexploited, natural attractions, to develop and promote alternative eco-friendly forms of tourism, to attract new tourist target groups, and to enforce measures to reduce the industry's environmental footprint. Finally, the Climate Change Impacts Study Committee study<sup>103</sup> also estimated that the operating costs to be incurred by accommodation establishments during adaptation to climate change would increase by roughly 5 – 7 percent annually. Consequently, there is an urgent need to develop a long-term strategic plan for Greek tourism, in collaboration with state authorities and representatives from the tourism industry, based on the two primary objectives outlined above.

Indicatively it was estimated that a sea level rise of 1 m would have a total cost of around €630 billion by 2100, due to the loss of residential and tourism land (using a discount rate of 3 percent, the value of these losses in 2010 amounted to an exorbitant €44 billion). Considering the above, the authors recommend the adoption of adaptation measures previously subjected to a CBA to determine their efficiency. More specifically, four basic measures were examined, namely beach stabilization, artificial beach, filters with geotextiles and beach drainage. A mix of all the above measures would be advisable as it would maximize the benefit-cost ratio (based on the Monte Carlo method), given the particularities of the Greek coastline. Finally, the strategy and action framework needed to address the impacts of climate change are discussed, placing an emphasis on growth policy, the operational priorities and the corresponding actions in view of the challenges facing Greek tourism, especially on the islands where water shortage, competitive land uses, desertification, and sea level rise are becoming increasingly pressing issues

---

<sup>103</sup> Greek Tourism and Climate Change: Adaptation Policies and New Growth Strategy, 2014, [http://www.bankofgreece.gr/BogEkdoseis/CCISC\\_Tourismandclimatechange\\_FwCh1.pdf](http://www.bankofgreece.gr/BogEkdoseis/CCISC_Tourismandclimatechange_FwCh1.pdf)

## **Annex 8. Cross-cutting Aspects**

### **Cross-cutting Issues with the Forestry Sector<sup>104</sup>**

Climate changes may seriously affect the health status of many forest tree species and forests causing mortality due to various reasons: disturbances such as fires, windthrows, insect outbreaks, and mass mortality due to drought waves. All these may cause severe logging activities which, combined with mortality, will have a negative effects of forest landscapes. This might be important for regions where tourism activities are being developed in forested areas and where tourists require forested landscapes with high aesthetic value. For example, modeling of the expected forest development in the Shiroka Laka region and specifically the Gela village valley and the southern slopes of mount Perelik in the Rhodope Mountains predicts serious growth decline of the main tree species in the landscape – Norway spruce. This might be associated also to mortality processes. In both cases, the forest managers will be forced to perform logging operations with higher than the current intensity, which will have a negative effect on the landscape. If carefully planned these operations may also be beneficial in the mid to long term (for example promoting deciduous tree species with higher aesthetic value in autumn, spring and early summer).

Other changes might have an indirect effect with higher potential impact. Examples are erosion on steep slopes, decrease of the water-holding capacity of forests and protection from rock fall on steep slopes because of mortality of tree species, and loss of forest cover. These can affect tourism in several ways: decrease of the quality and availability of pure drinking water, increase of the chance of flooding, and mud and rock slides in cases with torrential rain.

Forests and forest states are also directly related to game, which is closely related to the hunting tourism. Some game species require a landscape with certain tree species and changes in the tree species state may thus, affect the abundance of game.

---

<sup>104</sup> Source: Forestry Sector Report.

### **Cross-cutting Issues with the Urban Environment Sector<sup>105</sup>**

Urban tourism today is in the center of the urban economic development policies and the focus of the competition between cities for attracting headquarters, leading companies, global events, investments, and tourists. Bulgarian cities have a considerable potential for development of urban tourism due to their cultural heritage, numerous famous artists, year-round calendar of events, intangible treasures, and rich traditions. The leading bigger cities for urban tourism are Sofia, Plovdiv, and Kyustendil with their multilayer cultural treasures, and Veliko Tarnovo, Pliska, Preslav, Smolyan, Kazanluk, Tryavna, Koprivshtitsa, Troyan, and many others, among the smaller ones. The cultural assets in these cities are endangered, because of the neglected maintenance in recent years. Most of the archeological sites are at risk during heavy rains and floods, most of the buildings in the historical cities and zones are at risk during fires, due to the old wooden constructions and elements. A lot of the restituted listed buildings, in recent years, are also neglected, together with most of the old churches in the smaller cities, thus making the implementation of CCA measures more difficult. Such measures, in addition to energy efficiency ones, are among the priorities of the OPs for regional development, being implemented according to the funding eligibility criteria and the Ministry of Culture's strategy and priority list.<sup>106</sup> They are also among the main objectives of the most cross-border cooperation programs, together with measures for water and flood risk management and promotion of cultural and natural heritage.

---

<sup>105</sup> Source: Urban Environment Sector Report.

<sup>106</sup> OP 'Regions in Growth' 2014 – 2020, Priority axis 5. Regional tourism, Investment Priority 1: Conserving, protecting, promoting, and developing natural and cultural heritage.

## Annex 9. Prioritization of Adaptation Options

### Criteria for Choosing Adaptation Options and their Prioritization

*Table 20. Potential criteria for choosing adaptation options*

<b>Cost</b>	Costs to implement and maintain; cost-sharing possibilities
<b>Effectiveness</b>	Capacity to solve problems or realize opportunities derived from climate change impacts (for example, economic benefits, costs avoided, lives saved)
<b>Ease of implementation</b>	Potential legal, political, institutional, barriers
<b>Acceptability to local stakeholders</b>	All stakeholder identified adaptations are attractive to some stakeholders, but may not be equally attractive to all stakeholders for political, economic, social or cultural reasons
<b>Acceptability to financing agencies/ministries/donors</b>	Are the financing agencies/ministries involved willing to support the option?
<b>Endorsement by experts</b>	Is the option consistent with international best practice?
<b>Timeframe</b>	Are short-term or long-term strategies more desirable? How does the timeframe needed to implement the option compare with that available (for example, are there specific project or funding time horizons)?
<b>Institutional capacity</b>	How much additional capacity building and knowledge transfer is required to implement the adaptation
<b>Size of beneficiaries group</b>	Does the adaptation provide small benefits to a large number of stakeholders and people or large benefits to a small number?
<b>Potential environmental or social impacts (maladaptation)</b>	Are there possible adverse impacts on the environment or people (for example, are additional GHG emissions likely)?
<b>Capacity to sustain over time</b>	Once implemented, can the adaptation be successfully sustained?

Source: *Approaches to Climate Change Adaptation, November 2010, The Committee on Approaches to Climate Change Adaptation, [https://www.env.go.jp/en/earth/cc/adapt\\_guide/pdf/approaches\\_to\\_adaptation\\_en.pdf](https://www.env.go.jp/en/earth/cc/adapt_guide/pdf/approaches_to_adaptation_en.pdf)*

*Table 21. Overview of available approaches for prioritization in adaptation*

Approach	Short description	Most useful to apply when...
<b>Cost-benefit analysis (CBA)</b>	CBA values all relevant costs and benefits to society of all options, and then estimates a net present value or a benefit. It is an absolute measure providing the justification for intervention, though it is often difficult to value all the costs and benefits of a particular project or policy.	Climate probabilities are known. Climate sensitivity is small compared to costs/benefits. Good data exist for major cost/benefit components.
<b>Cost-effectiveness analysis (CEA)</b>	CEA compares alternative options for achieving similar outputs (or objectives). In this regard, it is a relative measure, providing comparative information between choices (unlike CBA, which provides an absolute measure).	There is an agreement on a sectoral social objective (for example, acceptable risks of flooding) when non-monetary metrics are considered.



## *Climate Change Adaptation – Assessment of the Tourism Sector*

Approach	Short description	Most useful to apply when...
<b>Multi-criteria analysis (MCA)</b>	MCA is a systematic method for assessing and scoring options against a range of decision criteria, some of which are expressed in physical or monetary units, and some of which are qualitative. The various criteria can then be weighted to provide an overall ranking of options.	There is a mix of qualitative and quantitative data.
<b>Real options analysis (ROA)</b>	ROA quantifies the investment risk associated with uncertain future outcomes. It can therefore assess whether it is better to invest now or to wait — or whether it is better to invest in options that offer greater flexibility in the future.	Large irreversible capital decisions are to be made. Climate-risk probabilities are known, or adequate information is available. Good-quality data for major cost/benefit components are available.
<b>Robust decision making (RDM)</b>	RDM is a decision-support tool that is used in situations of deep uncertainty. It uses quantitative models, or scenario generators, with data-mining algorithms, to evaluate how different strategies perform under large ensembles of scenarios reflecting different plausible future conditions.	High uncertainty of climate change has been signaled. A mix of quantitative and qualitative information is available. Non-market sectors are involved (for example ecosystems and health).
<b>Portfolio analysis</b>	Portfolio analysis helps developing portfolios of options, rather than of a single option. It originated in the context of financial markets to explore the potential for portfolios of financial assets to maximize the financial return on investments, subject to a given level of risk.	Adaptation actions are likely to be complementary in reducing climate risks. Climate-risk probabilities are known, or good information is available.
<b>Adaptive management/ adaptation turning points</b>	Adaptive management is a long-established and less formalized approach that uses a monitoring, research, evaluation and learning process to improve future management strategies. A variation of the approach is to consider major biophysical, human, social or economic thresholds, and the MEDIATION project has developed such assessments using the term 'adaptation turning points', looking at sociopolitical thresholds (that is, a formal policy objective or societal preference).	High uncertainty exists. Clear risk thresholds and indicators are identified.
<b>Analytic hierarchy process (AHP)</b>	AHP is a form of MCA that undertakes pairwise comparisons using expert judgements to derive priority scales. The method allows the analysis of tangible and intangible elements together, allowing these to be traded off against each other in a decision-making process.	There is a mix of quantitative and qualitative information; and of qualitative and quantitative data. There is a need for consensus-building.

*Source: Martin et al. 2009.*

## **Climate Change Indicators**

Among the most important and easily measurable **climate change indicators are:** mean annual and monthly temperatures; heat extremes – number, seasonality, frequency; mean monthly and annual precipitations; heavy precipitations – volume and time distribution (frequency); floods – numbers, seasonality, duration, frequency; tornadoes - numbers, seasonality, duration, frequency; avalanches – numbers, territorial distribution, frequency; snow cover – altitude and duration (by regions); water demand/day/person – seasonality, territorial distribution; and Tourism Climatic Index (TCI) – a composite measure for systematically assessing the climatic elements that are most relevant to the quality of the tourism experience for the 'average' summer tourist<sup>107</sup>. The TCI uses a weighted aggregate of several climate variables (that is, maximum and mean daily temperature, humidity, precipitation, sunshine, and wind) to assess human comfort for general outdoor activities.

**Tourism-based indicators have to include all basic tourism indicators such as number of tourists and nights, average stay, and revenues, but they all have to be differentiated by regions and months for the trends in their dynamics to be traceable for different tourist types, seasons and destinations, for example,** number of tourists - international (by country), domestic, by regions (resorts, municipalities), by months; number of nights - international (by country), domestic, by regions (resorts, municipalities), by months; average stay (domestic, international) – by regions, by months; revenues – from international, domestic tourists, by regions, by months, by bed, by night, by tourist.

The measurement indicators (outputs) for the accomplishment of each adaptation measure are given in *Table 11*.

---

<sup>107</sup> Risk and Vulnerability Analysis and Assessment of the Bulgarian Economic Sectors to Climate Change, 2014