



GOVERNMENT OF THE  
REPUBLIC OF MACEDONIA  
MINISTRY OF ENVIRONMENT  
AND PHYSICAL PLANNING

## THIRD NATIONAL COMMUNICATION ON CLIMATE CHANGE



# TOURISM AND CLIMATE CHANGE

VULNERABILITY ASSESSMENT AND ADAPTATION MEASURES



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# TOURISM & THE CHALLENGE OF CLIMATE CHANGE

**T**his publication summarizes key findings from an assessment of the vulnerability of tourism in the Republic of Macedonia to climate change and possible adaptation measures and strategies.

This assessment was made as part of the Republic of Macedonia's Third National Communication on Climate Change to the United Nations Framework Convention on Climate Change by the Ministry of Environment and Physical Planning with support from the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF).

The full report is available at:  
**[www.klimatskipromeni.mk](http://www.klimatskipromeni.mk)**

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## THE TOURISM SECTOR – CURRENT STATUS

With its dramatic mountains and valleys studded with shimmering lakes, its great forests and unspoilt nature reserves, its rolling vineyards and traditional farming landscapes, as well as many fascinating monuments of its rich and diverse cultural heritage, the Republic of Macedonia offers an appealing variety of attractions to tourists and travellers.

These natural and cultural tourist attractions have the potential to provide for many types and combinations of holidays, including:

- winter adventure sports and skiing
- summer hiking in the mountains
- wine tourism, with vineyard tours and wine-tasting
- lake tourism, with swimming, boating, sunbathing,
- rural tours of villages with living traditional forms of farming, crafts and hospitality
- cultural tours of archaeological sites, monasteries and churches
- cultural tours of museums, artistic events and festivals
- conference and wellness facilities in attractive settings

Despite these natural and cultural assets, tourism has not traditionally been ascribed a very significant role in the country's economy and has been relatively neglected in national planning until recent years. Analysts agree that the Republic of Macedonia has certainly not yet realised the full potential of its tourist resources and significantly underperforms in comparison with other countries in the region. And though the Government has given higher priority to this sector in its latest revision to the 2009–2011 Tourism Development Strategy, the country's tourism sector remains uncompetitive by global standards.

To some extent, this neglect of tourism in national strategy and planning is due to the complex inter-relatedness and interdependence of tourism with other sectors and resources. This complexity makes it difficult to develop and apply a coherent and systematic approach to the sustainable development of the tourist sector—an approach which takes into account and adapts to the potential impacts of climate change on tourism in the short- and long-term future.

## DEVELOPING SUSTAINABLE TOURISM AND THE CHALLENGE OF CLIMATE CHANGE

Any successful strategy for developing the tourism sector must be adapted to changes in global trends, including changes in tourists' preferences and changes in global resources and economics. The 21<sup>st</sup> century is already seeing a shift, for example, away from traditional mass tourism towards more specialised alternative forms of holidays, such as eco-tourism. Worldwide, tourism strategies are constantly being adapted to these shifting trends.

Until very recently, however, global and national strategies for tourism have taken little account of what is potentially the most important factor of all in this sector—i.e., changes in the environment and climate.

Climate is a decisive factor in many tourists' choice of destination. Much tourism depends greatly upon climate stability. In the Republic of Macedonia, for example, reduced snowfalls can be devastating for winter sports resorts, especially those at lower altitudes like Mavrovo and Kruševo. Increased summer temperatures, meanwhile, can place certain outdoor destinations beyond the comfort-zone of most international tourists. The country's traditional landscapes, including its famous vineyard regions, may be altered considerably as a result of climate change. And any increase in the frequency of extreme weather events will further damage the appearance and ultimately undermine the structure of many of the country's cultural monuments that were built in very different environmental conditions.

Despite the crucial link between climate stability and tourism development, there has long been a critical gap in knowledge and scientific literature about the consequences of climate change for the tourism sector. Experts consider the present level of research into adaptation measures for this sector to be some five years behind such research in other sectors of the economy. This situation is changing rapidly, however, especially with the inclusion of tourism in the Fourth Report of the International Panel on Climate Change, and the extension of this coverage in the IPCC's upcoming Fifth Report.

The tourism sector has been included for the first time in the country's Third National Communication on Climate Change. The Communication incorporates the findings and recommendations of the first report undertaken in this country to assess the vulnerability of tourism to climate change and measures for adaptation.

## THE THIRD NATIONAL COMMUNICATION: AN ASSESSMENT OF THE VULNERABILITY OF THE TOURISM SECTOR TO CLIMATE CHANGE AND A PLAN FOR ADAPTATION

The Third National Communication begins with a survey of the current state of tourism development in the country and identifies the following factors as amongst the main impediments to achieving the full potential of this sector:

- **Unequal spatial distribution**, with a strong concentration of domestic and international tourism in the South-West Region and the capital, while the Northeast Region receives less than 1% of domestic and international tourists.
- **Insufficient scientific research** into tourism, especially in regard to specific resorts.
- **Insufficient support from institutions** for tourism development.
- **Insufficient maintenance and monitoring** of many natural and cultural attractions
- **Inadequate signage and interpretation for tourists**
- **Inadequate standards of much hotel accommodation outside of Skopje**

These impediments are compounded, moreover, by the relatively high costs of travelling by air to either Skopje or Ohrid.

Together, these negative factors account for the country's ranking 99<sup>th</sup> out of 140 countries in its prioritization of travel and tourism.

## THE CONTRIBUTION OF TOURISM TO THE ECONOMY

The 2013 Report highlights the growing contribution made by tourism to the Republic of Macedonia's overall economy and emphasizes the potential of this sector to generate entrepreneurial opportunities and employment in a number of regions that do not currently have many economic resources. By strengthening the competitiveness of tourism, including its adaptive capacity for sustained growth in the context of climate change, improvements will be apparent in the business environment, in human capital, and in rural development.

The current contribution of tourism to the economy is difficult to calculate due to insufficient data: national statistics on this sector are largely confined to data from hotel and catering activities, while Government data is not disaggregated for areas such as travel and the rest of the supply chain.

The Third National Communication thus made use of data from a study produced in 2012 by the World Travel and Tourism Council. The WTTC study estimated the direct contribution of tourism in 2012 to have been 6.3 billion MKD, or 1.3 per cent of total GDP. The study further projected that this direct contribution would rise to 4.2 per cent of GDP in 2013, generating 8,000 jobs, or 1.2 % of the employed labour force.

In addition to the direct contribution of tourism - in the form of accommodation and transport and the services associated with retail, sport, culture and recreation—the WTTC study also assessed the indirect contribution of this sector in terms of investment in travel and tourism and the general impact of purchases from suppliers and government spending to support the tourism industry. The total amount of this indirect contribution of tourism is estimated at 4.9 per cent of GDP, forecast to rise in 2013 to 5.2 per cent, generating 28,500 jobs, representing 4.4% of the total employed labour force.

The Report also presents figures published by the World Economic Forum on the performance of tourism in 2011, including a total of 327,500 tourist arrivals and revenues of 239.5 million US dollars. The WEF report shows these figures are rising exponentially, though arrivals are currently increasing faster than revenues, suggesting there is much room for improvement in the management of returns on investments in tourism.

The Third National Communication particularly emphasises the valuable potential of domestic tourism to bring about a more equal spatial distribution of economic development, shifting income and economic activity throughout the country. Tourism is especially suited to this role given its ability to take advantage of natural and cultural resources away from metropolitan centres and already well-established tourist centres. At present, however, tourism remains concentrated in the capital and in the south-west of the country around Lake Ohrid.

The Third National Communication concludes that improved planning and management of tourism could help significantly towards meeting the challenge identified by a recent World Bank report - the challenge of establishing 'a foundation for strong and sustainable growth by creating a more diverse, competitive, socially inclusive and environmentally sustainable economy'.

## THE GOVERNMENT'S LATEST MEASURES TO STRENGTHEN THE TOURISM SECTOR

The Government's current national Tourism Development Programme provides resources for the following key measures to strengthen the tourism sector:

- Gathering detailed statistical data on tourism to enable the creation of Tourism Satellite Accounts, in collaboration with the National Bank, the Ministry of Interior and the State Statistical Office.
- Undertaking a review to facilitate a national classification system for tourism.
- Developing a 'Life-Long Learning' platform to enhance the professional competence and capacity of employees and other stakeholders in the tourism sector.
- Improving the quality of signage for significant cultural, historic, and natural attractions, in collaboration with the Ministry of Interior and the Ministry of Transport and Communications.

In addition, the Government's 2011 revision to its National Tourism Development Strategy proposed several pilot studies to promote a more even spatial distribution of tourism so as to spread the economic benefits of tourism to less developed regions. The aim of achieving more equitable spatial distribution is in accordance with the Government's Spatial Plan for 2004–2020, which includes goals for preserving and enhancing the country's natural and cultural heritage and assets through zoning, capacity definition, monitoring and controls, as well as the expansion of protected areas.

These actions demonstrate the Government's recognition of the value of tourism to the Republic of Macedonia's social and economic development. However, all measures to increase the socio-economic contribution of tourism will need to take account of climate change.

*'Climate change imposes the necessity of adopting ecologically innovative approaches to support economic development.'*

Gjorge Ivanov,  
President of the Republic of Macedonia

## **BASELINE SOCIO-ECONOMIC SCENARIOS FOR THE GROWTH OF TOURISM**

The Report developed two baseline scenarios for the growth of tourism under business-as-usual conditions. In addition to using demographic data and projections from the World Bank, these scenarios were based on the following three main factors affecting the growth of tourism and the sector's sensitivity to climate change:

- The country's economic stability and cooperation with bordering countries
- A continuing level of tourist satisfaction with the country's tourism products and services, together with weather conditions remaining stable as the market internationalizes.
- The technical ability of institutions and the capacity of governance to manage changes in tourism products and services in line with developments brought about by climate change.

### **SOCIO-ECONOMIC SCENARIO 1 – STABLE & SUSTAINABLE GROWTH**

The first baseline scenario assumes sustainable growth of the tourism sector, with an emphasis on rural tourism in accordance with the Government's resilience planning.

With stable population growth of 0.5% per year, with conservation of natural and cultural resources, increased awareness of the recreational value of natural assets, civil society participation in the protection of these resources, and with GDP growth raising standards of living in line with European economic success, the socio-economic contribution of the tourism sector will continue to grow. In this scenario, traditional and nature-based tourism will grow and adapt to the need for greater differentiation of products and services, generating opportunities for alternative employment, especially in rural areas, helping to stabilise internal migration and local sustainable economic development. This scenario sees the overall growth of tourism as dependent upon a healthy European economy.

### **SOCIO-ECONOMIC SCENARIO 2 – RAPID & UNSUSTAINABLE GROWTH**

The second socio-economic baseline scenario assumes more rapid GDP growth as the country integrates more closely with Europe, with accompanying higher population growth, higher standards of living and increased urbanization. In the absence of any increased awareness of the value of natural assets and recreational resources, this scenario sees a moderate but unsustainable growth in tourism that will take the form of mass tourism that places a heavy burden on environmental resources, with poorly developed nature-based tourism due to lack of prioritisation of the protection of natural assets.

The Report indicates the dangers of scenario 2, pointing to the many areas of the Mediterranean coast that have suffered environmental degradation as a result of poorly planned mass tourism. Such a scenario, the Third National Communication concludes, will inevitably lead to an eventual decline in the quality of tourist products and services offered.



## CLIMATE SCENARIOS AND THE GROWTH OF TOURISM

The UN's World Tourism Organization, the leading international agency for promoting sustainable tourism as a driver of inclusive economic growth, has repeatedly emphasized the special sensitivity of this sector to climate change. In the agency's 2007 report, tourist demand for outdoor recreation was singled out as being especially susceptible, both directly and indirectly, to changes in climate, with some recreation activities becoming less attractive or even no longer feasible. Activities such as snorkelling and skiing, for example, will become more or less attractive depending on factors affecting the natural environment and climate.

The 2013 Report notes the potential positive effects of extended summer seasons due to climate change, with temperatures in the months of March and November, either side of the traditional summer season, possibly becoming conducive to outdoor sightseeing activities. The negative concomitant, however, is that temperatures in midsummer months may increase to a level beyond the comfort of many tourists. Shorter winter seasons, meanwhile, may have a devastating effect on the country's skiing season, especially in ski resorts at lower altitudes.

Two climatic scenarios were developed by the 2013 Report:

- Climate Scenario 1: SRES-A1B scenario 'Business-as-Usual' (familiar from IPCC AR3 and AR4)
- Climate Scenario 2: E1 'stabilisation' scenario based on 'aggressive mitigation'

Essentially, the first scenario envisages the impact of projected climate change on tourism in the case of 'business as usual', while the second scenario assesses the effects on tourism if no preventative measures are taken to mitigate climate change.

Both scenarios, based on climate projections for several emissions scenarios for Europe developed by the EU-funded FP7 ClimateCost project, forecast a temperature increase in summer temperatures in southern Europe of between 2 and 3 degrees Centigrade by 2071–2100, with drier conditions all year and considerable reductions in summer precipitation.

In both scenarios, therefore, higher temperatures and lower precipitation will have significant implications for tourism—especially for rural tourism and lake tourism—since these factors have a decisive influence on tourists' choices of locations. The implications, moreover, are closely inter-related: warmer winters, for example, may lead to an increase in artificial snow-making activities, which in turn will place pressure on water supplies. In the light of such implications, the Report stresses the need to upgrade the country's Hydrometeorological Service to provide more useful data on climate and its implications for specific tourist sites.

Both climate scenarios assess the impact of climate change according to the country's main five 'tourism clusters': lake tourism; wine tourism; cultural tourism; rural tourism; and mountain tourism.

CLIMATE SCENARIO 1 – ‘BUSINESS-AS-USUAL’	CLIMATE SCENARIO 2 – ‘STABILISATION’
<p><b>Lake Tourism in Climate Scenario 1</b></p> <p>Without the adoption of mitigation and adaptation measures, climate change is likely to have a number of damaging effects on the highly sensitive ecosystems of lakes that provide numerous services to tourists. Changes in the conditions of freshwater lakes, such as the Prespa and Ohrid lakes, may include cloudy water, with algae infestations and floating weeds. Increases in summer temperatures may reach levels beyond the comfort-zone for outdoor lakeside tourism. Reduced precipitation, meanwhile, may put the very existence of lakes in long-term danger. Vector-borne diseases may increase as a result of climate change, creating health risks for tourists.</p>	<p><b>Lake Tourism in Climate Scenario 2</b></p> <p>Under this stabilization scenario, the main risk to lake tourism will not arise from weather-related causes but from over-development and unsustainable use of the ecosystem services provided by the natural lake environments. Some minor alterations are likely to be needed in the types of tourist activities and attractions offered, but there may even be some potential benefits from extended summer seasons. In this scenario, then, the main policy challenge will be to achieve a more even spatial distribution of the benefits of increased tourism.</p> <p>It should be noted, however, that this scenario is dependent upon the preservation of the biodiversity of the country’s lakes and their surrounding environments. Existing threats to this biodiversity include non-tourism related factors such as the run-off of agricultural chemicals into waterbodies, which accelerates plant growth and reduces oxygen for other forms of life.</p>
<p><b>Wine Tourism in Climate Scenario 1</b></p> <p>The continued development of wine tourism through the promotion of vineyards and wineries as tourist attractions is only viable if weather conditions are conducive to comfortable visits and if the wine itself is of sufficient international quality to warrant the time and effort to go on such excursions. Without efforts at adaptation and mitigation, however, such as changes in irrigation, the adoption of UV nets and the movement of vineyards to higher altitudes, the country’s wine sector is at risk of reduced and lower-quality yields.</p>	<p><b>Wine Tourism in Scenario 2</b></p> <p>In this scenario, wherein the quality of wine remains constant or is even improved by climate changes, the wine sector is unlikely to be affected negatively.</p>

<p><b>Cultural Tourism in Climate Scenario 1</b></p> <p>An increase in the frequency of extreme weather events poses a substantial threat to the country's 'built cultural heritage', such as monuments and archaeological sites, undermining their very structure and making them less attractive for tourists unless preventative measures are adapted. Increased temperatures will further discourage excursions to these invaluable sites. The loss of tourist income arising from these negative factors would exacerbate the problem since this income has traditionally been used to help maintain and conserve these sites.</p> <p>The probable effects of climate change on the intangible cultural heritage, including cultural traditions, festivals, food, and cultural landscapes, are difficult to assess at the present time, but are likely to involve far-reaching changes to tourism.</p>	<p><b>Cultural Tourism in Scenario 2</b></p> <p>Cultural tourism will be largely unaffected by climate change in this scenario.</p>
<p><b>Rural Tourism in Climate Scenario 1</b></p> <p>Without further adaptation to climate change, including a projected increase in the frequency of heat waves, rural areas are highly likely to become drier and more prone to bush and forest fires, with temperatures too high for comfortable hiking and walking activities. Moreover, climate change will bring alterations on the country's intangible heritage of traditional food production, potentially reducing the attraction of rural tourism. In addition, vector-borne diseases may increase, creating health risks for tourists.</p> <p>The Government places a high priority on developing tourism in rural areas, seeing such tourism as providing economic opportunities for a range of areas outside the usual zones of Skopje and the already well-established lakeside and ski resorts. In accordance with this priority, however, much more detailed research and monitoring is needed into the effects of climate change on rural tourism and into possible measures for adaptation and mitigation.</p>	<p><b>Rural Tourism in Scenario 2</b></p> <p>Warmer summers and drier winters will negatively affect the appearance of the landscape even within this 'stabilisation' scenario, reducing the aesthetic appeal of some rural locations. Changes in plants and animal populations, moreover, with the threat of invasive species, could upset the balance and reliability of many ecosystems upon which rural tourism depends.</p>
<p><b>Mountain Tourism in Climate Scenario 1</b></p> <p>Without adaptation and mitigation measures to reduce the negative impact of climate change, mountain tourism is highly likely to suffer significantly, with snow-reliant tourist activities such as skiing, snowboarding and off-road adventure holidays becoming unviable in resorts at lower altitudes.</p> <p>An increase in the frequency of extreme weather events will place tourists and businesses at high risk, reducing the seasonal reliability of some resorts and sites and increasing the costs of insurance coverage to prohibitive levels.</p>	<p><b>Mountain Tourism and Nature Activity in Scenario 2</b></p> <p>Most climate models for Southern Europe predict warmer winters with less precipitation. These changes obviously have many negative implications for snow-reliant tourism such as skiing and snowboarding.</p> <p>At the same time, however, longer and warmer seasons may also create opportunities for more adventure and hiking holidays.</p>

## VULNERABILITY ASSESSMENT

*“It is self evident that an economic sector that relies so heavily on comfortable weather and the natural environment is both sensitive and vulnerable to climate change.”*

(SEEFCCA Report)

In assessing the vulnerability of the Republic of Macedonia’s tourism sector to climate change, it is crucial to take into account the findings of a recent Regional Climate Assessment Report. Published in 2012 by the South East European Forum on Climate Change Adaptation, the Report found tourism in the Balkan region—especially in the smaller countries—to be particularly sensitive to climate change.

The Report emphasised the unequal ways in which climate change will affect different regions and peoples, with notably more adverse effects in rural areas. This is especially the case in the Republic of Macedonia, where rural poverty and an ageing population are already altering patterns of agricultural land-use. With regard to the tourism sector, these changes, when exacerbated by climate change, may decrease the capacity of the rural economy to provide sufficient support for rural tourism enterprises. Rural depopulation, amongst other things, will reduce the attractiveness of rural tourist destinations, since such types of tourists seek to engage with living, healthy and interesting rural people and landscapes.

The SEEFCCA Report highlighted the important role that tourism can play in the Republic of Macedonia, especially in achieving greater diversification of sources of livelihood, particularly in rural areas. In order to realize the potential of the tourism sector, however, there needs to be greater investment in appropriate supporting infrastructure. Such infrastructure includes communications, facilities and attractions, as well as traditional infrastructure such as reliable water and energy sources and reasonably comfortable roads.

The Report underlines the importance for ecotourism of ensuring the sensitive development of national parks and protected areas in the region. Such development must ensure sustainable ecosystems, providing ways to raise public awareness of national parks and the importance of biodiversity while providing income for their maintenance.

## IMPACT ASSESSMENT

*‘Official plans and policies for tourism pay scant attention to the changes that are due to happen in the immediate, near and mid-term future. The private sector in tourism and the related investment community seems not only to be ignoring imminent changes but in denial about the imminent impacts of climate change.’*

The Report identifies a significant weakness in the country’s preparedness for the impact of climate change on the tourism sector. Despite an enabling policy environment for climate change mitigation and an active scientific community well aware of the need to prepare the economy and society for the changes ahead, the need for adaptation in the tourism sector is currently ignored in national policies and planning, while investments are still being made in low altitude ski resorts which are at high degree of risk from climate change.

The Report finds that all four sub-sectors of tourism in the Republic of Macedonia are at some degree of risk, as shown in the following table:

<b>Tourism clusters</b> \ <b>Hazard</b>	<b>Warmer winters</b>	<b>Hotter summers</b>	<b>Heavy rain events and flooding</b>	<b>Changes to flora and fauna</b>
<b>Lake Tourism</b> ***	<ul style="list-style-type: none"> <li>Extended seasonality</li> <li>Changes to cold water species</li> </ul>	<ul style="list-style-type: none"> <li>Altered seasonality</li> <li>Algae blooms</li> <li>Heat stress for tourists</li> <li>Altered lake environment</li> </ul>	<ul style="list-style-type: none"> <li>Flooding</li> <li>Clouding of water</li> <li>Business interruption costs</li> </ul>	<ul style="list-style-type: none"> <li>Increased potential for insects as vectors of nuisance and disease</li> <li>Algae blooms</li> </ul>
<b>Wine Tourism</b> **	<ul style="list-style-type: none"> <li>Extended seasonality</li> <li>Quality of wine (thus tourism) at risk</li> </ul>	<ul style="list-style-type: none"> <li>Heat stress for tourists at outdoor sites</li> <li>Altered quality and raised alcohol levels of wine linked to tourist motivation</li> </ul>	<ul style="list-style-type: none"> <li>Tours become unattractive</li> <li>Business interruption costs</li> <li>Vineyards at risk</li> </ul>	<ul style="list-style-type: none"> <li>Vineyards at increased risk from vector borne plant diseases</li> </ul>
<b>Cultural Tourism</b> **	<ul style="list-style-type: none"> <li>Extended seasonality</li> </ul>	<ul style="list-style-type: none"> <li>Heat stress for tourists at outdoor sites</li> </ul>	<ul style="list-style-type: none"> <li>Outdoor/ archaeological sites at risk</li> <li>Business interruption costs</li> </ul>	<ul style="list-style-type: none"> <li>Where culture meets agriculture and traditional methods, risk to tourism's demand for authenticity</li> </ul>
<b>City tourism</b> *	<ul style="list-style-type: none"> <li>Extended seasonality</li> </ul>	<ul style="list-style-type: none"> <li>Increased air conditioning costs</li> <li>Heat stress for tourists</li> </ul>	<ul style="list-style-type: none"> <li>Business interruption costs</li> </ul>	
<b>Rural Tourism</b> **	<ul style="list-style-type: none"> <li>Extended seasonality</li> <li>Risk to tourism based on biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>Landscape aesthetics reduced</li> <li>Risk to tourism based on biodiversity</li> <li>Increased risk of bush/ forest fires</li> </ul>	<ul style="list-style-type: none"> <li>Risk to accessibility and transport infrastructure</li> <li>Business interruption costs</li> </ul>	<ul style="list-style-type: none"> <li>Changes to sport hunting</li> <li>Risk to aesthetic traditions</li> <li>Risk to eco-tourism projects and products</li> </ul>
<b>Mountain and Nature Activities</b> ***	<ul style="list-style-type: none"> <li>Decreased snow cover</li> <li>Increased snow - making costs</li> <li>Extended season for non-snow adventure tourism</li> </ul>	<ul style="list-style-type: none"> <li>Increased shoulder season for hiking</li> <li>Risk of July August becoming too hot for adventure tourism</li> </ul>	<ul style="list-style-type: none"> <li>Business interruption costs</li> <li>Tourists at risk from landslides and flooding</li> </ul>	<ul style="list-style-type: none"> <li>Changes to sport hunting</li> <li>Risk to tourism based on biodiversity</li> </ul>

\*\*\* High sensitivity+ exposure= very likely vulnerable;

\*\* Some sensitivity+ some exposure= vulnerable;

\* Low sensitivity+ low exposure= low vulnerability risk



## SPECIAL CASE STUDY – WINTER TOURISM

As part of its impact assessment, the Report undertook a special case study of winter tourism in the Republic of Macedonia, applying lessons learnt from other countries in Europe where this sub-sector has traditionally made a significant economic contribution.

Winter tourism is the sub-sector expected to be the most sensitive to climate change. The success of ski-related tourism is dependent on the amount and reliability of snow cover, or what has been termed 'snow security'. Snow security has been defined, in the case of Switzerland, as "the altitude above sea level on which between December 16 and April 15 enough snow for skiing on at least hundred days is available." It is estimated that an increase of 2°C in mean temperature will change this altitude from 1200m to 1500 m 2030. According to another study, a 1°C increase in air temperature will move the snow line up by 150 metres.

Applying this climate risk/snow security data to seven ski resorts in this country, it can be seen from the table below that a 2°C increase in mean temperature will place the majority of locations at risk.

SKI RESORT	ALTITUDE	RISK FROM A 2°C INCREASE IN MEAN TEMPERATURE
Krushevo	1240–1400	High risk
Mavrovo/ Zare Lazarevski	1255–1860	High risk
Mount Kozuf	1550–2200	Medium risk
Oteshevo	1400–1600	Medium to high risk
Pelister	1429–2601	Medium to high risk
Ponikve	1560	Medium risk
Popova Sapka	1708–2510	Low to medium risk

On the basis of previous research and analyses of winter tourism, the 2013 Report identifies three factors that challenge the economic viability of winter tourism:

- A decrease in snow reliability due to changes in winter precipitation and the number of frost days per year. These affects the days of snowfall as well as the amount and number of days with snow cover.
- Thawing permafrost due to a rise in mean temperature and the number of summer days will reduce the security of the infrastructure in permafrost zones and raise the risk of landslides and rock falls.
- Extreme weather events, such as heat waves, droughts and flooding, may also affect infrastructure.

The Report concludes that these three inter-related factors will undermine the fundamental socio-economic components necessary to stabilise winter tourism, i.e. the components of weather, the natural environment, and reliable season duration.

Research needs to be undertaken into snow modelling and scenario-making. This research should make use of existing data and modelling to cover the following aspects:

- Snow depth
- Duration of snow cover
- Ablation-rate (i.e. the rate of melting and evaporation)
- Snow-to-rainfall ratio
- Regional maps and site-specific snow-depth profiles

The Report recommends that more detailed and accurate real-time data for such research and climate modelling could be gathered by the location of automatic weather-stations in tourism hot-spots.

Such research will help predict the probability of snow depth on given dates and enable accurate calculation of the snow-line elevation. This will also help inform as to the best location for snow cannons in resorts where the use of such cannons is part of standard operating procedures and the impact of artificial snow-making is deemed an acceptable environmental risk. (The Report notes, however, that artificial snow-making is a noisy process that requires water and energy, and that the snow thus produced is more compact than natural snow and thus stays on the ground longer, which may affect flora and fauna.)

The Report's special case study on winter tourism further calls for research into levels of 'risk perception' vis-à-vis climate change in the sub-sector of winter tourism. Such risk perception has a critical influence on the allocation of resources for adaptation measures.

The Report identifies a certain extent of 'cynicism' about climate change on the part of some influential members of the tourism sector—an attitude that has a negative impact on the sector's adaptive capacity, undermining investment decisions, business planning and future-proofing activities.

The Report's special case study concludes that the vulnerability of winter tourism to climate change can be reduced in some cases by shifting from snow-based tourist activities to summer outdoor activities such as walking, hiking and cycling. Such diversification, however, is only one of many measures for adaptation that will need to be undertaken to mitigate the negative effects of climate change.



## ADAPTATION MEASURES

The Third National Communication identifies a number of contradictions in terms of the capacity of the Republic of Macedonia's tourism sector to adapt to climate change.

Most importantly, the Communication finds that while some government personnel and institutions are fully aware of and engaged with issues arising from climate change, the tourism sector is not represented in any meaningful way in these adaptation activities. And although the country has a scientific community that is well aware of climate change implications, the Communication finds that this community has so far failed to investigate sufficiently the important relationship between tourism and climate change. This neglect could be due to a lack of incentives for empirical research into the issue.

While the scientific capacity for adaptation almost certainly exists, the issue is one of awareness, communication, and action. 'Adaptive capacity will only be improved by increased awareness of the need for climate action in the tourism sector.'



## GENERAL RECOMMENDATIONS FOR ADAPTATION MEASURES

The approach to adaptation to climate change favoured by the Government is that of 'no regrets' or 'low regrets' measures.

'No regrets' measures are actions that would be justified under all plausible climate scenarios, even including the absence of any anthropogenic climate change. 'Low regrets' measures are actions entailing moderate levels of investment aimed at increasing capacity to cope with the risks arising from climate change. For example, installing drains of a larger diameter to cater for a projected increase in the intensity of rainfall would represent a relatively low-cost measure ('low regrets' option) if carried out at the stage of drain construction or refurbishment as compared to the costs of increasing the diameter at a later stage.

'No regrets' adaptation may also take the form of mitigation measures such as the use of bio fuels and other actions offsetting the carbon footprint.

The Third National Communication identifies the following four steps to reduce carbon emissions that should be taken by all tourism-related businesses and institutions as part of an overall mitigation policy:

- Refraining from activities that can be avoided without causing significant change in the tourism product and quality of service.
- Focusing on energy efficiency practices in specific activities (typically accommodation and laundry services).
- Substituting practices that generate high levels of emissions with practices that have a lower carbon footprint.
- Offsetting remaining emissions to achieve full carbon neutrality (including invitations to guests to offset, following the example of airlines).



These steps need to be part of a management cycle that builds on common sense, feedback, and success based on careful monitoring and engagement of staff and customers.

Given the inter-relatedness of factors and resources affecting tourism activities, measures for adapting this sector to climate change need to be part of a comprehensive adaptation strategy. The Third National communication identifies the following components of such a strategy as being applicable to the tourism sector:

- Finance and investment: A much better understanding of climate risk to tourism is required in the Republic of Macedonia and throughout Southeast Europe in general. This need not put at risk either domestic or foreign direct investment in the sector but would help avoid expensive mistakes such as locating new ski resorts at low altitudes that are in imminent danger of diminished snow-security.
- Science and communication: The country has a highly competent scientific community. In common with many other countries, however, there is a lack of communication between researchers and policy-makers and practitioners, combined with a lack of enthusiasm for perceiving tourism as a strategically significant sector.
- Sensitivity and awareness of climate change amongst the public, businesses and government: There is an urgent need to communicate climate issues to all parts of the tourism sector.
- Risk management plans: As far as could be ascertained, no risk-planning is presently being undertaken within the tourism sector, even on the part of those sub-sectors obviously at risk in the short term.
- Coordination with other planning processes: In common with many other countries, tourism planning in the Republic of Macedonia is not mainstreamed into general planning processes. This is probably due to its present low contribution (less than 2%) to GDP. However, tourism planning should at least take account of wider government measures in environmental conservation and ongoing plans for cultural revitalisation. Given the vulnerability of this sector, it needs to be integrated into mainstream planning and risk management.

To overcome existing barriers to adaptation, the Government should facilitate greater coordination and communication within the scientific community, supporting further research into tourism and climate change so as to provide easily accessible data on climate risk. Climate risk information specific to tourism should put current and future climate in the perspective of changing national development priorities and the country's recognition of the need to develop a healthy international tourism sector.

## SPECIFIC MEASURES RECOMMENDED BY THE THIRD NATIONAL COMMUNICATION ON CLIMATE CHANGE

- To provide incentives for scientific research into tourism, both in general and specifically in terms of climate change, so as to provide robust, empirical evidence as the basis for a programme to raise awareness of climate change amongst tourism sector management and employees.
- To plan for 21st century tourism, based on the potential contribution of this sector to the conservation of culture and natural resources, rather than outdated models of 20th century mass tourism. Planners and policy-makers can provide a lead by providing incentives and regulations that do not harm business prospects and profitability.
- To ensure the sustainability of future tourist developments, including through the installation of solar panels in buildings together with heat exchange mechanisms and appropriate insulation to reduce energy costs. With IPCC AR5 predicting rises in temperatures in the South East European region, the urgency for such measures is self-evident.
- To adapt through diversification. Climate-sensitive activities like skiing and visits to outdoor cultural sites will be negatively affected by climate change. Adaptation measures in the tourism sector must therefore include diversification into activities most suited to emerging weather patterns.
- To conduct detailed climate and natural hazard risk assessments of the sensitivity and exposure of tourist assets. Previously assessed areas, such as viticulture and the cultural heritage, should be reassessed from the aspect of their relation to tourism and climate change.
- To facilitate and ensure sustainable development in all sub-sectors of tourism. All planned tourist developments and infrastructure should meet and exceed the highest standards for sustainability in order to reduce their vulnerability to increased energy costs and to mitigate emissions. This process should be tracked throughout the value and supply and service chains related to tourism, including the important area of solid waste management.
- To provide incentives and support for adaptation measures in the private sector. Incentives could include tax remissions for adaptation measures. Support could include awareness briefings and practical workshops for tourist sub-sectors with a focus on sharing expertise between large and small enterprises (e.g. major international hotel brands sharing their expertise with small rural properties).

## RECOMMENDATIONS FOR FURTHER RESEARCH AND ADVOCACY

One of the central findings of the 2013 Report on Tourism and the Challenge of Climate Change is that the Republic of Macedonia's tourist industry shows little awareness of climate change and is neglecting to prepare for the impact of climate change on tourism.

There is thus a clear and urgent need for a baseline survey to ascertain the attitudes and behaviours currently prevalent in each tourism sub-sector with regard to climate change. The findings of such a survey would provide the basis for designing an adaptive capacity-building programme for tourism and its stakeholders, underpinned by a suitable awareness programme.

Much more data needs to be gathered on tourism and climate change—especially site-specific data, including meteorological data. This data will help operators in the tourism sector to assess risks and plan for conservation and adaptation. The following studies are recommended:

- Site-specific case studies to provide examples for undertaking broader risk-planning and management.
- Assessments of tourist products in terms of quality and site-specific risks and vulnerabilities so that key changes can be integrated into the development of these products.
- Assessments of the impact of tourism on local cultures, populations and jobs to allow for continuous monitoring of these impacts.
- Assessments of the current condition/ status of traditional knowledge insofar as it contributes to some forms of intangible cultural tourism.
- Actions on the part of management to reduce energy usage and energy risk, especially in transport and accommodation.

The Third National Communication recommends the following measures to raise awareness and bring attention to the need for the adaptation of the tourism sector to climate change:

- Forming government partnerships with the private sector to combat climate issues, e.g. through the joint funding of site-specific weather monitoring stations.
- Forming international research and mentoring partnerships to improve scientific capacity to research the tourism-climate nexus.
- Prioritising communications to target audiences to ensure that awareness of climate change and the need for adaptation is widespread.
- Raising awareness amongst civil society and the general public of the risk posed by climate change to leisure activities in order to encourage engagement with and support for the development of a green future.
- Publishing key findings in forms accessible beyond the scientific community, such as newsletters, policy summaries and short films.

## **THE REPORT FURTHER RECOMMENDS THE FOLLOWING TRAINING TO INCREASE CAPACITY:**

- Site-specific workshops for professionals to increase awareness and capacity.
- Training for specific climate changes, such as training in how to deal with the risks associated with extreme weather events.
- Training to raise sensitivity and awareness in each sector to improve capacity for adaptation to climate change.