

THE IMPACTS OF CLIMATE CHANGE ON TOURISM AND POTENTIAL ADAPTATION RESPONSES IN COASTAL AND ALPINE REGIONS

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Abstract: Tourism is an important and fast developing economic sector. It is highly climate and weather dependent. In recent years it has benefited from improved weather and climate information, but climate change represents a significant threat to tourism. It is forcing the industry to adapt already now, but in future adaptation to climate change will represent a major challenge to tourism.

Keywords: *climate change, tourism, adaptation, natural resources*

1. INTRODUCTION

The main tourist attractions in Slovenia are well-preserved nature with its beautiful landscapes and rich cultural heritage. Snowy Alpine peaks and the Triglav National Park with many glacial valleys, gorges, waterfalls, lakes and crystal-clear wild waters attract visitors looking for peace in the mountains as well as sports climbers, skiers, rafters, canoeists, gliders and others in search for relaxation and excitement in everyday life. Landscape and opportunities for sport, recreation and leisure are highly dependant on local climate. Climatic conditions in Slovenia vary. There is a continental climate in the northeast, a severe Alpine climate in the high mountain regions, and a sub-Mediterranean climate in the coastal region. Yet there is a strong interaction between these three climatic systems across most of the country. This variety is also reflected in climatic variability over time and is an important factor determining the impact of global climate change in the country.

2. NATURAL RESOURCES

As nature based tourism prevails in Slovenia, climatic change could more or less seriously jeopardize some of the touristic resorts and activities. Already now it is evident that winter tourism based on sport and recreation on ice and snow is highly vulnerable and immediate efforts to adapt are needed. Climate change will shorten the tourist season in some parts of the country, but on the other hand there are locations, which will benefit with extended favourable climatic conditions for selected sport, recreation and leisure activities. It is expected that more tourists will concentrate in selected zones increasing environmental stress in that region. There are some natural phenomena (like caves with underground rivers in the Karst terrain, wetlands, lakes and waterfalls), which are very sensitive to precipitation regime. Some of those natural beauties could even disappear, if climate will change significantly. Ecosystems including some rare and protected species will be highly endangered in unstable climatic conditions. Already now tourism represents a significant environmental burden for some sensitive ecosystems, which could be unable to stand any additional stress that could result due to climate change.

3. COASTAL REGION AND CARST

The Coastal region is under stress in case of high tide occurring in combination with special weather conditions. Expected sea level rise will increase problems in that region. The first to suffer will be the salina landscape, a precious protected area for its cultural and environmental value. Snežna jama cave with its frozen stalactites in alpine Mount Raduha is a special sight, and the caves in the shallow karst of Dolenjska are also quite unique. The springs, waterfalls and lakes are different in each part of Slovenia. The karst springs of rivers are a surprising feature in the Julian Alps; waterfalls and white-water rapids are found on the Soča, the Sava, the Krka, the Savinja, and numerous other rivers and streams that flow here through narrow gorges and across wide valleys. Charms of a special kind are shown by karst lakes, among which the disappearing Cerknica Lake is the largest and the most picturesque. The Skocjan Caves are a

unique natural feature and cultural heritage; they have been on the UNESCO world heritage list since 1986, and in 1999 were put on the Ramsar List of Wetlands of International Importance as the world's largest underground wetlands. But they are also very sensitive ecosystems to all the changes in environment and consequently also to climate change. Changes in precipitation regime will have significant impact on all above-mentioned features.

4. CLIMATIC DIVERSITY

Slovenia is a heterogeneous country not only in its climate and relief, but also in its vegetation. This diversity in vegetation is affected by different temperature conditions, which directly define the length of the yearly vegetation period. Throughout Slovenia, there are forest reserves, and primeval forests are still to be found in some parts of Slovenia. Protected forests, trees, and the autochthonous flora and fauna are often a part of the landscape parks that preserve the heritage of individual areas. Many of Slovenia's natural sites are included in theme trails, forest education trails, and various local excursion programs. Droughts, flash floods, wild fires and severe storms can endanger them, but not only single weather events, also slow changes in temperature and precipitation regime could jeopardize them.

5. NEED TO ADAPT

Slovenia is perceived as rich with water, there is no perception that we should carefully deal with it yet. But certainly with progressive climate change during the next decades this perception will have to change considerably. Extreme weather and climate events have always represented a threat to society and the environment, in such a varied climate as ours extremes have various impacts and their consequences involve different aspects. During the last year more attention was paid to extreme events and potential consequences of climate change and a project focusing on assessing the impacts of potential climate change in Slovenia was established. The first step is to determine the vulnerability of our environment and society to climate change. In this respect tourism is an important economic sector, which occupies a visible place within the project. Only through the effective use and management of existing resources and adaptation to changing climatic and environmental conditions tourism revenues will increase, local small- and medium-sized enterprises will get a boost.