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## **Taking into Account Climatic Conditions in the Tourism Industry in Georgia**

**Liana Kartvelishvili, Lia Megrelidze**

Georgian Technical University Institute of Hydrometeorology, National Environmental Agency

liana.kartvelishvili@nea.gov.ge

**Abstract.** The resort and tourism industry is one of the most important sectors of the world economy, the development of which directly depends on the geographical location, topography, vegetation, fauna, ecology, weather and climate of a given region. Weather and climate are the two main factors that determine the bioclimatic resources of a place. Therefore, great attention is paid to the study of these resources, which is necessary for the organization and development of the resort and tourism industry. This work was carried out within the framework of the United Nations Convention on Climate Change and discussed therein the impact of climate on the development of the tourism sector in Georgia. To evaluate tourism-recreational resources in Georgia for the first time several Tourism Climatic Indexes should be used based on the combination of different meteorological elements. For the development of ski tourism it is important to take into account the aspects of climate change and regulations of snow cover change at Georgian winter resorts. Mountain-ski tourism is particularly sensitive to climate change.

**Keywords:** Tourism Climatic Index, bioclimatic resources, geographical location, ecology, recreational resources

**Introduction.** Tourism has various impacts on the outside world. The tourism industry exploits the country's natural, cultural and historical resources, pollutes the air, water and soil, and has a strong anthropogenic impact on the outside world. The positive impacts of international tourism include the protection and restoration of historical monuments, the creation of national parks and reserves, the protection of coasts, the preservation of forests, etc. However, in many developing countries, no measures are taken to protect nature due to the lack of financial resources. For example, the protection of parks can cause a decrease in pastures for cattle and lead to a decrease in food production. The negative impacts of tourism, unfortunately, outweigh the positive ones. In particular, these are the impact on water quality in rivers, seas and lakes. Air quality - due to pollution from vehicle exhaust, noise from various entertainment establishments; destruction of local fauna by tourists due to bonfires, destruction and damage to historical monuments.

The impact of tourism on the environment can be direct and indirect, as well as positive and negative. Tourism cannot develop without a direct connection with the environment, however, through tourism development planning, the negative impact of tourism can be somewhat reduced and the positive impact can be enhanced. The policy of protecting the environment is aimed at ensuring long-term tourism activity. However, some countries ignore this idea and choose commercial and financial profit. Different models have been adopted to assess the impact of tourism on the environment. In some tourist areas, the normative acts have a weak impact, and nature protection services are almost non-existent, however, the lack of a normative base, which ensures the protection of nature, should not stop the planning of developing tourism. Specialists in this field should conduct research. It should be noted that it is easier to protect the outside world than to repair the damage it has caused. Tourism is recognized as one of the most important economic and social phenomena of the last century. Today, tourism accounts for 88% of world exports, occupies a 31% share of the international tourism market, and employs more than 105 million people.

International tourist arrivals have increased from 25 million to 840 billion since 1950. According to research by the World Tourism Organization, it is growing by 4% annually and will reach 1.6 billion by 2020. 7.5% of world exports belong to the tourism sector. After the automobile and gas industries, tourism is one of the fastest growing sectors of international trade and services, the development of which is characterized by its geographical expansion, diversification and integration. For its sustainable development, it is necessary to expand the marketing sector and develop new forms of tourism.

Georgia was considered a leading tourism country in the former Soviet Union. More than 120 international and domestic tourist routes passed through Georgia. The political events that took place in the 1990s led to the complete paralysis of its structure, which led to the cessation of tourist flows. During this period, tourism suffered a double blow. First, the infrastructure was destroyed. Second, the personnel who had extensive experience in this field were lost.

Since 1993, Georgia has been a member of the World Tourism Organization, and tourism has begun to grow again. Gradually, both the geography of tourist-supplying countries and the number of tourists have increased. Georgia is visited by tourists from all six tourist regions of the world, with the largest share of the total number coming from Europe.

**Methods and Materials.** An important problem of modernity is the protection of the environment from negative anthropogenic activities and the rational use of natural resources. Climate is one of the important components of the environment. WTO considers that climate forecasts to become extremely important for sustainable development of tourism all over the world. WMO and WTO adopted first resolution on the need for assessment of tourism recreation potential on the base of climate change. Georgia is full member of both organizations (WMO & WTO), which preconditions the need for the assessment of tourism recreation potential (1).

Climatic indices were used to assess tourism and recreational resources. There are more than 200 climate indices. In general, the tourism climate indices can be classified into three categories. To evaluate tourism-recreational resources in Georgia for the first time the Tourism Climatic Index was used, based on the combination of different meteorological elements (air temperature, atmospheric precipitation, relative humidity, average duration of sunshine).

At the same time, this index does not fully incorporate the thermos physiological component necessary to evaluate. To study of the climate change impacts on the tourism industry development, the Holiday Climate Index (HCI) has been identified.

The five climatic variables used for the HCI input are maximum air temperature (C) and relative humidity (TC) (the set of these two parameters is the effective air temperature T) (%), cloud cover (A) (%), precipitation Rd (mm) and wind (W) (m/sec.) The Holiday Climate Index The effective air temperature is calculated according to a special nomogram [2].

$$HCI = 4 \cdot T + 2 \cdot A + 3 \cdot Rd + W.$$

Unique geographical location, complex dissected relief, land cover diversity and specific climate, containing almost every type of climatic zones. We have determined the complex climatic index of tourism not only diametrically different regions (such as Adjara-Guria and Kakheti region), but also in touristic mountain and ski regions (Borjomi-Bakuriani region, Mtskheta-Tianeti region, Svaneti).

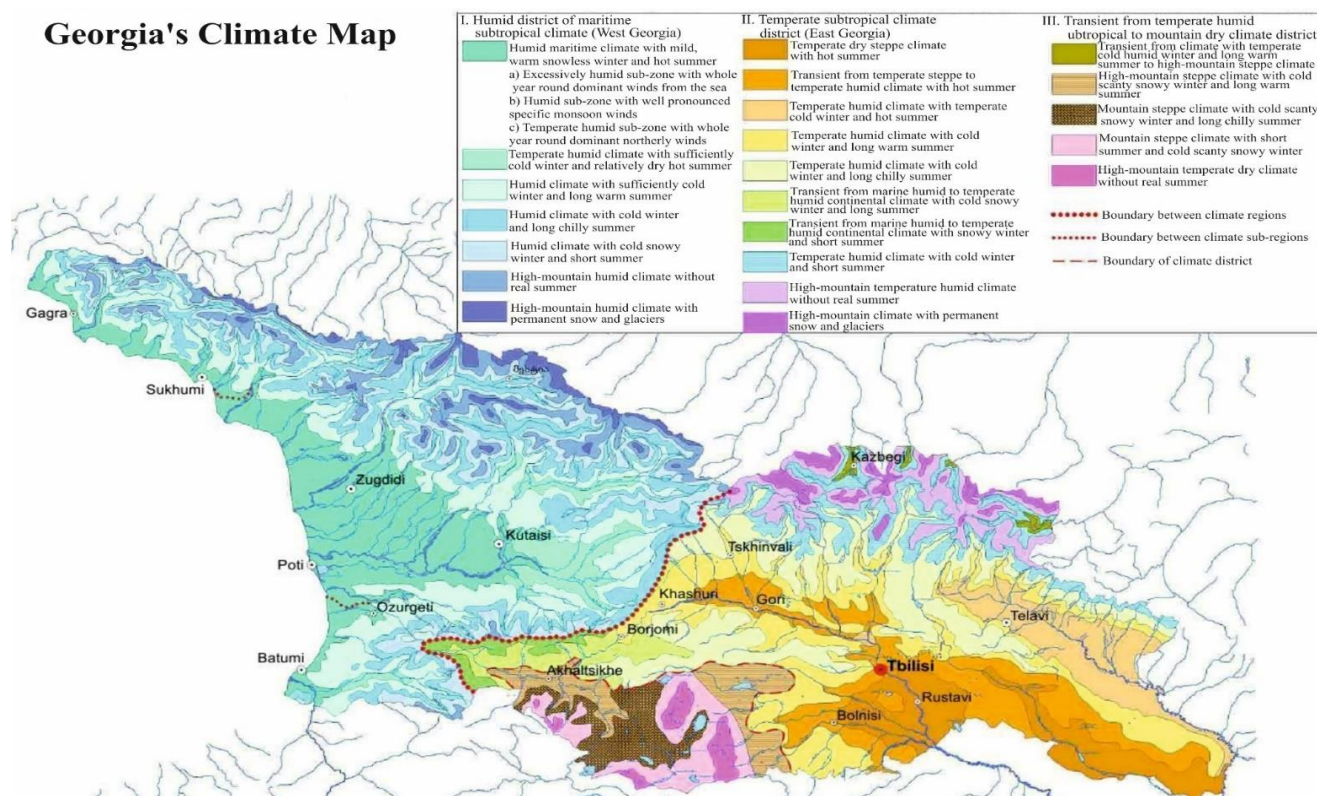


Fig. 1. Map of climatic regions of Georgia

Mountain-ski tourism is particularly sensitive to climate change, thus, it is necessary to take into account the climate change challenges for its reasonable development.

For several Georgian ski resorts (Mestia, Goderdzi, Gudauri, Bakuriani), the patterns of change in snow cover duration between two 30-year periods (I period 1956–1985 and II period 1986–2015) were assessed. Snow cover data are

incomplete - data are not available for all years. The length of the ski season may be significantly affected by climate change in the future, with average temperatures expected to increase in all months under the climate change scenario.

As studies show, precipitation is decreasing across almost the entire territory of Georgia, with the exception of a few stations located in lowlands. It is accepted that a ski area is considered reliable in terms of snow cover when the height of the snow cover (artificial or natural) exceeds 30 cm for 100 days.

In Bakuriani, the maximum average snow cover depth is in February (61.3 cm), the maximum snow cover depth of 130 cm was recorded in Bakuriani in March 1956. In Gudauri, the maximum average snow cover depth is in March (115.1 cm), the minimum - in October (0.7 cm). The maximum snow cover depth of 330 cm was recorded in Gudauri in February 2008. In the future, as a result of increasing temperatures and decreasing precipitation, the duration of snow cover is likely to decrease.

In Bakuriani, from 1956 to 1985, a noticeable change in the average mean depth of maximum snow cover was observed in January (decrease of 17%), in February (decrease of 19%) and in November (increase of 17%) in 1986-2015. The average maximum depth of snow cover in Gudauri increased in April (18%) and in November (30%).

In all three (coastal, mountainous and alpine) climatic zones of Georgia, there are currently favorable climatic conditions for the development of summer tourism.

Based on the forecast indicators of the climatic index of tourism, it can be said that by the a certain decrease in comfort will be expected in the coastal zone under the conditions of climate warming.

### Conclusion

- Involvement of climate change issues in tourism policy, strategies and action plans;
- Assessing and taking into account the possible risks of climate change when investing;
- Promoting / stimulating cooperation with other sectors / industries (transport, meteorological services...);
- Integrating adaptation issues into tourism industry consulting and education programs;
- Raising awareness of businessmen, tour operators and other stakeholders on the impact of climate change on the tourism sector;

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საქართველოში ტურიზმის ინდუსტრიაში კლიმატური პირობების გათვალისწინება/ქართველიშვილი ლ., მეგრელიძე ლ. სტუ-ის ჰმ-ის შრომათა კრებული-2025.-ტ.136.-გვ. 64-67. -ინგლ., რუს. ქართ., რუს.

კურორტებისა და ტურიზმის ინდუსტრია მსოფლიო ეკონომიკის ერთ-ერთი უმნიშვნელოვანესი სექტორია, რომლის განვითარება პირდაპირ დამოკიდებულია მოცემული რეგიონის გეოგრაფიულ მდებარეობაზე, ტოპოგრაფიაზე, მცენარეულობაზე, ფაუნაზე, ეკოლოგიაზე, ამინდსა და კლიმატზე. ამინდი და კლიმატი ორი მთავარი ფაქტორია, რომლებიც განსაზღვრავს ადგილის ბიოკლიმატურ რესურსებს. ამიტომ, დიდი ყურადღება ექცევა ამ რესურსების შესწავლას, რაც აუცილებელია კურორტებისა და ტურიზმის ინდუსტრიის ორგანიზებისა და განვითარებისთვის. ეს ნაშრომი ჩატარდა კლიმატის ცვლილების შესახებ გაეროს კონვენციის ფარგლებში და მასში განხილულია კლიმატის გავლენა საქართველოში ტურიზმის სექტორის განვითარებაზე.

საქართველოში ტურიზმისა და რეკრეაციის რესურსების პირველად შესაფასებლად უნდა იქნას გამოყენებული რამდენიმე ტურიზმის კლიმატური ინდექსი, რომელიც დაფუძნებულია სხვადასხვა მეტეოროლოგიური ელემენტების კომბინაციაზე. სათხილამურო ტურიზმის განვითარებისთვის მნიშვნელოვანია კლიმატის ცვლილების ასპექტების და საქართველოს ზამთრის კურორტებზე თოვლის საფარის ცვლილების რეგულაციების გათვალისწინება. სამთო-სათხილამურო ტურიზმი განსაკუთრებით მგრძნობიარეა კლიმატის ცვლილების მიმართ.

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**Учет климатических условий в сфере туризма в Грузии/Картвелишвили Л., Мегрелидзе Л. /Сб. Трудов ИГМ ГТУ. - 2025. – том 136. – гр. 64-67. - Англ.; Рез: Груз., Англ., Рус.**

Курортно-туристическая индустрия является одной из важнейших отраслей мировой экономики, развитие которой напрямую зависит от географического положения, рельефа, растительности, фауны, экологии, погоды и климата того или иного региона. Погода и климат — два основных фактора, определяющих биоклиматические ресурсы места. Поэтому изучению этих ресурсов уделяется большое внимание, поскольку они необходимы для организации и развития курортов и туристической отрасли. Данная работа проводилась в рамках Конвенции ООН об изменении климата и рассматривает влияние климата на развитие туристического сектора в Грузии.

Для первоначальной оценки туристических и рекреационных ресурсов Грузии следует использовать несколько индексов туристического климата, основанных на сочетании различных метеорологических элементов. Для развития горнолыжного туризма важно учитывать аспекты изменения климата и правила изменения снежного покрова на зимних курортах Грузии. Горнолыжный туризм особенно чувствителен к изменению климата.