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## **TOURISM CLIMATE INDEX IN TBILISI**

### **Introduction**

A picturesque nature, landscapes Great Caucasian Ridge, subtropical zone of the Black Sea, rivers and waterfalls, cave towns, resorts and mineral springs, urbanized cities and settlements, and traditional Georgian hospitality make Georgia the country of tourism.

With a territory of 64 700 km<sup>2</sup> Georgia includes 330 km of subtropical Black sea coast, extensive agricultural regions and alpine valleys with dramatic mountains such as Shkhara (5198 m) and Kazbek (5048 m). Near 39 % of the country is forest. It has 19 nature reserves, 860 lakes, numerous waterfalls and more than 25 000 rivers whose total length is 54 768 km. There are almost all kinds of mineral waters with more than 2000 springs already.

Georgia has 12 000 historical monuments and 150 museums: medieval towers pepper the sub alpine zones, and some of the cathedrals, churches, monasteries and some of the cathedrals, churches, monasteries and bridges date as far back into the past as the VI-V millennium B.C.

Activities relating to tourism in Georgia include the following:

- Cultural tourism: archaeology, history, agriculture, ethnography;
- Adventurous tourism: trekking, mountaineering; skiing, horseback riding; mountain-biking etc.;
- Eco Tourism: Bird watching, Botany, Active Eco tours;
- Agro Tourism;
- Special interest tourism (wine and gourmand tours, photography, etc.);
- Resorts and recreational tourism;
- Conventions and Conferences;

The diverse climatic conditions in Georgia give a tremendous potential for tourist resort development. However, the determination of the climatic potential of Georgia for the tourism in the correspondence with the standards accepted in the developed countries was not conducted. This somewhat hampers the comparison of the climatic potential of Georgia from the point of view of tourism with the same for other countries. As a result this can have an unfavorable effect on attractiveness level of the Georgia for the potential tourists. In this work the determination of the climatic potential of tourism to Tbilisi (the capital of Georgia) into the correspondence with that frequently utilized in other countries of the “tourism climate index” (TCI) [2,4 -7] is carried out.

## Methods and data

In the past, tourism climatology information was provided through climate indices such as those found in applied climatology and human biometeorology. There are more than 200 climate indices. In general, the tourism climate indices can be classified into three categories [7]. Elementary indices are synthetic values that do not have any thermo-physiological relevance and are generally unproven. The bioclimatic and combined tourism climate indices involve more than one climatological parameter and consider the combined effects of them.

An example of a combined index is the Tourism Climate Index (TCI). Developed by Mieczkowski (1985) the TCI uses a combination of seven parameters, three of which are independent and two in a bioclimatic combination:

$$TCI = 8 \cdot Cld + 2 \cdot Cla + 4 \cdot R + 4 \cdot S + 2 \cdot W$$

Where Cld is a daytime comfort index, consisting of the mean maximum air temperature  $T_{a,max}$  (°C) and the mean minimum relative humidity RH (%), Cla is the daily comfort index, consisting of the mean air temperature (°C) and the mean relative humidity (%), R is the precipitation (mm), S is the daily sunshine duration (h), and W is the mean wind speed (m/s).

In contrast to other climate indices, every contributing parameter is assessed. Because of a weighting factor (a value for TCI of 100), every factor can reach 5 points. TCI values  $\geq 80$  are excellent, while values between 60 and 79 are regarded as good to very good. Lower values (40 – 59) are acceptable, but values  $< 40$  indicate bad or difficult conditions for tourism [2].

Data of the monograph [3] and hydrometeorological department of Georgia were used for the TCI calculations.

## Results

The results of TCI calculations on the fig. 1 and fig. 2 are presented.

As follows from the fig. 1 during January, February and December value of TCI in Tbilisi corresponds to category "Marginal". During March and November value of TCI corresponds to category "Acceptable", during April – "Good", during May, July, August and October - "Very good", and during June and September – "Excellent". Thus the climate of Tbilisi for tourism is favorable practically entire year.

Share of the monthly TCI components in the summary value of TCI in Tbilisi are presented on the fig. 2.

As it follows from the fig. 2 the values of daytime comfort index (Cld varied from 34 to 51,9 %) and precipitation (R varied from 12,2 to 38,3 %) make the greatest share to the value TCI. The values of daily comfort index (Cla varied from 6,4 to 13,5 %) and mean wind speed (W varied from 7,2 to 11,5 %) make the smallest share to the value TCI. The share of daily sunshine duration S varied from 11,5 to 21,6 %.

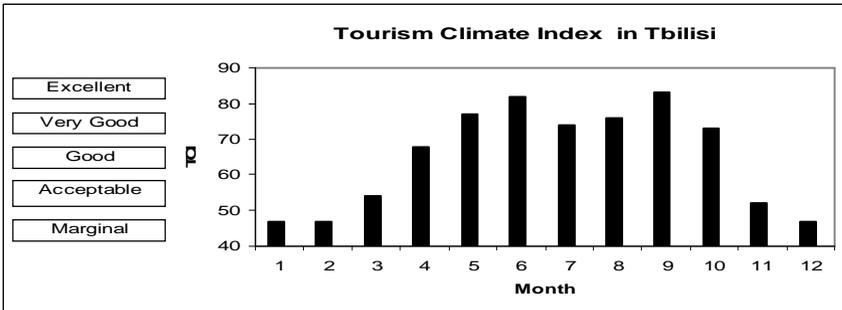


Fig. 1

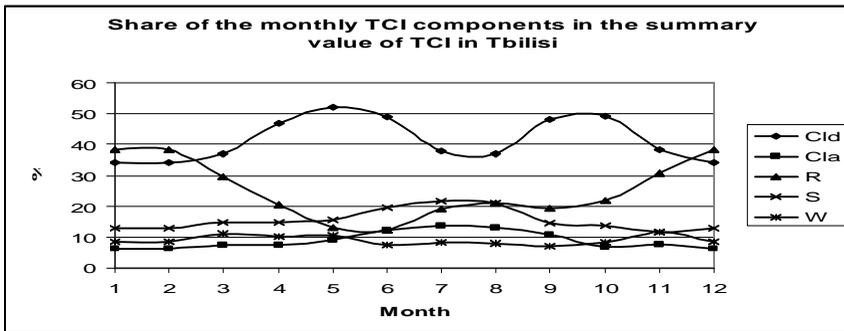


Fig. 2

Let us note that the climate of Tbilisi for the tourism into the entire more favorable than in Edmonton and Toronto, and it is a little inferior to the climate of Sydney and Canakkale [1, 2].

### Conclusion

A picturesque nature, landscapes Great Caucasian Ridge, subtropical zone of the Black Sea, rivers and waterfalls, cave towns, resorts and mineral springs, urbanized cities and settlements, and traditional Georgian hospitality make Georgia the country of tourism.

Climate has a strong influence on the tourism and recreation sector and in some regions represents the natural resource on which the tourism industry is predicated. In this work the determination of the climatic potential of tourism to Tbilisi (the capital of Georgia) into the correspondence with that frequently utilized in other countries of the “tourism climate index” (TCI) is carried out.

In the future we plan a more detailed study of the climatic resources of Georgia for the tourism (mapping the territory of Georgia on TCI, study trends of

TCI, determination of other climatic and bioclimatic indices for tourism - Physiologically Equivalent Temperature, Mean Radiant Temperature etc.).

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ტურიზმის კლიმატური ინდექსი ტბილისი/Amiranashvili A., Matzarakis A., Kartvelishvili L./Transactions of the Georgian Institute of Hydrometeorology. -2008. -t.115.-gv. 27-30.- ingl ; rez. qarT., ingl ., rus.

ნაშრომში მოცემულია ტბილისათვის ტურიზმის კლიმატური პოტენციალის სეფაზება სხვადასხვა ღვეანასი xსირად მხარებუი "ტურიზმის კლიმატური ინდექსის" შესაბამისად.

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**КЛИМАТИЧЕСКИЙ ИНДЕКС ТУРИЗМА В ТБИЛИСИ./Амиранашвили А., Матзаракис А., Картвелишвили Л./ Сб.Трудов Института Гидрометеорологии Грузии. -2008. – т.115. – с. 27-30. – Англ.; Рез. Груз., Англ.,Рус.**

В работе проведена оценка климатического потенциала туризма для г. Тбилиси (столица Грузии) в соответствии с часто используемым в различных странах "Климатического индекса туризма".