

Patterns of Winter Tourism Activity in the Bucegi Mountains – the Prahova Valley (the Southern Carpathians)

Mircea VOICULESCU¹, Florentina POPESCU¹, Martin OLARU^{1,*}

¹ West University of Timișoara, Department of Geography, Bdul Vasile Pârvan, 4, 300223-Timișoara

* Corresponding author, martinolaru@yahoo.com

Received on <29-11-2011>, reviewed on <15-03-2012>, accepted on <06-07-2012>

Abstract

The Bucegi Mountains and the Prahova Valley represent the most important destinations for winter tourism activities, of great heritage value in the Southern Carpathians - Romanian Carpathians. A number of resorts have developed here over time, currently enjoying great popularity among those keen on such activities. This article aims at presenting, on the one hand, the natural features (terrain factors and climate variables) favourable for winter tourism activities, and on the other, our results concerning the statistical analysis of the accommodation infrastructure, ski amenities and tourist flow. The expansion of the ski area and the development perspectives of the existing infrastructure as much as the local, regional and national authorities' interest represent the premises for hosting the winter edition of the European Youth Olympic Festival, in 2013 and the Winter Olympic Games in the year 2020 in the outlined area.

Keywords: *winter tourism activities, terrain factors, climatic models, statistical analysis, Bucegi Mountains - Prahova valley, Southern Carpathians*

Rezumat. Modele ale activității turistice hibernale în Munții Bucegi – Valea Prahovei (Carpații Meridionali)

Munții Bucegi și Valea Prahovei reprezintă cea mai importantă destinație din România pentru activitățile turistice de iarnă, de mare tradiție în Carpații Meridionali - Carpații Românești. O serie de stațiuni turistice s-au dezvoltat aici de-a lungul timpului, în prezent regiunea bucurându-se de o mare popularitate printre cei dornici de astfel de activități. Acest articol își propune să prezinte, pe de o parte, caracteristicile naturale (parametrii topografici și variabilele climatice) favorabile activităților turistice de iarnă, iar pe de altă parte, infrastructura de cazare, facilitățile pentru activitățile de schi și fluxul turistic. Extinderea pârtiilor de ski, perspectivele de dezvoltare a infrastructurii existente, interesul autorităților locale, regionale și naționale, reprezintă premisele pentru găzduirea ediției de iarnă a Festivalului Olimpic European de Tineret, în 2013 și a Jocurilor Olimpice de Iarnă din 2020 ani în regiunea prezentată.

Cuvinte-cheie: *activități turistice de iarnă, parametrii topografici, variabilele climatice, analiză statistică, Munții Bucegi – Valea Prahovei, Carpații Meridionali*

Introduction

Today, more than ever, tourism is part of the global change and development (Page and Connell, 2006) having economic, social, cultural and educational results, but environmental consequences as well (Murphy, 1985; Wall, Mathieson, 2007; UNEP, 2007). Tourism industry represents one of the major drivers of development for any society, by creating different entertainment and accommodation facilities, infrastructure networks and job opportunities. At the same time, tourism is a driver for the development of the

related activities and for the overall growth of a state's annual income (Heberlein et al., 2002). Mountain tourism with its countless types of activities represents one of the most spectacular forms of tourism, as stated by several works in the literature (Booth and Cullen, 2001; Heberlein et al., 2002; Jeanneret, 2001; Godde et al., 2000; Yang et al., 2009). Winter tourism activity, and in the same time of sport activity, has generated an entire industry within mountain areas (Agrawala, 2007; Bürki et al., 2005; Hudson, 2002; Lew et al., 2008). Snow represents a very important component of earth system physics (Beniston et al., 2003) and of

socioeconomic systems in mountain regions (Beniston, 1997) at the same time. Snow has become an important tourist resource (Besancenot, 1990) which is fundamental for winter tourism activities (Rixen et al., 2003).

Romania is endowed with an important mountainous area which covers close to a third of its territory. The most important area for winter tourism activities in Romania is to be found in the Bucegi Mountains, component part of the Southern Carpathians. The scientific and economic interest for this tourist area has been underlined either by syntheses or by punctual research papers (Bogdan, 2008; Institutul Național de Cercetare - Dezvoltare în turism, 2009; Micu, Dincă, 2008; Mihai et al., 2002;

Mihai, 2005; Pompei, 2010; Surugiu et al., 2010; Voiculescu, Popescu, 2011).

The scope of our paper is to highlight the present features of the winter tourism activities having in view its natural potential and also the accommodation infrastructure and the skiing amenities, and, most of all, to promote this tourist area of exceptional value in geographic literature.

The Bucegi Mountains are located at the eastern end of the Southern Carpathians, within the ridge that bares their name (Fig. 1, Fig. 2). They have the appearance of a suspended synclinal and are made of limestone, conglomerates with sandstone intercalations.

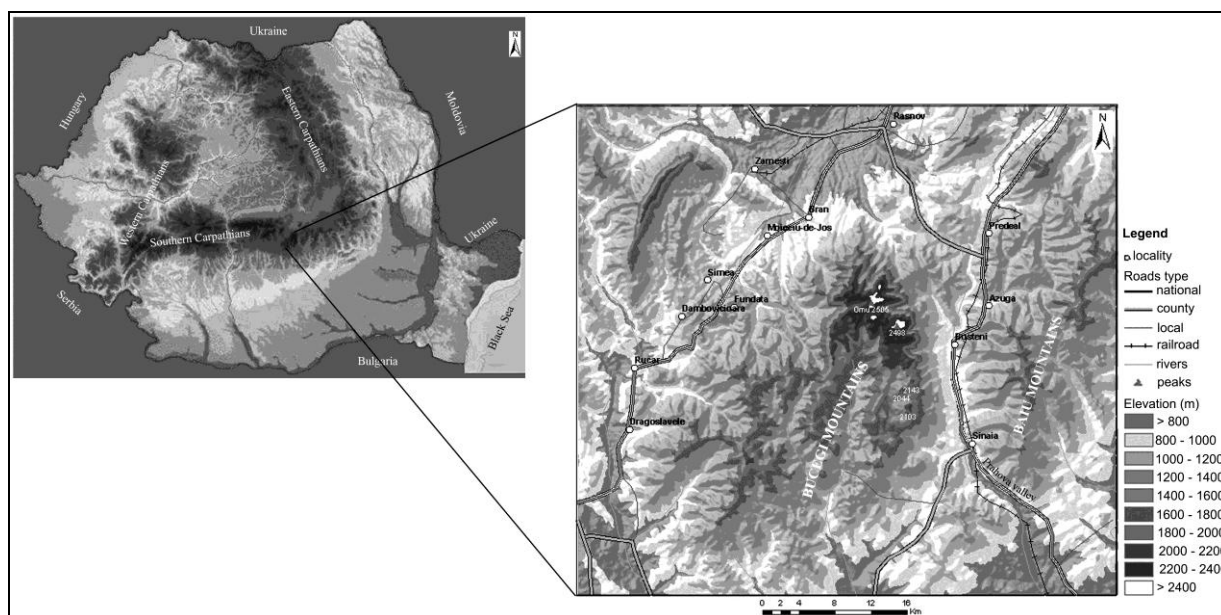


Fig. 1 Geographical location of Bucegi Mountains-Prahova valley

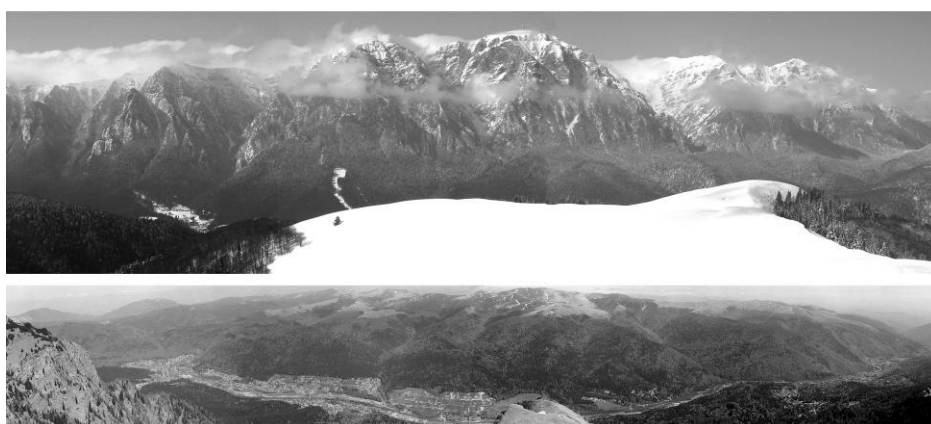


Fig. 2 The Bucegi Mountains (on the top) and Prahova valley (on the bottom)

They have a north-south orientation and the shape of a semicircle with its opening towards the south and bare in their northern part the main orographic knot, Omu peak (2505 m). Two large

crests start from here, each with peaks over 2300-2400 m, which delineate two structural cliffs, made of simple and staked cuesta fronts of erosive or tectonic-erosive structure (Velcea, 1983). The eastern

cliff raises 1000-1200 m over the Prahova Valley. Here specific landforms appear: gates, windows, stacks, chimneys and brâne which have a high tourist value. Within the Prahova valley, the resort of Sinaia emerged, known also as the Pearl of the Carpathians, which has polarized the development of other smaller resorts along the valley (Bușteni, Azuga and Predeal), each with different sized ski domains, accommodation facilities and specific infrastructure.

The leisure heritage of the Bucegi Mountains and the Prahova valley and their surrounding area is

favourably exploited due to their location: in the central part of Romania, 120 km far from the country's capital city, Bucharest and to the existence of the transportation network. On the other hand, their high altitudes, their cliffs, the glacial, periglacial, structural and limestone landforms, as well as the favourable climate, fresh air, the alpine flora, endless coniferous forests, belvedere points and remarkable landscapes contributed to the initiation and early development of the tourism phenomena (Table 1):

Table 1 The main phases of the tourism development within the Bucegi Mountains and Prahova valley

Period	Main actions
17 th -19 th centuries	Custom procedures on the Prahova and the Dâmbovița Valleys Establishment of the first inns
1864 - 1914	Founding of the Eforiei Spitalelor Civile 1864 Establishment of the first hotel and of rest houses The Sinaia Carpathian Society (1895-1900) built the first mountain shelters and delineated the first hiking trails
1921 - 1949	Other sport-tourism associations were founded: Hanul Drumeților (1921) which changed into Romania's Touring Club and built the Peștera house and rebuilt the Omu shelter 2505 m In 1922 the Peleş Club was founded (skiing and mountain-climbing association) In 1936 the National Tourism Organization is founded (ONT) which build several chalets in the Bucegi Mountains
1949 - 1989	The General Labor Confederation assumed most of the private villas and turned them into rest houses and also finished the construction of the Alpin Hotel at Cota 1400 (altitude) The first cable transportation and the bob slide were built with the support of the Romanian Ski and Bob Federation
1990 - 2000	Reorganization of the tourist industry by modernizing the accommodation facilities and by the emergence of private investors Involvement of international organisms and NGOs in the local development
2000 - present day	Establishment of new rural and urban guesthouses (bed & breakfasts) Establishment of new cable transportation in the resorts of Predeal, Azuga, Bușteni and Sinaia Emergence of new winter-sports

Data and Methods

According to Jamieson and Johnson (1998), McClung and Schweizer (1999), and Schweizer and Jamieson (2001) terrain factors and climate variables are the most important parameters to be considered in the analysis of ski areas. Therefore, in order to assess the natural potential of the ski area from the Bucegi Mountains we have used the tools of the ArcGIS software to derive land surface models (hypsometry and slope) and also climatic models on the basis of meteorological processed data from the weather stations in the area for the climate's evaluation. As input data we have used a 30 m resolution DEM - derived from SPOT satellite images. The climatic models were built with the help of the regression equation derived from the

processed climatic data and the DEM which was introduced as a parameter in this equation. On the other hand, for the statistical analysis of the tourist infrastructure, the accommodation capacity and the tourist flow we have processed the large quantity of data provided by the National Tourist Research and Development Institute (Institutul Național de Cercetare - Dezvoltare în Turism, 2009).

The area of the Bucegi - Prahova valley is endowed with exceptional topographic and climatic conditions, therefore tourist winter practices are very well developed in highly favorable prerequisites (Mihai, 2005; Voiculescu, Popescu, 2011). Alpine skiing as an attribute of winter tourism, and in the same time sport activity, has generated an entire industry within mountain areas (Agrawala, 2007; Bürki et al., 2005; Hudson, 2002; Lew et al., 2008), a fact that holds true in the Bucegi - Prahova valley as well. Presently, along the traditional winter tourism

activities (alpine skiing, winter sport events) new contemporary winter tourism activities (snowboarding, skiboarding, telemark skiing, skitouring, freeride and freestyle) have emerged here as in other mountain areas of the world (Hudson, 2004; Pickering et al., 2003; Rinker, 2009).

Discussion

1. Terrain factors

The most important terrain factors for skiing and other winter sports are altitude and declivity. Altitude is essential for skiing activities (Fig. 3). At the latitude of the temperate climate, where Romania is situated, it has to be of at least 1000 m

(Besancenot, 1990) in order to maintain a favorable snow layer for at least 3 months/year.

Declivity represents another factor of great importance for skiing activities (see Figure 2). This is the element that separates the categories of this activity's practitioners into two large categories: skiers and beginners. The first category was defined as *users of skis, snowboards or other gravity-propelled recreational devices whose design and function allow users a significant degree of control over speed and direction on snow* (Penniman, 1999, 36) and as for beginning skiers or beginners as: *those individuals who are using one or another of these devices for the first time or who possess marginal abilities to turn or stop on slopes with incline greater than 20%* (Penniman, 1999, 36).

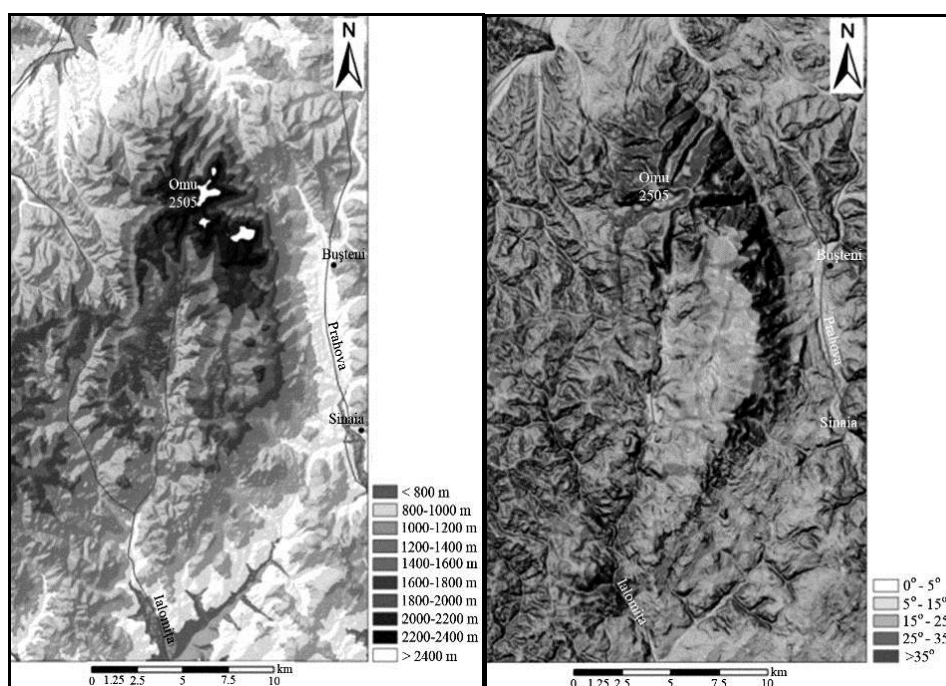


Fig. 3 Hipsometry model (on the left) and slope declivity model (on the right)

Depending on the terrain's configuration, on its morphometric characteristics, and on the local interest for winter tourism activities, each resort of the Prahova valley has developed its own ski domain (Table 2, Fig. 4, 5, 6, 7).

The Sinaia ski area is characterized by the largest surface covered by ski tracks in Romania, of over 0.37 km². The ski tracks have departure locations at the highest altitudes as well, which go beyond 1800-2000 m and as total length, they rank highest as well, with over 12,000 m. As an average they are also the steepest tracks in the study area and in Romania as well. This is why Sinaia is a resort mostly for advanced and medium skiers which summed up

should stand for 84% of the clientele to be in accordance with the difficulty level of the ski tracks.

The resort of Bușteni is just beginning to build its ski domain, presently having only one ski track of medium difficulty level.

The resort of Azuga is undergoing a large expansion plan due to the interest of the local authorities, but also with the help of private investors. The ski tracks are relatively long; they occupy a surface of 0.28 km², and the difficulty levels range from beginners to medium.

Having in view that the resort of Predeal is situated at the altitude of 1090 m, the ski tracks have the arrival points towards the center of the resort, but their departure points do not exceed 1500 m.

Their total length of over 8000 m and the difficulty levels ranging from beginner to medium skiers represent a few of the attractive elements for the

skiing clientele. These features make Predeal one of the most famous resorts of the sort in the Southern Carpathians.



Fig. 4 View from ski tracks from Sinaia (on the left) and from Azuga (from the right)

Table 2 The main features of the ski areas (according to National Institute of Research-Development in Tourism, 2009, with additions)

Sinaia Resort											
Name of ski piste	Features of the ski pistes								homologation date	Facilities	
	difficulty level	length (m)	departure elevation (m)	arrival elevation (m)	mean slope (%)	vertical drop (m)	average width (m)	surface (km ²)		type of cable-way	artificial snow
Valea Dorului sub telecabin 2	M	804	2049	1818	28.7	231	40	0.032	02.07.2008	chairlift	no
Valea Sorelei	M	1191	2035	1820	18.1	215	40	0.048	02.07.2008	chairlift	no
Valea Dorului Varianta	M	896	2033	1834	22.2	199	40	0.036	02.07.2008	chairlift	no
Valea Dorului sub telecabin 1	M	776	2040	1822	28.1	218	40	0.031	02.07.2008	chairlift	no
Carp	D	1382	2056	1607	32.5	449	50	0.069	02.07.2008	cablecar	no
Papagal	M	847	1870	1649	26.1	221	40	0.034	02.07.2008	cablecar	no
Drumul de vară	M	2971	2044	1650	13.3	394	30	0.089	02.07.2008	cablecar	no
Scândurari	M	505	1969	1820	29.5	148	50	0.025	02.07.2008	ski-lift	no
Încăpători	B	173				20			not homologated		
Legătura	D	173				91			not homologated		
Târle	D	534				221			not homologated		
Furnica	B	270				77			not homologated		
Noua turistică (Cota 1400)	M	2154				402			not homologated		
TOTAL	23.07% for advanced skiers 61.5% for medium skiers 15.3% for beginner skiers	12676						0.374			

Buzeni Resort											
Name of ski piste	Features of the ski pistes								homologation date	Facilities	
	difficulty level	length (m)	departure elevation (m)	arrival elevation (m)	mean slope (%)	vertical drop (m)	average width (m)	surface (km ²)		type of cable-way	artificial snow
Kalinderu	M	1400	1295	1000	21.1	295	40	0.056	28.03.2005	gondola	yes

Azuga Resort											
Name of ski piste	Features of the ski pistes								homologation date	Facilities	
	difficulty level	length (m)	departure elevation (m)	arrival elevation (m)	mean slope (%)	vertical drop (m)	average width (m)	surface (ha)		type of cable-way	artificial snow
Sorica	M	2100	1530	978	26.3	552	40	0.084	07.02.2008	gondola	yes
Cazacu	M	2050	1530	978	26.9	552	40	0.082	02.06.2006	gondola	no
Azuga Sud	B	910	1487	1333	16.9	154	50	0.046	07.02.2008	ski-lift	no
La Stănă	B	770	1487	1333	20	154	50	0.039	07.02.2008	ski-lift	no
Cazacu varianta	M	360	1108	1000	30	108	60	0.022	07.02.2008	ski-lift	yes
Școală	B	130	1022	1000	16.9	22	60	0.008	07.02.2008	ski-lift	yes
TOTAL	50% for medium skiers 50% for beginner skiers	7320						0.281			

Predeal Resort											
Name of ski piste	Features of the ski pistes								homologation date	Facilities	
	difficulty level	length (m)	departure elevation (m)	arrival elevation (m)	mean slope (%)	vertical drop (m)	average width (m)	surface (km ²)		type of cable-way	artificial snow
Clăbucet	M	2100	1449	1051	20	398	35	0.073	01.10.2006	chairlift	yes
Cocoșul	M	2250	1449	1051	18	398	30	0.067	01.10.2006	chairlift	yes
Sub teleferic 1	D	1200	1449	1093	31	356	40	0.049	01.10.2006	chairlift	yes
Clăbucet Sosire	B	800	1194	1040	19.3	154	35	0.028	01.10.2006	ski-lift	yes
Clăbucet varianta	B	790	1194	1040	19.4	154	70	0.056	01.10.2006	ski-lift	yes
Clăbucet școală	B	200			7	30			01.10.2006	-	yes
Sub teleferic	B	670			7	45			01.10.2006	-	yes
TOTAL	14.8% for advanced skiers 28.5% for medium skiers 57.1% for beginner skiers	8010						0.273			

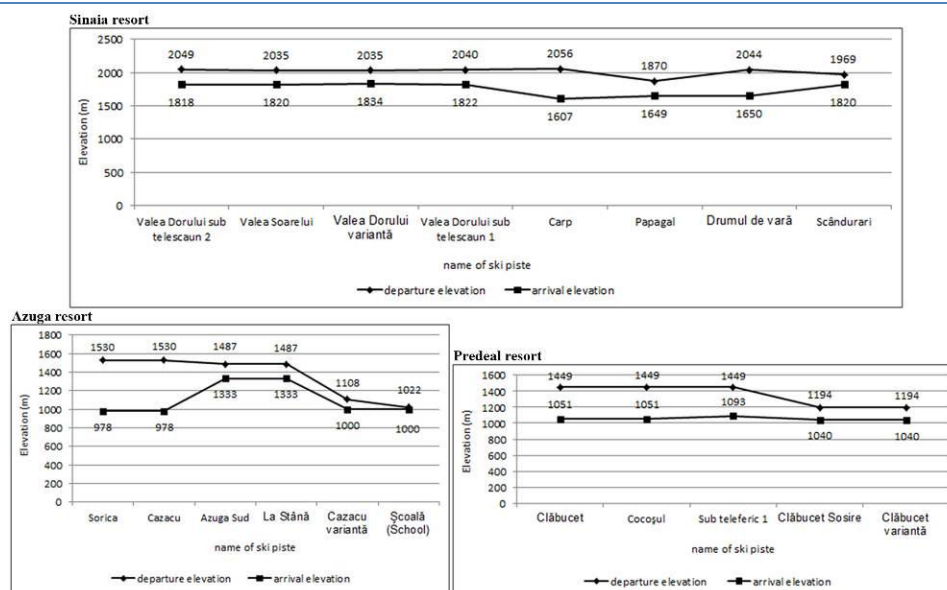


Fig. 5 Departure and arrival points of ski tracks

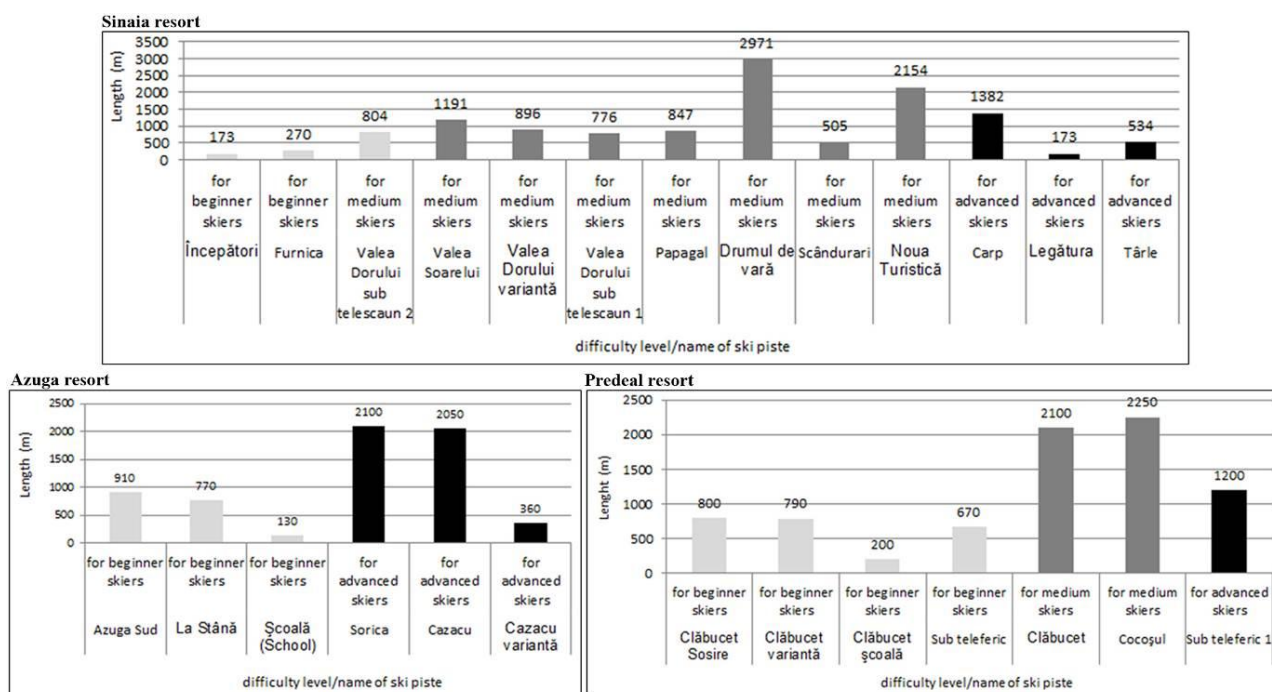


Fig. 6 Difficulty level of the ski tracks

Source: National Institute of Research-Development in Tourism, 2009

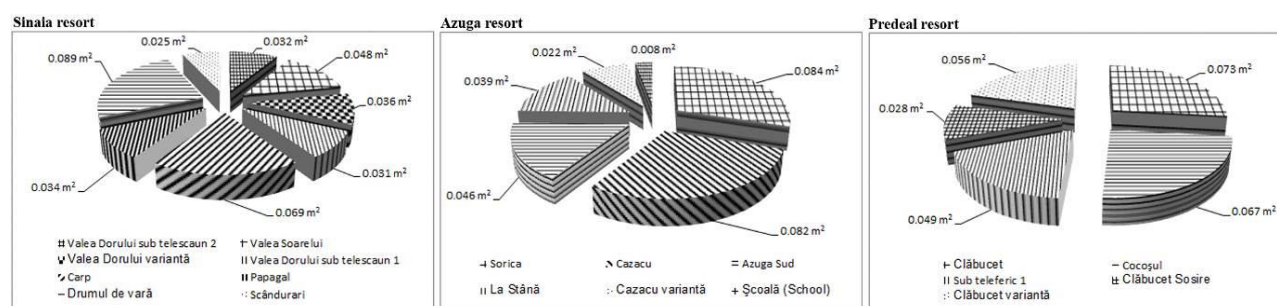


Fig. 7 Surface of ski tracks

2. Climate variables

In order to show the characteristics of the snow layer, we have processed the data form the local

weather stations registered between the years of 1961-2007 (Table 3).

Table 3 Pattern of weather stations din Bucegi Mountains and Prahova valley

Weather station (alt-m)	Geographical coordonates		Air temp. (°)	U %	Rain (mm)	Snow falls duration (days)				Snow depth		
	Latitude	Longitude				high	mediu m	lo w	annua l	selected April	period time	November-15
Vf. Omu - 2505	45°27'	25°27'	-2.5	87	1065.9	362	326	237	36.7			62.6
Sinaia - 1500	45°23'	25°30'	3.7	78	1226.9	276	238	181	14.5			33.2
Fundata - 1371	45°26'	25°16'	4.3	79	898.7	276	230	165	10.5			26.3
Predeal	45°30'	25°23'	4.9	83	942.5	264	203	140	12			30.9

The climate is an important tourist resource (Besancenot, 1990) and is analyzed considering the depth of the snow layer with regard to the ski activities, being safe to say we have a snow-reliable area if: in seven out of ten winters there is snow covering of at least 30 cm on at least 100 days between 1 December and 15 April (Becken and Hay, 2007, 38). Snow is a very important resource for winter tourism activities, especially for skiing (Breiling and Charamza, 1999).

At the highest altitudes, the optimum snow layer depth for skiing activities is registered from December until the first days of June. At medium and low altitudes, the optimum snow depth is present between December and March-April (see Table 3, Fig. 8).

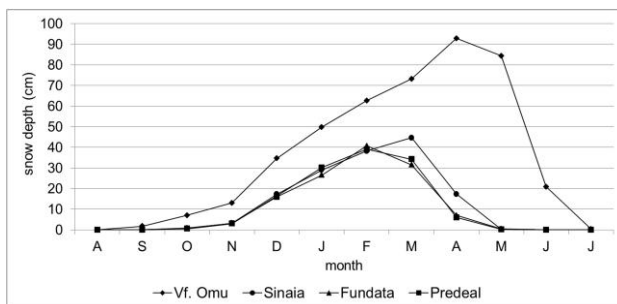


Fig. 8 Variation of snow depth in Bucegi Mountains and Prahova valley (1961-2007)

Source: National Institute of Research-Development in Tourism, 2009

To highlight the importance of this parameter for winter tourism activities, we have analyzed the following values: number of days with snowfall, number of days with snow coverage and the beginning, duration and the end of the snow-covered interval. Therefore, considering the local weather stations as reference points, we have observed that there is a good correlation between the altitude and the snow layer (Fig. 9).

In order to show the above mentioned correlation and to make evident their favourability, we have generated two climatic models: one for the yearly average of the snow depth and one for the number of days with snow cover (Fig. 10).

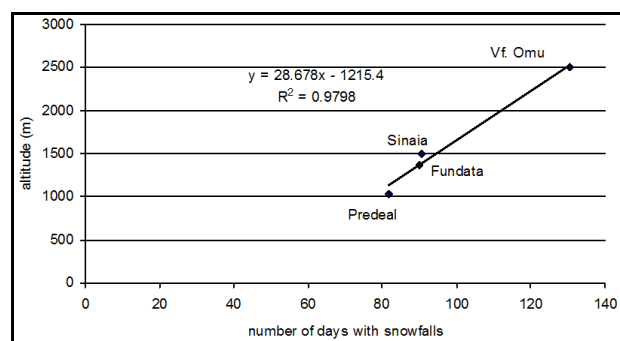
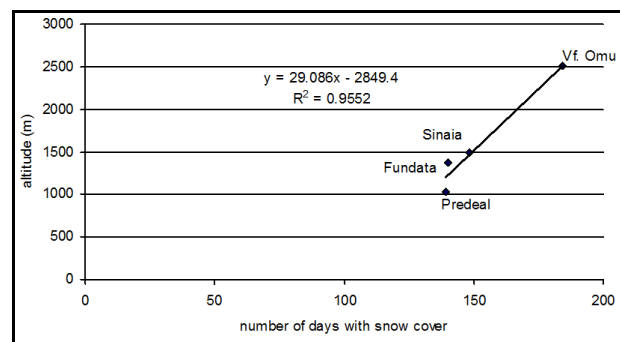


Fig. 9 Correlation between number of days with snow cover and altitude (up) and between number of days with snowfalls and altitude (down)

3. Accommodation Capacity

As a response to the favourable natural features for the development of tourism, the necessary infrastructure was built over time (see Table1). The number of accommodation places and the types of these facilities differ with the length of the tourism phenomena within resorts, with tradition and cultural background and was also influenced by the interest of private investors after the 1989 Revolution (Fig. 11).

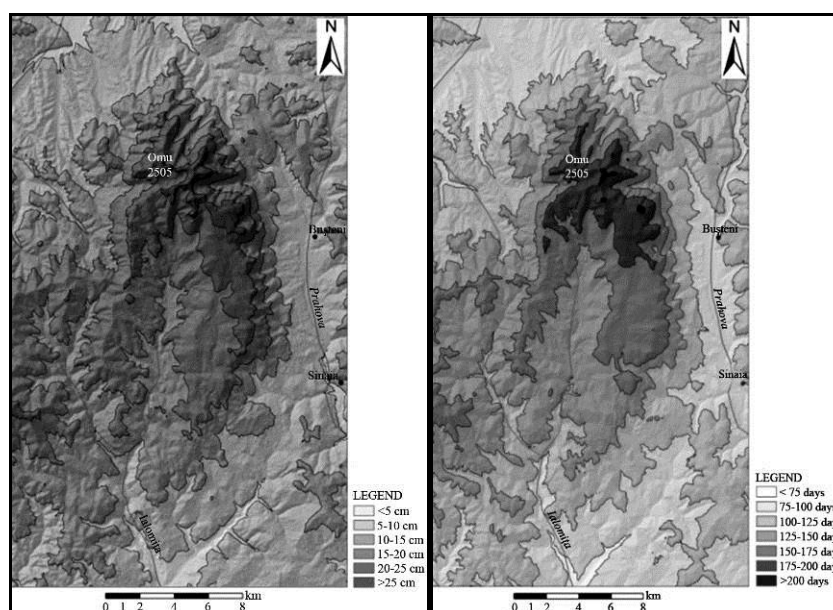


Fig. 10 Snow depth model - yearly average (on the left) and days with snow cover (on the right)

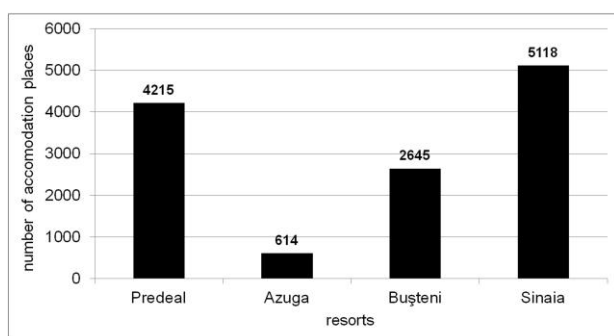


Fig. 11 Situation of number of accommodation places in resorts of Prahova valley

Source: National Institute of Research-Development in Tourism, 2009

The largest number of tourist accommodation structures (Fig. 12) is represented by guesthouses (bed & breakfasts) - 179 facilities, which account for 37.1% of the total units from the Prahova Valley. These have been established in the last 10 - 15 years by Romanian private investors. The hotels, the eldest forms of accommodation are represented by 69 facilities (14.1% of the total number of facilities) which provide safety, comfort and healthcare. They provide 54.4% of the total number of places in the Prahova Valley. Villas, traditional form of accommodation in communist times, are represented today by 89 facilities, which account for 18.4% of the total structures, but only 11.4% of the total accommodation capacity. They offer affordable prices, intimacy and tourist self-sufficiency. The rooms rented-out by locals are authorized by the

National Association for Tourism, but account for only 3.7% of the total accommodation places. In the same way entire houses function, which are fully equipped, making them self-sufficient in terms of tourist services and also the tourists can self cater for themselves to cut back on the total cost for the holiday. There are 44 such units, accounting for 9.1% of the accommodation facilities. The other types of accommodation facilities (motels, hostels, chalets, apartments to let and bungalows) account only for a small percentage of the total places.

Of the total capacity of these mountain resorts, 12,592 beds, Sinaia resort has the largest percentage 40.6%, justified by the winter and summer tourist activities, but also by its important historic and cultural landmarks. It is followed by the resort of Predeal with 33.4%, where winter tourism is characteristic. Next in line is Bușteni resort with 21% of the accommodation places, where winter tourism is characteristic, but also fresh air cures and walking to hiking activities. By far, Azuga has the lowest number of accommodation places accounting for only 4.8%; it is a small resort characterized by remoteness, fresh air and more recently important ski slopes. The most important percentage of the accommodation places falls within the 3 star category facilities (44.3% of the total) represented by hotels, villas, guesthouses and chalets. The 2 star accommodation facilities account for 28.3%, with places in hotels, hostels, villas, guesthouses and chalets and rooms to let. The 4 star category

accounts for 12.8%, with most of their places divided between hotels, villas and guesthouses. The 1 star category accounts for 10.4%, with places in all types

of facilities and 1.3% represented by the 5 star structures, represented by hotels, villas and guesthouses (Fig. 13).

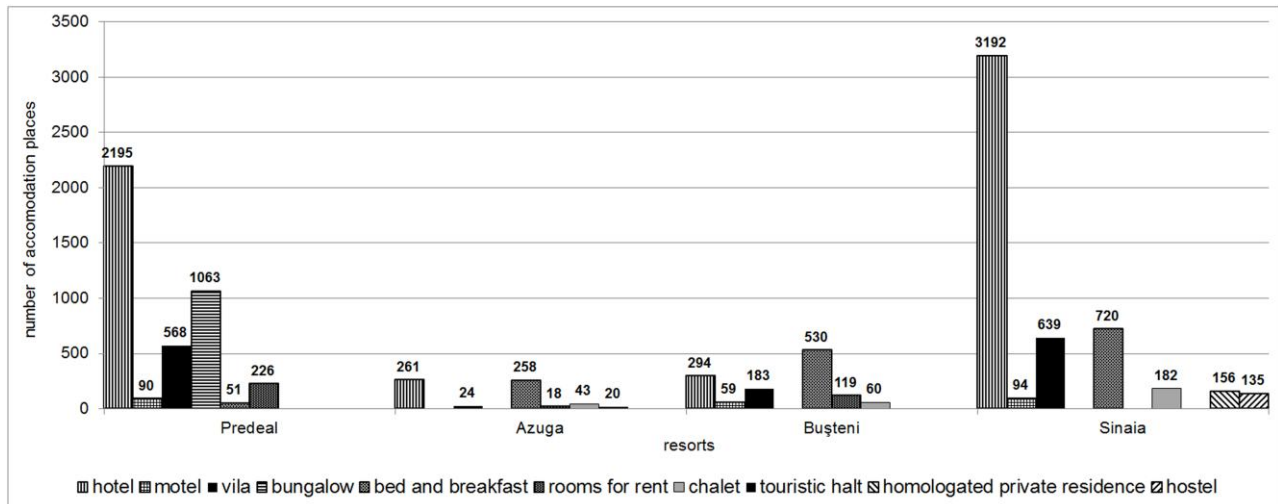


Fig. 12 Evolution of the number of type accommodation places in the resorts of the Prahova Valley

Source: National Institute of Research-Development in Tourism, 2009

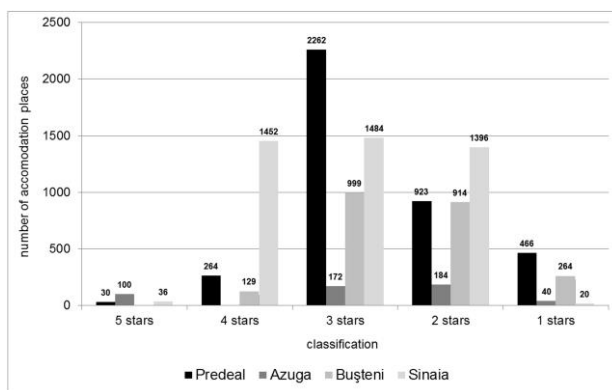


Fig. 13 The situation of the accommodation places falls within the stars

Source: National Institute of Research-Development in Tourism, 2009

4. Tourist flow

The tourist flow has registered significant growth proportionally with the growth of the accommodation capacity and with the enrichment of the tourist offer. All resorts, except for Bușteni, have registered significant growth in the number of incoming tourists, especially Predeal and Sinaia (Fig. 14). To render evident this phenomenon for the Prahova Valley, we have used the demand variation index (Cristureanu, 1992):

$$\Delta D = D \frac{t_1 - t_0}{t_0} \times 100$$

where

ΔD - demand variation index

t_1 - total value for the year 2007
(number of tourists)

t_0 - total value for the year 2003
(number of tourists)

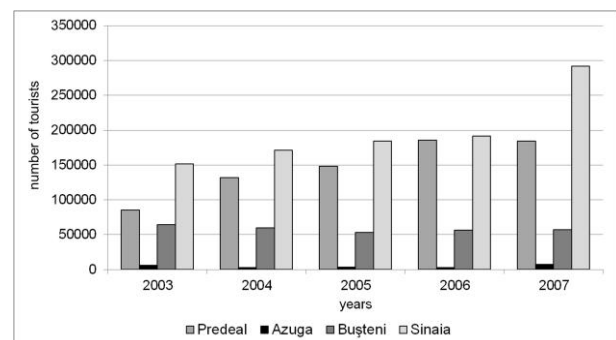


Fig. 14 The evolution of the number of tourists in the Prahova Valley

Source: National Institute of Research-Development in Tourism, 2009

The value of the index for the Prahova Valley between 2003 and 2007 was 76.2%, which represents an important growth of the tourist flow. The highest value was registered for Predeal resort, a growth of 116.8%, whose tourist role is essential, followed by Sinaia resort, with a growth of 92.6%. Even Azuga registered an important growth of 31.1% due to the recent development of the ski domain in the Baiul

Mountains. The resort of Bușteni lost 11.6% of the tourist flow, to its competitors, Sinaia and Azuga resorts which tend to polarize the winter-sport tourists due to their important ski domains. The Prahova Valley and the Bucegi Mountains receive important flows of tourists from 11 main European and North-American countries (Table 4). The main

market is represented by Israel, Poland and Germany, the second by the Republic of Moldova, Germany Italy and the USA, the third market is represented by Israel, Austria and the Russian Federation, the fourth by Italy, France, Austria and Spain and the fifth by Ukraine, Russian Federation, Italy and France.

Table 4 Main foreign markets (National Institute of Research-Development in Tourism 2009)

	First market		Second market		Third market		Fourth market		Fifth Market		All markets
	Country	%	Country	%	Country	%	Country	%	Country	%	(%)
Predeal	Israel	14.4	Germany	10.9	Austria	8.7	France	6.6	Russian Fed.	5.0	45.6
Azuga	Poland	41.1	Rep. of Moldova	25.9	Israel	15.4	Italy	8.5	France	2.8	93.9
Bușteni	Germany	18.8	Italy	8.9	Russian Fed.	8.5	Austria	6.3	Ukraine	6.1	48.5
Sinaia	Israel	40.7	U.S.A.	7.5	Russian Fed.	5.4	Spain	4.1	Italy	3.9	61.7

The largest percentage of tourists is represented by Romanians, between 94% and 98% (Fig. 15), except for Sinaia resort, where almost 20% of the tourist are foreigners, due to its remarkable tourist

landmarks and diverse accommodation facilities. The preferred accommodation facility of the foreigners is the hotel, in Sinaia and Bușteni resorts reaching the highest percentage (see Fig. 15).

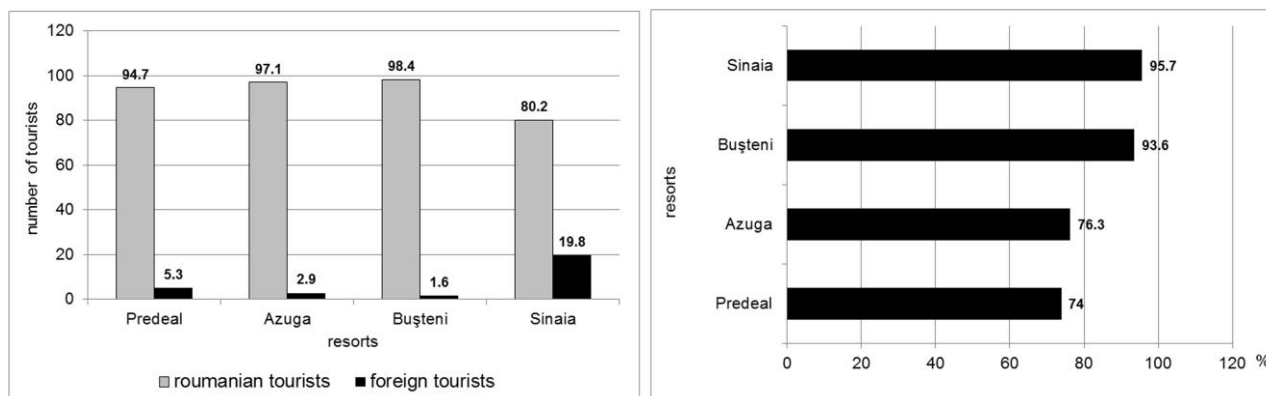


Fig. 15 Percentages of Romanian vs. foreign tourists (on the left) and the number of hotel places for foreigners (on the right)

Source: National Institute of Research-Development in Tourism, 2009

The medium duration of stay also differs for the two categories of tourists: domestic and international (Fig. 16). The highest values are characteristic for the winter and spring months, since these resorts are winter-sports resorts, where the ski season can last up to 4-5-6 months/year, considering the altitude and the snow quantity. In some resorts, the highest values are registered in the summer months (Azuga and Sinaia) or even autumn (Azuga and Bușteni) when the climate and the landscape is favourable for tourist practices like walking, hiking or fresh-air cures.

In order to show the relation between the numbers of tourists coming to the resorts of the Prahova Valley and the local population, we have applied the tourist traffic density index (Cristureanu, 1992):

$$I_{ttd} = \frac{N_t}{Pop},$$

where,

I_{ttd} - tourist traffic density index

N_t - total number of tourists

Pop - population of the resort

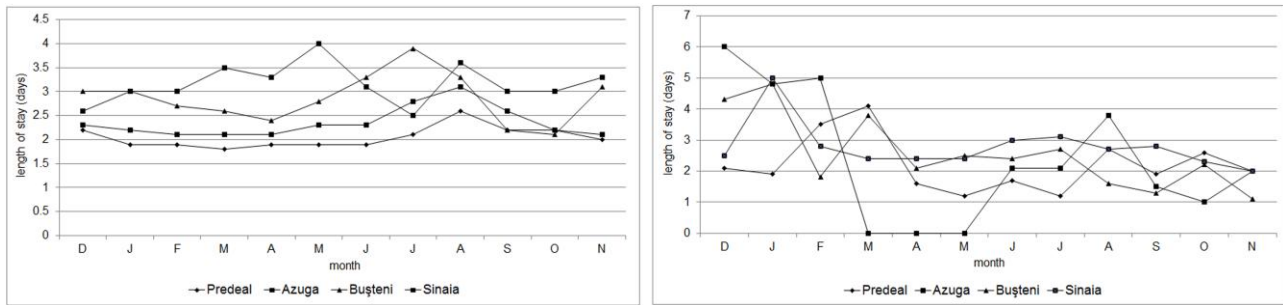


Fig. 16 Comparative situation of medium duration of stay for domestic tourists (on the left) and for international tourists (on the right)

Source: National Institute of Research-Development in Tourism, 2009

The highest value of 32.8 was calculated for Predeal resort, due to the large number of tourists and the few residents (5651 persons). In Azuga resort (with a population of 5213 residents) the index is 1.4, in Bușteni resort (with a population of 10463 residents) the index is 5.4 and for Sinaia resort (with a population of 12888 residents), the index has the value 22.6 due to the large number of incoming tourists. Having in view that the main economic role of these resorts is tourism, the resident population's service capacity is considered to be optimal for the number of tourists they receive.

Conclusion

The land surface of the studied area, through its characteristics, especially altitude and slope, and also the climatic features related to snow favour the development of all types of winter tourism activities. On the other hand, it is without a doubt that tourism in the Bucegi Mountains has registered significant growth. The more experienced tourist-demand reclaimed the construction of new of accommodation facilities, but also the improvement of the living conditions. The foreign as much as the domestic tourist flows with certain demands have determined the emergence of new forms of tourism for both the summer and the winter seasons. The Bucegi Mountains and the Prahova valley represent a tourist area of major importance within the

Romanian Carpathians, which is why it was included in the first group of resorts as a consequence of its tourist potential and of its numerous facilities for tourism activities (Țigu, 2001). The tourist value of the winter resorts can be acknowledged with the help of the functionality index (Țigu, 2000). Therefore the indices calculated for the resorts of the Prahova valley have show frequencies based on the types of tourist activities, of the presence and density of the specific infrastructure and accommodation facilities (Table 5).

Table 5 Functionality index

	Q_t/Q_p	L_t/N_{loc}	Q_t/N_{loc}	L_p/N_{loc}
Predeal	0.8	0.6	0.2	1.9
Azuga	2.2	5.7	5.1	11.9
Bușteni	1.6	2.3	0.4	0.5
Sinaia	2.2	1.7	1	2.4

where

Q_t - hourly capacity of the cable transportation

Q_p - ski tracks capacity (parameters considered are the length, width and degree of difficulty)

L_t - length of the cable transportation

L_p - length of the ski tracks

N_{loc} - number of accommodation places (beds) in the resort

On the other hand, according to Țigu (2001), we have evaluated the degree of attractiveness of the resorts from the Prahova valley, on the basis of the following factors (Table 6).

Table 6 Mountain resorts' attractiveness rating

Resort/factor	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	Total
Predeal	5	5	5	5	4	4	4	4	3	3	3	5	4	5	5	5	4.43
Azuga	4	4	4	2	2	2	3	2	3	3	2	3	1	3	3	2	2.81
Bușteni	5	5	4	4	3	3	3	1	2	2	3	4	2	4	3	2	3.24
Sinaia	5	5	5	5	4	5	4	4	4	2	4	5	5	5	5	5	4.60

where

F1 - accessibility from the physical geography point of view, but also from the infrastructure point of view (airport, roads, railroads)

F2 - tourist potential, the variety and quality of natural and man-made landmarks

F3 - potential ski area, possible to delineate for alpine or back-country skiing

F4 - accommodation capacity

F5 - degree of comfort of the accommodation facilities

F6 - length and quality of existing ski tracks

F7 - number and quality of the cable transportation facilities and their correlation with the capacity of the existing and potential ski tracks

F8 - correlation of the length of the ski tracks with the number of accommodation places

F9 - correlation of the length of the cable transportation facilities with the number of accommodation places

F10 - correlation of the cable transportation's hourly capacity with the number of accommodation places

F11 - type and diversity of summer leisure activities

F12 - the actual domestic demand

F13 - the actual international demand

F14 - the potential domestic demand

F15 - the potential international demand

F16 - the marketing activity of the resort, including international campaigns

In order to rise the degree of attractiveness, the local and national authorities plan on tacking measures with European financial aid in the forms of certain projects. The focus will be on the enlargement of the ski area by lengthening the tracks and enlarging their surfaces and at the same time lengthening the cable transportation facilities. Nonetheless, the optimal interconnectivity should be also found as much as a satisfying ratio of the tracks degree of difficulty which will ensure a higher rating of the resorts. The investment categories will be represented by modern cable transportation, artificial snow production and snow caterpillars (National Institute for Research-Development in Tourism, 2009).

According to National Institute for Research-Development in Tourism (2009) the accommodation capacity will increase and it will follow European standards of comfort. Also the existing traffic capacity will be optimized by the construction of a new highway. All these measures will be most necessary in the near future for the fact that Romania will host the winter edition of the European Youth Olympic Festival, in 2013. It will take place in the area of the Prahova Valley in the

resorts of Predeal, Azuga, Bușteni and Sinaia. This represents a preliminary stage of the procedures Romania has to accomplish in order to be able to apply for the organization of the Winter Olympic Games of the year 2020 (National Institute for Research-Development in Tourism, 2009).

Acknowledgements

This work was supported by the National University Research Council (CNCSIS - UEFISCSU), Romania, project number PNII - IDEI 1066/2009, Creation of the database and thematic maps for the ski areas in the Southern Carpathians using GIS. Analysis, up to date evaluation and prognosis within the global climatic changes perspective.

References

- Agrawala, S. ed. (2007). *Changements climatiques dans les Alpes Européennes. Adapter le tourisme d'hiver et la gestion des risques naturels* OCDE 140.
- Becken, S. & Hay, E. J. (2007). *Tourism and Climate Change: Risks and Opportunities* Multilingual Matters.
- Beniston, M. (1997). Variations of snow depth and duration in the Swiss Alps over the last 50 years: links to changes in large-scale climatic forcings *Climatic Change* 36: 281-300.
- Beniston, M., Keller, F. & Goyette, S. (2003). Snow pack in the Swiss Alps under changing climatic conditions: an empirical approach for climate impacts studies *Theor. Appl. Climatol.* 74 19-31.
- Besancenot, J., P. (1990). *Climat et tourism* MASSON Collection géographie.
- Bogdan, O. (2008). *Carpații Meridionali. Clima, hazardele meteo-climatice și impactul lor asupra turismului* Editura Universitatea Lucian Blaga Sibiu.
- Booth, L., K. & Cullen, R. (2001). *Managing Recreation and Tourism in New Zealand Mountains* Mountain Research and Development Vol. 21 No 4: 331-34.
- Breiling, M. & Charamza, P. (1999). The impact of global warming on winter tourism and skiing: a regionalised model for Austrian snow conditions *Regional Environmental Change* 1 (1) 4-14.
- Bürki, R., Elsasser, H., Abegg, B. & Koenig, U., (2005). *Climate change and Tourism in the Swiss Alps* in *Hall M C Higham S E J* eds *Tourism Recreation and Climate Change* Channel View Publications.

- Cristureanu, C. (1992). Economia și politica turismului internațional, Editura Abeona.
- Godde, P., Godde, M., P., Price, F., M. & Zimmerman, M., F. (2000). Tourism and development in mountain regions CABI Publishing.
- Heberlein, A., T., Fredman, P. & Vuorio, T. (2002). Current Tourism Patterns in the Swedish Mountain Region Mountain Research and Development 22(2):142-49.
- Hudson, S. (2004). Sport and Adventure Tourism, Haworth Press, 324.
- Institutul Național de Cercetare - Dezvoltare în turism. (2009). Plan Master în turism pe Valea Prahovei și zona Brașov Râșnov București.
- Jamieson, B. & Johnson, D., C. (1998). Snowpack characteristics for skier triggering Canadian Avalanche Association Avalanche News 85 31-9.
- Jeanneret, F. (2001). Different Human Impacts in Similar Settings Mountain Research and Development 21(4): 314-19.
- Lew, A., Hall, M., C. & Timothy, J., D. (2008). World Geography of Travel and Tourism: A Regional Approach Butterworth-Heinemann 363.
- McClung, D., M. & Schweizer, J. (1999) Skier triggering snow temperatures and the stability index for dry-slab avalanche initiation J. Glaciol. 45(150) 190-200.
- Micu, D. & Dincă, A. (2008). Climate variability and its implications for winter mountain tourism in the Prahova Valley Brașov area, *Proc. Int. Conference on Ecological Performance in a Competitive Economy, Vol. I, Supplement of "Quality-access to success" Journal*, 9, 94, 232-41.
- Mihai, B., Oprea, R., & Șandric, I. (2002). Aplicație GIS în amenajarea domeniilor schiabile. Studiu de caz: domeniul schiabil Predeal-Clăbucet, *Com. Geogr. VI* 75-80.
- Mihai, B. (2005). Munții din bazinul Timișului (Carpații Curburii). Potențial geomorfologic și amenajarea spațiului montan, Editura Universității București.
- Murphy, J. (1985). Tourism: a community approach Routledge.
- Page, S. & Connell, J. (2006). Tourism: a modern synthesis Cengage Learning EMEA.
- Penniman, D. (1999). Customs and Practices at U.S. Ski Areas for Mitigating Common Hazards through Trail Configuration and Maintenance in Johnson J R ed Skiing Trauma and Safety: Twelfth Volume ASTM International pp 35-45.
- Pickering, C., Johnston, S., Green, K. & Enders, G. (2003). Impacts of nature Tourism on the Mount Kosciuszko Alpine Area, Australia, in Buckley R Pickering C Weaver B D eds *Nature-based tourism environment and land management Volumul 2001* CABI 123-37.
- Pompei, C., ed. (2010). Plan de amenajare a Teritoriului zonal PATZ Interorășenesc - Sinaia - Bușteni - Azuga - Predeal - Râșnov - Brașov (Poiana Brașov).
- Rinker, K. (2009). Zurich & northeastern Switzerland Hunter Publisher.
- Rixen, C., Stoeckli, V. & Ammann, W. (2003). Does artificial snow production affect soil and vegetation of ski trails? A review Perspectives in Plant Ecology Evolution and Systematics Urban & Fischer Verlag Vol. 5/4 pp. 219-30.
- Schweizer, J. & Jamieson, B. (2001). Snow cover properties for skier triggering of avalanches Cold Regions Sciences and Technology Vol. 33 Issues 2-3 207-221.
- Surugiu, C., Dincă, A. & Micu, D. (2010), Tourist destination vulnerable to climate changes: an econometric approach on Predeal resort, *Buletinul Universității Petrol-Gaze/Ploiești*, Vol. LXII 1.
- UNEP. (2007). Tourism and mountains. A practical Guide to Managing the Environmental and Social Impact of Mountain Tours Tour Operator Initiative.
- Țigu, G. (2001). Turismul montan Editura Uranus București.
- Velcea, V. (1983). Geografia Carpaților și subcarpaților Editura Pedagogică și științifică București.
- Voiculescu, M. & Popescu, F. (2011). The management of Snow avalanches in the Ski Areas in Southern Carpathians. Case study: Făgăraș massif and Bucegi Mountains, in *Zhelezov G ed Sustainable Development in Mountain Regions: Southeastern Europe Springer* 103-120.
- Wall, G. & Mathieson, A. (2007). A tourism: changes, impacts, and opportunities Pearson Education.
- Yang, M., Hens, L., Ou, X. & De Wulf, R. (2009). Tourism: An Alternative to Development? Reconsidering Farming Tourism and Conservation Incentives in Northwest Yunnan Mountain Communities Mountain Research and Development 29 (1):75-81