

The Characteristics of the Ski Domains from the Romanian Carpathians

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Abstract

Most of the Romanian ski tracks have been equipped in the mountain areas, at altitudes lower than 1500 m, in the proximity of human areas. The most relevant indicator of the development of ski lands in Romania is given by the total length of the ski tracks which, in 2010, was 168 km. Without any further references to other constituents of the tourism infrastructure from this field, one can say that the Romanian ski area is characterised by an insufficient development of ski tracks. In the Romanian Carpathians, the average density of the ski tracks is about 2 m/km², with important variations in different mountain areas. The most equipped and developed ski domain from Romania (26% from the total length of the ski tracks) is located in the Curvature Carpathians area, in the territory of Prahova and Brașov counties. The development of this area was initiated and supported during the Communist regime through the layout of several mountain resorts of national importance within which the length of the ski tracks is noticeable. The main factor that influenced the development of the ski lands in this area is related to the proximity of the capital city, but also of several important towns, such as Brașov, Ploiești and Pitești that have provided the resorts with a large and constant flux of tourists. In the years to come, the development prospects of this field are considerable taking into account the growing interest shown by the Romanian tourists in the practice of winter sports, but also the availability of the local authorities towards earning European funds in order to lay out new ski tracks equipped at European standards

Keywords: *The Romanian Carpathians, winter tourism, ski domains, ski tracks, density of the ski tracks*

Rezumat. Caracteristicile domeniilor schiabile din Carpații Românești

Majoritatea pârtiilor de schi au fost echipate în zonele montane, la altitudini mai mici de 1500 m, în apropierea zonelor populate. Cel mai relevant indicator pentru dezvoltarea zonelor de schi în România este dat de lungimea totală a pârtiilor de schi care, în 2010, era de 168 km. Fără a face referiri la alte componente ale infrastructurii turistice din acest domeniu, se poate spune că domeniul schiabil din România se caracterizează printr-o dezvoltare insuficientă a pârtiilor de schi. În Carpații Românești, densitatea medie a pârtiilor este de circa 2 m/km², cu variații importante în diferite zone montane. Cele mai echipate și dezvoltate domenii schiabile din România (26% din lungimea totală a pârtiilor) este localizată în zona Carpaților de Curbură, în județele Prahova și Brașov. Dezvoltarea acestei zone a început și în perioada comunistă prin înființarea unor stațiuni montane de importanță națională în care lungimea pârtiilor este considerabilă. Principalul factor a influențat dezvoltarea domeniilor schiabile din această zonă este legat de apropierea de capitală, dar și de alte orașe importante precum Brașov, Ploiești și Pitești care asigurau stațiunilor un flux constant de turiști. În următorii ani, perspectivele de dezvoltare ale acestui domeniu au luat în considerare interesul crescut manifestat de turiștii români pentru sporturile de iarnă, dar și disponibilitatea autorităților locale de a câștiga fonduri europene pentru a înființa noi pârtii de schi dotate la standarde europene.

Cuvinte-cheie: *Carpații Românești, turism de iarnă, domenii de schi, piste de schi, densitatea pistelor de schi*

Introduction

International context of ski domain development

The snowfall, the layer of snow and the fragmented relief have always represented optimum conditions for the practice of ski. The ski appearance is tightly related to the Northern regions of Europe. The first proofs of the use of skis as a means of transportation on snow are around 4000 years old and originate from Norway. In order to travel more quickly and more efficiently, along time, human

beings have been manufacturing skis from sticks and branches – facts like these being represented in cave paintings, with people drawn with their knees bent. The antique skis are characterised by a specific element which is related to their different size – the longer ski was used for support and slide, while the shorter one, wrapped in seal leather, was used for pushing. The wood of conifers, from which these skis were made, were picked only if they had a prominent, natural curvature that, due to its toughness, was used for the ski points (Matei, 1982). In the Middle Ages, the skis were considered

some kind of witchcraft, the Northern people being seen as demons with deformed feet, capable of travelling from one place to another very rapidly. In this part of Europe, not only the use of skis was considered something common, but there also were real communication networks, such being the case of the rapid post-service, from the 16th century. Two centuries later, the skis were also used in the service of army in these Northern countries where there were regiments of ski-fighters who proved to be very efficient in the conflicts that took place during the winter, in cities difficult to conquer.

Skiing, as a sport, took place for the first time in the 19th century, in the land of Telemark, in the South of Norway. Sondre Norheim used the fixed binding in order to perform jumping schemes in the air, in this way managing to combine the classical ski with jumping and slalom (the word "slalom" comes from Norwegian language and it is a compound noun, made up of two words – "sla" meaning "slope and "lām", the track from the end of the slope).

By the end of the 19th century and the beginning of the 20th century the expeditions towards the poles of the Earth could not have been conceived without the use of the skis. At Oslo, at the Skis' Museum, and on the "Fram" vessel, the ski equipment, used by Roald Amundsen in his expedition from 1911 in which he conquered the South Pole, is exhibited to the public. During the 19th century and at the beginning of the 20th century, the ski began to be practiced by more and more people, being considered one of the most loved winter sports, in Norway being considered a national pride (Cârstocea, 1998).

The development of the ski domains in the Western Europe, especially in the mountain area of the Alps, speeded after the Second World War by an aggressive advertising campaign, but also by the modernisation of ski equipment. (Bieger et al 2004, Carcano, 2002, Soule, 2004) The most favourable period for ski took place between 1950-1960 when a new way of skiing, named "Welden", appeared on the Austrian ski tracks; it was characterised by a precise and short rhythmical balancing of the legs with the knees put together and a vertical position of the upper side of the body. The skier keeps his balance with the help of two sticks hold one in each hand. The popularity of this technique was supported by a series of innovations made in the ski equipment field. This was the way in which the ski boots appeared, made of rigid plastic that offered a better protection to the lower members of the skier. There were also manufactured skis of a smaller size, made of light, but tough materials, with steel brims that offered the skier a higher degree of control in his shifting through the snow.

Compared to the previous techniques, where the heavy, wooden skis needed the force of the entire body for the performance of bending, the new one favours a more rapid learning which is also more accessible to the public. This is considered to be the starting point of the mass practice of ski in Austria (Meethan et al., 2006). These conditions encouraged the rapid spreading of ski domains in the Western Europe, USA and Canada. In the same time, the ski domains from Japan start to develop, having a huge impact on the evolution of tourism in the mountain areas (Moon, 1989).

Unlike the developed countries, where the private capital determined an excessive development of ski domains starting with the 6th decade of the 20th century, in the Communist countries of the Eastern Europe the investments in the development of the ski domains were very feeble because of the financial resources which were mainly distributed towards the industrial field (Muntele, Iatu, 2003,).

The development of the ski domain showed a deficit also in the Communist countries from Asia where, in the last few years it has witnessed an extraordinary boom, a good example in this case being China which recorded an astronomical increase in the number of ski resorts. Thus, in the last fifteen years, there have been built over two hundred resorts in order to fit the huge tourist demand. The majority of these ski domains are situated near cities that provide them with weekend tourists, representing the middle Chinese class. The tourist Chinese increase encourages the construction of new ski domains, with a great impact on the environment. Under these conditions, in 2004, Beijing Municipal Council took a series of measures in order to restrict the appearance of new ski resorts near the capital city and the monitoring of the already existing ones in order not to break the environmental standards (World Travel and Tourism Council, 2006).

The development of ski domains in Romania

In Romania, the practice of ski is tightly connected to the mountain tourism which begins to develop in the second half of the 19th century. The first tourist resort from Romania was founded in 1872, at Sinaia, which was once declared royal residence. The first ski company was founded at Braşov, in 1880. The most pieces of information about the practice of ski, as a winter sport, belong to a magazine published in Transylvania, where companies and associations interested in the winter sports were established. These had an important impact on the tourism development of our country, especially in the mountain area. The first ski track was laid out at the end of the 19th century, near Sibiu, at Păltiniş, together with some villas for

accommodation. The foundation of the Păltiniș resort is connected to the economical growth of Sinaia where, according to the initiative of the specific companies, there were implemented a series of measures regarding the practice of mountain tourism (Cândea, Erdeli, 2001).

In 1913,, at Poiana Brașov, the first ski beat board was built, on which occasion there was organised the first ski jumping contest. The Romanian Ski Federation was founded in 1931, and in 1939 there was organised the first international contest named "The International Championship of Descending" with the participation of German, Austrian, French, Polish and English skiers. In the area of the Muntele Mic, the tourism activities and the winter sports are mentioned from the year of 1936, in the manuscript published by the "The Clerks' Association of Timișoara Town" which was edited on the 12th of July 1936, on the occasion of the inauguration of the buildings from that area.

After the Second World War, there began to appear ski centres in other mountain areas, such as Maramureș, Harghita, Parâng, Muntele Mare etc. In 1949, Romania organised the first edition of the "Balkanic Ski Sports", where it won the first place (Erdeli, Istrate, 1996, Grigoraș, 2002).

In Poiana Brașov, in 1951, there were organised the "World University Sports", on which occasion a hotel was built for sportsmen and the first funicular

railway from Romania, with a total length of 2150 m (Drăgoi, 2006).

During the Communist period, the financial resources of the country were mainly directed towards the industrial field, the investments in the tourism domain being only concentrated on the construction of spa resorts, the purpose being that of the physical recovery of the working class. The development of the ski domain was not a priority, therefore in Romania, in the years of the fall of the Communism (1989), there was only one ski domain, underdeveloped, with a total number of 100 km of ski tracks.

In the post-communist period, one of the aims of the Ministry of Tourism was related to the development of the mountain tourism in order to increase the competitiveness on the international market. The most important investments that are done nowadays concern the development of infrastructure that encourage the practice of winter sports. These investments concern the area of the Prahova Valley – Postăvaru Massif with Sinaia, Predeal, Poiana Brașov resorts with mountain ski, bobsled and sleigh tracks, skating rinks, and funicular railways. In the same time, there have also been developed the ski domains from other areas of Romania that led to a growth of the total length of the ski tracks, the most representative counties being Maramureș, Suceava, Harghita and Cluj (Fig. 1).

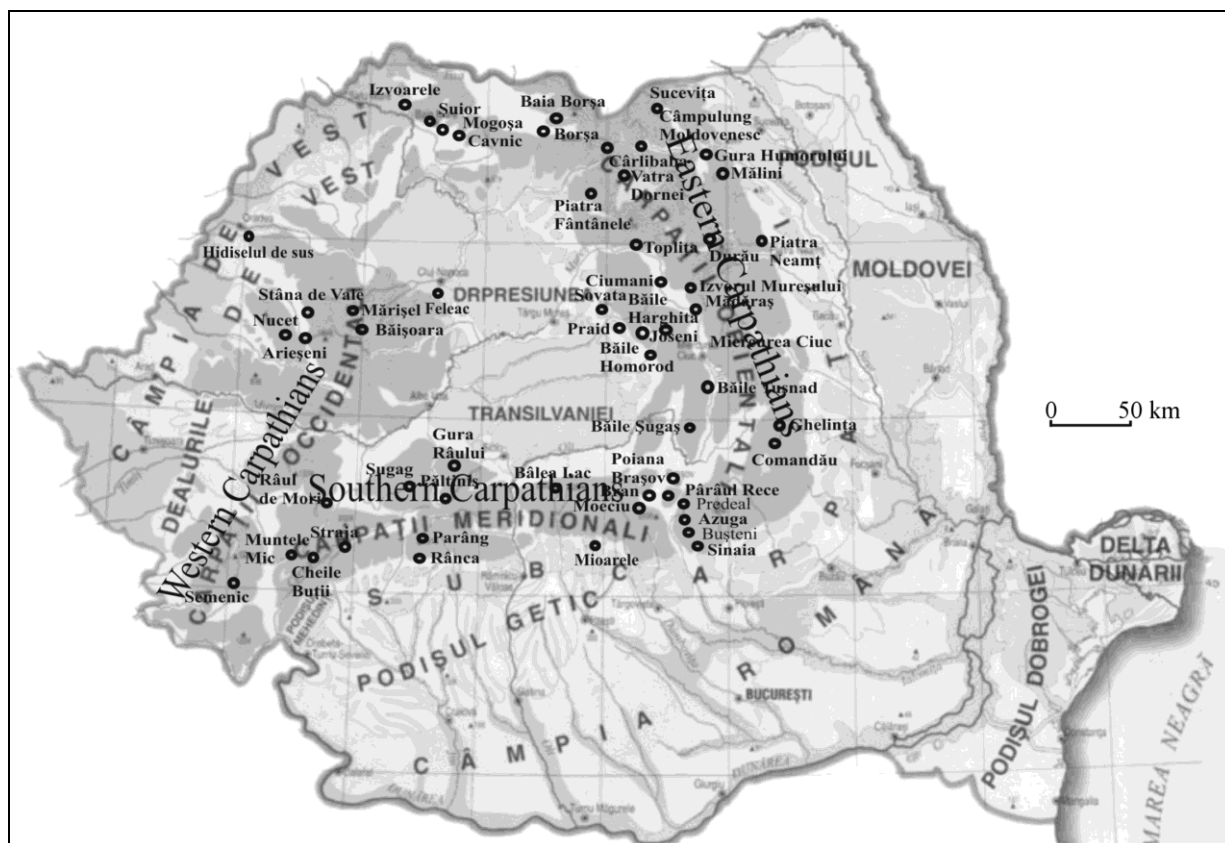


Fig. 1: The ski domains from Romania

The study methodology and the study area

The aims of this research are related to the presentation of the ski areas from the Romanian Carpathians, together with a minute analysis of the ski tracks seen as the basic infrastructure. The research had two distinct directions: a general one, referring to the Romanian mountain area, and a regional one, connected to the three mountain regions of our country. This research is based on a very thorough bibliographic documentation concerning the physical, economical and geographical conditions characteristic to the areas where there were founded the Romanian mountain ski domains. For the ski tracks there have been used the technical data procured from the Local or County Councils near which there are arranged ski tracks. Some of these data have been extracted from the layout plans of the ski tracks, executed at a scale of 1:5000 or from the topographical maps, designed at the 1:25000 scale and from aerial-photos, scaled 1:5000 from the year 2005-2006. A database that contains the morphometrical variables of all the ski tracks from the Romanian Carpathians was achieved. Graphical and cartographical materials were designed with the help of Excel, Philcarto and Corel Draw programmes.

Results and discussions

Considering that the specific of the Romanian ski domains is given by the layout of the ski tracks near the city area, that are also resorts, in a few cases, the development indicators of these domains cannot be directly connected to their present accommodation capacity. The most representative indicator of the development of the ski domains is given by the length of the ski tracks, together with some qualitative parameters related to the type of the transportation or snow-producing device, or the night-illumination wiring.

An extremely important aspect that is worth mentioning concerns the development that is needed in order to make a ski track functional under safe conditions. Considering this, some of the unequipped or natural ski tracks, that have or do not have wire-transportation device, such being the case of two ski tracks from the Bilea area, from Făgăraş, Sibiu county, or some other ski tracks from the area of Bucegi Massif, in Prahova county, that have to be included into a different category, that of ski domains appropriate for practising extreme winter sports.

Taking into account that in Romania the winter sports tourism is poorly developed, the number of tourists that practice extreme winter sports on

natural tracks is very low. One way of practising such kind of extreme sports is heliski which is common in the Făgăraş and Bucegi Mountains by very rich people

In conclusion, this research focuses on the minimum equipped ski tracks, enhanced with wire-transportation device, protection fences, and snow-flattening machinery.

The favourable geographical conditions for the practice of ski in Romania

The Romanian ski domains are tightly connected to the spreading of the relief, favourable to its development. Theoretically, the most part of the territory, about 60%, is characterised by proper conditions for the layout of ski tracks, considering the high degree of relief fragmentation specific to the highland areas, but also in the sub-Carpathian and Carpathian areas. The degree of the development of the ski tracks is, yet, conditioned by the climatic specific of Romania, that is the quantity of solid precipitation, the number of the days with snow layer and the number of the days with temperatures that drop below 0° Celsius, during winter. At altitudes higher than 1500 m, the snow layer stands up to 200 days a year, especially in the Western Carpathians characterised by large quantities of snow fall that are responsible for the remarkable duration of the snow layer, even at altitudes higher than 1500 m, such as Semenic (1446 m) or Băișoara Muntele Mare - 1400 m.

In the Western area, as the altitudes are lower, the number of days with snow layer decreases also, such being the case of Oradea (130 m) where the average number is 38 days per year, and Timișoara (90 m), where it is only of 30 days a year.

The number of the winter days increases as the altitude grows and it reaches 155 days a year at 2500 m high comparing with an average of 40 days a year in the Moldavian Plateau in the East side of the Western Carpathians or 20 days in the Tisa Plain, in the West.

The importance of the thermal element, as a favourable climatic constituent for the practice of ski, is vital, considering the average gradient of 0.55°C/100 m with which the temperature decreases along with the altitude. During a year, the value of this altitudinal gradient varies quite significantly from summer to winter. Thus, during the summer season, it is about 0.7°C/100 m, while, during the winter, it gets to 0.3 or 0.4°C/100 m.

This phenomenon is explained by the fact that during winter the thermal inversions are quite common, especially in the depression mountain areas which mild the thermal difference induced by the altitude.

An extremely important aspect for the development of these ski domains is connected with

the orientation of slopes on which ski tracks have been laid out, the most favourable ones being those that face the North because those that head towards the South are characterised by an average value of the thermal gradient of about 0.05 °C/100 m comparing with the Northern slopes.

The physical and geographical characteristics of Romania favour the development of ski domains, especially in the Carpathians mountain area, except some ski tracks located in the highland area, near some large urban areas.

The Carpathians represent the highest geographical unit from Romania, being considered central, both as a layout, but also as a geographical skeleton for the rest of the natural geographical units whose evolution, in the recent geological periods, was closely connected to that of the mountains, their physical and geographical characteristics being strongly influenced by the Carpathian sector.

The layout of the Carpathian sector in the Romanian territory is quite unique, the mountain arc including the Eastern and Southern Carpathians, and also the lower and less compact sector of the Western Carpathians.

The Romanian Carpathians present a relief that is characteristic to the low and medium high mountains, with absolute extreme altitudes between 617 m and 2544 m. In the highest sector (The Southern Carpathians), only 25% of the mountain area exceeds 1500 m, in the Eastern Carpathians, the areal percentage of the same altitudes being of 5%, while in the Western Carpathians it is only 1%. The favourability of the relief for the layout of these ski tracks is very high, considering the prolonged summits with plane tops, large depressions and longitudinal valleys, narrow sectors of transverse valleys, inclination of the slopes that excel the values of 35°, values of the vertical fragmentation of 400 m – 600 m and, exceptionally, above 1000 m (Posea et al., 1974, *Geografia României III*, 1987).

From a climatic point of view, the Carpathians constitute a favourable territory for the practice of ski considering the general characteristics of the mountain climate determined by the growth of altitude, by the influence given by the orientation and inclination of slope (the decrease of temperature, the increase of solid precipitation, the growth of the snow layer and its duration). The mountain relief leads to important changes in the circulation of air masses at the outskirts and in the interior area of the Carpathians. The Carpathian area influences both the Romanian's climate and the Central and Eastern Romania.

The climatic specific of the mountain area is given by the altitudinal layering of all climatic elements. The majority of the ski domains from the Romanian mountain area are characterised by an annual thermal average of +6 and -2.6°C (+6°C at

the extreme limit of the mountain area, +2° C towards the superior limit of the forest, at about 1800 m and negative values, higher than 2000 m, for example -2.6° C at 2500 m, in Omul Peak from Bucegi), with more than 180 days a year with frost, over 40 days a year with snow fall and over 75 days a year with snow layer.

The number of months with average negative temperature increases with the altitude, from 3 at 900-1000 m to 4 or 6 between 1400 and 1600 m to 6 or 7 higher than 2000 m, where winters may take more than half of year.

Romanian ski domains

In 2010, in Romania, there were 151 tracks laid out for the practice of mountain ski (Table 1). Their total length was about 168 km, a value that indicates a small degree of development considering that in France the value excels 200 km: Alpe d Huez – 249 km, Deux Alpes – 200 km, Espace Killy – 300 km, Evasion Mont Blanc – 445 km, Grand Serre Chevalier – 250 km, Paradiski – 425 km, Portes du Soleil – 650 km, Sybelles – 310 km, Trois Vallees – 600 km ([w.w.w.ski-france.com](http://www.w.w.ski-france.com)). In Romania, more than a third (35% of the total length) are tracks with low difficulty, 50% tracks with an average difficulty and 15% tracks with high difficulty. As for their distribution, the county of Braşov occupies the first place with a total length of the ski track of 26.3 km, followed by the county of Maramureş, with 23.8 km and Caraş Severin, with 20 km.

Table 1 Technical characteristic of ski domains from the Romania (Data source - County Mountain Rescue Service)

Romania	2010
No. ski tracks	151
Total length (m)	167806
Average length (m)	1108
The average of the level difference (m)	209
The average starting altitude (m)	1383
The average arriving altitude (m)	1108
The average width (m)	52
The average area (m ²)	57637
No. of artificial snow tracks	37
The length of artificial snow tracks (m)	38500
No. of tracks with night-illumination wiring	52
The length of tracks with night-illumination wiring (m)	44600
No. of tracks with artificial snow tracks and night illumination wiring	29
The length of tracks with artificial snow tracks and night illumination wiring (m)	28500
No. of tracks with funicular railway - teleski	111
No. of tracks with funicular railway – chair-lift	24
No. of tracks with funicular railway- cable car	9
No. of tracks with funicular railway- gondola	7
No. of tracks with different types of funicular railway	15

Out of the 35 equipped ski tracks from these two counties, 10 of them are supplied with artificial snow-producing machinery and night illumination wiring, facilities that allow the practice of winter

sports for longer periods of time (Fig. 4). The development of the ski domains in this area is closely connected to the Communist period (1947-1989), when funicular railway systems (cable car, chair-lift, teleski) were built, which are still used nowadays. After the fall of the Communism (1989-2000), the investments for the equipping of new ski tracks were quite modest, and most of the funds were directed towards the modernisation of the transportation system and artificial snow producing machineries. Nowadays there is a major interest in the development of this domain, considering the proximity of the capital city, an important source of tourists with income over the national average.

In Maramureş county, unlike Braşov and Prahova counties, in the post-Communist period, there have been laid out a couple of ski tracks, half of them existing in the present. The majority of these were enhanced with artificial snow-producing machineries, a fact that led to their utilisation for a longer period of time (Fig. 5). The ample development of the ski domains in Maramureş was supported by the local authorities for the purpose of social reconversion of the mine working-force. Such is the case of the ski domains from Cavnic town with a total length of the ski tracks of 8.4 km, Baia Borşa town and Şuior (Fig. 2). In the Caraş Severin county, the ski domains are characterised by a dramatic lack of investments in the modernisation of the wire-transportation system and ski tracks. In the post-Communist period, these two resorts from this county, Muntele Mic and Semenic fell down constantly because of the rustiness of the ski system and infrastructure (Fig. 2).

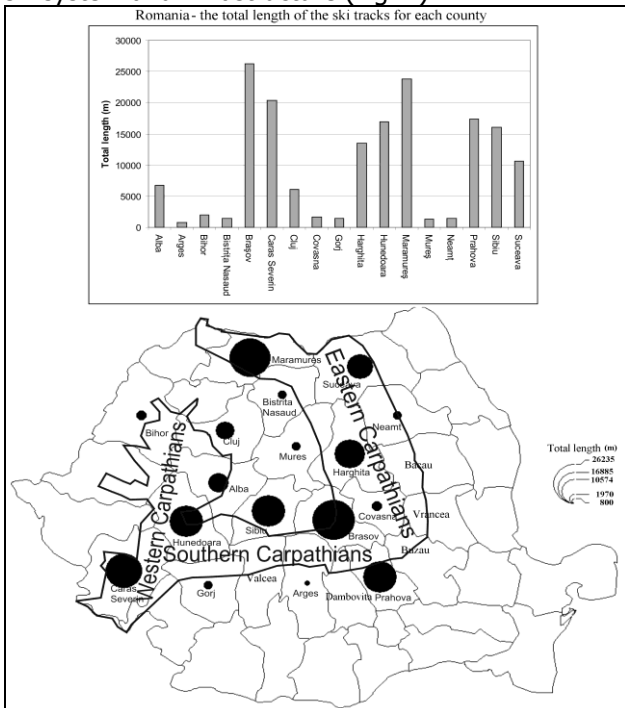


Fig. 2: Romania – the total length of the ski tracks for each county (2010)

On a national level, during the Communist period, a series of new ski tracks were laid out in the proximity of urban areas. Under these conditions, the forms of relief situated at modest attitudes rendered profitable (Feleacu, near Cluj Napoca – 640 m, Cozla, near Piatra Neamţ, 387 m, Şoimul, in Gura Humorului town – 473 m, Gura Râului, near Sibiu – 620 m). Two of these ski tracks (Cozla and Şoimul) are equipped with wire-transportation system (chair-lift) with a total transportation capacity of 1200 persons an hour (Fig.1).

The equipping of these ski tracks was made without taking into account the climatic conditions specific to these altitudes, the main purpose being related to the service of the urban areas as a way of encouraging the practising of winter sports. All the ski tracks mentioned before were equipped with artificial snow-producing machinery, even if they could not function more than two months a year, considering the high temperatures, the owners having to confront big problems in retrieving the investments.

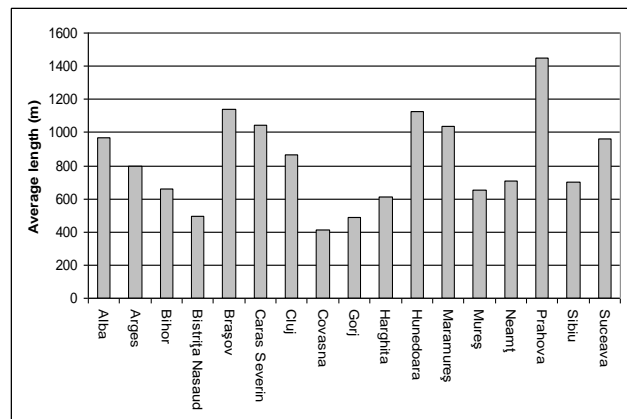


Fig. 3: The average length for each county

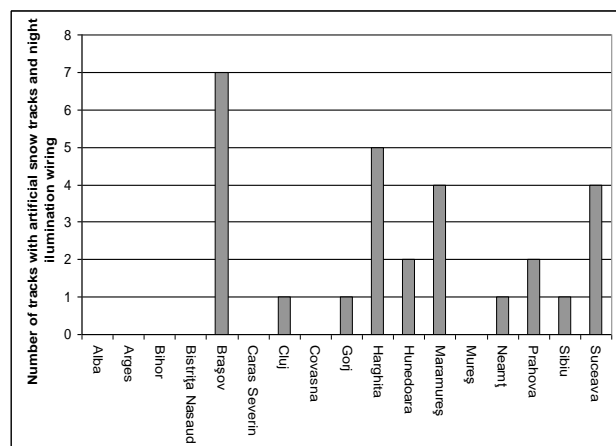


Fig. 4: The number of tracks with artificial snow tracks and night illumination wiring

The analysis of the investments in the ski domains in Romania indicates a massive orientation towards the layouts that are located in the proximity of urban

areas, without a tradition related to this aspect, and not towards mountain resorts well known for the practice of ski (Semenic, Muntele Mic, Păltiniș etc). The causes of these anomalies are numerous and are generally related to the economical and political context of those towns and counties.

The most developed area from Romania remains the Carpathian one which offers, besides the relief, climatic conditions which permit the maintenance of the snow layer for a longer period.

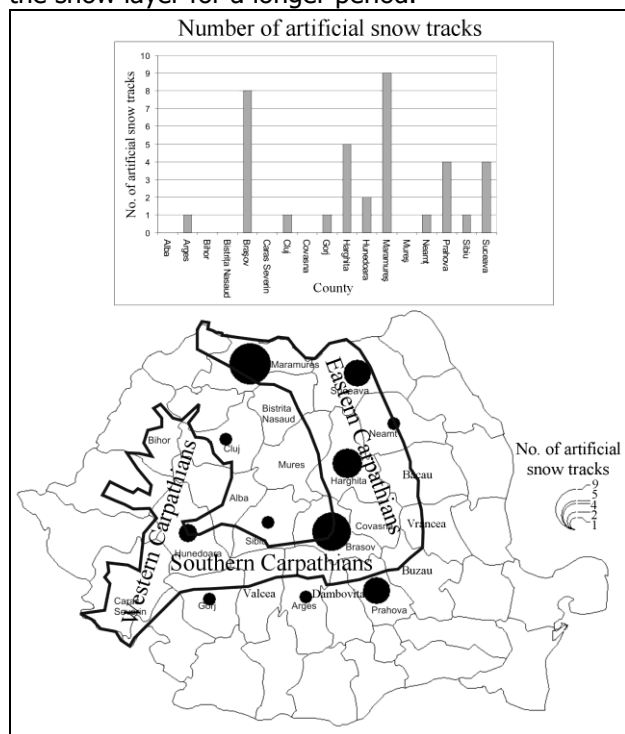


Fig. 5: Romania – the total number of artificial snow tracks for each county

The ski domains from the Romanian Carpathians

Out of all the 148 ski tracks located in the Romanian Carpathians (Fig.1), 101 belong to the Eastern Carpathians (35700 km²), 32 to the Southern Carpathians (13300 km²) and 15 to the Western Carpathians (21000 km²) (Fig. 6). The total length of these 101 ski tracks is about 97.4 km; the 32 ski tracks from the Southern Carpathians total 33 km, while the 15 tracks from the Western Carpathians is 11.3 km (Fig. 7). It results an average length of 955 m for the ski track from the Eastern Carpathians, of 1036 m for those from the Southern Carpathians and 752 m for those from the Western Carpathians. The differences that appear between these values are emphasised by a series of morphometric characteristics of the relief, but also of by social and economical characteristics.

Thus, the great number of ski tracks from the Eastern Carpathians (Table 2) is correlated to their very large surface which sums up to about 51% from the surface of the Romanian Carpathians, the

large number of the inhabitants (1.9 mil), of towns (38 towns). The Eastern Carpathians have an urban network that is denser than the national one, in some sectors more than 90% of the population living in urbane areas (The Depression of Brașov, the Prahova Valley). In this mountain branch there are the towns situated at the highest altitudes - Predeal (1040 m), Azuga (940 m), Bușteni (890 m), Sinaia and Gheorgheni (850 m) where there have been developed the most profitable ski domains from Romania. The majority of the towns had, for decades, a special dynamics - Brașov, Piatra Neamț, Miercurea-Ciuc, Gura Humorului, Câmpulung Moldovenesc etc. There have also existed, exceptionally, stagnant towns because of a narrow functional profile, such as Baia Sprie and Cavnic (almost exclusively mine towns) that, in the last two decades, tried to vary their functions with the help of ski domains.

Table 2 Technical characteristic of ski domains from the Eastern Carpathians

Eastern Carpathians	2010
No. ski tracks	101
Total length (m)	97366
Average length (m)	955
The average of the level difference (m)	200
The average starting altitude (m)	1319
The average arriving altitude (m)	1020
The average width (m)	52
Total area (m ²)	5187725
The average area (m ²)	50860
No. of artificial snow tracks	31
The length of artificial snow tracks (m)	34219
No. of tracks with night-illumination wiring	36
The length of tracks with night-illumination wiring (m)	30707
No. of tracks with artificial snow tracks and night illumination wiring	23
The length of tracks with artificial snow tracks and night illumination wiring (m)	25000
No. of tracks with funicular railway - teleski	73
No. of tracks with funicular railway – chair-lift	15
No. of tracks with funicular railway- cable car	9
No. of tracks with funicular railway- gondola	7
No. of tracks with different types of funicular railway	12

The development of ski domains from the Eastern Carpathians was supported by the presence of mineral waters which created proper conditions for spa resorts (Vatra Dornei, Tușnad-Băi).

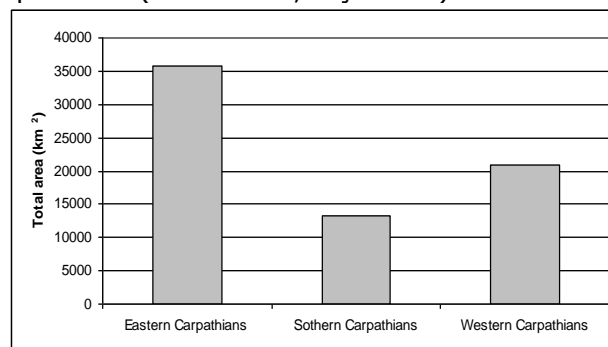


Fig. 6: The total surface of the Romanian Carpathian regions

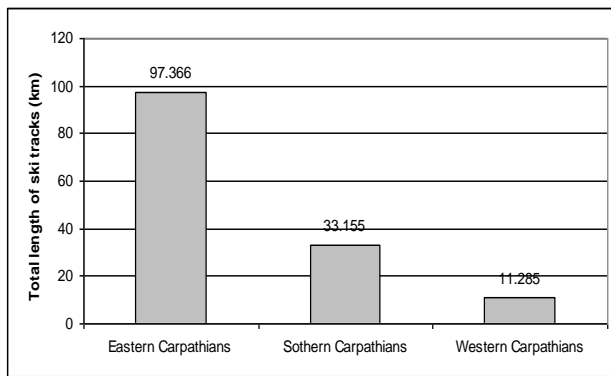


Fig. 7: The total length of the ski tracks from the three regions of the Romanian Carpathians

The average length of the ski tracks from the Eastern Carpathians (955 m) is a modest one and characterises, in general, the Romanian ski tracks. This characteristic does not depend on the possibility of equipping the mountain relief (this permitting, in general, the equipping of ski tracks with lengths which are higher than 2000 m), being tightly related to the volume of investments made in the development of wire transportation systems. Thus, if we take into consideration only the tracks from the Eastern Carpathians equipped with chair-lift, gondola or cable car (a funicular system which is more expensive than teleski), one can notice that they are fewer in number (21 tracks), with an average length of 2175 m, higher than the regional average.

Analysing the relation between the ski domains and the relief on which they are located, one can notice an average length of all the 41 ski tracks from the area of volcanic mountains of the Eastern Carpathians of 761 m, compared with the average length of 1103 m characteristic to the tracks from the mountain area covered with sedimentary rocks.

For the tracks situated in the area of volcanic mountains characterised by a lofty profile, with step slopes, well developed, and conical forms which exceed, in some cases, the altitude of 2000 m, the average length of 761 m is a consequence of the lack of major investments in the wire transportation system. In this mountain area, the development of ski domains, in the last 20 years, was made only with unimportant, local investments (Harghita Băi, Mădăraş, Cavnic, Miercurea Ciuc, Băile Tuşnad etc.) (Fig. 1).

The area of the mountains grafted on metamorphic rocks, with a massive relief and maximum altitudes that exceed 2300 m is characterised by the appearance of eight ski tracks located in Borşa resort and Cârlibaba town. It is an area which, although has an important ski potential, was very little developed till present because of its location in the central area of the Eastern Carpathians, far enough from the big towns situated

in the extra-Carpathian area. From a climatic point of view – the thickness and the duration of the snow layer, it is the most favourable area from Romania where the ski domains can develop a lot, rendering profitable the transportation and accommodation infrastructure from the rural areas situated in their proximity, but also by the layout of new ski resorts situated at altitudes higher than 1500 m in Rodna, Maramureş, Suhard, Giuralău and Bistriţa Mountains.

In the area of the Eastern Carpathians, the mountains formed on sedimentary rocks occupy the largest surface, being located in the Eastern part. The relief is extremely varied, being closely connected to the geological structure and to the petrography. The maximum altitudes excel 2500 m (Bucegi mountain group) at the border with the Southern Carpathians, encouraging the development of ski domains. In this area the most important Romanian resorts have developed (Poiana Braşov, Predeal, Buşteni and Sinaia). The most important ski domain from Romania is situated at Poiana Braşov (Postăvaru Massif) with 9 tracks that sum up 14.5 km length. In this area, there is also the longest track from the country, named *The Red Road* (Drumul Roşu), with a length of 4.6 km. On the second place there is Predeal resort with a total length of the tracks of 10 km. These nine resorts are followed by Buşteni, Azuga and Sinaia resorts that sum up 17.5 km of ski track. Considering these resorts, there can be drawn an area that contains Baiu, Bucegi and Postăvaru Mountains where the total length of the ski tracks is of 44 km (30% of the total length of the ski tracks from the Romanian Carpathians).

In the central area of the Bucegi Mountains, there is an ample plateau that favoured the layout of some ski tracks at altitudes higher than 2000 m. Five ski tracks, considered to be the highest in Romania, whose starting point is situated at altitudes higher than 2000 m, fall into this category.

Considering the characteristics of the ski domains from this mountain sector: the total length of the ski tracks, the total length of the wire transportation system, the type of equipment and its capacity of transportation, the high altitude where the ski tracks were laid out, the accommodation capacity (63% from the total capacity of accommodation from the Romanian Carpathians), one can notice that in this area there is the most developed ski domain from Romania.

In the Southern Carpathians, the average length of the ski tracks (1036 m) is close to that of the Eastern Carpathians, the ratio between the chair-lift and teleski system being 1 to 6 (Table 3). The relief was mostly formed on metamorphic, tough rocks, the highest altitudes excelling 2000 m.

Table 3 Technical characteristics of the ski domains from the Southern Carpathians

Southern Carpathians	2010
No. ski tracks	32
Total length (m)	33155
Average length (m)	1036
The average of the level difference (m)	210
The average starting altitude (m)	1556
The average arriving altitude (m)	1346
The average width (m)	50
Total area (m ²)	1677375
The average area (m ²)	52417
No. of artificial snow tracks	5
The length of artificial snow tracks (m)	3515
No. of tracks with night-illumination wiring	11
The length of tracks with night-illumination wiring (m)	10145
No. of tracks with artificial snow tracks and night illumination wiring	4
The length of tracks with artificial snow tracks and night illumination wiring (m)	2715
No. of tracks with funicular railway - teleski	26
No. of tracks with funicular railway – chair-lift	6
No. of tracks with different types of funicular railway	3

The Southern Carpathians ("The Transylvanian Alps") are characterised by a unique mixture between massiveness and relative accessibility. The massiveness is due to the geological frame that intensified structurally and lithologically the most massive morphology from the Romanian Carpathians. All these three mountain groups that belong to this mountain region excel the absolute altitude of 2500 m and almost all the subunits of second degree have altitudes higher than 2000 m. The relief energy is the highest within the Romanian Carpathians, with an average value of 750 m, with inclination of slopes varying between 35 and 55°, 25 per cent of the area exceeding 1500 m high. These characteristics of the relief cause a great frequency of the ski tracks situated at altitudes higher than 1500 m, the average value of the arriving altitude being of 1346 m, values which are clearly superior to the average value of 1020 m, characteristic to the Eastern Carpathians (Fig. 9).

In this mountain region, the development of ski domains was not as good as its potential, many of the ski tracks being older than 20 years, with wire-transportation systems with a low capacity of transportation (Păltiniș, Straja, Parâng, Muntele Mic), an exception to this being the layouts from the areas Șugag, Râul de Mori, Gura Râului, Cheile Buții and Râncă where the newer equipments have the necessary transportation capacity. The lack of major investments in the development of ski tracks from the Southern Carpathians is reflected by the small number of ski tracks (32) with a total length of no more than 33 km (Fig. 7), by the lack of wire-transportation system (gondola, cable car), and of the small length of ski tracks equipped with artificial snow-producing machinery and night illumination

wiring (four tracks with a total of 2.7 km Gura Râului, Straja, Râul de Mori and Râncă).

Considering the length of the ski tracks, one can notice that the most developed ski domain is found in Straja resort (9.2 km), followed by Șugag (6.8 km) and Small Mountain (Muntele Mic) (5 km). At a greater distance, there is Păltiniș resort (1.6 km) and Râncă (1.5 km), together with three rural areas that, with minimum investment, managed to equip three ski tracks (Râul de Mori, Gura Râului and Cheile Buții).

In the Transylvanian Alps, a special place is occupied by the Făgăraș Mountains where there is the highest altitude from Romania (2544 m in Moldoveanu Peak) with a great natural potential for the layout of the ski domains, but, which, do not have equipped ski tracks so far. In the Făgăraș Mountains, there was built, in 1975, the only cable car from this mountain area for practising extreme ski on the line of Bâlea Valley.

Though in some statistics from the ski domain, Bâlea ski track has a total length of 24 km, these lines are not equipped and cannot be considered as compatible with the ski domains that are analysed in the work.

The third region of the Romanian Carpathians is characterised by a scarce development of ski tracks (Table 4). The ski potential is high, with an extremely varied relief with prolonged summits with plane tops, with large, longitudinal depressions, transversal sectors of valleys, and even passes and straits, with inclinations of the slopes that frequently exceed 35° and high values of the vertical fragmentation. Just 1% from this mountain region excels 1500 m high, yet this aspect is balanced by great quantities of snow, by the thickness and the duration of the snow layer.

Table 4 Technical characteristics of the ski domains of the Western Carpathians

Western Carpathians	2010
No. ski tracks	15
Total length (m)	11285
Average length (m)	752
The average of the level difference (m)	173
The average starting altitude (m)	1382
The average arriving altitude (m)	1210
The average width (m)	57
Total area (m ²)	615610
The average area (m ²)	41040
No. of artificial snow tracks	1
The length of artificial snow tracks (m)	765
No. of tracks with night-illumination wiring	5
The length of tracks with night-illumination wiring (m)	3765
No. of tracks with artificial snow tracks and night illumination wiring	1
The length of tracks with artificial snow tracks and night illumination wiring (m)	765
No. of tracks with funicular railway - teleski	12
No. of tracks with funicular railway – chair-lift	3
No. of tracks with different types of funicular railway	0

The average length of all the fifteen ski tracks is about 752 m, which is less than in the other two mountain regions, as a result of the low investments made in wire-transportation systems, the ratio between the equipment of the chair-lift type and the teleski being of 1 to 8 (Fig. 8).

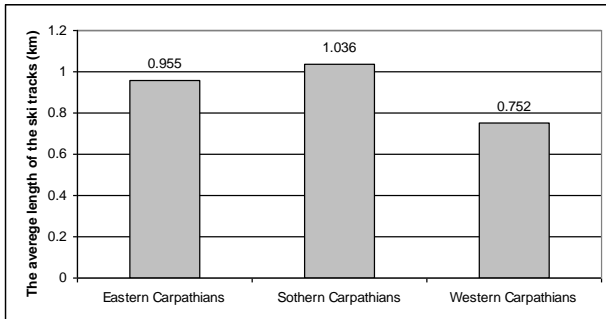


Fig. 8: The average length of the three Romanian Carpathian ski tracks

According to the total length of the ski tracks, on Băișoara resort is ranked the first (4.5 km), followed by Semenic (3.3 km), together with the ski domains from the Nucet, Stâna de Vale and Mărișel towns. For the equipped ski tracks from the Western Carpathians, the average arrival altitude is about 1210 m, a higher value comparing to that from the Eastern Carpathians because, in general, the tracks are shorter.

The ski domains from this mountain region have a great perspective of development due to their proximity to large urban areas, such as Cluj Napoca, Oradea, Timișoara or Arad.

In order to emphasise the degree of development of the ski tracks from the Romanian Carpathians, we consider that the best indicator is the density of ski tracks calculated as the ratio between the total length of the ski tracks from a certain area and its surface. The average density of ski tracks within the Romanian mountainous area is about 2 m/km². The highest average density of 2.7 m/km² is in the Eastern Carpathians, followed by the Southern Carpathians, of 2.5 m/km² and of the Western Carpathians, of 0.5 m/km².

The ski tracks are aleatory distributed; still, there is a higher density around urban areas or tourist resorts separated by areas of hundred of sqkm, deprived of an kind of equipment.

The Eastern Carpathians are characterised by a greater development of the ski domains from the mountain area in Maramureș county (5 m/km²), but also in the Southern sector from Brașov (12.2 m/km²) and Prahova counties (14.3 m/km²). At the other end, there are the mountain domains of Bacău, Vrancea and Buzău counties, which, although they cover an area of 4100 km², they have no ski track. The mountain domains of Neamț (0.4 m/km²), Bistrița

Nășăud (0.8 m/km²), Suceava (1.9 m/km²) and Harghita (2.5 m/km²) counties are less important.

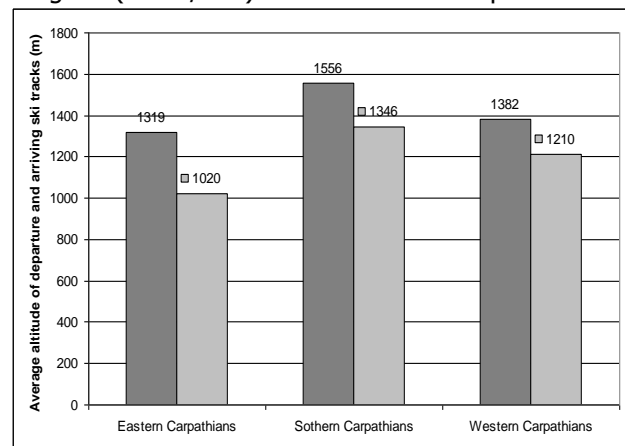


Fig. 9: The average altitude of departure and arriving from the three regions of the Romanian Carpathians

In the Southern Carpathians there are greater densities of the ski tracks in the mountain areas from Hunedoara (8 m/km²), Alba (7.2 m/km²) and Caraș Severin (4 m/km²) counties. Small densities of ski tracks characterise the mountain areas of Sibiu (1.8 m/km²) and Gorj (0.9 m/km²), together with the mountain areas of Argeș and Vâlcea, counties that do not have ski tracks at all.

In the Western Carpathians, the mountain area of Cluj county has the highest density of ski tracks reaching the value of 3.3 m/km², followed by the mountain areas of Bihor (1 m/km²) and Caraș Severin (0.8 m/km²). An important surface from the Western Carpathians, summing up about 8000 km², represents the mountain area of Alba, Arad and Hunedoara counties where there is no skiing equipment.

In the near future, according to the programmes that take place on a national level, the density of the ski tracks will grow especially in the mountain areas where, nowadays, they hold insignificant values, such as areas from the Eastern Carpathians (Bacău and Vrancea), from the Southern Carpathians (Argeș and Vâlcea) and from the Western Carpathians (Alba, Bihor and Hunedoara).

Conclusions

Compared to the European mountain countries, where the winter sports tourism occupies a very important place, the Romanian tourism knows an incipient stage of evolution with an extraordinary development potential, considering the fact that in the last few years there has been noticed an increase in the interest shown towards the practice of winter sports. The approach of the ski domains can touch different aspects of study, but we consider that the most relevant indicator of the development of ski

domains in Romania is related to the total length of the ski tracks, which, in 2010, was about 168 km. Without any other references to the constituents of the tourism infrastructure characteristic to this field (wire-transportation network, accommodation infrastructure, road infrastructure etc.), one can conclude that the Romanian ski domains are characterised by under-development.

Another indicator of the development of ski domains is represented by the density of the ski network system calculated in reference to the total length of the ski tracks from a certain region and its surface. For the Romanian Carpathians, the average density of the ski tracks is about 2 m/km², with quite important varieties in mountain areas. The most developed ski domain in Romania (26% of the total length of ski tracks) is located in the area of the Curvature Carpathians, in Bucegi and Postăvaru Massifs, in Prahova and Brașov counties where the density of the ski tracks is 14.3 m/km², for Prahova county, and 12.2 m/km² for Brașov county. The development of this area was initiated and sustained during the Communist period with the help of mountain resort placement, considered to be of national importance due to their high value of the total length of ski track - Poiana Brașov - 15 km, Predeal - 10 km, Bușteni - 5.5 km, Azuga - 6.5 km, Sinaia - 6 km. The main factor that influenced this development is in connection to the proximity of the capital city, Bucharest, and of several big cities, such as Brașov, Ploiești and Pitești, cities that provide the resorts with a constant and large flux of tourists. In the last 10 years, while the Romanian working force has been under the influence of globalisation, there has been noticed a growing interest in the development of the ski domain in other counties too, situated far from Bucharest, where there have been recorded an increase in the total length of the ski tracks up to 37%, which is 62 km. This is the case for Maramureș, Suceava, Harghita and Hunedoara counties that excel many others where such instalments do not exist yet - Bacău, Vrancea, Buzău, Dâmbovița, Vâlcea and Mehedinți counties, where the mountain area occupies about 7000 km².

In the years to come, the perspective of development of the ski domain is one of great importance considering the growing interest shown by the Romanian tourists in the practice of winter sports, but also the availability of the local authorities towards earning European funds in order to lay out new ski tracks equipped at European standards. For this, there is a National Programme of mountain development programme - "Superski"

in Romania", that is willing to invest more than 130 million euros in the development of this domain in four different mountain areas of the country (Poiana Brașov - Prahova Valley, Parâng - Vâlcan - Jiu Valley, Maramureș area and Suceava area.

References

- Bieger, T., Laesser, C., Beritelli, P., 2004, Tendances de la demande sur le marché mature des voyages aux sports d'hiver. Le cas des touristes suisses, *Revue de géographie alpine*, vol. 92, p 33-40
- Carcano E., 2002, *Snow Business, stations de ski, enquête sur l'envers du décor*, Tetras editions, Paris
- Cândeș, M., Erdeli, G., 2001, *România. Potențialul turistic și turism*, Edit. Universității, București.
- Cârstocea, V., 1998, *Schiul alpin*, Edit. IEFS, București.
- Drăgoi, C.C., 2006, *Turism și activități sportive în spațiul montan*, Editura EduSoft, Bacău
- Erdeli, G., Istrate, I., 1996, *Potențialul turistic al României*, Edit. Universității din București.
- Grigoraș, P., 2002, *Schi alpin, Snowboard, Carving*, Edit. Accent, Cluj Napoca.
- Matei, I., 1982, *Marea aventură a schiului*, Edit. Albatros, București.
- Meethan, K., Anderson, A., Miles, S., 2006, *Tourism consumption and representations*, CAB International 2006, UK, Berg London, p 140 - 158
- Moon, O., 1989, *From paddy field to ski slope: the revitalization of tradition in Japanese village life*, Manchester University Press, p 78 - 87
- Muntele, I., Iașu C., 2003, *Geografia turismului - Concepte, metode și forme de manifestare spațio-temporală*, Sed com Libris, Iași.
- Posea, G., Popescu, N., Ielenicz, M., 1974, *Relieful României*, Edit. Științifică, București.
- Soule, B., 2004, *L'instrumentalisation de la thématique sécuritaire : l'exemple des risques en station de montagne*, *Revue de géographie alpine*, vol 92-4, p 49-56
- ****Geografia României III*, 1987, *Carpații Românești și Depresiunea Transilvaniei*, Edit. Academiei R.S. România, București.
- World Travel and Tourism Council, 2006, *China, China Hong Cong SAR and China Macau SAR: The impact of travel and tourism on jobs and the economy*, London p 15 - 28
- w.w.w. ski-france.com
- w.w.w. skiaustria.com
- w.w.w. skiitaly.com