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## FEASIBILITY STUDY FOR CAREV VRV ON THE OSOGOVSKI MOUNTAINS

Within the framework of the project: "Preparation of feasibility studies for development of ski tourism in mountain areas of Belitsa, Bulgaria and Makedonska Kamenica, Macedonia"

GET READY FOR SKIING 2007CB16IP0007-2012-3-059

# SKI CENTER CAREV VRV

ELIPSA COR, Kumanovo







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#### **Goals and tasks**

After the completion of the technical analyses of the appropriateness of the field for skiing and snowboarding, with the purpose od defining the development of the locality Carev Peak or the surrounding localities and the mountain peak, as well as the identification of the possibilities for development of other year-round recreational purposes, two different zones which have potential for development of ski centers are identified. The plan for development of the ski center Carev Peak is defined as the development of a mountain resort which will be placed in these two zones. The development of the locality in a ski center according to the preparational plan includes planning of installation of new objects as well as the construction of basic infrastructure in the base of the mountain. The specific nature of the field is also defined by the scattered type of base settlement.

With the purpose of providing the best possible experience for the guests, modern ski centers require the most efficient, easy to use systems of ski lifts and ski stages. Ski centers are usually constructed in several phases, with the purpose of increasing the quality and size of the area, and, in time, allowing adjustments towards the demands of the market. The realization of the goal requires a complete understanding of the whole project and of the construction, so that the construction of the objects needs to be balanced out and the capital to be effectively waged. As it is stated in the proposal, the execution in phases and the investments in the next 10 to 20 years are taken into account in the financial studies.

The goals of the feasibility study and the plan for development of the ski center Carev Peak are the following:

- A modern, high quality ski resrot with modern equipment and design to be built; one which will provide quality for recreational experience for local, regional and farther destinations for skiers and snowboarders
- Optimization for use and operational efficiency of the suggested objects and the whole destination

- Usage of the infrastructure in the duration of the whole year to be provided.
- Providing ski stages that will fit all levels of skills of the skiers and snowboarders with clear definition of each ski stage.
- Balanced development of the ski stages in accordance with the market participation on the various levels of ski skills of the tourists on the market (market distribution with bigger number of beginners, valid in the many markets in development in the world is used as a reference)
- Balancing with the capacity of the lifts and ski stages with the purpose of sustaining the quality of conditions of skiing and snowboarding and satisfying the requests of the market
- Balancing the capacity of the mountain with the tourist capacity and services, daily parking for the skiers and accommodation
- Providing an adequate road access to the base settlement, but also access to the system of chairlifts and ski lifts
- Defining the basic infrastructure necessary for implementation of this project.

#### **Basic Data for the Region**

#### **Natural characteristics**

The eastern mountain region is located in the far east of Macedonia and, in general, covers the basin region of the river Bregalnica. This region has an area of 3537 km<sup>2</sup> or 14.2% of the territory of the Republic of Macedonia. Within the frame of the eastern region there are 11 municipalities: Berovo, Vinica, Delcevo, Zrnovci, Karabinci, Kocani, Makedonska Kamenica, Pehcevo, Probistip, Cecinovo-Oblesevo and Stip. On Picture no. 1 the municipalities that are within the Eastern mountain region are shown.

Picture no. 1



#### State Statistical Office of the Republic of Macedonia

Within the frame of the municipalities there are 217 settlements, of which 8 are urban, and 209 are characterized as rural settlement. In table no. 1 the basic characteristics of the municipalities of the Eastern mountain region are given.

No.	Municipality	Area km2	Person/km	Settlements	Participation (in %) of urban in total population
1	Berovo	598	23	9	50.2
2	Vinica	433	46	16	54.5
3	Delcevo	422	41	22	65.7
4	Zrnovci	56	58	3	0%
5	Karbinci	229	18	29	0%
6	Kocani	360	106	28	74.4
7	Makedonska Kamenica	190	43	9	63.5
8	Pehcevo	208	27	7	58.7
9	Probistip	326	50	36	66.8
10	Cesinovo- Oblesevo	132	57	14	0%
11	Stip	583	82	44	91.3
	Total	3537	51	217	66.3

Table no. 1 Municipalities in the Eastern mountain region

State Statistical Office of the Republic of Macedonia

The region of the eastern side borders the Republic of Bulgaria, with which there is one border crossing Delcevo in the municipality Delcevo. On the north the region borders the northeastern mountain region, on the west with the Vardar mountain region, and on the south with the Southeastern mountain region.

Although the number of rural municipalities in the region is relatively high, as well as the number of rural settlements (96,3%), still the largest part of the population can be found in the urban centers. This data shows a large internal unequal concentration of the population. In table no. 2 the basic characteristics of the Eastern mountain region are shown.

Region	Surface area in km2	Number of population - 2006	Density of population - person/km2	Number of municipal ities	Municipal ities with headquar ters in a village	Number of settlem ents	2002 Participation (in %) of urban in total population
Republic of Macedonia	25 713	2 040 228	82	84	41	1767	56.7
Eastern	3537	180 938	51	11	3	217	66.3

#### Table no. 2 Basic characteristics of the Eastern mountain region

#### Relief

The relief structure in the Eastern mountain region is quite dynamic and in it the flat parts are represented like part of Ovce Pole, Ezovo Pole, the ravines beside the river Bregalnica, the ravine Pijanec, Malesevska ravine, Ninicko-Kocanska ravine, Berovsko-Pehcevsto field, then slope parts comprised by torrential alluviums, cones, covered with diluvial, corrugated soils which comprise large surface areas and are dominant in the agricultural production, as well as the mountain parts like the mountains Osogovo, Plackovica, Certa, Konecka, Malesevski Mountains, Ograzden, Vlaina Mountains, Obozna and Golak.

#### Climate

The climate region of the Eastern mountain region is arid; the area in the larger part is arid-dry. For this type of climate characteristic are the long and dry summers with the frequent appearance of high temperatures that can achieve  $+41^{\circ}$ C and soft and wet winters with rare appearance of extremely low temperatures, which can descend to -22°C. This is a consequence of the conflict of influences of the mediterranean and continental climates. The average annual precipitation is about 506mm in the area of Kocansko Pole, and up to 672 mm in Malesevo. The precipitation is unevenly spread out in duration and amount. The maximum precipitation is in the months of April and May, whereas the minumum is in the summer months of July and August. The average daily mean in the flat part is 12.9°C, whereas in the Malesevija it is 8.7°C. The snow appears from December until March. Fog rarely appears in this region, except in the part of Malesevo, where on average there are 3 to 5 foggy days annually. The climate conditions in this region are favorable for the development of agriculture, particularly for production of rice.

#### Natural resources

For the Eastern mountain region it can be said that there is an abundance of various natural resources that can have an important role in the stimulation of development. Relatively big surface areas of agricultural land, forests and mineral riches represent a good basis for further development of the region. In table no. 3 data for the available natural resources of the region is given.

Agriculture surface (in hectarees)	Total arable area (in ha)	Forest area (in he)	timber/total timber (mil. m³)	More relevant water resources	More relevant mineral resources
123688	78328	136738	4.8	Bregalnica river, Orizarska river, Berovsko lake, Accumulatio ns Kalimanci, Knezevo and Gradce, Warm thermic waters – Istibanja and Kezovica	Led-zinc mines, asbestos, kaolin clay, opal brecha lignite

Table no. 3 Natural resources of the Eastern mountain region

Source: "Regions in the Republic of Macedonia 2013", State Statistical Office, Forestry 2012 and Physical plan of the Republic of Macedonia

In the Eastern mountain region several more significant water resources can be located, and the hydrograph is comprised by the river network, artificial accumulations and natural sources, among which are the mineral and thermal waters. The river Bregalnica can be singled out as the most significant water resource in the region. On this river the accumulation "Kalimanci" is located which has a capacity of 120 million m<sup>3</sup> of water, which is 48% of the total average annual flow of the river Bregalnica. In the basin of the river Bregalnica other smaller accumulations are located: Berovo lake – accumulation Ratevo, Petrasevec, Losana, Gradce, accumulation in village Pisica and other smaller ones. Of particular significance is the accumulation Zletovica – dam Knezevo with total capacity of 23.500.000 m<sup>3</sup> water which is used in Vinica (Istibanja) and Stip (Kezovica). In the flat alluvial part of the region there are underground waters which the population uses for individual purposes.

#### **Biodiversity**

In the Eastern mountain region protected areas with high natural value do not exist. Still, The Osogovo mountains are submitted for a new are for protection because of the values that are identified in the region of these mountains. The causes for the submitted protection in accordance with the Physical plan rely on the Geormorfological value, Protection of the scenery, protection of biodiversity, hydrological value and water resources. On Picture no. 2 the areas which are submitted for protection and the newly identified areas for protection are shown.

Picture no. 2



The Osogovo Mountains own significant values from the biological aspect. A large number of internationally and nationally significant types of flora and fauna are identified, of which a significant part are struck\*, endemic or rare species.

Besides that Osogovo is identified as: Significant vegetation area (ZRP), Important Bird Area (ZOL), An important corridor for movement of wild vegetation and animal species in the frame of the Pan-European Ecological Network and Southeastern Europe (PEEN SEE) and Emerald area. The Interaction between people and nature on Osogovo is characteristic and it is of exceptional significance for it to be maintained and nurtured.

From here it can be ascertained that the protected area will provide protection of the natural values and sustainable economic development in the region. 18 habitats according to the EUNIS classification system are registered; five of those are significant for preservation according to the Habitats Directive. 1007 species and subspecies of plants are registered of which 18 are registered only on Osogovo, among which are: *Viola biflora, Anemone narcissiflora, Myriophyllum verticillatum, Pulsatilla montana ssp. Slaviankae* and others. Carev Vrv is a unique locality for the *Genista fukarekiana* (endemic plant that can only be found on the Osogovo mountains), *Hypericum maculatum ssp. Maculatum* and *Viola biflora*.

A presence of 24 types of mammals is determined. 133 types of birds are registered, of which 36 are important species. Especially important is the ornithological locality "Ratkova skala". 10 types of amphibians and 21 types of lizards are identified. 11 types of fish are known of which eight are included on IUCN's red list. On Osogovo 16 Balkan endemic species from the group of snails are identified, a total of 243 types of spiders (14 of those are endemic), 15 types of dragonflies, 99 types of daily butterflies (*Erebia aethiops* and *Minois dryas* can only be found on Osogovo), 203 ground beetles - Carabidae.

Osogovo is characterized by the interaction between people and nature, and the biodiversity and human heritage, captures in natural scenery, contributed to the formation of characteristical areas. Six types of areas are identified, of which the most characteristic is the Osogovo mountain rural area. On Picture no. 3 the areas which are submitted for protection in accordance with the Physical plan in the Eastern mountain region are shown.



Besides the Osogovo mountains, on the territory of the Eastern mountain region the following natural values are identified and submitted:

Locality Dolna Zletovica, which comprises the lower flow of Zletovska river,

from village Tripatanci to under village Ziganci, the surrounding rice fields and low parts of the mountain Osogovo. The locality is significant for its fauna of birds (the only mixed colony of nightly, gray and little white heron) and the king eagles. It comprises a large part of the ZOL Dolina of the river Zletovica.

The Ovce Pole area comprises the most significant halomorphic (salty) soils in Macedonia on which the specific halophyte vegetation is developed and has a big botanical value. This is under pressure because of its conversion into arable land.

Kukuljeto can be found southwestern from the village Nov Istevnik (in the Delcevo region), and it has a botanical and geomorphologic value. Most significant is the presence of erosive forms – geomorphologic forms - land pyramids, located on two erosive slopes in a black pine forest. Part of the locality is ordered for tourism visits. The denudative relief forms - earth pyramids are build in pliocene sediments, on mostly pliocene sands. Their basic pre-requirement in the formation are biogenic layers which immediately protect the sediment underneath them from intensive erosion.

The region of Dolna Bregalnica is submitted for a monument of nature and has a big importance for protection of biodiversity, geomorphologic and paleontological value. The region has an exceptional geomorphologic significance because of the presence of the fossil trough and the meanders of Bregalnica. The fauna of birds and lizards has an exceptional value. Besides that, interestting types of plants and amphibians can also be found here. This area is especially significant for protection of birds. It has been identified as en Emerald Region (the Gorge of Bregalnica). This region equals with other important regions, such as: Ovce Pole, important ornithological region (Topolka-Babuba-Bregalnica) and the important vegetation region Krivolak (Orlovo Hill - Salty Valley - Serta).

The Malesevski Mountains are a significant area for specie management, on which territory many different significant areas with big natural dendrological, geomorphologic or plant values can be found, such as: Berovo Lake, Temniot Andak, Murite, Judovi Livadi, Macevo, Crnik.

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#### Vegetation

The diversity of biotopies conditions richness with vegetation types of the territory of the Eastern mountain region. The presence of a specific number of endemic types is evident. The specific climate conditions and geological diversity of the region condition the appearance of a heterogenous natural vegetation and a differentiation of the height belts.

High plants are the most, whereas the lower ones, which include the algae, moss and fungi, are not completely investigated. In the region there live many different plat communities. Besides them, the Eastern mountain region also is rich with a large number of various medicinal and aromatic plants, forest fruits, seeds and mushrooms. The richness of dendroflora can be seen in the presence of 25 types of trees, with many subtypes. Of the forest ecosystem, which in the largest part can be found on the mountains in the region, most prevalent are the forests with the wide varieties of maple and birch, whereas the pine forests are rare and in them the most prevalent are pine, firetree and spruce. On smaller areas mixed forests can be found. The forest cover has an enormous influence over the protection of the waters, the soil and sustaining biodiverstiy. From this region there is also a community of dry meadows, which can be found at flattened and soft slopes.

#### Fauna

An accompanying part of the biocenosis in the region of the Eastern mountains regions also are the various forms of animals from the groups of amphibians, mammals, lizards, birds and insects. The bird group and group of mammals from certain biotopes is comprised by a number of associations with a large number of units which can be found from the lowest to the highest altitudes above the sea level. The forest fauna in the region is rich with various types of wild animals. From the hairy game can be found rabbit, dear, wolf, wild boar, fox, wild cat, badger, otter and weasel, whereas from the feathery game there can be found: rock partridge and gray partridge, pheasant, pigeon, quail, wild ducks, hawks, coot, hazel grouse, magpie, raven, crow and others. Mammals can usually be found in the higher mountain regions. In the water ecosystems, most represented types of fish are: chub, barbel, roach, crucian carp, and more rarely carp and catfish. Because of the marring of the water regime and the water quality, the balance of the fish fond is drastrically marred.

#### **Forests**

The Eastern mountain region has significant forest areas that can be used for development of the logging industry, as well as the development of mountain tourism. Still, usage of the forests must come from the principle of rational usage of forests, their management and providing a high degree of protection.

The total forest surface in the Eastern mountain region is 145.228 hectareas or 14,71% from the total forest area in the Republic of Macedonia, which is 41,1% of the total area of the region. The tree mass is 4.8 million m<sup>3</sup> or 6% of the total tree mass in the Republic of Macedonia, and the planned logging of the tree mass is 250.000 m<sup>3</sup> annually or 18% of the total planned amount of logging in the Republic of Macedonia.

From the forests the most prevalent is the pine forest (f.Pinacae), oak forest (f. Queracae) and the birch forest (f. Fagacae). As a result of the yearlong intensive usage of the oak forests they are now in the phase of forming young seedings with different density. The birch belt is prevalent in the mountain region and the region under the mountain region. The second region most frequently is discontinued and not continual. The higher birch forests are better preserved, and they are of great importance for the forest economy. In the birch forests belt, acidophilic pine forests can be found, whereas in the higher belts there are white pine complexes (sp. Pinus Sylvestra). In Table no. 4 the data for the forest fund in the Eastern mountain region is shown.

Table no. 4

Types of plantations	Republic of Macedonia Surface area (he)	Eastern region Surface area (he)	Participation in the Eastern region
Decidious forests	597.657	85.788	14,35%
Conifer forests	66.479	10.739	16,15%
Mixed forests	280.061	45.729	16,33%
Degraded forests	43.348	2.972	6,86%

Statistical Office, Forestry, 2013

#### Natural and cultural-historical heritage.

Regarding natural heritage, that is exceptionally rich and it enables the possibility of rural tourism development. Proof for the rich natural heritage and the possibility of its usage are the few natural reserves (Goten, Linak, Males, Zrnovska river, Ulomija river), the natural monuments (Zvegor, Konjska Dupka cave, Morodvis, Macevo, Crna Topola, Lesnovska Dudinka, locality Borja, locality Ploce) and a large number of villages as well as the natural reserves Goten, Linak, Males, Zrnovska river, Ulomija river and the large number of natural monuments.

Besides the natural resources, the Eastern mountain region is rich with significant natural and cultural-historical heritage, which should be put into function of creating recognizability of the mountain region and tourism development. From the rich natural and cultural-historical heritage, especially can be singled out: the archeological locality Vinicko Kale, manastir Sv. Gavril Lesnovski and the archeological locality Bargala.

The basic characteristics of the Eastern mountain region shows that the region has significant natural resources and interesting cultural-historical heritage which is unsufficienty used. The concentration of the highest part of the population in the urban settlements somewhat influences the continuing situation of insufficient usage of the potential for development, but the non-existence of conditions for qualitative life in large part from the rural areas is the reason for migration of the population towards the cities.

#### Wildlife protection

Wildlife protection is an exceptionally important segment from the policy of regional development. The condition of quality of wildlife in the Eastern mountain region is similar, as is in the other regions in the Republic of Macedonia. The problems in wildlife in this region are identified and grouped in accordance with the media and areas of wildlife in which they are present. Those are: problems in waste management, as a consequence of the absence of an integrated waste management system; problems in water management, which include pollution of the water resources and an absence of treatment of the waste waters; air pollution with different intensity in different parts of the region and soil contamination. The lack of a developed monitoring system for wildlife is a special problem that pertains all media.

#### Solid waste

Solid waste management in the Eastern mountain region is comprised on its accumulation, transport and depositing. For solid waste management the municipal communal companies are responsible. In Table no. 5 the data for the amounts of created and accumulated waste in tons are shown.

	Amount of created waste (tons)		Amount of accumulated waste (tons)			% of accumulated waste			
2011 2012 2013		2011	2012	2013	2011	2012	2013		
Republic of Macedonia	735 250	786.909	793.000	543 954	550.760	555.250	73,98%	69,99%	70,02%
Eastern region	81 251	82 849	72 500	69 588	70.485	62 055	85,65%	85,08%	85,59%
%	11,05%	10,53%	9,14%	12,79%	12,80%	11,18%	115,77%	121,55%	122,24%

Table no. 5

The depositing of solid communal waste in the Eastern mountain region is done on local locations or the so-called municipal landfills which do not satisfy not even the basic sanitary-technical standards for safe waste depositing. In this region 17 landfills exist, which is evident in accordance with the National plan for waste management, and which according to the risk of environment pollution are classified on the following way: 3 landfills – high risk; 8 landfills – middle risk and 6 landfills – low risk.

Beside the municipal landfills, there are also a large number of so-call wild landfills. The wild landfills can particularly be found in the rural region and represent an additional threat to the environment. The number of wild landfills in the region is 171. In great measure these wild landfills are made because a large number of rural settlements are not covered by the accumulating and depositing service of the solid communal waste.

In accordance with the National strategy for waste management, the problems with solid waste management can be defeated through implementing a regional integral solid waste management, in accordance with the EU directives. The Eastern region plans to implement an integral communal waste management through the use of the EU IPA programme funds.

Recycling, or selection of recyclable fractions from the communal solid waste is done on a very small part of waste and that through selection of waste in set containers for waste in a few municipalities. The informal sector collects the wasted plastic and metal directly from the containers for waste accumulation.

Organized waste accumulation/gathering exists only for the waste from the packaging.

Other types of waste, such as tyres, batteries, waste oils and greases, used cars and waste from electronics are not selected and end up in the communal waste landfills. In the municipality of Stip certain private companies manage a part of these types of waste, but in amounts that are relatively small.

Medicinal waste only in the larger cities are collected separately and are treated accordingly (inseneration).

#### Water

Watter supply

Water supply with potable water in the Eastern mountain region is done through usage of water from wells, underground waters, surface water or a combination of these resources.

Underground waters are used for water supply in the cities: Stip (with prior processing), Kocani, Probistip and Delcevo.

Surface waters after the previous treatment of crude water use the cities of Berovo and Vinica. Delcevo and Vinica use a combination of surface and underground water. The water supply systems in the rural areas are generally provided through wells and underground waters, and frequently they use surface waters.

Water supply in the municipalities that are located in the Eastern mountain region is an obligation of the local public companies. The coverage of the population with water supply systems is from 90% in Stip to 100% in Vinica, whereas in the rural areas the same indicator is from 10% to 80%. In the rural areas there exists separate water supply systems. The total length of the water supply network in the Eastern mountain region is 384 km and it is usually located in the urban centers of the municipalities. In the duration of the summer period in several settlements from this region there is a shortage of drinking water. This problem is a consequence of: the high annual expenditure per capita, the loss of water in the supply systems for more of 50% due to its old age and improper maintenance, the insufficient volume of the reserves, the purifying stations and other objects.

#### Waste waters

The municipal waste waters are taken through the waste waters abduction systems which are 250 km in total length.

The collectors and city network is usually located in the urban centers of the municipalities. Regarding the coverage of population with a canalyzed network in the urban areas it is from 80% to 100%, whereas in the rural areas it is from 0% (septic tank) to 80%. Part of the rural settlements do not have systems or appropriate septic tanks for waste waters. Generally, the condition with the waste waters abduction systems is relatively bad, because the systems are characterized with drainage of the part of the waste waters in the duration of transport, with which the risk for soil and underground water contamination rises.

The coverage of the population with purifying stations of waste waters in the Eastern mountains region is 7,7% (12,7% on the level of the Republic of Macedonia). In the region there is only one purifying station for waste waters which is located in Berovo and is with a capacity of 14.000 e.z.

In accordance with the study for improvement of the environment in the Bregalnica basin, construction of purifying stations in planned for Stip, Kocani and Orizari, Vinica, Makedonska Kamenica, Pehcevo, Delcevo, Zrnovci, Karbinci, Lozovo and Cesinovo.

#### Water quality

The data for quality of the water ways are acquired by the National Hydrometeorogical Service of the Republic of Macedonia. In the Eastern mountain region 2 measuring places are defined, one on the Bregalnica river, and the other on the places Balvan and Ubogo. The organoleptic, mineralization, oxygenic, acidity indicators, eutrophication determinants, damaging and dangerous materials are continually monitored.

The amount of contaminating materia of the measuring places on the Bregalnica river decrease in the period of 2009 – 2011.

The water in the Bregalnica river are in the second class quality.

In the Eastern mountain region two locations for industrial contaminators are identified. The main potential industry contaminants of water are: the led and zinc mines in Kamenica and in Probistip.

#### Irrigation

The current condition of almost all hidromeliorative systems in the Republic of Macedonia is characterized by a weak technical condition of the objects, plants and the equipment, high losses of water, low efficiency of usage, insufficient capacity for changes of the flow of water through the canals, no regulation of the flow in the transferal structures (canals and pipelines) and so on. The condition is similar in the systems which are located in the Eastern mountain region. In accordance with the Minisrty of Environment and Physical Planning of the Republic of Macedonia, the causes for this bad condition of the systems are: insufficient maintenance of the canals, bad quality of original construction, incomplete construction according to the design, inappropriate solutions and design, insufficient and weak quality of hydromechanical equipment, a large number of water users, a small size of the parcels, bad financial condition of the organizations that manage water and emigration from the rural areas.

The following irrigation systems are located in the Eastern mountain region:

1. Gorna Bregalnica area, Bregalnica river, Ratevska river, underground rivers, it has a surface area of 1.334 ha and has water amount of  $7.258.000 \text{ m}^3$ 

2. Sredna and Dolna Bregalnica area, river Bregalnica, Zletovska, Iakovica and Mavrovica, has a surface area of 25.758 and has water amount of  $235.086.000 \text{ m}^3$ 

#### Soil

The diminishing of the quality of soil in the region derives from:

- Open mines and sedimentation of the mine remains on a large area;
- Inappropriate processing in agricultural areas, keeping cultures with intensive artificial fertilizers and pesticides;
- Increased and uncontrolled use of pesticides;
- Destruction of soil layers, erosion, destruction of forests and over grazing;
- Changes in the physical and chemical structure of the soils under influence of the existing industrial objects and well as sedimentation of sediments from polluted air;
- Usage of contaminated water for irrigation;

## Inappropriate management with waste and waste waters; and so on...

Industrial pollution

In the Eastern region the following industrially contaminated localities are identified – "hotbeds":

- 1. Toranica led/zinc mine municipality Probistip
- 2. Zletovo led/zinc mine municipality Probistip
- 3. Sasa led/zinc mine municipality Makedonska Kamenica

#### Erosion

One of the most-recognized erosive basins can be found at Kamenicka river with an annual production of erosive material for 150.000 m<sup>3</sup>. According to the erosion map of the Republic of Macedonia, the territory is divided into 5 classes of erosion intensity – from class I which represents the most extreme erosions to class V, representing the extremely low levels of erosion.

## Picture no. 4 Erosion and natural hazards - physical plan of the Republic of Macedonia



In the Eastern mountain region the water management area Gorna Bregalnica has more than half of the territory and is characterized with powerful erosion of 66,46%.

#### Air

The air quality in the Eastern mountain region is relatively good with the exception of certain urban areas, where in the winter period in the year there are some increasements in the concentration of pollutive elements, of which are mostly PM particles. The air quality measuring station is located in Kocani.

The data shows that in the urban areas in the region in the duration of the winter period a higher level of PM particles can be found.

#### **Demographic development**

#### Scope of population

In accordance with the most recent available data pertaining demographics, the Eastern mountain region has almost four times smaller growth of population in comparison with the population in the country. There exist drastic differences in the growth of population and its physical dislocation between the very regions and they are significantly unfavorable. According to the estimations for the number of citizens in 2013 the Eastern mountain region had 178.270 citizens or 2.0% less that the number of citizens in 2002 when the last census<sup>1</sup> has been done. The natural movement of the population in the region has a below average natality, above average mortality and a negative rate of natural increase.

The newborn death rate in the region is below the average and is 8,4 (10,6 on the level of the Republic of Macedonia). The total fertility rate in the region is 1.22 and cannot provide a rejuvination of the population. The number of live births on a population of 1000 is 8,6 and is smaller than the average number of live births per 1000 on the level of the Republic of Macedonia, which is 11,2. The age average of the population is 40, whereas that level for the Republic of Macedonia is 38.

#### Density of population and physical dislocation

One of the vital characteristics of the Eastern mountain region is the density of the population which is 50,4 persons per km<sup>2</sup>. However, because of the permanent process of depopulation, the number of

<sup>&</sup>lt;sup>1</sup> State Statistical Office, Publication: The Regions in the Republic of Macedonia 2014

dislocated villages is large, villages with a size of up to 100 persons and villages with noticeable aging index. This condition leads to population concentration of about 66% in the urban areas.

Total population	178.270
men	90.171
women	88.099
Density of population	50,4
ages 0-14 (%)	14,6
ages 65+ (%)	13,5
Old age dependency coefficient	39,2
on 000 population	
Live births	8,6
Deceased	10,4
Marriages	5,7
Divorced	1,0
Infant mortality rate	8,4
average age:	
Population	40
First time mother	26
First time wife	25,6
Deceased	72

Table no. 6 Basic demographic indicators<sup>2</sup>

#### Migrational movements

Regarding migrational movements, the prevalence of inner migrations is dominant, more precisely in between the municipalities, and less prevalent are the local migrations which are more frequent in the municipalities of Berovo, Vinica, Delcevo, Makedonska Kamenica and Probistip. Regarding external migrations, more prevalent is the emigration

<sup>&</sup>lt;sup>2</sup> State Statistical Office, Publication: The Regions in the Republic of Macedonia 2014

rather than immigration, and this migration has a tendency to be intensified with the immigration of the young and highly educated people.

#### Population by gender, age and education

The general conclusion regarding the age of the population in the Eastern mountain region is that it is occupied by an intensive process of demographic aging. These changes lead to a decrease of the part of children, an increase in the population able for work and those aged over 65. This shows that the load on the older population that is able to work increases, which leads to a number of unfavorable consequences on the economic and social development.

Regarding other changes, in the households and families the average number of members in them is decreasing, inner-regional differences become more noticeable and the participation of single households and the population living in them increases.

The cultural-educational and educational level of the population show a decrease of the number of illiterate and those with lower education, as well as an increases in the population with middle and high education.



Picture no. 5 Population by gender and age<sup>3</sup>

<sup>&</sup>lt;sup>3</sup> State Statistical Office, Publication: The Regions in the Republic of Macedonia 2014

#### **Economic development**

The Eastern mountain region is economically well developed. Its participation in the GDP of the Republic of Macedonia is at the level of 8.1% which is less than the participation of the region in the total territory (about 14%) and is at the level of participation of the population from the region in the total number of population for the country.

Table no. 7

	2009	2010	2011			
Republic of Macedonia						
GDP (in millions of denars)	410.734	434.112	459.789			
Participation	100.0%	100.0%	100.0%			
Eastern region						
GDP (in millions of denars)	30.683	37.171	37.092			
PArticipation	7.5%	8.6%	8.1%			

Measured per person, the Eastern mountain region in 2012 had a GDP per person of 204.748 denars.





For the past 4 years it can be said that in the Eastern mountain region an accelerating trend of economic activity is characterized and a gradual approaching to the GDP in the region to the average of the Republic of Macedonia, which is a good result and it points to the revitalization and modernization of the economy.

Looking at it wholly, the Eastern mountain region developed relatively quickly, which is adequately reflected on the degree of its development. The Eastern mountain region today has a development index of 0,67, economic social index of 0,95 and a demographic index of 0,50.<sup>4</sup>. In that way the region approaches the regions that are better than the average for the Republic of Macedonia.

#### Production and new employments

It is interestting but the data for the gross added value does not reflect the impression on the field that the economic activity in the region is really speeding up. This can also be explained with the fact that not all parts of the region appropriately become alive and/or the prices of products of the region fall, or that the international competition from cheaper countries and regions, for example in the textile industry, influence the decrease of international prices. But, this indicator also shows that other regions in the state raise its indicator on an aggregate level, or that in the frame of the region there is a lot of place for additional economic development. Be as it may, this is a data that the individual stakeholders for regional development with have to study in greater detail

<sup>&</sup>lt;sup>4</sup> Source: Одлука за класификација на планските региони според степенот на развиеност за периодот 2008-2012, Службен весник бр. 162/2008

in order to discover the reasons and develop a set of networks for softening or changing the direction of the trend.

#### Table no. 8

Gross added value (in millions of denars)	2010	2011	2012
Republic of Macedonia	381,148	402,392	395,335
Eastern region	32,363	32,462	31,560
Participation of the region	8.49%	8.07%	7.98%
Index (2010=100)	100	100.31	9.75

The structure of the gross added valude according to activities and participation of agriculture is on the level of the state, and the participation of the industry is almost doubly increased from the average of the state, which is a positive result.

#### Table no. 9

Gross added value	Republic of Macedonia	Eastern mountain region
Total	395,335	31,560
Agriculture	40,705	3,663
	10.30%	11.61%
Industry	70,198	9,675
	17.76%	30.66%
Construction	31,166	2,999
	7.88%	9.50%

Trade	85,261	4,297
	21.57%	13.62%
Other activities	168,005	10,926
	42.50%	34.62%

The Eastern mountain region in 2013 had 5.796 active business subjects. The dynamic of the number of active companies in the previous period, per years is shown in table no. 9.

#### Table no. 10

Active business subjects	2009	2010	2011	2012	2013
Republic of Macedonia	70.710	75.497	73.118	74.424	71.290
Eastern region	5.788	6.069	5.845	5.913	5.796

Although the number of business subjects does not have to be a good indicator for the level of activity, still it is indicative that the region had a larger number of companies in 2010 and that the number varies and the trend of this indicator is hard to predict.

However, looking at it from the size of the business subjects it can be seen that a larger part of them (84%) are practically micro companies with low accumulative force and generally formed with a mission to provide economic existence for the owner and the few employees in them, and not for more serious and also in volume larger business endeavors. The whole region had only 175 companies from the middle size and only 18 big companies. From there, the relation between the small and medium – total companies is 97% to 3%.

Table no. 11 Companies in the region according to the number of employees

Number of employees	Number of companies
0	254

1-9	4,894
10-19	281
20-49	174
Total small	5,603
50-249	175
Total medium	175
250 +	18
Total big	18
Total	5,796

Agriculture and industry (food, meat and metal industry), textile and shoes are the most significant sectors of economic activity. The scope of investments in the basic means in the region is not bigger than the relative size of the region, and it is especially concerning that the region fails to maintain its step with the other regions that invest more in fixed funds. This is also data that directs the attention and needs to appropriately be addressed in the future development programme of the region.

	2010	2011	2012
Investments in basic means	82,968	94,698	105,443
East region	7,953	4,444	5,511
Participation in the region in the total investments on the level of the Republic of Macedonia	9.59%	4.69%	5.23%

Table no. 12 Investments in basic means (mil. Denars)

Additionally, the structure of investments is unfavorable. Compared to the average in the region more is invested in industry, but at the same time the investments in construction objects are bigger than the average.

#### Table no. 13

Investments	Macedonia		Eastern region	
Total investments in basic means	105,443	100	5,511	100
In agriculture	2,557	2.43%	229	4.16%
In industry	26,428	25.06%	2,061	37.40%
In construction	34,679	32.89%	2,200	39.92%
In trade	15,860	15.04%	430	7.80%
Other	25,919	24.58%	591	10.72%

By the way, construction notes a growth and measure according to the value of cosntruction works. In 2013, 293 approvals for construction were issued, and the value of construction works was 1 bilion and 614,495 million denars.



Picture no. 7 Number of completed apartments

Labor market

The data for the rate of active population, empolyment and unemployment are more favorable from the national average, but the region besides these results does not manage to maintain its step with the more developed regions. This is probably due to the fact that the economic activity in the Eastern mountain region is with a smaller newly added value and is more labor-intensive than, for example, the one in the region of Skopje. This indicator can also serve as anindication in which direction the planned activities in the regional development should be directed in the following period.

Population able to work	Republic of Macedonia	Eastern mountain region
Active population	1.672.460	150.184
Rate of activity	57.2	61.0
Rate of employment	40.6	49.1
Rate of unemployment	29.0	19.5

Table no. 14 Rate of active population

The productivity of labor measure as BDP per working hour (2.184 hours annually) shows that the region has about 314 denars gross domestic product per work hour.

Table no. 15 Productivity of labor

Macedonia	2011
BDP (mil.den)	459,789
Employed	709,689
BDP per work hour	325 denars
Region	2011
Region BDP (mil.den)	<b>2011</b> 37,092
Region BDP (mil.den) Employed - estimation	<b>2011</b> 37,092 54,000

#### Productivity 314 den/work hour

However, the results acquired like this should be taken with consideration. Because in the private sector the usage of available overtime work is almost full, the real indicator for productivity is somewhere at 80% from the one thusly calculated. Be as it may, the global indicators as the basic productivity are good indicators for the relative relations.

The comparison of indexes of employment with the indexes of GDP determined the dynamics of productivity of the labor in the region. The index of productivity grew in the period of 2010/2009 because of the high index of growth of the GDP and stagnation in the index of employment, for the conditions to equalize in the following period 2011/2010 when practically both the DBP and employment have an equal trend, so productivity is higher for only 0.4 index points.

	2010/2009	2011/2010		
GDP i	GDP indexes			
Republic of Macedonia	105.69	105.91		
Eastern region	121.15	99.79		
Employment indexes				
Republic of Macedonia	100.78	100.52		
Eastern region	99.19	99.39		
Indexes of productivity				

Table no. 16 Indexes of GDP and productivity

Republic of Macedonia	104.87	105.37
Eastern region	122.13	100.40

The structure of unemployments in the region, compared to the average of the state and total and according to the gender and place of living shows that the unemployment in the urban and in the rural area of the region is under the average of the state, especially at women, which is attributed to the big participation of textile in the structure of the industry.

Table no. 17

Structure of unemployed by gender and places of living	Republic of Macedonia	Eastern region
Total	29.0	19.5
Men	29.0	22.0
Women	29.0	16.6
Urban area	30.6	22.4
Men	30.8	26.3
Women	30.4	17.9
Rural area	26.7	14.0
Men	26.7	14.1
Women	26.6	13.8

#### **Social development**

The population in the Eastern mountain region lives a little bit lower than the national average. The Eastern region has the lowest (72.56%) average of paid net pay/wage per employee for 2013 and regarding the total average in the Republic of Macedonia (27.2%). The city environments have a relatively good urban infrastructure and objects of social standard. The health and social care in the mountain region in general are relatively good.

The condition regarding coverage of population with health insurance in the Eastern mountain region is about 99%. Accessibility of health services
from primary and secondary health care is on an average national level, whereas the higher degrees of health care are less available. Hospital care is organized through a network of general hospitals in city areas.

In the region there are 9 public institutions for caring and education of children, in 29 subjects and organized in 139 groups. Kindergartens are located in the larger urban areas, while in the rural areas there are dispersed groups. The coverage of children in kindergartens is better than the average in the country. While the coverage for the Republic of Macedonia od 21% from the children up to 5 years of age, the coverage in the Eastern region was 34.4% or if on the level of average for the state in kindergartens almost each child is covered, that data for the Eastern region shows that there every third child is covered. Also, better than the state average is the data for children that use the child benefit (8% versus 3.8%), but, from the other side, that speaks for the insufficient economic force of the region. In the whole Eastern mountain region, households that use social benefit had 16% which is still less than the state average (21.1%).

#### Table 6p. 18 Table no. 18

Conditions in social benefit	Eastern region	Republic of Macedonia
Children ages 0 to 5 in kindergartens (5)	34.4	21.0
(%) Uses of child benefit up to 18 years of age (5)	8.0	3.8
(%) Uses of special benefit to 26 years of age (7)	1.1	1.0
Households – uses of social benefit on 000 population	16.2	21.1

In Table no. 19 the data for the inclusiveness of the youth through the middle and high education system are shown. In the frame of the region there are 93 elementary schools, with 7,400 students. There are 13 middle/high schools with 7.700 students.

#### Table no. 19

Elementary school students	2009/10	2010/11	2011/12	2012/13
Republic of Macedonia	210.381	204.439	198.856	195.311
Eastern region	16.033	15.485	14.934	14.589
Students in the middle/high schools	2009/10	2010/11	2011/12	2012/13
Students in the middle/high schools Republic of Macedonia	<b>2009/10</b> 95,343	<b>2010/11</b> 94,155	<b>2011/12</b> 93,064	<b>2012/13</b> 89,884

The number of enrolled students on undergraduate studies in the Eastern mountain region (according to the place of living of the student) is shown in Table no. 20

Table no. 20

Enrolled students on undergraduate studies	2007	2008	2009	2010
Republic of Macedonia	210.381	204.439	198.856	195.311
Eastern region	16.033	15.485	14.934	14.589

In the region one of the biggest universities in the state, the Goce Delcev University, is placed. The number of graduated students per years in the region, compared to the average for the whole country is given in table no. 21.

Number of students	2010	2011	2012
Republic of Macedonia	9.807	9.707	10.210
Eastern region	953	811	894
Participation of the region in the total number of students	9,72%	8,35%	8,76%

### Infrastructure

#### **Road infrastructure**

Picture no. 8 Road infrastructure in the Eastern mountain region



The existing road infrastructure in the Eastern mountain region is comprised of 1187 km local roads, 177 km state roads and 302 km regional roads.

Picture no. 9



Main road directions that connect this region with other regions are the state road A3 (Veles – Stip – Kocani – Delcevo – Bulgarian border), and the state road A4 (Sveti Nikole – Stip – Strumica).

There is currently construction of a highway on the part of the state road A3 Sveti Nikole – Stip, with which this region will be connected to the modern road connection to Skopje. At the same time there is reconstruction and superstructure of the section Veles – Kadrifakovo on the state road A4.

The existing condition of part of the state network of A roads A4 (Stip – Radovis) and A3 (Stip – Kocani – Makedonska Kamenica – Delcevo – Bulgarian border) is in relatively bad state because of the damaged lanes and the inappropriate technical elemets that exist on these sections. Certain sections from the regional road network R1302 (Delcevo – Pehcevo – Berovo – Bosilevo), R 1304 (connection with A3 – Vinica – connection with 1302), R1205 (Kratovo – Probistip – connection to A3), as well as certain regional roadways from the second category R 2345 (connection to R1304 Dragobrasta – Bigla – connection to A#) and R2431 (Stip – Karbinci – Zrnovci – Vinica – Kalimanci) are also in relatively bad condition.

The condition of a big part of state A roadways and regional ways is not in accordance, not only with the economic development requests, but also with the safe traffic standards. Because of not investing and insufficient maintenance of the road network, access to the main road corridors is difficult for part of the minicipalities in the region.

In the Eastern mountain region the local road network is insufficiently developed and a greater part of the local roadways are in insufficient quality which is a consequence of insufficient maintenance and insufficient investments. On certain sections the quality of the local road network is at such a low level that it also represents a potential danger for normal traffic flow. Maintenance of the local roadways is insufficient and inappropriate, which is a result above all of the shortage of financial means. In the last few years part of the local roadways is reconstructed and superstructured (5%).

The density of the road network in the Eastern mountain region is 0,47 and is smaller for 17% of the density of the road network on the level of the Republic of Macedonia.

Road infrastructure in the Eastern mountain region in relation to the road infrastructure in the Republic of Macedonia.

Table no. 22

	Republic of Macedonia	Eastern region	%
"A" road network	1153	171,7	14,89%
Regional roadways	3771	302,3	8,02%
Local roadways	9258	1187	12,82%
Total	14182	1661	11,71%

In the Eastern mountain region there is one border crossing with the Republic of Bulgaria (Delcevo).

#### **Railway infrastructure**

In the Eastern mountain region part of the railway line Veles – Kocani is located. The total length of this railway line which is located in the region is 70 km.

No. 10 railway network in the Eastern mountain region



The density of the railway in the region is 17,3 km' on 1000 km<sup>2</sup> (27 km' average in Macedonia), and the density of the rails on a hundred thousand persons is 9.56 km' (33,9 km' average in Macedonia).

The railway network in the Eastern region has low density and it does not enable adequate servitude of the municipalities of the region. The only railway line ends up as a blind rail that does not enable rentable working. The quality of the railway services that are offered is at a very low level, which is actually a characteristic of the railway transportation in the Republic of Macedonia. In the region two more significant railway stations are located, in Stip and in Kocani and ther are in very bad condition and do not enable even the basic conditions for quality railway services.

The data pertaining the completed services in the railway transport in the Eastern region, as well for the road, so for the cargo, show a rapid decrease of the scope of completed services. The decrease of the number of transported passengers is 82,35% (a decrease of 32,84% at the level of the Republic of Macedonia), while the transport of goods the decrease is 55% (2011 – a decrease of 13,45% at the level of the Republic of Macedonia). The negative trend in the operating of the railway transport above all is due to the old rail park and the bad condition of the railway infrastructure.

#### Air traffic

In the Eastern region there is only one sports airport in the vicinity of Stip and one airfield for commercial aviation "Lakavica" which are not used enough.

The sports airport is distanced 4 km north-west from the city Stip. It is intended for air-sport activities. taking-off-landing runway: 14/32 with dimension 1000x100m. The runway is from grass and it is not equipped with signalizations from lights for night conditions. On this airport aircraft with a maximal weight of 5700 kg can operate.

With the existing international passenger airport in Skopje, part of the Eastern region is well covered, although the access to the main national airport "Alexander the Great" in Petrovec is not quick and simple.

#### **Energy infrastructure**

In the Eastern mountain region are located two small hydro power plants – Kalimanci and Zrnovci. With the construction of the hydro system Zletovica conditions are created for production of electric energy through the planned small hydro power plants of the Zletovica system, the river Bregalnica and its tributaries: Orizarska, Zrnovska and Kocanska river. Besides this locations for construction of small hydro power plants are identified.

MW	Republic of Macedonia	Eastern region	%
2011	1849	16	0,87%
2012	1913	17	0,89%
2013	1938	20	1,03%

Table no. 23 Installed capacity for production of electrical energy

According to the data for the period 2011-2013, the total average annual expediture of electrical energy in the industry in the Eastern mountain region was 75 GWh or about 3,1% from the total expenditure in the Republic of Macedonia.

GWh	Republic of Macedonia	Eastern region	%
2011	2194	79	3,60%
2012	2693	70	2,60%
2013	2369	76	3,21%

Table no. 24 total expenditure in the industry

#### **Osogovo mountains**

The Osogovo mountains are second in size in mountain massifs in the Republic of Macedonia, after the Jakupica massif. These mountains are a high and huge mountain massif that dominates in the Eastern part of Macedonia. The length (in the direction of east-west) is about 50 km and

the width is about 28 km. They are located between the Slaviska Kotlnia on the north, the Kumanovska Kotlina on northwest, Probistip-Zletovo basin on the west, the Kocanska Kotlina on the south, Pijanec at the southeast and the Strumica basin with the Kjustendilska Kotlina on the east of the territory of the Republic of Bulgaria; actually, the Osogovo mountains are located between the cities Kriva Palanka in the north, Delcevo and Kocani in the south, Probistip and Kratovo on the west. As a natural whole in two countries the Osogovo mountain massif encompasses a total surface area of 1.535 km<sup>2</sup>, of which 1.102 km<sup>2</sup> belong to the Republic of Macedonia or 71.8%, whereas 443 km<sup>2</sup> or 28.2% belong to the Republic of Bulgaria. The geographical location of the Osogovo mountains is the geographical latitude 42.1667 and longitude 22.5. Administratively, the area of the Osogovo massif belongs to 7 municipalities (Kriva Palanka, Rankovce, Kratovo, Probistip, Cesinovo-Oblesevo, Kocani and Makedonska Kamenica)

The relief of the massif is characterized with wide, massive and round peaks, cut off with deep and narrow valleys. The mountain is abundant with water and from here several rivers spring up: Toranicka river, Kamenicka river, Orizarska river, Zletovska river. The Ruenski ridge represents a watershed between the Vardar and Strumicki basin of Pcinja and Bregalnica.

In the lower part there is a forest, mostly birch in the middle part, and in the sub-alp range there are conifer and juniper trees. The upper parts – above 1800 meters are rich with grass meadows.

The Osogovo mountains have several peaks, of which some are over 2000 m. But also those under 2000 meter have their own beauty and present a challenge to be visited. The more significant peaks are: Ruen (2252 m, 2154 m), Carev Peak (2085 m and 2057 m) and Sokol (2038 m), Kitka, Kalin Kamen, Cepernik, Babina Cesma, Bel Kamen, Bandera, Petrovo Brdo, Orlov Kamen, Markova Stupka, Kostadinica, Jalovarnik, Cuka, Lisec, Uvo, Bukovec, Panagur, Ponikva, Cukar, Visoka Cuka, Kula, Breza, Borova glava, Propotnicki Cukar.

#### More significant tourist and cultural localities

More significant tourist and cultural localities that can be developed on a single tourist offer for the Osogovo mountains are:

#### 1. Monastery "Sv. Joakim Osogovski"

The Monastery "Sv. Joakim Osogovski" can be found three kilometers from Kriva Palanka, on the slopes of the Osogovski mountain. It is established in XII century, also known by the name Sarandapor. It is interestting to note that the monastery does not have a donor, but was built by the people themselves, which makes the people of Kriva Palanka very proud. The monastery in its rich history has rises and falls. For its significance the data that it was visited by many church clergy, state officials and travel writers speaks for itself. On the initiative on Hadzi Stefan Geglikcijata in 1847 the construction of the big cathedral dedicated to Sv. Joakim Osogovski begins. In 1851 it is completed and blessed. The construction was given to the protomaster Andrej Damjanov (1817-1878), coming from the Reznovci family, the most well known builder on the Balkan from the beginning of the XIX century. It can be found at 825 km above sea level on the slopes of the Osogovo mountain. The oldest object in the monesterial complex is the little church of Rozdestvo of Presveta Bogorodica, built in XIV or XVI century, on the foundations of a church that was built in XI – XII century. According to the builders concept it falls in the line of small cross-shaped solid-hoofed churches, with a crossshaped foundation, with a three sided apsis from the outside and a porch. The building is characterized by a byzantine style. It was built with two columns of brick and one column stone in horizontal columns, with a thick layer of mortar in between them. The church is one of the first middleaged churches in the Republic of Macedonia revived in these times.



Monastery "Sv. Joakim Osogovski"

2. On the Osogovo mountains the sports-recreational center Ponikva is located. Ponikva is a tourist center and weekend settlement located 20 km north from Kocani on the Osogovo mountains. It is as one of the 34 winter tourist centers in the physical plan of the Republic of Macedonia. The locality Ponikva is located on 1400 to 1600 meters above the sea level. The sports-recreational center and the existing ski lifts and ski stages are located at 1496 to 1610 meters above the sea level.



# Locality Ponikva

As a special tourist attraction for the lovers of hunting, in the immediate vicinity of the sports-recreational center Ponikva a wild life reserve can be found. The commercial hunting ground offers the visitors the opportunity to hunt wild game, as well as accommodation.

3. The locality Carev Vrv can be found on the high mountain area around this striking peak, with the highest parts from the Kalinkamesko ridge on the north, the Kostadenicko ridge on the west, Kitka ridge on the southeast and the Sokolsko ridge on the east. Also, in the frame of the locality the highest parts of the amphitheatral spring crest of Kriva river. In such a scope, it contains a surface area of about 7.2 km<sup>2</sup>, of which 1.2 km<sup>2</sup> are above 2000 meters above the seal level up to the highest point

Carev Vrv (Sultan Tepe) on 2085 meters. Carev Vrv has a central position on the Osogovo massif and in it the main mountain ridges are comprised, and it also represents an important hydrographical knot.



Carev Vrv

4. The locality Ruen comprises the area around the highest summit of the Osogovo massif: Ruen (2252 m), until 1700 meters above the sea levels, and the border is generally above the road Toranica – Sasa. According to the given scope, the locality has a surface area of approximately 4.7 km<sup>2</sup>, of which 1.35 km<sup>2</sup> is above 2000 meters above the sea level. Except for Ruen, over 2000 meters are also the summits Mal Ruen (2203 m) and Sokol (2038 m).



Ruen summit

#### 5. Kriva river

Kriva river is the biggest and longest in the region of Kriva Palanka. The spring of Kriva river is located under the summit Carev Vrv.



Kriva river

#### 6. Duracka river

Duracka river springs under the summits Kalin Kamen and Bel Kamen and flows into the river Kriva Palanka in the center of the city Kriva Palanka;



Duracka river

# 7. Kalin Kamen

The locality Kalin Kamen can be found at 1.870 meters above the sea level. Several ski stages are identified at this locality, but at the moment there is chairlift or ski lift. Kalin Kamen has an amusement park and a hunters cabin with a total capacity of 300 beds. In its surroundings there are nice places for rest and recreation and a small sports field, and from 2009 each year a revial rally for four wheel drive cars is organized. Besides the summit itself Kalin Kamin, several interestting localities are located, such as the lakes on Kalin Kamen, the locality Vlaski cabins and Vlaska mandra.

The locality Kalin Kamin can be approached by climbing the slope over the monastery Sv. Joagim Osogovski. The locality Kalin Kamen after the first half of the XIX century was a known wallachian settlement, significant for managing small cattle, and the quality of sheep, pastrami and wool made for excellent trade relations with Carigrad and Thesaloniki. From the wallachian settlement on Kalin Kamen today there is only a little bit of stone on places where there were once houses, but forgotten pots, jugs and dishes that were used in the settlement can be found lying about throughout the settlement.



Kalin Kamen

# 8. Stanecki waterfalls

The Stanecki waterfalls can be found 9 kilometers southeast from Kriva Palanka, close to village Stnaci on Kozo river. The waterfall is comprised of two waterfalls 9 and 11 miters tall.



In the area of the Osogovo mountains accommodation capacities with a total of 1257 beds are located, who are accommodation capacities which are not categorized or are categorized as low.

Municipality	Number of citizens	Number of settlements	Tourist localities	Accommodation capacity Name / capacity
Probistip	16.193	37	Monastery Sv. Gavril Lasnovski SRC Ponikva Stara Makedonska Arhitektura - Zletovo Lesnovski crater	Hotel Sent Nikol / 60 Hotel Crveno Topce / 50 Motel Brioni / 15 SD Done Bozinov / 129 Motel Osogovski Biser/20 Motel Champignone/20 Lesnovo / 20 <b>Total 314 beds</b>
Kocani	38.092	28	Monastery Sv. Pantelejmon SRC Ponikva Stara Makedonska Arhitektura Hunting reserve Osogovo	Motel Sarena Cesma / 20 Motel Izgrev / 50 Hotel Leder / 22 Mice / 25 Hotel Nacional / 50 Odmaraliste na MVR na RM / 220 Motel Brana Gratce / 50 <b>Total 437 beds</b>
Cesinovo - Oblesevo	7.490	14	Locality Pilavo Banjski center Banja Stara Makedonska Arhitektura	/
Kriva Palanka	20.820	34	Monastery Sv. Joakim Osogovski Locality Kalin Kamen	Vila Lulu /9 H.Turist /120 DOO Ugostitel/4 Motel Makedonija/30 Monastery Sv. Joakim Osovoski/ 120 <b>Total 283 beds</b>
Makedonska Kamenica	8.110	9	Monastery in s. Cera Accumulation Kalimanci	Manastirski konaci s. Cera / 20 Hotel Sasa / 40 Total 60 beds

# Climate

# Factors affecting climate, measuring stations and physical geographic characteristics of the Osogovo Region

The territory for which the climate is being defined and meteorological conditions analyzed, embraces the mountainous areas of the Osogovo Mountains massif as well as the northeastern parts of Republic of Macedonia that affect the formation of a specific type of mountainous climate, which has its own climate features. Several groups of influencing factors impact the climate formation of this area, such as: physical-geographic factors, radiation factors, circulation factors as well local factors.

The measuring observation network for defining the climate and meteorological conditions on the territory of the Osogovo Mountains, along with their parameters, have been analyzed through data received from the following main climate stations: Stip, Kriva Palanka, Berovo, Kratovo, Kocani, Kumanovo, Sveti Nikole and Delcevo, as well as from several rainfall measurement stations.

It must be noted that the spatial distribution of climate and meteorological conditions are not only determined by the size and allocation of the mountainous region and hydrographic and hydrological conditions, but also by the size of the basins and river valleys, the vegetation and pedological conditions, the influence of the general circulation of the atmosphere manifested through changes in airmass, as well as by the impact of solar and astronomical factors.

The boundary between the modified continental and continental pluviometric regime (Ristevski P. 1986) lies on this territory, extending on the mountainous regions of the upper river courses of Pcinja and the highest parts of the Osogovo Mountains on one side, the upper courses of the Bregalnica river confluence and northeastern territory of Republic of Macedonia, on the other side, through the influence of the mountain of Kozjak and Siroka Planina that affect the differentiation of the northeastern air-masses and their modification, which in most part are rich in moisture in comparison to other types of northern and northwestern air-masses.

Aside from the eastern and northeastern influence of these mountains on the transformation of the air-masses, by the reduction of the moisture they carry with them, these mountains also have an influence on the average changes in air temperatures and changes in other climatic conditions, on the amount of

snowfall, layer of snow coverage and length of snow retention, all creating specific types of mountainous climate.

# Spatial and time distribution of meteorological – climatic elements

For the purpose of defining the climate, air temperatures (with all parameters), rainfalls, snowfalls and snow coverage, along with some specific atmosphere occurrences have all been analyzed.

Within the characteristics of the thermal regime of air, apart from the average and extreme air temperature values, thermal air regime parameters have also been analyzed with the following specific values: number of ice days (minimum air temperatures Tmin < 0 C), number of extremely cold days, (maximum temperatures <-10 C), number of summer days (temperatures with a T max  $\geq 25$  C), and number of tropical days (days with air temperatures T max $\geq 30$  C), as well as their spatial distribution within the area that is subject to analysis. The characteristics of rainfalls, snowfall occurrences and snow coverage have also been analyzed; climate conditions have been defined, as well as the specifics of recent climate changes, according to the longest sequence of data for this region.

# Air temperature

In the effort to display the thermal regime of air in the area that is under analysis, available meteorological – climatic information that can serve in determining the thermal field (by months throughout the year) have been used. Average monthly and annual air temperature values were used in the analysis, which were received from several meteorological stations located in the valleys and the mountain massifs near the area being analyzed- Stip, Kratovo, Kriva Palanka and Berovo. The information which was presented shows the average changes in temperatures that occur depending on the altitude, per months and for the entire year. The following chart provides information on the numerical data analysis by meteorological stations, during which the spatial and time characteristics of the thermal conditions of the broader area of the territory under review have been taken into account, through the average and extreme values.

Measurement stations	I	II	III	IV	V	VI	VII	VIII	IX	х	XI	XII	T ave.
Continental-sub-Mediterranean climatic territory													
Stip	0,7	3,5	7,5	12,5	17,3	21,1	23,4	23,0	19,2	13,4	7,4	2,4	12,6
Kocani	2,1	4,5	8,8	13,3	18,3	22,2	24,1	23,9	19,8	14,4	7,9	3,3	13,5
Sv. Nikole	1,3	3,7	7,4	11,9	17,0	21,2	23,3	23,2	18,8	12,9	6,9	2,6	12,5
Kumanovo	0,4	2,9	6,7	11,8	16,8	20,7	22,6	22,2	18,0	12,1	6,0	1,6	11,8
	•	Warı	m cont	tinental	climatio	territo	ry						
Delcevo	-0,5	1,3	5,0	9,8	14,6	18,3	20,3	19,8	15,5	10,0	4,7	0,9	10,0
Kratovo	0,3	2,5	6,1	10,9	15,4	18,7	21,0	21,1	17,6	12,2	6,8	2,0	11,2
K. Palanka	-0,6	1,4	5,0	9,8	14,4	17,6	19,8	19,4	15,9	10,7	5,8	1,2	10,0
		Cold	contir	nental c	limatic t	erritory		•					
Berovo	-1,2	0,3	3,5	7,9	13	16,6	18,5	17,8	13,9	8,7	3,8	0,3	8,6

# AVERAGE MONTHLY AND ANNUAL AIR TEMPERATURE IN C $^\circ$

Other specific parameters pertaining to the thermal air regime are given in the chart below, displayed according to climatic territory, and number of frost and ice days that characterize the thermal regime of air.

AVERAGE AND ANNUAL NUMBER OF FROST DAYS

Measurement stations	Ι	II	III	IV	v	VI	VII	VIII	IX	х	XI	XII	total
Continental-sub-Mediterranean climatic territory													
Stip	22	16	8	1						1	8	18	74
Kocani	23	17	9	1						1	9	20	80
Sv. Nikole	21	17	9	2						3	10	19	81
Kumanovo	22	16	10	1						3	10	20	82
		Warm	contin	ental	climati	c territ	ory				•	•	
Delcevo	25	21	15	4						6	14	23	108
Kratovo	24	18	10	1						1	9	21	84
K. Palanka	25	19	11	2						2	10	21	90
		Cold o	contine	ntal cl	imatic	territor	гy						
Berovo	27	22	18	7					1	9	16	25	125

Measurement stations	I	II	III	IV	v	VI	VII	VIII	IX	x	XI	XII	total
Continental-sub-Mediterranean climatic territory													
Stip	3	1										1	5
Kocani	3	1	•	•	•	•	•		•	•	•	2	6
Sv. Nikole	4	1	•		•		•				•	2	7
Kumanovo	3	1					•					1	5
			Wa	rm co	ontine	ntal cli	imatic	territor	ý				
Delcevo	6	4	1				•					3	14
Kratovo	3	1	1									1	6
K. Palanka	4	2										1	7
			Сс	ld co	ntinen	ital clir	matic t	erritory					
Berovo	7	4	1	-								4	16

# AVERAGE AND ANNUAL NUMBER OF ICE DAYS

The parameters of the air temperature are also given in a cartographic presentation.



Average annual number of days with a maximum air temperature <0°C



Average annual number of days with a minimum air temperature <0°C

The analysis of the thermal regime of air was performed based on the results of the temperatures that were measured in the meteorological stations located within the region being analyzed, as well as on the overall available data for the entire territory of Republic of Macedonia, while taking into account the existing or established rules in relation to altitude and the according climate elements and climate parameters : number of ice days, extremely cold, summer and tropical days and other forms of climate parameters within the framework of the thermal regime.

The average annual temperatures in the northeastern part of the territory of Republic of Macedonia, as in the Osogovo region, ranges between 13.5 C<sup>o</sup> in Kocani, 10.0 C<sup>o</sup> in Kriva Palanka and Delcevo to 8,6 C<sup>o</sup> in Berovo.

With the help of isotherms, the following annual isothermal map shows the spatial distribution of the annual air temperatures of every 2C<sup>o</sup> for the territory that is being analyzed.



Spatial distribution of the types of climate on the Osogovo Mountains

Under the influence of the climatic factors that determine climate (astronomical, circulatory orographic and anthropogenic), the change in the annual air temperature, depending on the altitude, has the following temperature gradient F(x) = 1440.6x + 2111.8.

The average annual air temperature in the Osogovo Mountainous area, at an altitude of 700m, is 10°C, while at an altitude of 1400m it is 6°C. An isothermal map has been drawn based on the temperature gradient and functional dependence on altitude, which displays the distribution of air temperature in the area under review. The average annual air temperature, at altitudes higher than 1100 m, continues to drop, and at an altitude of 2100m it is 2°C.

The so-called subalpine and alpine climate types that are characterized with extremely harsh climate conditions on the territory of Republic of Macedonia, are present at altitudes higher than 2000m within the above-mentioned mountains (Filipovski g. and coop. 1996).

The spatial distribution of the air temperature depends on the geographic longitudes, latitudes and altitudes. A general conclusion can be made in regards to the temperature conditions of the area being reviewed, in that this territory is characterized with moderate temperature conditions, with increased annual amplitudes of air temperature (higher than 22 C in Stip, which is a characteristic of the continental type of climate for the central area of Republic of Macedonia), with about 50 tropical days in Stip to 24 tropical days in Kratovo, as well as with a significantly larger number of ice days at higher altitudes (between 84 in Kratovo, 90 ice days in Kriva Palanka, to 125 days in Berovo). The higher altitudes of the area reviewed are affected by much more harsh thermal conditions with significantly low January air temperatures and a lower number of tropical days.

#### Distribution of air temperatures depending on altitude



Due to the effects of altitude, the influence of the Mediterranean Sea and other local conditions, the average annual air temperature amplitude decreases with altitude. For example, at higher altitudes it is 20,8 C ( in Kratovo), and 20,4 C in Kriva Palanka.

The average **January** air temperatures in the lower parts of the area being analyzed range between  $2,1^{\circ}$ C in Kocani, -0,6 C in Kriva Palanka,  $-0,5^{\circ}$ C in Delcevo to  $-1,2^{\circ}$ C in Berovo.

The month of **July** in average is the warmest month within the northeastern parts of the territory of Republic of Macedonia and the Osogovo Mountains. The average monthly air temperature ranges between 23,4 °C in Stip, 21,0°C in Kratovo, to 19,8 °C in Kriva Palanka and 18,5 °C in Berovo. The monthly and annual number of ice days (number of days with a minimum air temperature lower or at 0°C) for this region is 90 days (in Kriva Palanka), 82 (in Kumanovo), 108 days in Delcevo and 125 days in Berovo.

# **Rainfall and pluviometric regime characteristics**

Based on the results of the rainfalls measured within the meteorological stations in Republic of Macedonia (main, standard and several other rainfall measurement stations), while applying methods that are common for this type of task: examining the homogeneity of the sequences, data interpolation, reduction of sequences to the same number of years, for a thirty year period, establishment of the correlative link "annual amount of rainfalls" – "altitude", the following annual isohyetal map has been drawn.



Annual rainfalls

Within the framework of rainfall and pluviometric regime characteristics, further in the text below information is given on the average monthly and annual rainfalls based on available data, which present the conditions in the area being analyzed: annual distribution of the maximum amounts of rainfall, daily maximum in mm per months and per year, absolute maximum snow coverage in cm, average monthly and annual maximum layer of snow coverage, as well as first, median and end date of continous snow coverage.

As a rainfall and pluviometric regime characteristic, further in the text below information is given on the average values of rainfall, obtained through data of the according network of measurement stations and with the assistance of the annual isohyetal map that has been prepared.

For the purpose of providing a clearer valorization, in regards to the pluviometric regime of the area being analyzed, the monthly and annual rainfalls for a thirty year period are given further below.

Measurement stations	Ι	II	III	IV	V	VI	VII	VIII	IX	х	XI	XII	Total
Continental-sub-Mediterranean climatic territory													
Stip	30,0	29,0	33,1	39,9	57,6	47,3	37,5	31,7	31,6	45,5	52,2	40,3	475,6
Kocani	27,4	34,2	32,6	43,9	51,3	45,5	45,7	34,7	36,3	43,7	60,2	43,2	498,8

#### AVERAGE MONTHLY AND ANNUAL RAINFALLS IN MM

Sv. Nikole	22,1	27,3	31,7	44,3	47,5	42,4	31,7	27,2	37,1	46,9	47,8	37,6	443,7
Kumanovo	30,8	33,4	34,8	41,6	59,6	43,1	52,0	26,1	42,4	41,3	52,9	41,2	499,3
	Warm	contin	ental cl	imatic t	erritory	/							
Delcevo	28,5	33,9	32,2	44,7	65,9	56,9	55,2	36,1	43,9	47,2	59,6	44,3	548
Kratovo	52,2	55,6	55,3	62	75,1	67,9	61,4	37,3	43,2	53,4	73,1	63,2	699,7
K. Palanka	40,1	41,5	45,4	51,7	72,7	66	56,5	47,9	45,4	43,5	63,3	50,7	624,7
		Cold o	continer	ntal clin	natic te	rritory							
Berovo	32,1	39,9	37,7	52,5	64,4	59,3	51,8	46,1	43,9	51,6	56,9	50,1	586

The average annual rainfall distribution for the territory undergoing the analysis is displayed according to the data obtained from the nearest meteorological stations.

The annual rainfalls range between 600 to 900mm in the period that was reviewed.

Highest rainfalls are recorded in the mountainous regions of the western parts of the Osogovo Mountains, where adiabatic processes of the winds (rich in moisture of those blown from the south) and air masses take place. This territory has a modified continental and a purely continental pluviometric regime.

According to the average annual isohyetal map, the largest territory of the area that was analyzed has rainfalls in the amount of 500-600mm. The higher mountainous regions receive an annual rainfall starting from 700mm, 800mm to 900mm, while at altitudes of around 1800m the annual rainfalls begin to decrease.

This conclusion is based on the information that was received from the greater part of the territory of Republic of Macedonia, and can be explained on the basis of the significantly low temperatures at higher altitudes, and on the nature of the rainfalls, which at higher altitudes are usually more drier with snowfalls in considerably low air temperature conditions.



Average monthly rainfall for January

The average annual rainfalls for the past several years in the area under review varies between 475,6 mm in Stip, 498.8mm in Kocani, 624.7mm in Kriva Palanka to 699.7mm in Kratovo (also according to data received from rainfall measurement stations).

The results from the existing measurement locations refer to the measurement stations that are located in the lowest parts of the analyzed area. The highest quantities of rainfalls are recorded in the mountainous regions of the Osogovo Mountains and the southern Serbian mountains, while lower annual values are observed in the lower parts of the respected area, ranging from 500 to 600mm. According to the results from the maximum values that have been measured in the area under review, the following types of pluviometric regimes are present throughout the entire year: continental pluviometric regime modified continental pluviometric regime and purely continental pluviometric regime.

The following table shows the highest (daily) quantities of rainfall, with the date of their occurrence in the period between 1971 – 2000, obtained from 8 different stations within the territory under review, per months and throughout the entire year.

Measurement stations	Ι	II	III	IV	v	VI	VII	VIII	IX	х	XI	XII	Max
			Conti	nental-	sub-Me	diterran	ean clir	matic te	erritory				
Stip	41,7	34,0	40,6	40,6	42,6	59,5	52,4	33,6	48,2	42,6	61,0	23,8	61,0
Kocani	26,2	30,8	25,8	44,0	35,2	82,0	39,5	44,1	41,0	38,5	53,5	34,4	82,0
Sv. Nikole	21,0	25,5	45,0	35,0	68,0	40,0	32,0	35,0	47,5	64,0	69,8	34,0	69,8
Kumanovo	34,0	36,2	33,2	42,8	70,4	34,0	88,2	27,5	48,8	46,4	102,0	42,4	102,0
				Warm	contine	ental cli	matic te	erritory					
Delcevo	35,4	32,0	29,0	27,8	48,9	49,6	66,8	44,5	33,0	46,0	95,0	36,2	95,0
Kratovo	51,8	59,4	54,5	52,8	50,2	58,8	69,0	49,0	50,7	67,3	54,3	54,0	69,0

K. Palanka	37,8	49,5	30,4	40,7	39,0	45,2	55,2	50,1	54,0	44,8	62,5	29,8	62,5
Cold continental climatic territory													
Berovo	25,5	42,3	29,5	35	51,8	62,9	57,2	50,1	51,6	47,8	57,1	30,4	62,4

Highest values, with daily rainfall maximums by months for the period of one year, are recorded within the meteorological station of Kumanovo in the amount of 102.0mm, observed for the month of November. Furthermore, a large quantity of rainfall is recorded in the meteorological station of Delcevo (also in the month of November) with a value of 95.0mm measured during a 24 hour time period.

The pluviometric regime (pluviometric regime map) has been defined based on the existing isohyetal maps that show the annual quantities of rainfall, as well as the annual distribution of rainfalls according to months (for the entire year),



# Snow and snow coverage characteristics

The absolute maximum depth of snow cover in the reviewed area ranges between 33cm in Kocani, 55cm in Kratovo and Kriva Palanka, to 80cm in Berovo. For this purpose, a map is attached which provides information on the situation of these types of climatic parameters, for the area that is analyzed. According to the enclosed map, in the lowest areas of the northeastern part of Republic of Macedonia and the Osogovo Region, there are in average 40 days with a maximum depth of 1cm, whereas in the higher mountainous regions of the Osogovo Mountains this number extends to 150 to 180 days. On the other hand, the average annual number of days with a depth of snow cover of over 10cm (in the lower parts) ranges from 10 to 20 days, while in the highest parts of the mountainous area of the Osogovo Mountains the number is between 120 to 150 days.

The average number of days with a maximum depth of over 30cm and 50cm is between 5 to 0 (more specifically it is 1), while in the higher mountainous

regions this number ranges from 70 to 100 days, in particular between 40 to 70 for over 50cm of snow cover.



The average maximum depth of snow cover is displayed on the following climate map that has been prepared on the basis of the data received from the following measurement stations: Kriva Palanka, Kumanovo, Kratovo and Katlanovo. The average maximum depth of snow cover within the lower parts of the Osogovo Mountains amounts to 49.8cm in Kumanovo and 60.1cm in Kratovo, while in the higher parts (mountainous areas of the Osogovo Mountains) it extends to 70 and 110cm.



Snow coverage was observed in the months of November, December, January, February and March with the following specific depths of snow cover.

Measurement stations	I	II	III	IV	V	VI	VII	VIII	IX	х	XI	XII	Max
Continental-sub-Mediterranean climatic territory													
Stip	40	53	20							6	20	51	53

# ABSOLUTE MAXIMUM DEPTH OF SNOW COVER IN CM

Kocani	33	31	14	3						20	26	33
Sv. Nikole	35	35	9							20	47	47
Kumanovo	50	70	38							20	42	70
			Warm	conti	nenta	l clim	atic te	erritory				
Delcevo	46	33	21	5					1	20	29	46
Kratovo	48	34	25	3						52	55	55
K. Palanka	29	55	21	8					7	18	27	55
			Cold	contir	nental	clima	atic te	rritory				
Berovo	49	61	29	14	29	28			25	80	43	80

# AVERAGE MONTHLY AND ANNUAL MAXIMUM DEPTH OF SNOW COVER IN CM

Measurement stations	Ι	II	III	IV	v	VI	VII	VIII	IX	Х	XI	XII	Aver.
	_	Cont	inental-s	sub-M	edite	rrane	an clir	natic te	errito	ry			
Stip	11,3	14,2	5,9							6,0	8,1	13,0	9,7
Kocani	8,7	11,6	6,2								11,7	8,8	9,4
Sv. Nikole													
Kumanovo	12,6	10,6	9,2								5,8	11,6	9,9
Warm continental climatic territory													
Delcevo	12,2	10,2	6,2							1,0	7,7	9,7	7,8
Kratovo	13,0	13,4	7,2								10,5	16,0	60,1
K. Palanka	12,9	12,0	6,3							4,5	8,3	11,4	55,4
	Cold continental climatic territory												
Berovo	15,8	13,8	8,5							8,3	10,6	16,5	12,2

Median end date of continuous snow cover

The following Tables provide the median end date (spring) of continous snow cover in northeastern parts of Republic of Macedonia, as well as in the reviewed area (region). The median end date of snow coverage in Kriva Palanka was April 4-th. The first date of snow coverage is February 28-Th, and the latest being May 3-rd. The median end date of snow coverage in Kratovo was March 27-th, while the extreme date of the absolute first day is February the 14-th, and the absolute last date was April 8-th. The average length of snow coverage in Kriva Palanka is 138 days, while in Berovo it is 137 days.

Measurement stations	F. date	Day of year	First date	Last date	Median date	Day of year	First date	Last date	Per.
	-	Continenta	l-sub-Me	diterranean o	climatic ter	ritory			
Stip	25.XI	325	28.X	30.XII	8.III	67	12.I	18.IV	95
Kocani	24.IX	267	6.X	27.XII	9.III	68	7.I	8.IV	50
Sv. Nikole									
Kumanovo									
		Warm cont	inental cl	imatic territo	ory				
Delcevo									
Kratovo	17.XI	321	6.X	28.XII	27.III	86	14.II	8.IV	115
K. Palanka	17.XI	321	17.X	25.XII	4.IV	94	28.II	3.V	138
		Cold contin	ental clin	natic territor	у				
Berovo	17.XI	321	17.X	25.XII	4.IV	94	15.II	3.V	137

# FIRST, MEDIAN AND LAST DATES OF SNOW COVER IN CM AND SNOW COVER DURATION

#### Moisture of air and fog occurrences

Based on the multi-year values of the relative air humidity, expressed in % and presented in the following Table, it is obvious that Stip has the lowest relative humidity of 67%, while Delcevo and Berovo share the highest value of 75% relative humidity.

#### AVERAGE MONTHLY AND ANNUAL RELATIVE AIR HUMIDITY IN %

Measurement stations	I	II	III	IV	v	VI	VII	VIII	IX	x	XI	XII	Aver.	
		Conti	nental	-sub-M	editerr	anean	climatio	territor	y		-			
Stip	80	75	68	63	63	59	53	54	59	68	78	82	67	
Kocani	79	77	72	67	66	63	60	62	67	72	78	81	70	
Sv. Nikole	84	81	75	70	70	66	61	62	67	74	81	84	73	
Kumanovo	85	83	75	67	65	64	60	60	67	74	81	85	72	
Warm continental climatic territory														
Delcevo	81	80	76	71	72	71	67	68	72	76	80	82	75	
Kratovo	83	79	76	68	70	68	64	63	66	72	78	83	73	
K. Palanka	76	73	68	63	66	65	61	60	64	69	75	78	68	
		Cold	contine	ental cl	imatic	territo	ſy							
Berovo	81	80	76	71	72	71	66	68	72	76	80	83	75	

The lowest values of relative air humidity have occurred during the summer months of July and August, with a relative air humidity of 53 percent in Stip in the month of July, and 68% in Delcevo and Berovo in August. Maximum values have been recorded during the winter months of December, January and February and range from 78% in Kriva Palanka in December to 85% in Kumanovo in January.

The occurrence of fog and its intensity varies throughout the different seasons and months, as well as throughout the year. The winter months of December and January have the greatest number of days with fog, whereas in some areas there is no fog at all during the summer period.

Measurement stations	I	II	III	IV	v	VI	VII	VIII	IX	x	XI	XII	Total	
	Į	Con	tinenta	al-sub-N	n Medite	erranea	n climat	tic terri	tory	I	1	1	I	
Stip	3	1	0	0	0	0	0	0	0	1	2	3	10	
Kocani	2	0	0	0	0	0	0	0	0	0	1	2	5	
Sv. Nikole	4	1	0	0	0	0	0	0	0	1	3	4	13	
Kumanovo	6	2	0	0	0	0	0	0	0	2	3	6	19	
	Warm continental climatic territory													
Delcevo	3	1	2	0	1	0	0	0	2	3	4	4	20	
Kratovo	6	3	3	1	1	1	1	0	1	3	6	7	33	
K. Palanka	K. Palanka         3         2         1         0         0         0         0         0         0         1         3         4         14													
		Colo	d conti	nental o	limat	ic territ	ory		•		•			

MONTHLY AND ANNUAL NUMBER OF DAYS WITH FOG

Berovo	1	1	0	0	0	0	0	0	0	1	2	2	7

#### **Climate of the Osogovo Mountain region**

The climate in this region is quite specific due to the influence of the altitude, orographic, pedologic and biogeographic factors, considered as constant factors, and also due to the influence of the variable climate factors that are manifested through the influence of the transportation and exchange of air masses, as well as the frequency of atmospheric frontal systems that affect the occurrence, intensity and type of rainfall, the changes in the thermal and hygric conditions, as well as the electric field.

Resulting from the specific physical-geographic and orographic conditions dominating in the mountainous regions of the northeastern areas of the territory of Republic of Macedonia and the Osogovo region, the following types of climate are present across the area (according to the change in the meteorological–climatic elements depending on altitude, as well as the change in the meteorological–climatic values depending on geographic longitude and latitude (Filipovski G. 1996).

- 1. Continental-sub-Mediterranean climate zone (stretching to an altitude of 600m.),
- 2. Warm continental climate zone (stretching at an altitude of 600m to 900m)
- 3. Cold continental climate zone (stretching at an altitude of 900m to 1100m)
- 4. Continental mountain climate zone (stretching at an altitude of 1100m to 1300m)
- 5. Continental mountain climate zone (stretching at an altitude of 1300m to 1650m)
- 6. Subalpine climate zone (stretching at an altitude of 1650m to 2250m).
- 7. Alpine climate zone (altitude of above 2250m)

The severity and range of the above-mentioned climate zones (territories) is not evenly spread over the area, in regards to the altitude. It differs depending on the different orientations of the mountainous region, on the prevailing currents, sun exposure, altitude and other local factors.

The Osogovo Mountain area is characterized by specific climate and mountainous conditions that result from the influence of the altitude and atmospheric circulation systems, in particular, air masses. The boundary between the continental pluviometric regime and modified continental pluviometric regime lies within the Osogovo Mountains area. This type of pluviometric regime

distribution affects the environmental conditions, the hydrological cycle, the surface and underground waters, the grass communities, the pedogenetic processes and the overall conditions of the mountainous region of the Osogovo Mountains.

#### Conclusion

The climate conditions have been analyzed based on results published in studies, papers and elaborations made through a textual interpretation of the results. Rainfall and pluviometric regime characteristics have been analyzed and elaborated, also the air temperature characteristics, relative humidity and fog occurrences. In general, it can be concluded that the respective locations do have the appropriate conditions of snowfall and snowfall retention that enable the development of winter sports.

# Market analysis

# **Tourism realizations in the Republic of Macedonia**

In the period from 2009 to 2013 the number of tourists as well as nights spent in Macedonia are continually rising.

		Tourist visitat	aions and nig	; <b>hts spent,</b> 200	9- <b>2013</b>	
		Tourist visitatio	ns	T	ourist nights sper	nt
	total	domestic	foreign	total	domestic	foreign
2009	587 770	328 566	259 204	2 101 606	1 517 810	583 796
2010	586 241	324 545	261 696	2 020 217	1 461 185	559 032
2011	647 568	320 097	327 471	2 173 034	1 417 868	755 166
2012	663 633	312 274	351 359	2 151 692	1 339 946	811 746
2013	701 794	302 114	399 680	2 157 175	1 275 800	881 375

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The total number of tourists in relation to 2009 in 2013 is increased by 19,4%. The number of foreign tourists regarding 2009 is increased for 54,19% while the

number of domestic tourists have a decrease for 8,8%. On the following diagram the trend for the number of nights spent in the period 2009 – 2013 is shown.



Picture no. 20 Number of nights spent

The number of nights spent by domestic tourists in 2013 is 1.275.800 and in relation to 2019 it is decreased for 16%, while the number of nights spent by foreign tourists in 2013 is 881.375 and in relation to 2009 it is increased for 50,97%. The average stay of tourists in 2013 is 3,1 days, while in 2009 the average stay of tourists was 3,58 days. For the domestic tourists the average stay in 2013 is 4,22 days and is a decrease of the stay in relation to 2009 for 9,4% (4,62 days), while at the foreign tourists the average stay in 2013 is 2,20 days and is a decrease in the stay in relation to 2009 for 2,14% (2,25 days).

The number of accommodation capacities in the Republic of Macedonia in the last 5 years has increased for only 736 units. The total number of rooms in 2013 is 26.887 and in relation to 2009 has increased for 1,88% or for a total of 497 rooms, which is a not significant increacement for the accommodation capacities. At the same time the number of beds has increased for 736 units or 1,06% in relation to 2009 and is 70.297 beds.

Structure of rooms is shown in Table no. 35

Table no. 35

	Number of beds				
	2009	2010	2011	2012	2013
TOTAL	69 561	69 102	69737	70 287	70 297
Hotels, total	11 307	12 374	13317	13 884	14 724
Hotels****	1 288	1 251	1488	1 680	1 740

Hotels****	2 748	3 150	3715	3 833	4 170
Hotels***	1 507	2 072	3474	3 730	3 806
Hotels**	3 264	3 565	2393	2 684	3 092
Hotels*	2 500	2 336	2247	1 957	1 916
Board, total	75	71	71	115	109
Boards**	17	17	17	17	17
Boards*	58	54	54	98	92
Motels, total	359	406	371	670	673
Motels****	-	-	-	59	59
Motels***	-	-	-	109	177
Motels**	304	362	327	344	279
Motels*	55	44	44	158	158
Guesthouse	163	195	184	195	238
Spa	1 091	1 217	1217	1 217	1 217
Mountain cabins	60	60	60	44	41
Workers hostels	4 501	4 056	3996	3 993	3 851
Children and youth hostels	7 272	6 668	6668	6 674	6 596
Youth hotels	48	48	48	48	48
Camps	8 726	8 971	8971	9 011	9 011
Houses, apartments for rest and rooms to let, total	25 134	26 132	26132	26 232	26 032
Temporary accommodation capacities	632	1 537	1692	1 584	1 371
Cars for sleeping	1 680	384	384	384	384
Uncategorized objects for accommodation	8 513	6 983	6626	6 236	6 002

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

From the total number of hotel rooms, 25,26% or 6792 rooms represent the hotel capacity (all categories of hotels), and 78,4% represent additional accommodation capacity. In Table no. 36 the percentage coverage of rooms per type of accommodation capacity is shown.

Table no. 36

Hotels, total	25,26%
Boards, total	0,17%
Motels, total	1,10%
Guesthouses	0,37%
Spas	1,98%
Cabins	0,04%
Workers ostels	4,80%
Children and youth hostels	5,26%
Youth hotels	0,09%
Camps	10,45%
Other	50,48%

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

Other accommodation capacities include: houses, apartments for rest and rooms to let, temporary accommodation capacities, cars for sleeping, uncategorized objects for accommodation and others.

The accommodations structure in Macedonia is characterized by a domination of houses, apartments for rest and rooms to let with 40,4% participation in the total accommodation capacity, followed by the hotel capacity (25,26%) and camps (10,45%). The number of motels is very small and the participation of rooms in motels in the total accommodation capacity is only 1,1%.

The quality of accommodation capacities in the country is still under international quality standards.

In Table no. 37 the structure of hotel accommodation in the Republic of Macedonia from the aspect of categories of hotels is shown.

Category of hotel	Number of rooms	Participation in the total number of hotel rooms
Hotels****	969	14,27%
Hotels****	1958	28,83%
Hotels***	1715	25,25%
Hotels**	1302	19,17%
Hotels*	848	12,49%

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The structure of beds by type of accommodation capacity is shown in Picture no. 21

Picture no. 21 Structure of beds per accommodation capacities



State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The organization of the accommodation capacities per region in the Republic of Macedonia is shown on the following table.

	2009	2010	2011	2012	2013
	Number of rooms				
TOTAL	26390	26189	26448	26877	26887
Vardar region	508	554	589	689	690
Eastern region	598	533	544	599	620
Southwest region	16369	16013	16033	16035	16050
Southeast region	2152	2105	2277	2298	2346
Pelagonia region	3102	3390	3330	3497	3322
Polog region	1080	1011	1018	1014	1072
Northeast region	297	292	302	306	300
Skopje region	2284	2291	2355	2439	2487
	Number of beds				
TOTAL	69561	69102	69737	70287	70297
Vardar region	1360	1496	1701	1829	1819
East region	1718	1591	1606	1721	1826

Table no. 38 -	<ul> <li>Capacities f</li> </ul>	or accommodation	n according to	statistical regions	
----------------	----------------------------------	------------------	----------------	---------------------	
Southwest region	42103	41458	41454	41458	41411
------------------	-------	-------	-------	-------	-------
Southeast region	5750	5724	6069	6088	6298
Pelagonia region	8999	10229	10165	10310	10001
Polog region	3182	3057	3058	3059	3153
Northeast region	805	633	645	653	647
Skopje region	5644	4914	5039	5169	5142

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

#### More significant tourist localities in the Republic of Macedonia

From the aspect of tourism development, more significant localities in the Republic of Macedonia are: Ohrid lake, Prespa lake, Dojran lake, Mavrovo, Popova Sapka, Pelister, Krusevo and Berovo. In these localities the largest percentage of accommodation capacities in the Republic of Macedonia are located.

**Ohrid lake** is the biggest tourist center in the Republic of Macedonia. Tourism in Ohrid lake is mostly from the seasonal character. During the summer a big number of nights spent occur. In the other period of the year in Ohrid there is mostly congres tourism, whereas only a small part falls to the other types of tourism. In the las years there is an intention for development of winter tourism on Galicica with the purpose of increasing the tourist season in Ohrid lake. A study for the development of a winter recreational center has been made, and this center is planned to be built on the location above the autocamp "Gradiste". It is foreseen for the ski stages to be connected with a chairlift with a tourist settlement. It also is foreseen the ski stages to be 15 km in length. Besides this the development of elite tourism in the slopes of Galicica is planned.

**Prespansko lake** is divided between the Republic of Macedonia, Greece and Albania. From Ohrid lake it is 10 km away. On the lake there are two uninhabited islands: Golem Grad in Macedonia and Mal Grad in Albania. As a natural rarity, Golem Grad was attractive even in the Roman epoch. Golem Grad is an archeological locality with remains from settlements, churches and necropolis and a rare reserve where rare species of fungi multiply. The surface

area is about 2 km<sup>2</sup> and it is known as a favorite picnic place, visited annually by 100.000 visitors. In several settlements in the past years the rural tourism is developed, but this development is very modest. Although in the past this was the second tourist center in Macedonia, today tourism in this center is narrowed down to a few small hotels and private accommodation.

**Dojran lake** is split between the Republic of Macedonia and Greece. Tourism is the most important economic branch in the municipality of Dojran. In the past several years the number of tourists is increasing, as well as the number of nights spent. Several private weekend houses which are rented by the tourists have been built. Several older accommodation capacities are renovated.

Other stated localities are analyzed in more detail in the frame of the analysis of the exiting tourist winter centers in the Republic of Macedonia or in the part of grasping tourism in the Eastern and Northeastern region.

#### **Tourism realization per months**

The data from the number of tourists per months shown that in the duration of the summer months the largest number of tourist visitors occur.

On Picture no. 22 the trend of the total tourist visits per months in the last three years is shown.





State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

At the domestic tourists the difference in the realized tourist visits in the duration of the summer months is even more characteristic. On Picture no. 23 the trend of tourist visits made by the domestic tourists is shown.

#### Picture no. 23



State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

At the foreign tourists we have a more even visit per months. Still, in the duration of winter months we have a big increase in the number of visits. On Picture no. 24 the trend of visits of foreign tourists in the duration of the months is shown.

Picture no. 24



State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

Regarding the number of tourist visits per certain types of places it can be said that the biggest number of visits for 2013 are realized in the category of other tourists places. In table no. 37 the data for tourist visits per types of places is shown.

	2009	2010	2011	2012	2013
			Tourist arriva	ls	
TOTAL	587 770	586 241	647 568	663 633	701 794
Skopje	127 266	126 327	141 386	152 412	168 623
Spa places	21 369	28 574	27 441	27 430	28 405
Mountain places	52 484	71 457	71 309	68 809	68 745
Other tourist places	283 430	263 278	279 695	280 375	300 540
Other places	103 221	96 605	127 737	134 607	135 481
DOMESTIC	328 566	324 545	320 097	312 274	302 114
Skopje	19 304	15 962	15 979	18 195	19 596
Spa places	17 062	24 688	23 401	23 826	24 380
Mountain places	40 130	58 170	58 100	55 076	52 615
Other tourist places	193 768	181 143	175 612	167 047	161 087
Other places	58 302	44 582	47 005	48 130	44 436
FOREIGN	259 204	261 696	327 471	351 359	399 680
Skopje	107 962	110 365	125 407	134 217	149 027
Spa places	4 307	3 886	4 040	3 604	4 025
Mountain places	12 354	13 287	13 209	13 733	16 130
Other tourist places	89 662	82 135	104 083	113 328	139 453
Other places	44 919	52 023	80 732	86 477	91 045

#### Table no. 39

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The percentage coverage of every type of place for 2013 is shown in Picture no. 25



### Picture no. 25

The increase of the number of tourists in the last five years is the biggest in the spa places, Skopje and other places, whereas on the mountains the increase is relatively big and is almost 31%. On Picture no. 26 the increase of the number of tourists by type of place is shown. The increase pertaining the data for 2013 in relation to the number of visits in 2009.

Picture no. 26



The increase at the mountains is positive at the domestic and at the foreign tourists, which shows at the change of habits and needs of the tourists who are more oriented towards mountain tourism. On Picture no. 27 the increase of the number of tourist visits in the mountain places in 2013 in relation to 2009 is shown.



State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The structure of foreign tourists shows that the largest number of tourists come from Turkey, Greece and Serbia. In Table no. 40 the number of tourists from the countries that surpass the 2% from the total number of foreign tourists is shown.

Tabl	le	no.	40
------	----	-----	----

Country	Participation of the total number of foreign tourists	Number of tourists
Austria	2,10%	8 376
Albania	4,25%	16 982
Bulgaria	5,23%	20 914
Germany	3,27%	13 065
Greece	11,56%	46 184
Kosovo	2,97%	11 887
Poland	3,25%	12 980
Slovenia	3,35%	13 404
Serbia	9,54%	38 127
Turkey	17,04%	68 124
Netherlands	6,39%	25 542
Croatia	3,18%	12 722
USA	2,32%	9 258

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

#### **Tourism in the Northeastern and Eastern region**

The locality Carev Vrv which is located at the Osogovo mountains is on the territory of Eastern and Northeastern mountain region. It can be generally said that in both regions tourism in not adequately developed. Only Berovo and Berovo lake are more significant tourist places in these regions, whereas other localities are with very smaller significance from the aspect of tourism.

#### **Tourism in the Eastern region**

The Eastern mountain region on the level of the state is a less developed tourist territorial whole.

In Table no. 41 the scope, dynamic, structure and percentage relation of the tourist visitation in the Eastern mountain region is shown.

Table no. 41 – Scope, dynamics, structure and percentage relation of the tourist visitation in the Eastern mountain region

Year	Number of domesti c tourists	Index base 2009	Number of foreign tourists	Index base 2009	Number of tourists in the region	Index base 2009	Total number of tourists in RM	Participation of the region in the total number of tourists in RM
2009	8135	100,00	4545	100,00	12680	100,00	587770	2,16 %
2010	8463	104,03	4591	101,01	13054	102,95	586241	2,23 %
2011	7948	97,7	5667	124,69	13615	107,37	647568	2,10 %
2012	12275	150,89	6590	144,99	12275	96,81	663633	1,85 %
2013	13582	166,96	7165	157,65	13582	107,11	701794	1,94 %

State Statistical Office, Tourism in the Republic of Macedonia 2009 - 2013

The number of tourists notes an almost continual increase, as at the domestic so for the foreign tourists. In the past 5-year period, except in 2011 where the index was 97,7 in relation to the base 2009 year, in all other years we have a continual increase in the number of tourists. In the past two years an increase of

over 50% can be determined, which means that there are positive realization in this regard. In 2013 the index is even 166,96 in relation to the base 2009 year.

This trend for the foreign tourists is almost the same with the exception that a decrease in the past period cannot be seen, and the growth index is 157,65 in 2013.

The participation of the number of tourists in the Eastern region in the total number of tourists at the level of the Republic of Macedonia is relatively low. Also, it is about 2% with a tendency of decreasement in the past 2 years under the value of 2%.

In Table no. 42 data for the scope, dynamics, structure and percentage relation of the nights spent in the Eastern mountain region are shown.

Table no. 42 scope, dynamics, structure and percentage relation of the nights spent in the Eastern mountain region

Year	Nights spent of domestic toruists	Indexd basa 2009	Nights spent of foreign tourists	Index base 2009	Total number of nights spent in the region	Index base 2009	Total number of nights spent in RM	Participation of the region in the total number of nights spent in RM
2009	15742	100,00	11767	100,00	27509	100,00	2101606	1,31 %
2010	14504	92,14	11183	95,04	25687	93,38	2020217	1,27 %
2011	15614	99,19	13238	112,5	28852	104,88	2173034	1,33 %
2012	20930	132,96	16428	139,61	37358	135,80	2151692	1,74 %
2013	24987	158,73	17235	146,47	42222	153,48	2157175	1,96 %

Source: State Statistical Office

Also at the nights spent the similar condition can be seen. Namely, the nights spent of the domestic tourists note a decrease, as well as an increase at different time intervals. In the first 3-year period there are values under the level of 2009 whereas in 2013 there is an increase of even 58% (24.987 nights spent).

At the foreign tourists the nights spent almost continually increase with the exception of 2012 where there is a decrease of almost 5% in relation to the base

year. Also here it can be seen that there is an increase of their number of almost 50% in 2013, which shows of positive results realized in this regard.

Similarly as to the number of visitor, in the Eastern mountain region the nights spent in the total number in the Republic of Macedonia show very low values. Thus, the average percentage of participation is 1,52% with a tendency of increasement in the past 5-year period up to 1,96% in 2013.

From the previous indicators of the number of visitors and nights spent in the different regions the average number of nights spent of the tourists in the Eastern mountain region can be analyzed. This analysis relates so the last 5-year period, and the results are given in the following table.

Year	Average stay of domestic tourists	Average stay of foreign tourists	Average stay of total number
2009	1,94	2,59	2,17
2010	1,71	2,44	1,97
2011	1,96	2,33	2,12
2012	1,71	2,49	1,98
2013	1,84	2,41	2,04

Table no. 43 – Average stay of tourists in the Eastern region in days

Source: State Statistical Office, own calculations

From the carried out analysis in the table a difference can be seen in the average stay at the domestic and at the foreign tourists. Thus, it is higher at the foreign tourists, but a decrease can be noticed in relation to the first analyzed year. Consequently, in 2009 the average stay for the foreign tourists is 2,59 days, and in 2013 that number decreased to 2,41.

The average stay of domestic tourists also decreased in relation to the first analyzed year, or it was 1,94 in 2009 and 1,84 days in 2013.

In 2013 that was 2,04. In the given table there is also an analysis of the average stay of the total number of tourists (domestic and foreign) which shows a decrease in the past 5-year period.

From the above stated it can be concluded that this trend is negative and that the causes for this situation need to be removed. More precisely, the tourist development policies need to be focused on increasing the average stay for the domestic and the foreign tourists in the Eastern mountain region.

### **Accommodation capacities**

Besides the dynamic of tourist visitations and stay of tourists in the Eastern mountain region, development can also follow the movements pertaining the buildings in the area of this activity. But, the capacities need to be compared to the other regions, as well as in the time frames. In the following table that analysis in the different mountain regions for the last 5-year period is given.

Table no. 44 – accommodation capacities according to statistical regions

	2009	2010	2011	2012	2013					
Number of rooms										
TOTAL	26390	26189	26448	26877	26887					
Eastern region	598	533	544	599	620					
Percentage participation on the level of Macedonia	2,27%	2,04%	2,06%	2,23%	2,31%					
Number o	of beds									
TOTAL	69561	69102	69737	70287	70297					
Eastern region	1718	1591	1606	1721	1826					
Percentage participation on the level of Macedonia	2,47%	2,30%	2,30%	2,45%	2,60%					

Source: State Statistical Office

In 2013 we have an increase of the accommodation capacities in relation to 2009. Also the number of beds is increased.

Table no. 45 – Accommodation capacities per types in the Eastern mountain region for 2010

Types of objects	ypes of objects Number of objects		Number of beds	
Total	24	96	1575	

Hotels total	9	39	514
Hotels ****	1	31	76
Hotels ****	/	/	/
Hotels ***	2	16	161
Hotels **	3	12	129
Hotels *	4	11	224
Motels	1	3	60
Spas	1	/	33
Workers hostels	2	/	114
Children and youth hostels	3	5	538
Uncategorized objects	7	18	240

In the previous table the types of accommodation capacities in the Eastern mountain region were given. It can be noticed that the biggest participation in the total number of objects show the hotels and the uncategorized objects. That also pertains the number of apartments where the hotels have a total of 39 and the uncategorized with 18 apartments. It is significant to note that in the Eastern mountain region there is only one 5 star hotel. The hotels with one star predominate (a total of 4). From the number of beds in the Eastern mountain region it can be noted that the biggest participation in the children and youth hostels who lead with the total number of beds of the hotels and uncategorized objects. Namely, the children and youth hostels have 538 beds from which it can be concluded that the tourist infra and suprastructural buildings allows giving services and food of market segments that are used by these types of capacities. In the next period it should be worked on promotion of the number of the remaining accommodation capacities with a higher category.

### Tourist expenditure (Profit from tourism)

The tourist expenditure is represented though the profit\* of the service establishments. Such an analysis is given for the Republic of Macedonia and the Eastern mountain region in the following table.

Table no. 46 – Tourist profit in service establishments in RM and the Eastern mountain region in thousand denars

	2011		1 2012			013
	Board expenditure	Non-board expenditure	Board expenditure	Non-board expenditure	Board expenditure	Non-board expenditure
Tourist profit in service establishments in RM, in thousand denrs	7428958	387385	7782534	383730	6389528	398687
Tourist profit in service establishments in the Eastern mountain region, in thousand denars	it in service ents in the untain 475494 10402 nousand		518463	10685	481173	13323
Participation by percentage of the board expenditure in the total board expenditureof RM	6,40%	2,69%	6,66%	2,78%	7,53%	3,34%

There is a difference between the board and non-board expenditure in the last 3year period

From the percetage participation of the profit from tourism<sup>\*</sup> an the Eastern mountain region in the total income of the Republic of Macedonia a relative low participation can be seen. Namely, the board expenditure is only 7,53% in 2013, and the non-board expenditure is 3,34%. The increasement of participation in the past 3 years is a positive appearance.

### **Tourism in the Northeast region**

The Northeastern mountain region is located at the northeastern end part of the Republic of Macedonia and can be found along the flows of the rivers Pcinja and Kriva river. The region is one of the smallest according to the surface area, encompassing 9.3% of the total surface area of the Republic of Macedonia, with a population (2013) that is 8.5% of the total population and a density of 76.1 persons per km<sup>2</sup>.

Part of the tourist destination in the Eastern mountain region who in the past were unknown to the tourist, today note an increased visitation.

Table no. 47 – Scope, dynamic, structure and relational percentage of tourist visits in the Northeastern mountain region and the Republic of Macedonia

Year	Number of domestic tourists	Index base 2009	Number of foreign tourists	Index base2009	Total number of tourists in the region	Index base 2009	Total number of tourists in RM	Participation of the region in the number of tourists in RM
2009	1436	100,0	2124	100,0	3560	100,0	587770	0,61 %
2010	1093	76,1	2005	94,4	3098	87,0	586241	0,53 %
2011	1379	96,0	2424	114,1	3803	106,8	647568	0,59 %
2012	1166	81,2	3280	154,4	4446	124,9	663633	0,67 %
2013	1856	129,2	3728	139,2	5584	156,9	701794	0,80 %

Source: State Statistical Office

The number of tourists changes in regard to the increase and decrease in the analyzed period. The total number of tourists that visited the region, generally increases with the exception of the year 2010 where a decrease of 13% can be found, or 3.98 tourists where noted, which represents a decrease from the year 2009 (3.560 tourists). In the following years the number increases above the value of the base 2009 year. In the year 2013 an increase of 56,9% can be seen, for 5.584 tourists.

The trend at the number of noted domestic tourists in the Northeastern mountain region is different. Almost all years note lower values in relation of the base 2009 year, or index values lower than 100. An exception to this trend if the last year – 2013 where there was an increase of 29,2% in relation to the first analyzed year (2009) and noted were 1.856 tourists which was more than the year 2009 (1.436 tourists).

The movements of the number of foregin tourists show similarities with the total number of tourists. Thus, for all years in the analyzed period a decrease can be noted in relation to the first year, with the exception of the year 2010 where the decrease is insignificant, but there are stagnation values. In 2013 the region was visited by 3.728 tourists which represent an amount of the index of 139,2 in relation to the base year (2.124 tourists).

From the percentage participation of the number of tourists that visited the region in the total number of tourists in the Republic of Macedonia, alarming amounts can be seen. Thus, that participation is less than 1% and the noted

changes of increasement and decreasement are insignificant. In 2013 the participation is 0.8% which is a very little increase in relation to 2009 (0.61%).

Table no. 48 – Scope, dynamic, structure and relational percentage of nights spent in the Northeastern mountain region and the Republic of Macedonia

Year	Nights spent of domestic tourists	Index base 2009	Nights spent of foreign tourists	Index base 2009	Total number of nights spent in the region	Index base 2009	Total number of nights spent in RM	Participation of the region in the total number of nights spent in RM
2009	2781	100,0	3466	100,0	6247	100,0	2101606	0,30 %
2010	1706	61,3	3922	113,2	5628	90,1	2020217	0,28 %
2011	1978	71,1	4829	139,3	6807	109,0	2173034	0,31 %
2012	1815	65,3	6105	176,1	7920	126,8	2151692	0,37 %
2013	2553	91,8	5691	164,2	8244	132,0	2157175	0,38 %

Source: State Statistical Office

In Table no. 48 where the scope, dynamic, structure and relational percentage of nights spent in the Northeastern mountain region are shown, similarities can be seen with the same parameters for the number of tourists that visited the region. Thus, the total number of nights spent in the region for the second year of the analyzed period (2009-2013) one decrease can be noted. More precisely, the index is 90,1 whereas in the following period it is over 100 which is the base 2009 year with 6.247 nights spent. In 2013 the number increased to 8.244 nights spent.

The nights spent of the dosmestic tourists in the analyzed period are noted by fluctuating values. However, even besides the rising and falling characteristics, the values in all consecutive years (after 2009) show lower values (values of the index lower than 100). That speaks for its considerably negative appearance.

The foreign tourists show more positive values. Thus, almost continually the number of their nights spent increases for the analyzed period with the exception of 2013 where 5.691 nights spent were noted which is a little decrease in relation to the previous year where the highest number of nights spent was determined (6.105), with index amount of 176,1.

The Northeastern mountain region has a significantly low percentage participation in the total number of nights spent at the state level, or the values

is about 0,3% in the whole period. The increase of that participation in the 5year period can be said that it is insignificant.

Year	Average stay of domestic tourists	Average stay of foreign tourists	Average stay of the total number
2009	1,94	1,63	1,75
2010	1,56	1,96	1,82
2011	1,43	1,99	1,79
2012	1,56	1,86	1,78
2013	1,38	1,60	1,48

Table no. 49 – Average stay of tourists in the Northeastern mountain region in days

Source: State Statistical Office, own calculations

In the last 5 years the fluctuation of values for the average stay of tourists in the Northeastern period or the past 5-year period can be seen. The average stay of domestic tourists notes an almost continual decrease from 1,94 days in 2009 to 1,38 days in 2013. Only in 2012 there is a slight increase (1,56 days) in relation to the previous year (2011 with the realized average stay of 1,43 days), but that is insignificant.

The foreign tourists in the region note almost the same values for the average stay of domestic tourists. A decrease in the stay can be noted besides the growing tendency of the stay for 2011 (1,99 days); in 2013 it is 1,6 days which is even less than in relation to the first analyzed year (1,63 days).

Besides the determined average values of the stay of domestic and foreign tourists, the total number of tourists notes similar indicators. Thus, the values have a decreasing character for 2013 the value of the average stay is lower in relation to the first analyzed year and is less than 1,5 days.

The negative aspects of the values of the realized average stay of domestic, foreign and total number of tourists can very easily be seen. Namely, the stay is too short and is less than 1,5 days.

Table no. 50 – accommodation capacities



TOTAL	26.390	26.189	26.448	26.877	26.887
Northeastern region	297	292	302	306	300
Percentage participation in the region	1,13%	1,11%	1,14%	1,14%	1,12%
	Number of beds				
TOTAL	69.561	69.102	69.737	70.287	70.297
Northeastern region	805	633	645	653	647
Percentage participation of the region	1,16%	0,92%	0,92%	0,93%	0,92%



Picture no. 27 – trend of accommodation capacities in the Northeastern mountain region per years

From picture number 27 as well as table number 50 the dynamic of the accommodation capacities in the analyzed period can be determined. This analysis shows stagnating characteristics. Namely, the values for increase and decrease of the number of rooms are insignificant and the number is about 300. Even greater is the decrease of the number of beds in the accommodation capacities in the analyzed period. Thus, after the year 2009 when the biggest number of beds (805) in the region are seen, their number rapidly drops in the following year (633 beds), and then it remains on the almost same low level.

The Northeastern mountain region also in relation to available beds and rooms in the other regions shows exceptionally negative values. It has the lowest number of accommodation capacities in the Republic of Macedonia, and that pertains for all analyzed years. Table no. 51 – Accommodation capacities per type in the Northeastern mountain region for 2010

Types of objects	Number fo objects	Number of apartments	Number of beds
Total	14	2	641
Hotels total	4	/	137
Hotels ***	1	/	78
Hotels **	2	/	47
Hotels *	1	/	12
Board	1	/	10
Motels	2	1	105
Guesthouses	1	1	13
Uncategorized objects	6	/	368

It can be seen that the most prevalent are the uncategorized accommodation capacities per number of objects with a total of 6, as well as the hotels with a total of 4 objects. The prevalence of hotels of lower category is characteristic, as well as of 2 motels and 1 guesthouse that are only with one apartment. The biggest number of beds are noted in the uncategorized object (368), then follow the hotels (137) and the motels (105) with a total of 625 beds.

The tourist expenditure can be shown through the realized profit in the service establishments. The realized profit of the territory of the Republic of Macedonia as well as the Northeastern mountain region is shown in Table no. 52.

Table no. 52 – Tourist profit in service establishments in RM and the Northeastern mountain region

	2011		2012		2013	
	Board expenditure	Non-board expenditure	Board expenditure	Non-board expenditure	Board expenditure	Non-board expenditure
Tourist profit in service establishments in RM, in thousand denars	7428958	387385	7782534	383730	6389528	398687

Tourist profit in service establishments in the Northeastern mountain region, in thousand denars	327572	9785	353575	2239	311084	2208
Percentage participation of tourist profit of the Northeastern mountain region in the total profit of RM	4,41 %	2,53 %	4,54 %	0,58 %	4,87 %	0.55 %

From Table no. 52 the difference of the board and non-board expenditure in the last 3-year period can be seen, which is logical. The amount of the total expenditure in relation to the profit in the service establishments in the Republic of Macedonia has a too low percentage of participation. The board expenditure of the region participates with something more than 4% on average and increases in the analyzed period in insignificant values. In 2013 the board expenditure is 4,87%, whereas the non-board expediture notes a decrease in the analyzed period and an insignificant participation of 0,55% for the last year.

### Conclusions

The dominant tourist destination of Macedonia is Ohrid lake, or the city of Ohrid, as well as the city of Struga and the surrounding areas around the Ohrid lake. The biggest part of accommodation capacities are located in the region of Ohrid lake.

The bigger number of hotels in Macedonia are to be found in the capital city of Skopje and in Ohrid;

In this moment there are 2 hotels in Macedonia connected to internation hotel chains (Holiday Inn and Ramada). The hotel brands focus its development strategies mainly on Skopje as the capital and largest city in Macedonia. The mountain resorts in Macedonia are still outside of the focus of the big hotel brands.

In the Eastern and Northeastern regions only a few accommodation capacities are located, and the only tourist destination is Berovo and Berovo lake.

Close by the Carev Vrv locality there are no significant accommodation capacities.

The vicinity of the lake Kalimacni creates preconditions for development of several types of alternative tourism and creation of an integral toruist offer for 365 days.

According to the season when tourist nights spent in Macedonia are realized, the biggest number of tourist nights spent were realized in the summer months (July and August), which is owed on the fact that the Ohrid lake as one of the most popular tourist destination in Macedonia attracts the largest part of tourists during the summer period.

The accommodation capacities in Macedonia stagnate in the past 5 years. From the aspect of quality, it can be said that the accommodation capacities per quality are mainly still far from international standards. In accordance with the national categorization, a bigger part of hotels are with a lower quality in the segment of 1 and 2 stars. The four and five star hotels in Skopje, Mavrovo, Berovo and Ohrid somewhat offer services that are appropriate to the standard quality.

Generally, tourism in Macedonia is based on local demand on which two thirds of all nights spent fall.

The mountain resorts are still not a particularly important part of Macedonian tourism because they participate with less than 10% of all realized nights spent. The average stay of 2 days shows that the business-oriented trips to Macedonia dominate. Key geo markets of Macedonia are all neighbouring countries and Turkey.

The biggest number of reports of tourists are realized in the hotel accommodation in comparison to additional accommodation. On the other side, tourists have a tendency to stay only 2 days in hotels, whereas the lenghts of stay in additional accommodation is much higher (5,4 days in average). We can conclude that the demand for hotels is above all guided by business purposes, whereas the demand for additional accommodation is mainly for vacation purposes.

### **Traffic connectibility**

The locality Carev Vrv is not connected with an asphalt road. To it one can come by three directions, but all of those are uncategorized roads which are mostly used by field vehicles. To the locality one can arrive from three sides. The first one is from the side of Ponikva, to which there is an asphalt road, and from Ponikva there is a gravel road 25 km in length. The second way is from Kalin Kamen which is connected to the monastery Sv. Joakim Osogovski and is connected with a gravel road. From the locality Kalin Kamen the locality Carev Vrv is 10 km away. The third way is from the village Gorna Cera to which there is an asphalt road 5 km in length.

The foreseen location for the base tourist settlement is in the vicinity of the regional road way R 1210 which connects Makedonska Kamenica to Kriva Palanka through the Osogovo mountains and the Ruen summit. This road way is not completed. The existing road that leads to the mine Sasa is in relatively bad state, or it has to be reconstructed and superconstructed, as well as it needs to be expanded to the planned location for the base tourist settlement.

Makedonska Kamenica is 145 kilometers away from Skopje. The road infrastructure in the part of Kocani is currently under reconstruction and superconstruction, and with the construction of the highway Skopje – Sv. Nikole – Stip the distance between Makedonska Kamenica and Skopje will decrease for 30 km. The part from Kocani to Makedonska Kamenica is in bad condition. The technical elements of the road are not appropriate for safe traffic, and the quality of the lane surface is low.

The closest airport to Makedonska Kamenica is the airport Alexander the Great in Skopje which is 130 km away but because of the bad condition of part of the road infrastructure travel usually takes 2 hours. With the completion of the begun reconstructions and construction of the road network, the travel distance will decrease for 30 km and the time for 30 – 45 minutes.

The closest railway station is the railway station in Kocani which is 30 km away. Taking into consideration the quality of the railway transport, as well as the time of traveling with a train in Macedonia, this type of transport should not be taken into consideration at all.

On the Osogovski mountains in Macedonia only one asphalt road way is located. That is the road way that connects Ponikva to Kocani; other asphalt roadways do not exists on the Osogovski mountains.

Picture no. 28 shows the road connectivity of Makedonska Kamenica

Picture no. 28



Winter sports tourism and winter sports destinations

#### Winter sports tourism definition

There are many definitions of tourism and it is not necessary to elaborate each and every one of them. Tourism can be defined as activities done by people during their stay in places outside of their usual surroundings with the purpose of resting or with other reasons. In Longman's dictionary of english language and culture (2002) winter sports are described as sports that take place on snow or ice, such as skiing. But, because this definition is pretty unclear and it does not help understand this theme, it is better for us to take into consideration the following definition: "Winter sports tourism can include alpine skiing, crosscountry skiing and mountaineering, but also activities that require specific condistion such as slide, bob sled, carling and ice skating. On the Alps, in many places winter sports are concentrated of alpine skiing, whereas nordic skiing is of secondary importance" (Van Egmond, 2001, p.71). During the explanation of winter sports tourism it is essentially important to clarify that is is a seasonal tourism. The winter season is defined by the climate conditions and the period between October 1st and March 31st. But, there are two periods with a high frequency, which is Christman and the January/February breaks.

Definition of winter sports destinations

Winter sports destination is a "geographic, economic and social unit which consists of those companies, organizations, activities, areas and installations who are intended to serve the specific needs of the winter sports tourists" (Flagesta dn Hope, 2000). Some authors (Miller, Kramer, and Krippendorf, 1991) agree with the fact that the "destination can be seen as a strategic business unit from the spect of management" (Bieger, 1998, pg. 7). This shows that the winter sport destination can have similarities with a company from the aspect that they are a "community of mutually connected economic activities" (Porter, 1996). At the same time it can be noted that although the purposes are connected with a collection of individuals and companies, that is in correlation, for example, with the societal structures, community inclusiveness and the relations with the stakeholders in destinations.

#### **Types of tourist centers**

Winter tourist centers appeared between 1940 and 1945 in France with the appearance of winter sports. Between 1950 and 1990 many centers have been built with heavy equipement. Today in Europe there are two different types of winter tourist centers: traditional or first generation centers which are built in the existing villages and functional or integrated centers. The integrated centers were built on empty spaces and designed to be focused on requiring every need of the modern skier on an easy and economical way. It is consisted of aquiring different parts in order to may a unique center. These type of centers can usually be found in new areas and belong to the investor. If the investor is private, in that case the municipality recieves the renting fee. There are three types of functional settlements: second generation of centers (can be found between 1000 and 2000 meters above the sea level, and their activity is mainly focused on the winter season); third generation centers (can be found between 1.500 and 2.000 meters, these centers are specialized only for skiing and have all types of services needed for this activity); fourth generation centers (in these centers the focus is on activites towards agriculture and development of different activities, especially in the summer period). Considering that there are many different types of centers, it is impossible to speak of a tourist center as a unique model. It is important to understand these differences with the purpose of viewing the development of each center as a special unit. Some centers are private, which means that they belong to the investor, and other are public,

which means that the municipality or state run the center. But, some centers have a private public ownership. Another difference which is very important to take into consideration when talking about ski centers is the height above the sea level. This is a very important factor that more or less influences the development and management of the center, because the height above the sea level is an element that mainly determines the snow cover.

### High and middle high mountains

High mountains and middle high mountains differ in accordance to the height above the sea level and that has a part in the development itself.

### High mountains

High mountain regions are considered because they have a difficult environment, where usually there are no inhabited settlements. The climate is cold (the average temperature is 0,5 celsius degrees colder than each following 100 meters in height) and there are big seasonal and daily variations in warmth. High mountain areas are widespread in the region of the Alps and are bove 2000 meters above the sea level. Those areas are valued because they offer important snow coverage in the duration of a long period in comparison to middle high mountains.

### Middle high mountains

Middle high mountain areas are a lot bigger from the high mountain areas and can be found under 1700 meters above the sea level, where life is continual and there are rurally developed areas with many activities. 90% of the mountain population lives in these middle high areas that comprise 20% of the surface area of the Earth. But, these regions are with poor and not so frequent snow falls which actually makes conditions for winter sports activities relatively limited if modern technology for making artificial snow is not used.

Most frequently the middle high mountain areas are undeveloped rural areas. The development of ski centers in these regions also provides developement for the areas themselves and usually the states provide financial support for this type of mountain centers.

Many limiting factors for the further development of winter skii center are identified and that is because:

- The price of winter sports tourism is pretty high in comparison to more cheaper summer arrangements;

- The climate risk wich makes the providing of enough snow cover during the whole seaons;

- Stabilization of new winter activities such as snowboarding or freestyle.

### Conclusion

It seems that winter sports tourism is a pretty complex organization with important stakeholders. The development of ski centers is based on a common public and private interestt. Because private and public interest are usually different and have different ways of doing things, managing the development of ski centers is relatively complex. All around the world tourism represents a powerful economy, especially winter sports that are in a big number of countries and are its main part. The position of every winter sports tourism and its future development requires a collective approach and it seems it is an imperative for every member of this industry to take part in its consideration.

## Identifying the stakeholders

For successful planning of development of one ski center it is necessary to identify the different stakeholders that are connected to tourism.





# Trends in tourism

Tourism, like every economic activity has been through several phases of its development. Globalization is a process that influences the development of each economic branch, and with that it also influences tourism. Today, each tourist destination participates in global competition of different tourist products. Characteristic for the development of tourism is its diversification and development of new trends in tourism that influence its tourist industry. The trends in tourism which are presented and the so-called megatrends in Europe<sup>5</sup>.

### **External surrounding of tourism**

### - Demographics

In almost all countries in Europe a decrease in the number of citizens and and increase in aging has been noticed. In the future the number of older people will continually increase. Older people will have better health and because of the good pension systems they will have more income than before and at the same time with the pension they will have much more free time. All this pertains to a short and middle term, but because of economic turbulence on the long term and increase in the limit for going into pension, decreasement of pensions is expected. The number of tourists that belong to

<sup>&</sup>lt;sup>5</sup> Tourist megatrends in Europe, ETC

this age group will increase in the short and middle term. The time for rest for this age group is unlimited in regard to going into pension. At the same time, slowly but surely the habits of people who are in pension change and the number of tourists increase who are oriented towards the mountain centers.

But, besides this age group, it is necessary to emphasize the increase of the income of the young generations which are 20% of the total number of tourists. Besides the incerase of income of the young generations and the increase of single households, the social structures that allow social and professional connection contribute to the increase of travels of the age group that is between 16 and 35 years of age. Different from the older people, the young generation because of their work responsibility will have little time for travel. At the same time the structure of the family is changed and fewer families are from the type of two parents and two children, and because of globalization a lot of families live in new living places, so travels because of family and relative visits are increasing.

The influence on tourism will be:

- Bigger demand of tourist products between the seasons
- Bigger demand of quality, security and comfortability
- Increased number of travels, but also a decrease of the number of days spent on vacation (more shorter vacations)
- Because of the decrease of the duration of the vacation, the demand of package arrangements or all inclusive arrangements will increase
- The shortened free time and the inability for the people to do creative hobbies will contribute to the growth of demand of active vacations, where they will be able to do something creative
- Older persons are more aware of the health benefits which will contribute to the increase in demand for health and spa tourism
- Younger people will want a vacation filled with activities and adventures
- The demand for an independent vacation will grow, versus the classical package arrangement

### - Environment

Climate change is of one of the biggest challenges of tourism on the long term. These changes can lead to a loss of many tourist destinations. Although much more data is needed in order to be able to see the consequences of these changes, still the value for the need for protection of the environment is on a high level. The media already promote the need for social responsibility and responsibility towards the environment.

Influence on tourism:

- The demand for sustainably tourist products will grow
- Grasping all consequences to the environment from tourism in the destinations will be necessary
- Expenditure increase for lowering negative influences from tourism on the environment
- The limitation from the greenhouse emmission will lead to an introduction of additional taxes, which will increase the price of transport
- The demand for organic products will increase
- Increased demand of eco tourism
- From the marketing aspect, a promotion of the sustainability of the tourist destination will be needed

## - Macroeconomic trends

The economic crisis that took hold of the world contributes to a drastic fall in tourism achievements. The recovery of the world economy is taking a much slower pace than expectations. Still, for the following years an increase in the GDP for about over 3% is predicted, which for some countries in Europe that increase will be bigger. As an effect of globalization there will be an increase of the regional cooperation which will also contribute to the increase of the offer on a regional level.

Influences on tourism:

Increasing of competition

- Faster growing economies will create new tourist destinations
- Need for marketing strengthening
- Increased mobility

### - Political factors

Because of the economic crisis many governments will need to increase taxes and other givings in order to be able to cover the needs for health, education, pensions and other needs. The need for increasement of security, health protection and decreasing imigration will contribute to a bigger control of transport and travels.

Influences on tourism:

- Increased need for coordination of security aspects of travels
- Decrease of travels of the older generation due to the increased age limit for going into pension
- Need for branding of destinations
- Increaseing tourist offers through the internet

## Trends of the clients

## - Travel experience

With the increasement of travels, people become more aware of the culture and surrounding of the tourist destination. As the experience of one client increases, so their demands for travels, new experiences and new destinations increase. This also contributes to a changing of the relation between the host and the guest. Tourists want more to experience a more interestting experience through changing of roles, as the rural or creative tourism provide.

Influence on tourism:

 The more experienced clients requiere more quality service on every level

- With the little number of returning visitors, some destinations will have problems in their working
- Growth of the requests for alternative forms of tourism

## - Life style change

Life styles in almost each society and especially in the developing states gradually change. For many people traveling is no more a luxury, but a way of life. With the increasement of the age of which young generations form a family, the freedom for traveling at the younger generation grows. The high prices of health services in Western Europe contributed to the development of the so-called health tourism, or traveling of people who have health needs in destinations where those services are cheaper. The need for tourist products that are oriented towards health, stress reduction, fitness will increase in the high developed economies.

Influence on tourism:

- Need for development of niche products
- Need for experiencing something different (adventures, exciting experiences)
- Increased demand for spiritual products, spa products and health products

## Tourist products and marketing

## - Marketing trends

The clients look for advice or opinion more than other clients using the internet. This will contribute to bigger investments in the development of internet strategies for promotion and new research techniques. The public private partnership is more significant, especially in marketing in tourism.

Influence on torusim:

- The internet will lead the distribution of future tourist products
- More knowledge will be needed for the motivation and interest of the whole group
- Bigger focus on confortability

- Marketing will be based on experience
- Smaller budgets of the clients will contribute to product creation

## Information technology and communications

New electronic payment systems will be developed. Increasing the usage of the internet in clients' information for tourist products and programs will increase even more. The clients will use the available tools for internet even more for comparison of prices of similar or the same tourist products. Through the different media richer informational stations will be available.

Influence on tourism:

-

- The experienced tourist will create their vacations and travels even more on a modular basis with direct reservations
- Destinational marketing will become more significant as a source of visiting the internet pages
- The possibility for "purchasing" on the internet will contribute to later reservations
- The role of travel agents will decrease
- The informativeness of clients for the culture and cultural torusim will increase
- There will be a need for development of new services for research and destination mapping

## - Transport

Changes in the way of transport increased in the last years. The need for using speedy vehicles and low budget air travel companies is in much greater demand. All this influences on the changes of the standard flows of travel. Travel traffic, although participates with over 70% in the total number of travels, more and more is facing certain congestions.

Influences on tourism:

Bigger availability of direct and cheap air flights or trains that will increase the demand for short international vacations

- Travels by bus will decrease
- The demand for fast trains on middle distance will grow
- The destinations that will not be easily available for direct or internodule transport will be less attractive

#### Winter sports competition

#### Winter tourism characteristics

#### Key facts for winter tourism

Winter tourism takes place from the period from November and all the way until April or the beginning of May, with certain exceptions in the ski centers that are located on the glaciers in Western Europe (Hintertux, Zermat and others) that operate in the duration of the whole year. Depending on the dependency of the state, the main months of winter tourism are January and February, when the nearly 45-50% of nights spent in winter tourism are realized.

Differently than summer torusim, the users of winter tourism are somewhat older. The averege age is 43,2 years in 2012 with a tendency for further development of the average age of tourists.

Picture no. 29 shows the coverage of certain groups of tourists according to age.

Picture no. 29



The users of winter

vacation are with a higher degree of education and have a higher income than the users of summer vacation.

In accordance with the statistical indicators, users of winter vacation frequently travel with the partner (40%) but also travels with friends is very popular. Less popular is traveling with the family (together with children under the age of 14) in comparison to the users of the summer vacation.

The following facts are characteristic for the users of winter vacation:

- 50% of the users do not need previous information pertaining the travel destination
- Informing for certain tourist destinations from "word of mouth" occured only at 21% of the winter vacation users
- 22% use the internet for acquiring information for the needed information for traveling
- > Winter vacation users are usually individuals, more than 90%
- The percentage of direct reservations is 65%, approximately 21% use the internet, and only 7% of the reservations are through the tourist agencies
- Approximately 65% of the tourists preffer hotel accommodation and boards
- > 80% travel by car, 10% by airplance, 6% by train and 4% by bus
- More than 65% of the clients emphasize that they are skiing or snowboarding

The average expenditure on a day per user on a winter vacation is estimated to be approximately 128 euros, which is 23% more than the users of summer vacations (106 euros)

The main motives for using winter vacations are:

- The beauty of nature/the surroundings
- The selection and content of recreational activities
- The attractiveness of the ski center / mountain resort
- The positive experience connected to the previous stay
- Attributes: hospitality, friendly, fun, safe

Descent of main European coutries of the users of winter vacation:

- Germany +0 45% of the total demand of skiing and winter sports comes from Germany
- The Netherlands
- Great Britain
- Belgium
- Eastern European coutnries that are not members of the EU

From the aspect of fulfillment of the accommodation capacities (hotels and similar objects) in the European ski centers it can be said that the percentage of fulfillment varies between 40 and 65% in the duration of the key winter vacation months (January and February). The best businesses get to a level of fulfillment of 60-70% in the duration of the winter period, while in the period of January, February and the beginning of March the fulfillment is between 85 and 95%. An interestting piece of data is that the accommodation capacities that are with a weaker quality (one or two stars) in the last years note a decrease in the level of fulfillment, while the high quality accommodation capacities 4 and 5 stars) constantly note an increase of the level of fulfillment.

### Development of winter tourism in the future

On the basis of the previously presented megatrens in torusim, as well as on the basis on the results of the analyses of the statistical and other data for the realizeations in winter tourism, winter tourism in the future will be characterized by:

- An increase in the competition of the winter tourist products
  - $\circ$   $\,$  Competition of the ski centers in the whole world
  - Concentrations of the relation between price and recieved value
  - Structuring and clear positioning of the ski destinations
  - Connecting the offers i.e. creating packedges
  - Creating umbrella brand names
- Increasaing the potential for winter tourism
  - The learning of a bigger number of individuals of skiing in their youth increasing later activities
  - The groups of so-called "star" youths grows
  - Simple transport access / ski lifts
  - Guides and annimation
  - Family offers
  - Winter sports and "weekly adventures" for kids and the young (different events)
  - Special packets for the older individuals
- Incerased demand of the "combined / varyied offer"
- Offer for varyed content during regional positioning
- Integrated chain of services
- Need for ecologically untouched nature and surrounding
- Increased need of the tourists for safety and security
  - $\circ$  Low level of criminality / delinquency
  - $\circ$   $\;$  Good health services in the vicinity of the vacation destination
  - Quick and simple access to the destinaion

- Electric access of the tourist products through the internet with the purpose of increased competition advantage

Generally, the number of skiing days in Europe could be twice increased in the frame of one generation, taking into consideration that in Eastern Europe additional skiing conditions are beind developed and the life standard of the population is growing.

In Eastern Europe 278 millions of people live and a big number of mountains with good geographic, field and climate (snow) conditions are located. Although Eastern Europe has a relatively low level of GDP and was struck with the world economic crisis, still it is real to expect that in the near future the growth of GDP will start to rise from 2 to 5% annually.

If the citizens of Eastern Europe would ski or snowboard as the citizens of Western Europe do, in 2030<sup>6</sup> the total number of ski slopes/stage/sresorts\* in Eastern Europe would be 719, and the total number of ski lifts 4907.

Generally, people learn to ski in the countries where they live, and then want to travel in order to see other destinations.

### Summer mountain torusim

Basic characteristics of summer mountain tourism

The main tourist season for the European tourists is the summer. A total of 70% of all nights spent are realized in the duraion of the summer tourist season. A characteristic of the summer tourist season in the past years is the change of destinations for summer vacation and an increase of the offer of new destinations which are not connected to a beach vacation. The beach vacation has a participation of 40% of the total summer vacation, then follow the package arrangements with 18%, the city tours participate with 14%, rural and mountain tourism with 6% and 6,5%. It should be mentioned that mountain tourism in the duration of the summer season has a continual annual growth. The users of summer vacation in 42% of the cases travel with the partner, and a bigger populatiry can be seen in traveling with the familiy. Approximately 45% of

<sup>&</sup>lt;sup>6</sup> On the basis on the vision "What is the future of mountain tourism?" – Zermatt Symposium 2006

tourists use the internet in order to acquire information for their wanted destination, and the average expenditure is 106 euros per day per tourist.

Important motives i.e. factors for summer vacation are: the beauty of nature and the surroundings, choice and content of recreational activities (mountaineering, bycicling, swimming and others), peace and quiet in the destination, a positive previous experience from the stay in the destination, as well as the attributes: hospitaliy, friendly, safe, fun.

The fulfillment in hotels and other accommodation capacities in the duraion of the summer toruist period (July and August) in the mountain tourism in the summer mountain destinations for vacation varies between 45% and 70%. The best offers realize a level of fulfillment between 60% and 70% for the summer period, while for the top season (July and August) they realize between 85% and 95% fulfillment. Also as for the winter tourism, for the summer tourism the accommodation capacities which are with a weaker quality (one or two stars) in the last year note a decrease of the level of fulfillment, while the high quality accommodation capacities (4 and 5 stars) constantly see an improvement of the level of fulfillment.

## Future of summer tourism

The basic requests of the clients in the future will be:

- Ecologically untouched environemt
- Increased safety and security
- Simple access, or travel to the destination
- Better services
  - Higher level of qualification of the employees in torusim
- Developed "service mentality" with an "emotional" component
- Increased demand of "natural" and "alternative" products

It is foreseen for there to be an increase of competition for the summer tourism as well, which will contribute for increasement of communication of the tourist offer through the informational systems; then an increasement of the concentration of the relation "price value", structuring and clear positioning of each destination, creation of addequate packages.
From the aspect of market segments it will come to a growth of the offers that will be specialized for certain segments of tourists, such as the mountaineers, byciclists and so on. And, having in mind the process of "aging" of the European population, there will be a need for increasement of the offers for the older generations. The offers of "learning through entertainment" and "animation" in combination with "nature" and the "body cult" will increase, as well as the meaning of the entertainment around the clock, primarily for the younger categories of tourists and creation of new thematic offers.

#### **Competition analysis**

The development of tourism in many countries is identified as one of the possibilities for achieving bigger economic development. Although traditionally the highly developed regions for winter tourism are in Austria, North Italy, France, Switzerland and Germany, more is invested in the development of winter centers in Southeastern Europe. What is characteristc about all winter centers is their intent to grow into centers in which tourism will take place in the duration of the whole year. At the same time in the Balkans and in other countries of Southeastern Europe a rejuvination of the tourist market is currently happening, which with the increasement of the economic power of the population it is expected to continue to grow more. The relatively lower board prices, as well as the lower prices for basic tourist services in the countries of Southeastern Europe make this region touristically attractive and attractive for tourists from the highly developed European countries. If we also take into consideration the changes of the international trends in mountain tourism, it is obvoius that the region of Southeastern Europe is bacomming more atrtactive. Macedonia does not have a significant mountain and winter center, but in the close vacinity of Macedonia the ski center Bansko is located, a ski center which had an intensive development in the period until 2008 and today is a leading ski center in the Balkans. The Osogovksi mouintains with the locality Carev Vrv primarily as a ski destination could compete to the similar destination primarily in Bulgaria, Serbia, Kosovo and Greece, but also with the existing ski centers in Macedonia. In Macedonia a process of identification of potential locations for the development of ski centers is currently under way and for that purpose several studies are prepared for certain locations. It is necessary to state that the biggest

competition for the existing ski centers in the Republic of Macedonia are the ski centers in the Republic of Bulgaria.

With the purpose of defining the existing tourist market as well as acquiring relevant data for the existing competition that will serve in the planning of the ski center Carev Vrv and the creation of a unique tourist offer on the Balkan, and analysis for the more significant national and regional ski centers from the aspect of location, skiing capacities, accommodation capacities and offer of products in the winter and summer tourism is done.

### **National competition**

In the Republic of Macedonia located are a few ski centers. The most significant ski centers are Popova Sapka and Mavrovo. Smaller ski centers are Kopanski – Pelister, Kozuf, Ponikva and Krusevo.



Ski centers in the Republic of Macedonia

## 1. Ski center "Zare Lazarevski" – village Mavrovo

It is located on the slopes of the mountain Bistra, at 1240 meters above the sea level near the shores of the Mavrovo lake and is a part of the National pakr "Mavrovo". The ski center "Zare Lazarevski" is located in village Mavrovo in the southeastern part of Macedonia, and can be found near Gostivar and Kicevo. It is from 1.250 meters above the sea level to 1850 meters above the sea level and from Skopje it is at a distance of about one hour of driving with a car.

The center has several neat tracks for hiking and mountain biking. The region has several hotels from various categories as well as cottage settlemests in the villages Mavrovo, Leunovo, Nikiforovo and Mavrovi Anovi which surround the Mavrovo lake. Over 1500 weekend cottages are located in these settlements. Private accommodation can be found in them.

Length of ski stages	Chairlifts	Capacity of the Chairlifts	Night skiing	Snowboarding	Price of daily ski ticket	Artificial snow
9,27 кт	3 Chairlifts 11 ski lifts	11.100 per hour	5 km	half pipe stage of about 900 meters	1100 denars 17,9 euros	Partly on the stages / not in use
Other	offer			skating rink		



Mavrovo



Structure of stages: 30% difficult; 30% normal; 30% easy; 10% for beginners

During the summer there are possibilities for mountain hiking and mountaineering, bycicling and mountain bike, hunting and fishing, tennis, basketball, handball, a football field, and lake kayaking.

Because of not having adequate coverage of artificial snow system the ski center Zare Lazarevski is totally dependent on the weather. The results from operating are quite different from year to year and that depends on the amount of snowfall. Because of the big competition by the Bulgarian ski centers, as well as the ski center Kopaonik, the number of visitors decreases in the duration of the last few years. The non-board serveices are limited. The ski center is primarily focused on the local tourist market, with a number of visitors comming from Albania, Kosovo and Serbia.

The center is rarely offered on the markets in the other countries. There is no centralized management in Mavrovo as a tourist destination.

Indicators	Total number of beds in relation to the total capacity of the lifts	Capacity of the ski lifts in relation to the length of the ski stages	Total number of beds in relation to the length of the ski stages
	0,073	1231,61	89,32

# 2. Popova Sapka

Popova Sapka is one of the oldest and largest ski centers in Macedonia, dating from as far as 1947. The ski center Popova Sapka can be located 18 km from Tetovo, 53 km from Skopje and 65 km from the international airport "Alexander the Great".

Popova Sapka is a tourist destination that can be located on Sar mountain. In its surrounding there are certain natural values and resources like the 27 glacial lakes of which 19 are continual like White lake, Black lake, Bogovina lake and others.

The winter mountain center Popova Sapka is one of the two most significant mountain centers in Macedonia.

Popova Sapka as a ski center had the best results in former Yugoslavia. In that period it was one of the more popular winter centers.

The fall of Yugoslavia and the following political instability had a negative influence on Popova Sapka, causing a decrease of the market demand and of the whole busineses performances of the ski center. In a period of 20 years there are no new big investments in Popova Sapka. The Popova Sapka center is located on 1.780 meters above the sea level on the Sar mountain.

The accommodation capacities of Popova Sapka include a total of hotel capacity of about 230 rooms and 810 beds and about 400 cottages.

In the last years the two big hotels Popova Sapka and Slavija note a significant fall of nights spent, 11% and 21% appropriately in the season 2011/2012 in comparison to the season 2010/2011.

Length of ski stages	Chairlifts	Chairlifts capacity	Night skiing	Snowboarding	Daily price of ski ticket	Artificial snow
20 кт	2 Chairlifts 5 ski lifts One gondola not is use	4000 skiers per hour	0,7 km	no	900 denars 14,61 euros	No, currently in construction
Other offer			Tour skiing			

The maximum difference in height is 680 metes, and the longest stage is 2,1 km. All of the stages are connected to a system of Chairlifts and ski lifts with a length of 2070 m.

In the frame of this center a stage of 2,5 km and another of 5 km for cross country and biathlon as well as one 100 meter biathlon shooting range have been built.

Currently under construction is an artificial lake and there is a procurement of guns that will serve the center. Also under construction or instalation is a new big chairlift with six seats that will run to the neareast high peaks of 2500-2600 meters as well as additional two new stages from the peak Cerepasina 2525 meters in the length of 7 km.



Structure of ski stages: 35% difficult; 35% normal; 20% easy; 10% for beginners

The ski center Popova Sapka as well as the Mavrovo ski center are totally dependent on weather conditions. The results from working are quite different from year to year and depend on the snowfall. Because of big competition from the Bulgarian ski centers as well as the Kopaonik ski center the number of visitors decreases during the last few years. Non-board services are limited. The ski center is primarily directed to the local tourist market, with a number of visitors coming from Albania, Kosovo and Serbia.

The center is rarely offered in the markets in other countries, except in some of the neighbouring coutntries. There is no centralized management with Popova Sapka as a tourist destination, although the center, as well as the more significant hotels are in ownership of ELEM.

Indicators	Total number of beds in relation to the total capacity of lifts	Capacity of the ski stages in relation to the length of the ski stages	Total number of beds in relation to the length of the ski stages	
	0,079	214	16,8	



#### 3. Kozuf

The ski center Kozuv can be found in the southern part of the country, in the bordering region between Macedonia and Greece, located on 1.550-1.600

meters above the sea level and on the northern slopes of the Kozuf mountain, in the vicinity of a few peaks above 2.000 meters, of which the highest Zelen Breg (2.171 m) and K-92 (2.102 m) are in the frame of the ski zone.

The ski center is relatively new, dating from 2006. The center still does not have a well developed infrastructure from the aspect of accommodation capacities and service establishments. It has only a few smaller objects, villas and restaurants.



The ski center has 24 km of stages for apline skiing as well as 40 km of untouched areas good for free ride skiing and snowboarding. There is one chairlift and 2 ski lifts. The maximum height difference is 460 meters and the longest stage is 3,2 km. 25% of the stages are with normal difficulty and 75% of the stages are easy. 1,8 km from the stages are covered by artificial snow.

Currently one chairlift with six seats and two ski lifts anchor are installed and they carry the skiers to the K-92 and Zelen Breg peaks, from where several stages and free ride zones are in function. Because of the size of the slopes that these ski lifts carry the visitors, the center is now attractive from the aspect of the skiing surface. The center has 10 snow guns and a pumping station that accumulates water from the artificial lake. The complex i.e. the tourist settlement has two restaurants in the settlement i.e. the center, and the other on 2000 meters at the end of the ski lift station. According to the adopted plan, there need to additionally be built 200 mountain cabins, over 2.000 vehicles, a multimedia center, stores, restaurants, bars and a number of big sportrecreational contents (football, tennis, golf, swimming and so on.) All stages are connected to a system of chairlifts and ski lifts 2600 meter of length and they have a total capacity of 5400 skiers per hour.

In the development plan of the center a system of 6 chairlifts is foreseen, with a capacity of 20.000 skiers per hour and a surface of almost 150 km of orderly ski stages, a free ride zone of 1.500 hectareas and a system of 14 km of stages i.e. connectors throughout the center.

In the last 3 years the center is not operational.

Other ski centers are smaller and have one to three chairlifts or ski lifts and from the tourist aspect are not very significant. These centers are usually directed towards the local market. Only the basic characterists are given for these centers.

### 4. Kopanki, Pelister

It can be found on the southwest part of Macedonia, and it is located on Baba mountain, whose highest peak is Pelister (2.601 m) and is within the frame of the national park Pelister. It is a relativly small ski center but it is interestt due to its natural beauties.



The center is located at the beginning on 1.420 meters and through the cable car it goes to 1.610 meters, and by the ski lift it goes to 1.800 meters. The center has several accommodation capacities, restaurants, hostels and the mountain hut "Kopanki" on 1.550 meters and the mountain hut "Golemo Ezero" on 2.200 meters.

The ski center Kopanski raspolaga so a two-seat chairlift and a ski lift: Begova Cesta (hotel "Molika"), the length of the chairlift is 680 meters, the beginning station is on 1.420 meters and the end station is on 1.610 meters, with a

capacity for 500 skiers per hour. For Kopanki, the ski lift length of the chairlift is 580 meters, the beginning station is on 1.610 meters, the end station is on 1.800 meters and the carrying capacity is 700 skiers per hour. The two bigger ski stages are with a combination of red and black classification, with an average inclination of 35-38% and with a complete length of almost 2.000 meters. In the frame of the youth hostel three smaller ski lifts can be found. In the vicinity of Pelister is the ski center Strezevo where there are two ski lifts with the length of 750 and 820 meters. But this center is currently closed and is not operational.



#### 5. Krusevo

The ski stages can be found close to the city of Krusevo which is at 1400 meters above the seal level. The city is connected with the ski center and the ski stages through the cable car. The ski slubs organize skiing schools for beginners and rent equipment. Special attention is given on nordic skiing. The ski stages are on the municipality Stanic, which is equipped with ski lifts: a two seat with a capacity of 700 persons per hour, a ski lift anchor with a capacity of 700 persons per hour; a single ski lift with a capacity of 600 persons per hour. The ski clubs from Krusevo organize ski schools for beginners by renting the complete equipment. There are also stages for skiing professionals, and that is the stage that can be found under the cable car and the ski stages for nordic skiing.

The stages have different levels of difficulty: there is a stage which is easy and is 350 meters long, there is a normal stage of 400 meters and a diffuclt stage of 700 meters of length under the two seat chairlift. The center has 6 new snow guns Areco, a new artificial lake for support of the snow gun system has been

built. Lighting for night skiing has been installed under the blue lift and the stage under the cable car. In the close vicinity of the center of the stages there is a service establishment object, a restaurant that offer various types of food and drinks. The center has a ski depot for renting skiies as well as a ski school.



#### 6. Ponikva

Ponikva is a tourist center located in Eastern Macedonia, 20 km north from Kocani on the Osogovo mountains. The urban area has three ski lifts, weekend cottages, fields for sport and recreation, hotels, hostels, service establishments and services for ski equipement. On Ponikva, besides the weekend settlement and the few motels there is also a youth hostel with a capacity of 220 beds.

The ski center Ponikva has three ski lifts of which two are operational. Ponikva has two stages of which one is intended for beginners and children and belongs in the category of easy stages. The length of the stage is 300 meters and the whole stage is lightened by reflectors. The capacity of the ski lift is 500 persons per hour. The second stage is not operational. Stage 3 is intended for advanced skiers and can be grouped in the normal-difficult stages. It is 700 meters long, and the first 200 meters are with a bigger incline. The capacity of the lift is about 1.500 skiers per hour. The whole stage is equipped with reflectors for night skiing and with artificial snow guns. On Ponikva there are 6 artificial snow

guns, artificial accumulation as support for the water supply for artificial snow and a snowboard park.



#### **Regional competition**



### Bulgaria

#### 1. Bansko



The ski center Bansko is the biggest ski center in Bulgaria. With its intense development in the past 10 years from a local ski center it grew to a leading ski center on the Balkans. It is located on the mountain Pirin in the close vicinity of the town Bansko and is located 160 km away from Sofia. It is located on 925 meters above the sea level and the highest peak Todorka is on 2746 meters above the sea level. Bansko is often called the winter capital of the Balkans. It contains a wide spectre of hotels which are mainly 5 star hotels. Invesments of 100 millions of euros were made for the construction of a system of chairlifts and ski lifts which enabled Bansko to acquire an international recongnition

through the organization of the FIS race of the World Cup. There are many restaurants there and a big Apres-ski offer.

Length of stages	Chairlifts	Chairlifts capacity	Night skiing	Snowboarding	Price of daily ski ticket	Artificial snow
75 km	One gondola, 6 four-seats, 1 three seat*, 5 ski lifts and 2 baby ski lifts	17.250 per hour	6 km	Yes park	28 euros 150 euros (for 6 days)	Yes 100%
Other offer		Skating rink, extreme skiing and paraglyding skiing			ng	

The maximum height difference is 925 meters, and the longest stage is 10,2 km. There are 5 easy stages, 10 normal-difficult stages and one difficult stage; or 30% for beginners, 45% for advanced skiers and 35% for expert skiers.

All stages are connected to a system of chairlifts and ski lifts by a length of 27 km.

During the summer the tourist offer consists of mountain hikes and mountaineering, bycicle riding and mountain bike, horseback riding, picnics, extreme mountaineering, paintball, hunting and fishing, visits to the National park and Bear park. The total number of beds is 13652 (2012).

Indicators	Total number of beds in relation to the total capacity of the lifts	Capacity of the ski lifts in relation to the length of the ski stages	Total number of beds in relation to the length of the ski stages
	0,804	230	185,03

This center is characterized by a large number of accommodation capacities of different category. There is a rich non-board offer. The center is offered to the markets of Great Britain, the Netherlands, Germany and other European countries. A large percentage of tourists are from abroad. Even thought the center is oriented towards the regional market it is successful on the European markets.

# 2. Borovec

The ski center "Borovec" is the oldest ski center in Bulgaria and is located on the northern slopes of the mountain Rila close to the town Samokov. It is on 1300

meters above the sea level and the highest peak Mugym is 2925 meters above the sea level. From Sofia it is 60 km away.





The stages are located from 1300 meters above the sea level to 2550 meters above the sea level. The maximum difference is 1054 meters and the longest stage is 12 km. There are 9 easy stages, 11 normal stages and 5 difficult stages. All stages are connected to a system of chairlifts and ski lifts 14,4 km long.

In the duration of the summer the tourist offer is mountain hikes and mountaineering, bycicle riding and mountain bike, horseback riding, picnics, extreme mountaineering, hunting and fishing, excursion and so on. The total number of beds is 5286 (2012).

Similarly to Bancko, thie ski center is oriented towards the regional market and towards the European countries. A big number of tourists come from the Western European countries through organized arrangements that include charter flights, half-boards and a ski ticket.

Indicators	Total number of beds in relation to the total capacity of the lifts	Capacity of the ski lifts in relation to the length of the ski stages	Total number of beds in relation to the length of the ski stages
	0,649	141,56	90,12

### Kosovo

#### 3. Brezovica

The ski center Brezovica is loceted on the northern and northwestern slopes of the National Park Was Mountain in Kosovo. It has 39 hectareas of fields for alpine skiing.



This ski center is established in the distant 1954 but due to no investments in the past 25 years the ski center does not have a significant role on the tourist market and is usually oriented towards local tourist markets. It has a system of five ski lifts mutually connected by 16 km of ski stages with an average distance of 3000 meters. The stages are located on 900 meters to 2500 meters above the sea level. Because of the good location of the center the snow coverage stays even in May. Currently there is a procedure under way for finding and investor who would invest in and manage the center. The center has a small number of accommodation capacities.

#### Serbia

## 4. Kopaonik

Kopaonik is the biggest ski center in Serbia and is one of the best of centers in the Balkans.



Length of the stages	Chairlifts	Chairlifts capacity	Night skiing	Snowboarding	Price of daily ski ticket	Artificial snow	
50 km	1 six-seat, 7 four-seats, 3 two-seats, 14 ski lifts	30.000 skiers per hour	7 km	Yes park	30 euros 100 euros (four 7 days)	Yes 97%	
Other offer		Skating rink, 20 kilometers of stages for nordik skiing and biathlon, snow park and childrens snow park.					

The stages are located on 1057 to 2017 meters above the sea level. There are 15 easy, 10 normal and 7 difficult stages.

Indicators	total number of beds in relation to the total capacity of the lifts	Capacity of the ski lifts in relation to the length of the ski stages	Total nnumber of beds in relation to the length of the ski stages	
	0,17	582,45	90,62	

#### 5. Stara Mountain

The ski center Babin Zub is located on Stara Mountaina in the vicinity of Knjazevac in the Republic of Serbia. This mountain is actually on the border with Bulgaria. The existing ski stages are located at a height of 1.100 to 1.900 meters above the sea level.

Length of the ski stages	Chairlifts	Chairlifts capacity	Night skiing	Snowboarding	Price of the daily ski ticket	Artificial snow
13 km	1 gondola 1 eight-seat 2 four-seats 3 ski lifts	6.690 skiers per hour	7 km	Yes	15 euros 52 euros (four 7 days)	Yes 100%
Other	offer	/				

. The ski center "Babin Zub" can be found on 1758 meters above the sea level.

The center intself is in the beginning stage of development.



## **Bosnia and Hercegovina**

## 6. Jahorina

The ski center Jahorina is located in Bonia and Hercegovina on the same mountain. It is known as an olympic center because in 1984 part of the skiing competitions in the frame of the Winter Olympics took place on this ski center.

Length of the ski stages	Chairlifts	Chairlifts capacity	Night skiing	snowboarding	Price of the daily ski ticket	Artificial snow
20 km	3 six-seats 2 two-seats 4 ski lifts	10.000 skiers per hour	No	Yes	9,8 euros 50 euros (four 7 days)	Yes 3,3 km
Other	offer	Nordinc skiing	, sledging			



The Olympic center Jahorina has more than 20 kilometers of apline skiing stages and snowboarding stages located on 1200 to 1800 meters above the sea level. In the close vicinity of the center (4 km) is the center for nordic skiing Dvoriste in which there are orderly stages for nordic skiing and an appropriate infrastructure for holding competitions and a shooting range for biathlon.

#### Conclusions

On the local level, or on the level of the Republic of Macedonia a significant winter resort does not exist. The existing ski centers are relatively small and offer a limited number of services. During the summer months the ski centers are seldomly visited and during the winter months there is a relatively good visitation only in the duration of the winter break for the students and during the weekends in February and the first half of March. Because of not having artificial snow systems or because of not using the existing ones all centers depend on the snowfall. The structure of the stages at all centers is not good is the stages are usually for beginners with the expection of a few. There is no appropriate management of the centers.

The local centers are primarily oriented towards the local market and are oriented towards one day or weekend visitors. Still, the big competition,

primarily from the Bulgarian centers has greately lessened the number of visitors.

Regional competition can be narrowed down on two leading ski resorts (Bansko and Kopaonik) and one somewhat developed (Borovec). The other ski resorts are relatively small and are in the phase of development. The intensive investments in Bansko and Kopaonik brought the expected results. These resorts are also being offered to the Western European markets and for a part of them Bansko and Borovec did well in relation to the demand for this type of toruism.

As a result of the inherited "mediterranean" relations towards traveling, regional demand for summer mountain tourism is relatively weak, which causes problems for the usage of the capacities of the hotels. For a bigger number of the regional centers, the real estate offer is characterized with an uncontrolled development which is not in accordance with the basic urbanization of the physical plan\*.

The Bulgarian vacation resorts are pioneers in the region in implementing the models of real estate management (sales and return, timeshare, condotel, etc.), mainly aimed for the western markets and with low prices, thanks to the urban destruction caused by uncontrolled development.

The regional markets are slow in accepting the models of real estate management, but it is expected for this situation to change in the following 5 to 10 years having in mind the foreseen end of the economic crisis and the existence of serious plans for development in the region (Stara Planina, Kopaonik, Jahorina, Brezovica, etc.), who already have implemented or are expected to implement such models.

#### **Market potential**

The market segment on which a new ski center can be focused is usually oriented towards regional markets, and only a small segment can be guided towards international markets.

In Table no. 53 data is given for the ski market in individual countries on who the tourist offer for the ski center Carev Vrv should be guided. The data that are presented are undertaken from the 2013 International Report on Snow & Mountain Tourism Overview of the key industry figures for ski resorts International report for 2013.

### 1. Albania

Albania is one of the poorest countries in Europe where due to the small purchasing power of the population the potential of the tourist market is quite low. In Albania there are no significant ski centers and the tourists who are oriented towards this type of tourism usually visit the ski centers in the neighbouring countries, Montenegro, Kosovo and Macedonia, and with the visa liberalization for the citizens of Albania their interest spreads towards Bulgaria as well as the developed ski centers in Western Europe. The existing demand is oriented towards Macedonia as the closest country and with an appropriate price policy which is aligned with their possibilities, it will be able to be counted also of a certain number of guests from this country.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per skiing day	Income potential of the project in €
Albania	3.020.209	8.231	0,05	15,00%	22.652	25	566.289

Table no. 53

Country	Number of ski centers 1	Number of ski centers > 4 ski lifts	Number of ski lifts	Visits from skiers <sub>2</sub>	Visits from skiers/ski lifts	Population	National participation relation (population in %)	Number of skiers (domestic)	Ranking in world tourism ₃	Arrivals of internation al tourists	Participat ion of foreign skiers	Visits of skier per citizen ₄	Visits of skiers per foreign visiter ,
Bulgaria	32	7	110	1.200.000	10.909	7.262.675	5%	363.134	39	5.700.000	25%	0,12	0,05
Serbia	31	2	64	650.000	10.156	10.159.046	3%	304.771	/	683.000	20%	0,05	0,19
Greece	22	Q	111	800.000	7.207	10.722.816	2%	214.456	16	14.900.000	10%	0,07	0,01
Bosnia and Herzegovina	11	4	35	400.000	11.429	4.590.310	5%	229.516	/	311.000	50%	0,04	0,64
Macedonia	8	2	34	300.000	8.824	2.061.315	8%	154.599	/	259.000	10%	0,13	0,12
Montenegro	4	2	23	250.000	10.870	678.177	10%	67.818	/	1.044.000	25%	0,28	0,06
Turkey	25	9	102	1.000.000	9.804	71.892.808	1%	718.928	ω	25.500.000	15%	0,01	0,01
										-		-	

<sup>1</sup> Cenrtain number of ski areas include many small ski centers

<sup>2</sup> On average the last 5 seasons or estimation

<sup>3</sup> Based on arrivals of international tourists

<sup>4</sup> Relation of domestic ski visits in relation to the population <sup>5</sup> Relation of ski visits by foreign tourists in relation to the total number of foreign tourists

### 2. Kosovo

Kosovo also is characterized with a low purchasing power of the population. In Kosovo the ski center Brezovica is located, which can be found in the vicinity of the Macedonian border. This market from the tourist aspect has a low potential. The Kosovo citizens are regular visitors to the biggest ski centers in Macedonia, Popova Sapka and Mavrovo. The existing demans is oriented towards Macedonia and Montenegro. With an appropriate price policy this potential can also be used.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per skiing day	Income potential in the project in €
Kosovo	1.733.872	5.846	0,15	10,00%	26.008	25	650.202

# 3. Serbia

Several ski centers are located in Serbia, of which the most significant one is the ski center Kopaonik. From the aspect of tourist potential Serbia is much more interestting than Albania and Kosovo, mostly because of the higher purchasing power of the population, but also because of the long tradition of skiing in Serbia. Over 50 ski clubs and associations are registered in Serbia, and there are many ski lovers, which makes this market quite attractive for the ski centers in Macedonia. Almost every year it is invested in Kopaonik, whereas the other ski centers such as Stara Planina are in a phase of development. In former Yugoslavia the visitors from Serbia were quite frequent visitors in Mavrovo and Popova Sapka and in certain pariods consisted even 35% of the total visitors. The smaller ski centers, such as Zlatibor, Divcibari and Tara have prepared development plans. There is also a greenfield investment for development on the mountain Golija near Kopaonik.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Serbia	7.209.764	8.538	0,2	2,50%	36.049	30	1.081.465

#### 4. Bulgaria

Bulgaria has almost the same number of citizens as Serbia but has a slightly higher GDP per citizens. The purchasing power of the population is increasing, even thought that is relatively small. Bulgaria is a known international tourist destination with over 6 million international visitors. The demand is lead by the offer which comes from three main renowned ski centers (Bansko, Borovec, Pamporovo) and more than 10 smaller ski centers. The offer is oriented towards regional but also towards UE markets, especially towards Great Britain, the Netherlands and others. More of the bigger ski centers are developed through the model of proliferation of real estate, which managed to raise its limit and today is in dead end (especially Bansko). The market in Bulgaria is with a great potential and if we take into consideration the big number of Bulgarian tourists in the summer centers of Macedonia in the future we cound count on some participation of the Bulgarian market which would owe on the already established position of Macedonia in the Bulgarian market.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Bulgaria	6.924.716	11.077	0,15	0,35%	3.635	35	127.242

#### 5. Greece

Greece is one of the countries that is ranked in the first 20 countries for tourismin the world in relation to the number of tourist visits. Although in the last years it is in a heavy financial crisis, still the purchasing power of the population is quite bigger in comparison to the other countries in the region. There are 18 ski centers in Greece of which more of them surpass the regional standards of quality. Although this market has a big potential it still needs to look and the limiting factors which are the weak traffic connectivity to Makedonska Kamenica, as well as the economic instability in Greece. Part of the potentials for this market can be used but for that providing an appropriate tourist offer per price and quality is needed; a product with a good international quality and good value of the offered money needs to be provided. During the winter season many Greeks enjoy winter sports and anlthough the skiers are not that skilled as those of the countries of the Alps, still the number of skiers and especially of the children significantly increases each year. Skiing is still popular in Greece and many of the ski centers in Greece are full of skiers and visitors during the weekends. The bigger ski center is Parnassos in Central Greece, only 200 km away from Athens and very close to the antiquities of the know antique city Delphi. The ski centers are operational thoughout the year including in the summer period when there are hiking possibilities for the citizens and tourists.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Greece	11.319.048	20.275	0,2	0,5%	11.319	100	1.131.905

#### 6. Montenegro

In Montenegro two ski centers are located in Zabljak and in Kolasin. The ski center Zabljak has old ski obejcts and a very little and small quality of accommodation. There are ambitious plans for development of Bjelasica / Komovi and Durmitor but all that is still in a phase of finding an investor. The small population which does not have a significant purchasing power results mainly in orientation towards the regional tourists markets. Only a small part is oriented towards the western countries. Although a small market, still with an appropriate price policy and a good marketing approach a part of this market can be conquered. The road connection will have to significantly improve with the purpose of creating preconditions for conquering of this market.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Montenegr o	650.036	9.154	0,25	2,50%	4.063	40	162.509

### 7. Bosnia and Herzegovina

In bosnia and Herzegovina there are 11 ski centers. A bigger part of these are small centers and are not significant as tourist localities. About 5% of the Bosnian population skiis. The foreign visitors come from Serbia, Slovenia, Croatia or Montenegro. The ski centers Jahorina, Bjelasica and Igman are the main ski resorts in Bosnia and Herzegovina and all are in the region of Saraevo. In all ski centers the possibility of doing alternative activities is provided, such as nordic skiing, driving motor sleds, sledging, skating and others.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Bosnia and Herzegovi na	3.871.643	6.385	0,15	0,50%	2.904	25	72.593

### 8. Croatia

Several smaller ski center that do not have a big tourist meaning are locate din Croatia. There are 6 ski centers and the total length of the stages is 25 km. The most known ski centers are Bjelolasica, located on 520 meters above the sea level, and Sljeme, which is near Zagreb and is located on the slopes of Medvednica. On this stage FIS races from the world cup take place. Although there are no significant ski centers, still a large number of Croatians ski. This market is mostly oriented towards the countries of western Europe, especially France, Austria, Italy and Germany. Still with the appropriate price policy and defining of the whole-day tourist product a part of this highly potential tourist market can be taken. A certain number of tourists visit the ski centers in Bosnia and Herzegovina primarily because of the lower prices in comparison to the European countries.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Croatia	4.470.534	13.692	0,3	1,00%	13.412	80	1.072.928

### 9. Other countries of the EU

Although the orientation of the European Union markets is primarily oriented towards the highly developed winter centers in western Europe, still there is a real possibility of break through in this tourist market as well. Bansko and Borovec, or the centers in Bulgaria in the last 10 years are intensively offered as winter ski centers in the markets of Great Britain, the Netherlands and other EU countries. According to the estimation even 25% of the total number of tourists in the winter period come in the ski centers from the EU countries. With the right marketing strategy, with providing quality services and creating and offering a complete ski tourist product break through on this tourist market will be provided.

Country	Population	GDP per citizen (€)	% of skiing days/ population	Market participat ion	Skiing days	Average expenditure in € per ski days	Income potential of the project in €
Other EU countries		Estima	ation		20.000	130	2.600.000

The summer results from the done analysis

In Table no. 54 the summed results of the done analysis of the potential markets in 2014 are shown.

Table no. 54

Country	Ski days	Average expenditure in € per ski days	Income potential of the project in €
Macedonia	83.669	25	2.091.719
Albania	22.652	25	566.289
Козоvо	26.008	25	650.202
Serbia	36.049	30	1.081.465
Bulgaria	3.635	35	127.242
Greece	21.551	75	1.616.334
Montenegro	4.063	40	162.509

Bosnia and Herzegovina	2.904	25	72.593
Croatia	13.412	80	1.072.928
Other European countries	20.000	130	2.600.000
Total:	213.942	40	10.041.280

The total potential value of the market is something above 10 million euros annually.

On Picture no. 30 the percentage coverage of the individual potential markets is shown.

Picture no. 30



# Market potential in 2024

## Assumptions and methodology

The analysis of the potential of the regional and European markets shows that there is a certain potential of each of the stated markets for the period of 2014 to 2024.

The calculation is based on:

- The relation of the population with ski days (the amount of ski days which is generated by each country in relation to the population), which is estimated on the basis on previous forecasts of ski industry development.
- Market share in the total ski days that can be attractive by each national market for this concrete project and is estimated on the basis on the

conclusions of the analysis of the regional market of mountain tourism processed in this document.

- The average expenditure of skier per ski day, which depends on the GDP per citizen and the purchasing power are not linear
- For a simpler calculation, it can be assumed that the population from the observed countries will increase on average for 5% at all observed countries, and the common average growth of GDP in the duration of 10 years will be 2,5% annually, that the relation of the population on ski days will increase for an average of 100% in the duration of 10 years and that the market participation will increase for 30% depending on the market.
- It is assumed that the ski centers do not have potential for attracting significant tourist volume from other markets in 2013 as a starting year, but it is assumed that and increase of 25% from the market (in ski days) of the regional and international markets in 2023 can be achieved.

In Table no. \_\_\_\_ the summed results of the made analysis of the potential markets in 2024 are shown.

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<b>Tab</b>

Country	Population (estimation 2024 + 5%)	GDP per citizen (€) + 28%	% of ski days/ population	Market participation	Ski days	Average expenditure in € per ski day	Income potential of the project in €
Macedonia	2.196.305	4.351	0,3	20,00%	131.778	30	3.953.349
Albania	3.171.219	3.588	0,075	15,00%	35.676	30	1.070.287
Kasava	1.820.566	2.985	0,225	10,00%	40.963	30	1.228.882
Serbia	7.570.252	5.140	0,3	2,50%	56.777	36	2.043.968
Bulgaria	7.270.952	6.171	0,225	0,35%	5.726	42	240.487
Greece	11.314.335	25.952	0,3	1,00%	33.943	06	3.054.870
Montenegro	682.538	6.351	0,375	2,50%	6.399	48	307.142
Bosnia and Herzegovina	4.065.225	4.302	0,225	0,50%	4.573	30	137.201
Croatia	4.694.061	13.418	0,45	1,00%	21.123	96	2.027.834
Other European country		Щ	timation		30.000	150	4.500.000
rotal:	42.785.453	8.029			336.958	48	18.564.020

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The total potential value of the market in 2024 is estimated for something above 18,5 million euros annually.

## Conclusions

- In accordance with the results from the completed analyses today, there is a potential for 200.000 – 220.000 ski days that fit on about 2.000 beds of the regional market, realized in the accommodation capacities categorized with 3 or four stars.
- 2. From the aspect of today, taking into consideration the current conditions that rule on the market a new ski center in the Republic of Macedonia would be built in accordance with international standards and with a length of the stages of 30 km, as well as appropriate accommodation capacities would have a potential for 7 to 8 million euros annual income.
- 3. If the presumptions come true, which were adopted during the estimation of the potentials for 2024, the regional market potential increases significantly up until almost 310.000 ski days which fits for 3.000 beds in the accommodation capacities in the ski centers.
- Under the presumption that the ski center in that time will achieve 10% of the visitions to be from the international marketts, that adds 300-400 beds.
- 5. This will bring the income potential of the center of more than 18 million euros (only above 14 of the regional markets).
- 6. Certain risks from the aspect of realization of the plannes results exist above all because of the external conditions such as economic growth and stability as well as the speed of development of the competing projects in the neighborhood (especially Brezovica and Stara Planina, as well as the development of other ski centers in Macedonia).
- 7. It will be necessary an appropriate mix of accommodation capacities to the provided for each phase, in the meantime taking into consideration the standards and results of the development of other ski centers

which show that the accommodation capacities with three stars (condotels) are the most prevalent type of accommodation in the first years of development.

8. The strategy for the prices of ski tickets to be on the low border of the regional average (23 euros at the most in the moment) which represents a serious challenge when they will face the imperative of a vacation resort in accordance with international standards to be built.

# Planning of development of the locality Carev Vrv

Defining of the concept of development for the locality Carev Vrv is done in the frame of the Study for development of the ski center Ponikva. In the frame of this study identification of a part of the possibilities for development of a ski center on the locality Carev Vrv is done. The primary analyses and testing that are done in the frame of the above mentioned study point to the existence of potentials for development of a modern ski center.

On the other hand the analysis of the existing market for winter tourism shows that the orientation towards local markets does not guarantee successful management of a ski center.

The defined concept for development of this locality does not provide a preparation of a more serious offer for occurrence on the international markets, after the example of Borovec and Bansko.

With the purpose of developing a center that will be attractive also for the international markets, it is approached towards a repeat analysis of the field potentials of the locality Carev Vrv and beyond, especially in the direction of the peak Ruen.

An on the spot visitation has been made and an aerial recording of the whole locality with the purpose of identifying the possible ski stages and locations for chairlifts on the locality has been made as well.

Defining of the development of the ski center has been started with an invertorization of the locality Carev Vrv and defining of the criteria for planning of development of the locality.



# **Inventorization of the locality Carev Vrv**

The field characteristics of the locality Carev Vrv are analyzed on the basis on the previously defined criteria appropriate for the basic elements what are analyzed during the defining of the development of one ski center.

The following characteristics of the locality are analyzed: topography, field inclination, field orientation (slope aspects) and climate.

From the aspect of topography, the minimal height which is adopted as good for locating the ski stages is defined on 1300 meters, in accordance with the recommendation of the World Skiing Federation and in accordance with the prognosis for influence of the climate changes of the climate in the region.

Field inclination	Field appropriateness	Avalanche risk
0 - 8 %	field which is ideal for locating the accommodation and service capacities, as well as locating alternative contents (skating rink, playgrounds and others), as well as a field appropriate for locating a ski settlement and the accompanying infrastructure	No
8 - 25%	ideal for beginning skiers and snowboarders but also for locating a certain infrastructure	No
25 - 45%	ideal for medium skilled skiers/snowboarders and inappropriate for construction of infrastructure	No/very little in extreme cases
45 - 70%	ideal for advanced and expert skiers/snowboarders	Middle risk
>70%	Too narrow for any kind of activity, but apropriate for freestyle extreme skiing or snowboarding	High risk

The criteria for inclination of the field are the following:

: Criteria for orientation of the field:

Field orientation	Appropriateness of the field	Sun exposure
North	ideal for snow retention, little possibility for creation of snow drifts	minimal
North-east	ideal for snow retention, little possibility for creation of snow drifts	minimal
East	good orientation for snow retention, medium degree of creation of drifts	Morning exposure
South-east	little snow retention, medium possibility for creation of snow drift	Complete exposure
South	little snow retention, big possibility for creation of snow drifts	Complete exposure
South-west	little snow retention, big posiblility for creation of snow drifts	Complete exposure
West	little snow retention, big possibility for creation of snow drifts	Morning and afternoon exposure
Norht-west	good snow retention, medium posiblility for creation of snow drifts	Late afternoon exposure

## Topography

Carev Vrv can be found on a height of 2084,7 meters above the sea level. The fields that are defined as adequate for locating ski stages can be found on 1300 meters above the sea level all the way to the Carev Vrv. The field is mountainous and has all the necessary characteristics for development of a modern ski center. On picture no. 31 and picture no. 32 the topographical characteristics of the locality Carev Vrv and the surrounding fields which are identified as good for construction of ski stages are shown.

Picture no. 31



Picture no. 32




### **Field inclination**

The analysis of the field inclination on the locality Carev Vrv and the surrounding fields has shown that the inclination of the field is quite steep except for the highest parts of the locality where there are certain segments where the field is relatively softer and with an average inclination up to 8%. The field which is appropriate for construction of ski stages is with an inclination that goes until 80% which provides the construction of stages for all types of skiing and snowboarding. This field configuration allows ideal natural conditions for the development of a ski center. The identified locations for the base settlement are with an inclination up to 8% and because of not having appropriate surface with a similar inclination on one place the colating of the settlement if done on several scattered locations which are close to each other. The parts of the field that are with a inclination bigger than 80% and which are in the close vicinity of the ski stages and the accompanying infrastructure will need to be secured from avalanches, or measures for decreasing the risk caused by avalanches will need to be undertaken, above all throughout the construction of protection fences in accordance with the direction for designing such measures published by the EU (The design of avalanche protection dams), introduction of an avalanche danger system and purposefull and controlled causing of avalanches. On these fields any kind of skiing or snowboarding should be forbidden. On Picture no. 33 an inclination of the field of the locality Carev Vrv is shown.



Avalanche protection

# **Field orientation**

Field orientation is varied because of the physical location of the locality. Part of the identified fields are with the wanted north orientation and on those most of the planned ski stages are located. Still, with the purpose of using the ideal natural conditions also the south-east oriented fields are used. The first stage of development of the ski center is based on ski stages that are mostly located on the north side, which will be key for the successful operations of the center. On Picture no. 34 the orientation of the fields of Carev Vrv is shown.









2.5 km



# **Development plan**

# Vision

# **Basic strategic elements**

The planning of the development of one ski center should be based on real and realizable goals that rest on the real field possibilities of the locality.

Defining of a real vision of the ski center Carev Vrv is necessary in order for the developmental directions of the locality itself to be determined. The real and realizable vision is particularly important as for the Macedonian tourism also for encouraging sustainable development of the municipality Makedonska Kamenica and the Easter mountain region in whole. The process of defining the vision should be done in accordance with the results of the made analyses of the existing condition, the geographic and field analyses as well as an analysis of the tourist market and climate conditions.

The vision is defined on the basis on the following strategic elements:

#### Market competition and market potential

The analysis of the market for this type of tourism showed that Carev Vrv as a ski destination in comparison to the ski centers that are located in the region and who are a smaller capacity and length of the ski stages, as are Mavrovo, Popova Sapka, Brezovica, Stara Planina and others undoubtedly have all the pre-condition for development of a competitive and modern ski center. The market positioning of tourism should be directed towards the local and regional market, but also towards the international markets following the examples of Bansko and Borovec.

#### **Tourist trends**

The change of tourist trends which is characteristic of the tourist market in the last years, as well as the trend of development of innovative tourist resources, above all because of the growing global demand for destinations that are characterized with protected nature and protected environment is a chance for sustainable development of an innovative ski center. Besides the considerable market differentiation and the growth of investments in the development of tourist centers on locations that until yesterday were unknown, are proof that the demand of this type of tourist destinations grows. If towards this we also include the continual growth of the existing mountain centers, as well as the tourist-hotel operations that are more oriented towards creating a big number of synergies of the development of new offers, it can be concluded that this type of tourism will will take a much bigger part of the tourist market.

#### Support for the development of tourism

The development of a ski center, or the realization of the idea for development of the ski center Carev Vrv is possible only through qualitative and real planning of the tourist development of this destination, on a way that will increase the competition of tourism in the eastern mountain region and will crash the inherited stereotypes for the quality, capabilities and competition of tourism in this region. The realization of a vision that from a modern aspect is quite brave is impossible without big changes in the immediate local surrounding. The needed changes cannot happen without an appropriate support from the authorities and other developers. Of course, support from the aspect of development of a surrounding infrastructure is necessary, which is necessary for development of the project. This project must rely on public financing of the external infrastructure and above all construction of the appropriate road infrastructure, as well as the construction of the basic infrastructure (water supply, canalization, hard waste, electric current and others).

# Vision

A wanted but a vision that can be realized of one tourist destination is the show of the picture that we want to see in the future, but one we can achieve. It is necessary for the vision to be real, or to have basis on which it can be realized. Also it is necessary for the vision to be accepted by all stakeholders but also from the population and wider public on a local and on a regional level, as well as to be acceptable for the national and local government and possible investors. On the basis on the total analyses of the different elements that are key for the development of one ski destination, a vision for the development of the locality Carev Vrv as a winter tourist destination is defined. The vision represents an objectivized picture of the development of this destination in the future, which is rational and a systemic basis for undertaking the next steps and activities for the realization of this project.

The following vision for 2025 is defined:



With the realization of the vision for development of the ski destination Carev Vrv, the sustainable development of Makedonska Kamenica will be achieved and the whole region and the quality of life of the local population will improve. The success will be achieved in accordance with the principles of sustainable development, taking into consideration the ecological standards, with which Carev Vrv will become the leasing example of a mountain destination.

# **Basic principles for the development**

During the projecting of the system of chairlifts, ski lifts and stages, there should be particulat attention on the optimization of the system in order to avoid the possibility of the planned system to create conflicts, suffocation, traffic or overloading on certain parts of the system, or unequal load on parts of the system.

There are more models with which the using of the system of chairlifts and ski stages is defined. Depending on the weather conditions and the visitators usage of different models for using the system, as well as guiding the skiers towards the preferred stages through the modality of maintaining the ski stages with artificial snow, provides guiding the skiers to the preferred stages with the goal of improving the usage of the stages or avoid congestion on certain chairlifts and stages.

The chairlifts and ski lifts need to be at a place where they will best serve the ski stages. The ski stages need to be planned so that optimal skiing conditions are provided, and the chairlifts and ski lifts need to be located where they can best serve the ski stages, because the chairlifts and ski stages are only a transportation device. The type of chairlifts and ski stages can be different, depending on the natural configuration of the field as well as the needed capacity to be balanced with the capacity of all stages towards which it gravitates. For each ski stage or group of ski stages the most appropriate type of chairlift or ski lift will be defined.

The positioning of the chairlifts and ski lifts does not need to be selected due to the appropriate lower and higher station or due to decreasing expenditure for construction. It is basic to have locations picked that will allow service of more ski stages. The expense for construction of the lifts have to be secondary in comparison to the quality of skiing, esthetics and ecological factors. It is recommended for the station for getting onto and getting out of the chairlifts and ski lifts to be located in the protected areas of the stages.

It is necessary to provide an appropriate space for waiting lines and for entrance to the lifts, safe stoppage, for exit from the lifts and access surface on both the lower and higher terminals of the lifts. When we have chairlifts and ski lifts which are not directly connected to the base settlements, it is especially important for the chairlifts and ski lifts that are directly connected to the base settlement to have enough capacity both for the transport of the skiers and their distribution with the system of chairlifts and ski lifts that do not have a direct connectivity to the base settlement in the frame of the period of the first two hours of the begining of the ski day.

The principals on which the development of the ski centers rest as well as the realization of the defined vision are:

- 1. The development of tourism is based on the proffesional rules and standards which are characteristic for the international tourist industry.
- 2. Respecting the criteria and standards for quality that are demanded by the international market.
- 3. Development of winter tourist product in compliance with the international standards for planning of alpine and nordic skiing.
- 4. Creating an attractive and innovative mountain tourist product for the summer months.
- 5. Offer for accommodation in different categories of accommodation capacities and structure for accommodation capacities that will allow the creation of an all inclusive offer.
- 6. Managing on the level of destination
- 7. Preparation of a planned urbanistic documentation

# Defining the position of the tourist market

The resort Carev Vrv is a mountain and ski destination in which the stay is organized in an untouched nature throughout the year and in thich the tourist offer is adjusted to the needs and demands of the different types of guests. The fulfillment of the vision is a challenge for any one who develops a mountain resort. The results from the analysis and the determined values of the natural resources which the locality has, the development will be based on the following elements, through which the positioning of the resort will be done:

- Creating various tourist products that will be guided towards fulfillment of the demands of the different types of tourists, and that will be modern, adjustable and various
- Creating a specific and attractive tourist product that will be based on the local particularities of the locality and its surrounding and who will be offered during the summer season
- Creation of a specific tourist product that will be focused on families
- Business MICE tourism (Meetings, Incentives, Conferences and Events) (seminars, conferences and team building)
- Spa and wellness tourism
- Sport activities, festivals, contests, fun and action

#### What is that which the locality can offer

Development but also sustainability of a tourist destination in the long term must be based on a connection between the own unique base of activities and the sistem of experiences, including the unique characteristics of the destination itself. In order for one destination to be successfully comercialized it is necessary to take into consideration the natural and physical capabilities of the location and to be defined what is that because of which the client (system of experiences) would come to visit.

For the self observation of the value of attractions which the destination has, it is necessary to be confirmed also by the market in order to achieve success. Identified are the following possible experiences from the aspect of attractiveness and attractiveness of the locality and which could be offered:

#### Experiencing the mountain

Peak on a height of over 2000 meters above the sea level, beautiful views and scenery, ski stages and ski infrastructure for alpine and nordic skiing,

snowboarding and sledging, infrastructure for attractivities on snow and attractivities in the summer, various accommodation capacities, object for service establishments on the stages themselves, panoramas, competitions, sport, free climbing, winter walks, mountain biking and so on.

#### Experiencing the untouched nature

Conserved biodiversity, thematic treks, bird watching, photo safari, horseback riding, nature orientation, nature schools and so on.

#### Experiencing tranquility, peace and relaxation

Appropriate accommodation capacities, spa and wellness center, providing peacefull and quiet atmosphere and so on.

The analysis of the experiences of similar mountain destinations is necessary from the aspect of creative tranferal of positive experiences on these destinations as well as defining the position of the locality Carev Vrv as a tourist destination in relation to the existing practice. From the aspect of the development model of mountain tourist destinations in Europe and America-Canada, it should be noted that the European model is characterized by development of a destination in accordance with the historical culture of using the range of the Alps in touristic purposes, while the American-canadian model is characterized with the so-called industry-tourist usage of the mountain space. Still, part of the mountain destinations in Europe and especially in France are developed on the basis of the culture of industrial usage of the mountain space.

All tourist products on the global tourist market have their own value, which is substituted for money by the client. Each product has its own place in the market and its own development trend. Today almost all products that are offered by the mountain destinations in Macedonia are narrowed down to only a modest offer for classic vacations with a very small scope of recreational contents. Differently from Macedonia, in the neighborhood in the developed mountain destination this type of classic offer evolved into a product with more contents and more modern products whose market commercialization presupposes a rounded system of values. Because of this the development of tourist products who will be characteristic for the whole center will be developed on the wider spaces of the locality and on part of the Osogovo mountains and they will have to be aligned with the demands of the global tourist market.

Grasping the results of all analyses it can be emphasized that there is a good potential for development and commercialization of the following tourist products: winter and summer year vacation on the mountains, short vacations, business tourism – MICE (Meetings, Incentives, Conferences and Events), spa and wellness tourism, sports and alternative tourism and rural tourism.

#### **Development plan**

On the basis on the completed analysis of the physical condition, the analysis on the characteristics of the space and of the locality Carev Vrv, above all from the aspect of possibilities for development of a ski resort, the field visits and the made talks and consultations, the development of the ski center Carev Vrv is defined.

The locality Carev Vrv from the aspect of development of tourism is practically untouched. The construction of the whole infrastructure is directly connected to the planned development.

The totality of contents that need to be build has to be provided through the basic principles of planning and development of mountain tourist destinations, to which regardless of the time frame of investment realization of the project there has to be provided and regulated a protection for the basic values of the future resort, or protection of the natural resources and attractions which the locality has.

The state ownership of almost the entire region that is undertaken with this project will very much ease and quicken the realization of this project. An unique developmental model is adopted, or a contract with an investor or more investors on the basis of a public private partnership as well as sales of allocations for individual houses and vacation apartments.

The development of the ski center Carev Vrv will take place in several phases. Each phase represents a technologically independent whole and can function independently from the other phases. The first phase is the most demanding and is connected with the biggest investment expenses, especially in the capital infrastructure.

In accordance with the Study for the development of the ski center Ponikva on the Osogovo tourist development at the Osogovo mountains it is based on the following points:

- The locality Ponikva is the basis for development of tourism in the Osogovo mountains.
- Ponikva, besides the existing roads with which Kocani is connected, is also connected with a new and modern road with Probistip
- The mountain destination Osogovski mountains will consist of tow base areas:
  - Sports and recreational center Ponikva in which the part of the accommodation capacities will be scattered and the rest of the tourist capacities and contents.
  - The ski center Carev Vrv in which the bigger part of the accommodation capacities and mountain infrastructure will be placed.
- The sports and recreational center Ponikva will firstly have contents that will be aimed towards the development of ski stages for alpine skiing for children and beginners, then various winter contents aimed at non-skiers such as sledging, tire sled, ice-skating, a winter park, winter child parks, walks, driving motor sledges, as well as a complete infrastructure needed for the development of nordic skiing and biathlon. SRC Ponikva will have more conditions for sports tourism, or there will be an appropriate infrastructure for various sports (gym, playgrounds for various sports), as well as an offer for alternative forms of tourism (adventure, nature, and others). Ponikva will be a modern sports recreational center and amusement park for children in the duration of the year.
- The ski center Carev Vrv will contain a system of ski stages with varying difficulty, length and inclination which will be connected to a system of chairlifts and ski lifts with various capacity. In the frame of the ski center

foreseen are accommodation capacities, as well as service capacities of which a part will be located on the stages themselves.

On the basis on the analysis of the area of the locality Carev Vrv which was done through forming and using the physical model for segments with a rich structure and complexity with the physical occurrences in them are discredited, as well as the on the spot visits, the positioning of the system of chairlifts and ski lifts and location of ski stages is defined. The best location for locating the future ski stages and the accompanying skiing installations, or the fields on which the biggest number of accommodation and other accompanying capacitates will be located is defined on the basis of the detail evaluation of all relevant physical characteristics of the micro locations of the locality Carev Vrv and the surroundings localities. The following physical characteristics are evaluated: topography, inclination of the fields, sides of the world, sun exposure, height analysis and the average inclination of the slopes and stages, capacity of the stages, traffic connection and infrastructure, maximal capacity of the area.



Location of the ski center Carev Vrv

## **Criteria for planning**

The criteria for planning are the most important factor in the process of planning the development of a tourist destination. The successfulness of a tourist center in great measure depends of the right and appropriate planning of its development. In the world today various criteria for planning of the mountain tourist centers are used. The criteria that are defined for planning of the development of the ski center Carev Vrv are in compliance with the international standards for planning of successful mountain resorts. The criteria that are defined pertain the standards from planning ski centers with a small size, or with a length of stages of 30 km and positioning of the mountain destination as a regional mountain center.

#### Stages

Length of stakes up to 60 km.

The width of the stages on average should be around 50 – 60 meters.

The coverage on the stages with artificial snow should be a minimal 50%.

The total surface area of the stages to be 120 to 180 hectareas, and the total surface of the center to be 600 to 1200 hectareas.

Defining of the difficulty of the stages according to the inclination, percentage of ski market and the density of skirs per hectare depending on the type of skier.

Skiing skills	Acceptable inclination of the field	Percentage of ski market	Density of skiers per hectare
Beginner	8 to 12%	5 %	35
Advanced beginner	to 25 %	15 %	40
Below average skier	to 35%	25 %	28
Average	to 45%	35 %	25
Advanced	to 55%	15 %	20
Expert	over 55%	5 %	12

## **Vertical transport**

The system of Chairlifts and ski lifts should provide satisfaction of the needs for vertical transport for all types of guests. The dimensioning of the chairlifts and the ski lifts needs to be in accordance with the vertical demand transport. The realization of the vertical difference in one day per skier depends on the skills of the skier. The average realization per type of skier is given in the following table.

Ski skills	Realized average vertical difference in days in meters per skier
Beginner	500 - 750
Advanced beginner	750 – 1500
Below average skier	1500 - 2250
Average	2250 - 3000
Advanced	3000 - 5500
Expert	5500 - 7500

Expert

The average duration of ski days 6 hours.

Average coverage of the ski lifts and Chairlifts is 80%.

## Accommodation capacities

Total needed accommodation capacities to 46% from the optimal number of skiers per day that the resort can accept, with a guarantee of comfortable carrying capacity-CCC.

The following structure of beds in the accodomation capacities is recommended:

Accommodation capacity	Recommended part of the total accommodation capacity
Category 4*	18 - 22%
Category 2 и 3*	30 - 45%
Private accommodation and apartments	8 - 18%
Youth hostels	5 - 10%
Other kind of accomodation	6 - 8%

On average about 70% of the guests in the accommodation capacities are skiers.

### Очекувани резултати

- \* Rate of fulfillment during the winter period 60%
- \* Rate of fulfillment in the summer period 25%
- # 45% of the total number of beds should be in the offer in the duration of the summer period

### Service establishments

The service capacities of the stages up to 50% of the optimal number of skiers per day that the resort can accept with a guarantee of comfortable carrying capacity.

## Accompanying infrastructure

- ⇒ Parking
  - $\circ~$  Up to 50% of the visitors can come by car, and 50% by bus
  - 2,8 to 3 visitor per car
  - 40 visitors per bus
- ⇒ Tourist infrastructure
  - o Winter
    - Ski school and renting of ski equipment
    - Skating rink
    - Snow park and a ski part for children beginners, children's park
    - Sledging stage
    - Snowboard park for beginners
    - Snowboard park
    - Stages for nordic skiing and biathlon (shooting ranges)
    - Mountain stages for winter mountaineering
    - Mountain center
    - Visitors center (info center, internal terminal, atm machine and so on.)

- Winter stage for snow raft
- Après-ski
- o Summer
  - Mountain and thematic stages
  - Modern slide stage and/or a summer stage for snow raft
  - Playgrounds for children (natural and adventure)
  - Infrastructure for summer camp
  - Stage for four wheel drives
  - Stages for mountain biking and mountain bycicling
  - Gym, playgrounds, sport recreational center
  - Infrastructure for rural tourism

#### **Carev Vrv parameters**

The parameters for the development of the locality Carev Vrv are defined with the purpose of ensuring sustainable development of the locality itself. Defined are parameters that pertain to the unit of the accommodation capacity, the ski stages and the vertical transport capacity:

- Total number of beds in the accommodation capacities in relation of the vertical transport meters per hour (0,08% - 0,10%)
- VTM/h per hectare of ski stages (30.000 35.000)
- Total number of beds in the accommodation capacities per hectare of the ski stages (20 – 35)

#### Artificial snow system

Quite often it happens in certain periods of the winter season there to be small amount of snowfall and an appropriate snow cover to not be able to form which would enable using of the ski stages. Today, all modern ski centers have appropriate systems for artificial snow. At the same time in those centers the artificial snow systems are also used for maintaining the snow cover of the ski stages for a longer time. It is usual for the system of artificial snow to be used for providing appropriate conditions for early beginning of the season (even in November), as well as prolonging the season (end of April). Artificial snow also is used for adding of snow that is used from the daily use of the ski stages by the skiers.

Instalation of equipment for production of artificial snow will provide a sure beginning and a late end to the season with the needed snow cover. In order for the ski season in one ski area to be opened and to remain openened with a significant number of skiers it is accepted that on the ski stages there needs to be a minimum of about 50 centimetres of layered snow on a surface that has been previously prepared and processed with the purpose of providing quality surface for skiing and snowboarding. Smaller than the recommended depth depending on the field conditions can result in the appearance of vegetation or rocks through the snow surface which can damage both the vegetation and the skiing or snowboarding equipement, as well as the speeding up of the melting of the snow cover. The artificial snow system should be dimensioned with an appropriate capacity for making 50 cm snow depth, which will provide opening of the ski season. Besides this the capacity of the artificial snow system should allows making of about 1 meter of snow cover in order for the basis to be incresed and the adequate depth to be maintained throughout the season because the height of the snow are lessened because of tamponing, sublimation and vaporation. This additional snow will provide a long term, quality surface that will take on a big amount of skiing passages. The ski center with the artificial snow usually opens the center in phases, with making the snow in various zones on the mountain in the duration of consecutive periods of time.

Surface of ski stages	Snow depth for opening	Snow volume	Need for water	Seasonal snow depth	Snow volume	Need for water
(ha)	(cm)	(m³)	(m³)	(cm)	(m³)	(m³)
1	50	5.000	2.750	100	10.000	5.500

Basic elements for dimensioning of the artificial snow system.

#### Mechanization for processing of snow on the ski stages

The criteria for planning of the number of mechanization – snowcat for processing or preparation for the snow on the ski fields, snowboarding and sledging, and for exceptionally the ski and snowboarding stages. The planning of the number of snowcats is based on the basis of the estimation that a completely operational snowcat will be necessary each night shift for processing and preparation of 23 hectareas of field. The areas outside of the ski stages are not processed. On the basis of these criteria, the need for appropriate mechanization for processing and preparation of the study.

#### Defining of the needed space for operating of the center

The defining of the needed surface of the various accompanying objects in which the basic service activities of the center need to take place is done on the basis of the following parameters:

Services for the tourists	Recommended space per guest m2
Service es	tablishments
Ticket sales /information	0,008
Public wardrobes (dressing room)	0,058
Equipment and repair	0,066
Resting rooms	0,018
Services for guests/ski schools	0,02
Programmes for children	0,028
Total service objects	0,198
Commer	cial objects
Food services	0,165
kitchens	0,082
Rest rooms	0,083
Retail	0,052

Total commercial objects	0,382
Management	
administration	0,051
Objects for the employees	0,017
First aid and ski patrol	0,022
Total management	0,09
Total management	0,67
Storage/Magazines	0,067
Mechanization/maintanence/service	0,1
All total	0,837

The defining of the base settlement, or the locations of the accommodation capacities, is done on a way that they are in the vicinity of the ski stages with the purpose of avoiding the transport from the accommodation capacities to the ski fields. The scattered type of base settlement provides a even load of the beginning chairlifts and ski lifts and with that the possibility for long waiting times for transport to the wanted stages is avoided. The base settlement should consist of a mixture of apartments, hostels, hotels and other types of accommodation capacities. All obejcts that are in the vicinity of the main street, or along the length of the main street from the village. Part of them will have a trade objects on the level of the street, offering a choice of restaurants and bars, shops and other ski and tourist services.

Part of the base settlement will be closed for traffic, or part of the sterets will be only for pedestrians. On the pedestrian streets, squareas, open spaces and recreational object in the village objects for fun for the guests will be placed for the duration of the whole year.

# Defining of the system of Chairlifts and ski lifts

The analyses of the space and field potentials of the locality Carev Vrv showed that the fields are ideal for skiing. In accordance with the results the most appropriate location for placing the future ski stages and the accompanying skiing infrastructure is from the peak Carev Vrv through the srt\* Kitka in the direction of the area called Meckin Kamen, then from Carev Vrv in the direction towards Ruen and from Carev Vrv to the direction towards Mal Cepernik, through Tasovo. On Picture no. 35 the locality Carev Vrv with the forecasted contents is shown.

Picture no. 35 Chairlifts and stages





C km

167

The system of Chairlifts and ski lifts is comprised of the following Chairlifts and ski lifts:

Chairlift	Length	Begins on height above the sea level	Ends on height above the sea level	Height difference	Type of chairlift
Chairlift 1	1732	1240	1900	660	D4D
Chairlift 2	1251	1388	1975	587	D4F
Chairlift 3	1358	1449	2016	567	D2F
Chairlift 4	1030	1506	1885	379	D4F
Chairlift 5	639	1424	1729	305	D4D
Chairlift 6	805	1530	1756	226	D2F
Chairlift 7	2362	1293	1900	607	D3F
Chairlift 8	2263	1335	1975	640	D2F
Chairlift 9	2410	1323	2070	747	D3F
Ski lift 1	1181	1750	1975	225	T bar
Ski lift 2	428	1921	2007	86	T bar
Ski lift 3	127	1975	2009	34	T bar

#### Legend:

D2F - two seat chairlift with fixed seats

D3F - three seat chairlift with fixed seats

D4D- four seat chairlift with slowed ascencion (separated seats)

D4F- four seat chairlift with fixed seats

T-bar – ski lift

The ski center Carev Vrv will have the following ski stages, ski stages and sledging stage.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas
Stage 1	5257	660	13%	Sledging	10,5
Stage 2	2376	660	28%	normal	14,3
Stage 3	1833	660	36%	normal	11,0
Stage 4	2000	660	33%	normal	12,0

Stage 5	1512	587	39%	normal	9,1
Stage 6	1313	587	45%	difficult	7,9
Stage 7	1365	587	43%	normal	8,2
Stage 8	1386	457	33%	normal	8,3
Stage 9	1584	457	29%	normal	9,5
Stage 10	1652	510	31%	normal	9,9
Stage 11	1631	379	23%	easy	9,8
Stage 12	1261	379	30%	normal	7,6
Stage 13	1604	379	24%	easy	9,6
Stage 14	1402	305	22%	easy	8,4
Stage 15	1225	305	25%	easy	7,4
Stage 16	1079	305	28%	normal	6,5
Stage 17	795	199	25%	normal	4,8
Stage 18	646	199	31%	normal	3,9
Stage 19	1000	226	23%	easy	6,0
Stage 20	786	226	29%	normal	4,7
Stage 21 Ski stage	1356	106	8%	easy	7,5
Stage 22 Ski stage	689	57	8%	easy	3,8
Stage 23 Ski stage	1016	41	4%	easy	5,6
Stage 24	2456	607	25%	normal	13,5
Stage 25	2418	607	25%	normal	13,3
Stage 26	2568	607	24%	easy	14,1
Stage 27	2309	640	28%	normal	12,7
Stage 28	2265	640	28%	normal	12,5
Stage 29	1104	225	20%	easy	6,1
Stage 30	1159	225	19%	easy	6,4
Stage 31	2579	747	29%	normal	14,2
Stage 32	2446	747	31%	normal	13,5
Stage 33	2765	747	27%	normal	15,2
Stage 34 ski stage	1089	225	21%	easy	6,0

Stage 35	434	86	20%	easy	2,4
Stage 36	130	34	26%	normal	0,7
Вкупно	58.490 m				316,5

# **Capacity of the Chairlifts and ski lifts**

### Chairlift 1.

Chairlift	Length	Type of chairlift	Capacity of hours	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 1	1732	D4D	2000	1188000	4950	90%	1440

With chairlift 1 the skiers and snowboarders that will use stages 1, 2, 3 and 4 will be transported. Although stage no. 1 is foreseen for sledging with the purpose of calculating its capacity, it is taken as foreseen for skiing.

In the table the characteristics of the stages that are connected to chairlift no. 1 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average numbers of skiers per hectare	Capacity of the stages
Stage 1	5257	660	13%	easy	10,5	40	421
Stage 2	2376	660	28%	normal	13,1	28	366
Stage 3	1833	660	36%	normal	10,1	27	272
Stage 4	2000	660	33%	normal	11,0	27	297
Вкупен capacity							

Regarding the difficulty of the stage determined by 100 meters on the greatest inclination the ski stages that are connected to chairlift 1 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 1	5257	660	22%	easy
Stage 2	2376	660	41%	normal
Stage 3	1833	660	49%	difficult
Stage 4	2000	660	43%	normal

The profile of the ski stages that will be services with chairlift number 1 are shown in the following pictures.



Stage no. 1 (stage for sledging)

### Stage no. 2



Stage no. 3







## Chairlift no. 2

Chairlift	Length	Height difference	Type of chairlift	Capacity per hour	VTM/hour	VTM demand	Climbing efficacy	CCC
Chairlift 2	1251	587	D4F	1400	821800	5250	70%	657

With chairlift 2 the skiers and snowboarders that will use stages 5, 6 and 7 will be transported.

In the following table the characteristics of the stages that are connected to chairlift no. 2 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skiers per hectare	Capacity of the stages
Stage 5	1512	587	39%	normal	9,1	28	254
Stage 6	1313	587	45%	difficult	7,9	20	158
Stage 7	1365	587	43%	normal	8,2	25	205

#### Вкупно

The difficulty of the stage determined by 100 meters on the biggest inclination of the ski stages that are connected to chairlift 2 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 5	1512	587	39%	normal
Stage 6	1313	587	47%	difficult
Stage 7	1365	587	43%	normal

The profile of the ski stages that will be serviced by chairlift 2 are shown on the following pictures.



Stage no. 5

### Stage no. 6







# Chairlift no. 3

Chairlift	Length	Height difference	Type of chairlift	Capacity of hour	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 3	1358	567	D2F	1000	567000	3180	70%	749

With chairlift no 3 the skiers and snowboarders that will use stages 8, 9 and 10 are transported.

In the following table the characteristics of the stages that are connected to chairlift no. 3 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage categorization	Surface in hectareas	Average number of skiers per hectare	Capacity of the stages
Stage 8	1386	457	33%	normal	8,3	28	233

Stage 9	1584	457	29%	normal	9,5	28	266
Stage 10	1652	510	31%	normal	9,9	27	268
Вкупно							

The diffculty of the stage determined by 100 meters on the biggest inclination of the ski stages that are connected to chairlift 3 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 8	1386	457	64%	difficult
Stage 9	1584	457	68%	difficult
Stage 10	1652	510	35%	normal

The profile of the ski stages that will be serviced with chairlift 3 are shown on the following pictures.



Stage no. 8

Stage no. 9







#### Chairlift no. 4

Chairlift	Length	Height difference	Type of chairlift	Capacity per hour	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 4	1030	817	D4F	1600	606400	3050	75%	895

With chairlift 4 the skiers and snowboarders that will use the stages 11, 12 and 13 will be transported.

In the following table the characteristics of the stages that are connected to chairlift no. 4 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skiers per hectare	Capacity of the stages
Stage 11	1631	379	23%	easy	9,8	35	343
Stage 12	1261	379	30%	normal	7,6	28	212

Stage 13	1604	379	24%	easy	9,6	35	337
Вкупно							

The difficulty of the stage determined by 100 meters of the biggest inclination of the ski stages that are connected to chairlift 4 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 11	1631	379	36%	normal
Stage 12	1261	379	38%	normal
Stage 13	1604	379	41%	normal

The profile of the ski stages that will be servised with chairlift 4 are shown on the following pictures.



Stage no. 11





Stage no. 13



#### Chairlift 5

Chairlift	Length	Height difference	Type of chairlift	Capacity of hour	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 5	639	305	D4D	1600	488000	2510	80%	933

With chairlift 5 the skiers and snowboarders that will use stages 14, 15, 16, 17 and 18 are transported. This chairlift is also connected to chairlift 6.

In the following table the characteristics of the stages that are connected to chairlift 5 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 14	1402	305	22%	easy	8,4	36	303
Stage 15	1225	305	25%	normal	7,4	28	206
Stage 16	1079	305	28%	normal	6,5	28	181
Stage 17	795	199	24%	easy	4,8	28	134
Stage 18	646	199	31%	normal	3,9	27	105
Вкупно							929

The difficulty of the stage by 100 meters of the biggest inclination of the ski stages connected to chairlift 5 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 14	1402	305	35%	normal

Stage 15	1225	305	43%	normal
Stage 16	1079	305	53%	difficult
Stage 17	795	199	31%	normal
Stage 18	646	199	28%	normal

The profile of the ski stages serviced with chairlift 5 are shown on the following pictures.

Stage 14


















## Chairlift 6

Chairlift	Length	Height difference	Type of chairlift	Capacity per hour	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 6	805	226	D2F	1000	226000	2600	70%	365

With chairlift 6 the skiers and snowboarders that will use stage 19 and 20 will be transported. In the following table the characteristics of the stages that are connected to chairlift 6 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 19	1000	226	23%	easy	6,0	35	210
Stage 20	786	226	29%	normal	4,7	28	132
·			Вкупно				342

The difficulty of the stage by 100 meters of the biggest inclination of the ski stages connected to chairlift 6 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 19	1000	226	28%	normal
Stage 20	786	226	36%	normal

The profile of the ski stages that will be serviced with chairlift 6 are shown on the following pictures.

Stage 19







### **Chairlift 7**

Chairlift	Length	Height difference	Type of chairlift	Capacity per hour	VTM/hour	VTM demand	Climbing efficiency	ссс
	2362	607	D3F	1400	849800	2580	70%	1383

With chairlift 7 the skiers and snowboarders that will use stages 24, 25 and 26 will be transported. In the following table the characteristics of the stages connected to chairlift 7 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 24	2456	607	25%	normal	13,5	28	378
Stage 25	2418	607	25%	normal	13,3	28	372
Stage 26	2568	607	24%	easy	14,1	35	494

### Вкупно

The difficulty of the stage by 100 meters of the biggest inclination of the ski stages connected to chairlift 7 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 24	2456	607	35%	normal
Stage 25	2418	607	43%	normal
Stage 26	2568	607	53%	difficult

The profile of the ski stages that will be serviced with chairlift 7 are shown on the following pictures.



Stage no. 24

Stage no. 25



Stage no. 26



## Chairlift 8

Chairlift	Length	Height difference	Type of chairlift	Capacity of hour	VTM/hour	VTM demand	Climbing efficiency	CCC
Chairlift 8	2263	640	D2F	1200	768000	3150	70%	1024

With chairlift 8 the skiers and snowboarders that will use stages 27 and 28 will be transported. In the following table the characteristics of the stages connected to chairlift 8 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 27	2309	640	28%	normal	12,7	28	356
Stage 28	2265	640	28%	normal	12,5	28	349
Вкупно							

The difficulty of the stage by 100 meters of the biggest inclination of the ski stages connected to chairlift 8 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 27	2309	640	38%	normal
Stage 28	2265	640	36%	normal

The profile of the ski stages that will be serviced with chairlift 8 are shown on the following pictures.

Stage no. 27



Stage no. 28



### **Chairlift 9**



With chairlift 9 the skiers and snowboarders that will use stages 31, 32 and 33 will be transported. In the following table the characteristics of the stages connected to chairlift 9 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 31	2579	747	29%	normal	14,2	28	397
Stage 32	2446	747	31%	normal	13,5	27	363
Stage 33	2765	747	27%	normal	15,2	28	426
Вкупно							

The difficulty of the stage by 100 meters of the biggest inclination of the ski stages connected to chairlift 9 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 31	2579	747	41%	normal
Stage 32	2446	747	49%	difficult
Stage 33	2765	747	38%	normal

The profile of the ski stages that will be serviced with chairlift 9 are shown on the following pictures.

Stage no. 31



Stage no. 32







### Ski lift 1

Ski lift	Length	Height difference	Type of chairlift	Capacity in hour	VTM/hour	VTM demand	Climbing efficiency	ССС
Ski lift 1	1181	225	T bar	800	180000	1350	90%	720

With ski lift 1 the skiers and snowboarders that will use stages 29 and 30 will be transported. In the following table the characteristics of the stages that are connected to ski lift 1 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Average number of skier per hectare	Capacity of the stages
Stage 29	1104	225	20%	easy	6,1	38	231
Stage 30	1159	225	19%	easy	6,4	40	255
Вкупно							

The difficulty of each stage determined by 100 meters of the biggest inclination of the ski stages connected to ski lift 1 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 29	1104	225	23%	easy
Stage 30	1159	225	21%	easy

The profile of the ski stages that will be serviced with ski lift 1 are shown in the following pictures.



Stage no. 29

Stage no. 30



### Ski lifts 2 and 3

Ski lift	Length	Height difference	Type of chairlift	Capacity per hour	VTM/hour	VTM demand	Climbing efficiency	ССС
Ski lift 2	428	86	T bar	400	34400	1500	70%	96
Ski lift 3	127	34	T bar	400	6800	1500	80%	44

With ski lift 1 the skiers and snowboarders that will use stages 29 and 30 will be transported. In the following table the characteristics of the stages that are connected to ski lifts 2 and 3 are shown.

Stage	Length (m)	Height difference (m)	Average inclination	Stage category	Surface in hectareas	Avrage number of skier per hectare	Capacity of the stages
Stage 35	434	86	20%	easy	2,4	37	88
Stage 36	130	34	26%	normal	0,7	28	20

The difficulty of each stage determined by 100 meters of the biggest inclination of the ski stages that are connected to ski lifts 2 and 3 are shown on the following table.

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 35	434	86	23%	easy
Stage 36	130	34	28%	normal

The profile of the ski stages that will be serviced with ski lift 1 are shown on the following pictures.

Stage no. 35







The profile of the stages shown on the previous picture shows that large construction works for construction of the stages are not needed. Smaller works for leveling out parts of the stages are needed, or leveling out the existing uneven parts of the stages.

The balance between the capacities of the stages and the capacities of the system of chairlifts and ski lifts is shown in Picture no. 36.

The average positioning of the system of chairlifts and ski lifts as well as of the ski stages is shown on Picture no. 37.



Picture no. 36 Balance of the capacity of the chairlifts and the ski lifts with the capacity of the stages.

Picture no. 37 Physical positioning



The total balance of the ski center Carev Vrv, including the capacity of the ski stages is shown on the following picture.





## Structure of the ski stages

The structure of the stages in the ski center Carev Vrv according to their difficulty are shown in the following table.

Stage category	length	%
Easy	11	19,0%
Normal	39	67,0%
difficult	8	14,0%

On the following picture the comparison of the structure of the stages in relation to the recommended structure of the stages for a ski center is shown.



Picture no. 39 (easy, normal, difficult; on the right: ideal)

## Phase construction (Construction in phases) of the ski center

A total of 36 stages are planned for the locality Carev Vrv, including the ski stages that serve as connecting certain chairlifts and for access to the base settlement. The system of chairlifts is comprised of 8 chairlifts, 3 ski lifts and 3 movable tracks. The total length of the stages is 58 km and the fields are on 306 hectareas, and the center itself on more than 1000 hectareas. The total length of the stages will rank this ski center between the first 5 ski centers in size in the Balkans and also beyond. The development of a ski center is an investment that is relatively big. All ski center developed in a contunial process that is comprised of several phases. The infrastructure that is needed in order for a ski center to be build requires relatively big financial means, or relatively big investmenet means. With the purpose of defining of a real concept that can be realized in the next 10 years, the development of the ski center that is planned to be located in the vicinity of Carev Vrv is foreseen to take place in two phases which are technologically separate one from the other. The developmental phases are shown in Picture no. 40. The phases are defined in accordance to the geographic characteristics and the commercial potential of all microlocations that are identified as approrpiate for construction of the ski stages and that are comprised with this ski center. Besides that the phases are planned taking into consideration the results from the analyses of the market and potential markets, estimations for the number of potential users, or visitors of this ski center and the international competition.

Picture no. 40 phase realization



P = 25,000

Picture no. 41 phase 1





## Picture no. 42 phase 2



P =1: 15000

0 0.25 0.5 0.75 1 1.25 km

## First phase of the development of the ski center "Carev Vrv"

The first phase of the planned development of a ski center on the locality Carev Vrv is defined according to the estimations of the need for construction of ski stages that would allow maximal acceptance at the same time of something below 5200 skiers/snowboarders. In table no. 56 the Chairlifts and ski lifts that will be realized in the first phase are shown. In table no. 57 the stages that will be done in the frame of the first phase are shown.

Chairlift	Length	Height difference	Type of chairlift	Capacity
Chairlift 1	1732	660	D4D	1440
Chairlift 2	1251	587	D4F	657
Chairlift 3	1358	567	D2F	749
Chairlift 4	1030	379	D4F	895
Chairlift 5	639	305	D4D	933
Chairlift 6	805	226	D2F	365
Ski lift 2	428	86	T bar	96
Ski lift 3	127	34	T bar	44
Total	7370			5179

Table no. 56

Table no. 57

Stage	Length (m)	Stage category	Surface in hectareas	Capacity
Stage 1	5257	Sledging	10,5	421
Stage 2	2376	normal	14,3	366
Stage 3	1833	normal	11,0	272
Stage 4	2000	normal	12,0	297
Stage 5	1512	normal	9,1	254
Stage 6	1313	difficult	7,9	158
Stage 7	1365	normal	8,2	205

Stage 8	1386	normal	8,3	233
Stage 9	1584	normal	9,5	266
Stage 10	1652	normal	9,9	268
Stage 11	1631	easy	9,8	343
Stage 12	1261	normal	7,6	212
Stage 13	1604	easy	9,6	337
Stage 14	1402	easy	8,4	303
Stage 15	1225	normal	7,4	206
Stage 16	1079	normal	6,5	181
Stage 17	795	normal	4,8	134
Stage 18	646	normal	3,9	105
Stage 19	1000	easy	6,0	210
Stage 20	786	normal	4,7	132
Stage 21 Ski stage	1356	easy	7,5	268
Stage 22 Ski stage	689	easy	3,8	136
Stage 23 Ski stage	1016	easy	5,6	201
Stage 35	434	easy	2,4	88
Stage 36	130	normal	0,7	20
Total	35.332		189,4	5.616

According to 100 meters of the biggest inclination the stages from the first phase are shown in Table no. 58.

Table no. 58 difficulty according to 100 meters of the biggest inclination

Stage	Length (m)	Height difference (m)	100 m biggest inclination	Stage category
Stage 1	5257	660	22%	easy
Stage 2	2376	660	41%	normal
Stage 3	1833	660	49%	difficult
Stage 4	2000	660	43%	normal
Stage 5	1512	587	39%	normal
Stage 6	1313	587	47%	difficult
Stage 7	1365	587	43%	normal

Stage 8	1386	457	64%	difficult
Stage 9	1584	457	68%	difficult
Stage 10	1652	510	35%	normal
Stage 11	1631	379	36%	normal
Stage 12	1261	379	38%	normal
Stage 13	1604	379	41%	normal
Stage 14	1402	305	35%	normal
Stage 15	1225	305	43%	normal
Stage 16	1079	305	53%	difficult
Stage 17	795	199	31%	normal
Stage 18	646	199	28%	normal
Stage 19	1000	226	28%	normal
Stage 20	786	226	36%	normal
Stage 35	434	86	23%	easy
Stage 36	130	34	28%	normal

The total length of the stages according to the skills required for skiing on them is shown on Picture no. 43

Picture no. 43 Length of the stages according to the difficulty



(Blue - easy; red - normal; gray - difficult)

The structure of the stages from the aspect of the needed skill for skiing as well as according to the recommended structure is shown on the following picture.

### Picture no. 44



## Artificial snow system

In accordance to the previously defined parameters for dimensioning of the artificial snow system, the dimensioning of the artificial snow system has been done.



In Table no. 59 the needed installations for the construction of a modern snow system are shown.

Phase	Ski stages total surface	Recommende d coverage of the stages with the system	Ski stages surface covered with the artificial snow system	Snow depth for opening	Snow volume	Need for water	Seasonal snow depth	Snow volume	Need for water
	(ha)	%	(ha)	(cm)	(m3)	(m3)	(cm)	(m3)	(m3)
Phase I	190	60	114	50	570.000	313.500	100	1.140.000	627.000
Phase II	170	60	102	50	510.000	280.500	100	1.020.000	561.000
Total									1.188.000

## **Snow processing**

The number of needed special vehicles for preparation of the stages, or softening of the snow, the so-called snowcats is defined on the basis of the surface of the ski stages and the classification of the ski stages according to their difficulty for the phase I. It is defined that one snowcat on average will be processed in one nightly shift 23 hectareas of stages. On the basis on these criteria, the needed number for special vehicles – snowcats – are calculated. The results are given in table no. 60.

Table no. 60

Class	Ski stages area (ha)	Machine coverage ((ha)/machines/ shifts)	Availability of the machines	Softening intervals (days)	Recommend ed number of machines	Total machin es
Phase I	190	23	80%	1	10,23	10
Phase II	170	23	80%	1	9,35	9
Total						19

## **Base tourist settlement**

Because of the steep field as well as with the purpose of locating the base settlement in the immediate vicinity of the chairlifts and ski stages, the base settlement is planned to be of the scattered type with a total surface area of approximately 25 hectareas. The settlement will be found in three units that are with an average size of 8 hectareas and are in the immediate vicinity of the stages. In the frame of each complex parkings are foreseen.

After the completion of the technical analyses of the feasibility study of the locality Carev Vrv and determining of the appropriateness of the fields for skiing / snowboarding, also defined is the base settlement, or the concept for using the land for development of the base tourist settlement. The concept that has been developed is on a basic conceptual level of planning and is developed with the purpose of defining the investment and operational expenses of the planned center and it is not a substitution for the detailed master plan, that should be developed in the next phase of the development of the ski center together with the basic project.

The base tourist settlement is foreseen to the in the focus of development as a commercial and fun center of the ski resort. The settlement is comprised of various types of accommodation capacities such as apartments, condohotels, hostels, hotels and others.

All objects that are located along the length of the main road as well as the main streets in each of the individual parcels of the settlement should have trade objects on the level of the street, offering a choice of restaurants and bars, shops and other skiing and tourist services. Pedestrian streets, squareas, open spaces and recreational objects in the village will be the source for entertainment for the guests throughout the year. The objects for accommodation of the tourists should be located in the center of the settlement in the vicinity of the shops, restaurants and clubs, or on the so-called ski-in/skiout locations (access to the stages from the hotel on skiis and skiing to the hotel). With the purpose of increasing the density of buildings in the most wanted areas for development as well as providing an appropriate number of parking places, all tourist accommodation need to have underground parking, or a combination of surface parking and individual garages.

The physical positioning of the objects that are foreseen to be realized in the first phase of the construction of the ski center is shown in Picture no. 45.

Picture no. 45 Physical positioning Phase 1



Dimensioning of the needed number of accommodation capacities is shown in table no. 61

Table no. 61

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	Total number of beds in the accommodation capacities in relation to the meters of vertical transport per hour (0,08-0,10)	number of beds in the nodation capacities in ion to the meters of al transport per hour $(0,08-0,10)$ UTM/h per hectare of ski stages $(30.000-35.000)$ and $(20-35)$ (20-35)		56% from CCC	average
I phase	3262	31459	3800	2900	3321
II phase	2275	29576	2140	2484	2299
Total	5537		5940	5384	5620
Average		30517			

5600 beds that will be located in the accommodation capacities that are different in type and categorization will be needed for the two phases of development of the ski center Carev Vrv. The structure of the accommodation capacities are shown in Table no. 62

### Table no. 62 Accommodation capacities

	Recommended structure	Adopted	I phase	II phase	total
Category 4*	18 - 22%	22,00%	726	506	1232
Categories 2 and 3*	30 - 45%	40,00%	1320	920	2240
Private accommodation and apartments	8 - 25%	25,00%	825	575	1400
Youth hostels	5 - 10%	8,00%	264	184	448
Other types of accommodation	6 - 8%	5,00%	165	115	280
Total			3300	2300	5600

For the first phase of construction of the ski center a total of 3300 beds that will be located in the above defined accommodation capacities are needed. In table no. 63 the type of accommodation capacity for each of the above mentioned types of accommodation capacity is shown.

Table no. 63

	number of beds	type of accommodation capacities
Catagory 4*	762	1 MICE hotel; 1 hotel oriented towards families
Category 3*	1320	1 Wellness hotel;1 for sport professionals; 2 for families
Private accommodation and apartments	825	100 weekend cottages; 100 apartments
Youth hostels	264	2 hostels 2*
Other types of accommodation	165	Alpine houses 20; hotel board 4
Total	3300	

### Accompanying objects

The total capacity of the ski center in the first phase of realization is 5500 skiers/snowboarders. Of the maximum number of skiers and snowboarders that at the same time can accept the stages that will be built in the first phase

approximately 4200 will be stationed guests, whereas the number of the oneday skiers will be 1300. For the needs of the one-day guests 700 parking planes for cars, 48 parking places for commercial vehicles and 12 parking places for buses will have to be built.

As accompanying objects, or accompanying infrastructure in the duration of the construction of the first phase of the ski center, a certain number of objects for services wil be built and equipped, then a certain number of rooms that will be with trade content and which will mainly be accomodated in the frame of the accommodation capacities (on the ground floor).

Part of the service establishments will need to be placed on the stages themselves, or on each stage one or two service establishments need to be built. 50% of these object should function on the basis of self service.

On the locality itself, today two ruined objects (old sentries) are located for which it is suggested to be recontruscted and repurposed into a mountain hut (the one object) and a service establishment with accompanying contents (events, entertainment, thematic contents and so on).

During the projection of the accommodation objects, especially the objects from a higher category, attention should be paid on the need for increasing the capacities with the further development of the ski center, or with the realization of the second. At the hotels and hostels the parking needs to be solved by the construction of a parking on a level of -1 and -2, in the frame of the objects. The remaining accommodation capacities will need to solve the parking in the frame of their parcels.

In accordance with the defined maximal number of skiers, as well as the number of beds, also defined are the remaining contents necessary for the functioning of a modern ski center. In table 12 the planned contents, or objects for the needs of the ski center in the base settlement are shown.

For the purpose of traffic flow in the base tourist settlement, approximately 6700 m of roads and 50 parking places for the supply needs need to be built.

With the purpose of increasing the attractiveness of the ski center, as well as expanding the offer in the center, during the realization of the first phase of the ski center it is need the projects that are defined and explained further in the study to be realized. In table no. 64 the surfaces of the objects that are planned to be built in the frame od phase 1 and phase 2 are shown.

Table no. 64

Service activities for the tourists	Surface of objects				
	I phase	II phase			
Service objects					
Ticket sales /information	41,6	17,6			
Public dressing rooms	301,6	127,6			
Equipment and repair	343,2	145,2			
Rest rooms	93,6	39,6			
Services for guests/ski schools	104	44			
Programmes for children	145,6	61,6			
Total service objects	1029,6	435,6			
Commercial objects					
Food services	858	363			
Kitchens	426,4	180,4			
Rest rooms	431,6	182,6			
Retail	270,4	114,4			
Total commercial objects	1986,4	840,4			
Management					
Administration	265,2	112,2			
Objects for the employees	88,4	37,4			
First aid and ski patrol	114,4	48,4			
Total management	468	198			
Total	3484	1474			
Storage/Magazine	348,4	147,4			
Mechanization/maintenance/service	520	220			
Total	4820,4	2039,4			



Mountain hotel with 3 \* intended for families - capacity 350 beds

Description Hotel from the middle class intended for families. The hotel will offer standard services for this type of hotels, will have should be near the beginning station of one of the chairlifts and will offer the appropriate value for the money that will be spent for its services. The hotel will have a nice surrounding, and through the nice service the guests will feel a covered swimming pool, internet access, 24 hour reception, room service and other services. The location of the hotel

have limited financial means and who will look for a balanced relation between the quality and the price. The whole complex will consist of two objects, and each object will be five stories tall. In total there will be 70 rooms of which 20 welcome and will enjoy in their stay. The target group of this hotel will above all be the tourists or families that will will be standard, 15 superios, 30 will be two room apartments and 5 junior apartments.



## Services

reception there need to be appropriate games and toys available for various ages of the children, as well as appropriate The hotel needs to offer various services that will be aimed towards the children and services will especially need to be offered that will allow the parents and the children to have a nice stay in the hotel. For the family apartments on the beds for the babies. The furniture must be appropriate or adjusted and safe for the children and have an appropriate security for the sources of electricity. In certain rooms and apartments there needs to be an appropriate baby monitoring equipment. The restaurant must be with capacity of 300 people and have the possibility for delivery of food for children.

and similar, open playgrounds with castles from tyre sled, children attractions, an artificial beach, childrens swings and Necessary contents of the hotel: closed swimming pool and shallow swimming pool for children, place for rest and safe monitoring, kindergarten for children, divided in age groups, with departments for drawing, playing, children theater possibility for using the stages, appropriate food for children, a kids' table during the lunch and dinner with provided playing for children in a closed area, a playground for children in the frame of the land of the hotel, an all inclusive slide, carousel, tricycles, automobile toys, different houses for playing and other.

# Accommodation objects hotel category 4\* - capacity 350 beds

## Description

Incentives, Conferences and Events) The hotel with 4 stars is mainly a big hotel with quality of services above the average. Also the offer of services needs to be rich with various contents and there needs to be a wider Hotel intended for business and congress tourism with "Wellness on the mountain" – MICE hotel (Meetings,

in accordance with the offer of services. The hotel restaurant should offer a menu with more food options as well as room service. The hotel itself should be located near the ski stages, i.e. in the central part of the base offer of the standard services, i.e. more luxurious services to also be available i.e. fitness center, swimming pool, baths, massages, programmes from a health aspect and etc. The hotel that is recommended to be a part of the ski center Carev Vrv is above all aimed for services on the market of congress tourism not only in Macedonia, but beyond as well. The hour star hotel needs to have a high quality of service and adequate prices settlement. The hotel should have quality, well equipped and light rooms, 24 hour reception, appropriate level of technical equipment, parking place.



## Services

Within the hotels there should be 2 restaurants, 2 cafes, a fitness club, a closed swimming pool with sauna, baths and appropriate services, a closed parking, two halls for simposia, meetings, trainings and a small hall for meetings with a capacity for up to 20 people. One of the halls needs to have a capacity of up to 200 persons, and the other to be with a capacity of up to 50 persons.

# Hotel with 3 \* Wellness и Spa - capacity 250 beds

## Description

services and cosmetic treatment, internet access, 24 hour reception, room service, as well as other services. The relatively low prices, for this type of service intended for visitors that will take care of their health and who have limited financial means. The standard offer of the hotel will be oriented towards spa and wellness services in the spa center which the hotel will have. The hotel will have several types of sauna, relaxation rooms, massage Within the offer for accommodation capacities in the ski center a middle class hotel needs to be built, one with hotel needs to be in a peaceful and quiet surrounding, near a forest and will have a nice and relaxed surrounding,

services to be offered to the other guests in the center. In the frame of the wellness part there should also be a with an appropriately equipped interior so that the guests enjoy their stay. The architecture of the hotel needs to be adjusted for mountain objects. The complex will comprise of four objects, and each object will be three stories tall. The welness and spa center must be accessible from outside the hotel as well, with the purpose of the medicine center for beauty, as well as a beauty salon.



Services

The hotel needs to offer complete services that are part of the standard spa and wellness programs. The hotel is directed towards the middle and older generation that take more care of their health. Within of the hotel a part for wellness is planned, with a total surface area from 1500 to 2000 m<sup>2</sup>, in which besides the swimming pool and saunas, the rooms for treatment and relaxation will be included as well. In the frame of this part the following services should also be included:

- The programs and treatments must be available 6 days a wekk and for 5 hours during the day
- An offer for cosmetic treatment and various relaxation treatments and improvement of the physical look
- A departpment for fitness with the appropriate equipement, aromatherapy, reflexology, a wide spectar of massages and so on
  - Rooms and equipment for various programs for reduction of body weigth
- At least two small swimming pools aimed for mountain wellness (a swimming pool with herb evaporations, hydrotherapy, stone bath etc.)

# Apartments with $3^*$ и $4^*$ - capacity 350 beds

## Description

reception of the objects is ussually common for all capacities and can be found outside of the apartment objects. The can be part of the capacity for renting only if they are available for renting when the user does not use them. The equipped so that they can be used. Each apartment will have a completely equipped kitchen. The accommodation units The accommodation capacity of the apartment type are houses with identical looks that are built in row and that actually are a whole of one complex. The apartments are aimed for rent per night and they have to be completelly

jakuzi, a fireplace, to be more luxuriously equipped, to have cable television and so on. In the vicinity of the apartments need to be built in 5 to 7 objects. Part of the apartments need to be of a higher category and equipped with apartments a supermarket needs to be foreseen. The height of the obejcts should not surpass four stories.



Services

The apartments need to offer appropriate services for accommodation on the basis on nights spent for tourists that want to take care for their food themselevels and who want to have bigger freedom or cohice for organizing their time. \* three room apartment with 6 to 8 beds and they will comprise of a bath, kitchen, living room and three bedrooms

- \* two room apartments with 4 to 6 beds and they will comprise of a bath, kitchen, living room and two bedrooms
- \* one room apartment with 2 to 4 beds and they will comprise of a bath, kitchen, living room and bedroom

Hostels – total capacity 250 beds

Description

The hostels are accommodation objects from the economic class that offer relativally cheap accommodation. The hostels exchange of cultural specifics between the young. In the hostels the guest can rent a bed in a communal bedroom and are mostly intendedi for younger visitors and mountaineers. The basic goal is to provide short term accommodation for the visitors in relatively low prices for accommodation. As one of the specificities of the hostels is the possibility for

use the communal bathroom, kitchen and resting areas. Part of the accommodation capacities can also be private and two bed room. The positive sides of the hostels are above all the low prices for accommodation in comparison to the other types of accommodation, as well as the possibility for getting to know other visitors. The hostels are usually less formal than the hotels. The reception can be found in the frame of the hostel and is with a opredeleno working hours.



## Services

number of hostels the bathrooms and kitchens are shared by all guests in the hostel, and in relation to the accommodation to the accommodation it can be chosen between two bed and more bed rooms. Usually they have communal rooms in which the guests can spend their free time. The hostels need to be with a differenct capacity which The hostels offer only the basic services for accommodation, as well as using the communal kitchen. In the bigger needs to be from 20 up until 100 beds.

## Hotel board - total capacity 150 beds

## Description

small nuber of beds and accommodation units. The prices for accommodation and services are relatively acceptable for a bigger number of clients. The location should be in the vicinity of the chairlifts, but distanced from the center of the base accommodation with breakfast or halfpansion. They are managed by one family and are relatively small or relative to the The small hotels are called hotel pansioni. Usually they are private and represent family hotels what usually offer settlement. It is necessary for a simple and easy access to the object to be provided.



## Services

The hotels-pansioni besides the basic services of accommodation and food offer some additional services as are the food, vegetarian and others). In the object itself there could also be a restaurant for the guests. They should have several two bed rooms in which more beds can be added. Part of the rooms are adjusted for accommodation of families solarium, sauna, massages, but also food acustomed to the various needs of the guests (bio products, home prepared There are various types of categories for this type of hotels: from hotels with 2 stars up until luxurious small hotels with and they can be of the apartment type. Quite often in these hotels the type of apartment accommodation is offered. 5 stars.

## Mountain cottages - total capacity 250 beds

## Description

projecting of this type of object in order for all to have similar arhitektonic elements. The size of the needed parcela is between 4 and 10. The location needs to be in the vicinity of the newly projected stages and the parking should be in the The mountain cottages are objects that are characterized by its specific architecture which is characteristic for the from 600 to 1000  $m^2$  per object. The size of the objects is from 120 to 200  $m^2$ . The number of beds is different and is locality on which they are built. Usually the architecture should be adjusted to the local specificities, or the local old architecture. Mostly they are built by a combination of stone and wood. It is necesssary to be propisat standards for frame of the parcela. These object should be completelly equipped and shoul allow a nice stay for a bigger company.



## Services

basis of apartment is offer, but depending from the category of the object in the frame of the complex there can also be a closed swimming pool, fitness gym and other types of offers. As part of the offer there can also be a delivery of home The services that are offered in this type of accommodation capacity are various. Most often only accommodation of the prepared meals, bread and other types of bakeries, as well as delivery of organic products and local specialities.
## Content 1.

# Sledging stage

Macedonia and beyond there is no sledging stage. With the construction of the stage tourists will be attracted who are allow the possibility of recreation also to the visitors who are not skiers. Of course a big part of the skiers will use the Description: Stage number 1 which is serviced from chairlift no. 1 is foreseen to be a sledging stage. All of those that do not ski or snowboard or are not skiers and have smaller possibilities for recreation in the duration of their stay in one ski center who is exceptionally directed towards active skiers or snowboarders. The construction of the sledging stage will chance to try something new and interestting. Within this service renting of sledges per hour is foreseen. Today in willing for adventure and an active vacation. In the frame of this object there should be procured the so-called snow bycicles so that they can also be rented.

Basic goal: Increasing the offer in the duration of the winter period and attracting visitors that are not skiers or snowboarders.





# Ski park for children

children), as well as a movable rug, sledges, an entertainment tent with a podium, short stages for descent with snow rafts or snow tubing, and differeng figures for children. The necessary surface are is  $5.000 \text{ m}^2$ . The location of the park is foreseen to be in the vicinity of the base settlement. With the project conditions for increasing the offer aimed at families the park conditions for learning skiing and snowboarding skills through play and in a fun environment will be created, in a surrounding that is entertaining and safe for the children. In the frame of the ski park there will need to be provided Description: **The ski park is aimed at children that are beginning to learn how to ski or snowboard. Through the realization of** appropriate rooms in which other services will be provides (food, drinks, relaxation places, toilets accustomed for will small children as well as skiing beginners will be created. Basic goal: Creating and environment in which the children and beginners will more easily solve the skiing skills thought the construction of a snow park and a development of a winter tourist product aimed at families with children.



Content 3.

# Snowboard park

length of 20 to 25 meters, steep fence, jumps with various lengths as well as half pipe and separated jumps. Through the Description: Each year the number of snowboarders increases and more and more young people decide to start for the snowboard park, such as: five meter and three meter fence, fun box, roller combo, roller, jibbing, fence with a snowboarding. Particularly interestting for the young population is snowboarding in the snowboarding parks. The location of this park is foreseen to be on stage no. 36. In the frame of the park there need to be several basic elements constructed increase and it will enable positioning of Carev Vrv as one of the most attractive destination for snowboarders in Southeast construction of this park the competetiveness of the ski center Carev Vrv in the frame of the winter tourism offer will Europe.

Basic goal: Increasing the offer for the target group of snowboarders and using the world trend on a much bigger number of this type of tourists.



## Content 4.

Stages for tobogan snow tubes

stages need to be constructed on a location that will allow usgin one of the chairlifts for vertical transport and those are a construction of an in-between-station of the chairlift itself. Each year different stages need to be made so that the From 5 to 7 stages are needed, which are combined with the tobogan snow stages in the duration of the summer. These attractiveness of the offer itself increases. In the offer for the stages, using the chairlifts and renting the necessary Description: The stages for tobogan snow tubes, which need to be from 100 to 150 meters of length and built on Ponikva. equipment needs to be included.

Basic goal: Creation an attractive offer for the target groups of families with children, young people and tourists that do not ski. Increasing the competitiveness of the ski center in the winter tourism



Content 5.

Summer stage for tobogan slide

the stage, as well as its shape are easy for change with which the attractiveness of this activity increases. It is usuall to Description: Stages for tobogan slide. The stage is made from a special material and it is flexible. The location and length of have it located near a chairlift so that the chairlift can be used for transport of the users and with that the use of the chairlift during the summer to be increased. The length of the stage should be between 150 and 200 meters with a inclination on the field between 10 and 25%. The channels that are necessary for these stages to be made may also be used for tobogan snow tube. These stages need to the constructed on a location that will allow usage of one of the chairlifts for vertical transport and those are construction of an in-between-station on the chairlift itself. Each year different stages need to be built in order for the attractiveness of the offer itlest to be increased.

tourists that do not ski. Increasing the competitiveness of the locality in the duration of the summer through the offer of a Increasing of the attractiveness of the locality Carev Vrv for the target groups of families with children, young people and Basic goal: Creation of stages for tobogan snow tube, or forming a tourist product "fun and action on the mountain". new tourist product.



# Slide stage

Description: The slide stage falls in the adventure type of fun. On the stage a similar experience is experienced as spustanje down a bob sled stage. The length of the stage should be between 1,2 and 1,5 kilometers, and the location of the stage should be defined in such a way that it allows using one of the chairlifts for transport of the users. The slide stage needs to be located outside of the ski fields because it is a fixed object that can be used in the duration of the whole year. It is necessary also for the appropriate equippement to be procured. In the offer on the stages, using the chairlifts and renting the necessary equipement should be included.

Basic goal: Creating an infrastructure for forming a tourist product "fun and action" and increasing the attractiveness of Carev Vrv for the target groups of families with children, young people and tourists that are thirsty for fun and adventure, as well as increasing the competitiveness of Carev Vrv in the duration of the summer through an offer of a new tourist product.





### ZipRider

from a certain height. With the descent on the stage a similar experience is experienced like flying with a paraglider. The length of the stage should be from 1,2 to 1,3 kilometers and the location of the stage should be such defined that it allows that is usually ised in the summer months but it can be used throughout the year. The appropriate equippement needs to Description: The ZipRider falls in the adventuristic or high adrenaline types of fun. It is about free descent on the ZipRider an appropriate height for descent to be provided. It should be located outside of the ski stages because it is a fixed object usage of one of the chairlifts for transport of the users. It is usuall for the highet points of a locality to be used in order for be procured. In the offer the descent, using of the chairlifts and renting of the necessary equipement needs to be included.

the competitiveness of Carev Vrv in the duration of the summer through the offer of a new tourist product, such as there is Carev Vrv for the target groups of young people and tourists that are thristy for fun and adventure, as well as increasing Basic goal: Creation of infrastructure for forming of a tourist product "fun and action" and increasing the attractiveness of none in the Balkans and beyond.



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Attractive mountain cottages for drustveni activities after skiing (Apes Ski)

Description: The construction of relatively small mountain cottages that can be dismantable and will serve as provide services that will contribute to the increase of the offer in the duration of the day or the period after skiing. In accordance service (food and non-alcoholic beverages), while in the other part to be on the principles of service (alcoholic drinks). The with the size on the ski center six mountain cottages are planned to be built with a charactiristic architecture that will be located in the vicinity of the beginning stages stations of the chairlifts. The capacity of these objects needs to be about location of part of these obecjts should be in the vicinity of the hotels so that their usage is providing also in the night 100 – 200 sitting places, of which about 50% need to be in the open. In one part they should be on the principle of self hours.

Basic goal: Increasing the service offer and fun and providing a space for fun in the period after the ending of the skiing day. Increasing the attractiveness of the ski center for the target groups of young people and people thirsty for fun.





Skating rink

it will offer its services to the tourists. With the skating rink the offer for tourists that do not ski will increase and also the Description: Construction of a skating rink in the open with a surface of 1200 – 1500 m<sup>2</sup>, procurement of the appropriate equipment for skating which will be able to be rented. In the frame of the skating rink a skating school will be forms which offer in the duration of the day will increase, or in the period after skiing. Basic goal: Increasing the attractiveness of the ski center for the young and sport oriented tourists, as well as increaseing the tourist offer in winter, above all for the youngest.



Walks and mountaineering on the snow

Description: In the frame of this content it is planned the appropriate equipment for mocing on the snow or mountaineering in winter conditions to be procured. The mountain treks and stages will be used, who will be appropriately be marked and conditions, and within of the offer there will also be an organized climbing to some of the surrousning peaks of the categorized in relation to the difficulty of each of the stages. The mountain stages will need to adjust to usage in the winter Osogovski mountains. Thematic walks with a certain dose of adventure and excitement will also be needed to be organized. In the frame of the project the appropriate equipement that will be rented will need to be procured. Basic goal: Increasing the tourist offer in the winter for non-skiers, as well as increasing the attractiveness of Carev Vrv for the wider specter of target groups.



Content 11.

Motor sledges

Description: A big number of developed ski centers that are regionally and beyond well known expand their offer with the possibility for renting and driving motor sledges. In the frame of this content it is needed to be procured 12 motor sledges, as well as the approrpriate protective equipement, that will be rented per hour. As part of the tourist offer it is needed for there to be an offer for organized driving, or driving in a group of motor sledges through certain stages on the mountain.

Basic goal: Increasing the tourist offer in the winter for non-skiers, as well as increasing the attractiveness of the center for the young and tourists thirsty for adventure





# Treks and a park for mountain biking

Description: Preparation of several stages for mountain biking, then a downhill stage, a park formountain biking as well as the tourists that are oriented towards this type of sport and recreation. Part of the stages need to be with an approrpiate services for renting bycicles and equipment for bycicling, will allow the ski center to become a desired place for visiting by width so that sport contests can be held on them. Basic goal: Creating a tourist product that will be aimed for tourists that like sports and adventure as well as creating conditions for conditions for doing sports contests.



# Hiking and mountain tours

Description: Preparation of the whole necessary infrastructure for providing recreational mountaineering and hiking of the capacities to be adjusted to the needs of the mountaineers. It is also necessary to train the mountain guides and to make for crossing the treck. In the duration of the stages places for rest with an appropriate infrastructure to be also made. As Osogovski mountains. It is necessary for the already existing mountain treks to be prepared but to also make new especially towards the localities that are more significant from a tourist aspect. Part of the accommodation and service maps with marked treks. It is needed for the treks to be appropriately marked and categorized with an market time needed part of the offer for recreational mountaineering, spenind the nights in tents duing longer mountain tours can also be organized. Basic goal: Creation of a tourist product that will stimulate the summer mountain tourism and will be part of the wellness program.



Content 14.

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Description: Preparation of an adventure playground for children that will be made from appropriate materials and will be comprised of several different elements such as: tree house, place for climbing for the children, an artificial climbing rock, treks for walking barefoot, tree balancing and others. The surface of the playground is  $2000 \text{ m}^2$ . Basic goal: Increasing the offer for the youngest visitors in the duration of the summer as well as increasing the attractiveness of Ponikva for families with little children in the duration of the summer period.



Content 15.

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Description: A closed sport gym for handball, basketball, futsal, as well as tennis fields. The sports players but the people that recreationally play sports with one of the target groups towards which the ski center Carev Vrv will be directed. In order for the conditions to be provided for the preparation of sportists it is necessary for the needed infrastructure to be built. Beasides the sports gym it will be needed to be built a minimum of 2 tennis fields that would be lighted. Basic goal: Creating an infrastructure for forming a tourist product aimed at sportsmen, sport clubs, as well as tourists oriented towards sprot activities as well as increasing the competitiveness on Carev Vrv in the duration of the summer through creating complete conditions for preparation of sportsmen and sport clubs.



# Content 16.

Horseback riding and carriage and/or sledge driving

developed ski centers horseback riding, carriage driving or sledging by horses is a prt of the standard tourist offer. In Description: Horseback riding as a recreation in modern times is taking a much bigger impact. In the biggest part of accordance with the concept of sustainably mobolity which is characteristic for mountain resorts the transportation of tourists with this type of transport can be one of the alternative ways of transport. Basic goal: Creating a tourist product intended for nature lovers, tourists that are willing to try something new and different from that they have in their everyday lives, as well as the tourists that enjoy in peace and quiet.



#### Input parameters for estimation of the financial expenses

Determining the height of the needed investment means is the basic elements for determining the economic sustainability of the development plan for the ski center Carev Vrv. The goal of this analysis is to estimate or determine the height of the needed investments for each of the phases that are foreseen for development of the ski center. At the same time it is necessary for the operational expenses for the operations of the center to the determined and that for a period of 20 years. The defined development of the ski center Carev Vrv is done on the basis of interaction of several types of experts. The expenses for all additional projects that are identified in order for the offer and the attractiveness of the center itself to increase are added to the basic capital expenses. The expenses of capital for the ski center are divided on expenses for the basic infrastructure and expenses for projects. The estimations of capital expenses are based on the average prices for construction of similar objects or installations in similar ski centers, but the prices are also adjusted towards the conditions of the market in Macedonia. The capital expenses are estimated in 2014. The estimation of the capital investments is done on the following presumptions:

- The investments in the external infrastructure that comprise the transport infrastructure, basic communal infrastructure will be financed by the public agencies or agencies competent for the appropriate type of infrastructure and those are not taken into consideration during the estimation of the feasibility of the project.
- The investments in the internal infrastructure are part of the total investments and will be an obligation on the future investor.
- The expenses for contrustion of objects that are directly needed for operating the ski lifts include all phases of construction (projecting and construction), as well as their equipping. The single price on m<sup>2</sup> on the objects that are located in the base settlement is estimated on 1380 euros, whereas for the objects located on the stages the estimated value is 1520 euros for m<sup>2</sup>. The objects that are necessary for maintenance of the mechanization, garages are estimated for 700 euros/m<sup>2</sup>.

- For the preparation of the stages or their processing foreseen are relatively small means, because of the configuration of the field and the need for relatively small corrections and measures for preparation of the stages. The needed financial means for preparation of the stages are estimated for 2200 euros/ha.
- The expenses for the artificial snow system are estimated for 100.000 euroes per hectare, whereas the espenses for the reserves are estimated for 18 euros per m<sup>3</sup>.

The estimated expenses for each type of object or project are shown in the following tables.

#### Expenses

#### **Capital expenses**

Planning and projecting

Table no. 65 Planning and projecting

Description	Unit measure	Single price €	I phase €	II phase €	Total €
Geodetic recording and mappring	lump sum	40.000	28.000	12.000	40.000
Master plan		150.000	150.000	/	150.000
Detail urban plan for base settlement		30.000	20.000	10.000	30.000
Preparation of basic projects and EIA		280.000	200.000	80.000	280.000
Total			398.000	100.000	498.000

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Public	Equipi	Room	Servic	Childr	Total <b>s</b>

staurant on stages	nall service establishments	oms for rest	tail	tal commercial objects
Rest	Sma	Rool	Reta	<b>Fota</b>

ministration	jects for the employees	st aid and ski patrol	al operative	al	orage/Magazine	chanization/maintenance/service	la
Admin	Object	First a	Total c	Total	Storag	Mecha	Total

#### Chairlifts and ski lift system

During the estimation of expenses for construction of the system of chairlifts and ski lifts into consideration is taken the construction of new chairlifts and ski lifts on the principle of moving in right away. In the expenses also are included the entire needed equipment, the necessary accompanying objects, as well as all needed construction works for construction of each chairlift and ski lift.

	Chairlift	Type of chairlift	I phase €	II phase €
Chairlift 1		D4D	4.100.000	
Chairlift 2		D4F	2.050.000	
Chairlift 3		D2F	1.740.000	
Chairlift 4		D4F	1.980.000	
Chairlift 5		D4D	3.560.000	
Chairlift 6		D2F	1.590.000	
Chairlift 7		D3F		2.950.000
Chairlift 8		D2F		2.360.000
Chairlift 9		D3F		3.110.000
Ski lift 1		T bar		420.000
Ski lift 2		T bar	320.000	
Ski lift 3		T bar	150.000	
	Total €		15.490.000	8.840.000

Table no. 67 Chairlifts and ski lifts

#### Preparation of ski stages

The preparation of the ski stages comprises processing of the field, or its preparation, removing the trees in the part of the stages that go through a forest, leveling out the field, planting grass where it is needed and fertilization.



#### Construction of ski stages

In Table no. 68 the estimations for investment expenses for the construction of the stages, the artificial snow system, as well as the expenses for all other foreseen contents are shown.

Table no. 68

Description	Unit measure	Amount	Single price	I phase	II phase
C	Constructio	on of ski stag	es		
Ski stages not in the forest	ha	216	800	91.200	81.600
Ski stages in the forest	ha	144	2.200	167.200	149.600
Total ski stages	ha	360	3.000	258.400	231.200
Leveling of the stages	lump sum	360	150.000	90.000	60.000
Artificial snow system	ha	216	100.000	11.400.000	10.200.000
Reserves	m³	1.188.000	12	7.524.000	6.732.000
Additional contents					
Ski park for children	lump sum	1	30.000	30.000	/
Snowboarding park	lump sum	1	20.000	20.000	/
Hiking treks	lump sum	1	100.000	100.000	/
Mountainbike stages	lump sum	1	100.000	100.000	/
Other additional winter projects: tyre descent, skating rink, procurement of equipement for renting, wiegand alpine coaster, snow carriage, sledging and others)	lump sum	1	1.210.000	1.210.000	/
Summer contents: ziprider, climbing wall, adventure park for children, summer park for children at the peak of chairlift 2, summer stage for tyre descent, mini golf and other	lump sum	1	1.651.000	1.651.000	/
Total				22.383.400	17.223.200

#### Infrastructure

The infrastructure which is necessary for construction and operations of the ski center is estimated on the basis on the market prices for these types of work. The infrastructure comprises the accessible roads, parking spaces, distribution of electrical energy, as well as the basic communal infrastructure.

Table no. 69 infrastructure expenses

Description	Unit measure	Amount	Single price €	Phase I €	Phase II €
Parking for daily visitors (cars, commercial vehicles and buses)	Parking place	1300	700	490.000	420.000
Streets in the base settlement	m'	7.500	450	2.250.000	1.125.000
Mountain roads	m'	20.000	40	480.000	320.000
Other surfaces	m²	5.000	50	200.000	50.000
Distribution of electrical energy from the base settlement all chairlifts and objects on the stages	m'	15000	38	456.000	114.000
Necessary electrical equipement for the chairlifts and ski lifts (junction plates, transformators and other)	lump sum	1	600.000	450.000	150.000
Water supply	lump sum	1	2.500.000	2.000.000	500.000
Sewege and purifying station	lump sum	1	2.800.000	2.400.000	400.000
Managing the space	lump sum	1	1.800.000	1.400.000	400.000
Tot	al			10.126.000	3.479.000

#### Vehicles and equipment



Special vehicles for

the preparation of the ski stages

The expenses that are stated in the following table are estimation for the needs of financial means for procurement of appropriate vehicles for preparation of the stages, vehicles for transport of snow and vehicles necessary for functioning of the various services in the ski center, as well as expenses for the necessary equipment. All vehicles and the entire equipment are foreseen to be new.

Table no.	70 Expr	neses for	vehicles	and	equipme	nt
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Description	Unit measure	Amount	Single price €	I phase	II phase
Special machine for preparation of the stages - Snowcat	vehicle	19	280.000	2.800.000	2.520.000
Additional mechanization for the Snowcats – half pipe (Pipe shaper) and other parts	number	3	24.000	48.000	24.000
Motor sledges	number	15	12.000	132.000	48.000
pick up vehicles 4x4	number	4	25.000	75.000	25.000
Radio connection and equipment	lump sum	1	4.000	4.000	/
Equipment for maintenance of the vehicles	lump sum	1	10.000	7.500	2.500
Equipment for ski patrol and gorska service for rescue	lump sum	1	20.000	20.000	/
Marking the stages and security measures	lump sum	1	40.000	30.000	10.000
total				3.116.500	2.629.500

#### Unforeseen and other expenses

Besides the above mentioned expenses in the total estimations of the capital expenses vleguvaat expenses for unforeseen works that are estimated at 10% of the total capital expenses and 2% financial and other types of taxes.

#### **Total expenses**

The following investments expensees that are necessary for construction of the ski center Carev Vrv are defined.

Description of expenses	Phase I €	Phase II €
Planning and projecting	398.000	100.000
Construction of objects	5.360.888	2.268.068

System of chairlifts and ski lifts	15.490.000	8.840.000
Preparation of ski stages	22.383.400	17.223.200
Infrastructure	10.126.000	3.479.000
Vehicles and equipment	3.116.500	2.629.500
Other expenses (2%)	1.137.496	690.795
Unforeseen expenses (10%)	5.687.479	3.453.977
TOTAL	63.699.763	38.684.540

#### **Capital infrastructure**

The future ski center Carev Vrv and the base settlement should be connected to the existing infrastructural road network. Connection of the base settlement with the existing electrical network and telephone network is needed. For the base settlement it is necessary to be built a system for water supply, canalization and purifying station.

#### **Traffic connectivity**

The base settlement will be connected with the regional road Makedonska Kamenica – Kriva Palanka through the newly constructed road way 6 km long. With the construction of the road way from Kriva Palanka the traffic connectivity of the future ski center will greatly improve. Modernization is needed, or reconstruction and expansion of the road from Makedonska Kamenica through the Sasa mine to the point of separation of the newly foreseen road. Certain parts need to be displaced from the existing trace.

The estimation for the needed financial means for modernization of the existing road and construction of the new road 6 km long is between 3 and 3,5 million euros.

Maintaining the regional road ways in the Republic of Macedonia is under jurisdiction of the public agency for state roads of the Republic of Macedonia. The access road to the base settlement that is shown on the appropriate pictures is just an informative showing of the road and does not mean that it is a future solution for its locating.

#### **Electrical energy supply**

Connecting the base settlement with the existing distribution network for electrical energy is planned to be done in the vicinity of the Sasa mine. The initial estimations are that approximately 1 MW of electricity will be needed to be provided, which will be enough for the first phase of development of the ski center Carev Vrv. It is necessary for a dalnovod to be constructed that will connect the bsae settlement with the existing network with a total length of approximately 8 km. The estimation of the needed financial means is between 1 and 1,4 million euros.

#### **Operation of the center**

Operation of the center is defined through formulation of the following elements for operation of the center:

The center and 50% of the accommodation capacities will work in the duration of the whole year, pri sto the periods are divided on the following way:

- \* Non season ..... October and November
- ✤ Low season ..... April, May
- \* Before and after the season ..... June, September
- Main season ..... December, January, February, March, July and August

In the period from December to March all chairlifts and ski lifts will be operational. In the period of July and August only one chairlift will be operational, whereas in the other period of the year the chairlift will be operational only during weekends and hollidays.

In the duration of the winter season all objects will be operational.

The ski center will realize the following incomes:

- Ticket sales
- \* Income from the ticket sales from the riding with the chairlift
- \* Income from salesof food and drink
- \* Ski equipment servicing
- \* Ski equipment renting
- Ski school

Income from the additional offer (winter children's park, sledging and spustanje with gumeni camci, bycicle renting, motor vehicle 4x4 renting, motor sledges renting and so on)

Gradual annual growth in the total number of sold services until the fifth year of operating (period of stabilization).

The average prices of services will not change in the first five years and then will increase on average 5% on each three years in the duration of the razgleduvaniot period.

The average price for ski ticket on a daily level is 24 euros.

The duration of the ski season is estimated for 120 days, with a beginning level of 40 of usage in the first year and to achieve 75% after the fifth year of operations.

The average price per consumation of food and drink is projected at a level of 7 euros per visitor.

The price for repair and maintenance of the ski equipment is projected on a level of 20 euros per repair.

The average price for equipement renting per day is 12 euros.

The undivided expenses are projected as a standard percentage of the total income.

The expenses for energy are projected on a level of 40\$ of the total income

#### **Operational expenses**

The operational expenses are estimated only for the first phase of the ski center because in the first phase only evaluation of the financial and economic profitability of the ski center will be done. Because the realization of the second phase of the ski center should begin at least 10 years after the completion of the first phase, the financial and economic feasibility of the second phase will need to be evaluated before beginning the implementation and on the basis on the achieved results from the working of the ski center.

The average number of employees in the ski center and the estimation for the amount of the wages is shown in Table no. 71.

#### Table no. 71 Average number of employees in the ski center and calculations for the amount of the wages

Operational unit	Number of employees	Gross gymry (monthly) €	Total gross gymry (monthly) €	Total for wages (annually) €
	Ful	ll time employees	5	
Chairlifts and ski lift	16	800	9.600	153.600
Preparation of the stages	12	750	9.000	108.000
Other activities	5	700	8.400	42.000
Services	15	500	6.000	90.000
Administration	5	750	9.000	45.000
Marketing and sales	3	750	9.000	27.000
Total	56	3.670	51.000	465.600
	Sea	asonal employees	5	
Chairlifts and ski lift	20	700	3.500	70.000
Preparation of the stages	5	650	3.250	16.250
Other activities	25	650	3.250	81.250
Services	35	450	2.250	78.750
Administration	2	600	3.000	6.000
Total	87	3.050	15.250	252.250
TOTAL			66.250	717.850

#### Income

On the basis of the recommended contents of the ski center Carev Vrv, the type of income that the ski center will make by its operating are identified. The income are divided in the following types:

- \* Sales for ski tickets and tickets for riding with a chairlift
- \* Income from the services of food and drink
- Income from the renting of ski or snowboarding equippement, sledging equipment, as well as servicing of the ski/snowboarding equipment
- \* Income from the ski school

Income of the additional offer (winter children's park, snow tyres descent, renting of bycicles, slide, renting 4x4 vehicles, renting of motor sledges, renting bycicles and so on.)

For each type of foreseen income the average prices are defined.

In Table no. 72 and Table no. 73 the projections for the income from phase I for the nect 15 years are shown.

In Table no. 74 and Table no. 75 the projections for the expenses of phase I for the next 15 years are shown.

Table no. 72 Income in euros

Income years	1	7	ω	4	ß	Q	۲	80
		Ski	ticket sales					
Maximum day capacity				52	00			
Number of days in a season				12	0			
Number of usage in a season	40%	48,8%	57,5%	66,3%	75%	75%	75%	75%
Total number of visitors annually	249.600	304.200	358.800	413.400	468.000	468.000	468.000	468.000
Average price of the daily ski ticket				24 e	uros			
Income from ski ticket sales	5.990.400	7.300.800	8.611.200	9.921.600	11.232.000	11.232.000	11.232.000	11.232.000
Services								
Number of sold services - covers	162.240	197.730	233.220	268.710	304.200	304.200	304.200	304.200
Average price				7 er	Iros			
Total income from services	1.135.680	1.384.110	1.632.540	1.880.970	2.129.400	2.129.400	2.129.400	2.129.400
		Income fr	om other serv	ices				
		Income fro	om equipment	rent				
Estimated number of users (days of rent equipment)	<b>d</b> 87.360	106.470	125.580	144.690	163.800	163.800	163.800	163.800
Single price				15 e	uros			
Total income from equipment rent	1.310.400	1.597.050	1.883.700	2.170.350	2.457.000	2.457.000	2.457.000	2.457.000
Income from equipment service and maintenance								
Estimated number of users	44.928	54.756	64.584	74.412	84.240	84.240	84.240	84.240
Single price				17 e	uros			
Total income from equipment service and maintenance	763.776	930.852	1.097.928	1.265.004	1.432.080	1.432.080	1.432.080	1.432.080
Income from others not mentioned servi	es 2.500.000	2.500.000	2.500.000	2.500.000	3.000.000	3.000.000	3.000.000	3.000.000
Total income €	11.700.256	13.712.812	15.725.368	17.737.924	20.250.480	20.250.480	20.250.480	20.250.480

Table no. 73 Income in euros

Income	ears	g	10	11	12	13	14	15
			Ski ticket s	ales				
Maximum day capacity					5200			
Number of days in a season					120			
Percentage of usage in a season		75%	75%	75%	75%	75%	75%	75%
Total number of visitors annually		468.000	468.000	468.000	468.000	468.000	468.000	468.000
Average price of a daily ski ticket					24 euros			
Income from ski ticket sales		11.232.000	11.232.000	11.232.000	11.232.000	11.232.000	11.232.000	11.232.000
Services								
Number of sold services - kuveri		304.200	304.200	304.200	304.200	304.200	304.200	304.200
Average price					7 euros			
Total number of services		2.129.400	2.129.400	2.129.400	2.129.400	2.129.400	2.129.400	2.129.400
		Inc	come from othe	er services				
		Inco	me from equip	ment rental				
Estimated number of users (days of rent	ed equipment)	163.800	163.800	163.800	163.800	163.800	163.800	163.800
Single price					15 euros			
Total income from equipment rental		2.457.000	2.457.000	2.457.000	2.457.000	2.457.000	2.457.000	2.457.000
		Income from	service and equ	uipment mainte	enance			
Estimated number of users		84.240	84.240	84.240	84.240	84.240	84.240	84.240
Single price					17 euros			
Total incom from service and equipment	: maintenance	1.432.080	1.432.080	1.432.080	1.432.080	1.432.080	1.432.080	1.432.080
Income from other not mentioned servic	ses	3.000.000	3.000.000	3.000.000	3.000.000	3.000.000	3.000.000	3.000.000
Total income €		20.250.480	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480

Expenses	ar 1		2	Э	4	5	6	7	8
				Sales expense	SS				
Ski tickets	179.712	219	.024	258.336	297.648	336.960	336.960	336.960	336.960
Services	374.774	456	.756	538.738	620.720	702.702	702.702	702.702	702.702
Equipment rental	26.208	31.	941	37.674	43.407	49.140	49.140	49.140	49.140
Equipment service and maintenance	30.551	37.	234	43.917	50.600	57.283	57.283	57.283	57.283
Other not mentioned services	125.000	125	.000	125.000	125.000	150.000	150.000	150.000	150.000
Wage expenses	717.850	717	.850	717.850	717.850	717.850	717.850	717.850	717.850
Energy	3.861.08	4 4.52!	5.228	5.189.371	5.853.515	6.682.658	6.682.658	6.682.658	6.682.658
Marketing					10.0	000			
Fixed expenses	30.000	30.	000	30.000	30.000	30.000	40.000	40.000	40.000
Taxes	1.404.03	1 1.64!	5.537	1.887.044	2.128.551	2.430.058	2.430.058	2.430.058	2.430.058
Insurance	117.003	137	.128	157.254	177.379	202.505	202.505	202.505	202.505
Other	35.101	41.	138	47.176	53.214	60.751	60.751	60.751	60.751
Total C	6.881.31	4 7.940	6.837	9.012.361	10.077.884	11.399.907	11.399.907	11.399.907	11.399.907

Table no. 74 Expenditure in euros

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Expenses	ar	6	10	11	12	13	14	15
			Sales expens	es				
Ski tickets		336.960	336.960	336.960	336.960	336.960	336.960	336.960
Service		702.702	702.702	702.702	702.702	702.702	702.702	702.702
Equipment rental		49.140	49.140	49.140	49.140	49.140	49.140	49.140
Equipment service and maintenance	Ð	57.283	57.283	57.283	57.283	57.283	57.283	57.283
Other not mentioned services		150.000	150.000	150.000	150.000	150.000	150.000	150.000
Wage expenses		717.850	717.850	717.850	717.850	717.850	528.840	528.840
Energy		6.682.658	6.682.658	6.682.658	6.682.658	6.682.658	6.682.658	6.682.658
Marketing					10.000			
Fixed expenses		40.000	40.000	50.000	50.000	50.000	50.000	50.000
Taxes		2.430.058	2.430.058	2.430.058	2.430.058	2.430.058	2.430.058	2.430.058
Insurance		202.505	202.505	202.505	202.505	202.505	202.505	202.505
Other		60.751	60.751	60.751	60.751	60.751	60.751	60.751
Total €		11.399.907	11.399.907	11.399.907	11.399.907	11.399.907	11.210.897	11.210.897

#### **Economic and financial analysis**

The economic and financial analysis is made in order to determine the profitability of the projects from the aspect of comparable expenses and income for the duration of the expected life span of the project. The procedure for the economic-financial analysis will be made through:

- 1. Financial analysis.
- 2. Economic analysis.
- 3. Method for discounted monetary income.

The financial analysis of the project include an analysis of the direct expenses and income connected to the users i.e. the client. The economic analysis of the project includes the indirect expenses and uses that are connected not only for the client but also for the whole economy of Macedonia.

Basically, the model is based on the principles of discounted monetary income. In the model the performances of the project through the indicators for internal rate of rentability, net present value and period of payment of the project need to be evaluated. For the creditors it is important to evaluate the DSCR (coverage of the servicing of the debt).

The details for the calculations are given in the following tables.

#### Basic assumptions of the approach

- The discounted rate is a substitute 8% in accordance with the weighted average cost of capital (WACC) for Macedonia (see: <u>http://www.cea.org.mk/Documents/Public%20Sector%20Discount%20Rat</u> <u>e%20short%20version%20final.pdf</u>).
- The evaluation is done with a financial internal rate of rentability (FIRR) and a financial net present value (FNPV) of the project
- The evaluation is done with an economic internal rate of rentability (EIRR) and an economic net present value (ENSV) of the project.
- Period of payment of the project.

- Evaluation through coverage of servicing of the debt with net operational income (DSCR).
- Life span of the project of 15 years.
- The amortization<sup>7</sup> is calculated at an average of 5% (construction objects 2.5%, roads 3%, equipment for distribution of energy 5%, machines and transport means 10%)
- The conditions for crediting are taken: borrowing in the height of investment expenses, without a grace period, without own participation, interestt rate in the height of the discount rate -\*% and 15 year payment period.
- Evaluation of risks is done through a sensitivity analysis.

#### **Results from the analysis**

The results from the analysis are illustrated in the following table.

Table no. 76 Project indicators

Индикатор	Вредност
Discount rate	+8,00%
FIRR	+7,90%
FNPV	-464,442 euros
Average DSCR	1.53
DSCR after the 5th year	1.66
Financial period of payment	10 years
EIRR	+14,75%
ENPV	+31,722,868 euros
Average DSCR	1.53
DSCR after the 5th year	1.66
Economic period of payment	8 years

<sup>&</sup>lt;sup>7</sup> In accordance with the Decree for calculating amortization (Official gazzette of R.M. number 64/2002; 98/2002 and 10/2008).

From the analysis it can be seen that the project financially is on the border of feasibility (FIRR=7.9%), but is economically payable (EIRR=14.75%). The economic period of payment is 8 years. DSCR is 1.66 after the 5th year with an average for the whole period of 1.53. This means that during the working of the project it generates on average annually 66% more income than the value of anuity ater the 5th year or for 53% average annually more than the value of anuity. It is normal to expect for projects that are higgly infrastructurally depended for the first years to have a DSCR close or lower than 1. The project from the aspect of creditors is attractive having in consideration the value of DSCR and the nature of the project.

The risk of the project is analyzed with an evaluation of the sensitivity of EIRR from three variables: income, investment and price (expenditure) of electrical energy. The results of the analysis of the sensitivity are illustrated on the following picture.

Picture no. 77 Analysis of the sensitivity of EIRR from the income, investments and price (expenditure of electrical energy)



	<u>Carev Vrv</u>											
	<u>Worksheet 3 - CAPIT</u>	AL EXPEN	DITURE									
			<u>Year</u>	0	1	2	m	4	ъ	9	7	ω
빌	<u>Row Description</u>	<u>Units</u>	<u>Source/</u> <u>Comments</u>									
	Planning and projecting	euros		398.000								
2	Chairlifts and ski lifts	euros		15.490.00 0								
Μ	Preparation of stages and treks	euros		22.383.40 0								
ß	Ski center objects	euros		5.360.888								
9	Mountain infrastructure	euros		10.126.00 0								
~	Vehicles and special equipment	euros		3.116.500								
ø	Other expenses	euros		1.137.496								
6	Unforseen expenses	euros		5.687.479								
10												
11	Other objects	euros										
12		euros										
13	Total CapEx	euros		63.699.76 3								
14				63.699.76 3								
15	<u>Amortization</u>											
16												
17	At the beginning of the year	euros			63.699.763	60.514.7 74	57.329.7 86	54.144.7 98	50.959.8 10	47.774.8 22	44.589.8 34	41.404. 846
18												
19	Amortization rates	%/Year			5,0%	5,0%	5,0%	5,0%	5,0%	5,0%	5,0%	5,0%
20												
21	Amortization	euros			3.184.988	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.9 88
22												
23	At the end of the vear	euros			60.514.774	57.329.7 86	54.144.7 98	50.959.8 10	47.774.8 22	44.589.8 34	41.404.8 46	38.219. 858
24	Amortization				3.184.988	3.184.9 88						
25	At the beginning			63.699.7	63.699.763	60.514.	57.329.	54.144.	50.959.	47.774.	44.589.	41.404.
of the year			63		774	786	798	810	822	834	846	
--------------------------	------------------------------------	--------------	----------------------------	----------------	----------------	----------------	----------------	------------------	------------------	----------------	----------------	
At the end of tives vear	he		63.699.7 6( 63	0.514.774	57.329. 786	54.144. 798	50.959. 810	47.774. 4 822	14.589. 4 834	41.404. 846	38.219. 858	
			<u>Year</u>	6	10	11	12	13	14	15		
Line	Row Description	<u>Units</u>	<u>Source/</u> Comments									
1	Planning and projecting	euros										
2	Chairlifts and ski lifts	euros										
m	Preparation of stages and treks	euros										
ß	Ski center objects	euros										
9	Mountain infratructure	euros										
7	Vehicles and special equipment	euros										
8	Other expenses	euros										
б	Unforseen expenses	euros										
10												
11	Other objects	euros										
12		euros										
13	Total CapEx	euros										
14												
15	<u>Amortization</u>											
16												
17	At the beginning of the year	euros		38.219.8 58	35.034.8 69	31.849.8 81	28.664.8 93	25.479.9 05	22.294.9 17	19.109.9 29		
19	Amortization rate	%/Year		5,0%	5,0%	5,0%	5,0%	5,0%	5,0%	5,0%		
20												
21	Amortization	euros		3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8		
22												
23	At the end of the year	euros		35.034.8 69	31.849.8 81	28.664.8 93	25.479.9 05	22.294.9 17	19.109.9 29	15.924.9 41		
24	Amortization			3.184.9 88	3.184.9 88	3.184.9 88	3.184.9 88	3.184.9 88	3.184.9 88	3.184.9 88		
25	At the beginning of the vear			38.219. 858	35.034. 869	31.849. 881	28.664. 893	25.479. 905	22.294. 917	19.109. 929		
26	At the end of the year			35.034. 869	31.849. 881	28.664. 893	25.479. 905	22.294. 917	19.109. 929	15.924. 941		

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	<u>Worksheet 4 -</u> FINANCING										
			<u>Project</u> 0 <u>Year</u>	-		7	Ś	4	Ŋ	9	7
e Lin	Row Description	<u>Units</u>	<u>Source/Commei</u>	<u>nts</u>							
	CapEx	euros	63.6 <sup>0</sup>	99.7 3							
2	Total Debt	euros	63.6 <sup>1</sup> 6.	99.7 3							
m	Total Equity	euros									
4	Loan Principle	euros	63.6 <sup>1</sup> 6.	99.7 3							
ы	Loan Term	Years	Ŧ	Ъ							
9	Interestt Rate	%/Yea r	8,00	%0(							
~	Loan Year	Years			1	7	m	4	ъ	Q	7
ω	Interestt Payment	%/Yea rs		ری ر	- 5.095.98 1	- 4.908.29 8	- 4.705.60 1	- 4.486.68 8	- 4.250.26 2	- 3.994.92 2	- 3.719.15 4
6	Principal Payment	euros		N	- 346.03 3	- 2.533.71 6	- 2.736.41 3	- 2.955.32 6	- 3.191.75 2	- 3.447.09 3	- 3.722.86 0
10	Total Debt Service	euros			- ,442.01 4	- 7.442.01 4	- 7.442.01 4	- 7.442.01 4	- 7.442.01 4	- 7.442.01 4	- 7.442.01 4
11	Remaining Principal	euros		Ψ	61.353.7 29	58.820.0 13	56.083.6 00	53.128.2 74	49.936.5 22	46.489.4 29	42.766.5 69

;

Project 8 Year Source/Comments

Lin Row Description e

<u>Units</u>

1	CapEx	euros									
2	Total Debt	euros									
m	Total Equity	euros									
4	Loan Principle	euros									
ъ	Loan Term	Years									
9	Interestt Rate	%/Year									
7	Loan Year	Years	œ		6	10	1	12	13	14	15
8	Interestt Payment	%/Year				1	1	i.	i.	ı.	-551.260
		S	3.421.	326 3.0	029.670	2.752.283	2.377.104	1.971.912	1.534.303	1.061.687	
6	Principal Payment	euros				1	1	ı.	ī	ī	I
			4.020.	689 4.3	42.344	4.689.731	5.064.910	5.470.103	5.907.711	6.380.328	6.890.754
10	Total Debt Service	euros				1	1	ı.	ī	ī	ı
			7.442.	014 7.4	42.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014
11	Remaining	euros	38.74	5.88 34.4	403.53	29.713.80	24.648.89	19.178.79	13.271.08	6.890.754	0
	Principal		0		9	വ	ប	ო	7		
	Worksheet 5 - INCON STATEMENT	ш	<u>Project</u> 0 <u>Year</u>		÷.	7	m	4	'n	G	7
e Li	Row Description	<u>Units</u>	<u>Source/Commei</u> <u>s</u>	비							
1	Total income	euros		11.7	00.256	13.712.812	15.725.3	68 17.737 24	9 20.250.4 80	20.250.4 80	20.250.4 80
4	Total income	euros		11.7	00.256	13.712.812	15.725.3	68 17.737 24	9 20.250.4 80	20.250.4 80	20.250.4 80

	20.250.4 80	20.250.4 80		336.960	702.702	49.140	57.283	150.000	717.850	6.682.65 8
	20.250.4 80	20.250.4 80		336.960	702.702	49.140	57.283	150.000	717.850	6.682.65 8
	20.250.4 80	20.250.4 80		336.960	702.702	49.140	57.283	150.000	717.850	6.682.65 8
	17.737.9 24	17.737.9 24		297.648	620.720	43.407	50.600	125.000	717.850	5.853.51 5
	15.725.368	15.725.368		258.336	538.738	37.674	43.917	125.000	717.850	5.189.371
	13.712.812	13.712.812		219.024	456.756	31.941	37.234	125.000	717.850	4.525.228
	11.700.256	11.700.256		179.712	374.774	26.208	30.551	125.000	717.850	3.861.084
N										
	euros	euros		euros	euros	euros	euros	euros	euros	euros
	Total income	Total income	Sales expenses	Ski tickets	Service	Equipment rental	Equipment service and maintenance	Other services	Wages	energy
۵I	1	4		ß	9	~	ω	6	10	11

12	Fixed expenses	euros		30.000	30.000	30.000	30.000	30.000	40.000	40.000
13	Marketing	euros		10.000	10.000	10.000	10.000	10.000	10.000	10.000
14	Insurance	euros		117.003	137.128	157.254	177.379	202.505	202.505	202.505
15	Total operational expenses	euros		5.472.182	5.614.381	6.311.066	7.007.75 1	7.899.43 6	7.909.43 6	7.909.43 6
16	Inflation	%/Ye ar		%0	%0	%0	%0	%0	%0	%0
17	Intrests	euros		5.095.981	4.908.298	4.705.601	4.486.68 8	4.250.26 2	3.994.92 2	3.719.15 4
18	Amortization	euros		3.184.988	3.184.988	3.184.988	3.184.98 8	3.184.98 8	3.184.98 8	3.184.98 8
19	Total expenses	euros		13.753.151	13.707.667	14.201.655	14.679.4 27	15.334.6 86	15.089.3 46	14.813.5 78
20	Total taxed income	euros		-2.052.895	5.145	1.523.713	3.058.49 7	4.915.79 4	5.161.13 4	5.436.90 2
21	Income tax - rate	%/Ye ar	10,00 %	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%
22	Income tax	euros		0	514	152.371	305.850	491.579	516.113	543.690
23	Net income	euros		-2.052.895	4.630	1.371.342	2.752.64 7	4.424.21 5	4.645.02 1	4.893.21 1
24	Dividedds	euros		I	I	I	ı	ı	ı	I
25	Net income – dividedds	euros		- 2.052.895	4.630	1.371.342	2.752.64 7	4.424.21 5	4.645.02 1	4.893.21 1
26	Retained gain	euros		- 2.052.895	- 2.048.265	- 676.924	2.075.72 4	6.499.93 8	11.144.9 59	16.038.1 70

15		20.250.480	20.250.480
14		20.250.480	20.250.480
13		20.250.480	20.250.480
12		20.250.480	20.250.480
11		20.250.480	20.250.480
10		20.250.480	20.250.480
6		20.250.480	20.250.480
ω	omments	20.250.480	20.250.480
<u>Project</u> <u>Year</u>	Source/Co		
	<u>Unit</u> §	euro s	euro s
Worksheet 5 - INCOME STATEMENT	Row Description	Total income	Total income
	e Li	H	4

	336.960	702.702	49.140	57.283	150.000	528.840	6.682.658	50.000	10.000	202.505	7.730.426	%0	551.260	3.184.988	11.466.674	8.783.806	10,00%	878.381
	336.960	702.702	49.140	57.283	150.000	528.840	6.682.658	50.000	10.000	202.505	7.730.426	%0	1.061.687	3.184.988	11.977.101	8.273.379	10,00%	827.338
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	50.000	10.000	202.505	7.919.436	%0	1.534.303	3.184.988	12.638.728	7.611.752	10,00%	761.175
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	50.000	10.000	202.505	7.919.436	%0	1.971.912	3.184.988	13.076.336	7.174.144	10,00%	717.414
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	50.000	10.000	202.505	7.919.436	%0	2.377.104	3.184.988	13.481.529	6.768.951	10,00%	676.895
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	40.000	10.000	202.505	7.909.436	%0	2.752.283	3.184.988	13.846.707	6.403.773	10,00%	640.377
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	40.000	10.000	202.505	7.909.436	%0	3.099.670	3.184.988	14.194.095	6.056.385	10,00%	605.639
	336.960	702.702	49.140	57.283	150.000	717.850	6.682.658	40.000	10.000	202.505	7.909.436	%0	3.421.326	3.184.988	14.515.750	5.734.730	10,00%	573.473
	euro s	euro s	euro s	euro s	euro s	euro s	euro s	euro s	euro s	euro s	euro s	%/Ye ar	euro s	euro s	euro s	euro s	%/Ye ar	euro s
Sales expenses	Ski tickets	Service	Equipment rental	Equipment service and maintenance	Other services	Wages	energy	Fixed expenses	Marketing	Insurance	Total operational expenses	Inflations	Intrests	Amortization	Total expenses	Total taxed income	Income tax - rate	Income tax
	ы	9	~	8	σ	10	11	12	13	14	15	16	17	18	19	20	21	22

7.905.425	·	7.905.425	67.164.400		7		4.893.211	3.184.988	8.078.200	-3.722.860		4.355.340	20.250.480	7.909.436	12.341.044
7.446.041	ı	7.446.041	59.258.975		9		4.645.021	3.184.988	7.830.009	-3.447.093		4.382.916	20.250.480	7.909.436	12.341.044
6.850.577	ı	6.850.577	51.812.934		Ŋ		4.424.215	3.184.988	7.609.203	-3.191.752		4.417.450	20.250.480	7.899.436	12.351.044
6.456.730		6.456.730	44.962.356		4		2.752.647	3.184.988	5.937.635	-2.955.326		2.982.309	7.737.924	7.007.751	0.730.173
6.092.056	ı	6.092.056	38.505.627		ſ		1.371.342	3.184.988	4.556.330	2.736.413		1.819.916	5.725.368 1	6.311.066	9.414.302 1
5.763.396	I	5.763.396	32.413.570		2		4.630	3.184.988	3.189.618	2.533.716 -		655.902	3.712.812 1	614.381	3.098.431
5.450.747	I	5.450.747	26.650.175		1		052.895	184.988 3	132.093 3	346.033 -2		213.940	700.256 13	472.182 5	228.074 8
5.161.257	1	5.161.257	21.199.428		0	e/Com	-2.	М	1.	-2.	- 63.699. 763	1. 63.699. 763	11.	5.	6.
					<u>roject</u> <u>Year</u>	t <u>Sourc</u> ments	0	0	0	0	0	0	0	0	0
euro s	euro s	euro s	euro s		ā	<u>Uni</u> s	euro s	euro s	euro s	euro s	eurc s	euro s	euro s	euro s	euro
Net income	Dividedds	Net income – dividedds	Retained gain	<u>Worksheet 6 - CASH</u> FLOW FINANCIAL		<u>Row Description</u>	Net income	Amortization	Cash flow from operating	Principal of borrowing	Investments	Balance	Income	Operational expenses	Operating income
23	24	25	26			<u>ne</u>		2	m	4	ы	9	8	δ	10

		v								
11 /	Anuity	euro		7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014
		S								
12	DSCR									
				0,84	1,09	1,27	1,44	1,66	1,66	1,66
13	Average DSCR	T	,53							
14	Short term liquidity			-1.213.940	-558.038	1.261.878	4.244.187	8.661.638	13.044.554	17.399.894
15	Net cash inflow	euro s 63.6	- 599. 763	1.132.093	3.189.618	4.556.330	5.937.635	7.609.203	7.830.009	8.078.200
16	Financial NPV - FNPV	euro s <b>464</b>	4 0							
17	Financial IRR - FIRR	7,9	%0							
-	Opening cash balance	euro s	0	-	- 1.213.940	- 558.038	1.261.878	4.244.187	8.661.638	13.044.554
_	Net cash inflow	euro s	0	- 1.213.940	655.902	1.819.916	2.982.309	4.417.450	4.382.916	4.355.340
-	End cash balance	euro s	0	- 1.213.940	- 558.038	1.261.878	4.244.187	8.661.638	13.044.554	17.399.894
		6369	- 976 3	-62567670	-59378051	-54821722	-48884086	-41274884	-33444875	-25366675
	Worksheet 6 - CASH FL	<u>-OW FINANCIAL</u>								
		Project Year		8	9 10	11	12	13	4	15

MOLVALIERLO - CAOLI L LO										
	Projec	<u>tt Year</u>	ω	თ	10	11	12	13	14	15
<u>Lin Row Description</u> <u>e</u>	<u>Unit</u> <u>s</u>	<u>Source/(</u>	<u>Somment</u>							
1 Net income	euro s		5.161.257	5.450.747	5.763.396	6.092.056	6.456.730	6.850.577	7.446.041	23.830.36 6

2	Amortization	euro s	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988
က	Cash flow from operating	euro s	8.346.245	8.635.735	8.948.384	9.277.044	9.641.718	10.035.56 5	10.631.03 0	27.015.35 4
4	Principal of borrowing	euro s	-4.020.689	-4.342.344	-4.689.731	-5.064.910	-5.470.103	-5.907.711	-6.380.328	-6.890.754
2J	Investment	euro s								
9	Balance	euro s	4.325.557	4.293.391	4.258.652	4.212.135	4.171.615	4.127.854	4.250.702	20.124.60 0
8	Income	euro s	20.250.480	20.250.48 0						
0	Operational expenses	euro s	7.909.436	7.909.436	7.909.436	7.919.436	7.919.436	7.919.436	7.730.426	7.730.426
10	Operating income	euro s	12.341.044	12.341.04 4	12.341.04 4	12.331.04 4	12.331.04 4	12.331.04 4	12.520.05 4	12.520.05 4
1	Anuity	euro s	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014
12	DSCR									
			1,66	1,66	1,66	1,66	1,66	1,66	1,68	1,68
13	Average DSCR									
<b>1</b> 4	Short term liquidity		21.725.450	26.018.84 2	30.277.49 4	34.489.62 9	38.661.24 4	42.789.09 8	47.039.80 0	67.164.40 0
15	Net cash inflow	euro s	8.346.245	8.635.735	8.948.384	9.277.044	9.641.718	10.035.56 5	10.631.03 0	27.015.35 4
16	Financial NPV - FNPV	euro s								
17	Financial IRR - FIRR									
	Opening cash balance	euro s	17.399.894	21.725.45 0	26.018.84 2	30.277.49 4	34.489.62 9	38.661.24 4	42.789.09 8	47.039.80 0

	Net cash inflow et	:uro s	4.325.557	4.293.391	4.258.652	4.212.135	4.171.615	4.127.854	4.250.702	20.124.60 0
	End cash balance	:uro s	21.725.450	26.018.84 2	30.277.49 4	34.489.62 9	38.661.24 4	42.789.09 8	47.039.80 0	67.164.40 0
			-17020430	-8384695	563689	9840733	19482451	29518017	40149046	67164400
S	heet 7 - CASH FLOW ECONOMIC	<u>u</u>								
	Prc	oject Year	0	1	2	m	4	ы	9	7
	Row Description	<u>Unit</u> s	Source/Comm	<u>ients</u>						
_	Net Income	euro s		- 2.052.895	4.630	1.371.342	2.752.647	4.424.215	4.645.02 1	4.893.21 1
•	Total Depreciation Expenses	euro s		3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.98 8	3.184.98 8
	Total Interestt Payments	euro s		5.095.981	4.908.298	4.705.601	4.486.688	4.250.262	3.994.92 2	3.719.15 4
	Income Tax Expenses	euro s		0	514	152.371	305.850	491.579	516.113	543.690
	Total Cash Flow From Operations	euro s		6.228.074	8.098.431	9.414.302	10.730.17 3	12.351.04 4	12.341.0 44	12.341.0 44
•	Total Principle Payment	euro s		- 2.346.033	- 2.533.716	- 2.736.413	- 2.955.326	- 3.191.752	- 3.447.09 3	- 3.722.86 0
	Investments	euro s	- 63.699.76 3	0	0	0	0	0	0	0
_	Balance	euro s	- 63.699.76 3	3.882.041	5.564.715	6.677.889	7.774.847	9.159.292	8.893.95 1	8.618.18 4
1	Fotal Revenues	euro s		11.700.25 6	13.712.81 2	15.725.36 8	17.737.92 4	20.250.48 0	20.250.4 80	20.250.4 80

10	Total Operating Costs	euro s	U)	5.472.182	5.614.381	6.311.066	7.007.751	7.899.436	7.909.43 6	7.909.43 6
11	Operating income	euro s	Ŷ	5.228.074	8.098.431	9.414.302	10.730.17 3	12.351.04 4	12.341.0 44	12.341.0 44
12	Total Debt Service Payment	euro s		,442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.01 4	7.442.01 4
13	Debt Service Coverage Ratio - DSCR									
14				0,84	1,09	1,27	1,44	1,66	1,66	1,66
15	Average DSCR		1,53							
16	Net cash flow	euro s	- 63.699.76 3	5.228.074	8.098.431	9.414.302	10.730.17 3	12.351.04 4	12.341.0 44	12.341.0 44
17	Economic NPV - ENPV		31.722.8 68							
18	Economic IRR - EIRR		14,75%							
19			- 63.699.76 3	- 57.471.68 9	- 49.373.25 8	- 39.958.95 6	- 29.228.78 3	- 16.877.73 9	- 4.536.69 5	7.804.34 9
Wor	ksheet 7 - CASH FLOW ECONOMIC									
	Project Year		ω	6	10	11	12	13	14	15
Line	Row Description	Units	Source/Commen	<u>ts</u>						
Н	Net Income	euros	5.161.257	5.450.747	5.763.396	6.092.056	6.456.730	6.850.577	7.446.041	7.905.425
2	Total Depreciation Expenses	euros	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988	3.184.988
С	Total Interestt Payments	euros	3.421.326	3.099.670	2.752.283	2.377.104	1.971.912	1.534.303	1.061.687	551.260
4	Income Tax Expenses	euros	573.473	605.639	640.377	676.895	717.414	761.175	827.338	16.803.321
Ŋ	Total Cash Flow From Operations	euros	12.341.044	12.341.044	12.341.044	12.331.044	12.331.044	12.331.044	12.520.054	28.444.995

9	Total Principle Payment	euros	-4.020.689	-4.342.344	-4.689.731	-5.064.910	-5.470.103	-5.907.711	-6.380.328	-6.890.754
~	Investments	euros	0	0	0	0	0	0	0	0
8	Balance	euros	8.320.355	7.998.700	7.651.313	7.266.134	6.860.941	6.423.333	6.139.726	21.554.241
6	Total Revenues	euros	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480	20.250.480
10	Total Operating Costs	euros	7.909.436	7.909.436	7.909.436	7.919.436	7.919.436	7.919.436	7.730.426	7.730.426
11	Operating income	euros	12.341.044	12.341.044	12.341.044	12.331.044	12.331.044	12.331.044	12.520.054	12.520.054
12	Total Debt Service Payment	euros	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014	7.442.014
13	Debt Service Coverage Ratio - DSCR									
14			1,66	1,66	1,66	1,66	1,66	1,66	1,68	1,68
15	Average DSCR									
16	Net cash flow	euros	12.341.044	12.341.044	12.341.044	12.331.044	12.331.044	12.331.044	12.520.054	28.444.995
17	Economic NPV - ENPV									
18	Economic IRR - EIRR									
19			20.145.393	32.486.437	44.827.481	57.158.525	69.489.569	81.820.613	94.340.667	122.785.662



	Cash from borrowing	<u>euro</u> s							
41	Cash from operating	<u>euro</u> s	<u>63.699.76</u> <u>3</u>	O	O	O	O	O	O
Ы	Accounts receivable	<u>euro</u> s	O	0	<u>1.213.940</u>	-558.038	1.261.878	4.244.187	8.661.638
9	Inventors	<u>euro</u> s	O	O	O	OI	OI	O	0
2	Other current assets	<u>euro</u> s	O	O	O	OI	OI	O	O
$\infty$	Total assets	<u>euro</u> s							
	Liabilities and capital	<u>euro</u> s	<u>63.699.76</u> <u>3</u>	<u>63.699.76</u> <u>3</u>	<u>59.300.83</u> <u>4</u>	<u>56.771.74</u> <u>8</u>	<u>55.406.67</u> <u>7</u>	<u>55.203.99</u> <u>8</u>	<u>56.436.46</u> <u>0</u>
	Retained earnings	<u>euro</u> s							
6	Long term borrowing	<u>euro</u> s		0	<u></u>	<u></u>	-676.924	2.075.724	<u>6.499.938</u>
10	Own capital	<u>euro</u> s	<u>63.699.76</u> <u>3</u>	<u>63.699.76</u> <u>3</u>	<u>61.353.72</u> <u>9</u>	<u>58.820.01</u> <u>3</u>	<u>56.083.60</u> <u>0</u>	<u>53.128.27</u> <u>4</u>	<u>49.936.52</u> 2
11	Total liabilities and capital	<u>euro</u> S	OI	0	0	0	0	0	0
	Check	<u>euro</u> s	<u>63.699.76</u> <u>3</u>	<u>63.699.76</u> <u>3</u>	<u>59.300.83</u> <u>4</u>	<u>56.771.74</u> <u>8</u>	<u>55.406.67</u> Z	<u>55.203.99</u> <u>8</u>	<u>56.436.46</u> <u>0</u>
	Equipment		OI	0	0	0	0	0	O
	Worksheet 8 - BALANCE S	<u>SHEET</u>							

		Project Year	ωI	6	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
le Li	Row Description	<u>Units</u>	Source/Cor	nments						
	Equipment									
÷-1	Current assets	<u>euro</u> S	<u>44.589.83</u> <u>4</u>	<u>41.404.84</u> <u>6</u>	<u>38.219.85</u> <u>8</u>	<u>35.034.86</u> <u>9</u>	<u>31.849.88</u> <u>1</u>	<u>28.664.89</u> <u>3</u>	<u>25.479.90</u> <u>5</u>	22.29
	Cash from borrowing	<u>euro</u> S								
41	Cash from operating	<u>euro</u> S	0	0	0	0	0	0	0	0
ы	Accounts receivable	<u>euro</u> S	<u>13.044.55</u> <u>4</u>	<u>17.399.89</u> <u>4</u>	<u>21.725.45</u> <u>0</u>	<u>26.018.84</u> 2	<u>30.277.49</u> <u>4</u>	<u>34.489.62</u> <u>9</u>	<u>38.661.24</u> <u>4</u>	<u>42.789</u>
9	Inventors	<u>euro</u> S	0	0	0	0	0	0	OI	0
	Other current assets	<u>euro</u> S	OI	0	O	OI	OI	OI	OI	0
)	Total assets	<u>euro</u> S								
	Liabilities and capital	<u>euro</u> S	<u>57.634.38</u> <u>8</u>	<u>58.804.73</u> 9	<u>59.945.30</u> <u>8</u>	<u>61.053.71</u> <u>1</u>	<u>62.127.37</u> <u>5</u>	<u>63.154.52</u> 2	<u>64.141.14</u> <u>9</u>	<u>65.08</u> 4 <u>5</u>
	Retained earning	<u>euro</u> S								
ଚା	Long term borrowing	<u>euro</u> S	<u>11.144.95</u> <u>9</u>	<u>16.038.17</u> <u>0</u>	<u>21.199.42</u> <u>8</u>	<u>26.650.17</u> <u>5</u>	<u>32.413.57</u> 0	<u>38.505.62</u> <u>7</u>	<u>44.962.35</u> <u>6</u>	<u>51.812</u> 4
10	Own capital	<u>euro</u> S	<u>46.489.42</u> <u>9</u>	<u>42.766.56</u> <u>9</u>	<u>38.745.88</u> <u>0</u>	<u>34.403.53</u> <u>6</u>	<u>29.713.80</u> <u>5</u>	<u>24.648.89</u> <u>5</u>	<u>19.178.79</u> <u>3</u>	<u>13.27</u> 2

<u>11</u> To	Ch	Eq
tal liabilities and capital	eck	uipment
<u>euro</u> S	<u>euro</u> S	
O	<u>57.634.38</u> <u>8</u>	O
0	<u>58.804.73</u> <u>9</u>	O
0	<u>59.945.30</u> <u>8</u>	O
OI	<u>61.053.71</u> <u>1</u>	O
0	<u>62.127.37</u> <u>5</u>	O
0	<u>63.154.52</u> 2	O
0	<u>64.141.14</u> <u>9</u>	O
0	<u>65.084.01</u> <u>5</u>	O

# Conclusion

We can conclude that the project is sensitive to the income because the elasticity of EIRR from the percentage change of income (from -30% to +30% to 10 percentage points) is relatively high. The project is not sensitive to the change of the height of investments and the change of prices of electrical energy.

During the discount rate of 8% we can evaluate the critical values of the income, investment and price (expenditure of electrical energy) during which the project is on the border of profitability. The critical values are illustrated in the following table.

Table no. 78 Critical values of the income, investment and the price (expenditure of electrical energy) during which the project is on the border of profitability.

Income	22%
Investment	58%
Price (expenditure of electrical energy)	65%

From the table it can be seen that during decreasing the income for 22% the project is on the border of profitability. During icreasing of investments for 58% the project is on the border of profitability and during increasing of the expenditure or price of electrical energy for 65% the project is already on the border of profitability which is least likely to happen. It has to be mentioned that the sensitivity analysis is done only if one variable changes and all the rest are constant.

# **Socio-economic analysis**

The realization of the investment in the development of a tourist resort has a relativally big socio-economic influence on the immediate surrounding, or the local and regional economic and social development. The financial profitability of a project, which is leading for the investments and is especially important for the investor, especially if those are private investments, is actually only one aspect of considering of gains from the realization of a project like this one. Besides this the evaluation of the socio-economic benefits that will be made from the realization of the project, actually give the real picture for the gains of society, or the wider community, that come from the project. The complete evaluation of profitability for the development fo the ski center Carev Vrv of the Osogovo mountains should be based on seeing all real attainable socio-economic influences. Tourism as a global phenomenon is one of the industries that employs a big number of employees. The development of tourism opens a big number of direct but also indirect working places in the accompanying industries. The development of a ski center or the realization of the planned activities that include the construction of the base and all needed infrastructure create new jobs as in the construction itself, so in the year of operating of the center, with which the local and regional economic activities increase and an additional income is provided. For each project that is undertaken for encouraging of tourism development, it is needed to be taken into consideration the socioeconomic and environmetal influences so that it could really be profited of the project to be determined.

Tourism as a socio-economic process has a global territorial distribution. In many countries tourism is one of the main movers of economic development. The socio economic influence of tourism is especially big in the tourist region, but also in the regions that have limited possibilities for economic development. Tourism is very important for the development of local enterprenuership and especially for strengthening of small and medium enterprises, which has a big influence on impovement of the life standard in the regions where it has an intensive development. From the economic aspect tourism has contribution in increasing the gross national product as well as strenghtening regional and rural development, whereas from the social aspect tourism contributes in the creation of new jobs, creation of better living conditions, it decreases immigration, or influences the demographic of a region.

#### **Existing condition**

Makedonska Kamenica is a town in which the main industry branch is mining, or the mine Sasa is the biggest economic capacity of the territory of the municipality and carries the local economic development. From the mine Sasa directly or indirectly live 900 families. There are several industry capacities as part of the machine and processing industry, as well as textile capacities and over 80 micro and small private business objects. Unemployment in the municipality of Makedonska Kamenica is about nine percentage.

#### Employment

The development of a ski center that by its characteristics can be ranked as middle and has a big influence on the local and regional economy. Generally, the tourist industry is one of the industries that create a large number of jobs. Tourism is an intensive working industry which besides the direct jobs that it creates, it also creates a large number if indirect jobs. The jobs that are created are of different rank and are those for which a high expertise is needed (managers, marketing, engineers and so on), then administrative and all the way to jobs for unqualified workers who in the process of heigene maintenance in the accommodation objects, communal services and others. From the aspect of tourism the notion of employment includes three different categories. Direct employments, that are connected to the process of preparation and construction of the whole needed infrastructure and equipment for development of a ski center, during which it should be pointed out that this pertains to the total needed employments for preparation and reazliation of a project which is a part of the process of tourism development.

The next category of jobs is direct employment that are connected to the operating and maintenance of the ski center. These jobs are necessary for the successful operation of the tourist destination or in this case, jobs that are in the function of the operating of the ski center, the accommodation and service industry capacities and the remaining functional wholes.

The third category of employments are the indirect employments or jobs that are created in the accompanying sectors that are connected to the construction sector that is responsible for the construction of the infrastructure, but also the supporting sectors that are connected with tourism, such as the food industry, agriculture, service activities and other types of economic activities.

Direct employments after the construction of the first phase of the ski center Carev Vrv and completion of the vertical transport system will be 56 full time and 87 seasonal employments, whereas with the complete realization of the ski center Carev Vrv the number of new employments will increase to 77, or 142 seasonal employments. The total number of direct employments, taking into consideration all foreseen accommodation capacities, service industry obejcts and realized projects with which the offer of the locality will increase are estimated to be approximately 850. The direct employments on the basis of the construction of the ski centers and the whole infratructure are not taken into consideration. The influence over the total number of employees in the Eastern mountain region would be 2,2% or for approximately 2,2% the number of employess would increase, and the number of unemployed would decrease for approximately 4,2%. The number of indirect employments is relatively difficult to determine. Usually the number of indirect employmet is determined on the basis on the so-called coefficients of multiplication which depending on the authors are quite different and can be 1:0,5 (according to ON), 1:1,4 (according to the Canadian researches in the ski centers). The largest number of authors adopt the 1:1,25 coefficient. In accordance with this the number of indirect emplyments would be approximately 1100.

The total influence on increasing the number of employees would be 4,48% and the decrease of the number of unemployed would be 9,56%.

### Demographic

Tourism in its economic effects positively influences also the demographic development of a region. Especially big are the influences on the demographic development of regions that are economically undeveloped and where the demographic structure of the population is especially nepovolna. The experiences so far in the world have shown that tourism is one of the best

industries for overcoming regional undevelopment and improving the demographic structure of the populaltion. In a great number of cases, the development of tourism would be an initial factor for increasing the number of the population, influx of young people and young families. In the developed tourist regions, tourism is not only a positive influence on the migrations, but is also a cause for seasonal migration of the work force from other regions.

The creation itself of new jobs in great measure influences the decreasement of the proces of immigration, as in the rural places so from the urban centers in the region. The number of directly newly created work places that is estimated on 950 means a secured existence for the same number of families. The structure of employees at the existing ski centers shows that the biggest number of employees are local population, or they live in the close by popullated places except those employees for which specific skills and knowledge is required. Beseides direct employemt, indirect employment also influences on the decreasement of the negative demographic appearances. The development of a ski center with all its content will have a big influence on agriculture in the Eastern region, especially having in mind that the Eastern region is mostly an agricultural region. With the construction of the planned projects and the functioning of all accommodation and service industry capacities a safe market for the locally made agricultural products will be ensured.

The influence of tourist on the structure of the population is different. Tourism is not a factor that radicalizes the societal constitutions and cannot significantly influence the biological structure of the population, but generally tourism increases employment of women, with which it influences the bilogocal structure of the population.

## **Rural development**

The development of alternative types of tourism and especially the development of the mountain torusim contributes intesivation of rural development, through the creation of businesses and new jobs. Agriculture, or production of food products that are necessary for functioning of the accommodation and service indutry capacities encourages rural development through keeping the exitsting jobs in agriculture, enables possibilities for learning and transfer of knowledge, introduces new skills and provides trainning and education possibilities. At the same time the production of organic products that would be offered in the frame of the center will allow the creation of products that have a bigger value, with which the development of new ways of agricultural production in the rural areas will be provided. Craftsmanship also has its part in increasing the tourist offer through the development of souveneers, hand made products, charactieristic local products, with which existence is provided for this type of production.

### **Economic development**

### Gross domestic product

With the complete realization of the projects the two localities (the first phase of Carev Vrv) the gross dometic product will increase for about 3,2%, while with the completion of all phases of the development of the locality Carev Vrv the GDP increase would be about 4,95%. The increasing of the GDP that will come from the accompanying industries as well as the construction of the necessary infrastructure is not taken into consideration.

An investment of over 60 miollion euros, with 850 direct employments created, has a big influence on the economic development of the Eastern region. Tourism has a great potential for sustainable development of small and medium enterprises.

## **Social dimension**

The development of a ski destination will have a positive influence on the social development of the region. Generally the influence can be divided into two categories: increasing life standard and increasing social cohesion and stability. Investments in one municipality that is exceptianly dependent on only one industrial capacity, as well as investments in economically undeveloped region, would bring new employemts and with that new income in a certain area, positively influence the change of the various social and cohesional trends in the local or regional community (lower rate of unemployment, increasing of the gross domestic product, increasing of the income of families and others). Certain rural populated places and also areas in the Eastern mountain region are

endagered with a high rate of immigration which already brings into question their physcall existence because the number of the population is under the level of biological sustainability. It is especially important to be stressed that the influence over the labor market in these rural areas of the Eastern region. Taking into consideration the meaning of tourism for the rural areas, the realization of the project in a whole, it can be said that the project will have an exceptianal influence on the rural labor market through direct employments but also through suppor of the accompanyinf economic branches. With the development of the ski center Carev Vrv the mountain regions will become a source for zarabotka and cinitel of social stability, with shich preconditions for survival of the rural communities are created. Today, this locality is completely abandones and unused. The Osogovksi mountain and practically untouched and unused by the local authorities.

The implementation of a complex project for tourism development also includes measures and activities in which in great measure the population from the closest rural or urban centers is included. The posibilites for providing additional income in the families contributes to the creation of long term changes of the behaviour of the population, which usually results in improvement life of the population, but also towards increasing the investment by the local population in the area of enterpreneuership.

### **Managing model**

A basic shortage of the existing tourist localities as well as the existing ski center in Macedonia is the lack of appropriate managing with a tourist destination. The construction of a ski center is a complex project that includes implementation of a big number of activities, actually, the development of a ski center is a project that with its size and complexity it represents a mega project, especially countries where there are still no similar ski center. Generally the development of tourism in an area or a locality is especially a complex process that is comprised of a realization of a big number of projects that are with different degree of complexity. The realization of this mega project has a big influence on the region where it is being realized and in a relatively big measure contributes for the economic and social development of the region, and through the realization of the appropriate measures for protection of wildlife and environment, or measures for decreasing the negative influence on the wildlife it contributes towards sustainable development of the region itself. The realization of this project must satisfy the damands and expectations of the different stakeholders, while taking into consideration not only their interests but also the capacity of each stakeholder for the realization of activities that contribute towards the realization of their interests.

The analysis of the stakeholders from the aspect of their inclusion in the realization of the project shows that the expectations on the local level are relatively high. The capacity of the local stakeholders from the aspect of investment and organization of the realization and from the aspect of organizing and managing with the destination are relatively limited, or ensuring investment means enough for the realization of the project cannot be expected. Still part of the separated projects that are noted in the study itself also allow entrace of a local private capital, or these projects can be interesting for the local private and public stakeholders. The care and control of the usage and way of using the natural resources, normally above all are the interest of the local stakeholders.

The possible investing above all should be demanded by the international interested subject, or the stakeholders or by the public sector on the national level.

The transparency of the procedure of investment is a basic preconditions for the successful realization of the project in whole.

The creation of an internationally competitive project that is understandable for the domestic and foreign stakeholders above all is based on the definition of the role of the different subjects in the development of the project itself. This is especially pertaining the public sector on the national and regional level, who actually should also appear as an initiator for the realization of this project. It is also necessary for the role of the various actors from the private sector to be defined, starting from the investors, through the managers, and all the way to the local small and medium enterprises. Generally, starting from the size of the project itself, the size of the are that is comprised with the project and the low level of developed infrastructure in the area itself, it is necessary for the public sector to provide basic conditions for realization of the project through the construction of the capital infrastructure, or planning and urban defining of the whole area, providing infrastructural equipment of the locality Carev Vrv from the aspect of construction of a road infrastructure and traffic connectivity of the localities with the near urban centers. New roads are necessary, reconstruction of part of the existing roads, electrification, water supply and introducing waste waters with their purification with which the development of the tourism in the Osogovski mountains will be supported, through the realization of the project.

Because of the existing economic crisis in Europe and beyond, as one of the options for the future development of this locality also is the complete undertaking of the initiative for realization of the project by the public sector, with the purpose of ensuring efficient managing with the space and protecting the ecologic balance of the Osogovski mountains. This would mean undertaking of the complete responsibility for development and managing with the ski locality, or investing in the specific mountain infrastructure and specific equipment, as well as undertaking the complete managing and maintenance of the ski center. As one of the forms for this type of development of a tourist destination is the private – public partnership.

In accordance with the positive experiences from the development of already established ski centers, as well as the specificities and laws of the market economy and private business, during the realization of the so-called greenfield investments, the risk that is connected to the construction of the necessary accommodation capacities in the base settlement it should be connected to the private sector.

The development of the locality Carev Vrv represent a completely new investment and necessary it the construction of the basic and accompanying infrastructure so that this locality can be developed.

### **Recommended model for management**

The management model of a ski destination primarily is based on the need for creating a modern management model that for its purpose has the development

fo the ski center Carev Vrv, or attractiving possible investments. An investment in great measure depends of the clearly defined real estate relations of the whole land on which the infrastructure, the stages and the remaining accompanying contents of the ski center are recommended to be located. Administrativelly, the Carev Vrv area belongs to 3 municipalities: Makedonska Kamenica, Kocani and Kriva Palanka. The successful development of a destination depends on the way of managing the destination. Today, for the development of tourism responsible are the departments for economic development in each of the above mentioned municipalities. It is not real to expect some significant result in the development of tourism on Carev Vrv until that development is managed by three different subjects. The development of the ski center Carev Vrv should be based on an integrated approach.

The questions of defining the concept of using the real estate that belongs to the state (obejcts and land) from the aspect of models and types of investments, by rule is connected to the relation of the planned and realized development in a country, but also with the specificality of the destination and the resources that are used. In the case of Carev Vrv, the defining of the development plan above all is connected to determining the answers to the following questions:

- Should it go on the basis of real estate sale, especially the land, on the potential investors and if yes in which cases can that be done
- should there be based a public company for development and construction
- should there be a concession and if yes in which cases should that be done
- should there be a strategic partner involved in the project

The search for the answer on these questions is characteristic for the development of any ski center.

The quick and direct real estate sale is limited by one basic problem, and that is the investors market, which by rule are not inclined towards investments in projects for whose a complete integral vision is not ensured and the development is not completely documented with real estate relations solved.

The founding of a public enterprise for development and construction of the planned localities is one of the models that is often used for the development of tourist destinations. With the founding of such an enterprise, the development of the locality Carev Vrv would be the responsibility of only one subject that would undertake the necessary steps for the realization of this project. There are several modalities in relation to the way of management by the public enterprise on the development and construction of a tourist destination. One of the basic modalities is the enterprise to develop or build the locality and later to sell certain or all projects to the private sector, whereas a second modality is for the enterprise to realize all activities that are needed for documenting the complete development and solving the basic issues, above all from the aspect of real estate relations and the way of construction of the localities, and the construction itself to go through a concession, strategic partner or other way of investing.

On the basis on world experiences, concession if given on a longer deadline (30 to 50 years) minimization of the risk and increasing of security of the investment is provided, with which the attractiveness and acceptability of the investment itself increases. The concession especially is used when it is about specific and naturally attractive destinations.

In accordance with the analyzed management models and taking into consideration the specifications of the locality, but also to the Republic of Macedonia, the following management model is recommended:

Forming on an inter-municipal public enterprise for the development of the locality Carev Vrv that will take care for the development of the locality itself. Primarily the enterprise will be responsible for documenting the whole process of realization of the planned projects, or making of a Master Plan and other planning documentation, solving the real estate relations, construction of the basic infrastructure and setting the needed specific equipment, defining of the way of investing and ensuring the timely controlling of investments with the purpose of ensuring the integrality of the whole locality, as well as all necessary activities for the realization of the projects.

The enterprise for managing with the destination is an organization that is responsible for managing and/or marketing of a certain destination. These type of organizations, through the functions that they realize have a key role in increasing the competiveness of the destination. The enterprise for managing the destination has the following primary functions: marketing of the entire destination, coordinator of tourism, presenting the destination, economic initiator and creating a picture for the destination. The responsibility of this type of organization is more functional, but the basic goal is ensuring sustainable development of the destination and a timely response or reaction to the changes in the market.



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