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WINTER TOURISM IN PORTUGAL - ENCOURAGING ITS INCREASE

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Every year between seventy thousand and one hundred thousand Portuguese practice winter sports, mainly skiing and snowboarding (Carvalho, 2006). Unfortunately for Portuguese tourism most of them go abroad to spend their money.Serra da Estrela is the only mountain where it is possible to practice winter sports in Portugal but it doesn't attract many Portuguese. Problems with accessibility (Petur,2006) inexistency of accommodation near the ski slopes (Carvalho,2006) and not enough kilometers of ski slopes(Tonge, Veronica) are some of the main reasons for this lack of attraction.The aim of this paper is to demonstrate that is possible to increment the number of kilometers of ski slopes in Serra da Estrela.To provide the design of the new ski slopes we went to the mountain and marked over a thousand points in GPS. These points marked on the field provide us the information to design the new ski slopes. These new ski slopes will help Serra da Estrela to become more attractive, avoiding the need for Portuguese to go abroad to practice winter sports.

Keywords: Winter tourism, Serra da Estrela,ski, Snowboard.

Literature Review

"Serra da Estrela" is a mountain in Portugal, the only one where it is possible to practice winter sports. This mountain is positioned in the middle of Portugal between "Covilhã" and "Seia" and it is about 2000 meters high.

There are not official numbers about how many Portuguese tourist went abroad to practice winter sports in the last years. Some non-official numbers point to fifty thousand people, some others point to a hundred thousand people, we believe the real number is somewhere between this two figures.

According to the "Etude realisée par le cabinet Architecture etTerritoire pour le compte de la direction du Tourisme (2005)" the average time that winter tourists go skiing is one week. If we multiply the figures above by six nights we conclude that there are somewhere between three hundred thousand and six hundred thousand nights spent by Portuguese abroad in winter tourism.

There are many studies regarding people's motivation on the choice of the ski resort. In Portugal we would like to salient the study of MárioCarvalho (2007) from which we are going to present some conclusions.

In the inquired 91,5% choose the car as the favorite transport mode to go to a ski resort.Regarding the accommodation, Portuguese skiers prefer:

- Apartment - 39%
- 3 stars hotel - 29,3%
- 4 stars hotel – 18,3 %

MárioCarvalho (2007) considered two kinds of factors that influence the choice of the snow destiny, internal and external.

In the internal factors we have:

- Kilometers, number, kind and colors of the ski slopes
- Quality and kind of snow
- The price of the "forfaits"
- Capacity and modernity of mechanic means

In the external factors there are:

- Distance from the usual residence to ski resort and the quality of the roads
- The price of the accommodations
- The distance from the accommodation in the ski resort to the ski slopes
- Proximity of the airport to the ski resort

Another study about the main factors that influence the choice of the ski resort was made by Veronica Tonge. This author did not separate the internal factors from the external factor. The results presented were as follows.

- Pistes for your ability - 3.39
- Transfer time (from usual residence to ski resort) - 2.70
- Snow reportprevision of the resort - 2.67
- Reputation of resort - 2.65
- Km of piste - 2.64
- Beauty of scenery and resort - 2.57
- Price - 2.53
- Traditional village - 2.37

There is also an interesting study from Greece that agrees with the idea of the importance of the distance between the usual residence and the ski resort, in the choice of the ski resort.The distance between the residence and the ski-center is a very important factor that affects the frequency of visits. Olga G. Christopoulou ,Ioannis J. Papadopoulos (2001).

In resume, there are three main factors that people pay attention when they choose where they are going to ski. Adapted from Carvalho(2007), Tonge , Christopoulou and Papadopoulos (2001).

1) The distance from home to the ski resort.
2) The distance from accommodations on the resort to ski slopes.
3) The number of kilometers and quality of ski slopes in the resort.

If we analyze why the Portuguese go abroad to skiing instead of come to Serra da Estrela the answer is that it has not enough ski slopes and there is a big distance between the accommodations in the ski resort and the ski slopes.

The distance from home to ski resort, is an advantage that should be managed.The distance from accommodations on the resort to ski slopes, can be fixed by building accommodation close to the ski slopes.The number and quality of ski slopes in the resort of "Serra da Estrela" is the most difficult issue that is necessary to be fixed.

Justification for This Paper

There are just a few studies about winter tourism in "Serra da Estrela". Studies proposing the implementation of new telpherage, there is only the PETUR. But the PETUR only propose the implementation of telpherage that could substitute the roads when they are closed. There are no studies proposing the implementation of new ski slopes in "Serra da Estrela".

Objective

Make the ski resort of "Serra da Estrela" became more attractive allowing it to compete with the ski resort in the proximity. "Manzaneda" in the north close to "Oviedo", "San Isidro" and "Fuentes de Invierno" in the north close to "Leon" and "Bejar" at east close to "Salamanca".

This enforcement in the attractiveness of "Serra da Estrela" will be obtained by proposing the implementation of new ski slopes and consequently the increasing of the number of kilometers of ski slopes.

Method

First Phase – Analysis previous of the field – In this analysis previous there are observed, local maps, military maps and google earth. In the mountain every time it is possible, the field is observed from a distant point before being invade.

Second Phase – Marking Points – Using two GPS, there were marked over a thousand points where the new ski slopes shall pass. In the first GPS the points were marked automatically, after identifying the starting point of the ski slope, it is just necessary to mark the finish point. In the second GPS specific points are marked manually.

Third Phase – Introducing Points on the computer – The information of the points marked on the field has been introduced in the computer and the points were connected allowing us to see the design of the ski slopes. These points were introduced manually in the software Google Earth, because some of the points marked automatically in the field and saved in the GPS cannot be used to design the ski slopes. It happens because sometimes we start marking a new ski slope and then we find out that it goes nowhere.

Fourth Phase – Talking with Specialists – The specialists advise us to abandon some of the ski slopes already marked. The level of altitude and the solar exposition were the main factors for abandoning some of the ski slopes.

Fifth Phase – Final design of the ski slopes – After finishing the previous phases we are at this point able to design the ski slopes to be proposed. At this phase a good knowledge of the terrain allow us to make a first analysis of the ski slope difficulty level. In this phase some of the ski slopes might be divided according to their difficulty level.

Constrains of the Research

The main limitation of this research is the fact that the ski slopes marked on the field were flagged based only in the opinion of the author. Despite the author's forty years of skiing experience, a second opinion of another specialist on the field would be an important asset. Several interviews with Carlos Varandas, Director of the ski resort of Serra da Estrela that has a good knowledge of the field, in a certain way permit to reduce the impact of this limitation.

The second limitation is the fact that the points were marked on the field during the summer, when there isn't any snow on the ski slopes. The snow usually has a tendency to accumulate in places with less wind close to uneven ground or in places like holes or ditches. This fact usuallyallows the skier to cross easily some obstacles that in the summer look like they are difficult to transpose. But sometimes when the snow changes the furrow of the ground can make appear some obstacles that are not predictable on the summer.

Results

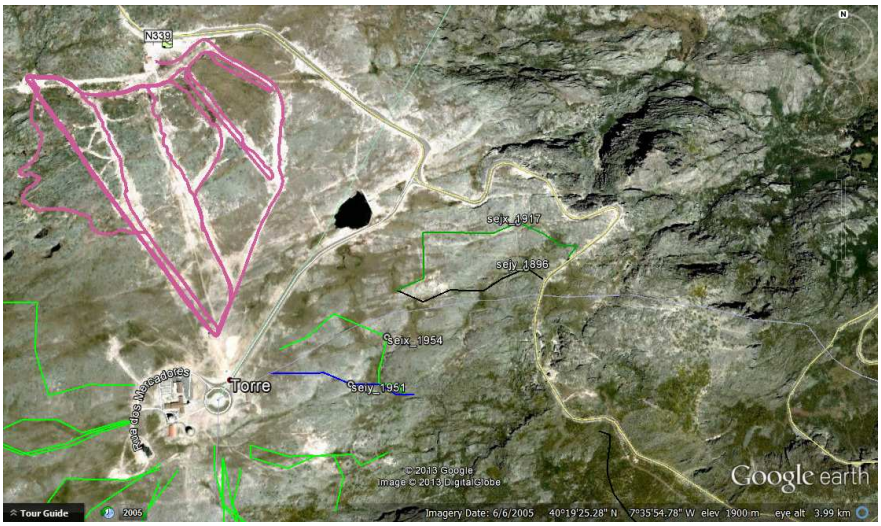
There were identified in the field several ski slopes that can be explored in the future. To easily identify them we choose to organize them by zone.Identified zones were "Zona de Nossa Senhora; Zona do Covão das Quelhas; Zona do Covão do Boeiro; Zona da lagoa do Peixão". There were identified two more zones thathave been abandoned afterword's, "Corgos da Ribeirinha e Covão do Ferro".

The zone of "Corgos da Ribeirinha" was abandoned because its solar exposition was regarding south, the zone of "Covão do Ferro" was abandoned because of its low level of altitude.

To support the text we considered essential the existence of images to accomplish the ski slopes design. To obtain these images we used the google earth. To exist ancertain proportionality in the dimension of the ski slopes proposed, we use in the different zones always the same eye altitude, approximately four kilometers above the sea level.

Zone of "Nossa Senhora das Neves"

In this zone there were identified two ski slopes, hitch one with two variants. The ski slope "sei" starts near to "Torre", at the GPScoordinatesN 40° 19' 21'' W 07° 36' 41'', going to east to the GPS coordinatesN 40° 19' 19'' W 07° 36' 25''. The variant "seix" extended by 539 meters, has rather less inclination then the "seiy" with 393 meters. It is curios that this ski slope has existed in the pass and has been abandoned. According to the guard of "Torre" that lives and work there for more than twenty years, this ski slope has been abandoned because it had too much snow. The excess of snow brought some difficulties to permit the normal function of the cableway,at first several meters of snow accumulated didn't allow the skiers to pass under the poles that suspend the cables. Afterwards the weight of the snow bended the poles that suspend the cables and the ski slope has been dismantled.



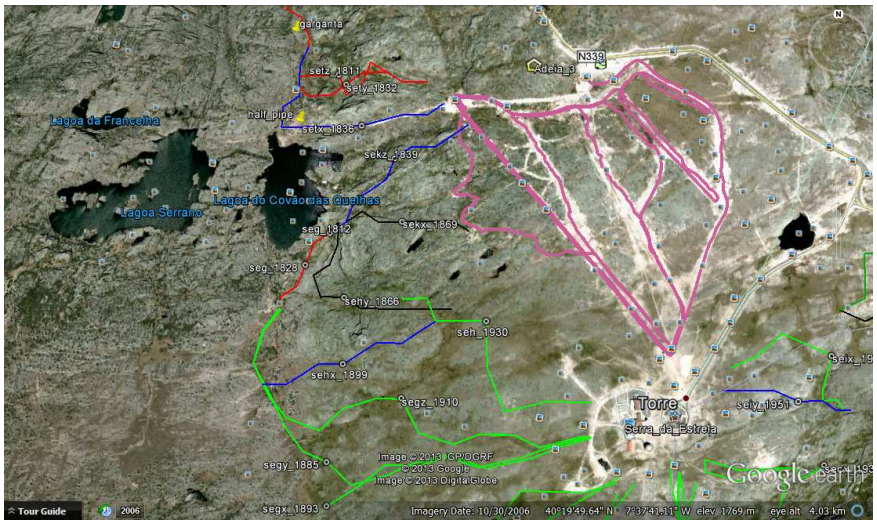
Picture of "Zona de Nossa Senhora das Neves" – own source.

The ski slope "sej" starts in the hill above the abandoned house at east of the road that goes to "Torre" at the GPS coordinatesGPS N 40° 19' 28'' W 07° 36' 27'' and goes east to the plateau of "NossaSenhora das Neves". The existing road to "Covilhã" obstruct the progression of the ski slope that ends in a little plateau posicioned at north of "NossaSenhora das Neves". This ski slope has two variants "sejx" extended by 688 meters and "sejy" with 440 meters.

The zone of "NossaSenhora das Neves" allow the creation of 2060 meters of new ski slopes. The lower point for this zone is at altitude of 1866 meters at the GPS coordinates N 40° 19' 29'' W 7° 36' 10''.

Zone of "Lagoa do Covão das Quelhas"

This zone permit the implementation of two new ski slopes, "seg" and "seh" and still make the conection "sek" from the black ski slope, also knowened as bike slope, to the "lagoa do Covão das Quelhas".



Picture of "Zona da Lagoa do Covão das Quelhas" – Own Source

The ski slope "seg" starts close the "Torre" at the GPS coordinatesN 40° 19' 17'' W 07° 36' 56'' and goes to west. Its width allows the existence of several variants from hitch we highlight the "segy" in south extended by 1323 meters, and "segz" in the north with 1300 meters. When they join again together at the GPS coordinatesN 40° 19' 20'' W 07° 37' 34'' these alternatives goes together to north during 277 meters. While they get closer to the "lagoa do Covão das Quelhas" its difficulty level to the skier increase. The lower point stands by the margin of the lagoon at 1812 meters of altitude.

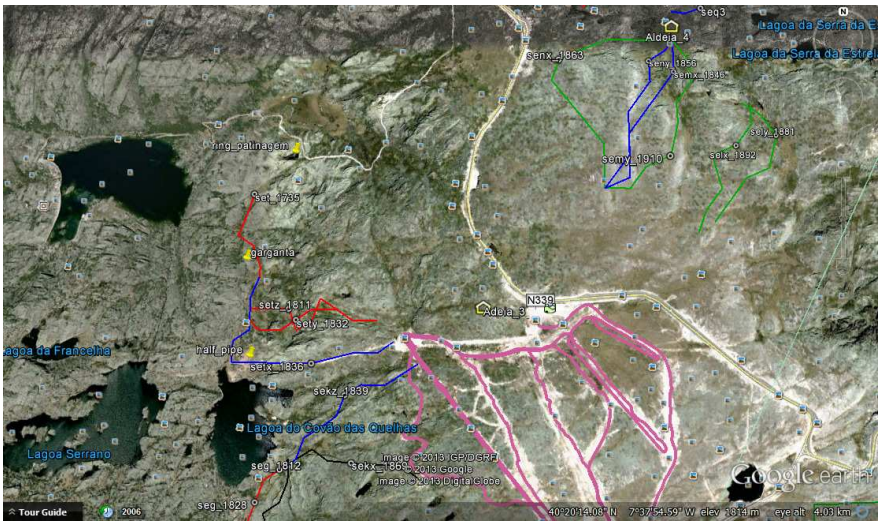
The ski slope "seh" extended by 774 meters, starts close to the "Torre" at the GPS coordinatesN 40° 19' 20'' W 07° 36' 56''and goes down to northeast. Afterwards this ski slope is divided in two options at the GPS coordinatesN 40° 19' 27'' W 07° 37' 14''. The softer option "sehx" extended by 551 meters to southeast until meet the piste "seg" at the GPS coordinatesN 40° 19' 21'' W 07° 37' 35''. The harder option "sehy" extended by 676 meters, has a bigger inclination and a lot of obstacles and goes to northeast until finish by the margin of the lagoon.

The ski slopes "sek" allow the connection between the black ski slope locally known us bike slope and the lagoon called "lagoa do covão das Quelhas". This several connections have a bigger inclination when they start more south and smaller inclination when they start in the north side. These connections all go to southwest, "sekx" extended by 438 meters and starts at the GPS coordinatesN 40° 19' 35'' W 07° 37' 10'', "seky" extended by 418 meters and starts at the GPS coordinatesN 40° 19' 39'' W 07° 37' 12''and "sekz" extended by 540 meters and starts at the GPS coordinates40° 19' 45'' W 07° 37' 10''.

The zone of the lagoon of "covão das Quelhas" permita total creation of 6014 meters of new ski slopes. The lower point for this zone is situated by the margin of the lagoon at 1812 meters of altitude at the GPS coordinates N 40° 19' 35'' W 7° 37' 27''.

Zone of "Covão do Boeiro" – Half Pipe andIce skating

The Zone of "Covão do Boeiro" accept the implementation of a ski slope "set" with several variants. This ski slope start at the end of the existing chair cable lift at the GPS coordinates40° 19' 47'' W 07° 37' 13'', and ends at the zone of "Salgadeira" positioned according to the military map at the GPS coordinatesN 40° 20' 01'' W 07° 37' 31''. This ski slope can have several options from each we would like to emphasize setx, sety and setz.



Picture of Zone of "Covão do Boeiro" – Own source

The variant "setx" extended for 761 meters, starts at the end of the chair cable lift and follows the land road to west pointing to the lagoon of "Covão das Quelhas", when it get´s close to the lagoon at the GPS coordinatesN 40° 19' 45'' W 07° 37' 33'' it follow the direction to north passing by "barrosvermelhos" and ending near the "Salgadeira".

The variants "sety" and "setz" also start at the end of the existing chair cable lift and follow to west in a parallel line to "setx". The variant "sety" will extend by 419 meters and the variant "setz" will extend by 363 meters. When "setx" leaves the land road to follow north, it will join together with "sety" at the GPS coordinatesN 40° 19' 49'' W 07° 37' 31''and "setz" at the GPS coordinatesN 40° 19' 50'' W 07° 37' 31''. After that point the different variants of "set" follow together during 288 meters to north and the ski slope end at the zone of "Salgadeira".

The ski slope "setx" has in its way three natural places that can be used by the skiers. At the picture close to the lagoon of the "Covão do Boeiro" it is marked a "half pipe" at the GPS coordinatesN 40° 19' 45'' W 07° 37' 31''. Actually the shape of the rocks on that spot can be easily used to build a natural half pipe. The "garganta" also signed in the picture at the GPS coordinatesN 40° 19' 54'' W 07° 37' 32'' can be used as a stepping stone to little jumps. The "ring de patinagem" also pointed in the pictureat the GPS coordinatesN 40° 20' 05'' W 07° 37' 26'' is a small lake at the zone of "salgadeira" that has small deepness and can be used as ice skating spot. This little lake is positioned between the end of the ski slope "set" and the land road that comes from the "Barragem do Covão do Boeiro" to the road that goes to "Seia", passing by "LagoaComprida".

If by any reason the skier prefers to avoid these obstacles he should follow the land road that passes on the left of the half pipe and follow the ski slope on the right side of the jump called "garganta".

The zone of "Covão do Boeiro" permits the implementation of 1831 meters of new ski slopes. This zone will have its lower point at an altitude of 1735 meters at the GPS coordinates N 40° 20' 01'' W 7° 37' 31''.

Zone of "Lagoa do Peixão"

The zone between the existing ski resort and the "Lagoa do Peixão" is a zone with a high potential to create new ski slopes. The landscape can proportionate the construction of several ski slopes with a great advantage, this ski slopes will be facing north and the melting of the snow will be slower.

Picture of Zone of "Lagoa do Peixão" – Own source

From the existing ski resort if you face north it is possible to view two hills. The ski slope "sel" will start at the top of the hill standing in the east side. The ski slopes "sem" and "sen" will start on the hill standing on the west side.

The ski slope "sel" as we said before will start at the top of the hill standing in the east side attheGPS coordinatesN 40° 19' 57'' W 07° 36' 37'' and will go north. This ski slope ends attheGPS coordinatesN 40° 20' 09'' W 07° 36' 31'' close to a place that we call crocodile neck because there is a rock with this format at theGPS coordinatesN 40° 20' 10'' W 07° 36' 31''. This rock is an obstacle that proportionates a deep depression with three or four meters high, that make the progression very hard. It is possible to go round this obstacle and achieve the ski slope "sem". It is possible to go round following left going out of ski slope to "sem". It is also possible to go around this obstacle by the right, but for doing so it is necessary to turn right before reaching the crocodile neck.

The ski slope "sel" present two variants. The variant "selx" on the west side extended by 457 meters, starts going north and after passing the GPS coordinatesN 40° 20' 04'' W 07° 36' 35'' turns to northeast.

The variant "sely" with 462 meters on the east side, start going northeast until the GPS coordinatesN 40° 20' 06'' W 07° 36' 27'' and after that point it turns to northwest to the crocodile neck.

The ski slope "sem" and "sen", both start at the top of the hill positioned in the west side at the GPS coordinatesN 40° 20' 01'' W 07° 36' 48'' and both go north, hitch one with two variants following its own way. This ski slopes all meet again at the plateau existing at "planalto de Chancas" at the GPS coordinatesN 40° 20' 15'' W 07° 36' 39''.

The ski slope "sem" present two variants, "semx" extended by 526 meters and "semy" with 600 meters. The variant "semx" goes almost in a straight line until the theGPS coordinatesN 40° 20' 12'' W 07° 36' 39'' and from that point on it goes directly to north until arrive at the "planalto de chancas". The variant "semy" goes almost in a straight line to the GPS coordinatesN 40° 20' 12'' W 07° 36' 36'' and from that moment on goes to northwest until arrive at the "planalto de Chancas".

The ski slope "sen" also present two variants "senx", extended by 765 meters and seny with 513 meters. The variant "senx" follows almost a straight line until the theGPS coordinatesN 40° 20' 11'' W 07° 36' 54'' and then turns to north to the GPS coordinatesN 40° 20' 13'' W 07° 36' 53''. Afterwards it turns east to the "planalto de Chancas". The variant "seny" goes almost in a straight line to the GPS coordinatesN 40° 20' 13'' W 07° 36' 42'' and then it turns to northeast to the "planalto de Chancas".

In this same plateau by the "Planalto deChancas" start another two ski slopes "seq" and "ser". The piste "seq", with 96 meters will be a small ski slope starting at the GPS coordinatesN 40° 20' 18'' W 07° 36' 39''andgoing east to the GPS coordinatesN 40° 20' 18'' W 07° 36' 35''.

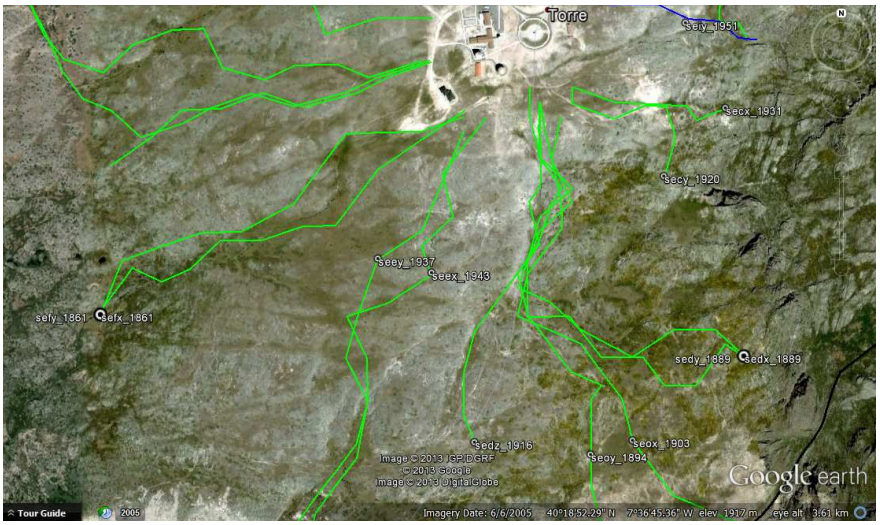
The ski slope "ser" extended by 136 meters, starts at the GPS coordinatesN 40° 20' 19'' W 07° 36' 42'' andgoes north and then join with the ski slope "ses" at the GPS coordinatesN 40° 20' 23'' W 07° 36' 42'' and then turn east until the end.

The ski slope "ses", with 459 meters starts at west of the plateau of "Planalto de Chancas" at the GPS coordinatesN 40° 20' 18'' W 07° 36' 50''and go north until the GPS coordinatesN 40° 20' 23'' W 07° 36' 46''whereit turn east and find the ski slope "ser" at the GPS coordinatesN 40° 20' 23'' W 07° 36' 42''. From that moment one they go together until a place very difficult to transpose at 1771 meters of altitude at the GPS coordinatesN 40° 20' 24'' W 07° 36' 35''.

In the zone of "Lagoa do Peixão" can be created a total 4014 meters of new ski slopes. The lower point of this zone is at 1771 meters of altitude at the GPS coordinate N 40° 20' 24'' W 7° 36' 35''.

Ski Slopes Facing South

The ski slopes "sec, sed, see, sef and seo" in the zone of "corgos da Ribeirinha" and the zone of "Alto da Torre", were abandoned because of its solar exposition oriented to south. This solar exposition oriented to south make the snow melt faster, making difficult the economic viability in the case of existing investments in mechanics means.



Picture of the ski slopes facing south – Own source.

However we consider that by its reduced inclination, all this zone can be used to create ski slopes for Nordic ski. The ski slope "seo" is the one who better characteristics have for this kind of ski slopes.

The ski slopes for Nordic ski don't need any investment in mechanic means, that being the case the viability of this ski slopes is possible to this kind of ski.

Ski Slopes at Low Altitude

In the zone of "Barragem do Covão de Ferro", also known by "Barragem do Padre Alfredo" were identified three ski slopes, "sea, seb and sep".

Picture of the Zone of "Barragem do Covão de Ferro" – Own Source

The ski slope "sea" starts at south of the zone of "NossaSenhora das Neves" and goes to southeastto the zone of "Covão de Ferro". This ski slope has a solar exposition to south and a low altitude, this fact don't allow snow to survive for a period long enough to have economic viability.

The ski slope "seb" starts between "Terroeiro" and the "Barragem do Covão de Ferro" and goes to north, passing at east of the "Barragem do Covão de Ferro". This ski slope besides being exposed to north would be difficult to keep snow without melting because of its low altitude. This ski slope would end at an altitude close to 1500 meters.

The ski slope "sep" has a very strong inclination. If the decision to create this ski slope goes forward, it must be used only by very experienced skiers with a strong security back up. The entrance on this ski slope can be done from the "Torre" descending the ski slope "seo". The exit from this ski slope can be done going around the margins of the "barragem do Covão de Ferro". This ski slope could never be to commercial exploration, but could work as publicity of "Serra da Estrela" if professional skiers were contracted to ski over there.

Conclusion

As we saw in the objectives, the aim of this paper is to make the ski resort of "Serra da Estrela" became more attractive to skiers.

It was verified on the literature review that the attractiveness of a ski resort depends on several factors:

1) The distance from home to the ski resort.
2) The distance from accommodations on the resort to ski slopes.
3) The number of kilometers and quality of ski slopes in the resort.

As we saw in the literature review in the case of "Serra da Estrela" the distance from home to ski resort, is an advantage.The distance from accommodations on the resort to ski slopes, can be fixed by building accommodation close to the ski slopes.

The most difficult problem to solve is to increase the number of kilometers and quality of ski slopes in the resort.

It has been proved during this article that it is possible to increase the number of ski slopes in "Serra da Estrela" and consequently the number of skiable kilometers. As we could verify in our proposal there are several zones where it is possible to create new ski slopes increasing the existing ski resort.

Table. New ski zones proposed – Own source.

Proposed Zones	Meters
Zona de Nossa Senhora das Neves	2060
Zona da Lagoa do Covão de Quelhas	6014
Zona do Covão do Boeiro	1831
Zona da Lagoa do Peixão	4014
Total of the Proposal	13919

This fact allows us to affirm that it is possible to increase the attractiveness of "Serra da Estrela" as ski resort.

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