GEOMORPHOLOGIC FEATURES AND TOURISM POTENTIAL OF THE VALLA CANYON-KASTAMONU/TURKEY

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ABSTRACT
The Valla Canyon has a karstic structure and is located in northern Turkey in the Pınarbaşı District of the historical Kastamonu city. It is one of the biggest canyons in Turkey and was composed by merging the Devrekani and Kanli Streams. The length of the canyon is 12 km and the depth is 1000-1200 m. Access to the canyon is located in Kure Mountains National Park (The only PAN Park in Turkey) and it is possible to access it via paths. Few people know and visit the canyon because of the lack of advertisement. The aim of this research is to determine geomorphological features of the canyon and to reveal tourism potential. Geological, topographical, and tectonic features were mapped and tourism potential was determined by analyzing SWOT as a method. Flora diversity, magnitude of the canyon, climate, humidity level of the mountains, its being close to water production sources, its huge karstic features, and its numbers of caves and waterfalls are strengths of the canyon. As a result, Valla Canyon has a huge tourism potential with natural beauties, attractions and it is proper for nature sports like rock climbing, canyoneering and trekking. Because of the high difficulty level, it will be a unique example for international climbers and canyoneers.
Keywords: Valla, Canyon, Canyonnering, Climbing, Tourism, Kastamonu, Turkey

ÖZET
Valla kanyonu, aşınıma bağlı olarak temelin birçok yerde yüzeye çıkması nedeniyle karstik bir vadi yapısı özelliği

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göstermektedir. Tarihi Kastamonu şehrinin Pınarbaşı ilçesinde 26 km. uzaklığında bulunan kanyon Devrekani Çayı ve Kanlıçayı'nın birleşmesiyle oluşmuş Türkiye'nin en büyük kanyonudur. Kanyon, Pınarbaşı ilçesinin Muratbaşı Köyü, Varla (Valla) Mahallesi sınırları içinde başlayıp Cide'in Hamitli köyünde son bulmakta, kanyonun uzunluğu 12 km ve derinliği yer yer 1000- 1200 m'yi bulmaktadır. Küre Dağları Milli Parkı sınırları içinde bulunan kanyonun ulaşımı bazı patika yollarla sağlanabilmekte ve kanyonun tanıtım yetersizliği nedeniyle pek az insan bilmektedir. Çalışmanın amacı kanyonun jeomorfolojik özelliklerini belirleyip turizm potansiyelini ortaya çıkarmaktır. Jeolojik, tektonik ve topografik özellikler haritalanmış turizm potansiyelini ortaya çıkarmak için de SWOT analizi uygulanmıştır. Doğal güzellikleri ve çekici özellikleri ile bölge turizmine katkı sağlayacak olan bu kanyon yüksek zorluk derecesi ile de uluslararası boyutta dağcı, kaya tırmanışçıları ve yürüyüş sporu ile ilgilenenler için uygun bir özellik göstermektedir.
Anahtar Kelimeler: Valla, Kanyon, Turizm, Kastamonu

Valla Canyon is located in the northwest of Kastamonu, between Cide, Azdavay, Pınarbaşı and on the city border of Bartin (Figure 1). The Canyon begins with the border of Muratbasi Village, through Hamitli Village in Cide and finishes in Gomeren Town. The canyon has been protected until now because of bad road conditions like the stabilized road to the Muratbasi village and 1.5 km pathways inside the canyon.

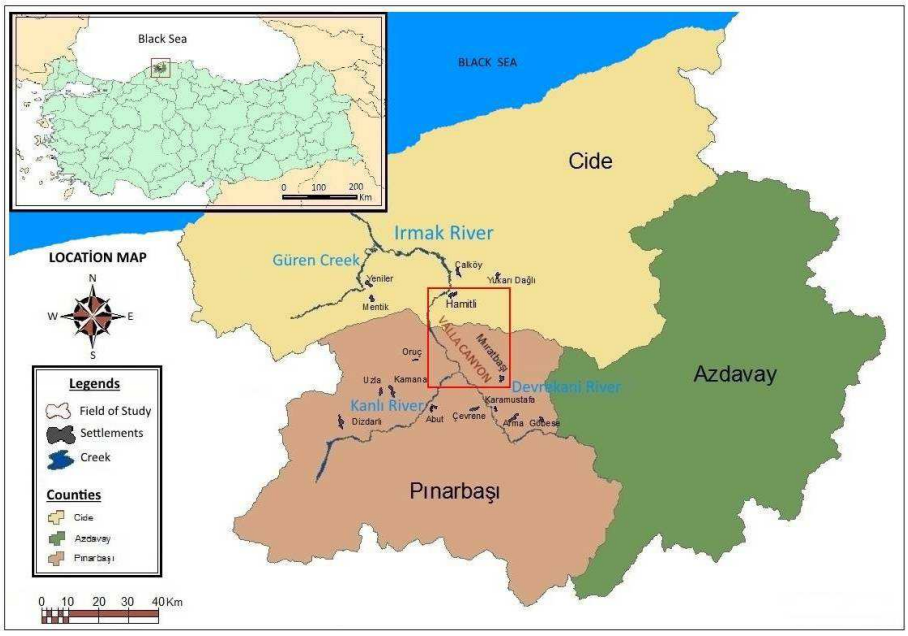
The joining of Devrekani and Kanlicay is the starting point of Valla Canyon. The canyon through Kure Mountains National Park (First PAN Park in Turkey) is 12 km in length. There are 800-1300 meter cliffs at both sides of the Canyon (*PAN Parks (Protected Area Network), an independent non-governmental organization founded by the WWF and Molecaten, is in collaboration with the local and international businesses on local and Europe-wide protected area management*, KMNP-2015).

Geographers, like many other researchers, have been most interested in relationships between landscape and tourism. It is logical for sustainable development especially in the field of tourism which is growing day by day (Butler, 2007). This research is a combination with geography and tourism.

Tourism is limited with a few tourists in the region. The reason is that there are not suitable transportation and accommodation possibilities. This negative situation keeps the natural beauties undisturbed. Valla Canyon has endemic flora, wildlife and landscape diversity for nature lovers. UNDP (United Nations Development Program) determined 48 mammals from 15 families live in the canyon. Besides birds and mammals in national park, endangered species like bats, bobcats, foxes, sea otters and deer are also started to be protected in an international scale (Vurdu et.al, 2004).

In this research, geomorphological, tectonic and topographical mapping and SWOT analysis were used as a method to reveal tourism potential of the region.

Figure1: Location Map



GEOMORPHOLOGICAL FEATURES AND FORMATIONS OF VALLA CANYON

Diffractions that happen in limestone depend on fault systems because of intense tectonism. Diffraction and crack systems expand because water movements (Surface water + underground water) in these diffractions melt carbonates. So, karstification increase and a lot of karstic forms have occurred in this region. Canyons consisting of these karstic formations located in Kure Mountains National Park are natural beauties – and they occur as the result of the fact that streams corroded deep and narrow valleys depending on the directions of faults in Inalti limestones especially while passing through water basins.

The Southwest/Northest Azdavay-Pinarbasi zone is lower and the Devrekani, Senpazar, and Pinarbasi streams settled down onto it. After that, the Devrekani and Senpazar streams settled down into the Northwest/ South-east secondary fault systems. This also means they began to flow to the sea. Thus the formations of Valla and Aydos Canyons started to occur. That limestone zone has an interesting characteristic with deep canyons, especially ones occurring in the direction of horizontal caves and very old forests on plateau. Coastlines involving upper Miocene island dunes are the

last morphotectonic forms and occur through very old faults. This situation shows us the tectonic along the Black Sea Coast is still active (Tuzcu, 2005).

Figure 2: The Valla Canyon Geology Map

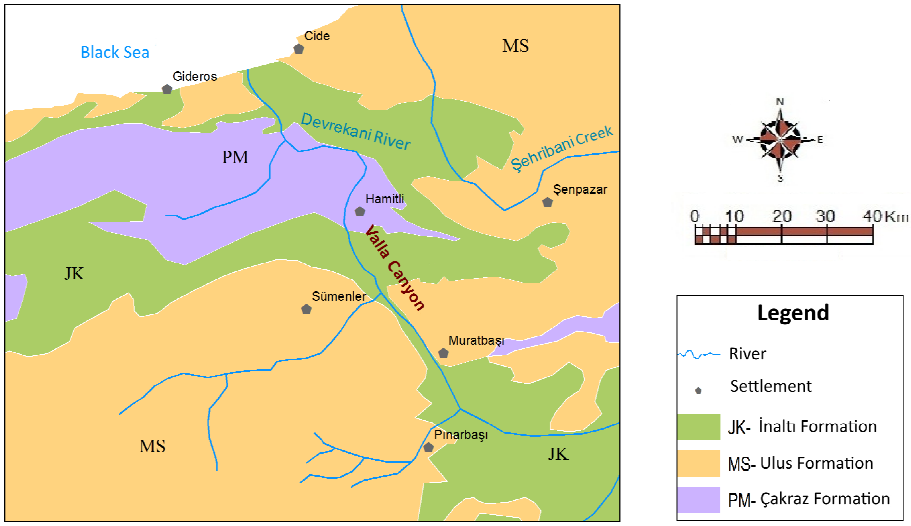
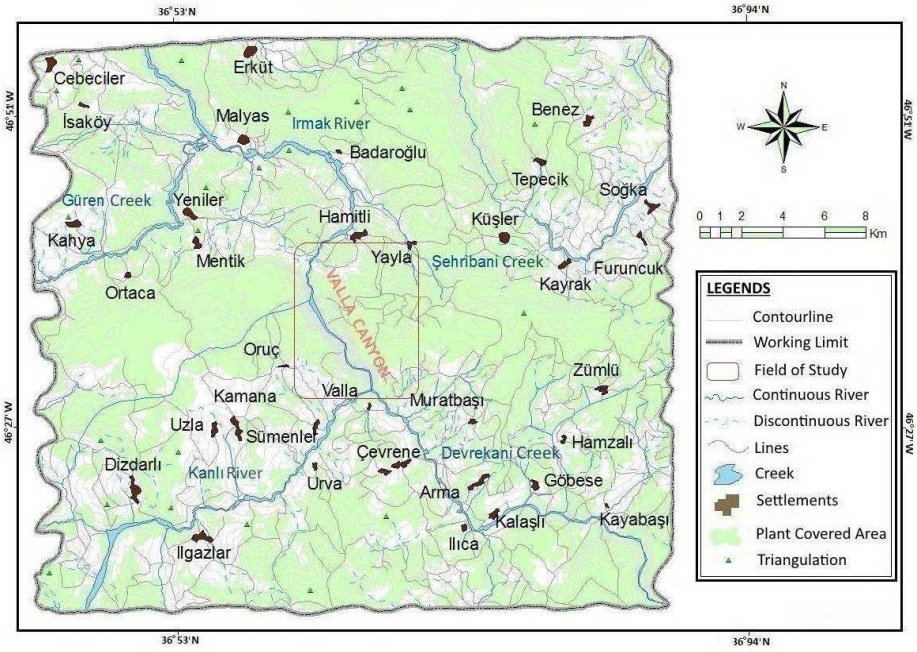
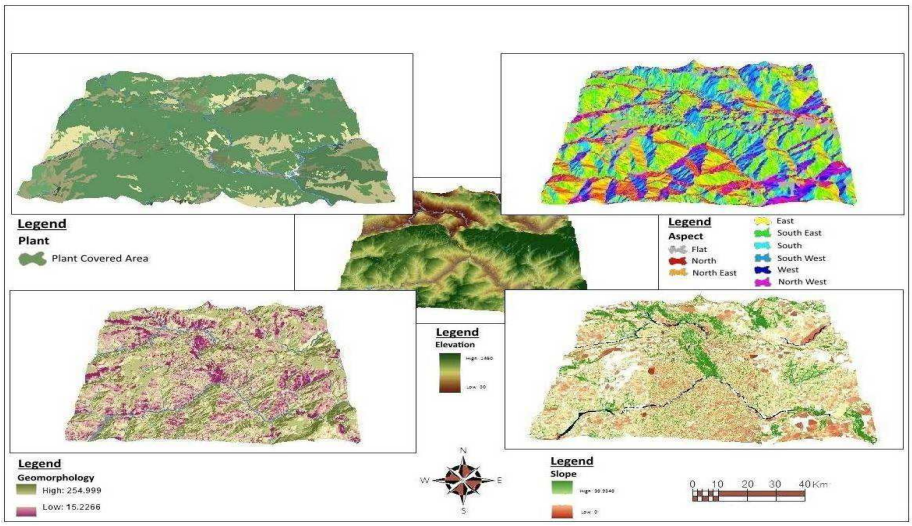


Figure 3: Topographical Map of Research Area and its Environs



Ballıdag heights (1746 meters) south of Azdavay, one of structural strips we mentioned, consist of abrasion resistant crystal basement rocks. The second strip is Azdavay, Pinarbasi, Ulus plateau strip (600-800 m), which consists of abrasion sensitive Mesozoic old clastic rocks. The third strip consists of more abrasion resistant Inalti limestones. Fourth, the Cide-Kurucasile strip consists of both abrasion sensitive and resistant Mesozoic old formations. Tersier formations, covering all those forms, surround research area from the south and the west. Research area (?) creates territorial abrasion on Tersier and Kuater. Those structural strips mentioned above are the results of separation into the segments of the field with the Southwest/Northeast direction main fault systems [by the reason of neo tectonic movements started after medium-low Myosin when spread erosion surface occurred (Kirmizitas, 2010).

Figure 4: 3D Map



When we look at Paleozoic old rocks, we see that at the end of Paleozoic era the region passed to shallow and marshy land firstly and then it passed territorial land completely. Rocks consisting of coarsened material show that wide materials were wafted from the land to the basin. In this era, quite thick Cakraz formation that consists of red terrestrial sediments was formed. In Jura, transgression from the north developed incrementally. In those times, Hersinien foundation met the Jura Sea like a barrier and prevented the sea from proceeding and made it slow down. When progression went on during all the time in Kretase, some Pontids got under water slowly and grabenization started. Huge breaks throughout Northeast/Southwest lines were become in west Pontids.

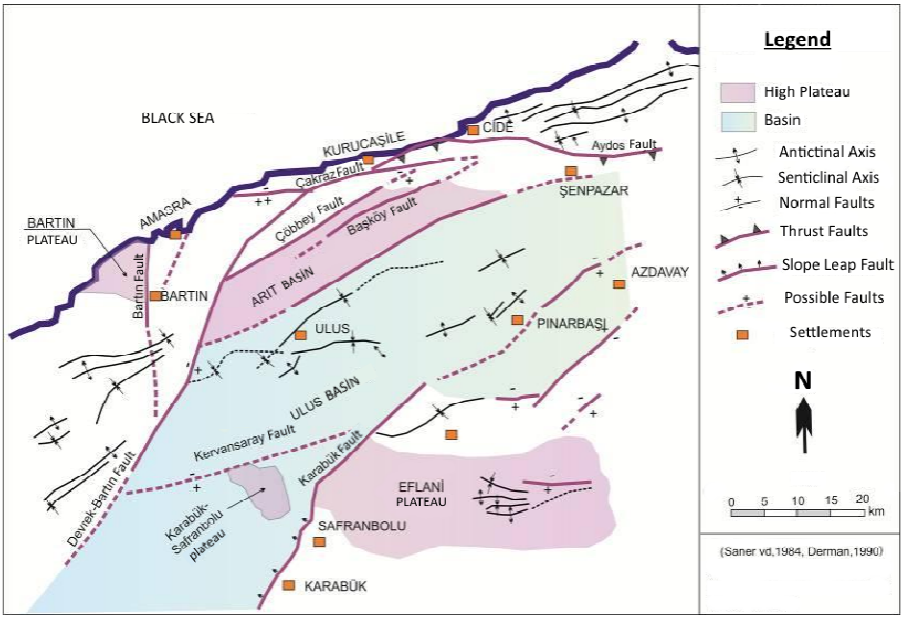
East-west direction horsts and grabens started to be constructed because of tectonic events. Basins started to collapse slowly then fast depend-

ing on this collapse basin started to fill with clastic materials. As a result of clash of the continents in Paleojen, repression from south to north occurred Aydos fault was formed. Curves and breaks happened during that tectonic pressure and helped to make today's morphological shape occur.

The region is still an abrasion phase and in active earthquake zone. (Region developed by strain tectonics control and a lot of anticlinal and synclinal forms were formed.

Faults are generally in the East/West or Northeast/Southwest directions. Inalti limestones formed steep slopes resulting in these faults. These faults were formed as the result of pressure and strains on the Northwest/Southeast directions. Faults developed parallel to each other and the Aydos opposite fault was formed by pressure tectonics. It is more suitable to accept Aydos fault as a fault zone because the Aydos fault zone occurs with a lot of faults in a 3-4 km area. Throughout the fault zone there are breaks, curves and crushes (Tuzcu, 2005).

Figure 5: Tectonic Map



Winters are cold and summers are relatively warm in the region. The interior region is colder. Rain is wide in coastal sides, but is not wide in the interior. Average rain is 438 mm in the interior region. It is below the average of Turkey (which averages at 643,3mm). The average annual rain is 1041, 1mm/year according to Bartin (neighbor city of Kastamonu) rainfall station (Bartin Environment Impact Assessment, 2006).

There is special flora because of the climate. The West Black Sea Karst Zone is on (in?) the passing zone from the ocean climate type to the Mediterranean climate type. The Terrestrial rainfall regime in the Kastamonu and Daday rainfall stations turns into the Mediterranean rainfall regime in Azdavay. The half-terrestrial rainfall regime in the south and more humid oceanic rainfall regime can be seen in Cide north of Kastamonu. So in all, Europe-Siberian types in the north, Mediterranean oriented types in the interior and coastal sides, and Iran-Turan oriented types in the south, can be found. However, there is lack of information about fauna because of inadequate research. UNDP (United Nations Development Program) determined that 48 mammals from 15 families exist in their research. Besides birds and mammals in the national park, endangered species like bats, bobcats, foxes, sea otters and deer are also started to be protected on an international scale (Vurdu et.al, 2004).

All the streams inside the research area flow to the Black Sea. There are two important streams named the Sehriban Streams which are the starting points of the Devrekani and Aydos streams. Tectonic lines direct them to the stream network. Geological structures have a huge effect on the features of the stream network. Valley systems and stream basins create water production areas after the Stream abrasions and fluvial process. Parts protecting water and moistness on the mountainside come into prominence with natural beauties.

The most important stream in the Kure Mountains National Park is the Devrekani Stream. It rises from Devrekani Town and flows to the north of Ballidag in an East-West direction. The stream, coming from Azdavay including the Pinarbasi stream, turns its direction northwest by adjusting according to the Valla Canyon fault. The stream's valley gets deeper in the west. The Devrakani stream, which created the Valla Canyon, reaches to the sea. The main line of the Devrekani stream is 146,7 km. 95,7 km of the main line is outside the border of the Kure Mountains National Park; 51,0 km is inside the park (Bartin Environment Impact Assessment, 2006).

The other stream in the region is the Aydos (Sehriban) Stream. While it flows in an East/West direction, it is curled near the Dagli Village and goes into the Southeast/Northwest fault zone. It reaches to the sea by creating the Aydos Canyon. However, some of the observation data is discrete , gathered between 1971 and 1991 constantly. When we look at this data, the annual average flow is 9,45 m^3/s. It was high at about 15 m^3/s in 1987 but it was 4,75 m^3/s in other years (Bartin Environment Impact Assessment, 2006).

TOURISM POTENTIAL AND PLANNING OF THE FIELD

People need to work harder and harder to have higher life standards. This is a huge pressure on human physiology. People want to have different alternatives to relax close to city centers. This results in recreation areas and

varieties increasing day by day (Sengun and Tombul, 2005). People started to prefer to spend more time in quiet, natural protected, wildlife areas with their families. So wilderness areas have become attraction centers for humankind (Ozdemir, 2004).

Kastamonu has many beauties because of large geographic boundaries. Kastamonu has many opportunities for tourism activities with mountain ecosystems, landscape, wildlife, flora and fauna diversity, interesting geomorphological forms, plateaus, canyons, waterfalls, rural architecture, cultural beauties, healthy climate. The Kure Mountains National Park is the first and only PAN Parks (Protected Areas Network) in Turkey. PAN Park certification is given to only the best parks in Europe. Even just because of this, this area has a huge tourism potential. Moreover, the Valla Canyon and its environs were selected as a model project area by Ministry of Forestry and Water Affairs, United Nations Development Program and FAO (Food and Agriculture Organization).

Geo-tourism, as a new tourism trend, is an activity to see rare geological forms which have natural beauties. The Valla Canyon has huge tourism potential because of its natural geography. Geomorphological landscapes, monumental forms, lakes, geothermal sources, ancient caves and biological richness all are important to Geo-tourism (Ozdemir and Senkul, 2008). Research and inventories should be done to create a new and alternative tourism type because of geo-tourism potential.

Valla Canyon is a wonderful place to experience alternative tourism activities like trekking, wildlife and bird watching, taking panoramic photographs, rafting and canyoneering. Canyoneering is a very popular type of international sport now in Turkey. Three to four people can complete the canyon in 4-5 days. Before going inside the canyon, it is very crucial to be aware of the forecast (Ozturk, 2005). Although there is not enough information about wildlife because of insufficient research, 48 mammals from 15 families in the Kure Mountains National Parks and its environs were determined by United Nations Development Program (UNDP). Besides birds and mammals in the national park, endangered species like bats, bobcats, foxes, sea otters and deer are also started to be protected in an international scale.

Sumenler-Kayabasi Village, 27 km north of Pinarbasi, is one of most beautiful bird's eye views to see the canyon. The entrance of the canyon and opposite villages can be seen from wooden platforms that were made by the Kastamonu Governership on Bakacak Hill in Muratbasi Village. Pınarbaşı-Gereköy, Hamitli-Cide, is a forest road on which tourists can take photographs with traditionally dressed villagers while on safari trip. Also, Horma Canyon, Ilgarini Cave, and Ilıca Waterfall are fascinating tourist destinations close to Valla Canyon. They are just 8 km far from Pinarbasi.

There are no systematic visitor registers for the entrance of the canyon and its environs. Registers in Kastamonu-Bartin Kure Mountains National Park between 2002 and 2003 can be found. According to the registrations,

there are no visitors in winter (December, January and February), and a few visitors come to the national park in October, November, March and April. Tourists prefer to visit to the national park in summer because of harsh winter and transportation problems during the winter (Bastemur and Gul, 2013). The number of tourists visiting the region has been increasing day by day based on our observationsand interviews of local people. The result of effective advertisement of national parks and canyons increases the number of hotels and hotel alternatives. Package tours to the region from different cities have also begun. Recreational values have started to be used effectively in hospitality management.

Visitors mostly prefer to stay in traditional village houses. These style wooden accommodations are consistent with traditional architecture. They are not luxorious and tourists can be alone in nature. Besides these places, tourists can also stay in other places close to the national park like Kastamonu City Center, Ilgaz, Amasra, Kurucasile and Cide.

SWOT analyses are prepared regarding master plan of Forest and Water Affairs in 2013.

1. Strength points of the canyon are:

- The Valla Canyon is very large and high; it has huge tourism and marketing potential.
- The canyon is located in the national park and is suitable for tourism activities and planning.
- The canyon has many caves and the access to some of the caves is open.
- The visual extent of the karstic forms are high quality.
- Many places in the canyon has been mapped.
- The region is supported by local authorities.
- New advertisements for the region are planned to attract the tourists.

2. Weak points of the canyon are:

- The Valla Canyon has safety risks because there have been a few injuries and deaths.
- There is no mountain and cave search or rescue team in the region even though it is necessary.
- Unrefined water from Devrekani Stream enters the Valla Canyon.
- There are some issues protecting the historical caves.
- Caves in the canyon are on scattered and hardly accessible. It makes the protection of the caves almost impossible.
- The lack of professionals is a problem for expeditions of the canyon.
- Canyoneering still is not very common in people's mind.
- There is destruction of geological features because of treasure hunters.
- Legal opportunities are limited to make a tourism investment because karstic forms that have no status.

- There are not accommodation opportunities close to the region.

3. Opportunities of the canyon are:

- Fluvial erosions, valley systems and river basins have created water production areas.
- There is a large variety of flora in the region.
- Summers are warm but not too hot.
- Humidity can be limited to the mountains.

4. Threats of the canyon are:

- The region is on erosion phase end and is located on a seismic belt.
- Cliffs between 800-1300 m. are located on both sides of the canyon.
- The scientific research of the fauna is not sufficient about the region
- All of the siphon points are not available on the map.

SWOT analyses chart without details is prepared to have a general point of view. (Table 1)

Table 1: SWOT chart

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Magnitude of the canyon	Dangerous parts	Water production areas	Active seismic belt
Difficulty level for climbers	Lack of search and rescue team	Flora diversity	200-1300 m cliffs
Location in National Park	Water purification problems	Climate	Lack of scientific fauna research
Numbers of caves and waterfalls	Cave protection problems	Transportation prob-lems	Siphon points
Huge karstic features	Educated staff	Humidity in mountains	X
Mapping	Treasure hunting	X	X
Local Manage-ments Supports	Legal limitations	X	X

RESULTS

The canyon and its environs have huge tourism potential. The evaluation of the value of this region is very important for 2023 tourism strategy of Turkey. Therefore, leaflets with other languages should be prepared and distributed to travel agencies and advertisements on local and national televisions or radios should be given a priority (Imat et.al, 2012). Because the Kastamonu region was exposed to karstification intensively, it became a geological wonder and a touristic attraction. This region has a major importance with regard to geomorphological landscape - just like the Grand Canyon in the USA. In this region, many canyons were formed like Valla, Karacehennem, Evsizlerdere Canyons. These canyons are the most beautiful canyons in Turkey because they are located in 10 hotspots in the world. Because of the protection this region, it is suitable for nature tourism, alpin-

ism and canyoneering. The Valla Canyon is close to portable water sources and has a high difficulty level for climbing. So these factors are very suitable for climbers and canyoneers. The biggest threat is siphons for climbers. There are dangerous siphon points in the canyon. *'Siphon is used to transfer fluids from one container to another by means of atmospheric pressure'* (Merriam-Webster Dictionary, 2015). Some of these points were mapped - but all should be mapped eventually. After mapping, a search and rescue team should share their experiences with new climbers and canyoneers. Warm summers are advantageous for tourists who want to partake in natural sports. Summer months are suitable for climbing and trekking in contrast to the very hot Mediterranean Region located in southern Turkey. Because water limits the humidity to the mountains, flora diversity has a huge natural attraction power.

Tourism strategies are developed by analyzing strengths, weaknesses, threats and opportunities.

- Canyons are very important for marketing of Kastamonu as a tourism attraction and its karstic forms.
- Valla and other canyons are high in number and attraction so the location of them (like Azdavay, Senpazar and Cide known as Canyons Region located in the Northern West Kastamonu Region) are very important for tourism potential.
- Preparing detailed trekking routes and maps, completing marking trekking routes are necessary.
- Other natural and cultural tourism destinations need to be well planned by this region and taken into consideration.
- City Culture and Tourism Managements should be encouraged to the investors for accommodation to support the destination.
- It is necessary to educate the professionals for different skills like, canyoning, flora fauna guiding and so on for the region.
- Mountain, canyon and cave search and rescue teams should be organized and educated by AFAD (Emergency and disaster management agency) because of life security.
- Kastamonu is a very important place for cave tourism. After completing preparations, caves should be advertised on an international scale.
- It should be given a priority to openly map aesthetical caves which are also undestroyed in terms of wild life and ecosystem for cave tourism.
- It is needed to take mechanical precautions to avoid destructions in the caves.
- Because dirty water flows to the canyons, rafting cannot be experienced. Waste water treatment facility should be built by Cityhall and Special Provincial Directorate of Administration. Environment and Town Planning City Management needs to control the facilities.

This region will be well known in an international scale with this article. This is the first tourism geography research about this region.

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