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FROM PAST TO PRESENT: FLOODING IN EDIRNE AND ITS VICINITY (TURKEY)

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Abstract

Catastrophic floods frequently occur in Edirne and its close vicinity. Various aspects of these floods are examined by many researchers. This study attempts to answer the question of which geographic factors cause flooding and show how they have undergone changes over time creating more flooding than expected.

Part of a larger scale project, this approach focuses on the topographic characteristics of the area, drainage features, climatic and land-use characteristics. Where possible it has been attempted to examine these geographic characteristics in Ottoman and Republic periods respectively.

The paper examines flood activity through Ottoman and Republic period topography maps belonging to the area, old flood recordings, Ottoman buildings such as palace, caravanserai, fountain, bridges which lie within the flood zone, the locations of residences, and social, cultural and religious places. The obtained data has been correlated with the current conditions for flood, and comparisons have been made between the flood activities in the past and present. The results indicate that floods exist at all times but there are remarkable differences in their frequency, intensity and impact zone.

Keywords: *Edirne, Floods, Geography, Ottoman and Republic periods.*

Introduction

Floods that can be qualified as disasters often take place in Edirne and vicinity. Those floods have been examined by many researchers in terms of different aspects. Studies about flood in region are going on in an international cooperation.

In this study, which composes one of the basic parts of a broad project, answers to several questions have been sought such as what important floods occurred in this period, what the frequency and density features of those floods were, whether those

features have changed in time or not and what kind of precautions and preventions to decrease the damages were taken, taking a time period of approximately 500 years into account. It was aimed to reach conclusions to prevent floods at present and decrease the impact of destruction from the gained results.

In accordance with these aims, the topographic characteristics of Edirne and vicinity, drainage features and geographical features like land use, the characteristics of these geographical features in Ottoman and Republic Periods have been tried to be examined within the bounds of possibility. The locations of the structures like palace, caravanserai, fountain, bridge of Ottoman Period … etc., every building older than 100 years, social, cultural and religion centres within the field of flood have been researched. The records of floods in the past have been prepared by scanning the historical records and newspaper archives in Edirne. The Ottoman and Republic Period topography maps of the region have been used for different aims. Assessments between the present floods and the past floods in Edirne and vicinity have been made by relating the gained current conditions in terms flood.

Meriç Basın and The Edirne Section

Floods are an expected result of hydrographical improvements in river basin in the control of geomorphology, climate and landuse features. Sometimes these can cause disasters. The effectiveness of human being plays an important role in the transformation of floods into disasters.

The floods causing great destructions in Edirne take place as a result of Meriç River's increasing to exceptional flows in the region of Edirne. Meriç River with a large part in Bulgaria, placed within the borders of Greece and Turkey is basically formed of four big sub-basins. (Figure 1, 2). Although the floods occurred in Edirne are natural results of geographical developments in these sub basins, only the area where flood disaster occurred was focused on in this study. (Figure 3). In this part of Meriç Basin; where the old city of Edirne was placed on the surface of the plateau, Meriç River flood plain and the slopes setting these two geomorphologic units apart are land forms that come into prominence. (Figure 3, 4, 5). The surface of the plateau is with a 100-140 metres height is split by the branches of Meriç River. The flood plain of Meriç River is at 42-32 metres height in the part of Edirne. 42 metres height in northwest decreases to 32 metres in the direction of southeast within a distance of 25 km. (Figure 4, 5). When these height values are taken into account, it is obviously seen that Meriç River has an approximately 0.4% incline in the area of the flood plain within the part of Edirne. This incline value is quite appropriate for the flood and is an encouraging feature. The drainage system of Meriç River in the part of Edirne is also in the quality of encouraging flood. Meriç River, Tunca and Arda meet at the alluvial plain with 0.4% incline in only the 6 km distance (Figure 3, 4, 5, 6). These drainage systems cause water mass with great volumes able to result in a flood accumulate in one place. In other words, the water Meriç, Tunca and Arda Rivers bring, gather in the alluvial plain of the basin at the same time. The present drainage channels are not capable to carry such a volume of

water mass. Inevitably; Meriç River alluvial plain with 42-32 metres height and 0.4% incline values stays under water.

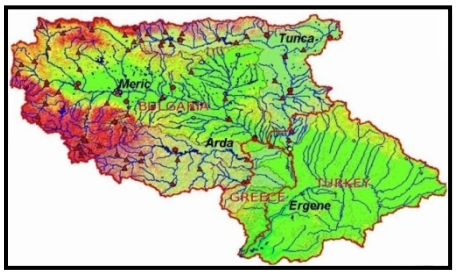


Figure 1: Meriç River Basin (Sezen, 2011).

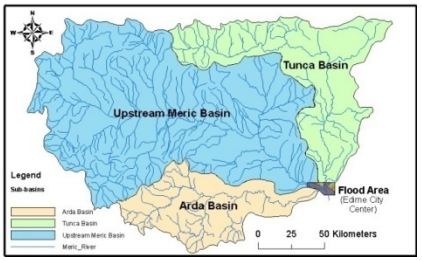


Figure 2: Upstream basins of Meriç River and flood area in Edirne region (Turoğlu, Uludağ 2012).

Previous Floods in Region

Some of the great floods that took place in Edirne and vicinity approximately in 500 years of time have been listed in Table 1 (Kazancıgil, 1995; Sezen, 2011; Turoğlu and Uludağ, 2010). As it can be understood from the records of archive, Edirne having been harmed of floods is a state that has existed from past till today.

One of the most important previous floods in historical records happened in 1571. By this flood which took place in II. Selim Period, Edirne Palace was flooded and its inside stayed under water. In this pre study conducted; it is seen that Edirne was damaged by floods and Edirne Palace and other important structures stayed under water and the frequency of floods in the effect of disaster occurred in a few ten years or more.



Figure 3:Connections of Meriç, Tunca and Arda Rivers in Edirne region.

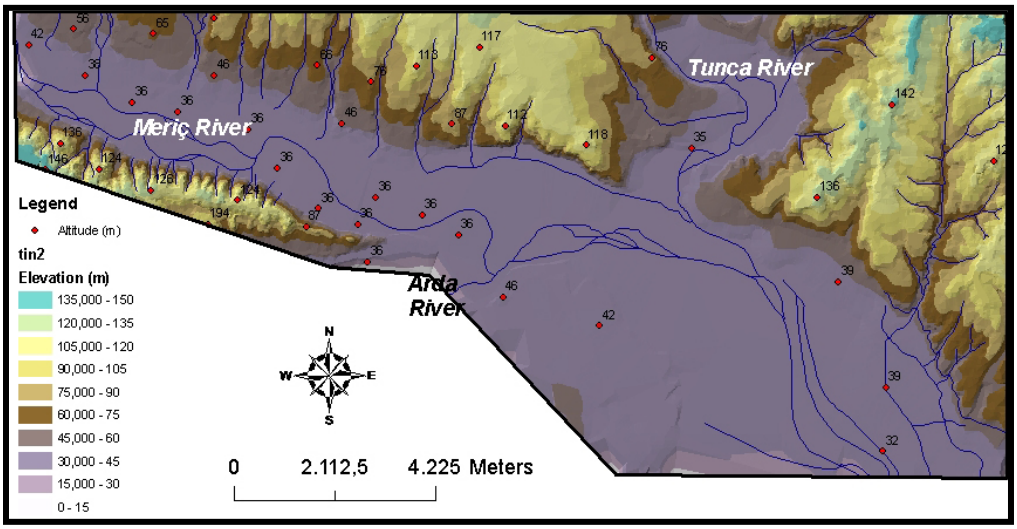


Figure 4: Topographic features of flood area and close vicinity in Edirne region (Turoğlu, Uludağ 2012).

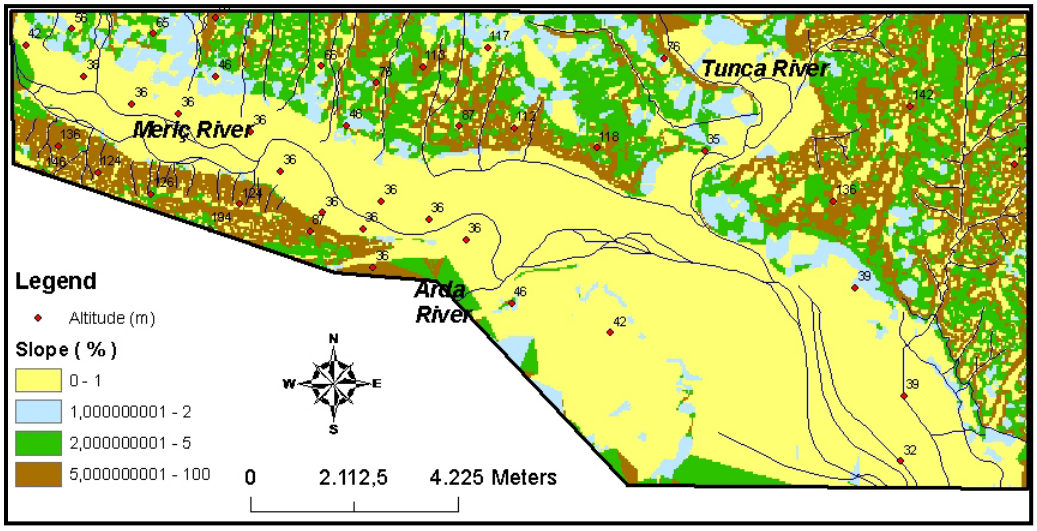


Figure 5: Slope features of Edirne city center and floodplain of the Meriç River (Turoğlu, Uludağ 2012).

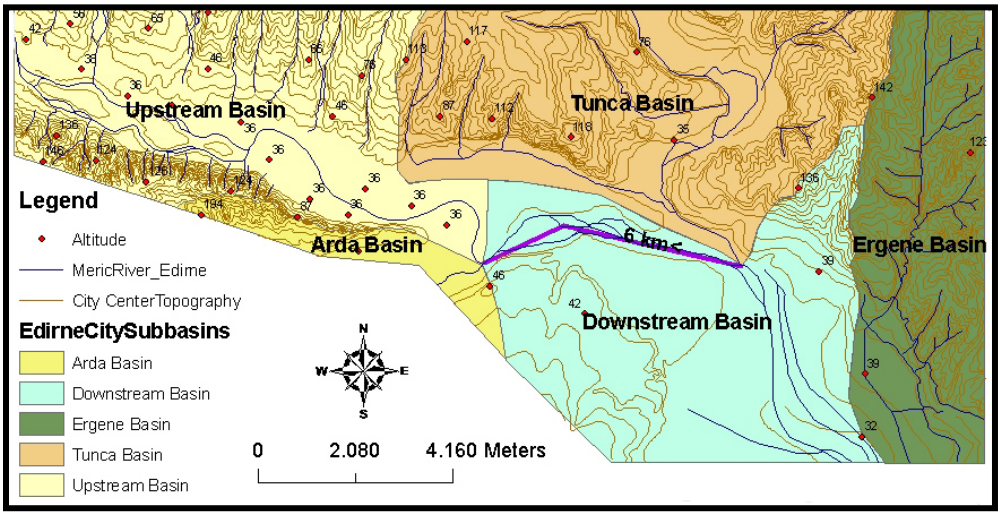


Figure 6: Meriç River Sub-basins and the connection distance of the sub-basins in the Edirne floodplain (Turoğlu, Uludağ 2012).

It is possible to group the frequency and density of the changes in the features of climatic variables and preventions to Meriç River. The preventions to Meriç River can be ordered as the dams constructed on the up line of Meriç River, channel improvement and flood prevention projects carried out in Edirne and vicinity.

The planning of these projects was conducted in the 1950s and their accomplishment started in 1960s. A great number of the dams set on Meriç River are mostly in Bulgaria and some stay within the borders of Greece. After the building of the dams, the differences in the causes of floods in Edirne started to take attention. The studies are carried out in an international cooperation in the aim of preventing and controlling these floods emerging related to the use of the dams and occurring in the form of disasters recently.

Previously solitary and limited, there were some flood prevention studies, for instance; as it happened in the construction of flood set to protect the Bosnaköy in 1938. Under the name of channel improvement projects, drainage channels intervention and the construction of banks to protect Edirne against flood started to be built after conceptualizing the project in 1955. It was observed that these projects were far away from contributing into the expectations of preventing floods and decreasing damages as they had compatibility problems with fluvial principles. The frequency of flood after 1960s is noteworthy. The inadequacies in terms of taking into account the fluvial principles in the interventions of channel section changes carried out during the applications of channel improvement, bed shift and by-pass regulations and etc. seem to be the most prominent problem of these projects.

Table 1: Some importand floods for 500 years in study area (Kazancıgil,1995; Sezen, 2011; Turoğlu and Uludağ, 2010).

Date	**Explanation**
September1509	Great flood in Edirne (the first prominent flood on records).
1571	Selim the second Period: The flooding of Edirne Palace and the rescue of the sultan with difficulty took place as the flats in the palace (Sarayiçi) were overflowed.
1657	Sultan Mehmet the fourth Period. As a result of the great winter, three rivers flooded through spring and especially Tunca River did not leave the areas of the palace for months.
January 1747	In the flood, named as "Great water" by people in Edirne, the water rose up to the gate of Ağa Caravanserai and 1500 houses were destroyed while the water stayed for 10 days.
18 January 1845	A few hundreds of houses, shops and offices in the city centre were flooded as Tunca, Arda, Meriç Rivers flooded at the same time, which had not been seen for a long time.
7 November 1857	Tunca, Arda, Meriç Rivers harmed the city badly by flooding.
29 January 1863	Tunca, Arda, Meriç Rivers flooded all and hundreds of houses flooded afterwards, the water was frozen and the area turned into an ice-covered sea.
December 1894	All three rivers (Tunca, Arda, Meriç Rivers) flooded which had never seen in 20-30 years. The connection between Karaağaç and the city was ruined.
10 January 1896	As the snow turned into rain, first Arda and then Meriç were flooded and the area stayed under water.
May 1897	After the heavy rain on the 16th of May; Tunca, Arda, Meriç Rivers flooded in a way which had not been seen since the flood in 1845 called "Great Water" and the suburbs of the city were flooded by paralyzing the life in the city and causing tremendous destructions.
13 March 1929	Flood Disaster. Edirne – Karaağaç flooded.
17 February 1931	As a result of melting snow and rain, water started rising in Meriç, Tunca and Arda Rivers and the flood invaded the

	plain and the suburbs of Edirne.
27 February 1931	As a result of heavy rain in Balkans and melting ice, the water rose and overflowed from the river bed. The neighbourhood in İmaret, Yıldırım and Kirişhane districts stayed under water.
14 December 1931	"Great Flood" is also called "Great Deluge". As a result of the constant rain for 18 hours everywhere was flooded, Sazlıdere Bridge was destroyed and the city stayed in an invade of water.
13 February 1937	With the impact of both constant rain and the melting ice because of southwest made Meriç and Tunca Rivers flood unexpectedly. The plains and the coastal neighbourhood of Edirne like İmaret and Kasımpaşa were flooded.
27 January 1940	Rivers (Tunca, Arda, Meriç rivers) flooded again and there emerged great harms as everywhere stayed under water.
13 November 1940	As a result of rain showers, the entire plains standing at Meriç, Arda, Tunca and Ergene banks submergenced, the water level of Meriç rose.
21 December 1940	The level of river Meriç rose like that before and the water flooding the near villages caused serious damages on people's lives and goods. Because of this midnight catastrophe, animals in the barns died.
05 March 1946	Due to the constant rain, the rivers Meriç, Tunca and Erngene flooded. As a result of the flood, some parts of cultivated areas and the settlements flooded. The river Tunca whose normally level is 2.5 meters rose to 4.06 meters and so the river Meriç rose to 4.36 in Edirne.
29 January 1947	From Edirne to Enez, Meriç valley seemed more like a sea and the entire town and coast placed near the bank flooded.
15 February 1947	To the suburbs of Edirne, the Tunca Bridge which was built by Ekmekçioğlu Ahmet Sultan and located at Söğütlük-Karaağaç route collapsed.
04-05 March 1950	The constant rain during 28 February and 5 March caused Meriç and Tunca Rivers to flood. The level of water reached 4.20 meters and the area between these two rivers submergenced the terrain near Kazanova and Saraçhane also submergenced.

06 November 1950	The unceasing rain falls to Thrace and Balkans caused Meriç and Tunca Rivers to flood on the date 6 November.
10 October 1953	As a result of constant and severe rain, Meriç River left its bed and caused floods near Edirne and İpsala affecting the cultivated areas.
05 March 1954	On the date 5 March in 1954 and following days the water levels of river Meriç and Tunca rose and overflowed. It is understood that the snow melts in the Balkans were the source of that flood.
20-21 November 1954	Before the days 20-21 November in 1954, the area faced constant rainfalls. Due to this, Meriç and Tunca Rivers overflowed and gave serious damages to the city and the cultivated areas
11 January 1955	The flood on this date is also called "Great Water Strike". It turned into a great catastrophe. The water rose to 5 meters invaded the slum quarter areas of the city.
January 1956	In January in 1956, Thrace had rain over the normal values. The flood showed itself through the whole river. Meriç River submergenced a very large area from Edirne's west plain areas through that route.
22 May 1956	On that date, Meriç River rose to the level of 4.26 meters and the flood caused a serious damage.
30 December 1960	The severe rainfalls in the Balkans affected Meriç River, the water level reached 4.5 meters, lots of plain areas submergenced, electricity, flour and bread facilities submergenced.
02 October 1962	As a result of the rain falls to the basin in Thrace Region, Meriç and especially Ergene River's branches caused floods. Because of this, many important cultivated areas were damaged and there were losses of lives and goods.
10 February 1963	As a result of severe and constant rain falls with snow melts in the basin, the rivers Meriç and Ergene and their branches flooded and serious damages occurred.
09 December 1966	As a result of constant rainfall during November and February in Edirne and nearby areas, the water level of Meriç, Tunca and Ergene Rivers ascended and wide areas submergenced. The areas which were submergenced faced

	great agricultural damages.
January and February 1981	The constant rain started on 13 January in 1981 in Edirne and nearby areas continued till 23 January 1981. The rain that started again in the first week of February turned into snow. With the increase of the temperature, the snow started melting. The meteorological events mentioned above caused floods at Meriç River and its branches.
06-10 March 1984	The constant rain of 68 hours and snow melts caused the level of Meriç River to increase to 5.5 meters and floods. 28457 acres cultivated areas submergenced, 68 villages and neighbourhoods, 7 private farms, Edirne open prison were some of the damaged facilities.
15 February - 7 March 2005	As a result of melting of the snow covering the rivers Tunca, Meriç and Arda, torrential rain and water release of Bulgaria from the existing dams, there occurred water level increases between 12 February and 7 March and so the floods stroke. The period of 20 days between 15 February and 7 March, three of the four floods occurred successively were identified as the heaviest floods of last 21 years.
07 January 2006	The water level of Meriç, Tunca and Arda Rivers ascended and wide areas flooded.
20 October 2007	Tunca, Arda and Meriç Rivers flooded and large areas were inundated.
16 February 2010	Tunca, Arda and Meriç Rivers flooded and large areas were inundated.
7 February 2012	As a result of the collapse of the Ivanovo Dam located at Bulgaria's Harmanlı region, Meriç River overflowed. Because of the flood, 3 villages of Bulgaria and Edirne's riverside settlements submergenced, the schools around Karaağaç district ceased temporarily. Also Hamzabeyli Border Gate was closed to traffic.

The Effects of the Former Floods in Edirne Cıty

When the effects of the floods especially during the Ottoman Period are researched, it is clearly understood that Edirne Palace was damaged from every flood. Another noteworthy point found in the archive records is the statements about Tunca, Arda and Meriç Rivers to have flooded all.

It is stated in the archive records that because of the old floods Ottoman period Edirne's large areas and nearby villages submergenced and even as a result of floods in 16th ,17th and 18th centuries, Edirne and some villages got stucked because of the flood and the citizens there suffered from famine for days. It covers a lot of space on archive records that Ottoman Period floods stroke cultivated areas strongly. In general; another feature of the floods occurred in 16th, 17th and 18th centuries is their being at very low frequency however longer floods (Figure 7) (Photo 1, 2).

According to a record on 18 March in 1673; it is stated that VI.Mehmet, in the Edirne sections of rivers Meriç, Tunca and Arda, always went to barns and stud farms which were located in Ahırköy (Bosnaköy) from his palace by using the boat. It is understood from this statement there was safe river transportation on Meriç and its branches. In spite of many of the floods occurred in March, at this time of year, the transportation on Meriç River and its branches stands for as a big contrast.

The location of damage information acquired after archive review and the Ottoman buildings remained from flooded areas were mapped (Figure 7). When the kind, strength and the location of the damages caused by old floods are investigated, it is possible to reach meaningful results for present. The most important factor on this topic is that; the flood reality which can also be named as disaster always exists but the frequency of it is so little.



Figure 7: Locations of old buildings damaged from floods during the Ottoman period.



Photo 1: Tunca flood in December 1894.



Photo 2: Flood on connection point of Meriç and Tunca river in December 1894.

Conclusion and Discussion

When considered its geomorphologic and hydrographical characteristics, Meriç River Basin has suitable geographical conditions for the floods that can affect Edirne and vicinity. Thus, the floods are actually natural and normal environment events. The contribution of mankind plays a great role in turning this nature event into a disaster.

The bridges formed by lots of doorways show that how high the water level ascended and the floods' scales. However, it is so invincible that buildings like palace, caravanserai, mosque, tomb and fountain were damaged due to the floods. As long bridges with many doorways show us that Ottoman Period authorities and technical staff were aware of the flood reality, in contrast, the same people approved the construction of such kinds of buildings.

It is stated on the archive records that Ottoman Period floods had the characteristics of disasters. It is understood that water flood formed lakes which covered Edirne and nearby regions for days and caused serious losses.

When flood statistics are analysed; it is understood that the floods occurred in Edirne show the difference between their severity and density in time.

It is seen that the floods occured in Edirne has some outstanding milestones about quality, density and severity. There are;

- The dams built at Meriç River sub basins and the administration of these dams,
- The interventions to the natural drainage system of Meriç River and,
- The construction of flood dams.

Even though flood characteristics of Meriç River are known, it would be beneficial to search the precautions and results against the floods and the reason of using the flood area for human activity during the Ottoman Period.

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