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Water Management Approaches in the Ottoman Empire

Osmanlı İmparatorluğu'nda Su Yönetimi Yaklaşımları

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Öz

Günümüz dünyasında başta su olmak üzere temel yaşam kaynaklarının azalması, insanlığı bir defa daha konforlu ancak sorumsuz yaşam modelinden arınmasını gerektirmiştir. Çünkü su, sadece hayati bir ihtiyaç olmakla kalmayıp, toplumların yerleşim yerleri, yaşantıları ve kültürleri gibi pek çok konuyu şekillendiren birincil bir faktör olmuştur. İnsanoğlunun varoluşundan itibaren süregelen bu etkileşim çevre tarihi açısından değerlendirildiğinde, köklü geçmişinden gelen başarısıyla Osmanlı Devleti ön plana çıkan medeniyetlerden biri olmuştur. Osmanlı Devleti'nin su ile ilgili yaklaşım ve duyarlılığı, "su medeniyeti" olarak anılmasına ve bundan dolayı çalışmanın öznesi olarak seçilmesine esas teşkil etmiştir. Bu çalışmada, çevre tarihi açısından Osmanlı Devleti'nin "su" ile ilgili ayak izleri takip edilmiş; su temini, atık su, tasarruf, kaynakların korunması ve güvenliği, sel baskınları, alınan tedbirler ve suyun sanayiden enerjiye kullanımıyla ilgili yaklaşımların ortaya konulması amaçlanmıştır. Ayrıca, günümüze ışık tutabilecek nitelikteki yaklaşımların, bugünkü modern toplumlara rol model teşkil ederek ilham kaynağı olması ve çevre bilincine katkı sağlaması önemli çıktılar olarak hedeflenmiştir.

Keywords: Su, Çevre Tarihi, Osmanlı İmparatorluğu, Çevre Bilinci

Abstract

In today's world, the decrease in basic life resources, especially water, has required humanity to once again purify itself from its comfortable but irresponsible life model because water is not only a vital need but also the primary factor that shapes many issues such as the settlements, lives and cultures of societies. When the interaction that has been ongoing since the existence of humanity is evaluated in terms of environmental history, the Ottoman Empire is one of the civilizations that stands out with its success coming from its deep-rooted past. The Ottoman Empire's approach and sensitivity to water has formed the basis for it to be called the "water civilization" and therefore to be chosen as the subject of the study. In this study, the footprints of "water" of the Ottoman Empire in terms of environmental history have been followed; it aims to reveal approaches related to water supply, sanitation, conservation, protection and security of resources, floods, measures taken, and the use of water from industry to energy. In addition, it aims to shed light on the present, to be a role model for today's modern societies, to be a source of inspiration, and to contribute to environmental awareness.

Anahtar Kelimeler: Water, Environmental History, Ottoman Empire, Environmental Awareness

Introduction

Mankind has benefited from the natural resources around it to meet its vital needs. With the increasing population and developing technology, this benefit was mostly realized unilaterally, unplanned, and quickly. Pollution caused by industrial gases, destruction of forests, wastes, pesticides, mining, and many other effects have caused the deterioration of ecological balances due to increased consumption. This situation brings many problems such as natural disasters, acid rain, a decrease in biodiversity, and global warming. The search for solutions to environmental pollution, which has more severe consequences with each passing day, continues. Depending on the situation, field experts took over the situation and warned of dangerous consequences. However, countries did not heed these warnings due to economic concerns, political events and similar reasons. For this reason, the most effective and permanent way to solve the problems is through increasing the environmental awareness of the societies. On the subject, the discipline of "Environmental History" has come to the fore as one of the new fields of expertise that experts are expected to make a significant contribution to this diagnosis. In this direction, "environmental history", which presents the mistakes that civilizations have made in the past regarding the environment as a lesson and the truths as exemplary models for today's people, has an important mission. This field, which has succeeded in changing the traditional understanding of history, has become a sub-discipline closely followed by environmental engineers. Thanks to this sub-discipline, important information has been obtained about the interaction between man and nature in many problems ranging from pollution to environmental health, from drought to flood disasters (Oosthoek, n.d.). Another issue as effective as the wars that brought the end of civilizations is environmental problems. Among them; in particular, problems related to water, which is one of the basic needs of all living things, have become more important than all other problems. For this reason, the water problem has been treated with priority and greater care. Based on these reasons; water is a current subject of the study, the Ottoman Empire was chosen as a subject of the study depending on its rightful past.

As seen on the map above (Figure 1), one of the issues that the Ottoman Empire, which has ruled for many years and has a deep-rooted past, has reflected its environmental awareness, was "water" (Gulday, 2021). The main reason for this situation is the importance of water in Islam. With this importance, the Ottoman Empire, which was instrumental in being referred to as "water civilization"; has recorded many exemplary approaches in the memory of human history, from the protection, purification, safe supply of water resources, water conservation, and benefit as an energy source. In this context, the Ottoman Empire's approach and practice on the subject of water have been studied under different topics in this study to become a source of inspiration for today's societies.

In the study, the literature review was based on written documents. This method was appropriate for the study to increase the reliability of the cause-effect relationship between historical subjects and events. As seen in the map in Figure 1 (Gulday, 2021), archival documents and various research regarding the environmentalist approaches of the Ottoman Empire, which managed large geographies for many years, were scanned. Some of the documents, which are among the important data sources, and were gathered because of wasting a long time, have been shared only in the study.

1. Protection of Water Resources

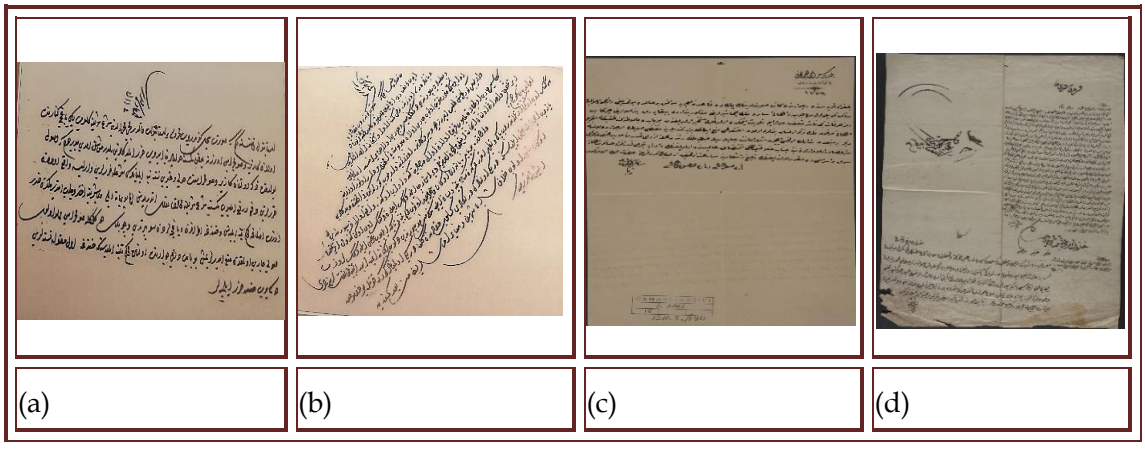
The protection of water resources is of great importance in terms of access to healthy water and its sustainability. Because contamination of water sources with various factors can cause dangerous, and even irreversible problems in terms of life. The Ottoman Empire, which also showed its sensitivity to social issues, set examples with many approaches in the records. For example, to prevent the pollution of the Kırkcesme water supply system, one of the most important water resources of the time, and the biggest project done by Mimar Sinan, the construction of houses, agricultural practices and barns in these regions was prohibited by keeping a distance of 20 cubits (an ancient unit of length, equivalent to about 68 centimeters today) on both sides of the water line with the Sultan's edict. A similar situation was experienced in the Golden Horn. Due to various natural disasters such as floods and erosion, the debris accumulated in the Golden Horn caused pollution and as a result, Fatih Sultan Mehmet Khan was not allowed to settle around the Golden Horn to prevent pollution. In addition, another precaution was to clean overdosed sludge in the Golden Horn coming from erosion and sedimentation and use it for making pottery, ceramics, jugs, etc. It was stated that craftsmen who utilized these sludges in their works were exempted from taxes and awarded with financial incentives. This practice can be considered within the framework of recycling. With these measures, water pollution was prevented, and pollutants were re-evaluated as raw materials. The

Golden Horn has not been polluted for many years with these measures (Zehir, 2000). Another example of the protection of water resources was the implementation in Masjid al-Haram. The cleanliness of the Zamzam water was carefully emphasized. In a letter written from the official authority of Mecca to the official authority of Istanbul, it was stated that a dirty maslak in the boundaries of the Masjid al-Haram and the water used for ablution caused pollution of the Zamzam water. Upon these complaints, an edict was issued in 1560 to remove the water expenses that caused the pollution of Zamzam water and it was recorded that this incident should be eliminated as soon as possible (Tekin, 2005).

Figure 2 below contains sample documents on the protection of water resources. Among these documents, in an incident mentioned in the Ottoman Archives of the Prime Minister's Office (BOA) of BOA, A. DVNS. MHM. d, no. 21, s.171, hk. 411, 1573, which is indicated by (a), rubbish, garbage, etc., is thrown away. It has been established that waste causing pollution was being thrown away. As a result of complaints about this situation, an order was given to the Istanbul judge in 1573 not to throw objects that could cause pollution into the water. In the provision marked with (b) BOA, A. DVNS. MHM. d, no. 52, s.13, hk. 36 1583, it was complained that the water pollution caused by some people throwing garbage and rubbish into the Debbaglar Stream in Eyup, Istanbul, also polluted the drinking water. As a result, an order was issued to clean the front doors of houses in the area and to prevent the transportation of garbage from these places to the creek bed. In addition, the decree of 1583 stated that garbage and waste should not be thrown into the Debbaglar Stream and the names of the people who threw them should be reported (Ozturk, 2007). In another event occurring in the document specified in (c) BOA. İ.HUS, no. 180, 1893, it was reported to the authorities that the inhabitants of the village of Belgrade and immigrants were causing pollution by washing clothes in the water of the dams. In order to prevent this situation, officers and soldiers were sent to the region, the banks of the stream were inspected and washing clothes was not allowed. In addition, the necessary orders were given to meet the water needs of the villagers from another source and not to be victimized. In another document referred to as (d) BOA. C.BLD, no. 5533/ 1782, it is stated that the water needs of the mosque built by Sultan Suleyman the Magnificent in Istanbul were met with water from Kagıthane. However, it has been stated that the source is in danger of drying up due to the cutting of trees around the water sources. After this incident, the cutting of trees around the water sources was prohibited in order to avoid similar situations. If this ban is violated, an order has been issued that those who disobey the rules will be sentenced to lifelong hard labor and their property, such as horses and cars, will be confiscated. If there are protectors who tolerate this situation, the Sultan's edict has taken its place in the records that they should be punished in the same way (Tıras & Unal, 2012).

The records, of which there are many examples in the archival documents, clearly show that the Ottoman Empire gave the necessary importance to the issue. Many environmental problems, especially global warming, have made the protection of water resources a necessity for people today, indicating that similar approaches as those of the Ottoman Empire should be reinforced by legal methods if necessary.

Figure 2. Sample Documents on the Protection of Water Resources



(a) (b) (c) (d)

References: a) BOA, A. DVNS. MHM. d, no. 21, s.171, hk. 411, 1573 b) BOA, A. DVNS. MHM. d, no. 52, s.13, hk. 36, 1583 c) BOA. İ.HUS, no. 180, 1893 d) BOA. C.BLD, no. 5533, 1782.

2. Reclamation of Swamps and Lakes

In the Ottoman Empire, the marshes that were formed due to flooding turned into small lakes over time. This caused the spread of bad smells and diseases such as malaria and led to the migration of people in the region and the formation of useless lands. In order to prevent such problems, the Ottoman Empire carried out the most important struggle for the improvement of marshes in the 19th century (Ozvar et al., 2015). In the course of those studies, maps of the swamps in different provinces such as Thessaloniki, Iskenderun, Mudanya, Beirut, and Aydın were made. Some suggestions were made for the improvement of swamps and lakes shown on the maps, and an "administrative body for marshes" was established. In this direction, swamps and lakes were rehabilitated and incentive projects were carried out to make them useful for agricultural activities. For example, in the document (BOA. Y. A. RES, No.106, Gömlek No.7, 1899), it is stated that as a result of the rehabilitation of the marshes in the Gokceviran locality of Adapazarı, an area of fifteen thousand decares, was put to agricultural use (BOA. Y. A. RES, No.106, Gömlek No.7, 1899). Another example is Lake Iznik in Anatolia. The marshes were formed by opening channels such as caves, creeks, rivers and streams in the lake. In this way, many lands were prevented from flooding, and reclaimed. The reeds and marshes between Tarsus and Iskenderun, the Tamyanus Lake, the Red and Green Rivers in Siroz Sanjak, and the lakes in Kesro and Oltu towns were reclaimed and opened for agricultural activities (Ozturk, 2007).

The main problems caused by swamps were foul smelling and noxious they emit. Foul smells from the lakes of Seydisehir and Beysehir are a good example of this issue. The document (BOA. DH. MUİ. No. 36, Gömlek No.48, 1909) of the BOA mentioned that residents around these lakes complained too much about their foul smell. After taking these complaints, it was recommended that acacia trees should be planted around the lakes to eliminate foul smell. Another exemplary event is chosen from the experiments in the Kemerciftligi region in Aydın Province. The mitigating bad smell of the marshes in Kemerciftligi came onto the agenda. Because, this region was located on the pedestrian routes. Additionally, the negative impacts of railway transportation near this region necessitated the rehabilitation of the marshes (Ozturk, 2007).

3. Floods and Measures Applied

Floods, civilization's single greatest natural enemy throughout history, were also common disasters in the regions of the Ottoman Empire. The Empire took a lot of measures and made a great effort to minimize the loss of life and damage to properties caused by floods. In order to prevent flooding in streams: Sediment and dirt particles that are carried to stream beds by wind, rain, or ice, and human activities were controlled by regular cleaning; animal husbandry was not allowed around the stream beds in order not to clogged with garbage; and also others except for these measures such as removal of settlements near the rivers were taken for minimizing negative impacts of floods (Gonullu, 2010). Floods also destroy many trees, and replace pieces of stone, sand, gravel, etc. Since they cause the transportation of debris piles, first and foremost, bends with water retention function and regulator should be constructed and canals and ponds should be improved (Yılmazcelik & Erdem, 2015).

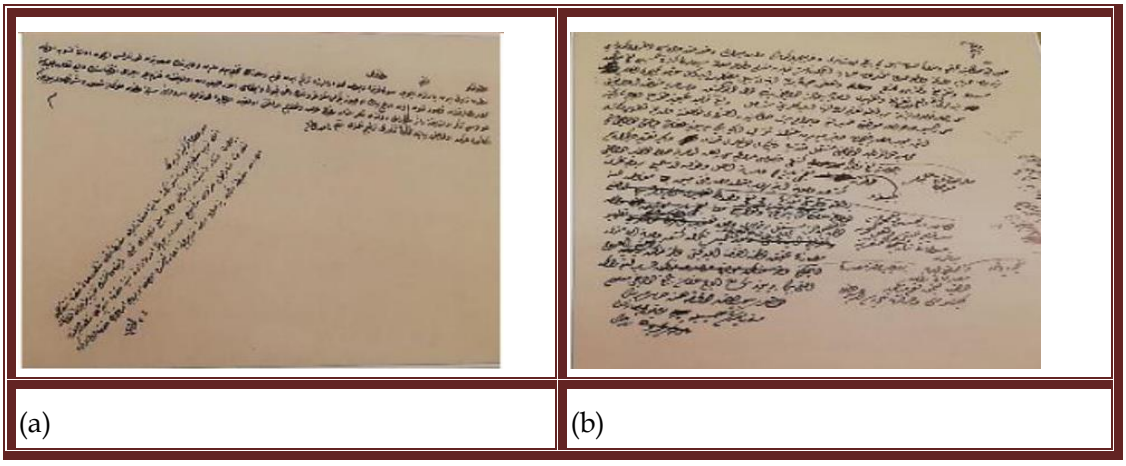
The Sanjak of Isparta was one of the regions where these improvement works were carried out in 1899. The stream with the pouring rain frequently brought the inhabitants of the region to face flooding. Necessary measures were taken to prevent the harmful effects of floods by constructing walls in the sections where the depth of the streams was low with the help of embankment (Gonullu, 2010). The practices in the lands around Meric River, which is still very much on the agenda today with floods, are another example. The Province of Edirne was flooded almost every year in the past and suffered great damage. In order to prevent these damages, the mills and rafts along the Meric River were removed in 1894. Additionally, few dams were built on overflowing rivers such as the Meric River in order to retain water (Yılmazcelik & Erdem, 2015). In this era, another method used for mitigating the harmful effects of flooding was the opening of bridge eyes. This method played an important role in bringing the flow of the river to its average speed during floods. Cleaning the riverbeds was another measure used in this era. Because, if the rivers are not kept clean, they flow out of their beds, and the direction of water routes changes. This also cause some problems in agricultural areas, animal husbandry activities and swamps. It was very costly to restore the course of rivers to their original states or to a reference state. For this reason, the Ottoman Empire also attached great importance to the cleanliness of the riverbeds (Batmaz & Tok, 2015). One of the issues to be considered in flooding is the maintenance of neighborhoods, streets, and pedestrian roads. The road passing under the bridge in Bebek village was blocked when a flood disaster occurred as a result of pouring rain. The households have suffered a lot from this situation. The affected households demanded from the relevant authorities to reopen the road. As a result of the inspection report of the empire authorities, Sultan Abdülmecid Han gave an order in

1851 to repair the broken paving stones and reopen the road (Ozturk, 2007).

In Figure 3 below, sample documents regarding the measures taken to prevent floods are given. The document (A.MKT.UM, No.462, Gömlek No.13, 1868) (a) was written to the Ministry of Finance with the Sehremaneti which fulfilled the task of today's municipality and was established during the last period of the Ottoman Empire. In the document (A.MKT.UM, No.462, Gömlek No.13, 1868) written to the Şehremaneti, the Ministry of Finance mentions the accumulation of sand and debris in the streets and neighborhoods of Eyup due to heavy rain. It was requested that these piles of stones be removed from the streets and neighborhoods. The document (Ozturk, 2007) (b) states that the roads leading to Yenibahce Gardens, Hacılar Palace, At Square, Horhor Street and Aksaray Bridge were closed due to the floods that occurred around Topkapı in 1797. The provision regarding the execution of the necessary works for the cleaning of the water channels on this route was taken as a subject (Ozturk, 2007).

Many measures taken by the Ottoman Empire against flood disasters can be found in the Ottoman archives. Today, the number and destruction of flood disasters increase day by day due to the impacts of climate change, and Türkiye, like the rest of the world, is still seriously exposed to flood disasters. The measures taken and the methods applied in combating floods are of great importance both for the protection of natural water resources and for the prevention of loss of life and damage to properties.

Figure 3. Sample Documents Regarding the Measures Taken to Prevent Floods



(a) (b)

References: a) A.MKT.UM, No.462, Gömlek No.13, 1868 b) Ozturk, 2007.

4. Water Supply and Security

States have made great efforts to reach water because of the fact that water resources are not equally dispersed among countries. In this regard, the states that could not have reached a sufficient amount of water existed for a short time in history, and the others that could have provided water safely and permanently, developed into successful civilizations. The Ottoman Empire, one of the most powerful and longest lasting civilizations ever to occupy the earth, also succeeded in providing water safely and permanently to its citizens. This success is also evidenced by many architectural water structures such as canals (water channels), underground water channels, and arches that have survived to this day. Water in the Ottoman Empire was carried out from these structures. First of all, water was collected in structures such as dams and pools. The water collected in these structures was carried to the maksem and sluices of the period, which were the distribution centers of the city, by canals. The sediments on the surface of the waters reaching the city through maksems and weirs were left to settle. From here, healthy water, which was needed by the public, was provided to flow from the fountains through pipes (Tabakoglu, 2017). Considering the conditions at that time, these water structures appear as engineering miracle. The Hamidiye spirit level, shown in Figure 4, is just one of the prominent examples. Photograph (a) in Figure 4 is the exterior of the Hamidiye spirit level. The photo (b) is the view from inside of the Hamidiye spirit level. In the photograph (c), the marble plate separating the water reservoirs and the nozzles are shown (Sonmezer & Sahin, 2014).

Figure 4. Hamidiye Spirit Level in the Early 20th Century

(a) (b) (c)

References: a) Exterior of Hamidiye spirit level b) View from inside of the Hamidiye spirit level c) Marble plate separating water reservoirs and nozzles.

The Hamidiye spirit level, completed in the 19th century, was built in order to prevent damages that may occur in the pipes by adjusting the pressure of the water. The spirit level played an important role in transporting healthy water to fountains, public wells, baths and similar structures. In this context, the Ottoman Empire brought water by pipes to the water scales, and from there water was brought up with pipes so the pressure was balanced. The working principle of the spirit scales can be expressed with modern water pumping systems (Sagir, 2016). The systems used at that time attracted attention of European travelers; they mentioned the technical structures, built by the Ottoman Empire, for water supply with fine calculations in their travel notes (Cantay, 1999).

The Ottoman Empire, which gave importance to water supply, made great efforts to supply water to the Hijaz region, where there was not enough water due to the climatic conditions of drought. Various types of technical studies have been carried out in order to prevent and combat water scarcity, experienced by local people and visitors from abroad, as the water shortage becomes more evident due to the increasing population, especially during the pilgrimage season. Researchers have conducted the study for the aim of solving the water shortage issue by using seawater to provide drinking water. However, due to its high cost and insufficient technological opportunities in this field, these works did not resulted successfully until the 19th century. After the invention of the steam engine, significant progress has been made in the studies on the chemical structure of water. This facilitated the process of obtaining drinking water from seawater. As a result of these developments, the first station was established in Hijaz in 1894 with the aim of meeting the drinking water needs of inhabitants by desalination of seawater (Yılmaz, 2012).

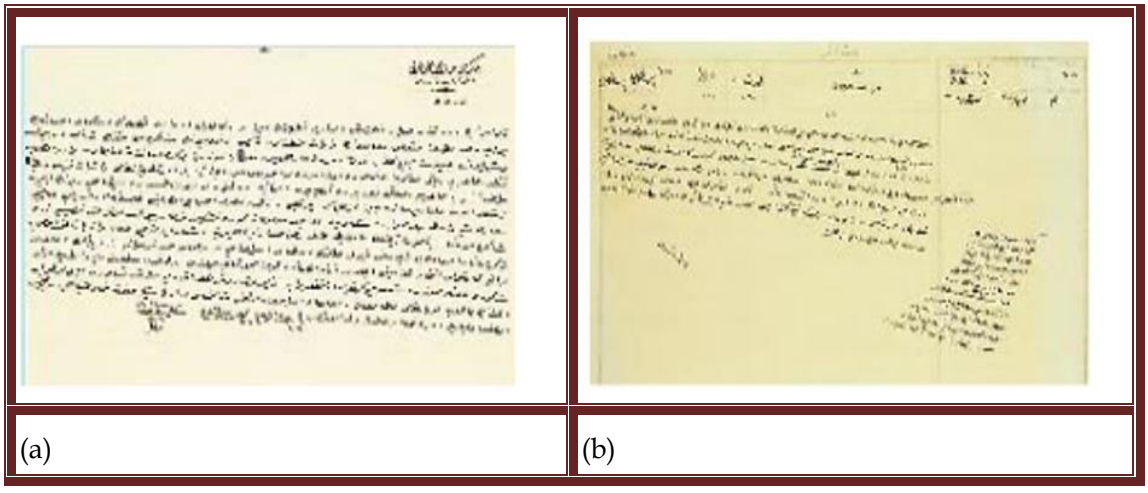
The document in Figure 5 (BAO.İ.HUS, Defter No. 20, Gömlek No.68, 1893) (a) was issued to investigate the possibility of obtaining drinking water by using electric current to purify seawater. (b) (BEO. No. 571, Gömlek No 42805, 1894) mentioned that there was an urgent need for water in the Vilayet of Hijaz, so potable water should be replenished from the nearest region to Yenbu by means of ferries loaded with sea water (Yılmaz, 2012).

As it is seen in Ottoman archive documents, the Ottoman Empire resorted to different ways of supplying water in regions suffering from extremely high baseline water stress. Jerusalem, a region with water scarcity problems due to its location, is a holy city for the religions of Islam, Christianity, and Judaism. For this reason, it is one of the regions where water needs should be urgently supplied. With the expedition of Yavuz Sultan Selim Han to Egypt in 1517, the Sanjak of Jerusalem, which remained under Ottoman rule for 400 years, became a city where the traces of water civilization are still visible today. After the conquest, infrastructure construction works were carried out with the aim of eliminating water problems in the region. The main water need of the Sanjak was met by laying water supply pipes from the village of Artas, located south of Bethlehem, to Jerusalem. In addition, the Ottoman Empire built a large reservoir outside the city walls to supply water to the caravans that came to Jerusalem for worship (Memis, 2019). During the Ottoman rule, Sultan Suleiman the Magnificent and II. Abdulhamid Khan were more interested in architectural activities, especially for water supply, in the Sanjak of Jerusalem. The water basins and canals in Bethlehem were repaired during the reign of Sultan Suleiman the Magnificent. Moreover, many public wells and fountains were built to provide water and meet the needs of faithful. During the reign of II.

Abdulhamid Khan, the cleaning, maintenance and repair of many buildings were carried out by giving due importance to the water needs of the region.

It can be given more examples of Ottoman water supply works. On the other hand, the Ottoman State did not only give importance to the drinking water supply, but also gave an importance to meet other public needs. The Canaan Canal was built on the Tigris and Euphrates Rivers during the period of the administration of Midhat Pasha, the governor of Baghdad, in order to make the agricultural lands in the country more productive. As a result, agricultural activities expanded throughout the country, and the wealth of the country increased steadily. The construction works for supplying agricultural and drinking water needs of the region had been continued during the reign of Sultan Abdulhamid such as dams and canals on the Euphrates and Tigris Rivers. With the construction of Al-the Great Wall of Hindiya Barrage, the second most important canal and dam project of the Ottoman Empire after the Suez Canal, the inhabitants water needs were supplied at significant level (Akpinar, 2017). The Al-Hindiya Barrage was also secured by security officials of the Ottoman Empire. Today, it is still important issue to secure water resources and structures, especially due to epidemics and wars (Korbalta, 2019). For example, Syrians cannot access healthy water because of the ongoing war in Syria, one of the Türkiye's neighbors, and this reveals again the importance of water security.

Figure 5. Two Ottoman Archive Records on Water Supply



(a) (b)

References: a) BAO.İ.HUS, Defter No. 20, Gömlek No.68, 1893 b) BEO. No. 571, Gömlek No 42805, 1894.

5. Saving Water

Global environmental problems such as unconscious consumption of water resources, climate change, etc. highlight the importance of water conservation. In different periods of the past, humans faced with same environmental problems, especially water shortages. Therefore, fresh water as a limited resource has been conserved in every period from the past to the present. In this context, the Ottoman Empire paid great attention to water conservation and showed exemplary approaches in this regard. As an example, Sultan Murad Han asked Mimar Sinan, the well-known architect, to build a fountain in Istanbul in the name of his grandfather, Sultan Suleyman the Magnificent. Architect Sinan realized that water was being wasted, so he built a water reservoir at the back of the Suleyman the Magnificent Fountain to store excess water. Three times a day, water in the reservoir has been accumulated in the pool which was built in front of the fountain in order to meet the water requirements of livestock (Ugurlu, 2000).

Another saving water application was the use of twisted taps in fountains, toilets, baths, and similar structures. This mechanism is also used in today's devices such as valves and faucets (Sagir, 2016). Prior to the introduction of the twist nozzle in the reign of Sultan Suleyman the Magnificent, water was traditionally transferred by aqueducts and water distribution lines. Water waste was largely reduced through using these new mechanisms (Oguz, 2000). These twisted nozzles may be considered artistic or aesthetic structures over time and have been varied according to the types of architectural structures.

6. Wastewater Management and Sanitation

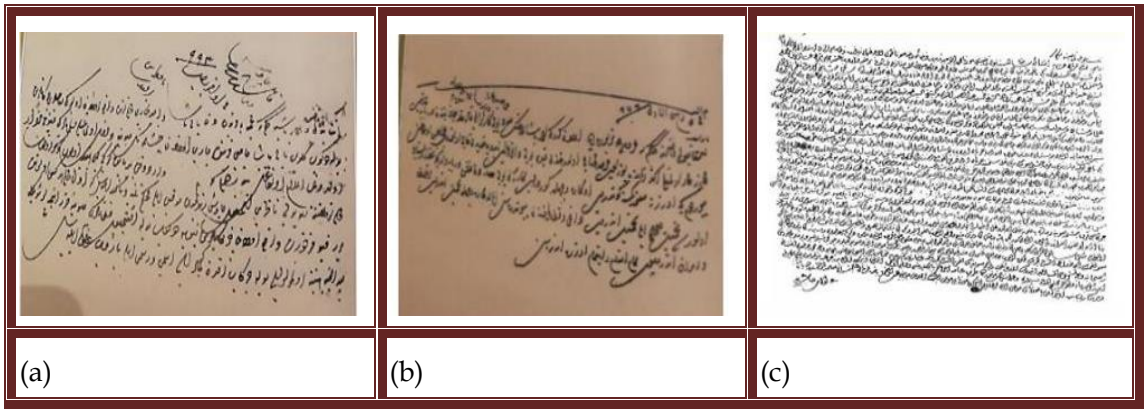
The disposal of wastewater without harming the environment and human health is of vital importance as the

provision of safe drinking water and that's why wastewater should be disposed of with the best techniques (Direk et al., 2022). This issue was carefully addressed by the Ottoman Empire, and many exemplary practices were implemented in its regions. The decision issued in 1593 prohibited the discharge of household wastewater (known as "chirkab" in Persian) directly into water resources and the environment (Zehir, 2000). Home wastewater coming from washrooms and toilets must be collected into open discharge septic tanks for environmental sanitation. This infrastructure did not exist even in Europe at that time. Additionally, it was ordered that wastewater from public baths, and toilets in ablutions of mosques must be also collected into open septic tanks (Zehir, 2000). During this study, we accessed a lot of information and many legal documents on the practices for protecting the environment and public health during the period of the Ottoman Empire in the BOA. For example, in the document of Istanbul Şehremaneti (BOA. Y.MTV, No. 81, Gömlek No. 49, 1893) it is stated that some residents regularly throw diapers into the stream at the end of Nisantası Tesvikiye Street. Cleaning the stream regularly was ordered so that epidemics would be prevented and foul smell would not be released into the environment (Ozturk, 2007). These practices show us that the Ottoman State took a lot of measures and made legislation for protecting water resource, and preventing pollution of the environment by wastewater. Another archive document (Tak, 2015) is about the establishment of a committee consisting of a chemist, a doctor and a few pharmacists in 1892 in order to control the environmental and health impacts of wastewater. This committee was tasked with inspecting the neighborhoods which were located around mosques, baths, and houses (Tak, 2015). Its all-administrative regions were inspected with maintaining an uncompromising attitude.

The BOA document (BOA. A. DVNS. MHM. d, No. 58, Hk. 828, 1585) in Figure 6 (a) states that the open water wells around the Bali Pasha Mosque in Istanbul was polluted because the residents in the Bali Pasha and Emir Buhari neighborhoods threw away their old cloths on streets. The decree of 1585 (BOA. A. DVNS. MHM. d, No. 58, Hk. 828, 1585) mentioned that a well should be dug in every house for the aim of dumping old cloths into these wells. The document (Ozturk, 2007) in Figure 6 (b) is about the decision to repair the sewers of the Gedik Pasha Bath (Ozturk, 2007). The document (BOA. A. DVN.ŞKT.d, No.111/230/1, 1568) in Figure 6 (c) also mentioned that cloths used for different purposes in the Eregli Mosque, Araba Bath, and some mills and ovens in the Dadlıkapı area around Yenibahce/Istanbul were threw away and caused pollution by mixing Kırkcesme Water System. Therefore, it was ordered that the architectural structures around Kırkcesme Water System should be demolished to prevent water contamination (Kala, 2003).

As it is seen, in the Ottoman Empire period wastewater disposal was a very important problem, and a lot of measurements and law enforcement were taken for the sustainability of quality and healthy water resources. Today, humankind faces the same problem of sustaining water resources healthy and clean because of rapid industrialization, massive urbanization, and overpopulation considering scientific and technological development. Undoubtedly, the main reason behind unresolving wastewater problem is ongoing industrial developments. Although different types and huge amount of wastewater are released from industries, there are inadequate treatment systems in terms of both number, capacity and technical features. These issues cause not only water pollution but also many environmental problems. The recent slime problem in the Sea of Marmara is just one of the events that show the importance of this situation.

Figure 6. Wastewater Sample Provisions



(a) (b) (c)

References: a) BOA. A. DVNS. MHM. d, No. 58, Hk. 828, 1585 b) Ozturk, 2007 c) BOA. A. DVN. ŞKT. d) No.111/230/1, 1568.

7. Use of Water in Industry

The foundation of the industrialization process in the Ottoman Empire dates back to the beginning of the 16th century. The production-oriented approach continued to meet the army's various needs, such as gunpowder and weapons production, clothing, and footwear. Towards the end of the 18th century, the Industrial Revolution and inventions in Europe influenced the industrial development of the Ottoman Empire. The invention of revolutionary steam engines, especially by solving the chemical properties of water with advanced technological possibilities, played an important role in the increase of industrialization (Dogan, 2013). The Ottoman Empire closely followed the industrial developments and began to use steam machines in industrial production. These developments caused some environmental problems. Especially in the 1860s, with the increased number of facilities using steam machines around the Golden Horn Area of Istanbul, the smoke from the factory chimneys harmed the environment. As a result of the increase in the smoke coming out of the factory, air pollution has occurred, and due to the increase in complaints of the people who are discomforted by air pollution, some research studies were carried out in the region. After analyzing the results of the studies and researches, it was decided to move the factories working with thermal energy to places far from the city where they have not affected the health of residents. In this regard, 40°C and above were considered as high thermal power, 13-40°C as medium, and below 10°C as small class. As a result of this evaluation, it was forbidden that the facilities working with high and medium thermal power steam engines built in or near the settlements. On the other hand, the construction of plants with low thermal power between streets and neighborhoods was forbidden, and it was allowed to be located in areas far from the city. Additionally, it was also determined that the boilers and machines used for reducing smoke density should be operated indoors (Ozvar & Yılmaz, 2015). Another important measurement was that before constructing a new factory, the officials bounced this new project off the residents in the region. After that, the factory was/wasn't constructed in accordance with the assessments of the officials. It can be said that "Environmental Impact Assessment", a trending practice these days on the assessment of the effects of certain public and private projects on the environment, has been in this regard done since that time. In an example of how community complaints were taken into account by the officials of the Ottoman Empire, the residents made complaints about oil extraction factory, built in the creek bed in 1867, when its wastewater into the creek became harmful to the environment and public health. After evaluating their complaints, the officials launched to read up on the factory and its impacts. They determined that the factory should be relocated to any area farther away from settlements to mitigate harmful effects on water and human health (Ozvar & Yılmaz, 2015). Considering the high cost of relocating the factory with this decision, it is seen easily that the environment and human health were given an important place in the Ottoman Empire.

8. Getting Energy from Water

The Ottoman Empire like many pre-industrial states had a predominantly agricultural economy. This was very effective in accessing natural water reources and getting energy from them. In particular, energy was obtained by harnessing the power of rivers. Mills and water closets were at the forefront of the systems used with this logic. Flour mills, mills for separating the rice from the husk, mills that worked with water or animal power, and mills for extracting oil are just a few of them. In water closets, water was collected in buckets with the help of the energy obtained from the movement of water, and this water was used for irrigating the land through canals (Ozturk, 2015).

Discussion and Conclusion

Global environmental problems are getting higher day by day, threatening not only today's societies and environments, but also future generations, flora, and fauna. Especially in recent years, global climate change, wars, and epidemics have increased the threat dimension and brought all countries together in common concerns and studies. However, the success achieved in raising awareness has not been sufficiently translated into the implementation of solutions. The future of the planet will only be possible with the realization of analytical approaches that all countries will show with the same sincerity and simultaneously. Although these facts seem to be accepted by everyone and authorities, unfortunately, another striking contradiction is ignoring these. In particular, countries in the race of industrialization and modernization ignore the situation in order to keep their first place, and also further stimulate their civilized life, which they have equipped with their ambitions. On the other hand, there are significant efforts to solve global environmental issues. The most important step will be to raise individual environmental awareness one by one. It is not still at the desired level. Undoubtedly, this will be possible to promote effective environmental education around the world. Many studies have been carried out in

order to complete the deficiencies in this context, and "environmental history" has come to the fore as one of the effective steps taken. The purposes of this new field are :1) to deal with the history of mankind from an environmentalist perspective, 2) to point out mistakes to today's people for learning from past practices. Environmental history, which aims to shape the future with the traces of the past, motivates individuals by ensuring that the environmental messages and training given to individuals are more striking, effective, and lasting.

In parallel with the mission of environmental history, water culture in the Ottoman Empire was the subject of the study. The Ottoman Empire, which managed to rule for many years in a wide geography, correctly evaluated its period and determined its policies and targets in line with rational principles. Furthermore, he also shaped his policies and goals with the civilization, developed within the framework of Islamic beliefs. The relationship between man and nature is perceived as mutually complementary in the religion of Islam; humanity cannot exist without the natural world. For that reason, the responsibility of protecting environment and natural resources is given to Muslims by Allah and his Messenger. Both the social and individual life in the Ottoman Empire were also shaped by the rules of Islam religion and law. That's why the Ottoman Empire was more respectful of the environment and nature than the other states at his age. From this point of view, the practices on water and wastewater in the Ottoman Empire may be described as an "environmental practices" not only in his age but also in the contemporary world. From the point of view of environmental history, the rules and implementations in the field of water in the Ottoman Empire are exemplary implementations for today's modern civilization, and also the success of Ottomans in this field despite technical and financial limitations should be unexpected for today's world. Many research records on water supply, sanitation, conservation, protection, and security of natural resources, flood, measures, and use of water in industry and as an energy sources has revealed numerous exemplary implementations in the age of the Ottoman Empire. It is possible to give numerous examples in the field of environmental protection. And environmentalists shall be inspired by these rules and implementations. To sum up, the Ottoman civilization is called a "water civilization" and this definition alone proves his attitude and approach to water.

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