

Hasankeyf: A Cultural Heritage Reflecting the History (Archaeometric Approach)

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Abstract

Hasankeyf has hosted substantial number of civilizations some of which are known as the first human settlements in Mesopotamia gathering the Byzantine, Ottoman, Artukid, Eyyubid, Assyrian, Urartian and Arabic cultures. As soon as the Ilisu dam project is completed most of the region along with its numerous ancient relics will be left under the water. Therefore some precautions should be taken such as transferring movable historical assets and investigating unmovable ones using archaeometry which generally prefers chemical, thermal, mineralogical, spectroscopic, optical and microscopic investigation that would provide significant information about the findings uncovered from archaeological excavations. The comprehensive and detailed knowledge obtained by archaeometry, which gathers engineering, natural and social sciences, creates a convenient date base for studying historical artifacts. In this study, it is aimed to evaluate the importance of Hasankeyf in elucidating the history of Upper Mesopotamia in the context of archaeometry and the cultural heritage.

Keywords: Cultural Heritage, Archaeometry, Hasankeyf (Turkey).

Hasankeyf: Tarihi Yansıtan Kültürel Bir Miras (Arkeometrik Yaklaşım)

Özet

Hasankeyf Mezopotamya'daki Bizans, Osmanlı, Artuklu, Eyyubi, Asur, Urartu, ve Araplar gibi sayısız birçok medeniyete ait ilk yerleşim yerlerine ev sahipliği yapmıştır. Ilisu baraj projesi bittiğinde ise bölgenin büyük bölümü birçok tarihi kalıntı ile birlikte su altında kalacaktır. Bu nedenle bazı önlemlerin alınması gerekmektedir; taşınabilir kültürel varlıkların transfer edilmesi ve taşınamaz olanların ise arkeolojik kazılarda ele geçen buluntular hakkında önemli bilgiler sağlayan ve kimyasal, ısı, mineralojik, spektroskopik, optik ve mikroskopik yöntemleri kullanan arkeometri ile incelenmesi. Mühendislik, fen-doğa ve sosyal bilimleri bir araya getiren arkeometri ile elde edilen kapsamlı ve ayrıntılı bilgiler tarihi eserlerin araştırılması için uygun bir veri tabanı oluşturmaktadır. Bu çalışmada Hasankeyf'in Yukarı Mezopotamya tarihinin aydınlatılmasındaki önemi arkeometri ve kültürel miras bağlamında ele alınmıştır.

Anahtar Kelimeler: Kültürel Miras, Arkeometri, Hasankeyf (Türkiye)

1. Introduction

Requiring a serious education, consciousness of preserving cultural assets is unfortunately not considered as an important issue by people, so they do not behave sensitive about their historical assets. In the 21st century, in which technology has reached its maximum level in sense of both research-developments (R&D) and practical use, there is a new branch of science named “archaeometry”. This science discovers the structural features of the ancient materials in order to find out the technological level, artistic approach and production techniques of the ancient communities. Archaeometry includes various analytical methods (i.e. X-ray Diffraction, Atomic Absorption Spectroscopy, X-Ray Fluorescence, Transmission or Scanning Electron Microscopy, Optic Microscopy, Differential Thermal Analysis, Thermo Gravimetric Analysis, Fourier Transform Infrared Spectroscopy etc.), and is frequently used to increase the efficiency and applicability of the archaeological investigation (Krapukaitytè et al., 2008; Biscontin et al., 2002, De Benedetto et al., 2002; Eramo et al., 2004).

Cultural assets play a crucial role in enlightening the characteristic features of the ancient civilizations. The artistic and architectural properties of historical structures have many traces reflecting the ancient social contents of human. Although some salvage studies are carried out in historical sites, they are occasionally insufficient because of some unexpected situations such as natural or human induced reasons which may appear as floods, landslides, earthquakes, fires, environmental pollution, global warming, unplanned urbanization, energy policies etc. Being one of such regions, Hasankeyf is located at north side of Mesopotamia. It is, today, under danger of being flooded from a reservoir lake of dam (Ilisu). Having a great number of cultural heritages, this region is one of the most significant places in terms of giving unique information about Mesopotamian civilizations. Consequently, importance and future of Hasankeyf is discussed in this study in the context of its cultural assets, and also evaluated in framework of archaeometry.

2. Mesopotamia

Having the meaning of “*place between two rivers*” in Ancient Greek (Adamantopoulou et al., 2009, p. 36), Mesopotamia takes place among two important rivers (Tigris and Euphrates) located along the Arabian Gulf and Southeastern Anatolia. It has frequently witnessed invasions and refugees because of the reasons such as appropriate climatic conditions and fertile lands, consequently; civilizations had a great progress in this

region through the cultural interaction between people (Sener, 2004). Location of Mesopotamia is shown in Figure 1 (wikispaces.com).



Figure 1. Map showing the territories of Mesopotamia (wikispaces.com)

Mesopotamia was wet and mild in winter and it was dry and hot in summer. Its both north and south sides were fertile regions thanks to the constant flooding and rainfall. People could feed themselves taking the advantage of the lands fed by the Tigris and Euphrates. The area along the rivers allowed people to cultivate crops such as sesame, wheat, flax, barley, different fruits and vegetables (Fekri, 2003; Postgate, 1992).

The social structure of Mesopotamia may be classified as Lugals, Priests, Scribes, Traders & Craftspeople, Common People and Slaves. Lugals were people who could own building, land and weapon, also could give them to the others. They could oversee all the established laws and projects as well. Priests were people who had control over their own lands and the content of schools. Scribes were working as public writers for the government or religious temples. Craftspeople were producing artworks and daily goods which were sold by the traders who had the right to sell the products locally or globally. Farmers were generally in the group of common people and they could change the supply and demand of the farm crops (i.e. barley or grain) in the market. Slaves were people who had been captured in wars or invasions, and became prisoners or who could not be able to find job to work. So they were indentured servants as well (Fekri, 2003; Postgate, 1992).

3. Batman and Hasankeyf

By the early years of the 20th century, Batman was a town of Siirt (Turkey) and named as Iluh. In 1957, the village became a district with the name ‘Batman’ and then became a city in 1990. The most striking feature of the city is petroleum extraction and

refining. The Modern Batman Refinery, founded to refine petroleum which was extracted in the region of Garzan and Raman Mountain, began to work regularly in 1955 and then expanded by the time. The main development in mining and industry was achieved by the completion of the petroleum pipeline placed between Batman and Iskenderun with a length of 494 km. The districts of Batman city are Beşiri, Sason, Gercüs, Kozluk and Hasankeyf. (Southeast Anatolian Guide, 2007).

Hasankeyf is located against the cost of the Tigris River in southeastern Turkey (Ulucam, 2007a) (Figure 2). It is thought that it was first settled at least three thousand years ago (Leedom, 2009).

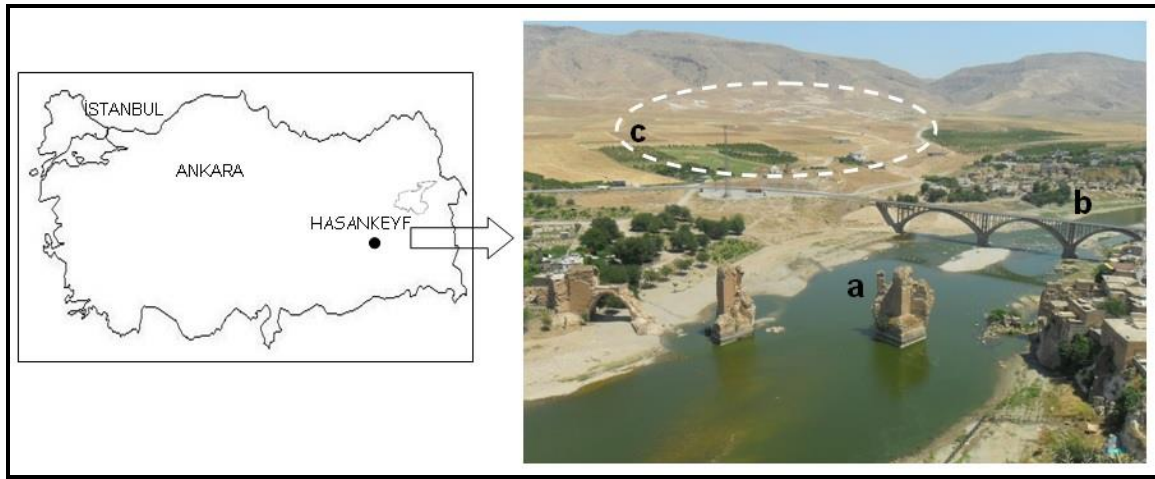


Figure 2. View of Hasankeyf from the castle*.

a: Old Bridge, b: New Bridge,

c: New residential area for the citizens of Hasankeyf (encircled with the white dotted line)

**Photograph has been taken during an “Academic Research Trip” in Hasankeyf, 2011.*

It is obvious that one of the most important natural effects on this region is the Tigris River. It is one of the major rivers forming Mesopotamia, and is located in the south of the Arabian and Anatolian Plates’ collision zone which is uplifted due to the differences in geological structures of these plates, especially the north side of the zone. Therefore the Tigris River has formed its own river bed around Hasankeyf, and has moved to the south side (Southeast Anatolian Guide, 2007; Postgate, 1992).

This river, being a natural phenomenon creating unique landscapes and ecosystems while flowing from Turkey to the Gulf of Basra, is the main source of fresh water for thirsty territories on Mesopotamia. The landscapes formed by the river are consisted of

deep canyons and humid forests. Having all these efficient features, the river has made Hasankeyf attractive for people and made it also rich in history throughout the ages (Postgate, 1992; Southeast Anatolian Guide, 2007).

Hasankeyf has hosted substantial number of different civilizations some of which are known as the first human settlements in Mesopotamia gathering the Byzantine, Ottoman, Artukid, Eyyubid, Assyrian, Urartian, Turkic, Arabic and Mervanid cultures, additionally according to the previous researches the first settled nation in the region was Assyrians or Urartians (Sener, 2004).

The region is now struggling with the danger of being destroyed by the Ilisu Dam project (Figure 3) (Kitchen and Ronayne, 2001) which is one of the multiple hydroelectric power plants in south eastern Anatolia (dsi.gov.tr).

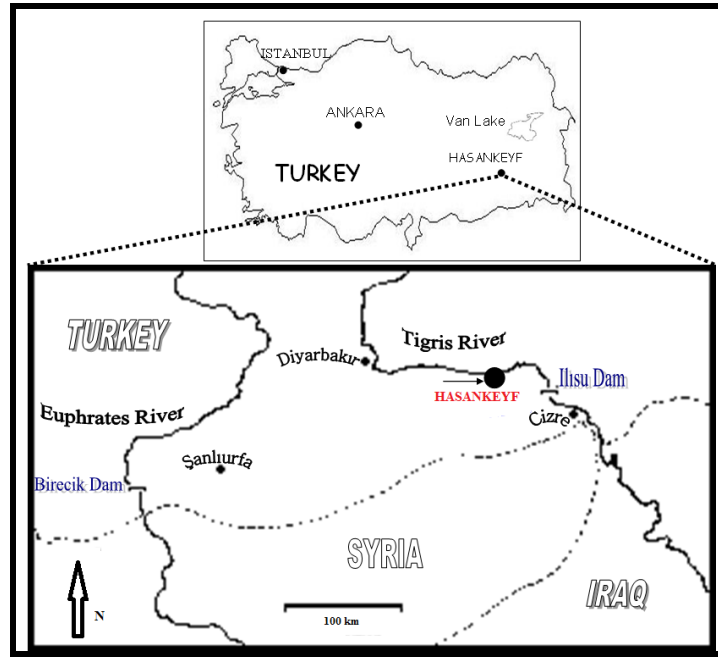


Figure 3. Map showing the location of Ilisu Dam (Kitchen and Ronayne, 2001).

4. Cultural Traces in Mesopotamia and Hasankeyf

The medieval urban fabric integrating with the natural formations such as caves and rock hollows has been one of the significant factors which make Hasankeyf valuable for both Batman city and Mesopotamia. It is predicted that the history of north side of Mesopotamia (including Hasankeyf) would be dated back to the BC 7th century and hereby the area became a unique residential center for human ever since the prehistoric times. Besides, the establishment of an independent church organization belonging between the

late antique and early medieval era (AD 4th-6th centuries) indicates that this region has become a religious center. This land has accepted the religion of Islam by the Arab invasions (AD 8th century) and was able to survive its cultural and artistic features till now through the conquest of the Seljuk and other Muslim principalities (Bas, 2006; Saganda, 2005, p. 98).

Hasankeyf was an important commercial center in upper Mesopotamia (especially after the Artuks). Most of the constructions (i.e. Kızlar, Ulu, El Rızık Mosques, and also Zeynel Bey Tomb, Small&Big Palace etc.) have been preserved and can be visited today (Ustel et al., 2006, p. 9-10).

It is known from the history that Mesopotamia has witnessed many innovative progresses which seriously affected the direction of humanity. For instance Mesopotamians invented wheel to ease movement and to improve faster transportation so that they would be able to transport foods with a less case of rotting. They invented kinds of farming tools and techniques such as irrigation which helped them for excellent vegetation and led them to domesticate the animals in order to use them for various purposes. Their most famous technique was to attach the yoke to animals, for example; they used oxen to get the ground ploughed. They developed written language and were very advanced in astronomy. The writing began as pictures and by the time slowly transformed into cuneiform. They were the first human being used bronze to make tools and weapons. Mesopotamians created the first set of laws and they invented money to use instead of exchanging their tools and products in markets. By using the laws they could control the commercial relations and manage their money (Fekri, 2003; Postgate, 1992).

5. Archaeometry in Cultural Heritage

Archaeometry can be evaluated as a multi-discipline science gathering various branches such as physics, chemistry, biology, material sciences, geology, and also archaeology, art, art history etc. The first analytical studies, regarding archaeometric investigation including the determination of production technologies and raw material contents of the archaeological findings, have been carried out in Renaissance period (AD 18th century) in Italy, and the first archaeometric analyses were applied on Ireland Bronze Age swords by Alcorn who was an analysis expert of the Kingdom of Italy at that time. (Henderson, 2000).

Being the most encountered materials in archaeological excavations, earthen wares (terra cotta or pottery-ceramics) are also frequently used in reaching information about production technologies and socio-economical features of the ancient civilizations by applying archaeometric methods (Charters, et al., 1993; Eramo, et al., 2004). On the other hand, this science is used in conservation and restoration applications (Felici, et al., 2004).

The main question at this point is to reveal the ancient production process and raw materials used by people lived at those time periods. By using various methods such as X-ray Diffraction, Atomic Absorption Spectroscopy, X-ray Fluorescence, Transmission or Scanning Electron Microscopy (with also Energy or Wavelength Dispersive X-Ray Spectroscopy), Optic Microscopy, Differential Thermal Analysis and Thermo Gravimetric Analysis, Fourier Transform Infrared and Micro-Raman Spectroscopy, Thermo-Mechanical Analysis, Auger Electron Spectroscopy, it is possible to get scientific data which can be used for characterizing ancient materials like ceramics, metal, glass or wooden stuffs, and also for the conservation and restoration processes of constructions and artworks (Mangone et al., 2009; Striova et al., 2006; Loehman, 1993; Issi et al., 2011, Okse, 2002; Felici, et al., 2004).

6. Archaeometric Studies in Hasankeyf

In the previous archaeological excavations in Hasankeyf, remains of some ateliers, which were probably belonged to the ceramic kilns due to the presence of potsherds and their typical forms reminding typical terra cotta kilns, have been revealed (i.e. Salahiye Gardens and Beach Palace) (Findık, et al., 2014: 260; Uluçam, 2007a; Gocmez, et al, 2004; Ceken, 2008; Findık, 2013). Some of the ceramic findings were archaeometrically investigated by the researchers in order to understand the production details of such earthen wares. One of them regarding the characterization of 13 unglazed ceramic fragments and 6 clay/soil samples has revealed information mainly about i: structural features (i.e. porosity-aggregate contents), ii: clay type, iii: firing temperature range, iv: provenance (Findık, et al., 2014: 267-268).

Another was about the investigation of some selected Hasankeyf potsherds which was carried out to enlighten the production features and the raw material properties by using multiple techniques such as XRD, Infrared Spectroscopy and Electron Microscopy (Gocmez, et al., 2004).

Apart from the ceramics there are also some archaeometric works focusing on conservation and restoration processes in Hasankeyf. For example four plaster covering samples belonging to the front sides of the iwan and dome of Koç Mosque were studied by using archaeometric methods such as gravimetric analysis, thin section analysis and X-ray diffraction in order to determine the appropriate way to preserve the structure (Demirci, et al., 2002).

Various archaeological materials such as ceramics, stone/rock, soil, limestone layer on stones and plaster of Paris sampled from Hasankeyf Artuqid Kiosk were also archaeometrically investigated by Akyol and Kadioğlu (Akyol and Kadioğlu, 2012).

Some of other important researches were carried out by M. Oluş Arık, Abdüsselam Uluçam (head of Hasankeyf archaeological excavation at present), Ayhan Gokben, Muharrem Ceken, Albert Gabriel, Yusuf Oguzoglu and Huseyin Yurttas etc. who have considered Hasankeyf from various aspects (Arık and Ahunbay, 1992; Arık, 1993; 2001a; 2001b; 2002; 2003; Ulucam, 2006; 2007a, 2007b; 2007c; 2010; Gokben, 2011; Ceken, 2007; 2008; Gocmez, 2004; Gabriel, 1964; Oguzoglu, 1997; Yurttas, 1997; 2002; hasankeyfkazıları.org).

These invaluable works and projects should be appreciated and supported because there is a very limited time left for the region which will be flooded by the reservoir lake of Ilisu Dam. As seen from the investigation details of the aforementioned researchers, although there is a substantial effort especially for the preservation and conservation processes, there is a very limited number of detailed archaeometric studies for the archaeological findings. In this context, it would be useful to characterize more samples and prefer various high-tech analytical techniques used in the world.

7. Results and Discussion

Energy need has increased particularly in last decades because of various reasons mainly depending on population, changes in natural balance and request of excessive consumption. All these parameters have many different effects on creating new alternatives in order to meet the vital needs of the countries, for instance; nutrition, health and housing which require advanced economies and convenient energy resources. In this context, today, countries are trying to strengthen their financial structures by discovering new ways for their energy needs. One of the most preferred options for their purposes is the renewable energy sources. In recent years bio fuels, solar cells and wind have found a significant

wide range of applications in energy production (Panwar et al., 2011). So, it will not be wrong to mention that these alternatives are the main parts of the sustainable energy resources.

On the other hand one of the easiest ways to supply energy is to build a dam which is actually not healthy due to its harmful effects (i.e. environmental and social impacts) and uncertain expiration time (Akkaya et al., 2009; Deniz and Ok, 2016). Nevertheless, dams have an important role in meeting the need of energy which is indispensable in human life. Thanks to the dams, water can be converted into electricity (the most used energy type in daily life). In this sense, it can be predicted that dams have a substantial importance for human, and they should not be underestimated. Another conspicuous point of dams is providing employment opportunities during their construction. For instance; it is suggested that about 15 thousand people will be employed during the construction of Ilisu Dam, and averagely 22 thousand people will be employed after the construction (ilisubaraji.com, tbmm.gov.tr).

Nonetheless, it is not possible to behave as if the historical assets, traditional customs and cultural heritages do not exist, or as if there will be no loss after the flood of historical places and cultural features by the construction of the dams. Fortunately, in the last century, some people began to be aware of the importance of the historical roots and attempted to do something to preserve them. A major example for this situation is Hasankeyf which is located in southeastern Anatolia. Being a culture icon and one of the most significant places in upper Mesopotamia, Hasankeyf has many valuable historical heritages thanks to its witness to numerous civilizations throughout the history. Unfortunately, the region is now under the danger of being flooded by the Ilisu Dam, and numerous archaeological residues, which have key roles in reaching information about ancient history of Mesopotamia, will probably be lost (Akkaya et al., 2009; Tankut, 2005). So, there is only a limited time left for saving the historical contents of the region.

Apart from the movable or unmovable structures there are also numerous artifacts waiting to be investigated. At this point archaeometry comes forward. Gathering many different sciences, this multi-discipline science can be used for discovering various unknowns; i: production technologies of the findings, ii: raw material content of the materials/constructions, iii: identification of counterfeit objects, iv: conservation and restoration processes etc. Archaeometric researches should be carried on both historical

structures (tomb, mosque, etc.) and archaeological findings (terra cotta-pottery-ceramics, metal, glass materials etc.) in order to reach specific information about the structural properties of the constructions and the materials produced for daily-artistic use. Thus, there will be a scientific basis for conservation and restoration applications, and also for the ancient materials.

Especially in recent decades, archaeometric approach became a necessity for both ancient settlements and artifacts in the whole world. In this context, being one of the most impressive and attractive ancient regions, it is thought that Hasankeyf deserves more attention in terms of archaeometric investigation mainly due to the danger of extinction because of the dam.

In Turkey, the foundation of archaeometry laboratories equipped with technological devices, which will enlighten the date, provenance and production technology, would increase the attention and alacrity of the researchers. Some developed universities have the opportunity of using multiple devices which are accessible in the laboratories existed in different departments such as physics, chemistry, biology, materials engineering or geology engineering etc. But instead of this complicated system, getting the devices together in one laboratory would be very useful to have a more rapid and more organized work-flow. Consequently, a central high-tech archaeometry laboratory, which might be founded in the region, would be useful for the archaeologists and archaeometrists. These labs can also be used for master and doctorate theses carried out in the field of archaeometry.

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