

## The Relation Water Structures Have with Culture and Architecture: A Case Study from Sagalassos

Danaci HM\*

Building Information Department, Akdeniz University, Turkey

\*Corresponding author: Danaci HM, Building Information Department, Akdeniz University, Turkey, Tel: +902423104203; E-mail: [hacermutlu@gmail.com](mailto:hacermutlu@gmail.com)

Received date: November 15, 2016; Accepted date: December 08, 2016; Published date: December 15, 2016

Copyright: © 2016 Danaci HM. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

Throughout history human settlements have been shaped by water to a great extent. Besides being a source of sustenance, humans have needed water for several other needs including transportation and recreation. It is a known fact that past civilizations have built their cities and villages near rivers, streams, lakes or other water sources throughout the historical process. Even in modern cities, water remains an important factor in the design of open spaces and for the quality of human life. For designers, water is one of the most attractive and entrancing design elements in the design and organization of urban open spaces. Sometimes water is used as an element of aesthetics, sometimes to cool the air, suppress noise, irrigate or for recreation. Over time, humans have developed several water structures like canals, fountains and ponds in an attempt to benefit from the aesthetic, psychological and vital qualities of water. In particular, street fountains situated in town centers were also a place for locals to socialize. The shapes and decorations on fountains essentially reflect social culture. This study will first briefly mention the place of water in the mythology and cosmology of different cultures before looking at the development of water structures in Anatolian culture during the Ancient and Byzantine periods with a special focus on fountains (in streets and squares). The ancient city of Sagalassos was the capital of Psycadia and was built on terraces on the SW hills of Akdag and this study will culturally and architecturally examine the monumental fountain in this settlement that was built between AD 161-180, during the reign of Marcus Aurelius to signify the prestige of the Roman Empire.

**Keywords:** Water structures; Architecture; Water in culture and mythology; Antonine fountain; Sagalassos

### Introduction

Throughout history water and water structures have always been influential in human life. Although having undergone some transformation, water still remains an integral part of our lives. Adding appeal to architecture, water has been used in all periods for functional, aesthetic and psychological purposes. According to Zulfikar and Yoshikawa [1] the utility functions of water are: a) canals and fountains have been built to meet potable water consumption; b) water bodies heat and cool later than land masses and this quality has been used to regulate outdoor air and surface temperature-acclimatization c) the noise of falling or flowing water provides noise control to buffer noise in urban areas including traffic, industry and other human activity, d) in the form of lakes, seas, rivers and etc. water provide recreational assets including pleasant scenery, swimming, fishing, rowing, diving, sailing and other water sports. Either still or flowing, water can be used for all these purposes [2].

In many societies water has influenced and even shaped creation epics and belief systems, which happen to be the essence of mythology and cosmology; and, on the intellectual level, water has been the philosophical answer to the question about human existence. In this regard, the relations ancient communities and societies established with water and their perception of water was very different, much more abstract and much broader compared to modern societies. Mankind's perception of water and reaction to water is contradictory. On one side humans restrain water, trapping it in dams; establishing power over water by channeling it to cities and fields. On the other side

humans bow down to water with some sort of cosmic celebration and glorify it in the form of water god, sea god or river god. There are occasions in history when water has been the answer to the origins of existence - one of mankind's most fundamental questions. Though in different forms, the cleansing divinity of water has been mentioned in all religions. For example, while the Pagans regarded water as a blessing, monotheistic religions like Islam, Christianity and Judaism believe that water is not blessed but rather seen as the creation of God - just like human beings [3].

Water has been represented in many ways in ancient mythology. For example, Aborigines believe that it was water inside the frogs that flooded the world. According to indigenous Amazonians the source of the Amazon River is the Moon's tears of sorrow due to the impossibility of a relation with the sun. Water has a leading role in Eastern mythology and is associated with both drought and prosperity. Ancient humans were intimidated by the damages caused by floods and initially regarded water as a holy and invincible force. However, technological developments in time allowed mankind to establish a certain degree of control over water, transforming water from divine to sacred. "Enki" was the god of water for the Sumer-Akkad. For Sumerians water god Enki was also deity of wisdom and civilization. For instance water is mentioned frequently in the Epic of Gilgamesh. According to Egyptian mythology life begins with water. Turks perceived water as a source of power and prosperity but also saw it as an agonizing and protective force. For Turks water was an ancient and sacred being. Water was sacred for Turks as their belief system originated from their faith in natural powers. They generally settled near water. Because Hindus believe in heaven, they scatter the ashes of their deceased in the River Ganges and during January-February each year; attend mass ablution ceremonies to purify their souls. The people

of western China consider water, fire, earth and air as the holy elements. Most of the Chinese population regards water, fire, earth, wood and metal the five types of basic energy. Japanese creation mythology begins with a water drop at the tip of a spear. In Greek mythology, people living on the shores of the Aegean and the islands in between described sunrise and sunset as the sun rising after bathing in the sea and setting after another bathe. According to Plato, water is “the liquid form of all variables, the first form of matter, the shape of spirit, the source and essence of differentiation and everything in the universe, the origin of all existing potentials”. Celt mythology mentions of a creature in human form created from ice and fire. Mayas sacrificed a great amount of young women in wells as they prayed for water from the rain god. The oldest Aztec god is the God of Rain and Prosperity. The god is depicted with two snakes around his eyes and nose to represent lightning and water [3].

Over the years water structures have been designed in various forms. Similarly, fountains, aqueducts and ponds remain in use today with their decorative and sculptural character. Water no longer merely has a recreational purpose. Modern day designers are working on new strategic studies that consider a city’s natural water assets like rivers, lakes and coastal areas [4].

### **Forms of Water Use and Water Structures during the Ancient and Byzantine Period in Anatolia**

Water is one of the most important elements for all creatures on this planet. Drought leads to dry soil, loss in food production; turning a once lush green area into a desert. Humans and animals cannot live without water. Surviving Hittite, Phrygian, Urartu, Greek, Roman and Byzantine structures, particularly water structures, are important relics to understand architecture and water structures in Anatolia after BC 11. Settling near rivers or lakes has been the easiest solution to access water for ancient communities. Indeed, the oldest settlements in Anatolia are generally located either by a river or lake, unless conditions had forced otherwise. There are settlements in higher altitudes mostly due to safety concerns. In such cases cisterns, wells or aqueducts were used to provide water. In almost all ancient Anatolian settlements, and particularly those constructed in high, rocky locations have been found to construct open or closed cisterns by carving out rock or building high walls [5].

During the first half of the 2nd century AD a local community brought water from three different springs at 1150 m from the Madra Mountains to the north, using three independent 44 km long ceramic pipelines that run parallel to each other. Then a 1.2 m x 3.6 m sized double compartment structure at 376 m elevation containing a sedimentation tank and loading room was built to create inverted siphoning with lead pipes resistant to 190 m water load, to transfer the water to the acropolis at 330 m [6].

Hittite era cisterns at Hattusa and the cisterns in Corycus from the 1st century BC are significant examples. The most prominent examples of superimposed soil dams supported by stones, soil or inner stonewalls to hold upstream water between two slopes in deep and narrow gorges situated in valleys with suitable foundations can be found around near Van and Adilcevaz. Urartians constructed these dams around the 7-8th century BC. Whether carved into rock, built using stonewalls or by laying clay/stone piping, in terms of canals, Anatolia is home to some of the best examples of water-related architecture designed to bring water from springs, reservoirs or dams to the settlements. It has been found that, during the peak of their

civilization in the 15-13th century BC, Hittite cities and fortresses like Hattusa, Zincirli and Alaca had built water canals from stone blocks covered with stone slabs or clay pipes [5].

2700 years ago, Urartian King Menua commissioned the construction of the Shamiram Canal to bring water from Gurpinar to Van. Celebrated by specialists as a wonder of hydraulic engineering, this water canal was used for thousands of years. Today the canal is still partially functional however it is threatened by urban development around it. A water canal constructed along the same route by the State Water Works during the 1950s caused damage to the Shamiram canal. The Urartians left 17 inscriptions to document various parts of this historic canal [7].

Better known as the “Ferhat Waterway”, the stone-carved canal probably built in the 1st century AD by the Pontus to bring water to the city of Amasya (Amasia) is probably one of the most important of such structures. The two-storey aqueduct that brought water from Marnas (Derwent) stream 6 km away to the monumental fountain located opposite the odeon, on the south side of the agora at Ancient Ephesus, is the oldest and best-preserved aqueduct in Turkey. The waterway that runs along a 5 km long narrow valley parallel to the Aydin Highway to the east of Ephesus was constructed by Caius Sestilius Pollio between the 4th and 6th century AD. The aqueducts of Aspendos dating back to the 2nd century AD are some of the most attractive and relatively well-preserved examples [8].

Troy’s terracotta pipes, the fountain in Izmir-Bayrakli dating back to the 1st century BC, the aqueducts along Izmir’s Melez stream and connected waterways, and the terracotta pipes of Teos are other prominent examples of water related structures in Western Anatolia. It is thought that water was brought to the district of Ephesus housing the Temple of Artemis around BC 500 using lead pipes and an inverted siphon system. These pipes with an inner diameter of 8 cm and outer diameter and length of 35 cm were connected with slotted marble clamps. An example is exhibited at Selcuk Museum. Alabanda, an important Carian city stands out from other settlements in the region for its diversity in water structures, which included a five-spring collection structure, sedimentation ponds, stone section dikes, rock carved dikes, retention walls, aqueducts, system observation tower, city reservoir alongside stone pipe inverted siphons and remains of forebays. Interesting relics of water structures of the period can be found in many cities in Anatolia including the rock carved dikes of Antakya and Amasya, Ankara’s water pipes, the aqueducts of Phaselis, Anamur, Dortyol and Urfa, and the cisterns of Termessos [6].

Pool fountains with architectural significance are nympheums found in several Greek cities across Anatolia. The 2nd century BC columned city fountain of Pergamum with a 21 m long and 3.15 m wide pool; the 3rd-2nd century BC Hellenistic fountain of Ephesus with Ionic columns on the front; the 2nd century AD nympheum of Perge with a 44.86 m by 2.36 m pool, decorated with sculptures on the façade, which, according to its inscription, was dedicated to Artemis Pergaia, Septimus Severus, his wife and sons; and the 2nd century BC nympheums of Aspendos and Side reveal the most characteristic features of ancient fountains. An original example of ancient pools is the 2nd century AD Faustina Baths of Miletus decorated with statues of the river god pouring water in the pool and a lion [8].

It is not coincidental that Roman Era aqueducts like Agora and Kadifekale (Pagos) have survived intact. This is because, the Byzantines, who succeeded the Romans, used these aqueducts, the Agora and the fortress for the same purposes. A commercial space like

the Agora and the fortifications were an asset for the Byzantines as well. It would be unthinkable to destroy an important component of the infrastructure, which supplied the city with water.

The most important types of cisterns are the Byzantine cisterns of Istanbul, which date back to the 5th century AD. The Cistern of Aetius (Cukur Bostan, next to Edirnekapi) is 244 m long and 85 m wide. Today this area is a sports field that lies 18 m below surrounding ground level. The Cistern of Aspar (Cukur Bostan, next to Sultan Selim Mosque) is a square shaped pool that measures 152 m on one side. The Cistern of Aghios Mokoios III is 140 m long and 70 m wide and contains 336 columns (today's Basilica Cistern/Yerebatan) [5]. Besides long distance connections to water sources, Istanbul's first large cistern-the Binbirdirek (Philoxenos) Cistern (a 64 x 65 m area vault with 14 m interior depth supported by 234=16 x 14 columns) was constructed in the 4th century AD as an infrastructure to elevate the mansion built above it. The first of the three Dara Dams constructed near Mardin in the Justinian Era (527-565) is considered to be one of the oldest arched dams in the world. The largest of the closed cisterns in Istanbul, which by then had reached a figure of 60 and a capacity of nearly 1 million cubic meters, was the Basilica Cistern built by Justinian in the 6th century AD near St. Sophia (a 140 x 70 m area vault with 8m interior depth supported by 336 =12 x 128 columns) [6].

During the Byzantine Era, water resources in Istanbul were largely limited to springs and some waterways that could only provide for the local community. The city lacked adequate clean water sources and fountains so the rulers of the period focused on overcoming this problem. In 368 AD, Valens commissioned the construction of an aqueduct in the city that became known as the Valens Aqueduct. Theodosius I built underground waterways. In 528 AD, Justinian II repaired the Aqueduct of Hadrian that dated back to the beginning of the century. In the 7th century AD, Andronikos I Komnenos repaired the underground waterways of the city [5].

### Sagalassos Settlement and Antonine Fountain

The ancient city of Sagalassos is located in Burdur province, Aglasun District, on the southern side of the Western Taurus Mountain range, at an altitude of 1450-1700 metres [9]. It was Alexander the Great that mentioned the city for the first time. It is understood that the city experienced its golden age during the Roman Era. Sagalassos was an important pottery production center of the ancient times and most of the remains are from the Roman Era. The city prospered economically, politically and socially during the reign of Emperor Hadrian (2nd century AD, the fifth best leader of the Romans. In 2009 the city was included in the UNESCO World Heritage Temporary List for being a 1000-year-old center of pottery production and its development in terms of urban planning [10]. Since 1989, the archaeological excavations carried out under the supervision of Professor Marc Waelkens have unearthed numerous buildings and artefacts (Figure 1).

The Antonine Fountain was built between AD 161-180, during the reign of Roman Emperor Marcus Aurelius to signify the prestige of the Roman Empire. Demolished by the earthquake that occurred in AD 500, the Antonine Fountain is a striking structure built using stones of seven different colours. Being a cascading fountain, the Antonine Fountain is made of Afyon (Nicomolis) marble, which creates luminous effects. The 28-metre long and 9-metre high structure is completely decorated with symbols dedicated to the God Dionysus. The fountain was heavily damaged during the earthquake that occurred in the 6th century AD. Only Dionysus statues were recovered

unharmed. Statues from other buildings were used to decorate the niches other than the ones bearing the statues of Dionysus.

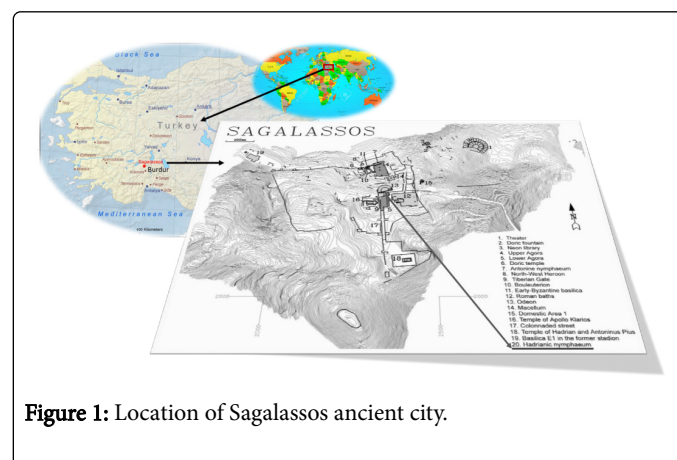


Figure 1: Location of Sagalassos ancient city.

The fountain was completely demolished after a second earthquake hit the city in AD 650. The fountain was originally constructed to add an aesthetic value the upper part of the Agora, which was also the political center of the ancient city. The monumental fountain constructed immediately in front of the existing terrace wall resembles the architecture of a theatre stage. The fountain is built using seven different stones and water fills the 81 cubic metre pool from a waterfall that cascades out a 4.5 metre high outlet in the central niche of the structure. One of the two Dionysus statues unearthed at the excavations at this location is exhibited at Burdur Museum [10] (Figure 2).



Figure 2: The Antonine Fountain, Sagalassos ancient city, Aglasun/Burdur (Original 2015).

### Conclusion

Water structures used in Anatolia have remained mostly in use in every period. Because transporting and storing water is particularly difficult, the pools/reservoirs used to store the transported water have also been used as landscaping elements or for public bathing. In later periods, access to water spread with the influence of Islam in the form of fountains constructed for the benefit of the public. "Sadirvans" (large fountains) eventually transformed into sections for the ritual ablutions at mosques.

Monumental fountains, especially like the Antonine Fountain have been popular throughout Anatolia in all periods. These fountains were built in many locations. For example, central piazzas of ancient settlements like Sagalassos, little side streets, sometimes in a village square under a plane tree or within a recreational area. Their size and decorations have changed perpetually based on local culture, the significance of the fountain, vegetation and the ruler of the period. However all fountains acted as a place for socialization besides its function of providing water to the public. Lovers would meet at fountains, new friendships would prosper; people shared their problems and exchanged some gossip. But once technology developed and water was delivered directly to our homes, places of socialization transformed parallel to a change in culture. Ultimately people feel the need to see, get together and socialize with others. For centuries architectural structures have tried to meet this human need at the same time, for example near the some water pools.

## References

1. Zulfikar C, Yoshikawa K (2008) International symposium for architect Sinan: water and architecture, Trakya University Faculty of Engineering and Architecture, Edirne pp: 237-242.
2. Booth NK (1983) Basic elements of landscape architectural design. Elsevier Science Pup Co Inc, New York.
3. Demirag D (2008) Suyula Gelen Kultur, İSKİ, İstanbul.
4. Bahaman A (2006) Landscape architecture: Water features. Loft Puplications, Barselona, Spain.
5. Onge Y (1997) Water constructions in Seljuk and Ottoman periods in Turkish Architecture, Atatürk Tarik Kurumu Printing House, Ankara.
6. Kırathılar O (1995) Development of plumbing and installation materials in Turkey, Publication of the Chamber of Mechanical Engineers, Ankara.
7. www.peyzaj.org
8. Akurgal E (1970) Ancient civilization and ruins of Turkey. Net Turistik Yayınlar San Tic, İstanbul.
9. Waelkens (2002) Romanization in the East. Istanbuler Mitteilungen, Band 52: 311-368.
10. (2010) Burdur Provincial Administration.