AN IMPORTANT MARITIME HERITAGE: LIGHTHOUSES ON THE AEGEAN COAST OF TURKEY

ÖNEMLİ BİR DENİZCİLİK KÜLTÜR MİRASI: TÜRKİYE'NİN EGE KIYILARINDAKİ DENİZ FENERLERİ

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Makale Bilgisi

Başvuru: 25 Mayıs 2018
Hakem Değerlendirmesi: 31 Mayıs 2018
Kabul: 6 Haziran 2018
DOI Numarası: 10.22520/tubaked.2018.17.008

Article Info

Received: May 25, 2018
Peer Review: May 31, 2018
Accepted: June 6, 2018
DOI Number: 10.22520/tubaked.2018.17.008

Abstract

All around the world the coasts have always been home to mankind, creating a culture surpassing boundaries and producing maritime heritage. Being surrounded by seas on three sides, Turkey owns diversified maritime heritage belonging to different historical periods. Maritime heritage has tangible and intangible values. Yet the change of contexts is a threat to these values.

Since 1920s legislation had been formed to conserve and manage maritime heritage. In Turkey decision, and planning legislation had not been integrated. Thus maritime heritage is excluded from planning, decision and management processes. There is no inventory to document the heritage or its damage. Conservation and management of maritime heritage is relatively new and still open to debate in Turkey.

Due to its location on the Mediterranean Turkish coasts had boasted with lighthouses. Today there are 459 lighthouses in Turkey. 22 of them are registered and under protection. There is no assessment for the others. Yet since 2006 lighthouses are being rented and prone to serious interventions.

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This paper discusses the maritime heritage and lighthouses in Turkey, particularly the Aegean coast. The first part covers the historical account and features of maritime heritage and lighthouses in Turkey. The second part introduces architectural, regional, social and cultural characteristics of lighthouses in Aegean Coast based on the research inventory. The problems due to the current context, condition and implementations are also presented here. In the last part, the future of lighthouses in Turkey, the Aegean Coast are discussed.

Keywords: Architectural Conservation, Lighthouse, Turkey, Aegean, Maritime Heritage, Cultural Heritage.

Özet

Tüm dünyada kıyılar yüzyıllar boyunca insanlara bir barınak sağlamış, sınırlardan bağımsız bir kültür yaratmış ve denizcilik kültür mirasını oluşturmuştur. Üç tarafı denizlerle çevrili Türkiye antik dönemden bugüne zengin bir denizcilik mirasını biriktirmiştir. Mirasa dahil olan ögeler somut ve soyut değerlere sahiptir. Ancak özgün bağlamların değişmesi bu değerler için bir tehdit kaynağıdır.

1920'lerden itibaren denizcilik kültür mirasının korunması ve yönetimi için düzenlemeler başlamıştır. Türkiye'de ise mimari koruma ve planlama yasaları bütünleşik hale gelememiştir. Böylece denizcilik kültür mirası planlama, karar alma ve yönetim sürecinden dışlanmıştır. Mirası ve tahribatını belgeleyen tamamlanmış bir envanter yoktur. Denizcilik mirasının korunması ve yönetimi Türkiye'de göreceli olarak yenidir ve halen tartışmaya açıktır.

Akdeniz'deki konumu ve deniz seyrine uygunluğu nedeniyle Türkiye kıyıları pek çok deniz fenerine sahip olmuştur. Bugün Türkiye sınırlarındaki fenerlerin sayısı 459'dur. Fenerlerden 22 tanesi tescillenerek korumaya alınmıştır. Diğerleri için kapsamlı bir değerlendirme bulunmamaktadır. Buna karşın 2006 yılından bu yana deniz fenerleri kiralanarak farklı işlevler yüklenmekte, ciddi müdahaleler görmektedir.

Bu çalışma, Türkiye denizcilik kültür mirası ve özellikle Ege kıyıları deniz fenerlerini tartışmaktadır. İlk bölüm Türkiye denizcilik kültür mirası ile deniz fenerlerinin tarihçesini ve genel kapsamını irdelemektedir. Deniz fenerlerinin mimari, bölgesel, sosyal ve kültürel özelliklerinin belirlenmesi, güncel bağlam ve uygulamalardan kaynaklanan sorunların saptanması sonraki bölümlerde ele alınmaktadır. Bildirinin son bölümünde Türkiye'nin Ege kıyıları deniz fenerlerinin geleceği tartışılmaktadır.

Anahtar Kelimeler: Mimari Koruma, Deniz Feneri, Türkiye, Ege, Denizcilik Kültür Mirası, Kültür Varlığı.

1. Introduction

All around the world the coasts have always been home to mankind throughout the centuries, creating a culture surpassing boundaries and producing maritime heritage. Today, the original natural, physical, social, cultural and economical context of maritime heritage is hugely modified by natural and human induced factors. As the land is modified through geological processes, the water level varies dramatically due to climatic changes and the original natural contexts of maritime heritage have been transformed. Human activities like urbanization, tourism, agriculture, energy production, industry, transportation and infrastructure are reflected as changes in the physical and economical context of the maritime heritage. In addition to all, due to technological progress most of the maritime heritage, including the lighthouses, become redundant, which lead to functional and social changes and even to their destruction. Thus, maritime heritage had been and still is threatened by a combination of natural and human caused problems today. As an integral part of maritime heritage, lighthouses face similar problems. They are going through a transformation process that cause a loss of their various tangible and intangible values.

2. Maritime Heritage and Lighthouses in Turkey, a Common History

Maritime heritage focuses on the tangible and intangible aspects of human activity at/ by the sea. It covers the people and communities that built ships, shipped goods, sailed ships, kept lights, rescued wrecks, fished waters, and kept the sea lanes open; the use of waterways for commerce, transportation, defense, and recreation in addition to the traditions and skills, arts and crafts, artifacts and documents, and buildings, structures, and vessels that reflect past maritime endeavors. (NPS of USA 2013) Thus, maritime heritage includes not only physical resources such as historic shipwrecks and prehistoric archaeological sites, but also archival documents, oral histories, and the stories of indigenous cultures that have lived and used the oceans/ seas for centuries. (NOAA 2013) The tangible part of maritime heritage involves immovable (mainly architectural) features likes harbours, ports, warehouses, shipyards, docks, fisheries, lighthouses and salvage buildings spread around the coasts as well as movable features like ships, submarines, other vessels and items located underwater. Traditional fishing, marine cuisine, ship building crafts, maritime building crafts and lighthouse keeping constitute the intangible part of maritime heritage.

Being surrounded with seas on three sides, Turkey owns a diversified maritime heritage belonging to different historical periods. Both as the outcomes and the indicators of the changing networks and relations in/ between land and sea in time, the maritime heritage sites can be considered as cultural habitats at the interface of landscape and seascape comprising various tangible and intangible values in different scales.

Regarding the geography, as the mountains lie parallel to the Black Sea and the Mediterranean, these coasts are wide and relatively smooth. In the Aegean region the mountains lie perpendicular to the sea resulting in a rugged coastline. Thus, the distribution of lighthouses differ regarding the regions. The Black Sea and Mediterranean lighthouses are mostly located on main land whereas the Aegean lighthouses are mainly on islands, islets or rocky patches.

The rugged nature of the Aegean coast, its opening onto the Mediterranean and the Dardanelle Strait had caused many ships to sink over a time span of more than 3000 years. Starting with Kaş Uluburun shipwreck from 1200 BC all the way to WWII ships and submarines as well as more recent wrecks, the Aegean is full of underwater maritime heritage[1]. The Mediterranean is a maritime network which had connected the coastal civilizations to each other for centuries. These maritime affairs had been exposed to accidents or wars from time to time and solid evidence had been buried underwater.

The developed road network of antiquity, mainly during the Roman Period, was initially started by the so called "Persian Royal Road" of 5th century BC. (Bektaş, 1999) This network grew through the Hellenistic Period following the topography of Anatolia.

The Roman network invented new ways to tackle the challenges of the topography and eventually gave access to important harbour cities on the coast. (Pelagios 2014) Maritime navigation gained speed and reached out further into the world. All the ancient lighthouses of Turkey on the map; namely Heraklia Pontika, Nara?, Patara, Soli Pompeiopolis and Aigai, lie within or nearby important harbours of this period. It must be noted that having a

[1] Pelagios: Enable Linked Ancient Geodata In Open Systems Project Web Site, accessed on 05.01.2014, http://pelagios.dme.ait.ac.at/maps/greco-roman/. Interactive Web Map of Digital Atlas of Roman and Medieval Civilizations (IW-MODAORAMC), accessed on 01.12.2014, http://darmc.harvard.edu/icb/icb.do?keyword=k40248&pageid=icb.page188868. The map is first published on 2007 but continously updated. Google Maps, accessed on 05.01.2014, https://www.google.com/maps. Institute of Nautical Archaeology Web Site, http://nauticalarch.org/projects, accessed on 01.06.2014; M. Aydemir. Ben Bir Türk Zabitiyim. (2004).

lighthouse was a rare priviledge given to a city during the Roman Period. The locations of these lighthouses are still critical for contemporary maritime navigation. Thus, along with their ancient companions, 19th century or 20th century lighthouses still stand in the vicinity.

During the early medieval period, the roads in Anatolia and maritime routes around would be used by different powers as Crusaders, Byzantine state and Anatolian Seljukids. The maritime routes in the Aegean and Marmara were controlled by the Byzantine and Crusader navies. Seljukids had set up a well established caravan road in Anatolia enhanced by the existence of caravanserais. (Bektaş, 1999) Alanya was the maritime arsenal and an important harbour of the Seljukid state. It is possible that the fortress had some sort of lighthouse or at least a beacon during 12th-14th century. (Alanya Fortress still has a contemporary lighthouse) (Merçil, 2009).

Other states or principalities of the period were controlling north of Aegean around Gelibolu and Behramkale. These states would also reach Ayasuluk in İzmir. (Merçil, 2009).

As early as the 8th century, the Mediterranean, the Aegean, Marmara and the Black Sea were started to be used by the Genoese and Venetian states. Until 14th century these states kept on developing their maritime power. They established bases in several Aegean islands, mainland Greece, western Anatolia, İstanbul, Samsun, Trabzon and had even set up colonies as north as Odessa and Crimea in Black Sea. The Venetian (WikiVenice, 2014) or Genoese (WikiGenoese, 2014) routes usually followed the ancient maritime routes at first. In time these states opened the way to knowing the Mediterranean more, thus longer routes were taken on by the seafarers.

The conquest of Istanbul in 1453 had changed the balance in the seas and the Ottoman State became the ruler of the Mediterranean along with the smaller neighbouring seas. The inherited road network of the Seljukid state was further enhanced by the menzils. 3 seperate road networks connected the capital to the further regions of the empire all the way from the west to the east. This road network had a military, commercial and correspondence purpose as well as a religious aim as it had carried the pilgrims to sacred lands, too.(Aktüre 1994) The Ottoman state had established several maritime arsenals as İstanbul Main Imperial Arsenal/ Tersane-i Amire, Gallipoli, Sinop, Izmit, Suez, Birecik, Samsun and Kefken. (Bostan, 2009) There were also smaller ship-building yards as Varna, Ahyolu, İneada, Trabzon, Semendire, Niğbolu, Mohaç, Budin, Sakarya, Kemer, Silivri, Biga, Samanli, İstanköy, İnebahtı, Preveze, Avlonya, Nova, Antalya and Alanya. Surprisingly, there were no lighthouses constructed in 15th or 16th century. The Ottomans would travel the seas with the local watchmen. Fenerbahçe (Ay, 2000: 123) lighthouse in Istanbul was constructed as late as 1562. The Maiden Tower[2] was also one of the few exceptions to early lighthouses. Attested by the written and visual documents, Rumeli (before 1567), Anadolu (before 1648) and Ahırkapı (1755) were among the earliest Ottoman lighthouses, too. (Kömürcüyan, 1952). Several harbours supported the maritime power of the Ottoman State, selling the local goods to the rest of the world and bringing in needed supplies to the empire. The coastal fortresses, some established as early as the Hellenistic period, in between these harbour cities would ensure the maritime security. Most probably, their lights at night and troubled times have provided the means for safe navigation when needed. (Cesur, 2009: 105)

Until the Crimean War the Ottoman Empire did not feel the need for the construction of lighthouses. In 1855 by the priviledge given to French, led by Michel Marius, "Fenerler İdaresi" (Lighthouse Administration) was established and lighthouses was spread all around the Empire coasts from Black Sea to Red Sea. (Toroslu, 2008: 20) In 45 years, 225 lighthouses were built.

Until 1937 January 1st, The French "Fenerler İdaresi" was controlled by the law of 3302. At that time it was bought and nationalized and was handed over to the newly established General Directorate of Denizbank. In 1940, February 1st, the "Fenerler İdaresi" was passed onto "Devlet Denizyolları ve Liman İşletmeleri Umum Müdürlüğü". And finally in 1952, March 1st, with the law of 5842 it started operating within Denizbank, under the name "Kıyı Emniyeti İşletmesi Müdürlüğü". In 17.06.1982, with the law of 1680, Denizbank was named as Türkiye Denizcilik Kurumu (TÜDEK). "Türkiye Denizcilik Kurumu" was changed as Türkiye Denizcilik İşletmeleri (T.D.İ.) on 08.06.1984, with law of 233, under "Kıyı Emniyeti İşletmesi". In 1997, by the 9466 numbered decision of the government, the association was declared independent as a public directorate "Kıyı Emniyeti ve Gemi Kurtarma İşletmeleri Genel Müdürlüğü" On 07.02.2007, its name was changed as "Kıyı Emniyeti Genel Müdürlügü" (KEGM), the General Directorate of Coastal Safety. (KEGM, 2017)

After 1937, the maintenance and repair of all the lighthouses had been carried by the above mentioned associations. The collapsed lighthouses had also been

[2] Maiden Tower was originally a Byzantine customs building and it was rebuilt after the conquest of İstanbul in 1453 by the order of Fatih. M. S. Türkhan, "XVIII. Yüzyılda Kız Kulesi", Üsküdar Sempozyumu V – 1-5 Kasım 2007 Bildiriler c. I İstanbul (2008) 653-664.

Figure 1. Maritime Heritage of Turkey, the relationship of coasts with maritime routes and inland roads. Yellow stars represent lighthouses within our research, (Başağaç 2012) and (Başağaç 2018: 110). / *Türkiye Denizcilik Kültür Mirası, kıyıların denizcilik rotaları ve kara yolları ile ilişkisi. Sarı yıldızlar araştırmamız kapsamındaki deniz fenerlerini temsil etmektedir. (Başağaç 2012) ve (Başağaç 2018: 110).*

replaced with the new ones by the control of these governmental bodies. A second wave of lighthouse construction coincided before and after the outbreak of the WWII. Today there are 459 lighthouses on Turkish coasts. (KEGM, 2017)

Constituting a big part of maritime heritage, the traditional fishing villages slowly turned into a more professional fishing industry in centuries. Several fishing shelters were built along the coasts to accommodate fishermen. New lighthouses were introduced to these shelters as well. (SÜHDB, 2004)

In the Black Sea region, fishing has always been an important income source and an integral part of traditional life. It might be argued that the whole coast is utilized by the fishing industry, both in urban and rural areas, looking at the density of fishing shelters located along the Black Sea coast. For the Aegean and Mediterranean coast, fishing takes up a considerable amount of space both on the coast and in open seas but in terms of income, it follows tourism. Thus, most former fishing villages have slowly morphed into mass tourism centers.

Several maritime museums reflecting Turkish maritime culture had been founded in 20th century. These museums are either privately owned or run by the navy.

As discussed above, the tangible part of maritime heritage in Turkey involves architectural features like ancient harbours and ports from Hellenistic and Roman periods, maritime arsenals of Seljukid and Ottoman period, docks, fisheries, fishing villages, coastal fortresses, lighthouses both ancient and from closer centuries, salvage buildings, ferry stations (Sert 2014), public and private maritime museums, marine parks (TDAV, 2014) as well as movable features like ships from all periods even from a millenium ago, submarines, wrecks, other vessels and items associated with them, located underwater. In addition to this tangible heritage we might add the intangible part of maritime heritage as fishing traditions, crafts related to ship building, lighthouse keeping, oral and written maritime literature, folk songs on maritime affairs and visual artworks using maritime themes.

3. Lighthouses of Turkey and their Architectural Characteristics: The Case of Aegean Coast

Due to its important position in the Mediterranean and availability to seafaring, Turkish coasts had hosted a lot of lighthouses since antiquity.

Pharalogy[3] defines a lighthouse as a fully or partially enclosed built structure bearing a light that is used as a navigational aid and that is capable of admitting at least one person to operate or maintain the light entirely from within. Thus lighthouses are different from lightstructures; any built structure bearing a light that is used as a navigational aid but is not capable of admitting one person to operate or maintain it entirely from within; or beacons; any artifact, built or floating, visible or recognisable from a distance, whether by land or sea, that is specifically intended to provide a signal or warning for any purpose not exclusive to navigation.(Pharology, 2012)

Today there are 459 lighthouses along the Turkish coasts owned by the General Directorate of Coastal Safety (Kıyı Emniyeti Genel Müdürlüğü). (KEGM, 2017) But this number includes all structures of lighthouses, light structures and beacons. Regarding Pharology definition, there are 21 lighthouses in the Black Sea Region, 21 lighthouses in the Aegean, 9 in the Mediterranean, 12 in the Marmara. Bosphorus / Istanbul region has 16 and Dardanelles has 18 lighthouses. 6 of the 102 lighthouses are ancient[4].

Out of 102 lighthouses only 22 are registered lighthouses depending on the law of 2863 for the protection of cultural and natural assets. (KEGM, 2017) There is not a comprehensive inventory or assessment for the other lighthouses. Despite the lack of a thorough assessment since 2006 lighthouses had been rented out and repurposed. This condition had given way to serious interventions on the lighthouses. Moreover, the structures are excluded from regional planning processes while being treated as singular buildings.

102 lighthouses are examined in our initial research. Problems are defined regarding their contexts and individual structures. According to the registry of KEGM there are 54 lighthouses with a keeper's residence. However, the actual number is much more as the KEGM list only counts the healthy/ standing residences. Yet, there are many keeper's residence remains in other

[3] Pharology is the study of lighthouses, The word 'pharology' is derived from pharos, the Greek word for lighthouse, http://www.pharology.eu/AncientLighthouses.html, accessed on 29.10.2012. The essays are preparedby Dr. Ken Trethewey using Trethewey, K R and M Forand: "The Lighthouse Encyclopaedia", CD-ROM, 2003, sixth edition, Lighthouse Society of Great Britain, Torpoint, Cornwall, UK. Lighthouses are called "phare" in French, "leuchtturm" in German, "faro" in Italian and Spanish, http://www.langtolang.com/, accessed on 29.10.2012.

[4] Adana Aigai, Mersin Soli Pompeiopolis, Antalya Patara, Datça Knidos, Çanakkale Abydos, Zonguldak Karadeniz Ereğli Heraklia Pontika lighthouses.

lighthouses as well. Regarding this early documentation phase a smaller study area is defined to be evaluated in greater detail through onsite surveys. The Aegean Coast, starting from the east of Dardanelle Strait in Çanakkale, following Gökçeada and Bozcaada respectively to the south, then Balıkesir, İzmir and Aydın in the middle and ending with Muğla, to the east of this city; has been chosen as the boundary of this study area. However, research constraints had obliged to exclude Muğla from this initial list. Thus, Çanakkale- Aydın study area contains 29 lighthouses in total.

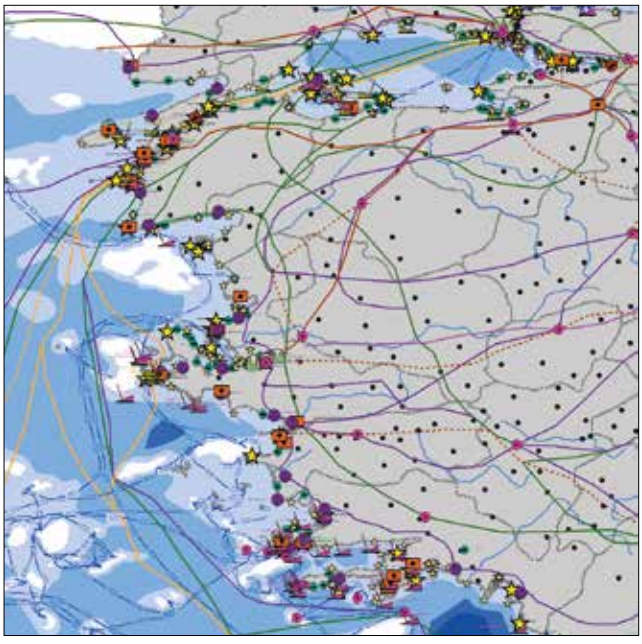

Figure 2. Maritime Heritage of Turkey, the Aegean Coast. Yellow stars represent lighthouses within our research, (Başağaç 2012) and (Başağaç 2018: 110). / *Türkiye Denizcilik Kültür Mirası, Ege Kıyısı. Sarı yıldızlar araştırmamız kapsamındaki deniz fenerlerini temsil etmektedir. (Başağaç 2012) ve (Başağaç 2018: 110).*

The main physical documentation of the lighthouses was focused on 1/100 scale survey drawings. This scale was enough to cover the basic dimensions and characteristics of the lighthouses and accompanying buildings as well as to represent the spatial relationships on a site level. The measurements were done with a reflectorless total station. Where the surveying conditions were inappropriate or time was limited, manual measurements with steel tapes were preferred. Further information about the details was collected through digital photos and video footage. The documentation was supported with physical survey sheets for verifying site characteristics, exterior and interior properties of single buildings, as well. The rate of data to be gathered was adjusted over the course of each site visit.

For the documentation of lighthouse keeping and the life at the lighthouses, a social survey sheet was prepared. This sheet was used to make a structured interview with the lighthouse keepers or technicians.

There are 6 ancient lighthouses within the broader research area. These are, Adana Aigai (3rd cent. AD), Mersin Soli Pompeiopolis (2nd cent. AD), Antalya Patara (64-65 AD), Muğla Datça Knidos, Çanakkale Abydos (222 AD), Zonguldak Karadeniz Ereğli Heraklia Pontika (2nd cent. AD- built before 189) lighthouses. Patara and Heraklia Pontika lighthouses have survived partially with their upper structures until today. The others are only in remains, few traces of foundations are observed or none. These are known through the ancient coins bearing their images.(Özkan, 2009) Patara lighthouse is composed of two parts: a rectangular prismatic pedestal of 20mx20m dimensions with a cylindrical light tower on top of 6m diameter and 5.5m conserved height. (Özkut, 2010:78-80). The light tower contains a cylindirical nucleus. Between the outer skin and this nucleus lies a masonry staircase. (Özkut, 2009: 25) Heraklia Pontika lighthouse is portrayed as 3 storeys on a Geta (198-209) coin and as 6 storeys on a Gallien (253-268) coin. (Özkan, 2009: 57) The existing remain today is a 3.25x3.5x10m rectangular prismatic pedestal with a door opening and masonry stairs leading up. The light tower where the fire had been lit had totally collapsed in time and is not visible today. (Özkan, 2009: 57-58)

The location of the lighthouses differ as on the peninsula- same level with the sea, on the peninsula- above the sea, distanced from the sea as the topography had changed, on a high hill overlooking the sea, on a sloping ground starting from the sea coast, on an island/ islet, within the bay- same level with the sea and on the mole. Aegean lighthouses are mostly on islands, islets and rock patches because of the rugged nature of the Aegean coast. Few examples lie on main land. Thus, the majority of accessibility is through the sea with or without sea quays. For mainland examples almost all have pathways instead of paved roads.

19. century lighthouses are actually building complexes composed of light towers, keeper's residence and service buildings. Situated away from settlements, usually in inaccessible sites they are designed to be self sustainable. In general the keeper's residence is located next or close to the light tower. The service spaces usually have different purposes like well, cistern, rocket house, boat house, depot, toilet, chicken coop, oven. The lighthouse complex is accessed through a courtyard or garden. The lighthouses without a residence is managed and operated by a keeper residing in another lighthouse in the vicinity.

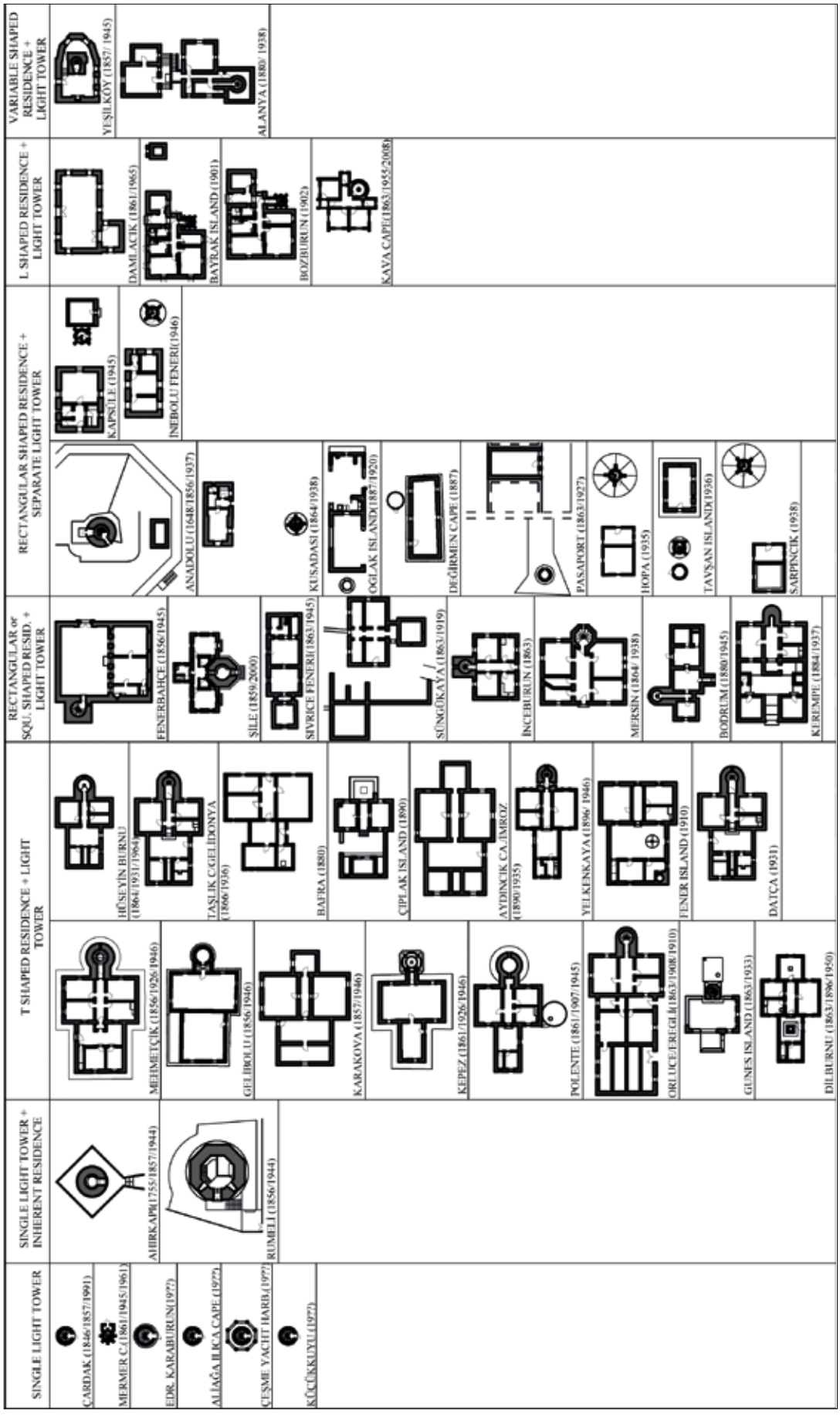

Figure 3. Plan typology of lighthouses, (Başağaç 2018). / *Deniz fenerleri plan tipolojisi (Başağaç 2018).*

Figure 4. Çardak Lighthouse in Gelibolu, Çanakkale is a single tower lighthouse without a keeper's residence, (Başağaç 2012). / *Çanakkale Gelibolu'da yer alan Çardak Deniz Feneri, bakıcı konutu olmayan tek kuleli deniz fenerlerinin bir örneğidir. (Başağaç 2012).*

Our plan typology has 7 different groups. Olcay Yerlikaya (Yerlikaya, 2011: 42) and Elif Özlem Aydın (Aydın, 2015: 30) discuss the typology of the lighthouses only assessing the ones with a keeper's residence, suggesting 5 groups. The typology is based on a list of already available survey drawings from KEGM of 24 lighthouses with keeper's residence. Yerlikaya enhances this initial analysis with self studied surveys of 5 lighthouses in İzmit Bay. The overall typology has 21 plans of different lighthouses. As stated above, KEGM only lists 54 lighthouses with a keeper's residence as these are the healthy buildings which have been used until recently. In our research, we have identified several other keeper's residences still intact and standing or in partial remains which were not included in the current list of KEGM. The number of newly identified lighthouses with a keeper's residence is 10[5]. However, regarding the pharalogy definition, lighthouses merely composed of light towers that are operated with at least one person from within are also included in our typology. Though not very common in our country, there are also few examples where keeper's residence is nestled inside the light tower,

[5] These are Karakova, Aydıncık Cape, Damlacık/ Gadaro Island, Güneş Island, Çıplak Island, Oğlak Island, Değirmen Cape, Pasaport, Süngükaya, Bayrak Island Lighthouses.

Figure 5. On the western tip of Dardanelle Strait in Çanakkale, a landmark between Marmara and Aegean, Mehmetçik (Hellespont) Lighthouse with a T shaped keeper's residence and 25m high light tower, (Başağaç 2012) and (Başağaç 2018: 113). / *Çanakkale Boğazı'nın batı ucunda, 25m yüksekliğindeki ışık kulesi ile Marmara ve Ege arasında bir sembol niteliğindeki Mehmetçik (Hellespont) Deniz Feneri, T planlı bakıcı konutu olan deniz fenerlerinin bir örneğidir. (Başağaç 2012) ve (Başağaç 2018: 113).*

Figure 6. Sivrice Lighthouse in Ayvacık, Çanakkale had a light tower within the keeper's residence until 1945. Today it has an independent concrete light tower, (Başağaç 2012). / *Çanakkale Ayvacık'ta bulunan Sivrice Deniz Feneri'nde ışık kulesi 1945 yılına kadar bakıcı konutu içerisinde yer almıştır. Bugün ise bağımsız beton bir ışık kulesi bulunmaktadır. (Başağaç 2012).*

such as Rumeli and Ahırkapı Lighthouses in İstanbul (Ay, 2000). Our research is enhanced by the onsite surveys, the studies of Reyhan Ay (Ay, 2000) and information gathered from KEGM resources. Thus, our typology has 7 groups assessing 48 lighthouses in total. These are (1) single light tower without a keeper's residence, (2) single light tower with inherent keeper's residence (3) T shaped keeper's residence and adjacent light tower, (4) rectangular or square shaped keeper's residence and adjacent light tower, (5) rectangular or square shaped keeper's residence and independent light tower, (6) L shaped keeper's residence and adjacent light tower, (7) variable shaped keeper's residence and adjacent light tower.

Figure 7. Oğlak Island Lighthouse in Foça, İzmir is a building complex with two large residences, a separate light tower and it is the only man made structure on an island which has turned into a cultural landscape, (Başağaç 2012) and (Başağaç 2018: 114). / *İzmir Foça'da yer alan Oğlak Adası Deniz Feneri geniş, iki adet bakıcı konutu ve bağımsız bir ışık kulesi ile bir yapılar grubudur. Oğlak Adası'nda inşa edilmiş tek yapı grubu olarak bugün bir kültür peyzajına dönüşmüştür. (Başağaç 2012) ve (Başağaç 2018: 114).*

Single light tower without a keeper's residence group is mainly composed of reinforced concrete cylindirical structures. 5 lighthouses[6] are basic cylinders and only one is a buttressed cylinder. All structures are accessed by a single door leading to steps which end in the light balcony. This group had developed during 1940s and it is stil being widely used as the structures are compact and easy to construct.

Two examples exist for single light towers with inherent keeper's residences: Ahırkapı (built in 1755 and rebuilt in 1857) and Rumeli (1856) Lighthouses of İstanbul. Both lighthouses have several storeys with a central space flanked by stairs. The walls and stairs are made of masonry whereas the floors are timber.

The most variety is observed in T shaped keeper's residence and light tower group with 16 lighthouses[7]. The earliest of this plan type is from 1856 and latest from 1931. T plan has living quarters and wet spaces in the T of the residence where the light tower is located towards the top of the T. Mehmetçik (Hellespont) and Bozcaada Polente Lighthouses are in this group. There are also some T plan examples where the lighthouse is situated in a courtyard, like Fener adası and Dilburnu (Yerlikaya, 2011: 42).

Square or rectangular shaped keeper's residence group has 8 lighthouses[8]. The earlieast example is from 1856 and latest from 1884. The examples of this group have living quarters and wet spaces arranged along a hall. At the end of the hall the light tower is attached.

Figure 8. Bayrak Island Lighthouse in Kuşadası Aydın is an example to L shaped residence with a light tower in the middle. This lighthouse is the only man made structure on this island and Turkey's westernmost land against Greek Samos Island, (Başağaç 2012). / *Aydın Kuşadası'nda yer alan Bayrak Adası Deniz Feneri, L planlı bakıcı konutu olan deniz fenerlerinin bir örneğidir. Yunanistan'ın Samos Adası'na karşı Türkiye'nin en batıdaki toprağı olan bu adada inşa edilmiş yegane ögeler, bu deniz fenerini oluşturan yapılardır. (Başağaç 2012).*

Square or rectangular shaped keeper's residence with an independent light tower group has 10 lighthouses[9]. The earliest example is from 1856 and the latest from 1946. These are usually simpler compared to the other groups. The entrance is through the middle axis of the building. There is a wet space and another room which is used for living and sleeping. The cylindirical or conical light tower is situated a few meters away from the residence. In the examples built between 1856-1935 the towers are either masonry or iron/ steel. The examples built after 1935 all have concrete light towers.

L shaped keeper's residence and light tower group has 4 lighthouses[10]. The earliest example dates from 1861 and the latest example was built in 2008. This group has

[6] Çardak, Edremit Karaburun, Aliağa Ilıca Cape, Çeşme Yacht Harbour, Çanakkale Küçükkuyu.

[7] These are namely Mehmetçik, Gelibolu, Karakova, Kepez, Polente, Örlüce, Güneş Island, Dilburnu, Hüseyin Burnu, Taşlık Cape, Bafra, Çıplak Island, Aydıncık Cape, Yelkenkaya, Fener Island, Datça Lighthouses.

[8] Fenerbahçe, Şile, Sivrice, Süngükaya, İnceburun, Mersin, Bodrum, Kerempe Lighthouses.

[9] Anadolu, Kuşadası, Oğlak Island, Değirmen Cape, Pasaport, Hopa, Tavşan Island, Sarpıncık, Kapsüle, İnebolu Lighthouses.

[10] Damlacık, Bayrak Island, Bozburun, Kava Cape Lighthouses.

the entrance close to the corner. Wet spaces, living and sleeping quarters are situated within the L whereas the tower is situated in the inner corner.

The variable shaped keeper's residence and light tower group has 2 lighthouses; Alanya Fortress and Yeşilköy. This group has wet spaces and living/sleeping quarters dispersed irregularly within the building. The light towers are attached to the residence or designed directly in the residence floor.

A great majority of keeper's residences are single storey. But there are few two storeys examples like Sarpıncık Lighthouse in İzmir where the residence has two storeys due to the topography of the site, Pasaport Lighthouse in İzmir which acted like a center for İzmir lighthouses in general and Yeşilköy Lighthouse in İstanbul. In terms of facade design; T plan, square/rectangular plan and rectangular plan residences show similar characteristics. The facades facing the sea which usually bear the light tower are designed symmetrically. Light towers of varying structural systems that stand in the middle axis divide the facade into two equal parts. The living and sleeping quarters directly behind the light tower have symmetrically placed windows on two sides of the tower. The same symmetry is usually found on facades facing the main land. Wet spaces are situated in the middle of these facades and the windows of the living/ sleeping quarters are placed symmetrically on both sides. The side facades are usually blind, the only opening is the entrance door on the entrance facade. L shaped and variable shaped types usually have the light tower on the sea facade. The other facades are different and mostly asymmetrical.

The design of lighthouses pay little attention to site characteristics. Thus, the same plan type may be observed in furthest two points in Turkey. For example İzmir Sarpıncık Lighthouse has the same plan with Artvin Hopa. Yalova Bozburun Lighthouse is identical to Aydın Bayrak Island. Single light towers of concrete were mainly developed during 1940s and onwards. Whereas the single light towers with inherent keeper's residences were built much earlier in İstanbul during 1755 and 1856. These are found only in the capital of the Empire. The other plan types had developed in mid 1850s and were mostly used until mid 1940s.

Figure 9. Sarpıncık Lighthouse in İzmir is a rare example of the lighthouses with a two-storey keeper's residence, (Başağaç 2012). / *İzmir Karaburun'da yer alan Sarpıncık Deniz Feneri, iki katlı bakıcı konutuna sahip nadir deniz fenerlerinden biridir. (Başağaç 2012).*

Figure 10. Çanakkale Kepez Lighthouse, with an iron light tower, (Başağaç 2012) and (Başağaç 2018: 111). / *Çanakkale Kepez Deniz Feneri, demir bir ışık kulesine sahiptir. (Başağaç 2012) ve (Başağaç 2018: 111).*

19. century light towers were rubble stone, occasionally cut stone and brick masonry with lime mortar. The majority of masonry towers were cylindirical though rectangular plan masonry towers also existed like Süngükaya / Paspariko Lighthouse in İzmir. The light room situated at the top was covered with a small, iron dome. There were also iron or steel light towers in the 19. century. The metal towers were constructed as skeleton frames or whole posts. From early 1900s onwards concrete towers emerged. These were either cylindirical or conical. Conical towers were usually buttressed. Adana Karataş Lighthouse tower was built as a rectangular prism in 1950. (Demirel, 2011)

A similar situation is seen in the keeper's residence and service buildings. They were generally stone/brick masonry buildings. The jambs were either cut stone or brick. The walls were finished with lime plaster. Stone mouldings or brick eaves connected the walls with roofs. All the buildings had sloping timber roofs and tiles except the light towers. The interiors were plastered with lime. *Yüklük* (a deep closet to keep mattresses and quilts), niches, cupboards, closets, dish shelves, fireplaces are the frequently used architectural elements. Room floors and ceilings were made of timber. Circulation and wet spaces were covered with *carro di cement* tiles.

4. Problems of Lighthouses on the Aegean Coast of Turkey

From the time of their construction until present the lighthouses had undergone several modifications due to particular reasons. The main reason of change in the relationship of maritime heritage and lighthouses had been the transformation of context. The problems that emerged in the coasts and maritime heritage had reflected upon the single buildings themselves. On the single building scale the major impact came from the advancement of technology. The equipment that provided the optical service of the lighthouse and the energy needed to fuel this service had defined the extent of the modifications. Starting from wood and coal the fuels had evolved into animal oils, gasoline and natural gas. Then natural gas was replaced by petroleum gas and propan finally giving way to acetilene. After 1850s electricity was slowly introduced to the lighthouses and new adjustments were done. But the lighthouses in remote locations or rugged terrains had to survive on acetilene until late 1960s. Recently, as of 2014, all the energy systems of the lighthouses in Turkey had been changed into solar power. As the light sources had been turned into centrally operated systems the need to have light keepers on site had disappeared. The structures left without the keepers quickly weathered and some fell into ruins.

1. Problems Related to Legislation

The related national laws can be discussed in two groups, the initial group pertaining to the conservation of cultural heritage and the second about the management of coastal environments, which houses maritime heritage and lighthouses in particular. Being a member state of the United Nations and ICOMOS and having taken part in several Council of Europe meetings, Turkey had been signatory to a great majority of the international documents about maritime heritage. This means there is a huge background regarding international legislation towards the conservation of cultural heritage, and maritime heritage in particular. Yet, in practice Turkey operates on a number of laws in order to plan, develop and protect coastal areas as well as conserving and protecting maritime heritage.

Since the Ottoman Period the coastal areas were defined as the State Property. And use of the coasts were always for public good. Management of Coastal Areas emerged as a concern around 1980s. Both through 5 Year Development Plans and legislation the coasts have been used in favour of tourism and construction sectors since 1960s. The public use is dismissed in favour of private sector benefits.

The lack of integration between conservation and planning legislation prevented inclusion of maritime heritage in coastal planning, decision and management processes. The only tool for the conservation of lighthouses is Act No 2863. Yet, only registered lighthouses may benefit from this Act. There is no completed inventory or assessment regarding maritime heritage and specifically lighthouses. The impact of increasing coastal tourism, construction, industry and other urbanization activities on maritime heritage is not specified[11]. In other words, conservation and management of maritime heritage and particularly lighthouses are still relatively new and open to debate in Turkey.

2. Problems Related to Use and Management

The first problem related to the conservation and management of maritime heritage is the lack of a completed registry. The content of maritime heritage in

[11] Regarding the academic studies about the conservation of lighthouses we can mention only 2 master thesis in Turkey: Ay, Reyhan, "İstanbul Boğazındaki Deniz Fenerleri ve Tahlisiye Yapılarının Koruma ve Değerlendirilmesi (Discussion About the Usage of İstanbul Bosphorus's Lighthouses and Restoration of Salvage buildings)", 2000, Yıldız Technical University, Department of Architecture and Yerlikaya, Olcay,"İzmit Körfezi'ndeki Tarihi Deniz Fenerlerinin Mimari Analizi ve Koruma Önerileri (Architectural Analyses of the Historical Lighthouses in Izmit Bay and Conservation Suggestions)", 2011, Gebze Higher Institute of Technology, Department of Architecture.

Turkey is indefinite regarding many aspects. Thus, the registration status or the potential of heritage that has to be defined is yet unknown or insufficient.

The inventory of lighthouses and salvage buildings from an architectural, economical and social point of view is not complete. Thus, the number of registered structures is not enough and these few do not represent the true content of maritime heritage in Turkey. Moreover, the fate of registered lighthouses and the ones restored or rented so far is left to the Ministry of Culture. These structures have been restored without the inclusion of locals, local administration or visitors or any interested parties. The projects are treated as individual single structures/ building lots without paying attention to the integrity of the planning processes, user needs, accessibility and most important of all sustainability.

Figure 11. Foça Değirmen Burnu Lighthouse in İzmir had been rented as a disco/bar, except the light tower that operates as a navigational aid. The result is the ghost of a former cultural heritage which is wrapped in new construction three times its original size, (Başağaç 2012) and (Başağaç 2018: 114). / *İzmir Foça'da yer alan Değirmen Burnu Deniz Feneri, halen seyir yardımcısı olarak işleyen ışık kulesi haricinde, kiralanarak bir disko/ bara dönüştürülmüştür. Bu süreçte özgün boyutlarının üç katı büyüklüğünde yeni imalat ile çevrelenmiştir. Böylece bir kültür varlığının hayaleti haline gelmiştir. (Başağaç 2012) ve (Başağaç 2018: 114).*

3. Problems Related with the Context:

Change on the physical context was triggered by natural (global warming & sea level rise, land erosion or coastal erosion, eathquakes, big tides, flood, deforestation) and human induced (construction of coastal structures, tourism, transportation, energy, industry, urbanization) reasons. Change on the social context was accelerated by the departure of lighthouse keepers, lack of general maintenance, increase/ decrease of the number of users.

Figure 12. The original physical-social context of Bozcaada Polente Lighthouse first as a vineyard house, then as a wind power station had totally changed, (Başağaç 2012) and (Başağaç 2018: 111). / *Bozcaada Polente Deniz Feneri bir bağ evi niteliğinde iken bulunduğu alan rüzgar enerji santraline dönüştürülmüştür. Böylece özgün fiziksel ve sosyal bağlamı tamamen değişmiştir. (Başağaç 2012) ve (Başağaç 2018: 111).*

4. Problems in Building Lot Scale:

The building changes range from minor addition of technological devices to extensive reconstructions. From the slightest to most serious; change/ alteration of the periphery boundary (enclosure wall, fence, landscaping etc), construction of annexes, addition of new buildings, alteration of open/ closed space relationship, partial reconstruction and total reconstruction.

Figure 13. Aydın Güvercinada Lighthouse which had been knocked down twice due to storms and partially had been reconstructed, (Başağaç 2012) and (Başağaç 2018: 112). / *Aydın Güvercinada Deniz Feneri'nin ışık kulesi fırtınalar yüzünden iki kez yıkılmış ve kısmen yeniden inşa edilmiştir. (Başağaç 2012) ve (Başağaç 2018: 112).*

5. Problems in the Single Building Scale:

These problems can be discussed in two groups as problems related to the building exterior and interior. Problems related to the building exterior are, from the slightest to most serious, alteration of exterior facade finishing material, alteration of door/window/opening material and detail, alteration of door/window/opening size, addition/ removal of architectural elements on the facades (balcony, chimney, eaves, solar power panels etc…), closing of doors/ windows/ openings, alteration of facade construction system, alteration of roof construction system.

Problems related to the building interior are alteration of interior facade finishing material, alteration of door/ window/opening material and detail, alteration of door/ window/opening size, addition/ removal of architectural elements (cupboards, closets, etc …), alteration of the construction system of floor/ ceiling, alteration of the construction system of walls, division of the space with new structural elements, partial or total removal of walls/ structural elements.

When problems related to the overall material and structural system condition of the building(s) and degree of damage are evaluated we see partial material decay, material decay, material decay and partial structural deformation, material decay and structural deformation and ruined.

6. Problems Related to Lighthouse Keeping:

Evacuation of buildings, the departure of lighthouse keepers, the delayed on site interventions and the interruption of the transfer of knowhow in traditional keeping from father to son are the major sources. The social bond of lighthouse keepers with their close environment is lost. In many regions the lighthouses had been the pioneers for the introduction of latest technology, in a sense the keepers had acted as teachers in the enlightment of the locals. The end of permanent occupancy and daily life on the lighthouses had created losses in collective memory.

5. Concluding Remarks: the Future of the Lighthouses in Turkey

Evaluation and conservation of lighthouses can not be confined to only the lighthouse structures themselves. In order to understand the meaning and importance of lighthouses one has to interpret the complex relationships between lighthouses, their close (sites) and distant (regions) environments, service providers and users not only at a specific moment in time but over the centuries. Thus any conservation proposal must regard the relationship of the lighthouse to the maritime routes it is inherently tied with as well as the other cultural heritages nearby.

Conservation problems to be identified and the proposals to be developed can be undertaken in legal, administrative and technical contexts.

Figure 14a. Güneş Island Lighthouse in Ayvalık Balıkesir has been abandoned by its light keepers. The only man made element on the island, the lighthouse is a large building complex, composed of several structures and the only access to the island is through the rocks by the sea, (Başağaç 2012) and (Başağaç 2018: 112). / *Balıkesir Ayvalık'ta yer alan Güneş Adası Deniz Feneri'nin bakıcıları alandan ayrılmıştır. Deniz feneri, çok sayıda yapıyı kapsayan geniş bir yapılar grubudur. Bu yapılar adada inşa edilmiş yegane ögelerdir. Adaya tek ulaşım deniz içindeki kayalar üzerinden sağlanmaktadır. (Başağaç 2012) ve (Başağaç 2018: 112).*

Figure 14b. Güneş Island Lighthouse in Ayvalık Balıkesir has been abandoned by its light keepers. The only man made element on the island, the lighthouse is a large building complex, composed of several structures and the only access to the island is through the rocks by the sea, (Başağaç 2012) and (Başağaç 2018: 112). / *Balıkesir Ayvalık'ta yer alan Güneş Adası Deniz Feneri'nin bakıcıları alandan ayrılmıştır. Deniz feneri, çok sayıda yapıyı kapsayan geniş bir yapılar grubudur. Bu yapılar adada inşa edilmiş yegane ögelerdir. Adaya tek ulaşım deniz içindeki kayalar üzerinden sağlanmaktadır. (Başağaç 2012) ve (Başağaç 2018: 112).*

The ownership of lighthouses and their building lots had always been solely in the hands of the state. Today the ownership lies in General Directorate of Coastal Safety (KEGM) under the Ministry of Transportation, Maritime Affairs and Communication. Centralized ownership gives way to exclusion of lighthouses from local planning processes. While planning development, the building lots of lighthouses are kept almost isolated. Thus, it is important to set up a unit within KEGM to coordinate the planning process with the local administrations. The first step in this respect is the employment of technical staff in architectural, planning and architectural conservation areas. Currently, the technical team in İstanbul is composed of 1 architect and 2 technicians. İzmir Directorate has only 1 technician. Judging the 459 light structures spread all around the coasts of Turkey owned by KEGM (with 102 lighthouses among these structures) it is easy to understand that the current architectural team is insufficient. After the recruitment of the technical team, inventory, documentation and architectural assessment of lighthouses should be completed rapidly. In these circumstances the ownership of lighthouses exclusively by the state may provide an advantage in terms of conservation. A fast acting bureocracy may ease the process of implementation for conservation.

There are several different laws pertaining to the conservation of maritime heritage and lighthouses in particular. Yet none of them serves for the comprehensive conservation of this heritage. There is not a comprehensive (integrated) coastal policy. As the coasts lie on the interface of marine and terrestrial environments, the legislation should take into account the special physical characteristics of these areas. The most recent conservation law is Act no. 3869. But the lighthouses have to be registered in order to benefit from this law. The current number of registered lighthouses is only 22, which is very few when the whole is considered. That is why the inventory, documentation and assessment of lighthouses should be completed rapidly. Consequently, the qualified lighthouses (mostly with keeper's residence), 102 in number today, should all be registered.

When planning the conservation procedure the integration of lighthouses and maritime heritage with their coastal settings and rear geography should be regarded. This geography might be marine or terrestrial and is prone to constant change. Though many lighthouses are in a context much different from their original starts it is evident that cultural and natural values should live together. Regardless of the current function a proposal should be developed for public use and benefit. The solution does not lie in the conservation of single building lots but the formation of special protection zones. During the planning of hierarchy of priorities, several issues should be considered like authenticity/ level of integrity, urgency of intervention (level of damage), rarity, social priorities.

There are several parties in relation to lighthouses. Including Office of Navigation, Hydrography and Oceanography within the Navy, General Directorate of Coastal Safety, lighthouse keepers, professional seafarers, amateur seafarers, fishermen, local administrations, local people, tourism agencies, visitors, Ministry of Culture and Tourism. It is important to set up the social context and interview related parties during the planning processes. In the process the rented lighthouses should not be used over their capacity.

As the lighthouses had been automated the keepers had been taken out of the lighthouses and put into urban branch offices. Yet the keepers did not only watch out the light but they also maintained and cleaned the facilities. In many instances the keepers had been the first to respond to nearby vessels in trouble. The technology had reached lighthouses first in the furthest locations in Turkey. First radio, first television had become an attraction for the local villagers, thus the lighthouses had operated like a townhall for those who wanted to see the technology and receive the latest news. Due to the departure of keepers from the site, the buildings had fallen into social disuse as evidenced by several visuals. The social relation of the lighthouses with their surroundings is also damaged. Lighthouse keeping continues from father to son or mother to daughter. Leaving the maintenance solely to the technicians is a threat for this profession. At least one central lighthouse can be chosen for specific areas to accommodate keepers on site. This solution may be the most economical and healthy passive conservation method in the long run.

When the structural and material conditions of lighthouses are investigated common problems surface. In order to intervene easily and quickly a handbook must be prepared by the Coastal Safety and passed over to keepers and technicians. Systematic interventions as regular maintenance/ simple mending can increase the life of lighthouses. In the case of serious problems the keepers do not have to wait for the help of the central administration. Yet, if a wholistic system is proposed, these kind of interventions will not seem patchy. On the contrary it will be possible to follow the intervention process and respond to changing conditions.

Lighthouses in Turkey is an important part of Turkish maritime heritage and a crucial group within the broader family of Turkish cultural heritage. This heritage is the outcome of cultural, commercial, traditional, religious, military and political relationships which had been formed over centuries on a local, regional and global scale. In this respect, the conservation of lighthouses and maritime heritage is crucial for a comprehensive and inclusive representation of Turkish culture and future.

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