

TUDOMÁNYOS DIÁKKÖRI DOLGOZAT



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Underwater Cultural Heritage

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Abstract

Though seas and oceans have always had great importance in the life of humanity, the richness of the world's water is often underestimated. While on land cultural heritage has revealed lots of information about our history, oceans still have their secrets. Thousands of ships, entire cities have been lost under the surface of the blue world, well preserved by the waves over centuries. Nowadays, new developments in diving technology have made them accessible for everyone and thus more vulnerable. For this reason, in 2001, UNESCO created a Convention on the Protection of the Underwater Cultural Heritage, emphasizing its significance and providing help to protect and preserve such heritage.

In this paper, the aim is to reveal the definition, importance and significance of Underwater Cultural Heritage, its global situation, mentioning in Hungary and to examine its impact on the whole tourism industry.

I have always been attracted by the sea and underwater life, and my personal interest in this field has become stronger after completing a PADI (Professional Association of Diving Instructors) diving course. Being a certified diver has given me the possibility to better understand the history of diving, the operation of diving centers and to get closer to the secrets of underwater life.

Another reason for choosing this topic was the recent development that, on 21th March 2014 Hungary ratified the 2001 Convention on the Protection of the Underwater Cultural Heritage.

To collect all necessary information three different interviews were made: with the UNESCO itself, with Mr. Attila J. Tóth, the only Hungarian underwater archaeologist, and with the Centro Sub Campi Flegrei Diving Centre.

The results of the research have proved that with adequate awareness of the society, the sustainable development of Underwater Cultural Heritage can protect these values and lead to the contribution of the whole tourism industry, generating large profits.

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1. INTRODUCTION

1.1. Background of the topic

„After the magic moment when my eyes were opened to the sea, I was no longer possible to see, think and live as before.” [Jacques-Yves Cousteau]¹

The beauty of our lands and shores does not end where the sea begins; indeed, the underwater world has its secrets as well. Therefore, mankind has always had a desire to swim under the water since prehistoric times. Pictures of primitive devices to enable people to breathe underwater have been found dating from 3000 years ago, but our dream of moving freely beneath the ocean waves for long periods of time was only realized about 60 years ago, when French diving legend Jacques Cousteau developed the first practical Self Contained Underwater Breathing Apparatus, or scuba, in 1943, and the world under the sea was opened up to human beings.

Seas, oceans, lakes and rivers have for ages been part of trade and transport and beneath their blue surface they hide the story of all great civilizations of the antiquity, all periods of the development of global and European civilizations which take part of our culture and history. „Entire cities have been swallowed by the waves, and thousands of ships have perished at sea. While these ships, structures and other cultural items are not frequently visible from the water's surface, they have survived at the bottom of lakes, seas and oceans, safely preserved by the submarine environment.”²

Cultural heritage visits, including underwater cultural heritage visits, are responsible for a large part of tourism income all over the world. According to the World Travel & Tourism Council 9,5% of global GDP in 2013 was generated by tourism, in some Small Island States this percentage can reach even 40% and in the developing counties also can be higher. Moreover, approximately 266 million people - 1 in every 11 jobs - are employed in the tourism sector.

¹ Muciara Diving Center, In: <http://www.mydestination.com/sicily/things-to-do/1153290/muciara-diving-center> [visited on 03 November 2014]

² The World's Underwater Cultural Heritage, <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/the-underwater-heritage> [visited on 16 February 2014]

Recent studies showed that 37% of tourism has cultural motivation and, that heritage tourists stay longer, visit more places and spend more money than other tourists. Every dollar spent at a heritage site means about 12 dollars spent on transport, food, souvenirs etc. in communities around the site.³

Due to these facts, it is clear that heritage sites can play an important role in the development of a county, but such as many things also this faces some challenges.

Since inventing the Aqualung and opening up seas for human beings it has become accessible not only for scientists, but also for treasure hunters. Commercial exploitation, pillaging and looting of Underwater Cultural Heritage sites have caused huge losses to society. Therefore, UNESCO adopted the 2001 Convention on the Protection of the Underwater Cultural Heritage, which is a legal treaty to protect submerged remains, training underwater archaeologists worldwide and fighting against treasure hunters. The 2001 UNESCO Convention is one of the most universally acknowledged and respected international conservation initiatives ever undertaken for the protection of such heritage.⁴ Many countries have ratified it, including also Hungary, and have started, or are ready to start to take advantages of Underwater Cultural Heritage by protecting, preserving and making them accessible to the large public.

1.2. Diving tourism nowadays

*“The Sea, once it casts its spell, holds one in its net of wonder forever” [Jacques-Yves Cousteau]*⁵

Nowadays, diving tourism is one of the fastest growing recreational activities in the world and it still continues to grow. New locations and wrecks are being found from time to time and our waters are still mostly undiscovered.⁶ People of the 21th century are looking for a new type of vacation with adventures, with the will to learn something new and mostly to leave behind their crowded and noisy town. After realizing this need, diving has started to become more and more attractive among tourists and nowadays, it plays an important role

³ Culture and Development, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/culture-and-development/> [visited 03 November 2014]

⁴ UNESCO's Work and Achievements in the Protection of the Underwater Cultural Heritage In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/unescos-work/> [visited 16 February 2014]

⁵ Quotes, Jacques-Yves Cousteau, In: <http://www.quotes.net/quote/48983> [visited 04 November 2014]

⁶ Diving Croatia, Croatian National Tourist Board, Zagreb, Hrvatska Turistička Zajednica Publisher, p. 29.

in the tourism industry, making seasons longer, even in the less developed countries helping their advancement. Some States have already started to lay the foundations down for diving tourism, as their main income source, like Malta, where ships were scarpereed to create submerged touristic sites. In Dubai rich bankers give up their successful job to invest in the diving industry, in museums on underwater archaeology, dive trails, and other forms of public access. In Italy, according to the designs of Emanuele Boaretto, the world's deepest swimming pool, the Y-40 was established at the Hotel Terme Millepini, beating the Nemo 33 in Brussels. The 40 meters deep swimming pool was designed for plenty of activities under water, such as scuba diving, free diving, and has underwater caves for cave diving beginners. Also non swimmers can enjoy it from the transparent tunnel.

According to PADI statistics, which is just one of several global diving organizations, since 1967 they has issued more than 21 million certifications and, in 2012, granted more than 900,000 entry level.⁷ Some States has already started to lay the foundations down for diving tourism, as their main income source, like Malta, where ships were scuppered to create submerged touristic sites.

In Dubai rich bankers give up their successful job to invest in the diving industry, in museums on underwater archaeology, dive trails, and other forms of access for public promise a beneficial and lasting return.

Furthermore, exceptional submerged heritage can be a strong factor for urban development. The Vasa, Mary Rose, Bodrum and Roskilde Museums have contributed to the look of Stockholm, Portsmouth, Bodrum and Roskilde today. The newest international project is to revive the ancient city of Alexandria by an underwater park and develop tourism.

Seas and Oceans attract thousands of tourists worldwide to recreational dive, which is for the enjoyment of the wealth of the submarine-living world and has numerous alternatives to increase interest, such as cave, wreck, ice, or deep diving. Both old and young divers travel from one part of the world to the other to discover the wonders of a dive site, such as an interesting shipwreck, rare endangered sea creatures, or a special underwater habitat.

⁷ KLIMMEK, HELEN: An examination of the barriers to local community participation in the dive tourism industry in Flores, Indonesia, 1164425, London, 2013, p. 7.

The most attractive locations are, without doubt, those with archaeological sites and underwater wrecks.

The accessibility of these sites even at great depth has been increasing from the invention of the Aqualung by Jacques-Yves Cousteau and Emile Gagnam in 1942. It allows archaeologists to better understand Underwater Cultural Heritage and even recreational divers to enjoy it.



*1. Figure
Ancient cargo in Croatia – Photo by: D. Frka/UNESCO*

The twentieth century's development of the accessibility of submerged site, of underwater filming, photography, and archaeology led together to the rise of underwater tourism. At the beginning the experience came through the modern media in virtual tours, on-line interactive tours, educational programs, on-land museum interpretation, glass - bottomed boat tours, snorkel, dive buoys and interpretive guides for scuba divers. The next point of access is more complex and more extreme, through scuba or other diving-directed tourism, which involves diving to Titanic depths of 3,800 meters as well. Recreational dives to Titanic began in 1998 and in 2000 have attracted about three dozen visitors to the wreck

and continued in July 2012, when 70 individuals have paid approximately 46,665 € for the experience.⁸

In several cases, including the case of the Titanic, argues have been started about damaging the nature of the wrecks and sites by opening them to the public. In the following parts of this paper I will analyze this situation in a more detailed way.

1.3. The History of the 2001 Convention⁹



II. Figure

UNESCO Logo – Image by: UNESCO

While cultural heritage on land have already been benefitting a lot from safeguarding

actions, Underwater Cultural Heritage was not protected by any legal law. The 1982 United Nations Convention on the Law of the Sea (UNCLOS) contains a general obligation to protect Underwater Cultural Heritage, but it does not provide any regulations or schemes to be taken.

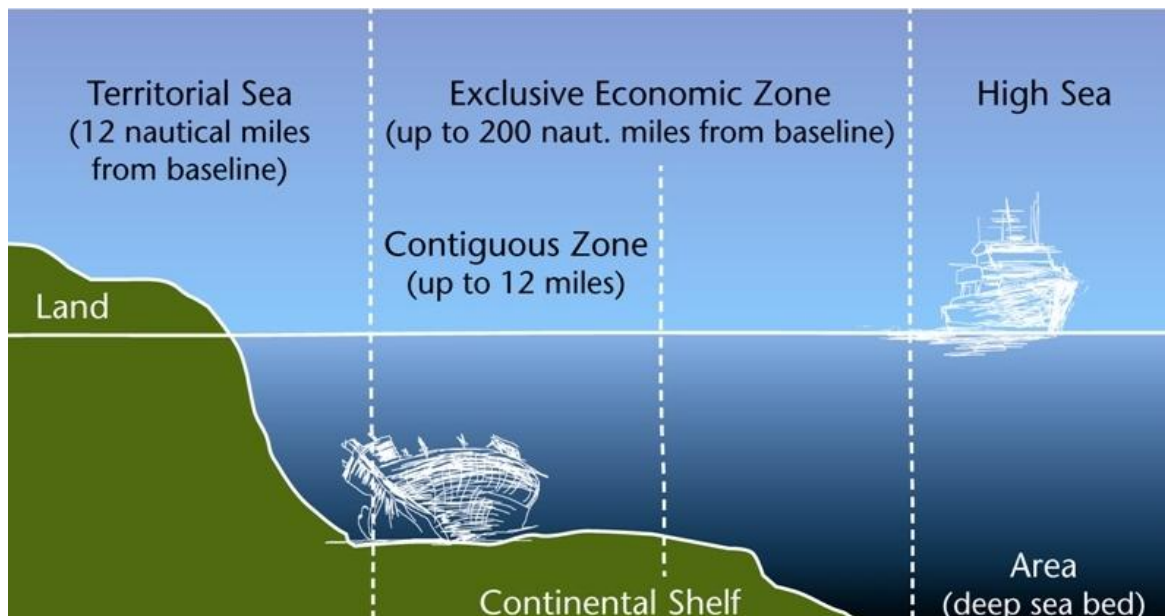
The 2001 Convention is an international agreement, especially created for the protection of such heritage, without modifying any regulations of the UNCLOS, or other international law, including maritime zones. It does not grant new jurisdiction rights to States respecting the desire to maintain the Sea as free as possible.

There was a need for its international protection for three principal reasons. Firstly, to obtain comprehensive protection for sunken cultural properties wherever it is located. The legal protection of submerged archaeological sites was insufficiently regulated, especially in international waters. In accordance with the United Nations Convention on the Law of the Sea only the Territorial Sea falls within the scope of the States. In the rest of the maritime zones, like on High Sea, the jurisdiction was limited to the State nationality of vessels and nationals. Therefore States were not able to prohibit interventions of vessels of other States on sites located in international waters, no matter how valuable the site is. The

⁸ DELGADO, P. JAMES: The impact on and opportunities arising from tourism to submerged sites, 2011, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH_S6_Delgado.pdf [downloaded 03 November 2014]

⁹ UNESCO: Frequently Asked Questions, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/frequently-asked-questions/> [visited 10 February 2014]

lack of legal protection in all maritime zones caused States to call for an international treaty to coordinate cooperation among States and to the protection of submerged heritage.



III. Figure
Maritime Zones - Image by: C. Lund/UNESCO

Secondly, to harmonize the protection of submerged heritage with the protection of heritage on land. Sunken heritage has always been less protected than on land heritage due to the fact that underwater archaeology has only recently become accessible and is still not as developed as archaeology on land so there is a need to improve it.

Thirdly, to provide archaeologists with guidelines on how to treat Underwater Cultural Heritage, which have been done with the detailed Annex of the Convention, setting the standards and ethics for the protection.

The Convention is an international treaty, which was elaborated and adopted by the UNESCO General Conference 2nd November 2001 and entered into force 2nd January 2009, aiming at the protection of Underwater Cultural Heritage and strengthening cooperation, awareness – raising and capacity building. The UNESCO Convention on the Protection of the Underwater Cultural Heritage ensures more effective safeguarding of submerged wreck and ruins and represents a response to the increased looting and destruction of such heritage.

“This is a very important step in the history of the safeguarding of cultural heritage,” declared Koïchiro Matsuura, former Director-General of UNESCO. *“This represents an essential addition to UNESCO’s standard-setting apparatus. From now on, it will be*

possible to offer legal protection to the historical memory that is in Underwater Cultural Heritage, thus curtailing the growing illicit trade by looters. ”¹⁰

Before entering into force twenty states, Barbados, Bulgaria, Cambodia, Croatia, Cuba, Ecuador, Lebanon, Libyan Arab Jamahiriya, Lithuania, Mexico, Montenegro, Nigeria, Panama, Paraguay, Portugal, Romania, Saint Lucia, Slovenia, Spain, Ukraine have ratified the Convention, and later on many other states have ratified the Convention including Hungary.

The Convention sets a common, minimum requirement, according to the capabilities of the States, for the protection and preservation of this heritage and, of course, each party can develop a higher standard of protection.

The Director-General of UNESCO assures a Secretariat for the 2001 Convention and convenes a meeting of State Parties within one year of its entry into force and later on at least once in every two years. This meeting aims to establish its functions, responsibilities, and may establish a Scientific and Technical Advisory Body making recommendations on scientific and technical issues.

The Convention sets the main principles for the protection of submerged heritage and enhances cooperation between the States. It consists of two big parts, the main text and the annex. The main text sets basic principles for the protection and provides a detailed reporting and coordinating system, while the annex provides 36 practical rules for the sustainable preservation and for excavations of Underwater Cultural Heritage. These rules about underwater interactions are the most important guideline for underwater archaeology and must be respected by every professional worker in this field.

The 2001 Convention is independent of other treaties and it only applies to States that ratified it.

In order to join the 2001 Convention, States must establish, or strengthen an existing national authority, which can be the Parliament, or a similar authority to ensure the

¹⁰ Underwater Heritage By UNESCO, In: <http://underwaterheritagebyunesco.blogspot.hu/2014/05/underwater-heritage-by-unesco.html> [visited 04 November 2014]

effective implementation of the Convention. These authorities should establish maintenance and update the inventory of Underwater Cultural Heritage. They are responsible for the protection, conservation and preservation of these heritage sites, and for the researches and education in this field.

In every case the ratification must be in writing and accepted by the UNESCO, who is the only one responsible authority to do it. They should also announce to the Director-General of UNESCO the names and addresses of their authority, responsible for Underwater Cultural Heritage.

There are three basic declarations that a State must take into consideration in ratifying the Convention. They must declare the method of transmitting records on new discoveries, and the applicable Rules to their water, included in the Annex of the Convention. Finally, States, not Parties to UNCLOS may choose among the different means of dispute resolution cited in Article 287. If everything is done the Convention will enter into force after three months from the date of the ratification.

Certainly, ratifying the Convention provides several benefits for the States, such as bringing the protection of submerged heritage to the same level as the protection for land based sites. State Parties can have advantages from cooperation with other States to protect heritage and exchange information. The 2001 Convention also helps to protect heritage from looting, by taking common step against illegal recovery and trafficking, and provides useful, practical guidelines for underwater archaeologists. Furthermore, it helps the tourism industry concerned.

2. UNDERWATER CULTURAL HERITAGE¹¹

The richness of the world's water is often underestimated. While on land cultural heritage have revealed lots of information about our history from the ancient times, oceans still have their secrets.

Entire cities have been vanished by the waves, thousands of shipwrecks have sunken at seas. While on the surface nothing can be seen of these remains, they are safely preserved and protected over centuries by the water lying on the deep seabed.

The new developments in diving technology have made them accessible for everyone and even more vulnerable. Submerged prehistoric settlements, ports, artifacts have been found worldwide dating back to even 1 million years. This Underwater Cultural Heritage are extremely diversified and well possessed which can be divided into five big groups. The groups include submerged wrecks, landscapes, rock art caves and wells, various underwater ruins and cities, sunken ports and fish traps now at the bottom of the sea. Many of these sites have been located, but many of them are unknown, while others are still waiting to be discovered.

According to the 1st article of the UNESCO 2001 Convention:

“»Underwater cultural heritage« means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years...”¹²

These could be different kind of sites, structures, buildings, artifacts and even human remains together with their archaeological and natural context. Furthermore, they can be vessels, aircrafts and other vehicles with their cargo or other contents.

Underwater Cultural Heritage includes also objects of prehistoric character, but pipelines, cables and other installations placed on the seabed shall not be considered as Underwater Cultural Heritage.

¹¹ UNESCO: Underwater Cultural Heritage, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/the-underwater-heritage/> [01 November 2014]

¹² UNESCO: Convention on the Protection of the Underwater Cultural Heritage, In: http://portal.unesco.org/en/ev.php-URL_ID=13520&URL_DO=DO_TOPIC&URL_SECTION=201.html [visited 09 February 2014]

2.1. Wrecks

The estimated number of shipwrecks spread across the ocean bed of the planet is over 3 million. According to the Dictionary of Disasters at Sea lists 12,542 ships and vessels lost at sea between 1824 and 1962. The majority of them are lying at a depth of down to 40 meters (130 ft) so within the boundaries of recreational diving. Passenger ships, merchant and cargo ships, torpedo boats and submarines are waiting for divers to explore the treasures of the blue world. Some of these have been under water for thousands of years from the ancient times, like an Etruscan wreck off - Giglio Island, Italy, dating back to 600 BC, others were sunken in the World War I. and there are wrecks whose story is still undiscovered. Certain wrecks can be entered to see the interior part which today gives home to much kind of fish and sea animals as well as underwater plants and corals.

Many famous vessels have inspired also books and films, including: The Titanic, the Spanish galleons that were voyaging between America and Spain, the Greek Antikythera, the nine ships of Christopher Columbus, the fleet of Kublai Khan and the wreck of the Armada of Philipp II.

They provide mostly historical information about trade and culture but in some of the cases, the cargo is historically more important than the wreck itself. They can be precious objects and even significant pieces of art. A lot of valuable marble and bronze statues that have been found in ancient Roman and Greek wrecks are now exhibited in museums, including the well-known Antikythera Youth. Usually, the marble ones were badly damaged by the saltwater while the bronzes can be recovered by different kind of conservation efforts. The environment is the most decisive factor for the preservation of these remains. Certain materials can be better safe-kept underwater than it would have been on land, while in other cases it is subservient to take them to the surface.

Another type of shipwreck lying on the seabed is the so called block-ships or wreck barriers sunk on purpose to prevent passage through a river, bay, or canal. Many of them were sunk during wars defending waterways from the entry of enemy forces or the exit of a defending navy.

Examples are the three cruisers HMS, Thetis, Iphigenia and Intrepid during the Zeebrugge and Oostende attack in 1918 for stopping the German Navy to take up the port and Swedish ship barrier in Greifswald Bay in the Baltic Sea. This practice goes back until the Dutch Raid on the Medway in the Second Anglo-Dutch War in 1667,



IV. Figure
Displayed cargo – Photo by: Klaudia Kovács

when warships and merchant ships were sunk in the Thames by the Royal Navy in order to stop the attacking forces. An earlier use of this method is known in the Roskilde Fjord from the 11th century to protect Roskilde from the Vikings. Today these ships are exhibited in the Viking Ship Museum in Roskilde, Denmark.¹³

Apart from shipwrecks, there are also airplanes from various wars that were found on the ocean floor. These sunken airplanes also have considerable historic importance, like the Lockheed P-38, located in the Mediterranean, close to Marseille, which carried the famous author Antoine de Saint- Exupéry when it crashed.

¹³ Blockship, In: <http://en.wikipedia.org/wiki/Blockship> [visited 11 October 2014]

2.2. Ruins and sunken cities

If we talk about submerged cities, for sure Atlantis will be our first thought. While the mysterious Atlantis remains a legend, other archeological underwater sites have been discovered. More than 150 sunken cities and port structures have been found off the coast only of the Mediterranean and numerous others around the world. They usually got under water as a result of earthquakes, like Port Royal in Jamaica, the most famous pirate city also named „the wickedest city on Earth”, while others were destroyed by flooding, landslides, or erosion. All of them have relevant historical, archaeological, environmental and cultural value. Some of them are the ruins of the first settlement of an area, or of sophisticated ancient civilizations. One of the oldest cities ever found is located below the sea in Greece, called Pavlopetri, dating back to 5,000 years.

Settlements and artifacts including pottery, log boats and timber remains dating back to Stone Age, to approximately 300,000 years, have been found off the coast of Denmark. The now submerged landscape once connected the British Islands, Scandinavia and the European continent.

India is rich in ancient water-related religious sites, such as the ruins of temples of the UNESCO World Heritage site at Mahabalipuram, or the site of Dwarka, which houses an ancient port with settlements. Also Italy takes pride in submerged heritage, such as the La Marmotta settlement, and the sunken city of Baia in the bay of Pozzuoli.

Without doubt the most important find under water were the remains of the lighthouse, once one of the Seven Wonders of the World and the Cleopatra's palace in the bay of Alexandria in Egypt. Moreover, the bay hides several sunken ancient cities, which could also be the attraction of a future underwater museum.

Not only ancient ruins located under the sea can take part of this group, but also pieces of medieval fortification in lakes, for example the Bulverket in Gotland, Sweden, or the Maya temples located in a lake in Guatemala.

Remains of dwellings constructed on lakes and rivers take also place in this group. Mostly in Europe several remains of dwellings built on islands or on pile in the water have been found, for example, in Scotland and Ireland the crannogs, the medieval lake side dwellings at La Colletière in France, or a pile settlement in a river close to Pompeii.

A unique pile – dwelling settlement was ratified to the underwater cultural heritage around the Alps. It includes of 111 individual sites in and around the Alps built around 5,000 to 500 B.C. on the edges of lakes, rivers or wetlands. Today most of them consist of the piles on which the houses were built and which have been well preserved under water.

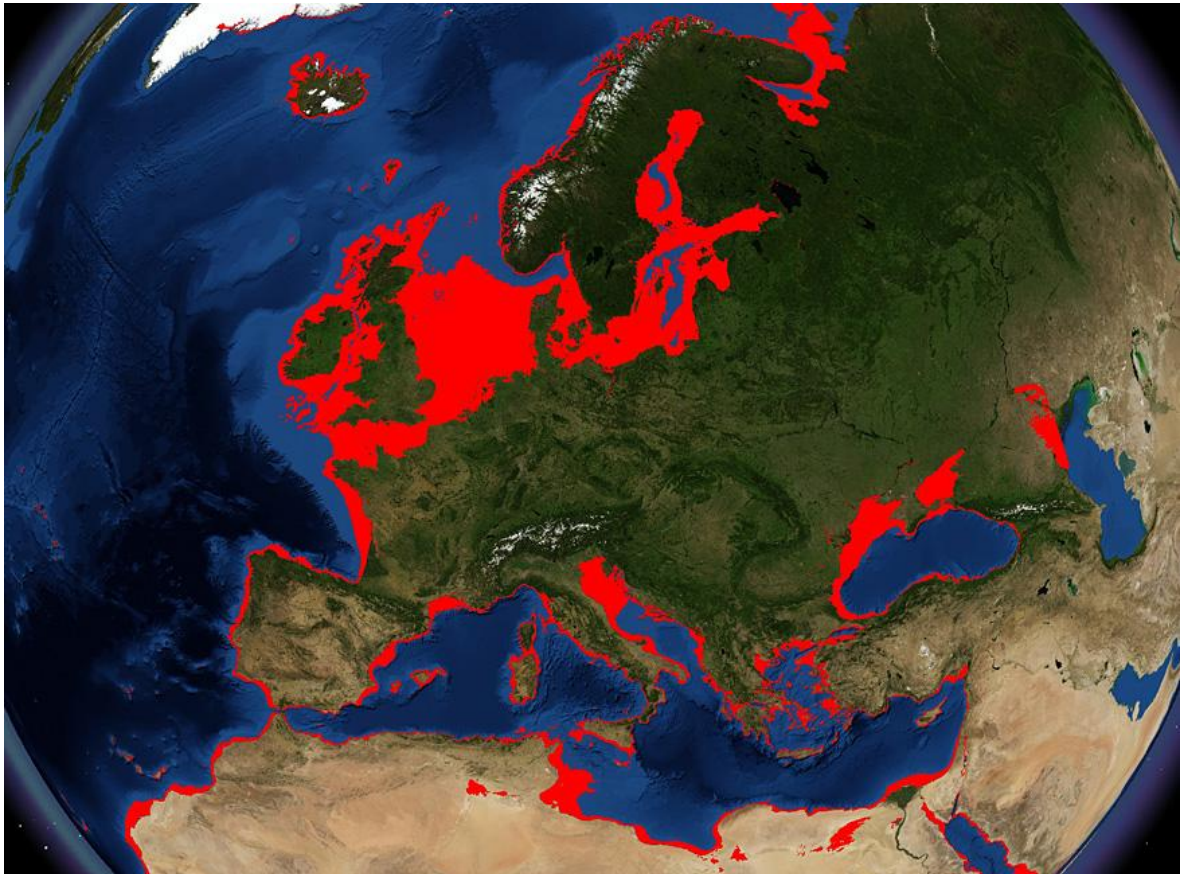


V. Figure
Divers during work - Photo by: ARQUA

2.3. Submerged landscapes

Over the ages sea level has been raising little by little and the current sea level was only established about 6,000 years ago. As humans mainly lived close to the water it means that the majority of humanity's records are now located under water. In the fact of this, only in

the past decade has been obvious how important the missing data of our history on the submerged sites is. The number of pre-historic underwater archaeological sites covering whole landscapes, ranging from over 300,000 years to 6,000 years is growing. Many times they have brilliant preservation of materials, such as wood and fibres. Such discoveries can be found mostly in the Black, North and the Baltic Seas. These materials were discovered accidentally during mineral extraction works at the bottom of the seas. Continuous researches have been made on the submerged landscapes particularly near Quatar.



VI. Figure
Submerged landscapes in Europe – Image by: USGS NED and ETOPO2

The world's best-preserved landscapes have principally survived on the seafloor of the Baltic and North Sea. Dating from 50,000 – 60,000 years ago, they consist of hunting grounds and camp sites. It is generally known that until 9,000 years ago Denmark, Sweden and England were one continent and the Baltic Sea a lake. But when the ice cap melted, at the end of the Ice Age, the sea level rose and a lot of human settlement got under water. For this reason there may have been thousands of square miles of post – Ice Age landscapes submerged in that area. This area now called „Doggerland”, where several tools, human remains and mammoth skeletons have been found. The discoveries were mostly made by chance, during recovering sand for construction works. From this moment

the involved enterprises takes care of its importance and they cooperate with archaeologists and paleontologists.

In the Black Sea, a submerged coastline is the evidence of a flooding taking place 7,000 years ago. This flooding may be the source for the story of Noah's Ark. Scientists claim that the Black Sea reached its size when melting ice raised the level of the Mediterranean, breaking a natural dam on the Bosphorus. Therefore the salt water flow into the Black Sea, which until then was a fresh water lake, raising its level and causing floods around its coast. A submerged coastline, 17 meters below the water provides remains of Mesolithic settlements and an ancient log boat.

The Persian Gulf is comparatively shallow with its average 35 meters depth that mean it could have been an open landscape with fresh water supply about 14,000 years ago. Probably the fresh water supplies were the Tigris and Euphrates, the noted rivers of Mesopotamia therefore researches are now undertaken on the area, hoping to find more information about early human life and migration, to enrich our knowledge of the cradle of human civilization.

2.4. Underwater Heritage in Caves and Wells

Underwater Cultural heritage contains artifacts and remains of human life survived in flooded caves and in wells. One of the most interesting caves is Cosquer cave at Cape Morgiou, in the Calanques, near Marseilles. The entrance located 37 meters under the sea level and can be accessed through a 175 meters long underwater passage, which claimed several human lives during its discovery. Its chambers are decorated with painted and engraved works of land animals, seals, auks, geometric symbols, digital markings, and 55 hand stencils, as well as an extraordinary representation of a slain man dating back to 27,000 and 19,000 years ago. However paintings are located on a higher level of the cave and are not submerged the cave is closed to the public in order to protect this exceptional site and for safety reasons, but a 3-dimensional reproduction of the cave was made by Electricité de France, giving an opportunity for everybody to a virtual visit.

Outstanding examples are the Cenotes in Mexico and the Dominican Republic. They are karst caves created by groundwater in limestone. Many of them housed prehistoric humans and later became important offering sites in particular for the Maya, like the Chichen Itza Cenote. For this reason they hold evidences of human sacrifices and offerings and are important from cultural, religious and ceremonial points of view. In other Cenotes older human traces have been discovered, including the oldest skeleton ever found in America, in Tulum, Mexico.

In Europe and Asia lakes, wells, springs and swamps were also used as offering place. Human bones, weapons, mummies, artifacts and biological materials have been found in these areas. In Bath, UK folded lead tablets with names, so called curse tablets were found in a sacred spring. They had been thrown in the spring to curse the named person.

In Germany many offerings such as rings and human or animal remains have been discovered during excavations by archaeologists.

In Mir Zakah in Afganistan took place the most appreciable find of all times, including about 500,000 coins and a wealth of gold and silver artifacts from Hellenistic times in a well. In wartimes, in 1992 the discovery was illegally exported and disappeared. Specialists claim that a unique coin deriving from the times of Alexander the great with his portrait was especially significant. In this area in 1947 more than 11,000 coins and golden and silver objects were discovered in the watery wells.

2.5. Sunken Ports and Fish Traps

Humans since ancient times have always preferred to live nearby seas, lakes and rivers. Ports, fishing installing, bridges remained as testimony for this close connection.

There are many ancient port, some of them are still operating, while others have been unfrequented and forgotten. Their buildings, breakwaters and protections can give us an idea about their size and significance. Numerous shipwrecks have been discovered in their surroundings. Examples of underwater ports are the Hendeby in Germany, which was a Viking trading port with several Viking shipwrecks nearby.

Around the coast of Italy, Roman ports can be seen by glass bottom ships like the one near Rome, called Ostia and Portus Iulius near Naples.

The Yenikapi Byzantine port in Istanbul includes 36 shipwrecks with the oldest Byzantine galley ever discovered, the oldest settlement with city wall dating back to the 4th century. Furthermore there are remains of ports also in Apollonia, in Lebanon and in Tunisia the famous Phoenician naval base of Carthage.

In Israel, a proper underwater park has been established for scuba divers including the remains of the port of Caesarea, founded by King Herold.

The well preserved ruins of the Leptis magna in Libya is an Underwater Heritage site, while its land based remains takes part of the UNESCO World heritage sites.

Ancient civilizations created early fish traps whose remains have survived until now representing the oldest technologies in Northern Wales, South Africa, Denmark, Canada, Australia, the Pacific Islands and Hawaii. They usually are artificial rock pools and stone walls.

Bridges and military constructions found at the bottom of rivers and lakes also became Underwater Heritage, such as the oldest bridge over the River Thames dating from 1,400 – 1,300 B.C, the 120 meters long wooden bridge across the Shannon river in Ireland and the one in Lake Murray in the USA. Military constructions from battles and wars survived under water like in Vietnam at beach Dong, where piles were lined up in the river to stop the enemy's fleet.

2.6. The significance of Underwater Cultural Heritage¹⁴

*“Although scientists believe they have categorically disproved the myth of Atlantis, the idea is more popular now than ever before.” [BBC2 on 14 December 2000]*¹⁵

In the past years, underwater cultural heritage has attracted more and more attention from the underwater archaeologists and the general public too. To scientists, it is a priceless source of information on ancient civilizations and seafaring, while to the public it provides a great opportunity for the innovation of leisure diving facilities and tourism.

¹⁴ UNESCO: The significance of Underwater Cultural Heritage, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/protection/significance-of-uch/> [visited 07 March 2014]

¹⁵ UNESCO: The UNESCO Convention on the Protection of the Underwater Cultural Heritage, Information Brochure, In: http://www.unesco.org/culture/underwater/infokit_en/ [visited 10 March 2014]

Underwater Cultural Heritage has also a great importance for cultural dialogue and national identity. It represents testimony to cultural dialogue from the beginning of humankind, wars, slave trade, exchange, or even natural disasters due to many sites that have not been touched over centuries. They are often much better conserved by the water, due to the lack of oxygen, which would have caused its deterioration, as it does with heritage on land. Thanks to this phenomenon artifacts can reveal the sophistication of ancient indigenous civilizations, which are not yet known.

As economic importance, not only the entrance fees to maritime museums, or the cost of leisure diving are determining, but the impact they have on local accommodation and on the whole cultural tourism industry.

2.7. Tourism and the valorization of Underwater Cultural Heritage¹⁶

Underwater Cultural Heritage holds a numerous potential for sustainable development. It is very interesting and fascinating, appreciated by the public so it opens long term tourism and development opportunities. According to the 2001 Convention on the Protection of the Underwater Cultural Heritage, the very first option to protect cultural heritage must be in situ, at the original location of the site, allowing and raising voice for the turistical use as well. From tourism point of view, it means responsible access to underwater cultural heritage sites to create public awareness, appreciation and protection of such values, except where access is irreconcilable with its protection and management. Fundamentally, the visibility is the first step to protect these lost objects, which create valorization and emotions, the two indispensable factors for the protection.

Before the Convention, the idea was to keep them in secret, as a main protection, but the result is that 99% of known wrecks are damaged by looting, also because of the lack of inventory and monitoring. Moreover, it will not be possible to control sites by system, the only way to protect them is by people. If humanity is proud of it and sees direct benefits to the society they will pay more attention on them. To obtain this aim we need to change the former strategy. From now on we should maintain in secret only the sites that can be

¹⁶ LLUÍS ABEJEZ, PERE IZQUIERDO, JORDI TRESSERRAS: Opportunities arising for national economies from the valorization of underwater cultural heritage, Barcelona, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH_S6_tresserasPPT.pdf [downloaded 09 September 2013]

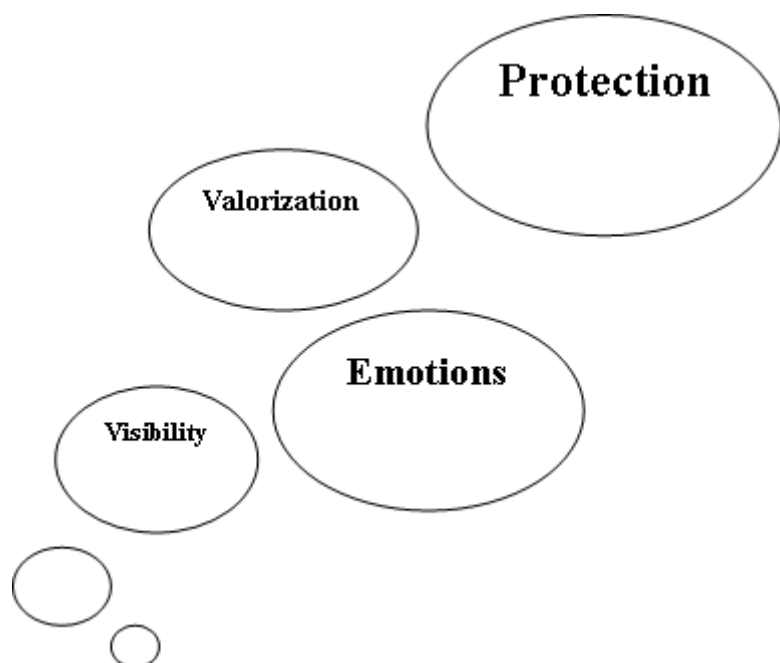
preserved by technical or physical devices and give sustainable and controlled tourism use to the rest of these sites, including the looted ones, completed with replica objects. Underwater cultural heritage sites should be considered as treasures for the community life, giving the sense to the population that any kind of destruction will be a loss to the community.

To make such sites accessible to the public there is a need for interactions between different organizations and public administrations to provide adequate economy in the territory. All the States are concerned and all levels of government, organizations and companies should form a partnership to provide and invest in the indispensable factors, like public transportation, streets, airports, accommodation, etc, to utilize these sites as tourism resources, building a non-disturbing and sustainable tourism for both the resources and for the industry.

Underwater archaeological sites preserved in situ could provide important benefits for society with conservation, research and specialized training programs, education, interpretation and museology as well as income from sustainable tourism (with special attention to the diving tourism niche) involving local community and creating jobs.

We should evaluate the entire local tourism supply chain and sustainable development from a cultural, economic, social and environmental perspective to determine a new, effective strategy for the protection and preservation of underwater cultural heritage.

Under social perspective, we mean the divers, as potential tourists of



VII. Figure
Steps of the protection – Image by: Klaudia Kovács

submerged sites, dive centers, other sea people, people working in the tourism industry and

in administration, who are the stakeholders of an international cooperation for the protection of underwater cultural heritage. Social and cultural impacts are in close connection with each other, as the cultural and educational level of these people, have been increasing. For example, wreck-divers submerge to learn more and to be touched by the past. Heritage, create emotions, which create different consideration of heritage and local pride. They make a place unique and generate more employment, so their above mentioned economic impact is also determining. Every Euro invested in land based sites increases the economical activity surrounding the site by a factor between 1,2 to 8 and for underwater sites a similar case is predicted. The greatest economic impact comes forward in the commercial tourism, mainly in the Baltic, Mediterranean and Caribbean, since these regions are rich in coastal history and intensive modern tourism. The same impact applies to the coast of Japan, and in parts of Asia and South America, as the standard of living has been increasing. These impacts arise from the construction of yacht marinas, coastal building of hotels, resorts, restaurants, water sports, touristic scuba diving, and the sale of souvenirs. There are a few examples of submerged sites, which have been studied, preserved and then opened for controlled tourism. Caesarea in Israel is a clear example, where tourist boat organizers and divers are aware of the submerged Lycian cities on the South-West coast of Turkey.

In addition, in certain areas there is one more potential for setting up research projects in maritime archaeology, marine biology and conservation creating new opportunities for graduates in these fields. The next big project is to create an underwater park for tourists in the bay of Alexandria. The structure will be composed of a diving centre, a ship with glass-bottom for those who do not want to jump into water, a submerged area for both surface and underwater tours, and a didactic centre.

All in all, the new strategy to protect submerged cultural heritage should be based on the interpretation of underwater heritage.

„Heritage interpretation is the art of revealing in situ the meaning of the natural, cultural or historical legacy to the public visiting these sites in their leisure time” [Morales, 1999]¹⁷

For the interpretation the emotions are the key factors, so first of all we need to give rise to emotions, which can be reached by experiences. For this, stakeholders are trying to search

¹⁷ LLUÍS ABEJEZ, PERE IZQUIERDO, JORDI TRESSERRAS: Opportunities arising for national economies from the valorization of underwater cultural heritage, Barcelona, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH_S6_tresserasPPT.pdf p. 14. [downloaded 09 September 2013]

the motivation of visitors to learn more and involve them in the protection and conservation. Taking advantages of new technologies and return the results of archaeological researches to the community is the best way to win their support.

The University of Barcelona has created a project, which was presented also to the EU frame program. The main aim of this program is to make a qualitative survey on some cases that are still working, a quantitative survey on all the archaeological sites adapted to touristic and educational use and a survey on wreck-divers, diving centers and clubs. Using these results an investigation is needed to determine the best and worst practices. Making experiences to improve the results in situ musealized underwater sites and give the results to community with a website and a handbook is one of the most important purposes. At last but not least building an international network of underwater archaeological sites suitable to visit would be a great step for their protection and preservation.

Like everything, even this project has its negative sides. Opening archaeological sites to great public always has the risk of damage and looting. In this case, the behavior of modern divers can destroy or save underwater cultural heritage. The success to prevent the undesirable impacts is in the education, because the more they know, the more they care. For this sustainable commercial tourism it is essential to have a well designed management program with an emphasis on education with diving and snorkeling etiquette, responsible use of resources, raising awareness among tourists, outreach and support for local communities. Many important archaeological sites are under special protection, where diving must be arranged and supported by licensed organizations or diving centers with professional guidance, which have been granted official permission to take tourists under water.¹⁸

Looking into the future there are several initiatives in this subject. The Dive-in-Heritage is the most considerable one, which has been evaluated in the EU Framework Program 7. The effective cooperation between states, according to the UNESCO UCH Convention, and the study of economic impact of interpretation sites, museums and sustainable tourism in coastal and underwater archaeological sites.

¹⁸ JAMES P. DELGADO: The Impact on and Opportunities Arising from Tourism to Submerged Sites, 2011, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH_S6_Delgado.pdf [downloaded 02 February 2014]

2.8. Public accesses

Our oceans and seas are the biggest living museums in the world, thanks to the countless cultural treasures ranging from wrecks to sunken cities and prehistoric sites. For this reason, it is important to make them accessible to as many people as possible through in situ experiences, in exhibitions, in museums or virtually. Public access to these heritage provides tangible connection to the past, fosters local pride and awareness. It can also generate huge profits for the local tourism industry, as well as it helps to monitor, research, preserve and protect such sites. To make possible public access to submerged sites the Scientific and Advisory Body of the 2001 Convention has recommended a meeting for States Parties to promote initiatives of maritime heritage museums, dive trails and virtual exhibits.¹⁹

In situ access²⁰

Once out of the water and exhibited on land, objects from submerged archaeological sites loose part of their context and significance, so the 2001 Convention recommends the in situ access as the first choice including dive trails for divers or tours on glass-bottomed boats and submersibles for non-divers. Diver-based access is also a cheaper solution than land based museums. Moreover, scuba diving is increasing in popularity worldwide by 12-14% annually and divers spend more time and money in a region than tourist who visit dry-footed museums. As every diver knows, after diving they need to wait at least for 24 hours to fly. Most divers fly far from home to explore a new exotic or unique site, so it means they will stay one day more in the region after their last dive. It generates even more profit for the region thanks for their money spent on accommodation, meals and other needs.

¹⁹ UNESCO: Culture and Development, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/culture-and-development/> [downloaded 01 March 2014]

²⁰ UNESCO: In Situ Access, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/in-situ-access/> [visited 03 March 2014]

The following case studies present the most important in situ dive spots in their region: well known by divers from all around the world:

The wreck of the SS Yongala, Townsville, Australia

The passenger ship, sank on 23 March 1911, today is the major tourist attraction for the scuba diving industry in Townsville. Moreover, the wreck lies in the Central Section of the Great Barrier Reef Marine Park, which contributes to the site with its exceptional underwater beauty. It features a unique array of marine life and at 110 meters long she is the largest and most important shipwreck from historical point of view, and unsurprisingly it is one of the top ten dive site recognized worldwide.



VIII. Figure
Measuring a wreck in Australia - Photo by: United Nation Information Centre Canberra

The Bou Ferrer Roman wreck, Villajoyosa, Spain

The large sailing ship from the 1st century AD with a cargo of hundreds of amphorae with fish sauce from Cadíz was discovered in 2000. This initiative makes possible in situ experiences for recreational divers during the excavation and researches of this spectacular merchant ship. The aim with the access of the wreck is to show people scientific archaeological work and the regional importance of ancient Roman trade. The regional

government of Valencia also initiated an in situ protective covering to prevent the pillaging of the wreck and involves the whole community in the protection.

The Florida Keys National Marine Sanctuary, USA

From 1987, the State of Florida has been developing a state-wide system of underwater parks focusing on shipwrecks and other historic sites. They contain interesting archaeological features with a variety of marine life that make these parks living museum in the sea. Sites are interpreted with plaques, brochures and laminated underwater guides available at local dive shops. There have been eleven parks so far and several others under development and are open during the year providing free access.

Shipwrecks in Croatia

The Croatian part of the Adriatic rich in archaeological heritage due to many Roman shipwrecks. In these waters divers are able to visit several shipwrecks, which are protected from external intrusion by metal cages. Guided tours take leisure divers to sites, such as the Roman merchant ship from the 2nd century BC, to shipwreck containing over 1,200 North African amphorae and to World War wrecks. During diving visitors are taught about the importance of the protection of these heritage.

The Casarea National Park, Israel

The Caesarea Maritima, an ancient port built by King Herold to honor his Roman patron, Caesar Augustus, was one of the largest ports in the Roman Empire around 10 BC. It is located on Israel's Mediterranean coast and today it has become an underwater museum. Waterproof maps are provided of the 28 sites and divers can swim along the sign-posts and admire the ruins of a lighthouse, an ancient breakwater, the port's original foundations and many ancient anchors, pedestals and even a shipwreck.

Glass-bottom boat and submarine visits

In addition to diving access, some projects give the opportunity to visit underwater cultural heritage also for non-divers.

The Underwater Archaeological Park of Baia, Italy

The ancient city on Baia was a popular holiday destination for rich families of the ancient Roman Empire. By the end of the Roman Republic it was more important than Pompeii or Herculaneum. Today due to the volcanic activity of the region, the ancient city is located under water in the Bay of Pozzuoli. In 2002 an underwater archaeological park was established in the area, to where diving clubs can get access, due to an agreement with the local authorities. The park provides glass-bottom boat tours for dry-footed visitors.



IX. Figure
Divers during research in the bay of Baia - Photo by: ICUCH

The Thunder Bay National Marine Sanctuary, USA

The marine sanctuary is located in north western Lake Huron, Thunder Bay within the Great Lakes system. The Thunder Bay MSN was designed in 2000 in the freshwater lake protecting 160 ancient shipwrecks in different depths providing diving opportunities at many levels. The shallower wrecks can be seen from the surface by snorkelers, kayakers and boaters. Also glass-bottom boat trips are provided by the sanctuary.

Submarine tours of shipwrecks in Barbados

Private dive clubs provide public access to underwater heritage in Barbados using a submarine. Four shipwrecks have been visited with diverse types of natural environment, which make the tour more exciting. The initiative includes explanations and introductory briefings on board, teaching people about underwater cultural heritage and helping their preservation in situ.

Due to the success of these initiatives many other countries have been establishing new and developing older dive trails, underwater museums, or on land museums and exhibitions worldwide.

One of the biggest projects is an underwater museum of the Pharos of Alexandria and the palace of Cleopatra in Egypt. These sites were destroyed by a series of earthquakes in the 14th century and today they lie under water in the bay of Alexandria. Underwater archaeologists have excavated and recovered thousands of objects, like statues, sphinxes, blocks, columns from Paranoiac, Ptolemaic and Roman periods, which have been displayed to the public attracting a vast of visitors. The rest of the ruins will be preserved in situ, taking part of an underwater museum, constructed in cooperation with the UNESCO.²¹

²¹ UNESCO: The Alexandria Underwater Museum Project, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/alexandria-museum-project/> [visited 05 November 2014]

One of the most successful in-situ projects is the Nordic Experience, which provides access through maritime dive trails and virtual simulation.

Underwater Cultural Heritage is exceptionally well preserved in the Baltic Sea due to the excellent preservation conditions, but they were only accessible for a small group of sport and scientific divers. For the efficient protection of such sites, is it essential to them accessible to the public, because visitors are the best protectors when educated with proper awareness and attitude. Heritage is a combination of a site and the people who use it, but not consume it. For this reason to make these submerged heritage more accessible in the Nordic and Baltic Sea Region, Denmark, Norway, Sweden, and Finland had created the Nordic Blue Parks project in 2009. The main aim was to improve existing dive trails and set up new ones and to formulate guidelines for their sustainability. With the project they have also set up a new concept for combining natural and cultural heritage and recreation at underwater trails and park sites. During the project three underwater trails were opened and two old ones were developed. The two old dive trails, the underwater nature trail in Koroppoo opened in 2005 and the Kronprins Gustav Adolf underwater shipwreck park in Helsinki opened in 2000 were used as examples. The new ones were opened in Finland, Denmark and Sweden. Also non divers can enjoy these sites through a museum exhibition, internet site publications and films.

The new park in Finland called the Perämeri Underwater Nature trail, opened in the Bay of Bothnia was created for scuba divers with natural, cultural and marine biological interests to show the typical sub-aquatic world of the Bay.

In Denmark the newly opened Højklint site, including Stone Age landscapes, offers seven information stations with safe and easy dive trails.

In Sweden the Dalraö Model was improved based on the idea to provide controlled access to protected shipwreck sites. Now divers can get permission to dive there with licensed underwater guides. Guides educate divers on the cultural heritage of the area and the shipwrecks. This increases professionalism and business opportunities among dive clubs in the region. In this model also non-divers can enjoy real-time experience on charter boats

²² UNESCO: The Nordic experience, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/Tikkanen_paper.pdf [downloaded 15 September 2014]

quipped with widescreen televisions and movie screens to display movies and animated reconstructions of ships.

In 2010, the Axmar Underwater Park was opened at Axmar industrial heritage iron works in a nature preserve and marine protection area to enjoy both nature and culture. The shallow waters are hiding many shipwrecks, which can be visited by divers, boat tourists, canoeist and some of them can be seen even from the shore.

In Norway an underwater park was established including the Lossen wreck from 1717. However the trail focuses on the wreck it also provides information plates on animal and plant life at the site. Moreover some general knowledge of the natural park, where the site is located, is available.

The Kronprins Gustav Adolf underwater park is in operation from 2000 and was the first maritime historical underwater park in the Baltic Sea region. The park is located at the wreck of the Swedish ship of the line Kronprins Gustav Adolf. 13 information signs are available at the site and several other bio-signs provide information about invertebrates of the area. Furthermore, the internet site of the park has been developed with additional texts and photos and a video footage was produced to make virtual dive at the site.

The Stora Hästö underwater nature trail offers two routes with information plates, a shallower one for snorkelers and a longer, deeper for scuba divers. In 2010 an underwater on-line camera was installed at the park, powered by solar panels set on land, providing almost live footage of the site.

Museums²³

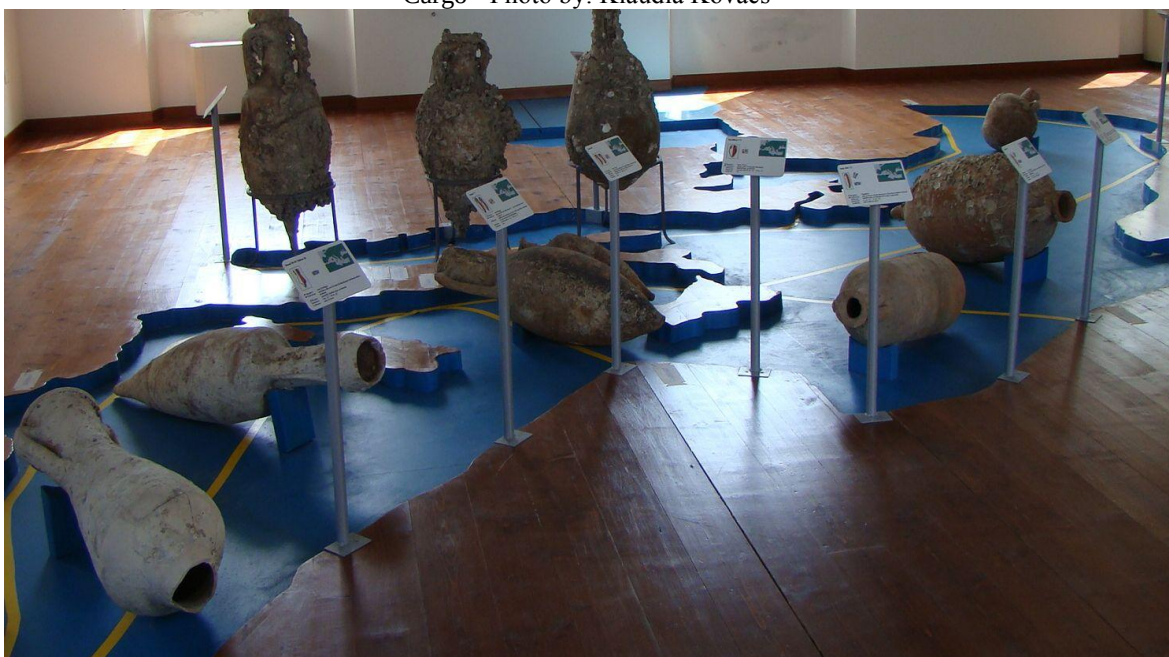
Once out of water and exhibited on land underwater cultural heritage lose a part of their significance. For this reason in situ initiatives are preferred to museums, but in some cases for the protection and preservation of a wreck it is necessary to recover it. These recovered pieces, cargoes, artifacts or even whole wrecks are displayed in exhibitions and museum attracting a large number of visitors during the year generating large profits for the region. Nowadays almost every bigger city by the sea has museums and aquariums for their values that have been found under water and to display underwater life in the region. Among all

²³ UNESCO: Underwater Cultural Heritage museums, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/museums/> [visited 09 November 2014]

the famous museums, without doubt, the most outstanding ones are the Mary Rose, the Vasa and the Bodrum Museums.



X. Figure
Cargo - Photo by: Klaudia Kovács



XI. Figure
Found cargo in the Mediterranean Sea – Photo by: Klaudia Kovács

The Mary Rose Museum of Portsmouth, UK

The Mary Rose Museum houses one of the main vessels of King Henry VIII fleet, the 16th century Tudor navy warship Mary Rose, which sank in a battle against France in 1545. The museum has already attracted more than 4 million visitors since its opening. In 1982, the raising of the 580-ton wreck from the ocean floor was broadcast live on British television drawing over 60 million viewers.

The Vasa Museum, Sweden

The Vasa Museum displays the Vasa warship, the most powerful boat of her times, built in the 17th century, is the most visited Scandinavian museum, which attracts 1 million visitors a year. Tourists spend one day more in Stockholm to visit the museum as they would otherwise have done. If an average cost of a tourist per day on hotel, meals and other expenses would be 200 Euro, it means a total of 200 million Euros more income for Stockholm yearly, without the entrance fee of the Museum.²⁴

The Bodrum Museum of Underwater Archaeology, Turkey

The Bodrum Museum is the second most popular tourist attraction in the county. It exhibits a wide range of archaeological remains from coins, amphorae and other cargo laments until five antique ships. When excavations of the Uluburun wreck started in 1959 in Bodrum the number of inhabitants was about 5,000. Today the population of the city is approximately 119,000 and tourism is the main factor for local economy.²⁵

A new promising investment is the establishment of underwater museums and museum-aquarium settings around the world. One of these new museum projects have been recently finished in China. The plan was to develop tourism on the Hailing Island, where actually there is no special attraction on land, but it is lying next to an ancient trade route, called the

²⁴ UNESCO: Submerged Archaeological Sites: Commercial exploitation compared to long-term protection, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH%20Commercial%20Exploitation%20versus%20Protection_07.pdf [downloaded 15 September 2014]

²⁵ UNESCO: Submerged Archaeological Sites: Commercial exploitation compared to long-term protection, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH%20Commercial%20Exploitation%20versus%20Protection_07.pdf [downloaded 15 September 2014]

Maritime Silk Road. To profit the best of this cultural attraction the first aquarium-museum of the world was built. An ancient shipwreck discovered along the route, the Nanhai No.1 was recovered and displayed in the aquarium. With the underwater museum the hoped success has been reached, increasing touristic attraction and local development.²⁶

Virtual access²⁷

Virtual exhibitions are especially important to display submerged cultural sites that cannot be visited in situ, or displayed in land based museums. The utilization of our modern technology is a brilliant idea to make those underwater cultural heritage sites available for public where sport diving is prohibited.

The Vrouw Maria Underwater Project is a perfect example for virtual exhibition. The Dutch snow ship, called Vrouw Maria, sailed between Europe and Russia, sunk in 1771 off the coast of Finland. It has a great international cultural and historical significance as a global maritime heritage, because of those colonial goods in the cargo, such as sugar, tobacco, coffee which had been derived from India, China, Africa and South-America. The wreck was found in 1999 at 40 meters depth in the strict preserve part of the Archipelago National park in a Natura 2000 Area, where even entering the area is restricted without permission as well as diving with apparatus is prohibited. Being so, there was no chance to build up an underwater park at the site. The only possibility to make the wreck accessible to the public was through virtual access. The goal of the project was to make the ship accessible through a blog site, virtual simulation and an exhibition. The interactive, real-time, 3D virtual reality simulation gives a feeling of being at the site and a possibility to experience the wreck, the underwater landscape and even the sounds, which are collected from different sources to tell the story, to create a submerging atmosphere of immersion and to give audible feedback for user's actions. The non interactive parts explain the historical events and the passing of time. There are info points for more detailed explanations.

²⁶ UNESCO: Submerged Archaeological Sites: Commercial exploitation compared to long-term protection, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH%20Commercial%20Exploitation%20versus%20Protection_07.pdf [downloaded 15 September 2014]

²⁷ UNESCO: The Nordic experience, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/Tikkanen_paper.pdf [downloaded 15 September 2014]



XII. Figure
Virtual reconstruction - Image by: MAV

In addition, the Museum exhibition displays also the recorded interviews, the ideas and feeling of those divers, who have visited the site bringing alive the whole idea of this virtual show.

Furthermore, the project aims also to create a touchable 3D-print of the underwater landscape for blind persons.

2.9. Protection and Management of Underwater Cultural Heritage²⁸

Since inventing the Aqualung, Underwater Cultural Heritage has become interesting, not only for scientists and archaeologists, but for treasure hunters as well. As a result, looting and damaging archaeological heritage is no longer restricted only to land, it takes also place under water.

Many undersea archaeological sites are pillaged without observing scientific and archaeological exploration actions.

Moreover, irresponsible recreational divers also take pieces for souvenir leaving behind the ships and sites destroyed.

In addition to human activities different environmental factors also have destructive effects on submerged heritage.

For this reason they need urgent protection and control with adequate guidelines and working standards.

However, many countries have raised the preservation of their heritage on land; their values under water are still unprotected.

The UNESCO Convention on the protection of the Underwater Cultural Heritage is designed to support the States with a mechanism for the protection of their cultural heritage located under the surface of their waters. It has legal importance on the protection of submerged heritage and assures universal protection, helps the cooperation between States and set standards. The text and the annex of the Convention, includes rules to help to cope with activities regarding the protection of this heritage. They contain practical and directly

²⁸ UNESCO: Protection of Underwater Cultural Heritage, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/protection/preservation/> [visited 15 September 2014]

applicable regulations on excavations, on project designing, on the required qualifications and skills and on conservation and site management.

As the first step for an effective site protection, the Convention determines the need of a survey of all submerged heritage sites. It offers knowledge about existing heritage and is the base for the inventory. Inventories are key components of the management plans of cultural heritage. It is indispensable to know all underwater heritage in a region for further protection, preservation and research activities. According to the 2001 Convention States are obliged to have a competent authority to provide maintenance and to update inventory of their heritage.²⁹

In accordance to its first rule, preserving submerged heritage in situ must be considered as the first option. The choice for protection in the original location is based on the recognition of the importance of the interplay between the site, its story and its context. It is significant to leave archaeological sites authentic and as undamaged as possible. Certainly it does not mean to reject completely the recovery of submerged heritage. It can also be authorized, if it is the best solution for making a significant contribution to protection or knowledge or enhancement of Underwater Cultural Heritage. The reason for choosing this way to protect such heritage could be a threat by natural or human factors, scientific researches, studies and disseminations enhancing their protection.

Furthermore, all the activities at Underwater Cultural Heritage must be non-intrusive methods, with the exception, when excavation or recovery is needed for scientific research or for the protection, but it must be as non-destructive as possible. It is very important for recovered heritage to be managed and conserved in a way that it provides its long term preservation with high standards of conservation. The long term protection of sites can help to avoid damaging of submerged heritage and limit the destruction of environmental factors, like bacteria, or storms.

²⁹ UNESCO: Protection and Management of Underwater Cultural Heritage, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/protection/protection-and-management/> [visited 03 February 2013]

In order to give State protection and preservation methods, UNESCO has also determined all the factors threatening such submerged heritage, giving advices on how to avoid or resolve these problems, which are the followings:

Commercial exploitation³⁰

Nowadays the world faces a decreasing availability of artifacts from dry land, and the pressure of the art market causes the acceptance of commercial exploitation of submerged heritage in several regions. In the last years about 365 important ancient shipwrecks have been commercially exploited worldwide. Their lost cargoes, measured up to 500,000 pieces would fulfill an entire museum. In many States of the world only 5 to 10% of historical wreck are left untouched in the shallower waters. Studies showed that all known Turkish wrecks have been pillaged, while in Israel 60% of cultural objects have been estimated to be lost without any trace in public collections. Similarly, in France only 5% of such heritage remains untouched.

Moreover, objects preserved in saltwater for a long time after bringing them up to the air from the seabed faces the problem of deterioration. They must undergo several treatments, like desalting to be conserved. When in 1840, artifacts from the Mary Rose were auctioned, it was noticed that cannon balls weighing 32 pounds after contacting with air, had shrunk to only 19 pounds. The higher temperature caused oxidization and, in addition the salt of the seawater had dried and eroded the structure of metal. This phenomenon destructs wood and pottery as well.

Unfortunately, treasure hunters do not take care about proper conservation methods disregarding the loss to humanity and science.

The 2001 Convention aims at decreasing the popularity of commercial exploitation through education by giving examples for it compared to long-term protection of heritage sites. During commercial recovery enterprises usually overlook the cost of search, retrieval

³⁰ UNESCO: Submerged Archaeological Sites: Commercial exploitation compared to long-term protection, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH%20Commercial%20Exploitation%20versus%20Protection_07.pdf [downloaded 15 September 2014]

and conservation, while the expected profit is set by once-in-a-while reached top prices, whereas it can only be true if a site holds many sellable objects, what is never guaranteed. Moreover, enterprises reduce the scope of material, for example, they just simply leave iron materials on the seabed, because the conservation of iron makes the intervention unprofitable for the involved enterprise.

Onwards, national authorities have often been persuaded to permit such activities with promises of profit shares, which they have never received, or have not included the most important objects.

As a result, many activities have lasted in court procedures even with imprisonments. The legal fees paid by the authorities are even higher than the value of the promised fund. In addition, exploitation has caused huge losses.

Heritage is a limited asset, which cannot be reconstituted. In order to reduce costs, enterprises keep documentation and costly diving hours at a minimum. They focus only on easy-recoverable and sellable artifacts, destroying the wreck, without awareness of its scientific value or even identity preventing further long-term scientific researches.

Contrarily, scientist and archaeologists respect the heritage values, lack of urgency and avoid unnecessary site disturbance. The example of the Belitung wreck in Indonesia shows perfectly the loss for the State of origin caused by commercial exploitation. The recovery of its cargo was prepared in eight days in 1998. Normally, an archaeological excavation of such site requires months of careful survey and project design considering documentation, storage, conservation and the security of funding. The found artifacts were sold for 32 Million USD to a private entity in Singapore. The profit given by treasure-hunters to Indonesia was only 5 Million USD. The 60.000 pieces of cargo firstly will tour the world than will displays at a museum in Singapore. This museum charges 8 USD entry fee and if we count with 1 Million visitors yearly, like the Vasa Museum in Sweden the acquisition fee returns in 4 years. Moreover, the collection attracts more tourists to Singapore, increasing the surrounding economy activities. In comparison, Indonesia has lost a very important source for economic development. A maritime museum now is planned to build near the original wreck, but the significant cargo has been lost and the wreck is destroyed. In addition, legal fees were paid on the pursuit of the commercial enterprise.

From this example, it is obvious that commercial exploitation may bring short term economic advantages, but long term protection is able to bring higher and sustainable benefits for the entire national economy. The history of land based archaeology shows that a hundred years ago the main goal was to search for ‘treasure’, but ideas have changes thanks to education. The same procedure still needs to be done for underwater heritage.

However pillaging is the most devastating threat for underwater heritage it can be easily got around by border control and monitoring of the movements of boats. These are existing solutions to prevent smuggling, drug traffic and illegal fishing. Large boats have to report their movements via satellite to the coast guards, so when they stop it gives grounds for suspicion and control.³¹

Trawling and fishing

Fishing has been one of the major reasons for humanity to settle down at the waterfront. All the fishing sites are important archaeological sites and fishing has influenced all the sites at sea. Fishing equipments and methods from previous periods can be a source of knowledge on the sites and civilization as well.

Therefore, fishing is an inseparable part of maritime archaeology. Fishermen have local knowledge and they are the prime discoverers of sites. Although recently new fishing techniques have been adapted to consume less fuel and cause less negative impact on the bottom of the sea, bottom fisheries on the seabed were a serious issue even before the 2001 Convention, and it is still an important issue to resolve. Fishing nets and trawling devices can get caught on submerged heritage sites, moving and dragging them on the bottom of the seabed. To avoid this, buoys should be installed to these sites and feature information warning panels about penalties.

Moreover, the declaration of protected marine areas and the identification with mapping of these sites would be an attainable solution. Anyway the main problem is the lack of communication and understanding between fishermen and archaeologists. An open dialogue and relationship between them would be more helpful.

³¹ UNESCO: Site Protection, In <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/protection/preservation/> [visited 05 November 2014]

Construction works

Infrastructural works, such as the construction of dams, ports, bridges or oil and mineral excavations can also damage heritage sites. Although they cannot be totally avoided, they should be limited and archaeological inspection must be done before starting any coastal operation. Furthermore, developers could be obliged to provide funds and to avoid damaging. This already has been practiced in many States, where archaeologists and companies cooperate to fulfill this requirement for the protection of heritage.

Environmental impact and climate change

Unfortunately, Underwater Cultural Heritage sites are not only threatened by human activities, but environmental influences also have their negative effect on them. Rising sea level due to climate change and the degradation of the ecosystem due to human activities is one of the most serious environmental threats for Underwater Cultural Heritage. As we have already known, sea level was much lower, Europe alone had an extra 40% of land, and further 2 meters of the present coastal zone will continue to submerge in this century. Changes in the environment caused by storms, temperature changing, earthquakes; tsunamis, erosions, or the oxygen level can even badly damage such vulnerable sites.

Although they are mostly located buried, or deep down on the seabed, where the level of



XIII. Figure
MACHU Project - Image by: NASA

oxygen is low and there is no light, which causes material degradation, they are lying under chemical, physical and biological threats.

The most disturbing chemical process is the corrosion of iron and other metals. Also fungi, woodborers and bacteria activity does a

lot of harm on wood, like in the case of the Vasa or the Mary Rose. Such shipworm can destroy an entire shipwreck in a few months. In waters where until today there were no

bacteria like these wrecks are well preserved, as in the Baltic Sea, in the waters of the Arctic and Antarctic. It is noticeable that these are the coldest waters on Earth, but even here, bacteria have already been found due to the raise of its temperature.

There are various useful solutions to avoid or reduce environmental impacts, which can be chosen according to the characteristics of the sites: Re-burial of layers of sand or with sand bag could be a solution, however it makes further researches more complicated. Fabric covers and nets are a cheap and easy way to protect submerged sites from anchor damage and pillaging. Metal nets are used to protect sites threatened by vandalism. Cages have been proven to be effective for physical protection and against looting. If maintenance or cleaning is required, divers can visit the sites entering the cages with permission. This could lead to cooperation with local dive clubs, which obtains permission for entering in exchange for supervision. As it can be clearly seen in the interview with the Centro Sub Campi Flegrei Diving Centre, diving centers can contribute to the preservation and sustainable development of Underwater Cultural Heritage sites by frequent monitoring, controlling, supporting and raising awareness of tourists. Visitors are also willing to pay additional entrance fees to underwater archaeological sites, helping their protection.³²

All in all, UNESCO emphasizes that the effective protection and management of Underwater Cultural Heritage is based on the cooperation of the concerned stakeholders. In maritime archaeology it means international cooperation and the exchange of information using a standardized language. This can include geological, climatological, geochemical, biological data and information about human activity. A perfect example of cooperation and joint management is the MACHU (MANaging Cultural Heritage Underwater) project sponsored by the European Union's Culture 2000 Program. The involved countries are Germany, Belgium, Poland, Portugal, England, the Netherlands and Sweden. However the main goal of the project was to create a better and more efficient way to manage Underwater Cultural Heritage and a network for international cooperation and exchange. They have also built up a web-accessible GIS (Geographic Information System) application with archaeological and historical information on Underwater Cultural Heritage. The GIS stores the present information and in combination with other data, it generates new information. For example, thanks to the MACHU Content management System (CMS) the location of a wreck, combined with some historical events may help to

³² UNESCO: Site Protection, In <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/protection/preservation/> [visited 05 November 2014]

reveal the history of the wreck. Combining Wikipedia and Youtube facilities in an international Underwater Cultural Heritage CMS could be a solution to present information to the public. So far there have been a lot of sites providing information, such as the www.shipwrecks.org or www.wrecksite.eu to satisfy people. Ideas of how the ship might have looked can be also added. Anyway, the aim of the system is to provide historical and archaeological context to wrecks and objects in order to make them more appreciated.³³

2.10. Underwater Cultural Heritage in Hungary

On 21th March 2014 Hungary was the 46th State to ratify the 2001 Convention on the Protection of the Underwater Cultural Heritage. This ratification enhances the raising awareness of Hungary on the importance of the protection of submerged heritage, as they already accorded to land - based heritage. The ratification by Hungary is an opportunity to increase cooperation in the protection of Underwater Cultural Heritage even in landlocked countries. Hungary has a wide range of underwater cultural heritage in rivers and lakes including important shipwrecks of the former Austro-Hungarian Fleet.³⁴

There are several significant and exceptional Underwater Cultural Heritage sites in Hungary in lakes and mostly in rivers. The River Danube is the largest one in Central Europe connecting Central Europe with Southeast Europe that was a waterway and even a boundary during centuries. The Roman limes followed the line of the river and its ruins of towers, fortresses, and forts now can be found at the bottom of the river well preserved in the mud. Due to the booming commerce, before the railway, rivers were the means of trade and communication inland Europe, and now various artifacts are lying deep down under the surface. There are three really important heritage sites, including a Turkish logboat accumulation dating back to the 17th century that served as a pontoon-bridge in the River

³³ UNESCO: Training Manual, Bangkok, UNESCO Bangkok Publisher, 2012, pp. 16-19.

³⁴ UNESCO: Hungary ratifies the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage, In: http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/dynamic-content-single-view/news/hungary_ratifies_the_unesco_2001_convention_on_the_protection_of_the_underwater_cultural_heritage/#.VF6rJp-AUZg [visited 09 November 2014]

Dráva³⁵ and a wooden wreck of a ship-mill was discovered near Dunaföldvár in the Danube. The interesting thing is that these ships were carved from a single log.³⁶

A similar shipwreck was found near Tahitótfalu, which is believed to date from medieval times. The third important heritage is the ruins of a roman port discovered in the bay of the Shipyard Island in the Danube. This is the only site, which could be suitable for in situ access, while the others are not protected by any island and have difficult diving conditions. Obviously mass tourism cannot be expectable, but a certain group of people, who are willing to pay a little bit more for this unique experience, could enjoy it.

The real problem is that in Hungary there is no professional underwater archaeologist, only a dozen of archaeologists and divers, who are trying to make researches. The only chance to develop tourism in this field would only be possible with the establishment of a deep swimming pool, such as the Nemo in Brussels by preserving and displaying this kind of heritage there.

Due to the lack of in-situ accesses, exhibitions, presentations are held by the Agronauts non-profit Research Group, established by Tóth J. Attila, the only Hungarian underwater archaeologist, and the project called "Cultural Passage along the Danube". They have also created a poster exhibition about the Underwater Cultural Heritage located in our water, which was displayed in numerous cities in Hungary and even abroad. These volunteers collaborate with French, Croatian, English and Serbian colleagues at sites located in Hungarian waters and also at Hungarian shipwreck sites located in the Adriatic-sea, such as the Saint Stephen warship. Another project is in consideration at the site of the Shipyard Island, thanks to the governmental rehabilitation of the Island, which could be extended for the protection and preservation of the underwater heritage site as well.

A future project could be the Queen Mary project, to find the sunken ship of the wife of King Louis II. The ship sank in 1526 in the Danube Bend, while Queen Mary was trying to save her treasures after the Battle of Mohács. To find the lost treasures is the big dream of

³⁵ TÓTH J. ATTILA: Örvények titkai, In: http://buvarregesz.blog.hu/2012/03/08/save_a_medieval_danubian_shipwreck [visited 03 November 2014]

³⁶ Argonauta, Argonauts Research Team In: <http://www.argonauta.hu/en/> [visited 03 November 2014]

the Hungarian archaeologists, but until today the expedition could not start due to the lack of funding.

However, in situ access and virtual access is still not available in Hungary, the country boasts in a Diving History Museum in Csobánka and even an underwater museum located at the bottom of the Palatinus Lake in Dorog. In both of the museum visitors can get to know with the early diving equipments and the history of diving.

Last, but not least Hungarian waters are not so rich in vulnerable objects for treasure hunters, so it is not so threatened by pillaging and commercial exploitation than heritage sites are in the sea and the circumstances are much worse. The only exception is at low water, when people go with detectors to find metals.

3. CONCLUSION

3.1. Summary in SWOT

In this part of my paper I would like to summarize all the strengths, weaknesses, opportunities and threats of Underwater Cultural Heritage in a SWOT analyses.

First of all its strengths are the fact that is breath - taking by reason of its mysterious location: under water, that can be an attraction of its own, as well as its story and, of course, its cultural and historical importance. Many times, it is a reminder of a tragedy, the end of a voyage and a loss of lives. Moreover, finding a shipwreck can allow us to go back in time and re-live the last moments of a ship and its crew. Underwater sites, due to their history, singularity and beauty, also have decisive economic importance for many regions. Museums, such as the Mary Rose, Bodrum, Vasa and Roskilde are the most visited ones in their country, while diving tourism is also a booming industry generating large profits extending also the summer season. Due to the thick diving suits for leisure divers, it is possible to dive from early spring until late autumn, while professionals can do it all year long. Furthermore, according to PADI statistics most of the new divers are between the age of 27 and 30 with college or university degrees. It is well-known that the highly educated younger generation is always open to learn something new, which is well applicable for the

protection of such heritage, as the more people know about something, the more they will care about it and protect it and hopefully they will transmit it to the next generations by helping their preservation. Nowadays, also the popularity of green tourism has been increasing and Underwater Cultural Heritage could do well out of it.

On the other hand, there are some weak points regarding the underwater cultural heritage. Many researches still should be done to understand better the historical importance of submerged heritage and to open them up for the large public. The challenge is the shortage of experts and cooperation in this field - since most archaeologists do not want to get their feet wet - the finding and funding of researchers, protection and preservation methods. Furthermore, at many sites the accessibility of underwater heritage involves archaeologists and divers as well. Moreover, there is a lack of promotion worldwide and still low utilization of diving tours in the traditional holiday packages.

Certainly, there are numerous opportunities to overcome many of these problems. In order to achieve the proper protection, preservation and research of underwater cultural heritage, UNESCO has launched a capacity-building program in more than 50 field offices to train specialists and help the cooperation with reliable implementation partners. Since 2008, they have trained more than 400 specialists from more than 80 countries, and UNESCO has established even a university twinning program for underwater technology, which brings universities worldwide together to teach underwater archaeology.

Specialists then can make new researches and broaden their knowledge about underwater cultural heritage that they can transmit to the public through education, raising awareness and finding public support for funding.

Another great opportunity is to make underwater cultural heritage accessible for the public by diving trails for recreational divers, glass-bottomed boat trips, museums and virtual accesses through films, books and utilizing the modern technology through virtual expositions, photo contests as well as by promoting diving destinations. Thanks to the state-of-the-art technology weak-sighted and handicapped visitors can also enjoy diving.

There is also a need for more publications of guides and publicity through social media. UNESCO should create a page also for Underwater Cultural Heritage for these purposes.

Last but not least, there are some not negligible threatening human and environmental factors. Environmental threats can be tsunamis, earthquakes, temperature changing,

erosions, changes in the level of oxygen and harms caused by shipworms and other bacteria, while human threats are the deep sea fishing, construction works and mostly commercial exploitation including looting. In the Training Manual for the Protection of the underwater Cultural Heritage, UNESCO recommends detailed solutions for these negative factors ranging from re-burials with sand, metal cages, different collaborations with diving clubs, authorities, fishermen, installing mooring buoys and designing more marine parks. Even leisure divers can have negative impacts on underwater cultural heritage and on marinal life by littering and looting, but appropriate education can save these heritage sites from such human destructions.

3.2. Final words

Underwater Cultural Heritage is the case study of this investigation with a purpose of determining its definition, significance and importance for the tourism industry. More time should be devoted to further, more detailed research, but this paper gives the reader a basic idea about such heritage and their valorization in, and the contribution to, the tourism industry. Looking at the results, the research confirms that Underwater Cultural Heritage has a great significance for humanity and largely contributes to the development of the sustainable tourism, generating big profits for the whole tourism industry all over the world.

Since all underwater cultural heritage sites are reminders of our history, many times testimony to a tragedy and a loss of lives. Moreover, finding a sunken city or shipwreck can allow us to go back in time and relive the last moments of their citizens and crew. Without doubt these sites have a great significance for human culture providing important source of information about our past.

In the case of Hungary, it can be clearly seen that even if this country has no sea, it is rich in unique examples of underwater cultural heritage located in lakes and mostly in rivers. Although these sites are not suitable for positive tourist development on-site, I see possibility to achieve success by making them well-known through non-diving access thanks to new technologies. I do agree with the Convention that in-situ protection, preservation and access should be the first option, but at sites, where it is not feasible, - like

in the case of Hungary and the majority of the sites, - it is more important to create new forms of interpretation in a different kind of tourism. Certainly, it will not replace in-situ access experiences, but it will enhance the significance of Underwater Cultural Heritage and draw more attention on them. I do believe in the success of a deep swimming pool and resort for divers, such as the Y-40 in Italy, where pieces of underwater cultural heritage could be preserved and displayed for the public.

Other innovations, such as diving for disabled visitors, virtual accesses to blind tourists and the concept of underwater museums with aquarium-like walk - through tunnels, I consider a great leap forward. Firstly, because the more people know and understand something, the more they will be interested in it and the more they will help to protect them. Secondly, without public interests archaeological studies should not have any meaning. They make research to study the past and to share what they have learnt. For this reason, I think there is a need for more films, 3D videos, interactive presentations and exhibitions made by archaeologists explaining their experiences underwater during the process of discovery and research.

Underwater sites due to their history, singularity and beauty have decisive economic importance for many regions. Museums, such as the Mary Rose in the United Kingdom, the Bodrum in Turkey, the Vasa in Sweden and the Viking Ship Museum in Denmark are the most visited ones in their country, while diving tourism is also a booming industry generating large profits. From the examples and facts of the thesis, it is obvious that Underwater Cultural Heritage can play an important role in sustainable economic development. Heritage visits are also responsible for a large part of tourism income and every single dollar spent on heritage multiplies it in the whole tourism industry. Heritage visitors always stay at least one day longer than non heritage tourists spending money on hotels, food, entertaining programs, public transports etc. It also provides job possibilities for local people.

Due to many threatening factors caused by environmental and human activities, there is an urgent need for their protection and preservation, which is obtainable mostly with adequate monitoring and management.

In addition, I personally do believe in education and I think this could be the key for the protection of Underwater Cultural Heritage.

Regrettably, I have experienced that many times visitors tend to take pieces of sites as souvenirs and diving centers occasionally attract tourists by recommending souvenir-hunting locations.³⁷ In my opinion the first point to be improved and changed is to reach long-term business interest instead of short-term income interest for a greater success. Diving centers are the connecting links between visitors of in situ sites, archaeologists and authorities, who are able to communicate with divers and educate them. Many of them have started the guardianship of such sites, but the majority has not made it yet. I am convinced that, each diver centre should take part of this mission wherever it is located in the world. Moreover, at schools or even at language exams there should be more reading tasks based on Underwater Cultural Heritage in order to make them more familiar for younger generations. New directions to submit knowledge about such heritage and to pay more attention on them should be taken into consideration such as their promotion in particularly via internet by creating pages for Underwater Cultural Heritage on social media sites. According to my observations, the promotion of this heritage is still in its infancy so I would highly recommend starting to promote them via internet, printed and published reports. A solution for the funding of new researches, promotions, museums and in situ trials could be made apart from the diving club guardianship, by the public visits of archaeological work. The idea of the evaluation of cultural development needs can also help to achieve a higher possible benefit, as well as tour and exhibition opportunities and the provision of film and book rights.³⁸

Ultimately, I would extend the Convention on the Protection of Underwater Cultural Heritage for all sites located under water, not only for those dating back more than 100 years, at least to prevent their commercial exploitation and pillage as they will stay there waiting for future generations

³⁷ UNESCO: Sharing as a principle, In: <http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/unesco-manual-for-activities-directed-at-underwater-cultural-heritage/unesco-manual/general-principles/knowledge-sharing/> [visited 05 November 2014]

³⁸ UNESCO: Submerged Archaeological Sites: Commercial exploitation compared to long-term protection, In: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UCH%20Commercial%20Exploitation%20versus%20Protection_07.pdf [downloaded 15 September 2014]

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