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Erasmus+ Programme  
of the European Union

## **Climate and Threats on Cultural Heritage**

### **CATCH**



**“I Am Preserving”**



## **Erasmus + KA 2 School Exchange Partnership**

**2020-1-ES01-KA229-082560**

“The publication and the project have been funded within the framework of the European Union Erasmus+ programme. This publication reflects the views only of the partner schools, and the European Commission and the National Agencies of the partner countries cannot be held responsible for any use which may be made of the information contained therein.”

## FOREWORD

“I am Preserving” is the main result of the Climate and Threats on Cultural Heritage project (Erasmus + KA2: Strategic Partnership in School Education). It includes detailed information to preserve cultural heritage areas in the partner school’s cities. The partner cities are Massafra from Italy, Tychy from Poland, Despotovac from Serbia, Kolarovo from Slovakia, Alfaro from Spain and Kütahya from Türkiye.

Climate change is one of the most pressing issues facing our planet today, and it is having a significant impact on cultural heritage sites around the world. These sites are not only important for their historical and cultural significance, but they also serve as a record of human civilization and can provide valuable insights into the past. Climate change is causing a range of environmental changes that are impacting cultural heritage sites. Rising sea levels, increased frequency and severity of storms, and changes in temperature and precipitation patterns are all contributing to the deterioration of these sites. In addition, changes in vegetation patterns and the spread of invasive species are also having an impact.

The cultural heritage community has a crucial role to play in addressing the challenges posed by climate change. This includes efforts to mitigate the impact of climate change on heritage sites, as well as measures to adapt to changing environmental conditions. It also involves building awareness and understanding of the importance of cultural heritage sites and their vulnerability to climate change.

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## INTRODUCTION

The EU is committed to taking action to limit global warming to well below 2°C above pre-industrial levels, in line with the 2015 Paris Agreement. In November 2018, the Commission adopted the 'clean planet for all' strategy, aiming for a prosperous, modern, competitive and climate-neutral economy by 2050. Education is an essential element of the global response to climate change.

As it was stated in the project summary, The general aim of the project is to build student awareness on the cultural heritage of their town, the preservation of cultural heritage and a critical awareness of climate change problems related to them. Other project objectives are:

- To provide permanent behavioural changing on the pupils about saving our planet and preserving cultural heritage areas through project activities;
- Raising awareness on tangible and intangible cultural heritage safeguarding in schools;
- To sharing best practices on cultural heritage and climate education among partner schools;
- To raise awareness level of importance of cultural heritage areas at town level;
- To develop foreign language and teamwork skills of the pupils and staff;
- To promote cultural diversity and EU citizenship and respecting other countries culture;
- To feeling that they a valuable member of wide EU cultural family.

We expect the following long-term benefits at the end of the project on the participants:

### **Students**

- Gaining permanent behavioural change on daily life routine to protect our planet;
- Willing volunteer to save cultural heritage areas;
- Knowing about importance of cultural heritage and of handing it over to the next generations;
- Knowing partner countries' cultures;

- Respecting the cultural and linguistic diversity and human rights;
- Breaking the prejudices about other cultures and nations;
- Improving the English Language skills;
- Developing teamwork and ICT skills;
- Feeling as a part of European Cultural Family.

### **Educational Staff**

- Breaking the prejudices about other cultures and nations;
- Developing professional skills and comparing the teaching methods with partner countries' education systems;
- Gaining new methods of cultural heritage education;
- Making long-term transnational cooperation with European colleagues;
- Promoting cultural and linguistic diversity;
- Fighting xenophobia and racism;
- Carrying the ongoing activities of the school to the international area;
- Improving the teamwork, ICT and foreign language skills;
- To eagerly continue to the international partnership projects.

### **Project Period**

01.09.2020 – 31.08.2023

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## CLIMATE CHANGE

Climate and weather have one difference. Weather measures the conditions of the atmosphere, through temperature, humidity, wind and precipitation, over a short period of time (day, week and month). Climate is the average weather for a particular region and time period, usually taken over 30 years. The climate system is very complex and studying it does not only mean looking at what is going on in the atmosphere but also in the ground, oceans, glaciers and so forth. Climate change refers to the long-term shift in global weather patterns that is largely attributed to human activities, particularly the burning of fossil fuels (such as coal, oil, and gas) and deforestation. These activities have released large amounts of greenhouse gasses, such as carbon dioxide and methane, into the atmosphere, which trap heat and cause the planet to warm.



The effects of climate change are being felt around the world, with rising temperatures, changing precipitation patterns, and more frequent extreme weather events such as hurricanes, droughts, and floods. Climate change is also contributing to sea level rise and ocean acidification, which are having significant impacts on marine ecosystems.



While climate has always changed naturally over time, the current rate and magnitude of climate change is unprecedented and is occurring much more rapidly than in the past. This is causing significant and far-reaching impacts on human societies and natural systems, including the loss of biodiversity, impacts on agriculture, and increased risk of natural disasters.



Addressing climate change requires a concerted global effort to reduce greenhouse gas emissions, transition to renewable energy sources, and adapt to the changes that are already occurring.

### Sources of climate change

Major contributors to global GHG emissions are:

Electricity and Heat	25%
Industry	21%
Forestry and land use change	18 %
Agriculture	15%
Transport	13%
Buildings	15%
Waste and waste water	4%

All these sectors consume energy from some of the world's top global emission sources, such as CO<sub>2</sub> from the burning of coal (27%), oil (24%), and gas (13%). CO<sub>2</sub> also comes from land-use change (9%), cement manufacture (4%). Methane and nitrous oxide comes from agriculture (14%), fossil fuels (5%), and waste (3%).

(UNEP Grid-Arendal climate change graphics)



## **CULTURAL HERITAGE**

Cultural heritage refers to the physical and intangible artifacts, traditions, and practices that are inherited from past generations and are valued for their cultural and historical significance. It includes the tangible elements of culture, such as historic buildings, archaeological sites, monuments, works of art, and other physical objects, as well as the intangible elements, such as language, folklore, traditional practices, music, and other forms of cultural expression.

Cultural heritage is an important part of human identity and serves as a record of human history and achievement. It helps to foster a sense of belonging and connection to the past, and provides insights into the social, economic, and cultural conditions of previous generations. Cultural heritage also has significant economic value, as it can attract tourism and contribute to the local economy.

The preservation and protection of cultural heritage is important for both present and future generations. However, cultural heritage is often vulnerable to natural disasters, conflict, and other threats, and preserving it requires careful planning, management, and conservation efforts.

## ALFARO - SPAIN



Alfaro is a small country town in the north of Spain, La Rioja community (world famous for its fine wines) It has a population of 9,800 inhabitants (approx.). The first testimonies of human occupation of these lands are given by the archaeological findings of the Eras de San Martín site, corresponding to the First Iron Age in the 8th century B.C. On this first settlement there is evidence of continuity of the Second Iron Age settlement, corresponding to the culture of the Basques. This settlement must correspond to Ilurcis (Celtic-Iberian settlement), a name that is cited on the occasion of the founding of the Roman town of Graccurrus.

The Roman general Tiberio Sempronio Graco arrived at Ilurcis and, after several conflicts with the town, created a new population nucleus in 179 B.C. The new town would be called 'Graccurrus', the first Roman foundation of the Ebro Valley, and it would become a fortress and municipality in the time of Emperor Tiberius.



The town is well-known for having the largest white stork colony in the world on a single building, San Miguel Collegiate (a clay-brick church built in the 16th century) During breeding season, almost 500 storks nestle on its roofs.



Alfaro's vegetable gardens and fruit trees contribute to the town's economy and also to every home's Mediterranean diet and so do several wineries which produce some of the best wines in the region.



Ecological agriculture is becoming more and more popular in the town. All in all, Alfaro is a nice place to live in and their people are really welcoming and helpful to everyone who comes to visit the town.



## Threats and Preserve Activities of Alfaro

Climate change is a reality and societies have reacted by demanding actions to reduce its impact, increasing their concern about its consequences and placing it on the public agenda. Global forecasts show an increase in temperatures, longer summers and a more heterogeneous distribution of rainfall. In this way, droughts will be more frequent and prolonged and there will be more anomalous phenomena.

These frequent droughts are seriously affecting our Ebro River Nature Reserve where vegetal and animal species are appearing and negatively modifying the ecosystems and somehow destroying them. Crop fields are also suffering the negative consequences of this lack of water and farmers are really worried about what the future holds for their crops.



In this scenario, a wine-producing territory such as that of Rioja is also being affected and winery researchers are trying to find or develop the right type of grapes which are resistant to droughts. On the other hand, paradoxically another major threat to our local cultural heritage is the humidity which is slowly but steadily wearing away the foundations of Saint Miguel Collegiate of Alfaro, as the picture shows. The southwest façade of San Miguel has just begun its restoration. The project seeks to replace the lost or deteriorated bricks in this part of the temple.



But not only droughts are a major danger to our natural and cultural heritage, floods are also quite common in the last few years, possibly as a consequence of heat waves or extreme temperatures.



The regional government is carrying out the Ebro Resilience programme. It is a strategy aimed at implementing the Flood Risk Management Plan in the middle section of the Ebro and improving the ecological status of the river. So that the recovery of normality after a flood episode is immediate and with the lowest possible social costs.



## MASSAFRA - ITALY

The town of Massafra is located in the south-east part of Italy, a few kilometres away from the Ionian Sea and stands on a territory characterized by Karst canyons, caves and rupestrian settlements, called “The Land of Ravines”. It contains a rich treasure of history, art, culture and nature. The ravines originated in the same geological era and were formed by the erosion of limestone rocks. The first inhabitants have been settling down in these ravines since the Neolithic. The two main canyons are “San Marco’s Ravine” and “Madonna Della Scala’s Ravine”.



“San Marco’s Ravine” divides the town into two parts which are connected by a bridge called “Ponte Garibaldi”. From this bridge it is possible to admire a picturesque landscape: stone houses and churches rich in frescoes, rich vegetation and numerous species of birds and insects. This ravine was a refuge for the Byzantines monks in the days of the iconoclasts’ struggle. They developed a veritable village in the rocks with cave-houses (Santa Marina’s village).



Another imposing ravine is “Madonna Della Scala’s Ravine”. It takes its name from a Sanctuary built on the rocks. The ravine is 4 km long, 40 m high and 30-50 m large. It contains more than 150 medicinal plants.



In the ravine there are almost 300 caves, on the west side of it. The most important ones are “The Cyclops' Cave”, used as a market by its inhabitants and “The Cave of the Magician Greguro and His Pharmacy”. Greguro was a magician who lived there with his daughter Margheritella in the year 1000. They collected the herbs and plants from the ravine and prepared ointments for the sick of the village. They kept the herbs in many shelves carved in the rock.

## Threats and Preserve Activities of Massafra

Climate change is deeply affecting our region Apulia as the rest of the world. As a matter of fact, Apulia is registering a strong degradation of habitats with a consequent loss of biodiversity and serious risks for the maintenance of ecosystems. Besides climate change, other heavy causes of degradation are: the destruction of forests, the plundering of seas and soils, pollution, the arrival of alien species.

The affected areas are different: the north of Apulia region has been invaded by many wind turbines which are used to produce renewable energy but that at the same time are transforming the landscape in worse. Also, in the "Land of Ravines", the presence of these wind turbines up to 150 meters high is very remarkable. The turbines are visible many miles away, not only during the day but also at night, due to the hi-tech lights, which are used to lessen the danger to planes and helicopters.



The “Salina dei Monaci” natural reserve is one of the most evocative and exciting places to visit in Salento, south-east Italy.

Separated by a strip of beach from the sea, surrounded by sandy dunes and Mediterranean scrub, it offers a breath-taking view of unique flora and fauna. And it offers the extraordinary spectacle of pink flamingos, which in flocks soar in the sky to glide elegantly in the salt pan. The Salina, populated by numerous species of birds, is an ideal place for birdwatching. It's a staging area for pink flamingos, whose flocks during migration fill the salt pans. In addition to flamingos, the saline is populated by cranes, swans, mallards, wild geese, herons, vultures, kingfishers, woodpeckers and other birds typical of the area.

Efforts are being made to further protect habitats and ecosystems. Biodiversity conservation and management policies have been adopted, aimed at improving the conservation of species and promoting a land development strategy.



Another natural place threatened by climate change is the Mar Piccolo site in Taranto. The place is characterized by the presence of coastal humid depressions, salt pans and a stream.

In the Mediterranean coastal areas, it is of central importance both from an environmental and an economic point of view. The area is characterized by communities of various and complex animal and plant species that determine a high level of biodiversity.



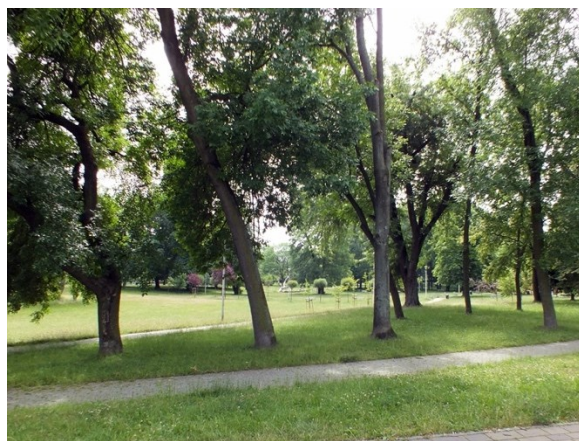
However, the Mar Piccolo site has been influenced by an intense process of industrialization of the city of Taranto which has been classified as an area of high environmental risk. For this reason, new measures have been introduced for protecting the environment and people's health.

## TYCHY - POLAND

Tychy is a town located in southern Poland, in the Silesian Voivodeship. With a population of around 124,000, it is an important industrial and economic centre in the region.



The town is famous for its diverse industrial base. Among other things, Tychy is home to the Fiat factory, which manufactures various car models for the domestic and foreign markets. The car industry is of great importance for the economy of Tychy and the Silesian region.



*(Parks in Tychy)*



*(Paprocany Lake)*



Tychy offers numerous recreational attractions. Paprocany Lake is a popular place with beaches, swimming areas, cycle paths and picnic areas. It is an ideal place for lovers of active outdoor recreation. In the very centre of the town is the old Mary Magdalene Church, which is an important part of Tychy's historical heritage. There is also the Old Post Office, a historic building now turned into a hotel.



*(Mary Magdalene Church and The Old Post Office)*

Tychy also has a flourishing cultural scene. Various cultural events, festivals and concerts take place in the town, attracting both residents and tourists.



## Threats and Preserve Activities of Tychy

Tychy, like many other places in the world, is experiencing the impact of climate change. There is an increase in average temperatures, both on an annual and seasonal basis. Winters are becoming milder and summers hotter. Higher temperatures are affecting various spheres of life, such as ecosystems, energy, tourism, public health and agriculture. Changes in precipitation are also noticeable in the Tychy area. Recently, periods of drought have been observed, but also sudden downpours and more intense rainfall in a shorter period of time, causing flooding.

Climate change also has consequences for local ecosystems. Shifting climate zones affect the occurrence of plants and animals, as well as the migration of species. Some birds do not fly away for the winter, moose move further north in search of cooler weather, and the golden jackal, which has migrated through the Carpathian Mountains, can increasingly be seen in Poland. This leads to changes in the structure of ecosystems and affects biodiversity.

The place where the inhabitants of Tychy are most affected by climate change is Paprocany Lake, located southwest of Tychy. This lake used to be a great bathing area for local residents, but unfortunately it is now affected by blue-green algae, which threatens people's health. Due to the drought and low water flow, the temperature of the lake has risen, which encourages the proliferation and growth of blue-green algae.



*(Thermo-insulation of a building and Electric Bus Fast-Charger)*

In response to climate change, Tychy is taking measures to adapt to the new reality. These include investing in renewable energy sources, improving the energy efficiency of buildings, developing eco-friendly public transport and nurturing green spaces. Tychy has long had trolleybuses and electric buses, and the town is known for its green spaces and surrounding forests.



*(Trolleybus)*

Moving slightly away from Tychy, we can observe two other developments related to human activity. One of them, which also plagues other regions of the world, is forest fires. These pose a serious threat to the environment, public health and infrastructure.



*(Forest Burn Area a few years after the fire)*

They can be caused by a variety of factors, such as drought, high temperatures, lightning, human carelessness, including leaving unextinguished fires, and criminal activity. Forest fires lead to the destruction of forest ecosystems. Plants, animals and habitats are directly exposed to burning or damage. Forest burning can also lead to soil degradation, erosion and reduced biodiversity. Forests burn quickly but grow very slowly.

The second man-made development to be seen close to Tychy is the European Bison enclosure in nearby Pszczyna. Here, in turn, we are dealing with an undoubted human success. An almost completely exterminated species, the bison (*Bos bonasus*), has been restored to nature thanks to captive breeding programmes and is no longer in immediate danger of extinction.



*(European Bison and some deer at the European Bison Enclosure in Pszczyna)*



*(European Bison)*

## DESPOTOVAC – SERBIA

Located in the Pomoravlje District, Despotovac, a town and municipality, is 130 km. south-east of Belgrade. The town has a population of 4,212, while the municipality has a population of 22,995.

Despotovac was first mentioned in 1381 as the village Vojnik, which was under the command of Prince Lazar. The village was inhabited and displaced several times during the Turkish rule. By order of King Milan Obrenović in 1882, it was named Despotovac in honour of the despot Stefan Lazarević.



Despotovac is the center of Gornja Resava. It is located at the contact of the Despotovac basin and the slopes of Beljanica and Kučaj, in an area rich in forests and minerals. The Despotovac Basin is an erosive extension that is tectonically predisposed. It is a clear morphological unit, surrounded in the north by the watershed towards Mlava and Zlatovski heights, in the south by the watershed towards Morava and in the east by the section of the Moravian dislocation. Only the western border of the basin is barely noticeable.



The Resava is a river that runs through Despotovac, and it is a 65 km-long right tributary to the Velika Morava. It also gives the name to the surrounding Resava region, the Resava Monastery, the coal mines in its valley and a popular tourist destination of Resava Cave. Brown trout and chubs live in the river, and a series of ponds have been built along its course where brown and yellow trout are cultured.



## The Manasija Monastery

The Manasija Monastery also known as Resava, is a Serbian Orthodox monastery near Despotovac, Serbia, founded by Despot Stefan Lazarević between 1406 and 1418. The church is dedicated to the Holy Trinity. It is one of the most significant monuments of medieval Serbian culture and it belongs to the "Morava school".



For more than 600 years of its existence, the Manasija or Resava monastery has been demolished and desolated many times. Climate change also damaged the walls and the monastery church. A more extensive restoration was done in 1956, and the restoration continues today. Manasija is owned by the Republic of Serbia and has been declared a cultural monument of exceptional importance.





The effect of accelerated climate change also affects forests. In the region of Despotovac there is the Vinatovača rainforest. What is characteristic of this rainforest is that not only a single tree has been cut down here, but it has not been taken away or moved. Simply, when a tree falls under the influence of snow, wind or old age, it remains in the rainforest, untouched. And that means: completely preserved nature, without the slightest human intervention. It is a strict nature reserve of the first category of state protection. The sign of protection of this natural treasure of Eastern Serbia is represented by hundred-year-old beech trees that have been growing here for more than 350 years. With an impressive height that reaches up to 45 meters and luxuriant green crowns, these trees give Vinatovača a special charm and beauty.





The Prskalo waterfall is located on the slopes of southern Kučaj, in the Nekudovo river valley, 13 km from the nearest settlement Resavica in the municipality of Despotovac, Pomoravski upravni district. The road that leads from Resavica to Cestobrodica passes by the waterfall itself. The height of the waterfall is 15 meters, and an interesting fact is that it is poor in water, even in spring, but it never dries up. The spray resembles a tall, stone sculpture and it is the most unusual natural phenomenon on Kučaj, a conical formation of rocks built from begime deposits that were deposited over the centuries by water flowing through a narrow channel on the very top and a real drop from the most prominent edge. The waterfall itself is quite unknown, partly due to poor promotion, partly due to the fact that during the peak activity of the waterfall, the path to it is almost impassable due to dense vegetation.

### **Waterfall Veliki Buk**



Tucked deep into the slopes of Mount Beljanica in Eastern Serbia, in the municipality of Despotovac, stands the Veliki Buk (“The Great Hum”) or Lisine Waterfall. The waterfall originates from a small river named Vrelo, the right tributary of the Resava river. It’s located at more than 380 meters above sea level and is 25 meters tall. The waterfall is one of the largest in all of Serbia

and was formed due to natural sinter (tufa) accumulation. A shallow pond with crystal clear turquoise water forms at the foot of the falls, surrounded by tufa blocks. The amount of water flowing through the waterfall depends on the weather conditions and seasons, with spring being the best time to visit. The falls and the surrounding landscape is protected as an exceptional natural monument by the Republic of Serbia.

## The Resava Cave



Resava Cave is a cave near Jelovac in eastern Serbia, about 20 kilometres from Despotovac. It is one of the largest cave systems in Serbia, with the corridors about 4.5 kilometres long. The cave is located in the Upper Resava region. The cave is estimated to be 80 million years old while the oldest speleothems date from 45 million years ago. It has four halls on two levels each and the speleothems are coloured in red, yellow and white. Altitude at the entrance into the cave is 485 meters and the lowest point inside is at 405 meters. The cave was formed by the sinking river in the limestone substrate. Cave formations are right at the entry. They are formed through the dissolving of the calcium carbonate.

The colour depends on the mineral through which the water flows: red from the iron oxide, white from the crystallized calcium and yellow from the traces of clay. The symbol of the cave is a massive stalagmite, 20 meters tall and 12 meters wide. After its appearance, it was named the *Statue of Mother With a Child*. The cave consists of 8 halls. In 2020, the survey which began in the mid-1990s, showed that the large cave, and some smaller surrounding caves in the Resava Valley, host 28 species of bats.



Researchers from the University of Belgrade's Biology Faculty calculated that even the smallest bats can eat up to 3,000 mosquitoes per night, which may explain the apparent lack of mosquitos in the Resava Valley and on the slopes of the Beljanica Mountain. Resava Cave was accidentally discovered by the local shepherds in 1962. After being explored for 10 years, the cave was officially opened for visitors on 22 April 1972. Out of its 4.5 kilometres, 2.83 kilometres is explored in detail, while 0.8 kilometres is adapted for the visitors.

## Threats and Preserve Activities of Despotovac

Our cultural heritage needs to be considered in the fight against climate change. It involves a strategic shift towards investment in new forms of development. For example, instead of demolishing old buildings of cultural value, they should be maintained, repaired, reused and retrofitted, which is more climate friendly. Additionally, awareness-raising is needed at all levels of society of the vulnerability of cultural heritage and the increasing threats posed by climate change. There is also a need to further invest in research and education by systematically including cultural heritage in the national education systems and national research programmes.

We see our capacity building activities as opportunities to connect conservation practices based on international standards with the development of business opportunities for the valorisation of cultural heritage while respecting local one's sensibilities. Accordingly, the country provides training not only to representatives of public institutions and non-governmental organizations, but also practitioners and students who acquire new knowledge, skills and attitudes.

Serbia has "Manual on Standards for Developing Cultural Heritage Management Plans" and it represents a further milestone in the engagement of the OSCE in the improvement of institutional capacities for the protection of heritage and the environment that surrounds them. Serbia also has the law on cultural heritage and according to that law, part 3, point 9, '*Cultural heritage in danger is cultural heritage, regardless of its type and whether it has been identified as a cultural asset, if it is exposed to the risk of destruction, disappearance, serious violation of integrity or damage*'. There are institutions for the protection and preservation of cultural heritage and they perform the activity of protection and preservation of cultural heritage in accordance with the provisions of this law and the provisions of special laws regulating individual areas of cultural heritage protection.

## KOLÁROVO - SLOVAKIA

Kolárovo (Hungarian: Gúta, Slovak: Kolárovo) is a town in the south of Slovakia near the town of Komárno. It is an agricultural center with 11,000 inhabitants, out of which 82.6 % are of the Hungarian nationality. The town of Kolárovo is located in the Danubian Lowland at the confluence of the Váh and Little Danube Rivers, only 20 kilometres from the Hungarian border.





Kolárovo belongs to the biggest towns of the lower part of the Rye Island. For the first time the village was mentioned in the documents in 1268. The village was plundered many times. The Kolárovo Castle was built in 1349 to protect fords and the business route. It was built upon the order of Queen Mary and she named it Békevár (the Castle of Peace). In the bill by the king Ladislav IV. from the year 1551 villa Gúta was already mentioned as a little town.

Between 1848-1849 at the time of national-liberating fights, the retreating Austrian troops fired on the town. After the war, according to the Treaty of Trianon, this fully Hungarian territory was separated from the Kingdom of Hungary and became a part of Czechoslovakia. The village was annexed back to Hungary in 1938, but after that it moved to Czechoslovakia again from 1945. After the Second World War, deportations and population changes forced thousands of Hungarian families to leave their homeland (more than 3,000 people from Gúta). Foreign Slovak settlers moved into their houses. In August 1948, the name of the village was officially changed to Kolárovo by the Slovak authorities after the name of a Slovak poet, Ján Kollár.

In the 20th century, Gúta started to develop greatly: the flood defence embankments were built, the railway connecting Komárom with Gúta, the steam mill and the brick factory were built. Gúta was the largest village in Czechoslovakia at this time. The population was very experienced in fighting against the floods, yet in 1965 they were surprised by a devastating flood that is still present in most of their memories to this day. One of the greatest natural disasters in the history of Czechoslovakia was the flood of 1965. Most of the adobe houses collapsed, and the whole country was involved in the reconstruction. Gúta gained its town status in 1967 and a new chapter in its history began.

Gúta currently has four kindergartens, three Hungarian and one Slovak primary schools and one vocational secondary school. In addition to these schools, there is also an art elementary school, a leisure center and an orphanage in the town. Most of the people work in the Austrian-owned cable factory, which manufactures automotive electronics equipment. The world-famous Babetta mopeds were made in Gúta in the 70's and 80's.



The wooden bridge in Kolárovo is the longest bridge built all from wood in Europe. The major part of the bridge is made of especially treated locust wood. The bridge leads to the local attraction – to the floating mill. The water mill is situated in an area with typical fauna and flora, lots of protected animal species live here. There is a dead-end channel of the river Little Danube which is very rich in fish. Lots of organizations try to preserve this beautiful natural area, e.g., the Ornithological society.

## Threats and Preserve Activities of Kolárovo

Kolárovo is located in the Csallóköz, the largest river island in Europe. It is bordered by rivers: the Danube to the south, the Little Danube to the north and the Váh to the east. This area is famous for its rare and protected birdlife. It is one of the most strictly protected landscape units in Slovakia. In 1993, the marshlands of the Csallóköz were declared a Ramsar site. The Ramsar Convention is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. Captain Jacques Cousteau, the famous French explorer, also visited the area.



Kolárovo's cultural and natural heritage is also located in this protected area: the Dögös nature reserve and the main attraction of Kolárovo, the water mill. Unfortunately, climate change is negatively affecting their condition. In the Dögös nature reserve is the Little Danube estuary, which was a navigable, living river until the 19th century. In the 20th century, however, no care was taken to clean it, and it became completely silted up and unnavigable. The river was therefore diverted, turning this stretch of the river into a backwater, home to an incredible number of rare and strictly protected plant and animal species in the last century. Today, however, it is in danger



of drying up before our very eyes, along with the two artificial lakes that run alongside it. Fish kills are common, and the number of animal species is declining, with fewer nesting birds and changes in behaviour. For example, storks do not fly to Africa, but stay here for the winter. The drastic decline in the number of swallows may have led to a previously rare mosquito invasion in the region.

Lots of organizations try to preserve this beautiful natural area. Enthusiastic volunteers also organize annual environmental days to clean up the area around the estuary from the huge amount of rubbish. Students from our school also take part in these activities every year. The Ornithological Society does a lot to save the bird species living in the area. There is also an ornithology workshop at the local leisure center, which is attended by our students. They are involved in bird ringing and in the creation of bird habitats in the Dögös area.

The most beautiful attraction of our town is the water mill. It is situated in the DÖGÖS nature reserve. The mill is accessed by the longest completely wooden covered bridge in Europe. In the area of the mill there is a folklore open - air museum. Directly at the mill, a water milling museum was established which features exhibits including a unique machine for production of fishing nets, one of the first in the world. The boat mill is also among Slovakia's national cultural heritage sites.





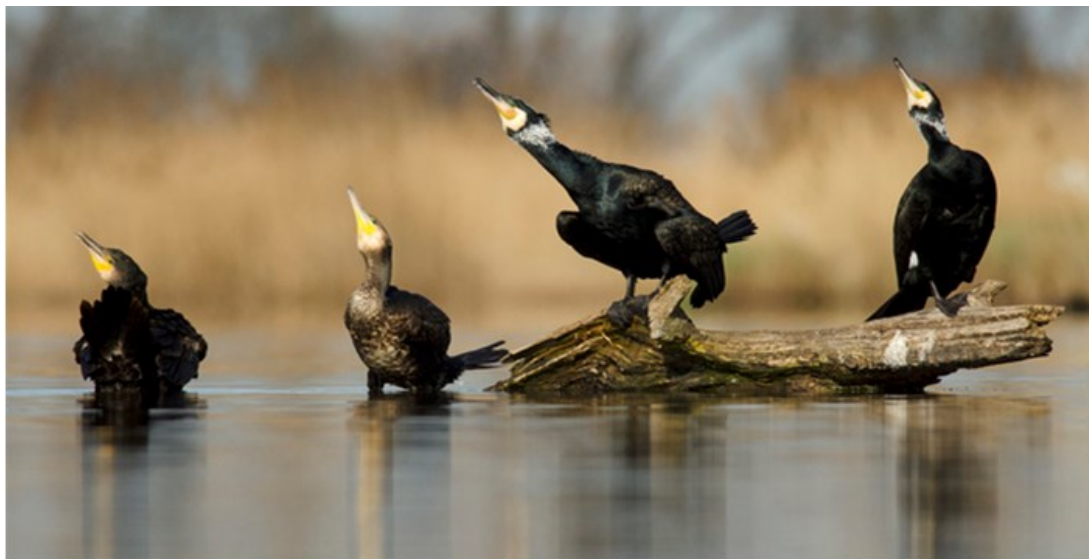
The milling industry in Csallóköz is one of the ancient professions, the first structures were built sometime in the 8th - 9th century. Over time, hundreds of mills were functioning on the rivers of Csallóköz. As I speak now, only three of them remained. One is located in Gúta/Kolárovo. As time passed, the mills increasingly lost their significance, meanwhile the steam mills took their place. Later on, engine-driven mills as well as electric ones appeared.



The original mill was built in 1920 which was standing on a two parallel floating, anchored boat. It was operational until 1945, but it burned down under mysterious circumstances.

People started rebuilding it in the 70s, the construction was finished in 1982. Eventually, the mill took its final place in 1995, ever since that, it's a part of the national cultural heritage. At the moment, it is functioning as a Mill Museum, but the reconstruction and maintenance cost a ton of money since it's permanently in water. In this manner, the timberwork quickly gets messed up. This year, the replacement of the mill - wheel cost 30,000 euros. The water mill association also arranges environmental programs for the student groups. The main mission for this association is to teach today's generation about organic education/ecology.

Ongoing climate change affects each of us. Therefore, it is crucial to be able to identify problems and implement the right adaptation and mitigation measures.



## KÜTAHYA- TÜRKİYE

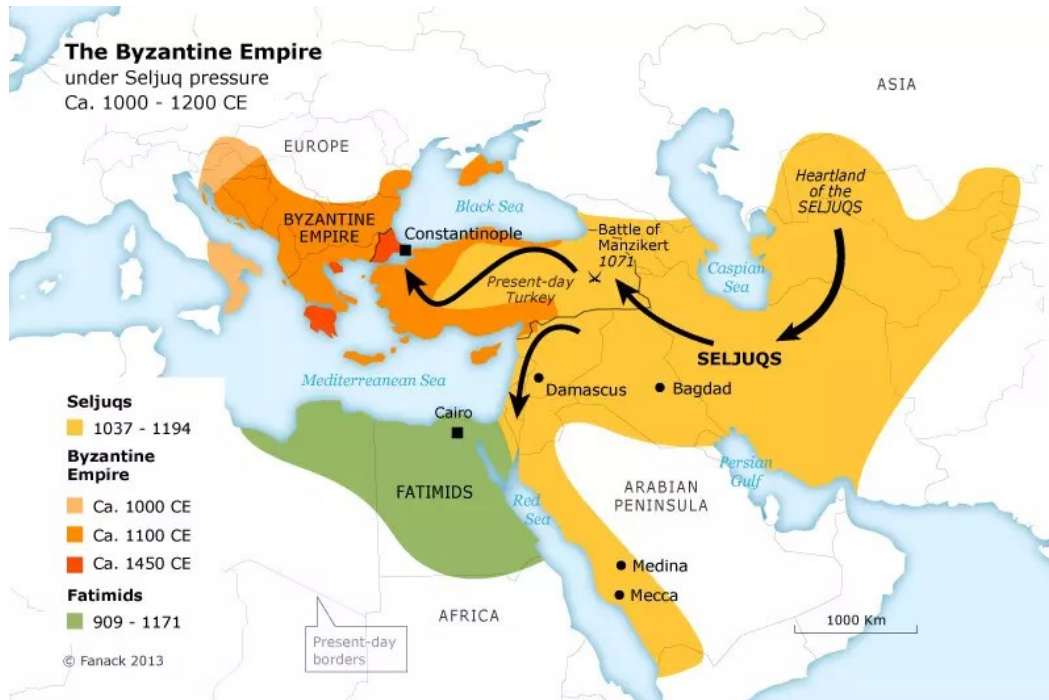
Kütahya is a city in western Anatolia which lies on the Porsuk River, at 969 meters above sea level. It is the seat of Kütahya Province and Kütahya District. Its population is 263,863 (2022). The region of Kütahya has large areas of gentle slopes with agricultural land culminating in high mountain ridges to the north and west.



There's no certain information about how Kütahya was founded but it's believed that Kütahya is a city around 3,000 years old. According to the ancient documents; Kütahya used to be called Kotiaeon, Cotiaeam and Koti in the olden days. The Phrygians are known to be the first people to have settled in the county area. The Phrygians, who came to Anatolia in 1200 BC, entered into the lands of the Hittite Empire and then formed a state. Later on, the Kimmerians defeated the Phrygia king Midas III and conquered Kütahya.



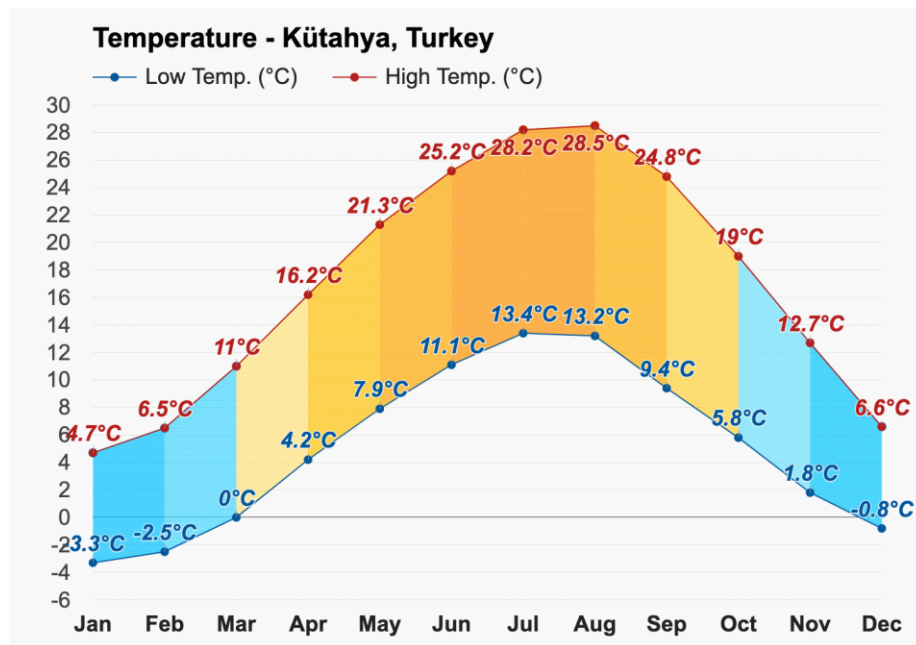
During the centuries Kütahya had been home to many cultures till in 1078, Shah Suleiman the son of Kutalmış who founded the Anatolian Seljuk State conquered the city.



Later on, it was given to Beyazit the son of Ottoman Sultan Murat I. in 1277 by Gıyaseddin Keyhüsrev II. It was a dower of Devlet Khatun by Germiyans for the Ottomans.



A small ewer, now in the British Museum, gave its name to a category of similar blue and white frit ware pottery known as “Abraham of Kütahya Ware” dated 1510. The industries of Kütahya have long traditions, going back to ancient times. Kütahya is famous for its kiln products, such as tiles and pottery, which are glazed and multi-coloured. Modern industries are sugar refining, tanning, nitrate processing and different products of porcelains and tile.



Kütahya has a warm-summer Mediterranean climate or a warm-summer humid continental climate, with chilly, wet, often snowy winters and warm, dry summers. Precipitation occurs mostly during the winter and spring, but can be observed throughout the year.

## Aizanoi Ancient City



This city is in the Çavdarhisar township, 57 kilometres from Kütahya city centre. The city experienced its golden age in the second and third centuries AD and became the center of episcopacy in the Byzantine era. The city has a temple built for Zeus which is the best-preserved temple in all of Anatolia. There is also a large theatre and a stadium adjacent to the theatre. There are two Turkish-style baths, one of them decorated with mosaics, plus a gymnasium, five bridges on Kocaçay which are still used today, an old dam, a trading building, and avenues with columns on both sides, the necropolis areas and the sacred cave of Metre Steune. The German Institute is still carrying out excavations in the city.

### The Temple of Zeus

Recent excavations have shown that layers of remains from the early years of the area were displaced to build the Temple of Zeus. Ceramic pieces dated to the Early Bronze Age were found at the level of the temple courtyard. The rubble from the removed layers was used to fill the temple area. The construction of the temple began in the second quarter of the second



century. The money needed for the temple's construction was met by renting out large temple fields. However, the people who rented these fields resisted paying any money for many years. The construction started only when the rents were paid under the instruction of the Emperor Hadrian.



The correspondence between the city and the Emperor on this subject was so important for Aizanoi that it rests in the northern side of the pronaos (front gallery) of the temple. On the outside of the same wall, there are long inscriptions. This inscription talks about Marcus Apuleius Eurycles, whom we know from the bridge inscription. The inscription praises Eurycles' virtues and his contributions to the city.

### **Stadium and Theatre**

The combination of the stadium-theatre in Aizanoi is unique. Excavation and research carried out from 1982 to 1990 showed that the construction of the building started in 160 A.D.

and continued until the middle of the third century A.D. During repairs to the eastern side of the entrance to the stadium, a number of inscriptions were found and placed in their original places.



The inscriptions tell us that Marcus Apuleius Eurykles, mentioned in the inscriptions of the main bridge, also made substantial contributions to the building of this complex.





### **Avenue with Columns and The Door Building**

The avenue with columns was the main axis of Aizanoi's city road system. This 450-meter-long road was discovered in a series of drillings in 1991. This avenue with columns was excavated in 1979, and remains of the door building which form the southwest end of the road are visible. This avenue was a part of the ceremonial road leading to the Metre Steunene sacred area outside the city after passing through the main bridge.



## Stock Market Building

On the walls of the round building (macellum) that is used as a grain bazaar in the second half of the 2nd century A.D., there are inscriptions that show the price lists of the all goods sold in the bazaars of the empire, rate settings made by Emperor Diocletian in 301 A.D. in order to fight against inflation. This building, considered as important due to providing accurate information about the architectural development and social life of the town, is identified as the first stock market of the world.

## Kütahya Castle

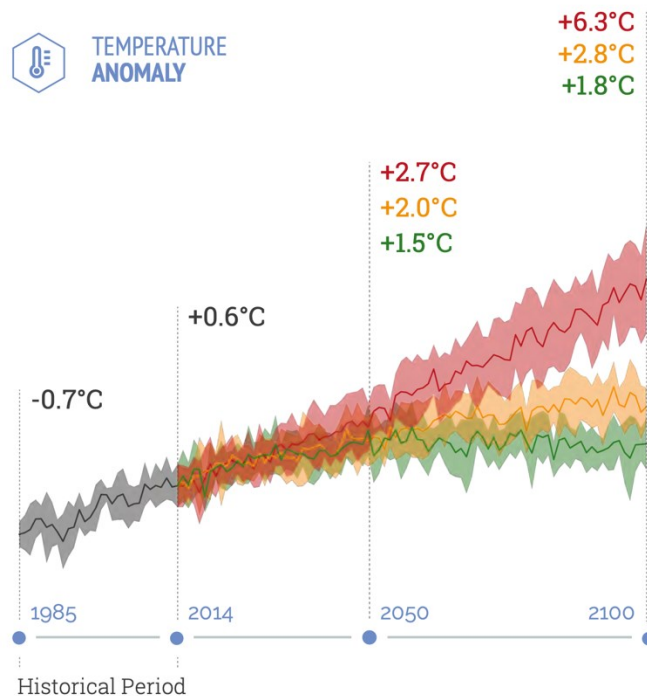


Having been housed since the ancient period, the Castle was reinforced with the fortresses built by Byzantines in the 5th century, the restorations and additions by the Germiyans and Ottomans. There are also two fountains, two prayer rooms, a rotating restaurant built during the period of the Republic and a coffee in the rural area at the Kütahya Castle.

## Threats and Preserve Activities in Kütahya

Türkiye presents a complex climate: the southern and western coastal areas have a Mediterranean climate whereas the eastern part adjoining Syria and the Middle East are very hot during the summer. Such complexity depends on different factors among which a variable topography, the presence of the Black Sea to the north and, beyond that, the vast Russian plain which in winter acts as a source of very cold air.

Türkiye's annual and maximum temperatures are rising, and 2020 was the third hottest year on record. Türkiye will be greatly affected by climate change, and is already experiencing more extreme weather, with droughts, floods and heatwaves being the main hazards. In its 2021 report, the U.N. Intergovernmental Panel on Climate Change (IPCC) concluded that Türkiye will experience three accelerating trends: rising temperatures, dehydration, and rising sea levels. Thus, the country is likely to experience more frequent and more severe weather conditions throughout the year.



By 2050 temperatures are predicted to increase by 2.5° Celsius in east and central Türkiye, and by 1.5° Celsius on the coasts. Temperatures exceeding 40° Celsius are expected in the summer for extended periods.

The temperature difference between night and day is very high and this situation destroys the stone and marble parts of the cultural heritage areas of Kütahya city. The city managers prepare a special tree planting campaign with the schools and associations to raise the green areas in the city center to solve this problem because the green areas prevent high temperature differences during the day.

The Kütahya city located in the Aegean Region and climate change effects can be seen clearly by the city dwellers. According to the city management system of the Türkiye, the city is managed by the local managers, city governor and municipality president. All the managers have great cooperation to reduce the effects of climate change and protect the cultural heritage areas.



