

Factors that Contributed to Kyrenia's Establishment

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Abstract – The main objective of this study is to determine the geographical factors that played a role in choosing the location of the city of Kyrenia during the Neolithic Era. To this end, the factors that affected the decision about the location of the city of Kyrenia, the physical and human geographical characteristics, and the interaction of these characteristics with each other, were studied from a geographical perspective. The research began with a literature search. Research was conducted at the TRNC National Archives, university and public libraries, State Planning Organisation Statistics and Research Department, Geology and Mines Department and similar government offices and among international electronic articles. The physical geographical characteristics were supported with field studies. Maps were created using the ArcGIS 9.3 programme. In light of the collated data, it could be said that the economic activities constituted the most important factor that played a role in the establishment of the city of Kyrenia. It is also thought that the Kyrenia-Nicosia mountain passage and the Kyrenia Port have increased the city's hinterland and allowed it to become the administrative centre of the northern coastal plain.

Keywords – Cyprus, Kyrenia, Site Selection, Neolithic, Port City, Geopolitical.

I. INTRODUCTION

Kyrenia is one of the most important cities of Cyprus, which is the third largest island in the Mediterranean. The city has been established on the northern coast of the Kyrenia Mountains that run on the east-west direction. The city of Kyrenia, which is located almost in the centre of the northern coastal plain that runs as a narrow strip



Fig. 1. Location of the city of Kyrenia

parallel to the Mediterranean and the Kyrenia Mountains (Figure1) is in the position of an administrative centre of the District of Kyrenia. Another important characteristic of the city is that it provides for road transportation between the settlements in the northern coast and the Mesaoria Plain, and the capital Nicosia.

“The spread of humans across the world and how this expansion took place still remain a secret, and our

knowledge about the issue does not go beyond certain theories and guesses” [1]. But with the development of palaeontology, the aging and characterisation of fossil remains and the development of archaeology, the physical remains of Primeval people have been studied and we have some information on the culture and life styles of the time.

Thanks to the work by both disciplines, we have information about the natural habitat and human life relating to the old ages. Drawing information from the aforementioned disciplines, [2], who works on the issue, states that the first visitors of the Island were the Mesozoic hunter-gatherers. However, due to the insufficiency of scientific work, there is no healthy information on which regions of the Island were inhabited by the Mesozoic people. At the same time, [3] in a research she conducted, states that Swedish archaeologist Einar Gjerstad and his team believe that Cyprus history dates back to the Neolithic period and that these people may have arrived from Anatolia. Even if it is proven that the first settlement in Cyprus took place in the Neolithic era, there is no concrete information about the establishment of the city of Kyrenia. [4] and [5], in their work, state that the establishment of the city dates back to 10th century BC according to environmental findings. They go on to say that, according to other sources, the city was established in 6th century BC by Persian King Cyrus, who seized the Island from the Egyptians. The same scientists state that according to the Lycophron records that date back to 586 BC, the city was established by Kephas or Kepheas, and that the people, led by Kephos, who came to Cyprus from the Dyme (Oleno) and Bourarais towns in the Achea region of Greece, gave the name Kyrenia to the place they settled in. They also state that the fact that one of the cities in the Achea region in 756 BC was called Kyrenia supports this argument.

Various factors played a role in the growth and development of Kyrenia. Without a doubt, the most important among these factors were the overseas trading activities and the Kyrenia Castle, which was built to ensure the security of the city and the port. [6] states that this castle was built by the Byzantines to protect the city from the Arab raids that began in 7th century AD. He also states that the city came to the forefront during the period of the Lusignans (1149-1489) (Figure 2). “The city was formed by encircling an area about twice as big as the castle with walls” [7]. [6], in the same study, states that the walls, which maintained their importance until the Venetian period (1489-1570) lost their function with the invention of gun powder and were destroyed to allow for the development of the city. This provided a basis for the current urban texture of Kyrenia and the city was able to expand more easily. [8], in his research, states that during

the Ottoman Empire period (1571-1878), Kyrenia expanded towards the south, and during the British period (1878-1960), Kyrenia functioned as the Island's northern port (Photo 1). Being the closest port city to the capital and with the economic opportunities provided by the British, Kyrenia expanded and grew in all directions. In the same study, [8] states that with the establishment of the Republic of Cyprus in 1960, Kyrenia continued to develop both in terms of commerce and tourism, and that in early 1990s, with the completion of the New Kyrenia Port, transportation activities increased. The historical Kyrenia port continued to serve as a marina.



Fig. 2. Kyrenia Castle and city walls (AD 1300, Turkan 2008)



Fig. 3. Kyrenia and its harbour in 1940 (Catselli, n.d.)

We see that some areas of settlement in Cyprus and in the world have developed and grown, while other city-states could not develop due to various factors and have been abandoned. Although Kyrenia was established initially as a small coastal and portal settlement, it became the most important city of the northern coastal plain due to the transportation, military, commercial and strategic importance of its location. In a census in 1881, the population of Kyrenia was recorded as 1,192 [9]. The fact that the population was 33,207 in a census in 2011 [10] can be considered as an indication of this. Separately, a research by [11] shows that in 1987, 82,462 passengers and 2,708 vehicles were transported from the Kyrenia tourism port, while in 2010, these figures went up to 172,098 passengers and 34,283 vehicles. The various tourist resorts and two active universities with student

capacities of more than 10,000 indicate that the development of the city is continuing.

II. FACTORS THAT PLAYED A ROLE IN THE ESTABLISHMENT OF THE CITY OF KYRENIA

1) Physical Characteristics

Geological and Geomorphological Characteristics

The rock groups around Kyrenia are made up of different rock formations from the periods of Mesozoic-Quaternary. The current sediments that are of these rock formations have been important in the development of fertile soil in the coastal plain and have contributed to the agricultural activities during the establishment of the city of Kyrenia. Fissured and permeable rocks such as calcarenite, argillaceous limestone, breccia, recrystallized limestone and dolomite in Kyrenia and its surroundings (Figure 3) increased infiltration, while impermeable rocks rich in clay, such as flysch, limited the infiltration and played a role in the formation of underground waters and resources. The aforementioned rock groups in Kyrenia and its surroundings are considered to have played a role in the choice of location of the city of Kyrenia since they allowed for water supply and agricultural activities.

Kyrenia was established on the Kyrenia Terrace, which has the widest dispersion among the Quaternary coastal dunes and marine terraces. The Yılmazköy (Kythrea) formation, which forms the base of the Kyrenia terrace, is composed of series of clay, sand and marl layers. Over this formation lie the permeable and fissured Kyrenia calcarenites of 3-5 m [12]. Late quaternary calcarenites are sandy, low-angle and high-angle cross-layered, and highly bioturbated. They consist of pebble pockets or thin layers [13].

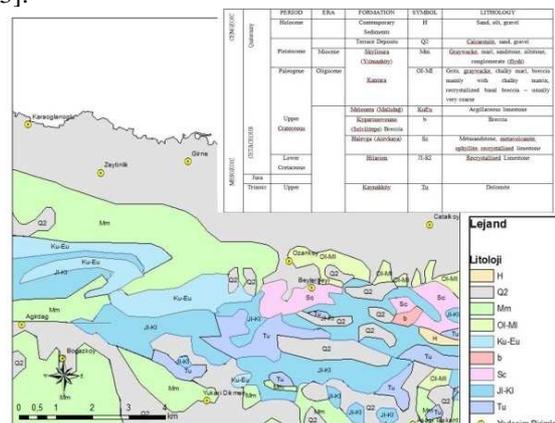


Fig. 4. The geological map of Kyrenia and its surroundings (using Constantinou, 1995).

The slope value is one of the determinative factors in the choice of a place of settlement. According to [14], areas with slope values lower than 4% are considered as plains, and all kinds of human and economic activities can be conducted on such plains. [15] states that people in the old ages chose topographies with low inclinations such as terraces as settlements since such topographies allowed for grazing animals and engaging in grains agriculture. In the field of study, the inclination values vary between 0°-4°.

These figures relatively increase only in regions where there are cliffs (Figure 4). The streams from the Kyrenia Mountains to the south of Kyrenia, especially during the pluvial ages, accumulated in the Kyrenia terrace and formed the coastal plains composed of fertile soils. This topographical surface, which is slightly slanted, allowed for the establishment of the city and the growth of economic activities.

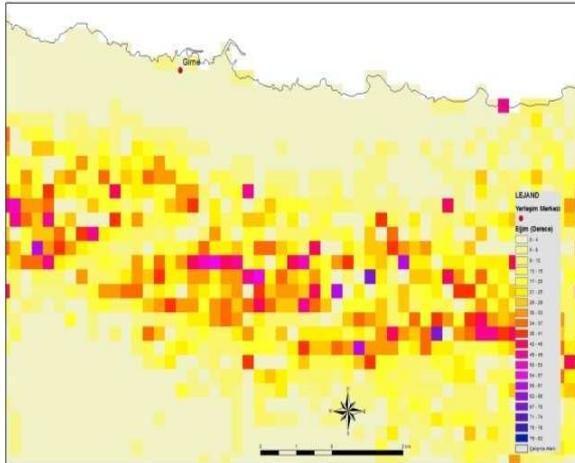


Fig. 5. The slope map of Kyrenia and its surroundings



Fig. 6. Kyrenia-Nicosia Mountain Passage

Another geomorphological characteristic that played a role in the development of Kyrenia into a city of current scales, is the Kyrenia-Nicosia mountain passage, which is the shortest route that connects Nicosia - in other words, the interiors - with the coast (Figure 5). The Kyrenia-Nicosia Mountain Passage is 5 km to the south of the city of Kyrenia. It is possible to say, according to measurements based on the Map, that the length of the mountain passage is about 3200m, its depth is about 420-480m and its width varies from location to location.

[16] States that this mountain passage was formed in the Late Miocene. In the same study, [16] says that due to the uplift of the Orogenic period, the stream here was nestled into the basis to open up the passage. With the uplift that continued, the passage diverged from the marine terraces and, in time, the upper part of the valley was filled with alluvion.

Parallel with the development of land transportation in the 20th century, and with the presence of the Kyrenia

mountain passage, the hinterland of Kyrenia expanded to Nicosia and its surroundings. This further increased the importance of Kyrenia and accelerated the development of the urban functions of the city.

CLIMATIC CHARACTERISTICS

[14] State that the climatic conditions are the most important factors in the distribution of cities in the world. Favourable climatic conditions do not limit human activities and therefore, allow the settlements to grow and develop. It is known that with subsequent climate changes many civilizations have suffered serious regress and some have collapsed. In fact, [17] state that the drought during the Late Bronze Age (BC 1200s) led to the regress and collapse of many civilisation in the Eastern Mediterranean. The paleontological studies conducted for this period have led to different views about the climatic conditions of the Mediterranean basin. For example, [18] and [19] have determined from data from Egypt, Tunisia and Morocco, that during the Early Holocene Period, the Eastern Mediterranean Region had a more humid climate. However, [17] argue that there were centuries-long shifts in the climate throughout the Holocene Period. According to [17], the pollen analyses at the Salt Lake in Larnaca in the southern part of Cyprus, show that 3200 years ago there was a drought on the Island for a period of 300 years. Two different plant formations were found in the pollen analyses: the Mediterranean forests and arid steppe formation. Two levels of steppes were determined on the Mediterranean forests, which started to wane during 1450 BC. The first level of arid steppes were defined to be dating back to 1450-1350 BC, and the second one, to 1200 BC. In that case, it is possible to state that more arid climate conditions prevailed during the period to which these arid steppes date back. [19] determined the agricultural activities of the early Neolithic from the pollen analyses conducted at Ifri Oudsidene in North-eastern Morocco. In light of all these different views, we may say that although there were climatic changes in the Mediterranean, the climatic conditions allowed for humans to sustain their lives in the Mediterranean as well as in Kyrenia.

The lack of information about the paleoclimatology at the field of study needs to be overcome in order to be able to give a more detailed information on the climatic conditions during the time of establishment of the city of Kyrenia. The pollen and fossil analyses that will be conducted in this respect would be vital in determining the climatic conditions of that time, and their direct and indirect impact on the establishment of the city of Kyrenia.

Hydrographical Characteristics

Water resources are vital for the continuation of life. Humans have been settling close to water resources since ancient times in order to meet their daily needs and carry on with their economic activities. Undoubtedly, the presence of water resources played a big role in the establishment of the city of Kyrenia. In this respect, the hydrographical characteristics – the streams, underground

waters, and resources - of Kyrenia and its surroundings have been studied.

There are many streams in the south of the city of Kyrenia that run parallel to each other in the north-south direction, which originate from the Kyrenia Mountains that run in the east-west direction (St. Hilarion Peak 786 m). The main streams, which formed wide river valleys during pluvial periods, are Kalafa Stream, Pamukçalı Stream, Değirmenbaşı Stream, Sarnıç Stream and Kocatarla Stream from the west to the east (Figure 6). The mentioned streams met the water needs of the first humans to inhabit Kyrenia, while at the same time, they drained the waters from the mountains and rendered the settlement to be safer from floods.

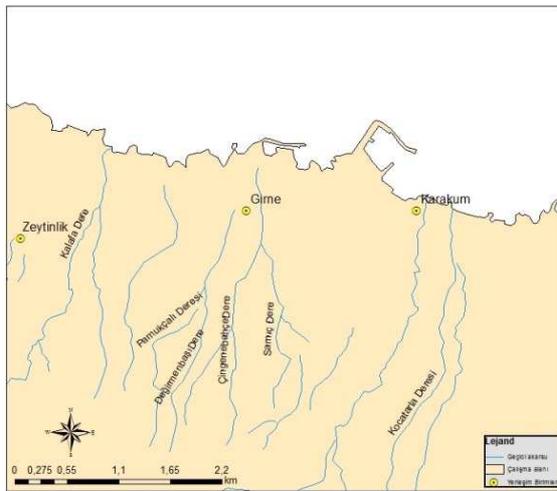


Fig. 6. Drainage map of Kyrenia (Using the Kyrenia city plan [2006]).

The underground water resources in the field of study is the Kyrenia Mountains Aquifer, which is the most important drinking water resource of North Cyprus. Almost 50 per cent of the drinking water needs of the Turkish Republic of Northern Cyprus are met from this aquifer [20]. Underground waters have had a vital importance in Cyprus since ancient times. So much so that [21] prove in their study that Early Neolithic wells considered to be dating back to 8000 BC were used in Kissonelgra-Mylouthkia and Shillourocombous in the south of Cyprus.

The lithological structure of the Kyrenia Mountains allowed for the formation of many water resources such as slope resources, karstic resources and fault springs, which have vital importance in sedimentism. For example, in his study, [22] states that the cliff on the eastern bay of the Kyrenia Castle, is made up of two different rock formations. According to [22], the one that is coloured grey and brown is clay and it is protectively layered by calcarenite. "During pluvial periods, the waters leaking through the calcarenites formed springs as they reached the impermeable clay layer and met the fresh water needs of the people. However, at the present time, some 70 springs from the Kyrenia Mountains karstic aquifer have dried up in the last 20 years, due to the frequent dry spells" [23]."

Flora and Fauna

[24] states that the climate in early Holocene was more humid and wet compared to today, and parallel to this, [25] states that Cyprus was once completely covered in forests. Eratosthenes (BC 276 - 196) also gives important information about the forests of Cyprus. Eratosthenes states that not only the mountains but also the plains of Cyprus were covered in forests and therefore, the soil, which is completely covered with trees cannot be cultivated. Separately, [26] states that although lumbering increased due to the copper and silver mines and for use in shipbuilding, the expansion of forests could not be prevented and that the people on the Island were allowed to cut trees and use the land cleared of trees as their own. It can be said that during the period when the city of Kyrenia was established, a higher variety of plant species that grew in more humid climatic conditions were found on the Island. The fact that the flora was so abundant, and the humid climatic conditions at the time of establishment of the city provided for a suitable environment for animals to survive and reproduce. Archaeological findings dating back to the Neolithic Period prove the existence of wild animals such as deer - [2]. There is no doubt that climate and flora provide for favourable conditions for wildlife to develop. Therefore, even if the flora and fauna characteristics did not play a direct role in the selection of location of the city of Kyrenia, they are important in providing for favourable conditions during that period.

Soil Characteristics

Another factor that plays a role in the selection of the location of a settlement is undoubtedly the soil characteristics that would allow for agricultural activities and the survival of natural flora. The soils in the field of study are sandstone, calcereous clay with interlayers, and calcareous clay. All the profiles of soils formed on lands that are almost flat, are brown, highly calcareous and of clayish loamy texture. Lime washing and petro calcic horizon thus created are present in the cross section. There are no obstacles of semi angled block structure in the solum, which limit crop production. However, high levels of lime content negatively affect the absorption of some nutrients" [27]. In fact, soils spread over Kyrenia Coastal Plain are "well-developed, fertile soils with a minimum thickness exceeding 30 cm" [28]. If the fact that the field of study focuses on an area with fertile soils today, is taken into consideration, then it would be possible to conclude that the soil characteristics of the city of Kyrenia were more fertile for sustainment of agricultural activities, and growth and expansion of natural vegetation. Hence, the rich vegetation on the island as well as in the Kyrenia Coastal Plain due to a more humid climate during the early Holocene, enriched the soil in terms of organic matter. Based on all of the above, it is understood that soil characteristics were another factor that played a role in the establishment of Kyrenia.

Human Characteristics

Geopolitical Characteristics

The Island of Cyprus is situated at the crossroads of the continents of Asia, Europe and Africa at a significant strategic position in the eastern Mediterranean (Figure 1).

The major evidence of the critical strategic location of the island of Cyprus since old ages, is the fact that it had been under the rule of several major civilisations and states such as Egyptians, Hittites, Persians, Ptolemaic Dynasty, Romans, Byzantines, Lusignans, Venetians, Ottomans and British. The Island of Cyprus was situated in such a crucial geopolitical location that Portuguese Josef Nassi told Selim III in 1570 that: "If you occupy the island of Cyprus, you will easily dominate Asia Minor, Syria and Egypt" [29]. The Island of Cyprus was established on territories that known today as Syria, Egypt and Turkey in the Neolithic Age and after. It served as a military base for ancient civilisations to thwart threats from the north, namely Europe. This further increased the strategic importance of the Island.

The number of vessels sailing in the Mediterranean increased along with the increasing maritime trade during and after the Neolithic Age. [30] states that prior to the invention of compass, vessels used to sail by taking the coasts as reference. They also stopped by the coasts in order to meet their needs. The fact that there was no other island in the Mediterranean that could serve for this purpose added to the strategic importance of Cyprus and its cities. That is why Cyprus' geopolitical characteristics had significant impact on both the establishment of new settlements in Cyprus and of the city of Kyrenia, and on civilisations that wished to dominate trade in the Eastern Mediterranean.

Another important factor, which added to the value of Cyprus along with its cities throughout history, was its rich resources. These rich resources constituted a copper mine and timbers. Cyprus became the frequent destination of various civilisations. International trade developed on the island by virtue of processing its copper mine and copper exports during I. and II. Millennia before Christ [28]. This initiated Cyprus' transformation into a centre of geo-economic attraction [31].

On the other hand, there are no findings relating to the geopolitical approach adopted by those, who settled in Kyrenia's Coastal Plain and the area where the city of Kyrenia is located today, during the Neolithic age. Meadows, water, and agricultural land necessary for the first people, who started farming and animal breeding, besides hunting and gathering, were present in the area. However, the first settlers of the northern coastal plain – the most strategic location – did not initially notice that. The strategic location of the city stems from the fact that it is established at the closest coastal point to the Kyrenia mountain passage. Thus, Kyrenia Coastal Plain is in contact with the Mesaoria Plain and the capital city Nicosia through this mountain passage that runs through mountains that are 1000 m high and extends its hinterland to the Mesaoria Plain. This characteristic of the city enabled it to be the largest and the only settlement with urban functions in the Kyrenia Coastal Plains.

Economic Activities

One of the major factors influencing people's selection of location was economic activity, as is the case today. One of the major fields of economic activity was hunting and gathering prior to the Neolithic age. This used to be an

important means of living for people, who did not engage in agricultural activities. Even though people started farming and animal breeding activities during the Neolithic age, they also continued hunting and gathering activities. It is known that Cyprus offered various opportunities, both as a whole, as the Kyrenia Coastal Plain, and in the city, to its first migrants for hunting activities. The rich vegetation and water resources arising from favourable climate conditions on the island created a habitat for prey animals. Archaeological studies specify that the "first migrants, who came to the island from the continent, brought along prey animals such as fox and Mesopotamian deer" [2]. [3] states that fox and deer bones, believed to have been brought to the island during the Early Bronze Age (2500 BC), were found during the excavations carried out in Tatlısu situated on the east of Kyrenia Coastal Plain. In light of these data, it would be possible to say that climate conditions needed by prey animals to survive were present, and therefore hunting activities used to take place. Gathering activities were also an important means of living besides hunting for the people of the time. Archaeological research shows that "Islanders produced spices by collecting wild mustard from the nature and used this plant in producing medicine". Therefore, gathering activities were also present.

[2] States that the island was uninhabited during the X. millennium before Christ. In this case, those who migrated to the island first, encountered untouched vegetation. This enabled animal breeding activities during the Neolithic Age. Archaeological findings show that people, who encountered a rich vegetation carried out animal breeding activities. [2] states that the analysis carried out in pig, cattle, sheep and goat's bones thought to be brought to the island by migrants showed that these animals were entirely domesticated during the 8th millennium before Christ and his study proves that animal breeding activities took place on the island throughout that era.

One of the major characteristics of the Neolithic era was the farming activity that was initiated by people, who adopted a sedentary life. Both the island of Cyprus and the Kyrenia Coastal Plain are covered with fertile soil. This characteristic of the island played a significant role in the initiation of Cyprus Neolithic age and its development. Data obtained through archaeological studies confirm that people, who lived on the island and around Kyrenia engaged in farming activities during the Neolithic age (9th millennium BC). The fact that "the durum wheat seeds originating from the Near East dating back to the end of 9th millennium BC, found in archaeological excavations held in Kyrenia – Tatlısu are of domestic characteristics in terms of their morphology" [2] supports this view.

People, in choosing another geographical environment, preferred coastal areas due to the living conditions. [1] states that some human groups switched to marine environment from territorial environments as a consequence of developments taking place in the Neolithic age, such as building small boats, weaving baskets and nets from fibre, and making tools out of animal bones for fishing. These allowed for the development of fishing

activities. Presence of almost full skeletons of sea turtles, bones of large and deep-sea fish such as sharks and tuna fish, and bones of smaller shallow sea fish show that fishing activities in Kyrenia were developed [3].

It is also possible to state that shipping was also developed in the island besides fishing during the Neolithic age and the eras that followed. Considering the facts that Cyprus used to be a deserted island and that the first people to arrive came from the continent, it can be stated that the first migrants who came to the island were acquainted with shipping activities. Furthermore, the fact that migrants brought along “animals that could be considered big animals, such as pigs and cattle” [3] demonstrates that shipping activities were successfully practiced.

Living conditions that improved with the Neolithic age, led to a decrease in mortality and morbidity rates, and to an increase in population and production. This also led to the development of first settlements consisting of small villages initially into larger and more populated settlements and allowed for the rise of various economic activities, such as trade. These developments based on economic values increased trade activities with civilisations around the cities of the island. As a matter of fact, the first timber contract that is believed to be one of the oldest was concluded between Egyptian Kings and people of Larnaca. Thereafter, Phoenicians and Alexander the Great used Cyprus timbers in building their navy [25]. Valuable timbers of the island and the fact that they were traded overseas rendered Cyprus important and laid the ground for establishment of the city of Kyrenia.

III. CONCLUSION

There are many factors that were influential in selecting the location of the city of Kyrenia, which has been established as of the Neolithic age and still continues to develop. Its flat and near flat topography, presence of a coastal form convenient for building a harbour, the fact that the surface allowed for creation of ground and surface resources, presence of Pamukçalı River in the west along with the Sarnıç Rivers in the east, fertile agricultural lands carried forward and collected by streams during the pluvial age, a more humid climate during the Neolithic age compared to now, and its natural environmental characteristics such a rich vegetation were among the leading factors regarding the selection of the location for the establishment of the city of Kyrenia. While such natural environmental characteristics that allowed for economic activities influenced the establishment of the city of Kyrenia on the one hand, they also led to the expansion of the city. For example, the Kyrenia Coastal Plain, which was covered with arable land, and the several streams coming from Kyrenia Mountains and passing over the plains to reach the sea, along with spring waters, facilitated agricultural activities.

Moreover, the geomorphological structure of the surroundings of the city of Kyrenia, its natural vegetation and climate characteristics facilitated animal breeding activities on the one hand, and positively contributed to

hunting and gathering activities. Fishing and shipping activities of the people of the Neolithic age, who had limited economic activities, are considered to be another important factor having affected the establishment of the city. Furthermore, marine trade that has developed since the beginning of Neolithic age is a factor, which influenced both the establishment and the development of the city. Marine traffic that improved with the building of the Kyrenia Harbour accelerated the urbanisation process of the city by enabling trade development and an increase in the population dealing with trade.

While majority of the factors that influenced the selection of the location of Kyrenia during the Neolithic age were common for all the settlements in the Kyrenia Coastal Plain, there may be two reasons why Kyrenia became the administrative centre of the northern coastal plain of Kyrenia as opposed to other settlements along the northern coastal strip. These are the Kyrenia-Nicosia mountain passage and the Kyrenia Harbour. The Kyrenia-Nicosia mountain passage connected both the northern coast and the foreign sea routes to the inland areas of Cyprus, and to capital Nicosia at the shortest distance thanks to the Kyrenia Harbour.

Clearly, the development of Kyrenia that was established in the prehistoric age, and which continued to exist until today, will continue with great momentum. Besides the continued effect of factors that led to the establishment and existence of the city, two significant factors of added value are also improving; namely the education and tourism industries, indicating that Kyrenia's growth will continue.

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