Flowing through time: Tracing the Legacy of Nicosia's Historic Water Systems and Their Role in Shaping the Urban Landscape

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Abstract

From its natural reliance on the Pedieos River to the development of complex water infrastructure, water has always been central to Nicosia’s survival, governance, and urban identity. In the context of heritage preservation, understanding the historical trajectory of water management in cities with complex pasts is crucial for modern urban planning. In Nicosia, water infrastructure reflects the influence of various ruling powers throughout the city's history, while also demonstrating how water management priorities and challenges shifted under each government.

This paper explores how historical water management practices have shaped Nicosia's urban landscape and socio-political structures, from the early settlements to the contemporary challenges of a divided city.

By analyzing historical maps, archival records, research, and architectural remains, this study investigates how water has been a defining element in the growth of Nicosia, both physically and culturally. It aims to uncover valuable insights into how past water management systems can inform contemporary urban challenges, including water scarcity, infrastructure sustainability, and equitable resource distribution. Examining the water management strategies employed under different rulers in Nicosia offers lessons for modern water governance, particularly in politically divided regions. These historical strategies may help guide future water systems that are sustainable, decentralized, and integrated into cultural heritage planning.

Contents

I. Introduction

Nicosia, the capital of Cyprus, is located at the center of the island. Its history is closely tied to the constant challenge of water scarcity a phenomenon that has remained unchanged from antiquity to the present day. Although situated far from the sea, water has always played a crucial role in the city due to the presence of the Pedieos River. The river, and the water it provided, was not simply a natural resource, it was an integral part of Nicosia's identity. At times, it served as a political and strategic asset, while at others, it shaped the city's cultural and social dynamics.

Water management has always been essential in city planning and the development of heritage cities. Throughout history, many societies have used water systems to address challenges such as arid climates and urban expansion, with water infrastructure supporting both urban growth and agricultural needs. [1]

The study of historical developments in Nicosia's water systems, from the past to the present, raises important and often intractable questions. How did each ruling power control and distribute water, and how did access to water shape urban and social life? How did the transformation of water systems over time affect their role in the city? And what impact did the division of the city after 1974 have on Nicosia's water infrastructure and management? These questions help frame water not just as a practical concern, but as a lens through which broader social, political, and urban processes can be understood.

For the case of Nicosia, it is interesting to explore the adaptations and improvements made to its water infrastructure over the years, and how it was utilized by various groups, locals, rulers, and others, to address issues based on their specific needs. The central research question guiding this exploration is: "How have the evolving water management techniques in Nicosia shaped its urban development, social structure, political dynamics, and heritage, and what insights can be drawn for future urban planning?"

Water management strategies employed by past civilizations are key components of adaptive urban planning and are vital for ensuring water sustainability in cities today. [2] As such, water management should be a core requirement in World Heritage planning[3],. Studying Nicosia offers valuable perspectives on this issue. By analyzing historical water management practices that have withstood the test of time, we can uncover solutions that proved effective under specific conditions. Even practices that ultimately failed may offer critical lessons for addressing contemporary urban challenges. [4]

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[1] Morató, Jordi, Olga Lucia Sánchez, and José Luis Martin. *Ancient Hydro-Technologies as a Response to Climate and Food Emergencies: Use of Cultural Heritage to Rescue the Future*. *Blue Papers 2025* (Vol. 4 No. 1): 10.58981/bluepapers.2025.1.04. Received 10.02.2025; Received in revised form 18.02.2025; Accepted 24.02.2025.

[2] Morató, et al., *Ancient Hydro-Technologies as a Response to Climate and Food Emergencies: Use of Cultural Heritage to Rescue the Future*

[3] Tino Mager, *"Water Management for Sustainable Development of World Heritage Properties," Blue Papers* 3, no. 2 (2024): 14–23, https://doi.org/10.58981/bluepapers.2024.2.01.

[4] Mager, *Water Management for Sustainable Development of World Heritage Properties*

Cyprus

Figure 1: The map of Cyprus and the location of Nicosia compared to the UN Buffer Zone

II. Water and the Formation of Nicosia: Early Strategies and Adaptation

II.I The Pedieos river and the development of a city

The early reliance of Nicosia on water was notable since the Chalcolithic Age (3900-2500 B.C.)[5] The city, which was then known as Mesaoria, was deeply connected to the flow of the river Pedieos. Since ancient times, the river had been defining the landscape of the area, enlivening the region with much-needed water and becoming the foundation for the city's future growth. A growth that extended beyond the geographical limits, also impacting the political and economic structures.

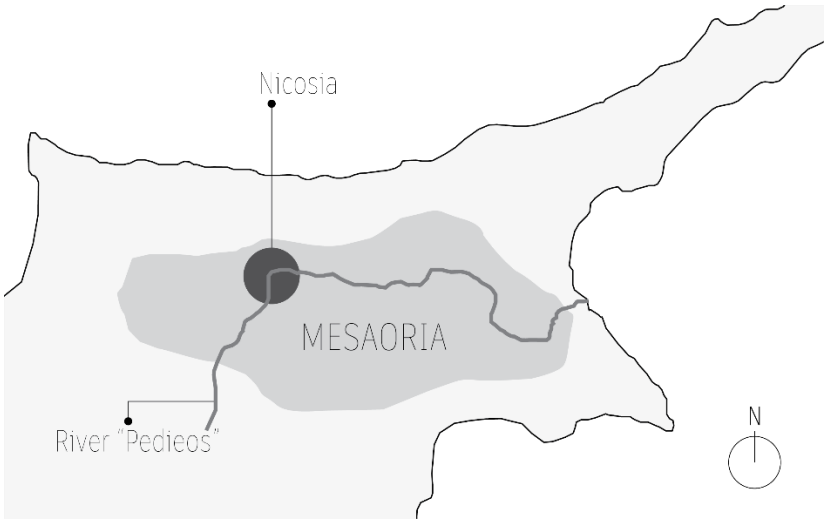

Figure 2: The area of Mesaoria and its spatial relation with Nicosia and the Pedieos river

Travelling through history, in 647, the Arabs destroyed the capital city of Cyprus, Salamis, and Nicosia became the new capital during the Byzantine period in 965. The new location for the capital was chosen for security, maintaining reliance on water. This connection to water may have played a key role in the decision to establish the capital there until today. In 1192, Cyprus was sold to the Lusignans, marking the beginning of Frankish rule, during which the first walls of Nicosia were built.[6] The Frankish walls consisted of nine gates, while the northern and southern parts of the city, divided by the river, were connected by wooden or stone bridges.[7] Furthermore, the Lusignans constructed aqueducts, both underground and above ground crossing valleys, in order to support agriculture and for domestic use. They were built with stone walls and masonry, and the ones above ground were also designed and decorated with rounded and pointed arches.[8]

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[5] Augousti, Chrysi . *The Venetian Fortifications of Nicosia: The Archetype of Symmetrical Bastion Fortresses,* Graduation Thesis, Aristotle University of Thessaloniki, 2011, https://ikee.lib.auth.gr/record/339808.

[6] Panagiotaraki, Evangelos N. *Historical Review and Urban Development of the City of Nicosia*, Master's Thesis, National Technical University of Athens, 2014, http://dx.doi.org/10.26240/heal.ntua.4028.

[7] Apostolou, Diamanto. *Architectural Details of Old Nicosia*, Bachelor's Thesis, University of West Attica, 2021, http://dx.doi.org/10.26265/polynoe-793.

[8] Lau, Marisa. *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus.* Graduate Theses, Massachusetts Institute of Technology (2012). http://hdl.handle.net/1721.1/77837 : 19

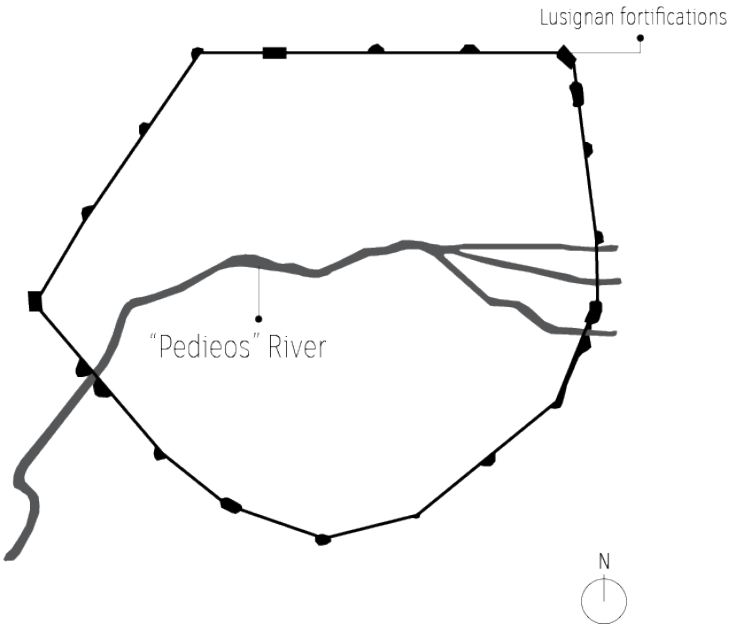

Figure 3: The situation of Nicosia during the Lusignan period.

The frst evidence of water infrastructure in the city were marked by the presence of a watrmill coming from the 12th century[9]. The reference to Nicosia being "characterized by wealthy gardens, springs, palaces, wells, and an underground water system" [10], prove that water management developmets started early in the city's history and highlight the crucial dependece on water. In 1374, the Genoese took and destroyed the city, and the same occurred in 1426 by the Saracens.[11] However, the Pedieos River remained a vital part of the city playing an important role in shaping the economic and socio cultural activities.

The relationship of Nicosia with the water element was not always unproblematic and was rather posing even significant challenges to the stability and the growth of the area. Various disasters, including frequent floods,[12] including the one of the Pedieos River in 1330, which destroyed the city, resulted in the lost of many important Gothic buildings from that period.[13]

Despite the chaotic construction of the city around the flow of the Pedieos River, an informal zoining system was designed carefully dividing Nicosia into three parts in an attempt to balance the benefits and risks associated with the water. The western part was occupied by the Frankish officials, the eastern part housed the locals, and the center, around the river, contained the gardens and springs.[14]

Some time later, Nicosia's water infrastructure became more sophisticated. As it is reported, in 1468 the city was supplied with water through underground wooden channels which were connected to other cities and villages of Cyprus. The growth of the city appeared to depend on water and continued to expand around it over the years, marking the early foundations of the water systems that exist in the city today

[9] Lau, Marisa. *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[10] Giulia Bressan, Anna Evangelisti, Paola Martire, and Livia Shamir, "Venetian Walls of Nicosia. A Palimpsest for a Common Future," in *Territorial Fragilities in Cyprus: Planning and Preservation Strategies*, ed. Alice Buoli and Oana Cristina Tiganea (Milan, Italy: Springer, 2023): 188
[11] Apostolou, *Architectural Details of Old Nicosia*
[12] Augousti, *The Venetian Fortifications of Nicosia*
[13] Augousti, *The Venetian Fortifications of Nicosia*
[14] Bressan et al., *Venetian Walls of Nicosia*

III. Water Management Under Different Rulers: Governance and Infrastructure

III.I Venetian Period (1489–1570): Water as Defense and Urban Structure

The Venetian Period in Cyprus started on the 14th of March 1489, when the then Queen of Cyprus Ekaterini Cornaro was forced to sell the island to the Venetians.[15] Throughout the entire duration of the Venetian occupation (1489-1571), Cyprus was facing the constant threat of a possible Ottoman invasion.[16] Hence, it was necessary to establish a plan for the protection of the country. For Nicosia, their strategic asset and protection tool became the water.[17] In order to make Nicosia's defence more effective, the first step they took was to demolish the Lusignanian walls, which they considered weak, and limit the area of the city.[18] With those plans, they built their own fortifications and diverted the Pedieos River towards the north to fill the moat around the walls. [19]

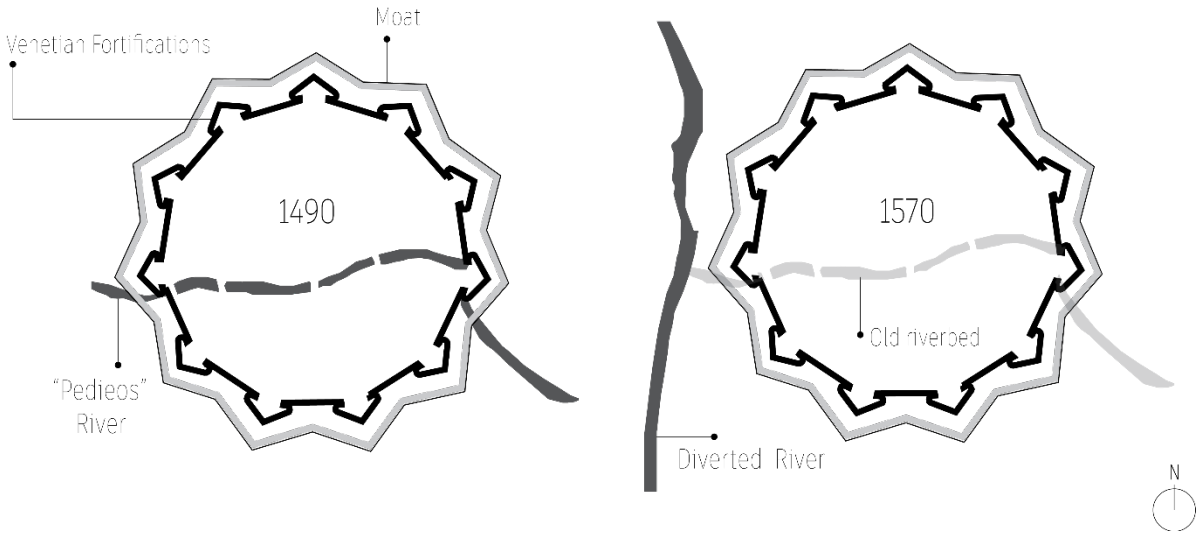

Figure 4: The Venetian walls and their actions related to the Pedieos river.

The Italian engineers Giulio Savorgnan and Francesco Barbaro responsible for the design[20], took inefficient decisions regarding the moat. The moat was deep and had a width of 80 meters, [21] however, it was easy for opponents to alter the flow of the Pedieos River at any point , stop the water supply and render the fortification ineffective for safety,as water was the main element keeping the walls secure. [22] Their approach followed a common Renaissance idea, the concept of the 'Ideal City.' [23] What did that mean? A city filled with water, inspired by their own Venice[24]. In practice, however, water was not always in favor of the Venetians, just like in Nicosia, where poor local adaptation led to the failure of

[15] Augousti, *The Venetian Fortifications of Nicosia*
[16] Christiana Violari, Spatial, Journalistic, and Economic Dimensions of Divided Nicosia: Urban Planning Interventions for Unified and Symmetrical Spatial Development (Diploma thesis, University of Thessaly, 2008), http://hdl.handle.net/11615/13946.
[17] Cuca, B., and A. Agapiou. *Contribution of Earth Observation and Geospatial Information for Urban Planning of Historic Cities' Centres: The Case Study of Nicosia, Cyprus.* Sustainability 13, no. 7023 (2021). https://doi.org/10.3390/su13137023.
[18] Doğa Üzümcüoğlu, *Analyzing the Moat of Walled City of Nicosia as a Public Open Space* (Master's thesis, Eastern Mediterranean University, 2016), http://hdl.handle.net/11129/4577.
[19] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[20] Bressan et al., *Venetian Walls of Nicosia*
[21] Panagiotaraki, *Historical Review and Urban Development of the City of Nicosia*
[22] Augousti, *The Venetian Fortifications of Nicosia*
[23] Augousti, *The Venetian Fortifications of Nicosia*
[24] Cuca, *Contribution of Earth Observation and Geospatial Information for Urban Planning of Historic Cities' Centres: The Case Study of Nicosia, Cyprus*

the plans. They viewed water more as a military asset than a civic necessity, resulting in conceptually strong but structurally weak design.

Their lack of of investment in civic water infrastructure is noticable in the rest of their actions. The water systems in Nicosia during the 16th century were not developed sufficiently, unlike other Venetian-controlled cities. [25] The lack of cohesion in the city, discouraged the idea of constructing a common urban water system in Nicosia.[26] As a result, according to Stefanos Lusignan[27], the city was relying on two primary sources of water: the "Piadia", referring to wells, and the "Acqua Dolce", referring to a source of water near the Fortifications, branching out throughout Nicosia. The last one was supplying public fountains, squares and royal residences. What is interesting is the fact that the certain water source was known to be curing the ills. [28]

The city was left vulnerable to water shortages, and waterborne diseases began to spread due to the absence of proper water infrastructure and a significant increase in population during those years[29] . Thus, the Venetians needed to take sanitary measures, such as the drying up of the Constanza swamps, on the southern part of the fortifications.[30] Once again it was proven that the Venetians' mindset related to water was reactive instead of proactive, allowing the problems to become critical before taking any measures.

Although most of the data about the water systems of Nicosia during the Medieval period were lost over the years, a general conclusion could be drawn from the existing data and the comparison of the city with other similar Venetian controlled cities such as Candia[31] [32]. Nicosia was considered by the Venetains more as a military outspot rathern than a full developed city, and therefore their action srelated to water infrasteuctrue was follwing that "rule" too.

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[25] Violari, *Spatial, Journalistic, and Economic Dimensions of Divided Nicosia: Urban Planning Interventions for Unified and Symmetrical Spatial Development*

[26] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

[27] Stefanos Lusignan (1537–1590), Cypriot historian from the family of the Lusignan kings of Cyprus. He was born in Nicosia and after the fall of Cyprus in 1570 by the Ottomans, he emigrated to Italy, where he developed a significant writing activity. His best-known work is the Chorography of Cyprus, published in 1573 in Bologna and in 1580 in Paris in an improved French edition. Despite its possible inaccuracies, his work provides rich information about medieval Cyprus.

[28] Patapiou, Nasa. *The History of the Water of the Fortification: Who Drained the 'Ancient Water' of Nicosia?* Politis: Parathyro, January 20, 2014. https://parathyro.politis.com.cy/146728/article.

[29] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

[30] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

[31] Candia is the Venetian-walled city of Heraklion in Greece

[32] Samidha Pusalkar, Norma Camilla Baratta, Massimo Izzo, Danila Saulino, and Filippo LaFleur, *Civic Water: Bridging Culture, Nature and People*, in Territorial Fragilities in Cyprus: Planning and Preservation Strategies, ed. Alice Buoli and Oana Cristina Tiganea (Milan, Italy: Springer, 2023): 159

III.II Ottoman Rule (1570–1878): Strengthening Water Infrastructure

In 1570, just three years after the Venetians begun to built their fortifications, the Ottomans managed to take over Nicosia, [33] inheriting a damaged city and a fragmented water system.

While the Venetians' initial intentions were put on hold, the Ottomans carried on with their work, in an attempt to repair and maintain the defence plan of the city. They fixed the damaged wall parts [34] and diged the moat to the depth originally intended, without filling it with water, nevertheless[35]. Their approach to water was similar to the Venetians, utilizing it as a tool for protection and consolidation of power.

The use of water was obviously less focused on the public health and livability of the city. For example, with the Ottomans' arrival the old riverbed of Pedieos was left open, which made it a dumping ground for refuse[36] In addition, the Famagusta Gate, which was located directly above the riverbed was transformed into a sewer, oftenly facing issues with flooding as well as being full of dirt and water [37] showing the Ottomans' lack of effort to improve public hygiene.

Notwithstanding, their contribution to the city's water systems were remarkable. During their rule, they established a well-developed agricultural system based on wells, irrigation canals, and watermills, which was vital for the economy of the place.[38] Other significant additions to the city's water infrastructure included the construction of aqueducts, washing areas in caravanserais and mosques, and hammams, [39] showcasign their control over the city's resources.

Figure 5: The Omeriye Ottoman Baths in the center of Nicosia, *Aga Khan Trust for Culture, Omeriye Ottoman Baths Restoration, Nicosia, Cyprus. Photograph. Archnet. Accessed April 17, 2025. https://www.archnet.org/sites/6218.*

Figure 6: Fountain from the Ottoman period in Nicosia, Dilara Oruç, photograph of Ali Ruhi Çeşmesi, in Ali Ruhi Çeşmesi, Kültür Envanteri, last modified July 13, 2022, https://kulturenvanteri.com/en/yer/ali-ruhi-cesmesi-2/.

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[33] Panagiotaraki, Evangelos N. *Historical Review and Urban Development of the City of Nicosia*
[34] Apostolou, *Architectural Details of Old Nicosia*
[35] Οι ενετικες οχυρώσεις
[36] Samidha Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies: Territorial Fragilities in Cyprus*, ed. Alice Buoli and Oana Cristina Țigănea (Cham: Springer, 2023), https://doi.org/10.1007/978-3-031-36076-3.
[37] Augousti, *The Venetian Fortifications of Nicosia*
[38] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*
[39] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*

The Ottomans seemed to understand how crucial water's role was for sustaining a city, as evidenced by their developments, such as utilizing a reservoir to collect rainwater, without the use of water pipes though. [40] At the time, the water infrastructure served religious, economic, and social functions, in addition to providing private water supply systems. Water became a symbol for the Ottomans to show and leave a mark for their presence so they funded the construction, repair, cleaning and maintenance of their water systems. [41] Examples of these water systems include baths, water taps throughout the city, aqueducts, and many more, which highlights the preserved systems that have remained present over time. The use of reservoirs and reliance on local water resources were practices that are still used in the city until today marking the importance of them for the city's resilience.

Figure 7: Nicosia Ottoman Aqueduct, TripBucket, "See Nicosia Aqueduct, Cyprus," photograph, accessed April 17, 2025, https://tripbucket.com/dreams/dream/see-nicosia-aqueduct-cyprus/.

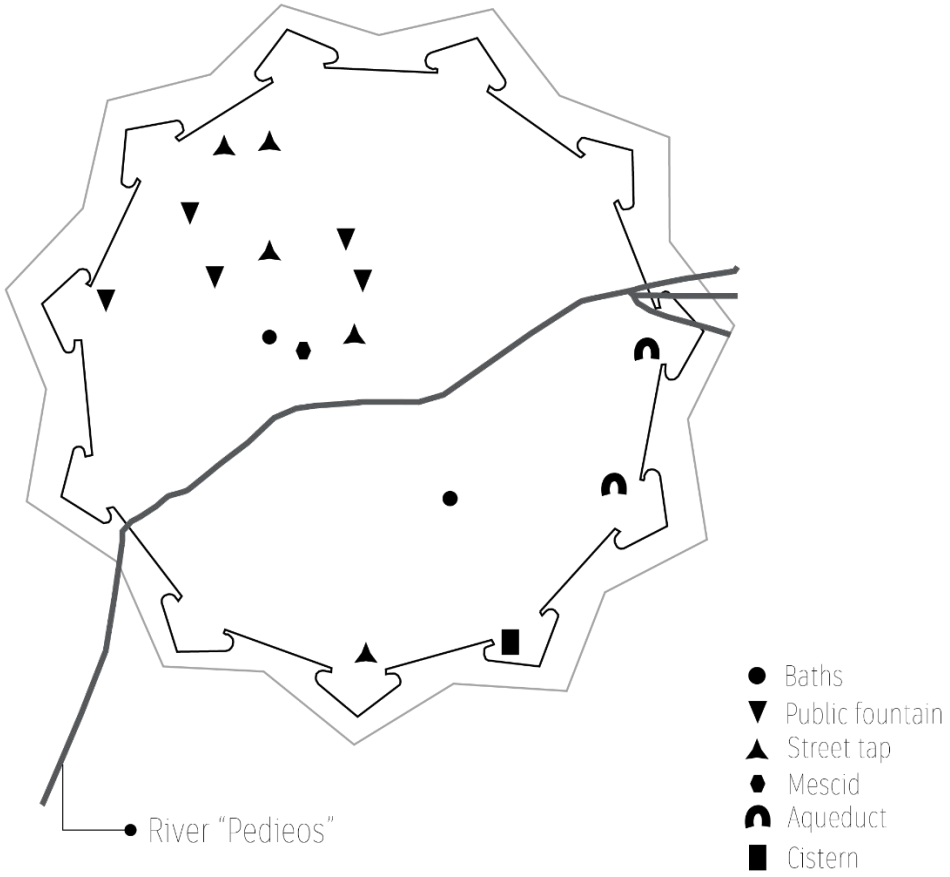

Figure 8: Water systems of teh Ottoman era in Nicosia

[40] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*
[41] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

III.III British Colonial Period (1878–1960): Modernization and Public Access

In 1878, with the beginning of British colonial rule in Cyprus, significant improvements in water management were observed.[42] The Ottomans had left behind a localized and religiously based water system that the British pursued to convert into a modern, centralized one.[43] The colonizers placed particular emphasis on addressing the problem of water scarcity, primarily for their own reasons. They repaired many irrigation projects and, through careful planning, carried out drillings to find artesian water. [44] However, their engagement on modernizing everything they got led to disregarding elements of the island's cultural heritage and reinforced social divisions. In a way they were practicing their own knowledge into an a city which was not yet that developed and ready to adopt their desires, without caring of the city's, history and heritage. In Nicosia, by that time, the Venetian walls were significantly destroyed and ready to be demolished[45]. Although, one might expect the colonial authorities to undertake a development project for them under the general umbrella of their urbanization activities, their value seemed minimal to them. As a result, their abandonment seemed inevitable, but their complete demolition was delayed and prevented [46] by the establishment of the Department of Antiquities in 1935.[47] These acts were the first samples that the British development initiatives in Nicosia were mainly a show of dominance over the country and a way to reinforce their authority and power within the capital. Their subsequent organization of water systems and administration would reflect this.

Without a doubt, their efforts to modernize the city were beneficial for Nicosia's future growth, but at that time, it was imposed in a way that neglected the history of the place. Rerlated to the water infrastructure, some of their modernization actions included water distribution and retention tanks and the addition of water towers and street taps in the center. [48] This allowed the city to accommodate a growing population, which later became a reason to manage water in a way that would help prevent issues arising from this growth. Therefore, in contemporary residences, lavatories were provided in an attempt to manage urban density and hygiene standards. The latter seemed to be a matter of great concern for the British, in a city were sanitasion measures were neglected throughout the Ottoman era. Their hygiene measures initially included the decision to cover the old riverbed of the Pedieos [49], something that would also result to a huge transformation of the hydrological landscape of the city.[50] Their priority might have been the center of the city, as around the walls, the moat was filled with waste and rubbish. Although some parts of the space were used for planting trees and other greenery, stagnant water was creating unhealthy conditions by then. [51]'

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[42] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*
[43] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[44] EOA - Nicosia. History of Water - NDLGO - Nicosia. NDLGO - Nicosia. April 15, 2025. https://ndlgo.org.cy/water-supply/informational-material/history-of-water/
[45] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[46] Bressan et al., *Venetian Walls of Nicosia*
[47] Augousti, *The Venetian Fortifications of Nicosia*
[48] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[49] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*
[50] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[51] Augousti, *The Venetian Fortifications of Nicosia*

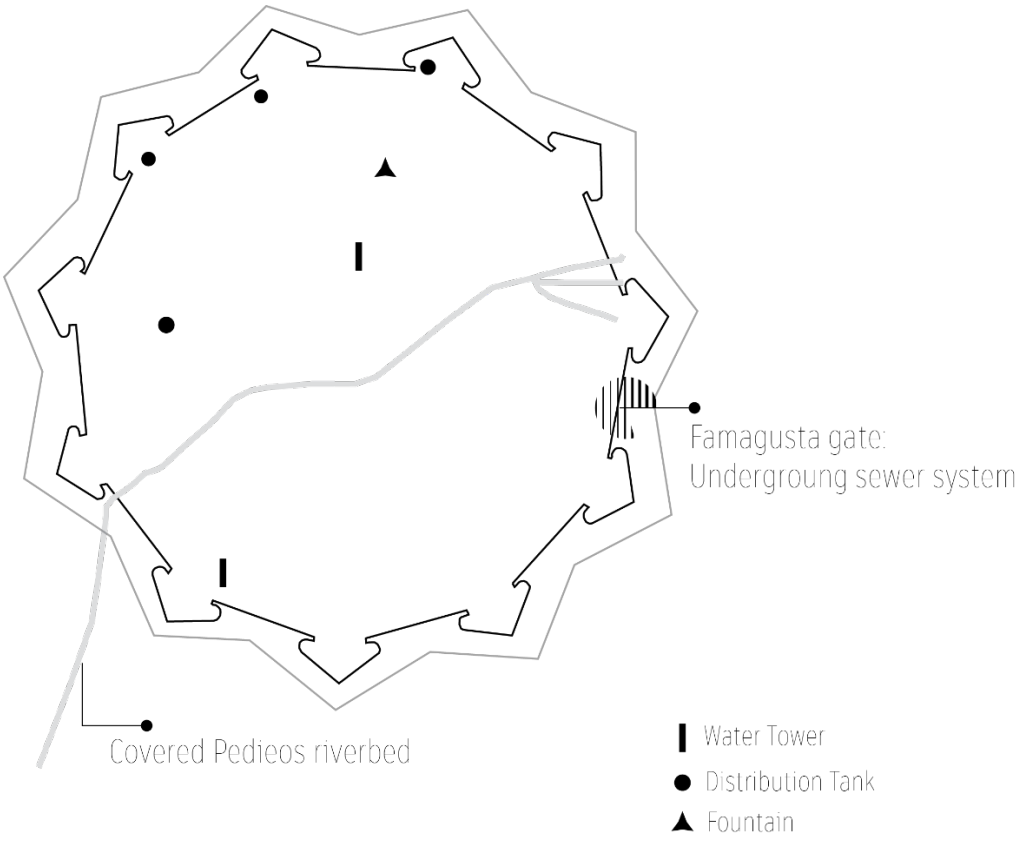

Figure 9: Water systems of Nicosia during the British Colonial Period

Developments regarding the water management continued for many years. In 1882, an underground sewer was constructed at the location where the Pedieos river was passing under the Famagusta Gate[52]. For that, the British used septic tanks and individual holding pits to manage waste[53] significantly improving the living conditions of the city. Later, in 1896, the biggest development of the British colonianism era occurred. The department of water development operated for the first time and was responsible for the water supply and irrigation. It was the first formal, centralized approach to managing water on the island [54] marking the beginning of greater development later in the history of Nicosia's water infrastructure. Further industrial-era efficiency was brought later in 1933, when aqueducts were replaced with earthenware pipes. However, the street fountains were preserved [55], and are still present at Nicosia's streets marking a symbol of cultural heritage.

[52] Augousti, *The Venetian Fortifications of Nicosia*
[53] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[54] Water Development Department (WDD), *Water Development in Cyprus*, Ministry of Agriculture, Rural Development and Environment, accessed April 17, 2025, https://www.moa.gov.cy/moa/wdd/wdd.nsf/page03_gr/page03_gr?opendocument.
[55] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

Figure 10: Fountain of Es-Seyyid Mehmet Emin Efendi, photograph, 1945, Leventis Municipal Museum Archives, in Lau 2012, 6.

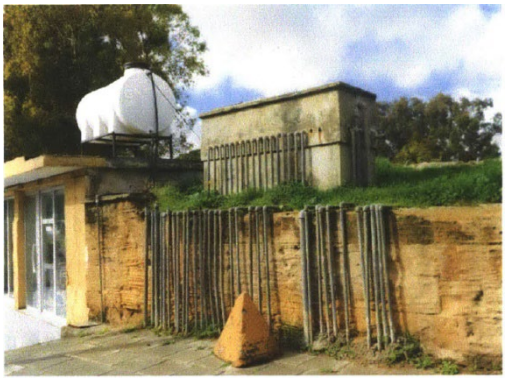

Figure 11: British era distribution tank, Lau, Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus

Just four years before the uprising of the Cypriots against the British rulers for the liberation and independency of Cyprus, in 1951, the modern organized development of the the water supply networks in Cyprus begun with the installation and creation of tanks and mains. [56] All these changes in infrastructure and the modernization of the sewer systems led to a rapid urbanization of the city affecting social and demographic structures too. As mentioned before, the landscape of Nicosia was significantly transformed by the covering of the Pedieos riverbed resulting in the beginning of a physical separation between the Greek-Cypriot and Turkish Cypriot communities which by then were mutually coexisting throughout the entire course of Nicosia. The city distributed in a way where on the North mainly the Turkish Cypriots were living and on the Southern part , the Greek-Cypriots, foreshadowing the later political and social fragmentation the city would encounter.

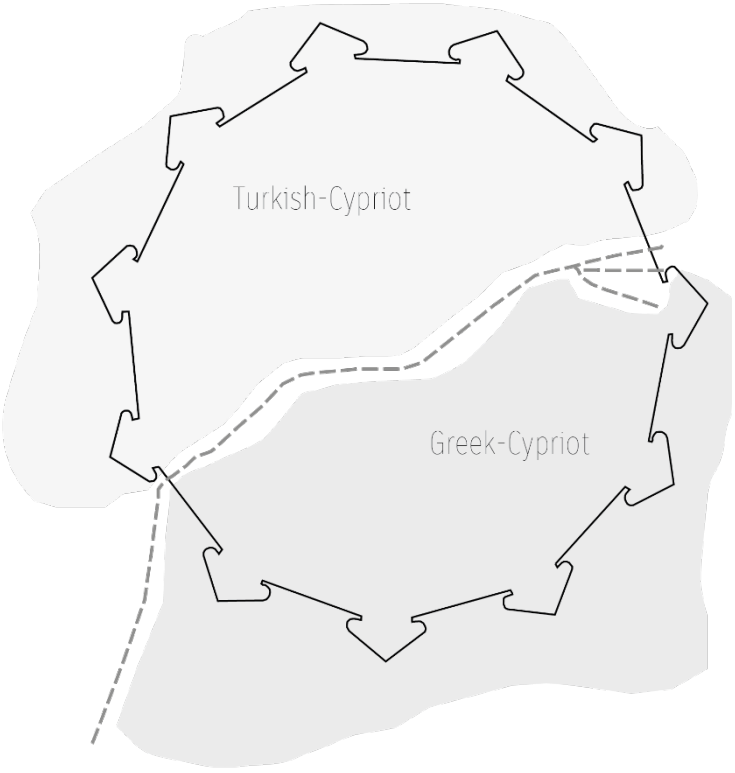

Figure 12: The division of the two communities

[56] Panagiotaraki, *Historical Review and Urban Development of the City of Nicosia*

It is apparent that the British colonial rule aimed to urbanize and modernize the city as they used to know, through actions focused on improving sanitation and water access. However, their signs of neglection for the island's cultural heritage and historical water systems reveals their actual intentions to reinforce control and implement developments to display their power to the Cypriots.

IV. Water in the Divided City: Post-Colonial to Present-Day Challenges

IV.I Post-Colonial Period (1960–1974): Urbanization and The Rise of Modern Water Infrastructure

The British left behind significant changes and developments in Nicosia's water systems. However, the most substantial evolution of the city's modern water infrastructure was yet to come. The first major steps were taken after Cyprus gained independence in 1960[57], when water storage caapicty in Nicosia was at a critical level. This motivated the beginning of great water infrustructure improvements for the city. The developments included the implementetion of dams into the citiy's landscape whih increased the freshwater storage capacity by 50 times[58]. Water shortage has always been a problem for the island, [59] and despite the emerging surface water infrastructure, groundwater from the Pedieos River, which now flowed along the outskirts of the city, continued to be the main water source, alongside limited rainwater.[60] The government adopted the slogan: "Not a drop of water to the sea", promoting conservation and efficient water use throughoout the whole island.[61]

One could say that the Pedieos river was "the diamond of the city" and that no one would interfere with it. However, the abandonment of the Pedieos riverbed from the British, occurred without any significant opposition or voices raised against that decision. Some years later, the river from being the main natural resource of "life" for Nicosia once, transformed into a social artery for the locals when it was covered and named as "Ermou street", hosting the main markets and events of the city,[62]. The conservation of historical water elements from past eras of the city's history, such as street taps and neighborhood fountains, offered gathering places for women and children.

Figure 13: Gatherings around water systems
Psomas, Konstantinos, Leuk-ousies. Master's thesis, Aristotle University of Thessaloniki, 2010-2011
https://ikee.lib.auth.gr/record/341950/files/PSOMAS_KONSTANTINOS.pdf.

[57] Koundouri
[58] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[59] Hadjichristos, *Cyprus: Nicosia and its D-visions*
[60] koundouri
[61] EOA - Nicosia, *History of Water*.
[62] Pusalkar et al., *Civic Water. Bridging Culture, Nature and People*, in *Planning and Preservation Strategies*

Figure 14: Hermes Street near Platanos Opposite Sophianos—Late 1950s, photograph, Press and Information Office Archive, 20C.151 (20), Ministry of the Interior, Republic of Cyprus, uploaded by Anita Bakshi, in Remains of the Day, https://www.researchgate.net/publica

These features were a daily part of life, embedding water infrastructure into the city's social fabric.[63] Its is remarkable how just a street was connecting and bringing together the locals and the two main communities of the city, the greek-cypriots and turkish-cypriots helping them to create strong relationships. In fact, the relationships became even stronger when a common future seemed to be more beneficial for both "sides". Because of sanitation issues, the two communities started to create trhough collaboration modern sewerage plans in 1968.[64] They also they started the transportation of water from distant villages and towns, reflecting a collective effort to address the scarcity they were facing. [65] Unfortunately, this cooperation came to an end when ethncic clashes led to an unconventioanl division of Nicosia around 1962-63. [66] The shifts in infrastructure and the Pedieos transformation, mirrored the changing identity of the city throughtout the years. The riverbed from a water resource, became a cultural hub and then a mark of separation and abandonment. Before 1970, the water infrustructure development relied on groundwater and traditional resources[67] and septic tanks where still part of the water management plans[68]. Since then, however, the zone in the center of Nicosia has frozen in time, and developments have not changed, marking the division of the communities. [69]

[63] koundouri
[64] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[65] Panagiotaraki, *Historical Review and Urban Development of the City of Nicosia*
[66] Bressan et al., *Venetian Walls of Nicosia*
[67] KOUNDOURI
[68] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[69] Pınar Şaşmaz Kavas and Payam Mahasti, *Reviving the Lost Spaces: Rewilding the Walled City of Nicosia Buffer Zone,* Journal of Asian and African Studies, 1–23, 2023, https://doi.org/10.1177/00219096231215703.

IV.II Division of Nicosia (1974-Present): Water Systems as Markers of Separation

In 1974, the Turkish army invaded Cyprus and illegally occupied the northern part of the island. This led to the permanent division of Nicosia, which remains physically and spatially separated to this day, dividing the Greek Cypriot and Turkish Cypriot communities.[70] After these political events, water management became even more complicated in Nicosia and the two sides began developing independently creating separated water systems. [71] Groundwater continued to be the main water source for both communities but overexploitation beyond sustainable limits led to shortages and a decline in water quality.[72] This and the idea of 'a common future,' motivated a cooperated development to begin shortly after in 1975, with the construction of the contemporary sewage system of Nicosia. [73] It appears that this was not truly a vision for a shared future, but rather a desperate solution to an urgent problem. The new sewerage system operated by collecting wastewater from individual households through a network of pipes, which transported it to the village of Mia Milia, located outside the city, where it was treated using aerated lagoons. The treated water was also recycled for groundwater recharge and irrigation purposes, significanlty benefiting agriculture and landscaping. [74] Despite this cooperation, the rest of the water management remained separated.

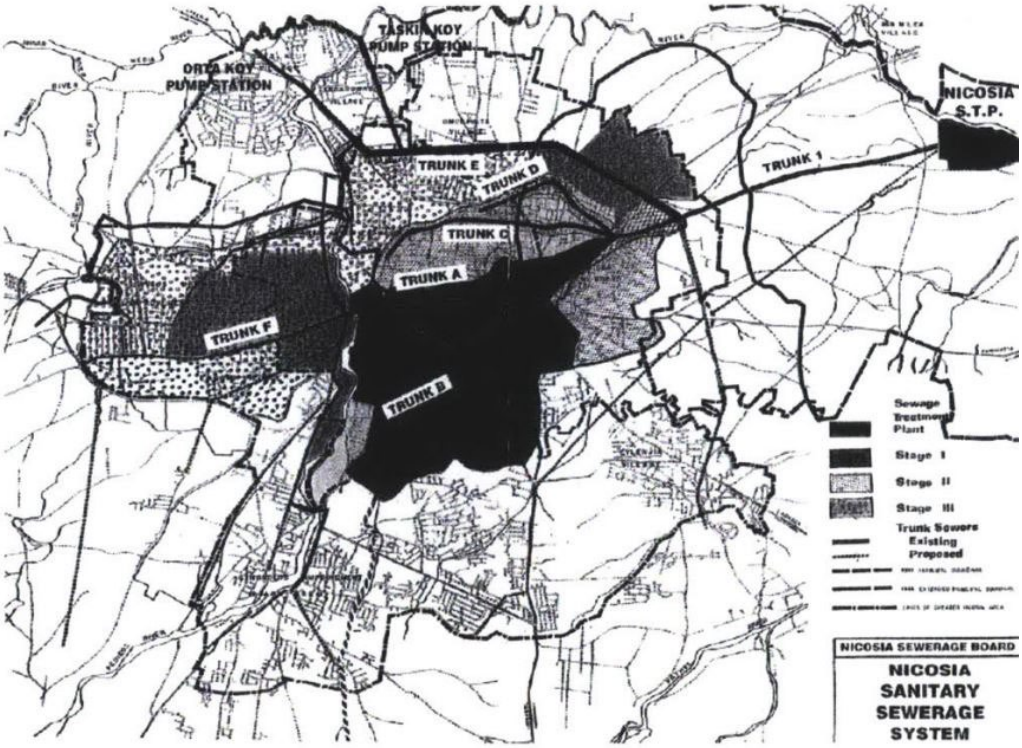

Figure15: Map of the sewerage system planned prior to the division of the island, Lau, Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus

Some years later, in 1978, with the support of the UN, the Master Plan of Nicosia was designed in order to coordinate and manage the shared sewage system and the development of the city. [75] Nonetheless, the problems were still there, despite the efforts from the United Nations. Alongside the Ermou street

[70] Christos Hadjichristos, *Cyprus: Nicosia and its D-visions*, *Architectural Design* 76, no. 3, Special Issue: *The New Europe* (2006)
[71] Koundouri Pjoebe
[72] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[73] Panagiotaraki, *Historical Review and Urban Development of the City of Nicosia*
[74] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[75] Hadjichristos, *Cyprus: Nicosia and its D-visions*

and around the walled city, often urban flooding is caused by poor stormwater management [76]. This reflects a common saying that most urban floods occur where historical riverbeds have been buried and natural drainage patterns disrupted.[77] Although by that time, it was clear that common development should have been a top priority and the main focus of water management efforts, the two sides were following completely different paths. On one hand, the southern side was striving for modernization, while the northern side was suffering from decay, [78]. But the again, a major project, "the New Nicosia Wastewater Treatment Plant (WWTP)", was completed in 2013 with joint funding from the Sewerage Board of Nicosia and the EU. It is a model of bi-communal collaboration, environmental protection, and sustainable resource reuse, partly powered by renewable energy.[79]

The first restoration efforts in the South started as early as the 1990, while on the North just in 2019.[80] However, since 2004, when Cyprus became a member of the European Union, water reallocation and demand management emerged as new policy priorities.[81] As a result, the northern part of the island, although not part of the EU itself, was funded in 2007 to replace leaking pipes and install water meters.[82]

Today, it is clear that despite challenges following the 1974 Turkish invasion, major progress was made in water development.[83] In the southern part of Nicosia, under the Republic of Cyprus, water management relies on a gravity-based system that includes reservoirs and pumping stations. [84] A lot of the historically significant water systems from the past are still preserved, even if they're no longer in use. Some have been recreated or adapted for new purposes, like the Venetian Walls' moat, which today serves multiple functions such as event spaces, parking areas, and sports fields

[76] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[77] Irini Hiliopoulou, *Spatial Representations of the Conflict: The Example of Divided Nicosia,* in Urban Conflicts, ed. Kostas Athanasiou et al. (Thessaloniki, 2015), 85–98.
[78] Bressan et al., *Venetian Walls of Nicosia*
[79] United Nations Development Programme (UNDP), "New Nicosia Wastewater Treatment Plant," accessed April 16, 2025, https://www.undp.org/cyprus/projects/new-nicosia-wastewater-treatment-plant.
[80] Bressan et al., *Venetian Walls of Nicosia*
[81] Koundouri Phoebe
[82] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*
[83] EOA - Nicosia, *History of Water*.
[84] Lau, *Adaptive Reuse and Revitalization of Water Heritage in Nicosia, Cyprus*

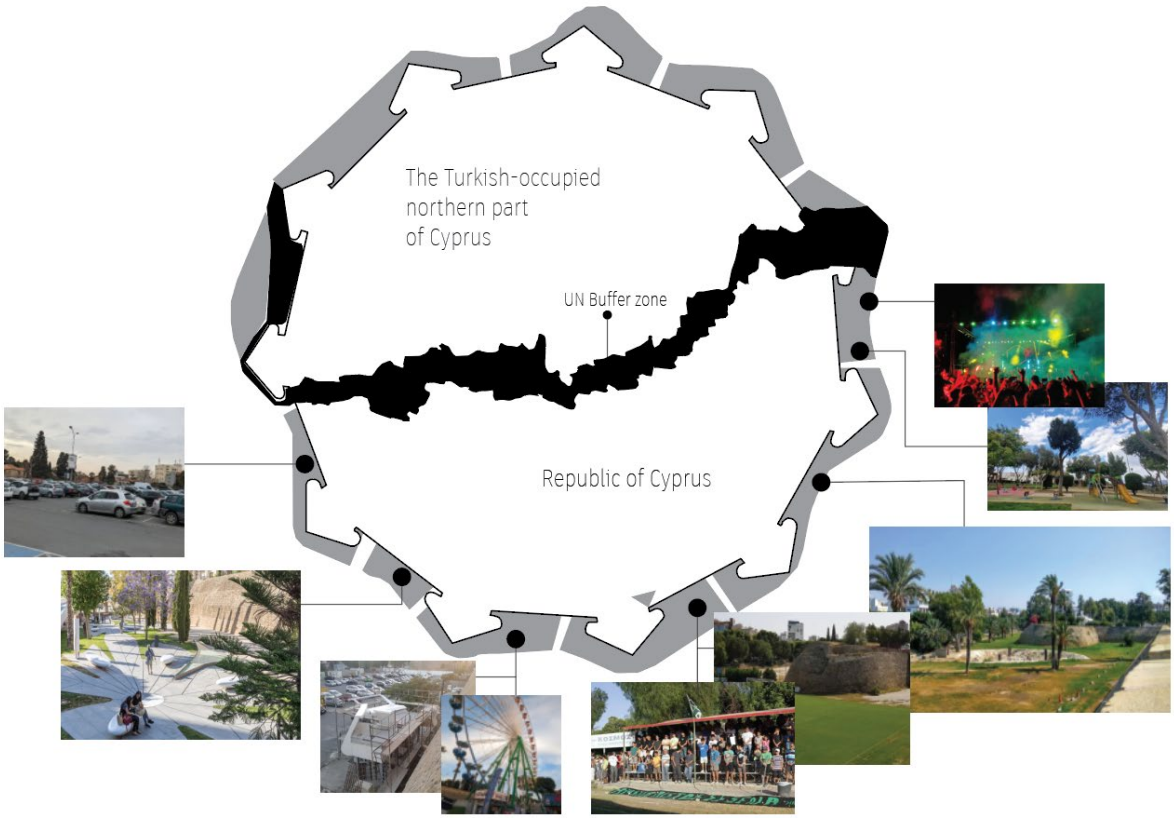

Figure 16: The situation of Nicosia today alongside with the different activities happening around the Venetian walls at the Southern part of the city

Although water resources in Nicosia are quite enough developed, challenges related to the water deficit persist. [85] For example, outdated water supply pipelines continue to burden the Water Development Department, local authorities, and ultimately residents. Many of these pipes date back to the British colonial era and frequently cause water loss, which persists despite ongoing repairs and replacements.[86] In addition, while they city suffers from drought in the summer, due to water shortages, in the winter, from the first rainfall the river tends to overflow and floods occure, as seen in figure 16.

Figure 17: The Pedieos River during a major flood event. "When the Pithkias Flowed Raging and Deadly," Famagusta News, accessed April 17, 2025. https://famagusta.news/news/kypros/otan-o-pithkias-katevaine-ormitikos-kai-fonikos.

Issues like these are raising questions about whether a common future in the water systems development should still be considered for the benefit of both sides, even if the political situation remains unresolved. If a landscape is shared and environmental issues are the same, how can a political situation create such a big problem and become a power above common sense for the resilience of a place?

[85] Koundouri Phoebe
[86] EOA - Nicosia, *History of Water*.

V. Lessons from the Past

The Water Development Department of Cyprus, considers that "addressing water scarcity and ensuring the sustainable management of water resources is a matter of utmost national importance, as it concerns both societal security and the country's developmental trajectory."[87] Would the solution then be to look back at the past to secure a better future?

The evolution of Nicosia's water systems serves as an exemplary model of how modern infrastructure can be integrated with the preservation of a city's cultural heritage. Nicosia is perhaps the only area of Cyprus that can boast of having been inhabited since the Chalcolithic era, in which major role for this to happened played the Pedieos river bringing life to the area. [88] Historians refering to Pedieos river, say that it has an incredible history that is closely linked to the course and development of Nicosia. This is true both during the city's ancient history and throughout the medieval period, as well as in more modern times when the first aqueducts were built. Other insist that the Pedieos River was the one "responsible"for defining the capital.[89] Cities like Nicosia demonstrate how water can shape urban development, serving as a powerful force that influences the city's form and function.

Today, the absence of water is noticeable on many levels. The moats are empty and dry, the water systems are underground, drought is becoming a part of the island's climate, and the Pedieos River is filled with water only for a few days per year. The only visible sign of water's past presence in the area is a few remaining water systems, preserved as heritage sumbols. The once called "Acqua Dolce, [90] is now only known through archival maps and historical documents. This absence may represent a loss of the city's cultural identity tied to water, but at the same time, it can be considered a part of the city's cultural heritage, reflecting its history throughout the past. The water elements, such as the street fountains that have survived through different time periods and under various rulers, symbolize water as a cultural connector. These fountains once provided spaces for social interaction among the diverse communities living in the city center. While the former Pedieos riverbed now marks separation and division , the underground sewage systems demonstrate that collaboration between the two divided areas can be beneficial. After all water management could serve as a bridge to foster peace and unity. Water can still connect what politics have divided. It is clear that urban development, politics, and heritage are deeply connected and implicated, so the question arises: can water be used to resolve urban conflicts? What if collaborative water management systems, like shared water distribution and sewage systems would be a "requirement" in urban planning? Undoubtedly, it is clear from this study that whenever the different communities in Nicosia were collaborating, only beneficial outcomes occurred for the city and its inhabitants. Even when rulers prioritized water management, it was during those times that the city experienced growth and development.

What if the conservation of water heritage elements, such as the water taps from the Ottoman period became again the foundation for vibrant community gathering points in modern cities, which are becoming increasingly inhuman every day? Or what about the coexistence of private gardens and public springs during the Lusignan era? Could organizing modern cities around central water resources, as in medieval Nicosia, help restore balance, inlcuding equitably distributing water-based city amenities, in today's urban environments?

It is noteworhy to see how differently each ruler used water in Nicosia and where each of them was giving emphasis on. The Venetians valued water as a tool for military defense, but a lack of long-term planning and the failure to create a cohesive system resulted in an inefficient and unsustainable water network. The Ottomans, although they continued to use water for safety, also integrated it into the

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[87] Panagiotaraki, *Historical Review and Urban Development of the City of Nicosia*
[88] Apostolou, *Architectural Details of Old Nicosia*
[89] Kasia, Ch. (2025, January 18). Pedieos River: Interesting facts you didn't know about "Pithkias". AlphaNews. https://www.alphanews.live/cyprus/potamos-pediaios-endiaferonta-stoicheia-pou-den-ixeres-gia-ton-pithkia/
[90] Patapiou, *The History of the Water of the Fortification: Who Drained the 'Ancient Water' of Nicosia?*

preservation of their culture, religion, and social life. In contrast, the British focused on modernization and improving sanitation and health, but they neglected historical heritage and used water as a symbol of control and power. Whether used for safety or as a tool for modernization, water has always been a powerful resource in the hands of ruling powers. Today, studying the historical uses of water can help find the ideal balance for creating successful, sustainable cities. As knowledge varies across cultures, and with the global population growing and water becoming increasingly scarce, cities worldwide should share their water management strategies and collaborate.

VI. Conclusion

This research aims to provide an understanding of the multiple roles that water plays in shaping urban environments while also offering valuable insights for urban planning. As sustainable urban development becomes increasingly essential, it is important to recognize that some of the most effective ideas are rooted in historical urban practices, specifically water management techniques and infrastructure shaped by various governing systems and time periods. Therefore, this historical study should be seen as the foundation for future design research where past water management practices can be applied in modern societies.

In Nicosia, the presence of water sometimes around the center of the city and sometimes flowing through it proved to be vital for the growth of Nicosia not only in terms of sustainable and natural necessity but also in shaping political, social, and cultural formation. The river from a life resource to a divider, shows how fragmented or divided approaches can create inequalities in urban development. However, sometimes water can become the solution, the connecting point for social communities, as seen in the bi-communal sewage system in the town.

What becomes most apparent is that the historical heritage of a place, and in this case, water heritage, can inform modern urban resilience and trigger the beginning of better modern cities, which are currently lost in the pursuit of modernization. Urban historians, planners, engineers, and communities must collaborate to build better cities. Cities that reassess their relationship with water and recognize that without water, urban growth is impossible

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