

# Lost and found: the water-based settlement of the historic city of Ayutthaya

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## Abstract

The historic city of Ayutthaya is known for its water management system. The Ayutthaya City Plan comprises a network of several rivers and canals, connecting the inner city with the outside. The historical monuments are taken care of by both domestic and international agencies, but their settings and built environments face numerous challenges causing the connection between historic monuments and water features is slowly fading away. This study aims to establish why the historical city has lost its sense of a water-based settlement. The result reveals that several areas outside the World Heritage Site remain connected. In times of flood, the traditional design of the historical structure, with its precise leveling and topographical surveys of the past, is able to prevent damage, bearing witness to how the community lives with water intrusion. Several settlements along the ancient *Chao Phraya* River also represent outstanding examples of the living practices in water-based settlements.

## Keywords

Historic city of Ayutthaya, Water-based settlement, Flood, River.

## Introduction

Phra Nakhon Si Ayutthaya Historical Park was inscribed onto the World Heritage List in 1991 under the «Historic City of Ayutthaya» based on criteria III, bearing excellent witness to true national Thai art. All works of art and architecture are acknowledged as properties of the World Heritage Site. Within the historical park, there are 95 historic monuments, covering 289 hectares inside Ayutthaya Island.<sup>1</sup> These properties include living monuments such as *Wihan Mongkhon Bophit* and *Wat Thammikarat*, which make an important contribution to the sense of identity and continuity of Ayutthaya. Even though the historic city of Ayutthaya has had no buffer zone since the time of its inscription, responsible authorities and the legal framework seems to be adequate for maintaining the city's outstanding universal value (OUV) within the boundaries.<sup>2</sup> Some of the most prominent historic structures are located beyond the World Heritage designated area but still registered as national monuments, such as *Wat Phanan Choeng*, *Wai Yai Chaimonkol*, *Wai Chaiwattanaram*, *Wat Na Phra Meru*, *Wat Phanan Choeng*, *Wat Phu Khao Thong*, etc. However, a study on the prospective strategies for expanding the World Heritage boundaries and adding a potential buffer zone is being conducted by the State Party under the Department of Fine Art, with the aim of limiting change in the future and ensuring that the OUV of the historic site is well protected<sup>3</sup>.

The sumptuous Ayutthayan art and architecture are part of its identity as a water-based settlement. The city of Ayutthaya is an island with three major rivers flowing through it, namely the *Chao Phraya* River, the *Pa Sak* River,



Fig. 1 The World Heritage Site (Source: Fine Arts Department, 2012)

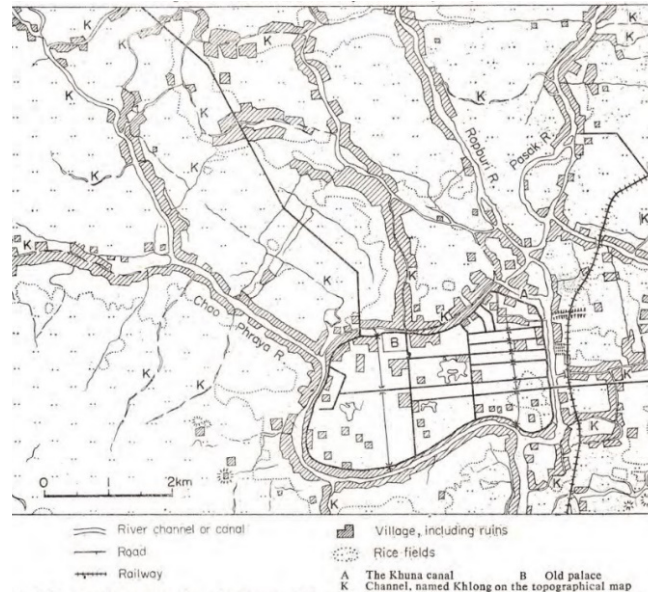


Fig. 2 Water network and settlement in and around Ayutthaya (Source: Tanabe, 1977)

and the *Lop Buri* River, making the land and surrounding area extremely fertile. Using the water supply from annual floods, farmers can obtain sufficient water for rice cultivation merely by digging small watercourses and ponds. Thus, the Ayutthaya government has concentrated on public works for the transportation of products and military affairs. <sup>4</sup> All these features are represented in the Ayutthaya City Plan with its many rivers and canals working as a network connecting the outside and inside of the city. <sup>5</sup> Therefore, Ayutthaya has historically been able to wield power over neighboring cities. However, the existing environment is in a critical state, with ditches, dikes, and canals inside and outside the historical park rapidly deteriorating. Although the historical park has maintained its water features, the same cannot be said of the surrounding area with modern developments, changing modes of transportation, and unprecedented urban expansion causing several canals to dry up. Water features unable to be linked to various physical aspects have been obscured by the road culture. It seems impossible to see the integrity of the city in such conditions. Most importantly, the surrounding environment of Ayutthaya, which was previously cultivated by farmers, has been transformed into an industrialized and commercialized area.

This paper aims to discover why this ancient city has lost its sense of a water-based settlement and identify the linkage between water features, historical monuments, and water-based habitation. The water management and cultural landscape are primarily concerned with achieving the qualitative inquiry of a better understanding as to how a particular water-based settlement and water flow changes affect the value of a World Heritage Site.

### LOST – Ayutthaya: historic monuments and water overflow

Ayutthaya was built on the seabed mud of the Dvaravati sea (3,000-1,500 years ago) <sup>6</sup> and is now approximately 5 m higher than sea level, sitting on the low plain of the Lower *Chao Phraya* River Basin, receiving water from the northern part. The network of old channels, tributaries, distributaries, and artificial short-cut canals make up a comprehensive system of water transportation. <sup>4</sup> Historically, the construction of several canals has frequently

caused the shifting of main channels, and the network of the *Chao Phraya* River has been transformed over time. The topography has slowly changed over the years with the pressure of unprecedented development (as a consequence of previous canal development) and climate change affecting the groundwater overflow system. Accordingly, the uniqueness of the water courses and their adjacent physical structures are likely to change due to natural factors.

However, floods have become a major problem since the development of the great *Chao Phraya* Project in the 1970s.<sup>7</sup> The loss of resiliency in water-based communities in contemporary society is mainly due to road system expansion which has created more rigid spaces. The water system remained stable for over 30 years, which means that at least one generation has not faced natural water overflow as a consequence of a series of dam constructions, new irrigation channels, and embankments throughout the river basin which created unexpected problems several years later. At this turning point, the water-based architecture on which daily life depends has been transformed into a merely symbolic application of water relevant to the present-day land-based society.<sup>8</sup> Due to the aforementioned irrigation development and climate change taking place since the 1990s, the flood phenomenon and water overflow patterns have shifted from short and frequent periods of 30-80 cm to longer periods with a higher level of water. The water resilient features have been reduced with spaces underneath the houses allowing water to interpenetrate thoroughly being replaced by a rigid concrete embankment and water protection sluice gate. The open public spaces in several temples and community spaces have been filled with concrete pavements and new water protection mega structures.

The World Heritage Site at Ayutthaya appears to be limited merely to the historical park and its technical operation. The limitations and scope of its meaning are vastly different from those of an entire historic city. Incidentally, an historic city is not only limited to temples and palaces but also consists of many physical aspects such as the habitats of people in neighborhoods, markets, streets, city walls, moats, river transport routes, canal systems, roads, and so on. These factors, together with the current trend of antiphobia, have created the new paradigm of disconnecting historic monuments from their authentic setting. The aftermath of the great flood in 2011 resulted in the creation of a flood-risk mitigation plan to protect the Ayutthaya World Heritage Site from future flooding. A sophisticated mechanical embankment was constructed, a significant number of manhours invested to prevent water overflow, and a zero-flooding approach policy taken to protect the city island. Keeping historic monuments safe without protecting their natural setting is not a testament to the past.

## **FOUND – Surveying the water resilient structure**

### **Monument**

Most of the natural water features have been washed away by the actions of a contemporary society. Dams have been built upstream to secure the water supply, concrete embankments created to protect the city from flood and erosion, and a water sluice gate controls almost all the water in the canal system. Although it appears that the core area of the city is protected from flood water, there is no evidence to suggest a relationship between historic monuments and seasonal water overflow. However, outside the core area of the city, ten fields with over 400 historic ruins contain both registered and non-registered monuments. According to their topographical features,



these ancient fields will continue to turn into water catchment areas during the monsoon season.

*Tung Lumplee*, a historic field located in the northwest of the city island, was previously a rice field and an important historic battlefield. It has been inhabited since 1600, and after Ayutthaya was disconnected, this area became abandoned. Most of the area is lowland, with a wide field and canals on all four sides. *Wat Na-Phramane*, *Wat Phrangam*, *Wat Chongkrom*, *Wat Phrayaman*, etc., were some of the fields' most outstanding monuments. The flood in September 2021 revealed a strong relationship between monuments and the water overflow level. Water from the *Chao Phraya* and *Lopburi* Rivers overflowed through several fields in the northern part of the city, *Thung Lumplee* being one of them, and many monuments and surrounding communities were inundated when the water level rose to between 80 and 120 cm for two weeks. The historic structure floated over the water's surface. The monument is surrounded by ditches alongside or at the edge of monument boundary, where most of the water collects. The main structures are set on high ground, elevated from the surrounding flat terrain. A large *Ubosot* (grand shrine) is located in the center of the axis with the coupled octagonal chedi on the rear side. All structures are sitting on the same plinth, which has been raised from one to three steps with the main building located on top. This design method can be found in *Wat Phrangam*, *Wat Chongkrom*, *Wat Phrayaman*, and another inundated area of the central flood plain. The special structures of the temple compound consist of *Kumpeang kunkluekratag* <<wave protection wall>> surrounding the boundary walls, like those of *Wat Phrayaman*, which is located at the top north of the field. Interestingly, the north side has indented corners, combining a stretcher bond brick wall to receive the lateral force of the waves.<sup>9</sup> This demonstrates how traditional design can prevent flood damage to the structure through precise leveling and topographic surveying as in the past.



Fig. 3 *Wat Phrayaman* during the flood in September 2021 (Image source: author, 2021).

## Settlement

The riverfront settlement along the *Lopburi* River remains related to water-based settlement. The river is of great historical importance. The 14 km stretch along the *Lopburi* River from city island to *Bangpahun* Sluiceway is testimony to the cultural tradition remaining on the natural embankment of almost the entire river course. A group of houses is settled apart 20–50 m from the river. The natural riverbank gradually slopes upward from the river to the houses, with different slopes creating variations in water overflow levels. There is a backyard area at the side of the riverfront and a rice field to the rear. However, two-story houses on high stilts can still be found with open spaces underneath to provide ventilation. Temporary multi-level wooden platforms have been set up in this space to cope with different water conditions. The house has a terrace on the riverside and a staircase leading to the pier. These physical elements represent the culture of the agricultural community in the central region, where they are responsible for day-to-day livelihoods during any season.



Fig. 4 Settlements along the *Lopburi* River remain have retained their traditions and natural characteristics (Image source: author, 2022).

One of the most outstanding features rarely found anywhere else is the naturally-formed embankment resulting from water overflows and the evolution of human living culture over time. The sediment from the river has become part of the embankment, helping household agriculture to grow. These natural barriers represent the outstanding riverine cultural landscape of the *Chao Phraya* River Basin, with the steps and slopes evidencing how local dwellers understand the changes and have utilized their adjacent environment through time. This can be seen in the local environment where architecture, monuments, and community characteristics help to combine traditions with modernity. Living in communities, local dwellers have changed, improved, adapted, and applied themselves to the current environment and the flow of water over time.

## Conclusion

Natural setting can rarely be found these days. Monuments and the city of Ayutthaya are strongly protected from any water changes, and it can be said that Ayutthaya's riverbank urbanity predominantly lives along the river. Modern solutions with large-scale structures have been proposed by the government to maintain a zero-flood policy, although it is doubtful whether this contemporary policy can fully address the flood issue. Constructing a giant wall with the help of a huge budget seems a strange solution when the whole city is very low. The unexpected consequences of climate change have already started to be realized, resulting in the area still being flooded. Current conservation measures are moving to human-centered approaches. Traditional knowledge and practices used by the people of Ayutthaya on how to live with water could be reconsidered as part of a valued-based resolution which places the people, nature, and culture at the center. Even though flood patterns have changed over time, by allowing the area to become inundated, it may be possible to find traditional knowledge hidden in the mud and brick ruins. However, water management in *Chao Phraya* River Basin involves almost 30 million stakeholders. The research suggests that monuments and settlements along the river require cooperation among stakeholders to achieve effective water management. The water resilience of archaeological sites and historic ruins should run across the site boundary.

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