น้ำในภูมิทัศน์วัฒนธรรมจำปาสัก

Water Element in the Champasak Cultural Landscape

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บทคัดย่อ

น้ำเป็นองค์ประกอบสำคัญทางภูมิสถาปัตยกรรมที่แสดงความสัมพันธ์ระหว่างผู้คนกับสิ่งแวดล้อมในภูมิทัศน์วัฒนธรรมของภูมิภาคเอเชียตะวันออกเฉียงใต้ งานวิจัยเรื่องนี้จึงเลือกศึกษาลักษณะทางกายภาพของแหล่งน้ำและการใช้น้ำในสองวัฒนธรรม คือ วัฒนธรรมเขมรและวัฒนธรรมลาว ในพื้นที่ภูมิทัศน์วัฒนธรรมจำปาสักซึ่งเป็นแหล่งมรดกโลกทางวัฒนธรรมที่ได้รับการยกย่องจากองค์กรยูเนสโก เพื่อทำความเข้าใจความสัมพันธ์ของแต่ละวัฒนธรรมกับลักษณะทางธรรมชาติของพื้นที่และอิทธิพลของทั้งสองวัฒนธรรมต่อพัฒนาการของพื้นที่ศึกษา วิธีการศึกษาเป็นการวิจัยทางเอกสารและการเก็บข้อมูลพื้นที่ในรูปแบบของเรื่องเล่าและภาพภายใต้กรอบโบราณคดีภูมิทัศน์ การศึกษาเรื่องนี้สรุปว่า วัฒนธรรมเขมรและลาวในพื้นที่ภูมิทัศน์วัฒนธรรมจำปาสักสะท้อนความรู้ความเข้าใจอย่างลึกซึ้งในลักษณะทางภูมิศาสตร์และสิ่งแวดล้อม ผ่านเทคโนโลยีในการจัดการน้ำผิวดิน ได้แก่ การก่อสร้างภูมิสถาปัตยกรรมและการเลือกพื้นที่ตั้งชุมชน และการใช้พิธีกรรมทางความเชื่อเป็นปัจจัยกำหนดการจัดการน้ำ

คำสำคัญ: ภูมิทัศน์วัฒนธรรม จำปาสัก การจัดการน้ำ โบราณคดีภูมิทัศน์

Abstract

In Southeast Asia, water is a crucial landscape element that signifies the evolving relationship between human culture and the surrounding environment. This paper will examine both ancient Khmer and more recent Laotian approaches to the design of water features, and functions within UNESCO World Heritage Site, “Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape” in order to illustrate each culture’s relationship to their natural environment and their influence on the development of the Champasak Cultural Landscape over time. Using a landscape archaeology framework, the site’s narrative and visual representations will be collected through field research and document study. The research concludes that Khmers’ and Laotians’ in-depth hydrological knowledge are each evident through their respective technologies for surface water management (e.g., landscape construction versus site selection) and cultural practices (e.g., rituals and ceremonies to manage water element usage).

Keyword: Cultural Landscape, Champasak, Landscape Hydrology, Landscape Archaeology

1. Introduction: Water in Southeast Asian Landscape

The Southeast Asian region is well-known for its abundant water resources (Inpantang, 2007; Molyvann, 2004). Due to the specific monsoon weather pattern, the high volume of water in this region comes from rainfall and thunderstorms. The rainwater generally infiltrates into the soil; however, in some areas, especially in the Mekong River region, the rainwater exceeds the ground's absorbing ability and becomes surface runoff that accumulates into natural water collections, like temporary swamps, ponds, canals, and rivers (Hang, 2014; Taillard, 2010). This characteristic of surface water results in the specific landscape conditions that are well acknowledged by local people.

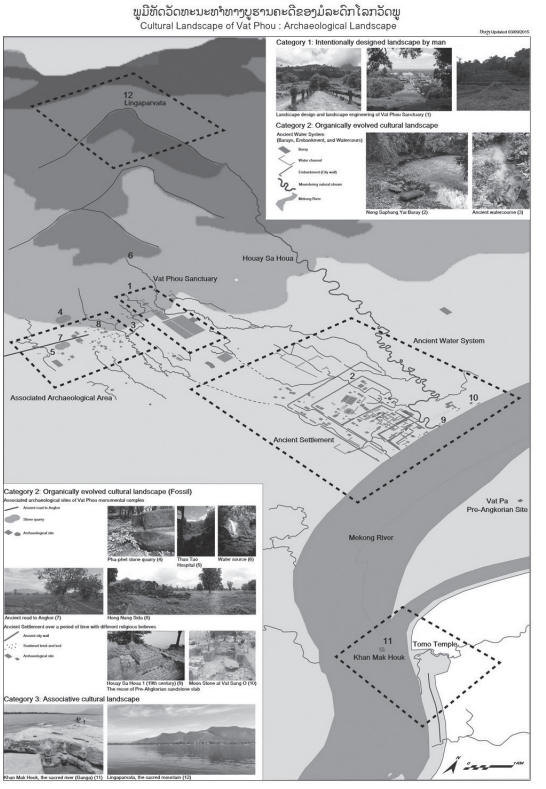
The dynamic surface water management has long been a part of Southeast Asian culture since early settlement. Inpantang (2007) presents that the traditional agricultural practices among indigenous groups in Vietnam demonstrate how well the local culture has evolved around the irrigation system in the rice paddy fields. The ancient settlements by the Cham and Khmer cultures exhibit how local people in Southeast Asia adopted the knowledge of water management from Indian culture and appropriated it into the unique geography of the Mekong region (Hang, 2014; Stuart-Fox & Reeve, 2011; Tawa, 2001). Similarly, Hindu water management culture from India is represented in Bali, Indonesia, where local communities regulate their shared water resources by incorporating the concept of water management into their religious practice and temple system (Geertz, 1972; Lansing & Kremer, 1993).

The local water management has evolved through history; accordingly, its changing features and functions have characterized the landscape of Southeast Asia. Hang (2014) and Molyvann (2004) illustrate that the traditional hydrological knowledge in the Khmer cultural region has progressed into a contemporary context with modern technology. The ancient water system in the lowland Mekong region has been replaced by a modern irrigation system, including weir, pump, and reservoir, which introduces a new form of agricultural practice in Southeast Asia (*Irrigation in Southern and Eastern Asia in figures: AQUASTAT Survey, 2011 / edited by Karen Frenken*, 2012; "New Irrigation Systems and Information are Helping Revive Livelihoods in Lao PDR," 2020). Moreover, the new construction of the Mekong River dams in Lao PDR has altered the local landscape in the Vientiane region (Taillard, 2010). The change in water elements reflects the changing landscape in both ecological and cultural dimensions.

By tracing the development of water elements in spatial and cultural contexts, one can comprehend the relationship between people and their surrounding environment over time. This dynamic relationship is the core of this cultural landscape study. This study selects Champasak Cultural Landscape—the first official "cultural landscape" designated by UNESCO World Heritage Nomination in Mainland Southeast Asia—as a case study. Its nomination dossier requested some further studies on the social and ecological aspects of the site that contribute to the integrity of the Champasak Cultural Landscape (*Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape*, 2000). This research aims to fill this knowledge gap by investigating the hydrological condition of the Champasak Cultural Landscape site.

2. Methodology: The Landscape Study of Water in Champasak Cultural Landscape

This research studies the development of Champasak Cultural Landscape by questioning the role of water in the landscape process. The research asks, “how does water—as a landscape element—play a central role in the creation and development of the Champasak Cultural Landscape?” The water elements are investigated to identify the Khmer and Laotian cultural significance that remains intact in the UNESCO World Heritage Site of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape. Without historical distinction or cultural boundaries, water has always flown through space and time. The study of water elements in the landscape will explain the Champasak Cultural Landscape’s integrity from the early period to the current state across the two cultural settlements.



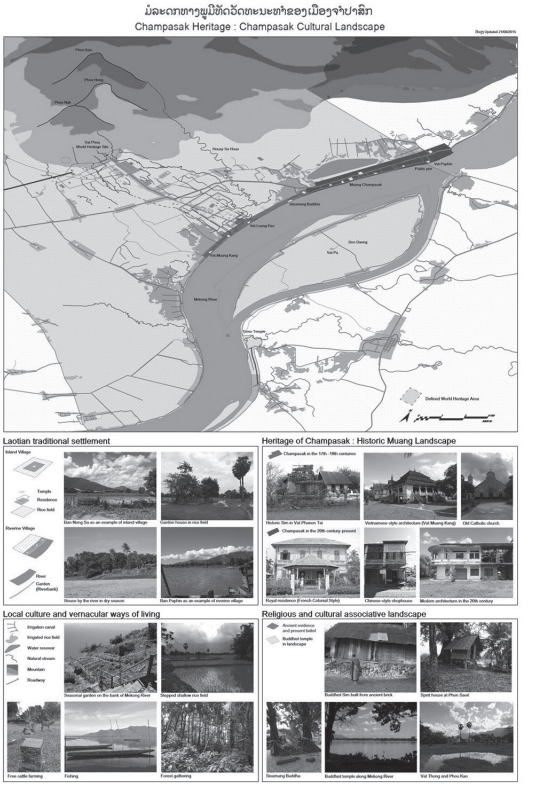


Figure 1 (Left) and **Figure 2** (Right)

The Initial Survey of the Champasak Cultural Landscape Development from the Khmer and the Laotian landscapes (Presentation Poster from the Interpretation Center in Vat Phou-Champasak Site Museum, 2015)

This study adopts the landscape approach in archaeology that views landscape as "the complex issues of the ways that people have consciously and unconsciously shaped the land around them" (Fennell, 2020). Anschuetz et al. (2001) state that the landscape approach resembles the goal in archaeology. The landscape "explains humanity's past through its ability to facilitate the recognition and evaluation of the dynamic, interdependent relationships that people maintain with the physical, social, and cultural dimensions of their environments across space and over time" (Anschuetz, Wilshusen, & Scheick, 2001, p. 159). In terms of its theoretical parameter, this study borrows from geoarchaeology that studies landscape in two aspects. One aspect is the landscape process, for example, the evolution of the built environment, and the other is the human activities that either bring about or result from the cultural environment (Sam, Lisa-Marie, & Francesco, 2018). The landscape framework situates this studied site in its intricate organization of space and time rather than focusing on one specific cultural context in a particular development period.

This research draws on two methods—field research and document study—for data collection. Since the information regarding landscape within the Laotian cultural context is limited, this study collected primary data on the Laotian cultural landscape by observations and interviews with the local community. The researcher conducted field research in 2014-2018 to investigate the Laotian cultural traces in the Champasak built environment. The UNESCO World Heritage Site office of Vat Phou-Champasak provides secondary resources on the Khmer culture that contributed to the Champasak Cultural Landscape. The list of documents includes archaeological research and studies conducted by scholars from the French School of Asian Studies (École Française d'Extrême-Orient—EFEO,) the *Champasak Landscape Study Project* (2016) by the French research team under the supervision of UNESCO Paris and Agence Française de Développement (AFD) and the official documents by the Department of World Heritage of Vat Phou-Champasak—for example, the nomination file (2000), the visitor's guide (2012), the cultural landscape management plan (2016) and the UNESCO mission reports (2012, 2013, 2014, 2015). The secondary data come in the forms of narratives and visual representations.

The research analysis focuses on water contents to identify the meanings of water in two cultures that are involved in the Champasak Cultural Landscape development. This research concludes with the explanation of water as the medium of landscape process in the Champasak Cultural Landscape that represents the relationship between the cultural settlements and the environmental conditions.

3. Background: The Champasak Cultural Landscape as a UNESCO World Heritage Site

The Champasak Cultural Landscape is the second UNESCO World Heritage Site of Lao PDR. The site is located in the southern region of the country. The nominated site covers 390 km^2 with the major part located in Champasak province and an adjacent section in Pathumphone province on the other side of the Mekong River (See figure 3).

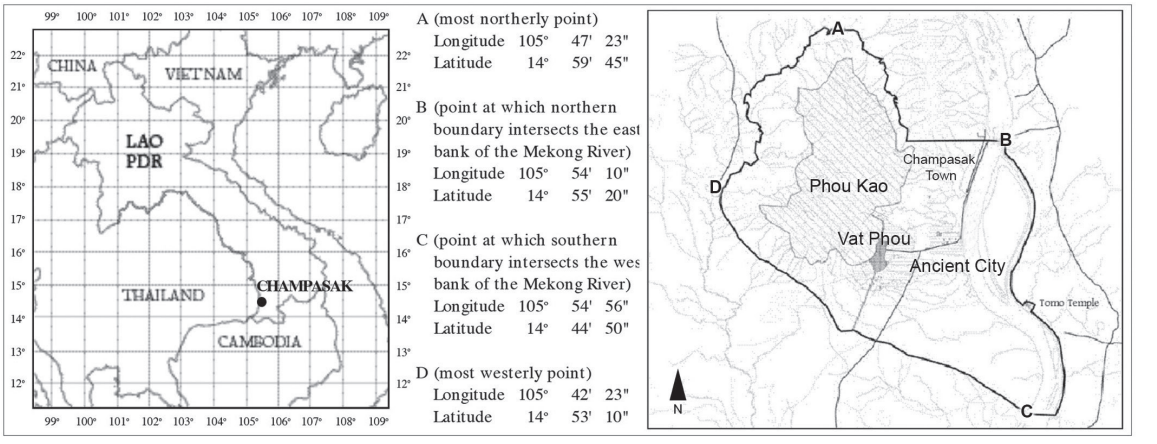


Figure 3 The Parameter of Champasak Cultural Landscape as in *the Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape (Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape*, 2000)

The nomination dossier of Vat Phou and Associated Archaeological Sites presents the Champasak Cultural Landscape as the vast site that hosts the remains of the ancient settlement. The Vat Phou monument is dated in the Khmer period between the 9th to 13th centuries, while the associated sites, located in the Ancient City of *Kuruksetra*, are earlier in the Cham period between the 5th to 7th centuries[1] (Cœdès, 1956; Hawixbrock, Santoni, & Souksavatdy, 2008).

The architectural monuments and archaeological artifacts in the Champasak Cultural Landscape show the "*Outstanding Universal Value*" that bears exceptional human creativity in

[1] The name of the Ancient City is not yet defined. In the nomination dossier, the Ancient City is called by the name *Shrestrapura*. However, Christine Hawixbrock—who currently works on the excavation of the Ancient City—argues that the name of the Ancient City should be *Kurukşetra*. The name comes from the initial study of the stone inscription found in the Ancient City.

specific geographical conditions. One feature of this unique landscape is the architecture of the Vat Phou sanctuary that connects the human settlement to the *Lingaparvata* or the holy mountain with the natural *Linga* icon that represents *Shiva*—the highest god in Hinduism. Standing as the site's focal point, the *Lingaparvata* is now known as *Phou Kao* mountain to which "Phou" in Vat Phou references.[2] In addition, the presence of the Mekong River as the sacred river in connection to the sacred mountain of *Phou Kao* complements the wholeness of the Champasak Cultural Landscape as it symbolizes the holy landscape in Hindu belief.

The Champasak Cultural Landscape also demonstrates the development of the living landscape of the Khmer people. The Ancient City on the Mekong riverbank is one of the earliest urban settlements in Southeast Asia with an advanced water management system, including surrounding earth mounds, road structures, drainages, and irrigations. These ancient technologies allow the cultural landscape of the Khmer people to develop on this site.

Other archaeological sites built under the same belief in Hindu-Khmer culture are located around Vat Phou, such as the temples at *Hong Nang Sida* and *Hong Thao Tao* Temple. The archaeological landscape has also extended to the east bank of the Mekong River with *Tomo* Temple Complex. These satellite monuments are linked to the Vat Phou sanctuary by water-courses. While these monuments have not yet been studied in detail, the initial archaeological landscape surveys can imply the linkage between them that illustrates the holistic value of the Champasak Cultural Landscape.

The Champasak Cultural Landscape from the experts' point of view, for example, in the UNESCO World Heritage reports, manifests the Hindu belief through the Khmer built environment. On the contrary, from the perspective of local offices and Laotian experts, the Champasak Cultural Landscape is characterized by the Laotian culture (*Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape*, 2000). This research puts together the information regarding the landscape of the Khmer settlement and the Laotian ways of living in the Champasak region to find values and meanings of water in the two cultures that contribute to the contemporary landscape of the UNESCO World Heritage Site of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape.

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[2] The word *Phou* means mountain in Laotian language.

4. Water Elements in Champasak Cultural Landscape

Khmer and Laotian cultures configure water features in the Champasak Cultural Landscape in two different periods—the Khmer in the 5th to 13th centuries: and the Laotian in the 16th century to the present. While water is prerequisite to both cultural settlements as they are agricultural societies, each culture has a unique way of managing water resources. The Khmer culture is renowned for its symbolic water landscape and hydrological technology, while the Laotian culture is notable for the harmonious way of life that compromises with nature.

4.1 Water in the Khmer Landscape

Khmer culture had denoted the early settlement in the Champasak Cultural Landscape. The archaeological study of the Khmer settlement reveals unique hydrological knowledge that has some influences from the Indian conception of sacred water in Hinduism. The Khmer people had taken the knowledge of the Indian culture to the local environment of Southeast Asia. This study will discuss two water features in the Champasak Cultural Landscape retrieved from archaeological studies. One is the sacred water in the Vat Phou sanctuary design, and the other is the surfaced water management system in the Ancient City of *Kuruksetra*.

4.1.1 Symbolic Water in the Landscape Architecture of Vat Phou

Water is an essential element in the design of religious shrines in the Khmer-Hindu culture. The architecture of the Vat Phou shrine is built to host two crafted icons—*Linga* sitting on top of *Yoni*—that are glorified during the religious ceremony. The ablution is performed with water poured onto the *Linga* and recollected from the *Yoni* foundation. This ceremonial water becomes sacred and is later distributed to the community through the water reservoir system called *Barays*. Accordingly, the Khmer temple design typically includes water-related elements. For example, the *Somasutra*, or ceremonial water pipe, is commonly found at the base of the architecture where sacred water is delivered to the general people who are not permitted to enter the ceremonial hall (Hawixbrock, 2012; Hawixbrock et al., 2008).

The design of the Vat Phou temple and its landscape architecture has been the topic of academic discussion since the Mekong Expedition (*Mission du Mekong*) in the early 1900s when the French Empire was scrutinizing the *Indochine* landscape—later known as Southeast Asia. The planning of the entire complex and the distribution of sacred water to the *Barays*—water reservoirs—was hypothesized by Henry Parmentier in 1914 (Lorrillard, 2013; Santoni & Souksavatdy, 2015). Cœdès (1956) proposed in an early study of the Khmer culture in the Southern Laos region that the Vat Phou temple was located on the mountain terrace to link to the *Lingaparvata*; however, he did not mention the importance of the water elements in the landscape architectural design of the temple. The archaeological study of the site had not fully explained the ceremonial conception in the Khmer-Hindu architecture at the Vat Phou

Sanctuary until the 1990s. From 1991 to 1996, the research team under the *Projet de Recherches en Archéologie Lao* (PRAL) had broadened to scope of the study area from the main structure of Vat Phou to the surrounding site. The archaeological excavation of the area around the sacred spring behind the main temple revealed the first information of the temple's landscape design that incorporated natural water resources into the religious sanctuary.

The Vat Phou archaeological research demonstrates the outstanding landscape architectural design of the Vat Phou sanctuary, which signifies the Hindu concept of sacred water in the religious structure. The landscape architecture design of the Vat Phou temple complex incorporated the natural water into the ceremonial space. The entire complex located on the mountain terrace was divided into the front section, where Vat Phou—the main Hindu shrine—was located, and the back area, where the sacred spring water was collected and diverted to the main shrine for ceremonial purpose through hard-scape design (See Figure 4). The site selection was intended for the sacred spring that constantly supplied the sacred water for the royal ceremony at the Vat Phou temple.

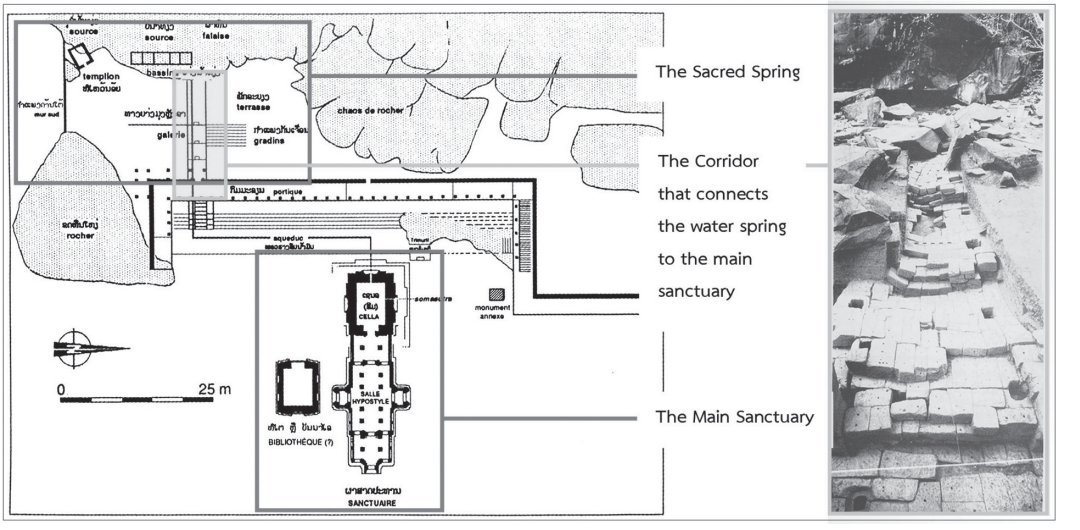


Figure 4 The plan and detail of the landscape architectural design of Vat Phou Sanctuary (Modified from images in article "Les Fouilles sur le site de Vat Phou-Champasak" by Santoni and Souksavatdy, 2015)

The discussion in the nomination dossier points to the original design of the water element in the Vat Phou sanctuary was not only for religious purposes but also for construction techniques. The flow of water from the temple terrace to the lower area of the main *Barays* was systematically controlled to cope with surface water drainage. Franzetti suggests in the *Technical Report on Water*

Management Restoration of Wat Phu Monument Site (1998) that the collapse of the original drainage system at the temple had caused the destruction of the Vat Phou sanctuary. His suggestion indicates that the preservation of the Vat Phou monument requires the restoration of the original landscape system and emphasizes the necessity of water and its management in the Champasak Cultural Landscape (*Champasak Heritage Management Plan*, 1999).

Since the ablution of the religious icon inside of the Vat Phou temple had lost its meaning due to the decline of the Khmer culture, the water system connecting the temple structure to the sacred spring no longer carries its original function. The Laotian community ascribes new meaning to the spring as spiritual water that Laotian people collect for blessing. While the landscape architecture of the Vat Phou sanctuary has been altered according to the cultural change, the water element remains the most critical feature of the temple's landscape design. The sacred spring water still attracts religious pilgrims to the Vat Phou sanctuary.

4.1.2 The Water System of Ancient Cham-Khmer Settlement

The Ancient City was first recognized from the aerial photograph taken in 1981 (See Figure 5). The image shows a defined settlement in square shape surrounded by earthworks that run as the city walls on the west and the south sides. On the north side, the city boundary is marked by *Houay Sa Houa*—a natural stream that flows from the *Phou Kao* mountain. The city faces the Mekong River in the east, having the Mekong River as one border. Inside the city settlement, archaeological research found extensive evidence of water management systems, including small *Barays*, human-made canals, road networks that function as flood protection, and artifacts of clay water pipes.

Figure 5 Aerial Photograph of the Ancient City (Hawixbrock, Santoni, and Souksavatdy, 2008)

The primary conclusion from aerial photograph analysis indicates that the Ancient City was well planned concerning water conditions. According to the nomination dossier, the idea of water management comes from the Indian influence of the Hindu sacred water and Southeast Asian perception of the dualism between mountain and water (*Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape*, 2000). The physical traces of archaeological remains also indicate the understanding of local geography and ecology in landscape planning. There are three aspects of water design in the Ancient City that supports this idea.

First, the locations of *Barays* are within the natural waterway. *Baray* is the most important feature in the water management system used in the Ancient Khmer culture. This specific type of water pond functions as water detention during the water season and as water supply during the dry season. The plan of the Ancient City shows that the system of *Barays* is carefully located in connection to the natural waterways, linking the city on the banks of the Mekong River to the religious sanctuary at the *Phou Kao* mountain by water.

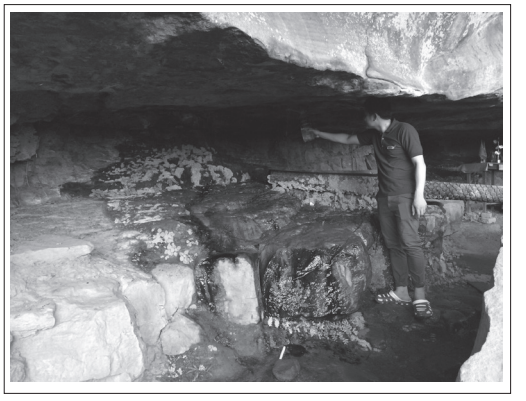
The Ancient City is located in the watershed of the *Phou Kao* mountain to ensure sufficient water supply for urban development. This aspect shows that the location of the Ancient City was carefully selected with advanced knowledge in local geography. The *Barays* system emphasized the crucial role of water in the planning of the Ancient City.

Second, the early settlement in Mainland Southeast Asia is known for the earthworks, including earth mounds or ramparts, human-made canals, and graded roads. They are designed not only for cultural function but also for water-control. These human-made landscape features are a part of the technology for directing surface water that is abundant in the region.

The system of earthworks exemplifies the intelligence of water management of the ancient people. As the Ancient City was located in the watershed zone between the *Phou Kao* mountain and the Mekong River, it could be flooded by runoff water from the mountain during the rainy season. The earth walls, clearly visible in the aerial photograph, worked together with the human-made canals in the south of the city and *Houay Sa Houa*—the natural water stream in the north—and the road network inside of the city for flood control. The earth walls on the west could redirect the surface water to the human-made canals on the south that let water drain to the river, while the road structure could work as an embankment, so the entire city was protected from the seasonal flood.

Finally, the design of the religious monuments symbolizes the importance of water in the Ancient City landscape as a whole. There are two sculptural elements built to represent the Hindu belief that was intended to form the sacred landscape. First, the water spring at Vat Phou sanctuary draws water from the symbolic mountain and distributes it to the living landscape. Second, the *Khan Mak Houk* Island in the Mekong River is craved with the images of Hindu gods and goddesses, as well as the Linga—icon of *Shiva* God (Santoni & Souksavatdy, 2015). This island stays underwater

for most of the year, resulting in the holiness of the entire river. A similar idea of creating a sacred waterway is known from the *Kbal Spean* site in *Phom Kulen* in Cambodia (Tawa, 2001). As the sacred water flows from the mountain and connects to the river, the Khmer cultural landscape's integrity is created as a whole.



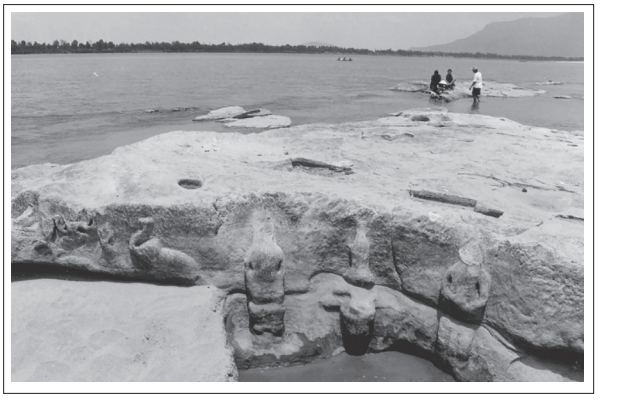


Figure 6 (Left) The Sacred Spring (Author, 2015) and **Figure 7** (Right) The Khan Mak Houk Island (Vat Phou Champasak World Heritage Department, 2015)

The discussion of the Khmer landscape through the water design in the Vat Phou temple complex and the management of water in the Ancient City illustrates the integration of environmental knowledge and cultural tradition in the Khmer cultural landscape construction. These water elements in the Khmer historic landscape remain intact in the current Champasak Cultural Landscape. However, their values and meanings have changed according to the Laotian cultural group, who reclaimed the site after the decline of the Khmer power.

4.2 Water in the Laotian Landscape

The end of the Khmer empire gave way to the rise of indigenous cultural settlement and the later occupation by the *Lao Loum*, who migrated downstream from the Vientiane region. During the political unrest in the 16th century, the Laotian people from the north relocated to the Champasak region. As a result, they have transformed the abandoned landscape of the Khmer culture into the living landscape of the Laotian settlement.

4.2.1 The Laotian Settlement along the Mekong River

The Champasak town is built on the Mekong riverbank in linear form according to the riverine landscape conditions and the traditional knowledge in Laotian culture. From the study of Vientiane urban landscape by Tillard (2010), Laotian people consider three landscape features for their selection of the settlement site: the riverbank, the alluvial plain, and the terrace. The direction of water flow along

with natural and built levees, the nutrients that come with the seasonal flood for rice production, as well as the large terrace for community settlement are primary concerns. The site selection seems more important for the Laotian settlement than the landscape engineering, as seen in the Khmer culture.

The landscape of the Champasak Kingdom resembles the settlements in Vientiane and Luang Prabang towns (Archaimbault, 1971, 1973; Archaimbault & Manikus, 1972). Due to the Mekong region's specific geography, the Laotian community often situates a town settlement in the alluvial plain between the Mekong River and a hill with secondary waterway on one side of the town perpendicular to the river. This condition is suitable for rice-growing—the main agriculture in Laotian settlement. Furthermore, it represents the belief in mountain-river dualism in Laotian culture (See Figure 8).

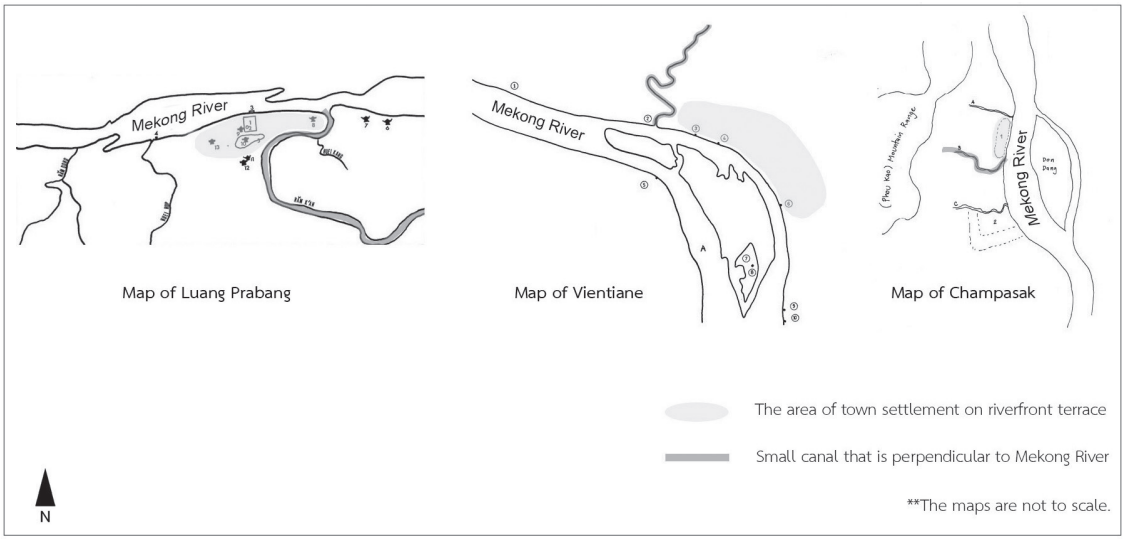


Figure 8 The landscape characteristic of major cities in Laotian settlement is dominated by the presence of the Mekong River and a small stream or canal on one side, forming the peninsular land. (Modified from diagrams of Luang Prabang and Vientiane by Archaimbault, 1972; and diagram of Champasak by author, 2019)

In Champasak Cultural Landscape, the water "flows down a rich network of seasonal streams supplying water for rice cultivation, to support fish production as an integral part of the local diet, and to fill the ponds of villages located far from the Mekong River" (*Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape*, 2000, p. 43). These inland ponds are the ancient *Barays* in Khmer culture that have become the essential water source for the Champasak community. The adaptation to the existing landscape gives a specific characteristic to the Champasak landscape.

The Mekong River is the essence of life in the Lao-Champasak settlement. It is the medium for fishery, agriculture, everyday task, as well as spiritual practice. Due to the local belief in Animism, the river is animated by spirit. Champasak people perform rituals and ceremonies to pay respect to the Mekong River spirit. Boat Racing ceremony is one of the most important events representing the value of the Mekong River in the Champasak landscape. The ceremony's main purpose is to pay respect to the river spirit, the ritual also reflects how local people engage with the local environment. For example, the local leader must predict the season change using deep ecological knowledge to determine the event's timing.

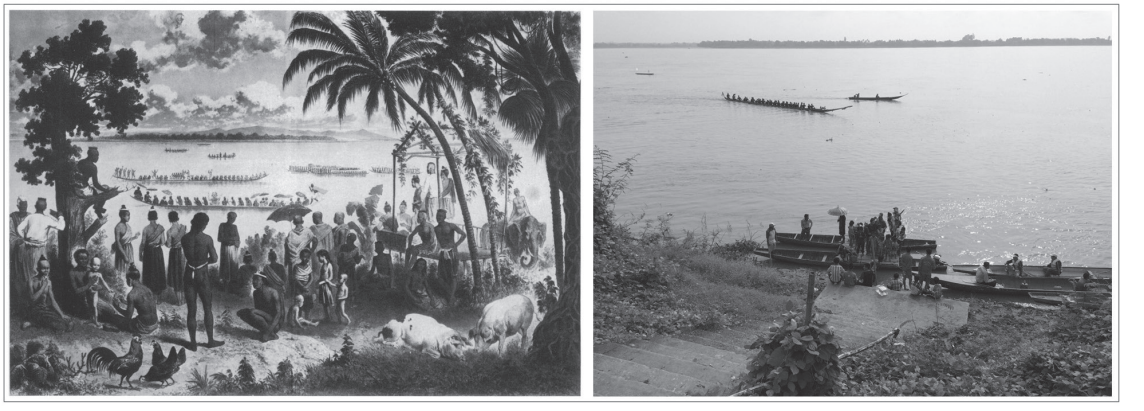


Figure 9 The Boat Racing Festival in comparison between the late 19th-century drawing and the contemporary one (Left: The Boat Racing Ceremony by Doudart de Lagrée in 1866 (Archaimbault, 1972), Right: The visitor group arriving before the Boat Racing Ceremony (Author, 2016))

4.2.2 The Overflow System in Rice Paddy Field

The cultural landscape of the Laotian group differs from the highly managed landscape of the Khmer culture. Instead of controlling the movement of water, Laotian people adjust their living to the natural watercourse. The different agricultural practices between the two cultures illustrate this point. The characteristic of rice production in Laotian culture diverts from the one in Khmer culture. The Laotian rice is crossed with the shallow-water rice from the upland area, so it does not require deepwater as the rice in the lower Mekong region, for example, in most areas of Cambodia and Vietnam (Manivong & Cramb, 2020). The rainwater supply with a slightly modified ground is a sufficient technique for managing water in the rice field. As a result, there is no need for extensive irrigation. The land can be cultivated with existing conditions (Farhat, 2016).

The organic irrigation system in the rice paddy field exploits the slope in landscape geography as the foundation. The ground is graded into steps. The landscape elements, including the small levees and the earth ditches, are used to detain and direct the flow of water according to the water need in different phases (Farhat, 2016). The rice-growing plots and the irregular pattern also follows the existing condition of the land gradient done by the Khmer settlement. These characteristics of the rice cultivation limit the disturbance on the buried archaeological ground to the minimum since the cultivation is not likely to reach its depth *(Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape,* 2000*)*. It can be said that the agricultural practice of the Laotian group helps preserve the Khmer landscape in the Champasak Cultural Landscape.

4.2.3 Symbolic Water in Champasak Rituals and Ceremonies

In the *Tamnan* of *Phone Samek Monk, Chao No Kasat*—who descended from the King of Vientiane—was coronated as the first King of Champasak.[3] This special event elevated the Champasak community's status from an indigenous town to the Champasak Kingdom with the proper establishment of the Champasak landscape under the central Laotian culture.

During the period of the Champasak Kingdom, water had been an essential component of monarchical rituals and ceremonies. The royal ceremonies in the Champasak Kingdom resembled the use of water in Hindu-Khmer culture with the purpose of the kingdom's governance. The Royal Oath Ceremony was one example of how the Champasak community assigned the Laotian value to the Khmer cultural element.[4] The ceremony required the water from the sacred spring founded during the Khmer period at the Vat Phou sanctuary. While the water still held its holiness value during the Champasak reign, it had no longer connected to the religious practice but the political purpose.

The *Barays* was also incorporated into the traditional Laotian ceremony of the Champasak Kingdom. The ancient *Barays* in the Vat Phou Temple complex, located at the foot of the *Phou Kao* mountain, were used for the temple's annual festival. The *Barays* were the venue of the royal ceremony and the kingdom's water supplement that the king provided for his people—the residents as well as the pilgrimages who visited the Vat Phou religious center. While the royal ceremonies of the Champasak Kingdom had ceased, the local rituals continue. The use of the *Barays* for the Vat Phou Festival has

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[3] Phone Samek Monk was a famous monk in Vientiane polity. When the number of his followers accumulated, he was seen as threatening to the kingdom's stability. He left the Vientiane city and journeyed downstream to the southern region of the Lan Xang kingdom. The legend of Phone Samek Monk is widely spread in the southern region of Laos and in the northeast of Thailand. His legend is regarded as the origin myth of the Champasak Kingdom in Laos; while in Thailand, his story is tied with the restoration of That Phom in Nakhonphanom Province.

[4] The current political system of the Lao PDR. does not maintain this traditional practice. The local people still believe in the spring's spiritual value; without an official ceremony, people generally collect the spring water as a blessing for their life.

continued with no connection with the royal culture. The other *Barays* are linked to the local belief in spirits; they are protected by spirits and must be respected and preserved. For example, the small *Baray* in the north of Vat Phou complex is called "*Nong Phi*" or a spiritual pond. The water in the pond is used during the annual spiritual ceremony of the Champasak community. The reuse of the ancient water elements illustrates the unification of the Khmer and the Laotian landscapes that form the current Champasak Cultural Landscape.

The use of water elements in the Laotian landscape demonstrates the evolving character of the Champasak Cultural Landscape. The Lao-Champasak way of life concentrates on the harmony between the living conditions and the surrounding contexts; consequently, their settlement has integrated the ancient Khmer built environment into their current living conditions. Some aspects of the Champasak cultural practices prolong the previous Khmer culture, resulting in the continuous use of ancient landscape elements, especially the water features. By tracing the history of the water elements in the Champasak Cultural Landscape, this research concludes that the Champasak Cultural Landscape has a high level of integrity in the landscape history that comes from the Khmer and Laotian landscapes together.

Figure 10 The contemporary functions of the ancient Barays (Author, 2014)

5. Conclusion

From the archaeological knowledge to the contemporary landscape experience, the interpretation of water elements in the Champasak Cultural Landscape reveals the landscape process that has evolved around the design of water features and functions in the Khmer and Laotian cultures. The ancient Khmer cultural settlement had engineered the landscape hydrology to form a livable and productive land. The Khmer community had used the *Barays* system to

control the surface water. Moreover, the *Barays* was the water feature for creating the integrity of the cultural landscape. The ancient culture ritualized the landscape by creating sacred water sources and linking them to the entire site through the *Barays* system. This multi-purpose water feature also helped prevent flooding and reserve the water for urban supply allowing the development of the oldest urban settlement in Southeast Asia. The landscape conditions created by the Khmer become the foundational environment for the Laotian settlement.

The more recent Laotian settlement adapts to the landscape conditions initiated by the Khmer culture. While the adaptation is mainly for living conditions, such as the use of *Barays* as an inland source of water, they also re-enact the values of the Khmer's landscape elements using rituals and ceremonies. For example, the Laotian community reuses the sacred spring for their spiritual purpose. These characteristics of water usage in Khmer and Laotian cultures give ecological as well as cultural values to the Champasak Cultural Landscape in the present.

Furthermore, the water elements in the Champasak Cultural Landscape has evidenced the extended landscape process from the ancient time to the contemporary period. Some of the Laotian cultural practices, such as shallow water irrigation, work to preserve the existing landscape conditions. The values of Champasak Cultural Landscape are evidenced in the Khmer landscape remnants with the new meanings given by the Laotian culture.

This research confirms that the unique Champasak Cultural Landscape has evolved through history, suiting the UNESCO World Heritage's cultural landscape category—organically evolved landscape—by which it is nominated. This study of the Champasak Cultural Landscape also synthesizes the holistic approach in the landscape study that extends beyond the time limit and cultural boundary.

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7. References

Anschuetz, K. F., Wilshusen, R. H., & Scheick, C. L. (2001). An Archaeology of Landscapes: Perspectives and Directions. *Journal of Archaeological Research, 9*(2), 157-211. Retrieved from http://www.jstor.org.proxy2.library.illinois.edu/stable/41053175

Archaimbault, C. (1971). *The New Year Ceremony at Basak (South Laos) with an Afterword by Prince Boun Oum. Abridged translation by Simone B. Boas*. Ithaca, N.Y: Cornell University.

Archaimbault, C. (1973). *Structures Religieuses Lao: (Rites et Mythes)*: Vithagna.

Archaimbault, C., & Manikus, J. (1972). La Course de Pirogues au Laos: Un Complexe Culturel. *Artibus Asiae. Supplementum, 29*, 3-126. DOI:10.2307/1522669

Champasak Heritage Management Plan. (1999). Vientiane: Government of the Lao People's Democratic Republic.

Cœdès, G. (1956). III. Nouvelles Données sur les Origines du Royaume Khmèr: la Stèle de Văt Luong Kău près de Văt P'hu. *Bulletin de l'École française d'Extrême-Orient*, 209-220. Retrieved from https://www.persee.fr/doc/befeo_0336-1519_1956_num_48_1_1288

Farhat, G. (2016). *Etude du Paysage Culturel du Site Classé au Partimoine Mondial de l'UNESCO: Vat Phu Champassak, Laos*. Ecole Nationale Supérieure d'Architecture de Versailles, Université Paris 1. Paris.

Fennell, C. (2020, August 21). Landscape Archaeology: Course Syllabus Fall 2020. Retrieved from http://faculty.las.illinois.edu/cfennell/syllabus/anth453/453syllabus.html

Geertz, C. (1972). The Wet and the Wry: Traditional Irrigation in Bali and Morocco. *Human Ecology, 1*(1), 23-39. doi:10.1007/BF01791279

Hang, P. (2014). La Gestion de l'Eau dans Angkor, Capitale de l'Empire Khmer. *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*, 783-802. Retrieved from https://www.persee.fr/doc/crai_0065-0536_2014_num_158_2_95018

Hawixbrock, C. (2012). *Collections du Musée de Vat Phu (Vat Phu Museum collections)*. Champassak, Laos: Département du Patrimoine mondial de Vat Phu - Champassak.

Hawixbrock, C., Santoni, M., & Souksavatdy, V. (2008). The French Archaeological Mission and Vat Phou: Research on an Exceptional Historic Site in Laos. Retrieved from https://www.vatphou-champassak.com/pdfs/Marielle%20Santoni%20MEP.2017.07.12.pdf

Inpantang, V. (2007). Irrigation System for Wet-rice Cultivation of Black Tai People (เหมือง ฝาย ราย ริน: ระบบทดน้ำทำนาของไทดำ). In *Plook Ruen Kloi Tam Peun Din, Puk Tin Kloi Tam Sai Nam (In Thai)* (pp. 144-167). Bangkok: Faculty of Architecture, Silpakorn University.

Irrigation in Southern and Eastern Asia in figures: AQUASTAT Survey, 2011 / edited by Karen Frenken. (2012). Rome: Food and Agriculture of the United Nations.

Lansing, J. S., & Kremer, J. N. (1993). Emergent Properties of Balinese Water Temple Networks: Coadaptation on a Rugged Fitness Landscape. *American Anthropologist, 95*(1), 97-114. DOI:10.1525/aa.1993.95.1.02a00050

Lorrillard, M. (2013). *Autour de Vat Phu: de l'Exploration à la Recherche (1866-1957)*. Paris: Ecole Française d'Extrême-Orient.

Manivong, V., & Cramb, R. (2020). From Subsistence to Commercial Rice Production in Laos. In R. Cramb (Ed.), *White Gold: The Commercialisation of Rice Farming in the Lower Mekong Basin* (pp. 103-119). Singapore: Springer Singapore.

Molyvann, V. (2004). *Modern Khmer cities*. Cambodia; Abingdon: Reyum; Marston.

New Irrigation Systems and Information are Helping Revive Livelihoods in Lao PDR. (2020, February 3). Retrieved from https://www.adb.org/news/features/new-irrigation-systems-information-helping-revive-livelihoods-lao-pdr

Nomination of Vat Phou and Associated Ancient Settlements within the Champasak Cultural Landscape. (2000). Vientiane: Government of the Lao People's Democratic Republic.

Sam, T., Lisa-Marie, S., & Francesco, C. (2018). Landscape archaeology. In *The Routledge Companion to Landscape Studies*: Routledge.

Santoni, M., & Souksavatdy, V. (2015). Les Fouilles sur le Site de Vat Phou-Champasak. In *Laos, Restaurer et Préserver le Patrimoine National, Coloque EFEO*, pp 167-251. Vientiane: Sisavath Printing.

Stuart-Fox, M., & Reeve, P. (2011). Symbolism in City Planning in Cambodia from Angkor to Phnom Penh. *Journal of the Siam Society, 99*, 105-138. Retrieved from http://www.library.illinois.edu/proxy/go.php?url=http://search.ebscohost.com/login.aspx?direct=true&db=hia&AN=82363681&site=eds-live&scope=site

Taillard, C. (2010). Devenir de l'Ancien Système Hydraulique de Vientiane. Des Héritages Paysagers dans le Développement Urbain. In P. Clément, C. Goldblum, & C. Taillard (Eds.), *Vientiane, architectures d'une capitale: Traces, formes, structures, projets* (pp. 121-139). Paris: Éditions Recherches.

Tawa, M. (2001). At Kbal Spean. *Architectural Theory Review, 6*(1), 134. Retrieved from http://www.library.illinois.edu/proxy/go.php?url=http://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=75545668&site=eds-live&scope=site