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IS GANGAIKONDA CHOLAPURAM BUILT BASED ON VAASTU SASTRA?

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Ramya Palani  
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IS GANGAIKONDA CHOLAPURAM BUILT BASED ON VAASTU SASTRA?

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BY THE COMMITTEE CONSISTING OF

Callahan, Marjorie P., Chair

Warnken, Charles G.

Fithian, Lee A.

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## Abstract

The Cholas (848 CE – 1279 CE) established an imperial line and united a large portion of what is now South India under their rule. The Cholas, known worldwide for their bronze sculptures, world heritage temples and land reforms, were also able builders. They followed a traditional systematic approach called *Vaastu Sastra* in building their cities, towns, and villages. In an attempt to discover and reconstruct Gangaikonda Cholapuram, an administrative capital (metropolis) of the Chola Dynasty, evidence is collected from the fragments of living inscriptions, epigraphs, archaeological excavation, secondary sources, and other sources pertinent to *Vaastu Sastra*. The research combines archival research methodology, archaeological documentation and informal architectural survey. The consolidation, analysis, and manipulation of data helps to uncover the urban infrastructure of Gangaikonda Cholapuram city.

*Keywords: Chola, Cola, South India, Vaastu Shastra, Gangaikonda Cholapuram, Medieval period, Metropolis, Reconstruction, Archival research, Manasara, Mayamatam.*

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## 1. Reconstruction of Gangaikonda Cholapuram

The Medieval Chola Dynasty of India conquered and reigned over an empire from the late 10<sup>th</sup> century to the early 12<sup>th</sup> century CE for approximately 450 years. Renowned for its successful battles (that accounts for the vastness of its kingdom) Chola's art and architecture also stand out. Chola Artists produced exquisite bronze sculptures that adorned their temples and palaces (Thapar, 1998, p. 403). Excellent engineers, they built over 80 stone temples that survived for approximately 1000 years (Sarkar, 1974, p. 7). Though there is significant literature about land reforms, tax collection, the social system, the quality of Chola Art, and the Dravidian<sup>1</sup> Temple Architecture, there is little to no documentation that pictures the urban context of a Chola city.

During the 13th century, all of the Chola metropolises (but for the Gangaikonda Cholapuram city and Chola Shiva temples), were systematically destroyed by the Pandya, Chola's rival (Nagaswamy, 1970, p. 3). All the metropolises were urbanized / occupied in the following millennium, except Gangaikonda Cholapuram due to its location. Over the centuries, Gangaikonda Cholapuram has been reduced only to foundation of its protective walls; and those are in jeopardy of disappearing as the local population used to steal its bricks to build their homes. It is time for researchers to reconstruct the spectacular cityscape of Gangaikonda Cholapuram.

This thesis, "Reconstruction of Gangaikonda Cholapuram" recreates the framework of the Gangaikonda Cholapuram Metropolis - articulating (1) the fortification of the city, (2) town planning, (3) water channel system, (4) materials used for construction, (5) elements of architecture (like, water tanks, temples, ) and (6) its overall architectural style. The evidence

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<sup>1</sup> Dravidian relates to a family of language (Tamil) spoken in southern India and Sri Lanka

collected from a combination of archival research methodology, archaeological documentation of the site, and architectural survey of existing Chola structures is used to create a physical reconstruction of the city.

The archival investigation involves peer reviewed scholarship of ancient texts (architectural treatises and translated Cholas inscription in English). The archaeological remains documented by Archaeological Survey of India (ASI), a governmental body of India, available for public use. Observational architectural survey (in all scales from architectural spaces to settlement level) undertaken during site visits to South India. The data collected from archival study synthesize architectural survey and ASI documentation to uncover the urban context of the Gangaikonda Cholapuram Metropolis to depict it visually and graphically recreate.

The interpolation of data helps reconstruct / discover / sketch the cityscape of Gangaikonda Cholapuram. Research revealed that the city's structure followed the architectural principles as documented in ancient *Manasara*<sup>2</sup> and *Mayamatam*<sup>3</sup> texts. The city contained two massive, concentric, fortified walls. Citizens of the city lived in the area between the two walls (outer and inner walls), divided among four castes<sup>4</sup>. This research also highlights construction materials used, as well as the pattern of dwellings, and public, and administration spaces. A translated version of the ancient text<sup>5</sup>, is used in this research (translation is very subjective). "Reconstruction of Gangaikonda Cholapuram" is the very first attempt to reconstruct the architectural history of Chola at Gangaikonda Cholapuram to date.

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2 Manasara is one of the treatises of Vaastu Shastra.

3 Mayamatam is one of the treatises of Vaastu Shastra.

4 Caste is the system of dividing society into hereditary classes

5 Ancient texts used in this paper are architectural treatise of Vaastu Sastra such as Manasara and Mayamatam.

## 2. Methods

The purpose of this study is to reconstruct the urban context of the City of Gangaikonda Cholapuram. It is important to emphasize the relationship with Vaastu Sastra<sup>6</sup> in the urban design and architecture of the city, as the Cholas followed the same for its construction.

### 2.1 Problem Statement

If we understand the relationship of Vaastu Sastra (*Manasara* or *Mayamatam*) in Urban Planning and Architecture of Gangaikonda Cholapuram, then the urban context of this long-standing city will be revealed.

### 2.2 Hypothesis

If Gangaikonda Cholapuram was a planned metropolis, then it was built according to the architectural treatise of *Manasara*<sup>7</sup> or *Mayamatam*.

### 2.3 Research Objective.

This research objective is to understand and reconstruct the city of Gangaikonda Cholapuram in South India using text, sources, and Vaastu Sastra to physically recreate the city.

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<sup>6</sup> Vaastu Sastra also known as Shilpa Sastra, according to An Encyclopedia of Hindu Architecture are two works ascribed to Kasyapa and Agastya, a set of rules to follow for performing art and architecture.

<sup>7</sup> Manasara is an architectural standard treatise of Vaastu Sastra. According to An Encyclopedia of Hindu Architecture, Manasara is a complete text on architecture and sculpture. It comprises 70 chapters in more than 10,000 lines.

## 2.4 Study Design - Methodology and Data

In order to understand the city of Gangaikonda Cholapuram, a detailed understanding of the history, architecture, art, administration, sociology, and political geography of the Chola Dynasty is required. The collection and dissemination of available scholarship elaborates upon the methodology followed to obtain sufficient information about the original planning, design principles, functions, spatial configurations of Gangaikonda Cholapuram City. This research aims to understand and reconstruct the city of Gangaikonda Cholapuram in South India based on a combination of archival research, archaeological documentation, and architectural survey of existing structures. Synthesizing these available data allows for the virtual, physical reconstruction of the city Gangaikonda Cholapuram.

### METHODOLOGY :



*Figure 2. Showing types of Data Collected.*

### 2.4.1 Archival Research

The archival research methodology surveys the peer reviewed translated work of ancient texts, travelogue, and inscriptions. The archives related to the Chola Dynasty are extensive, however the information about its domestic architecture and city planning, is scarce and scattered.

***Ancient Texts and Inscriptions.*** The inscriptions of Cholas are documented, translated and peer reviewed by Archaeological Survey of India - a government body of India (ASI). Peer reviewed translations of Eugene Hultzsch in particular are the primary sources for this thesis.

Ancient texts: *Manasara*<sup>8</sup>, and *Mayamatam*<sup>9</sup>. Interpretation of these texts (which are subjective) guided by P. K. Acharya's work - *Architecture of Manasara*, 1918 and Bruno Dagne's work *Mayamatam: An Indian Treatise on Housing Architecture and Iconography*, 1994. Data converted graphically as CAD drawings, with their given measurements.

#### **2.4.2 Archeological Excavation and Documentation**

Documents existing for Chola are in the form of inscription, fresco paintings, sculptures, architectural spaces, buildings like temples, archaeological remains, excavations and bronze sculptures, available for public use published by the ASI.

**Excavation Report.** Excavations and documentations were carried out by ASI at the actual site, Gangaikonda Cholapuram, during 1980 - 85, 1987, 1991 and 2009 (Kulke, K, & Sakhuja, 2009, p. 99). A book on the excavation of the Gangaikonda Cholapuram site is published by the ASI called *The Metropolis of Medieval Chola* (Natana, 1998) . Pierre Pichard (1994) documented the archaeological remains of the excavation along with the water channels and water tanks to the extent of 500 acres. This map is in the form of a plan in his book *Vingt ans après Tanjavur, Gangaikonda Cholapuram*, (Pichard, 1994) . It is available for academic purposes at the library of de L 'Ecole Française d'Extrême-Orient., Pondicherry, India. Scanned maps are used in this research as a reference to map the excavation remains and water system, assisted by the use of Google maps and excavation information given in the ASI report. This developed plan is an integral part for this research.

**Architectural Documentation.** Udaiyalur, today a historic village located a few miles

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8 Ibid

9 Mayamatam according to An Encyclopedia of Hindu Architecture, is Tamil treatise originated in South India on Shilpa-Sastra, said to have been originally composed in Sanskrit by Myen (Maya). Mayamatam edition available is formed from the selection, omission, and addition of original work under the guidance of person having practical knowledge in Shilpa - Sastra.



from Kumbakonam (another metropolis of Chola), was documented by the students of Centre for Environmental Planning and Technology University (CEPT) noting vernacular residential architecture. This documentation is available for academic uses on CEPT repository (“Udaiyalur Street Houses,” 2008) .The use of this evidence is necessary in understanding the residential quarters in the city, as these proportions are on par with the suggested proportions of architectural treatise.

### **2.4.3 Informal Architectural Survey**

Many Chola remains are documented by the ASI, and educational institutions and some remains (temples, spaces, sculptures) are yet to be documented.

***Site Visit (Primary Source).*** An observational architectural survey to many important hubs of the empire (Chola) was undertaken by the author during a site visit to India from April 30th - May 29th, 2019. The examples observed, from the remains of Chola structures built during the 10th - 11th century, had inscriptions and mentioned in ASI books, notably high sculptural quality, and different / new techniques used in its construction. This informal survey observed macro-level temple planning, village planning, sculptures, paintings, architectural styles, micro-level temple spaces, materials used for construction, and other small construction details. These were documented in the form of sketches, photographs, and video-graphs. Documented materials were then converted into illustrations, CAD drawings, and processed images. These are compliment data of the overall architectural details of the city, helped to determine the architectural style of the city.

***Topographical Information.*** The government of India uses high definition satellites to capture the landforms and topographical information. This data is available on the Indian Government website for the use by the public. In this research, the topographical information is collected from Google Earth software and the contours are identified with relation to water management. Studying the contour helps to determine how the Cholas strategically planned their

city. At completion of this work, GIS survey or laser scanning had not been completed at the research site. Basic satellite information and other technologies were used to collect data.

## **2.5 Analysis**

All the above primary data, along with secondary data<sup>10</sup>, organized and arranged in different patterns.

The plan overlapping all the factors - the excavation, water bodies mapping, case studies, and secondary sources is developed. Dictated by above mentioned various factors, each component is tested against the rules mentioned in the architectural treatise, to determine if the city Gangaikonda Cholapuram demonstrates Vaastu Shastra. The components tested are the overall fortification, the structure of the fortified wall, the placement of palace (the excavation site), placement of premier and other temples, etc. These elements analyzed demonstrate that the city of Gangaikonda Cholapuram followed Mayamatam, the architectural treatise of Vaastu Shastra.

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<sup>10</sup> The data collected from the secondary sources like books, research papers, articles, and chapters. All these are classified as secondary data in this thesis.

### 3. Literature Review (Secondary Sources)

Since the beginning of 19th century, Chola's and Dravidian temple architecture have been given great importance in scholarly writings of world authors. Figure 4 shows authors worldwide studying the Chola dynasty in detail and their respective topic. Few authors worth mentioning are Noboru Karaishma (Japan), Eugene Hultzsch (London), Pierre Pichard (France), Johan N Miskic (New York), Burton Stein (Chicago), Hermann Kulke (Germany), Tansen Sen (Shanghai), Nilakanta Sastri (India), Champakalakshmi (India). Few topics delta worldwide about Cholas are land survey, Nataraja, navy, ship building, cosmic energy, Chola state formation, trade, etc.

#### AUTHORS AROUND THE WORLD :

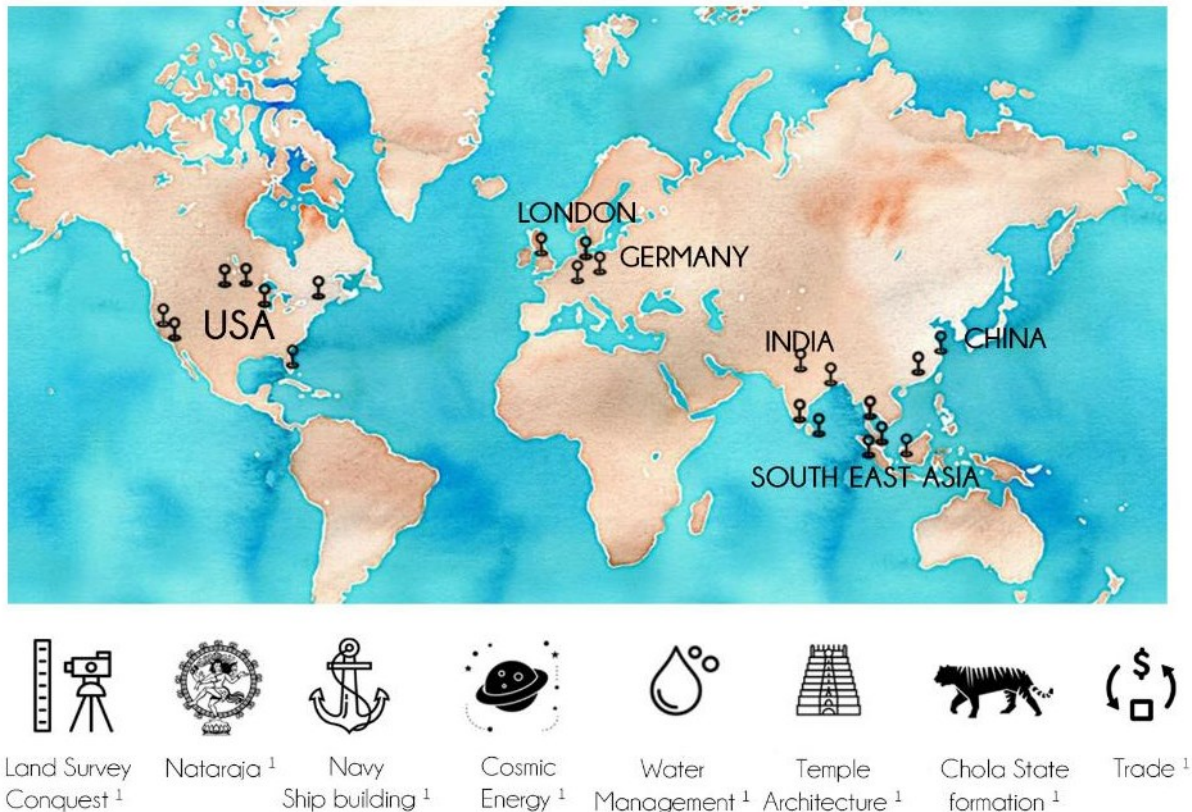
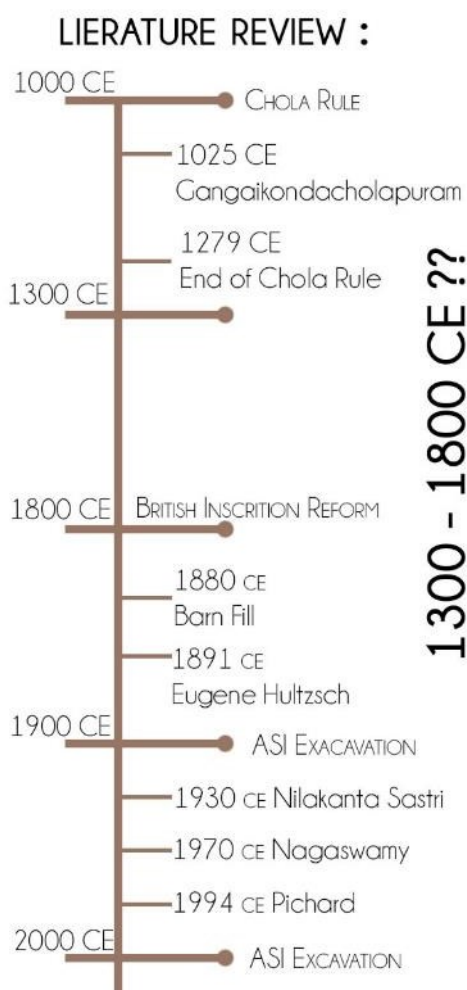


Figure 3. Showing Authors worldwide studying Chola Dynasty.

The study of Chola Architecture was not of great importance during the British colonial Period (1800 – 1947 CE). The ASI has done outstanding work in the study of Chola architecture (Pichard, 1994, p. 12). An article by B.R. Barnfill in *The Journal of Asiatic Society of Bengal* in 1880 contained the first description of the Temple of Gangaikonda Cholapuram, brief but precise

(Branfill, 1880, Pg.1 - 5).

Gangaikonda Cholapuram was described in the *Annual Report on Epigraphy* by E. Hultzsch, V. Venkayya, H. Krishna Shastri in 1891, 1913, and in 1923 (Eugen, Venkaya, & Shastri, 1891). *South-Indian Inscriptions, Tamil and Sanskrit* by Eugene Hultzsch is a peer reviewed translation of inscriptions appearing on stones and copper-plate edicts at Mamallapuram, Kanchipuram, in the North Arcot District, and other parts of the state Tamil Nadu (Previously Madras Presidency). This work is published by the ASI that supervises all the archaeological activities (Eugen, 1899).



*Figure 4. Showing A Timeline of Literature Review.*

In 1932, Nilakanta Shastri studied the Chola history and administration briefly (Sastri, 1932). In 1935, he gave a detailed account of the Cholas with respect to their history, origin, and

governance (Sastri, 1935). The first works devoted to the Big Temple of Tanjore are the works of local scholars. Somasundaram Pillai (1935) published a pamphlet on the temple, which focused on the history of the temple and the city and local traditions. A short appendix deals with the temple Gangaikonda Cholapuram ( p. 81).

Gangaikonda Cholapuram Temple sometimes is referred to in scholars' works on Indian Architecture. In 1914, Jouveau-Dubreuil mentioned Gangaikonda Cholapuram in *Archéologie du Sud de l'Inde* (Jouveau Dubreuil, 1914, p. 124). In 1942 , Percy Brown described Gangaikonda Cholapuram with photos but did not give any line drawings (Brown, 1942, p. 104-105). In 1960, C. Sivaramamurti published a small brochure for the ASI with photographs of Tanjore, Gangaikonda Cholapuram, and Darasuram (Sivaramamurti, 1960). K.R. Srinivasan gave a new description of Tanjore and Gangaikonda Cholapuram in the *General Presentation of Indian Monument* published by ASI (1964, p. 191-194). In 1970, the first monograph on Gangaikonda Cholapuram was published (Pichard, 1994, p. 14).

Nagaswamy (1970) published a book entitled *Gangaikonda Cholapuram*. In this book he gave a brief account on the temple and the city for the first time. This book has many photographs, but he did not include any architectural plans. Sarkar (1974) analysed four temples of the Chola – Tanjore, Gangaikonda Cholapuram, Tribhuvanam, and Darasuram. He also gave an account of 21 temples built during the Chola Period and their dimensions (Sarkar, 1974). Balasubramanyam presented most of his Medieval Chola period temples in his book *Thanjavur and Gangaikonda Cholapuram*. In this book he gave a very detailed account of the inscriptions and epigraphy related to Gangaikonda Cholapuram (Balasubrahmanyam, 1977).

In 1994, Pierre Pichard performed a detailed comparison of Tanjore and Gangaikonda Cholapuram Temples. He also studied the context of both temples and produced detailed maps and line drawings of the temples. The architectural survey by Pichard was the only detailed documented study about the Temple Gangaikonda Cholapuram and the remains of the city

(Pichard, 1994). In 1996, Champaka Lakshmi, in her book detailed the trade, ideology, and urbanization in South India from the Sangam Period (300 BCE – 300 CE) to the Medieval Period (700 – 1300 CE). In her book she gave a brief account about the organization of cities and villages during the Chola period (Champakalakshmi, 1996).

Natana Kasinathan (1998), an archaeologist of ASI gave a detailed account about the archaeological excavation that occurred at Gangaikonda Cholapuram from the period 1980 to 1998. In 2009, another archaeological excavation report was given by Sridhar on behalf of the Tamil Nadu, Archaeological Survey Department. This excavation report gave detailed descriptions on the materials used, excavated sites, and objects found during excavation. This report was written in Tamil language (Sridhar, 2009). These few works previously mentioned are some the most important of the many that are available. Some of these are used as reference in this thesis as text, literature, and graphics.

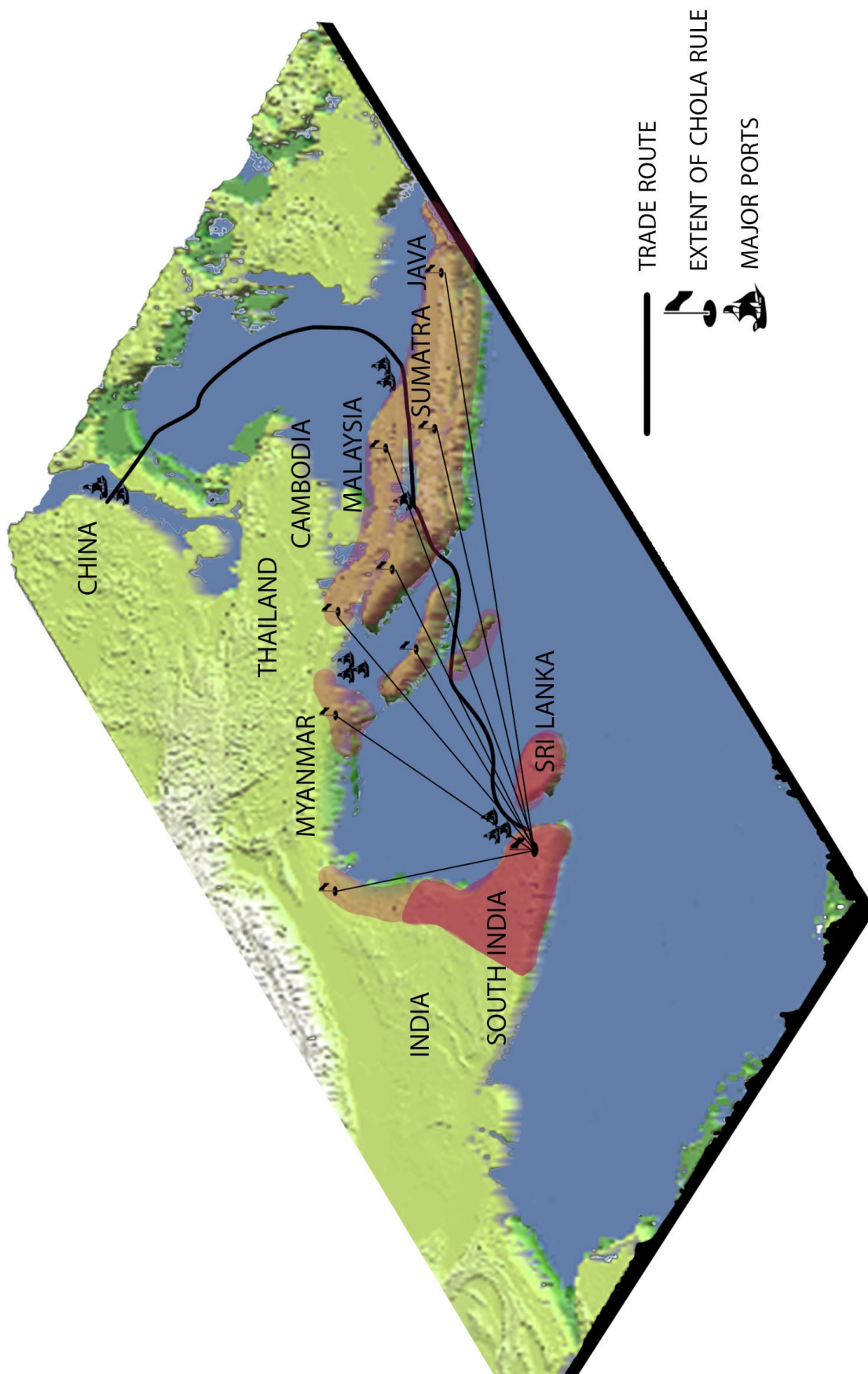
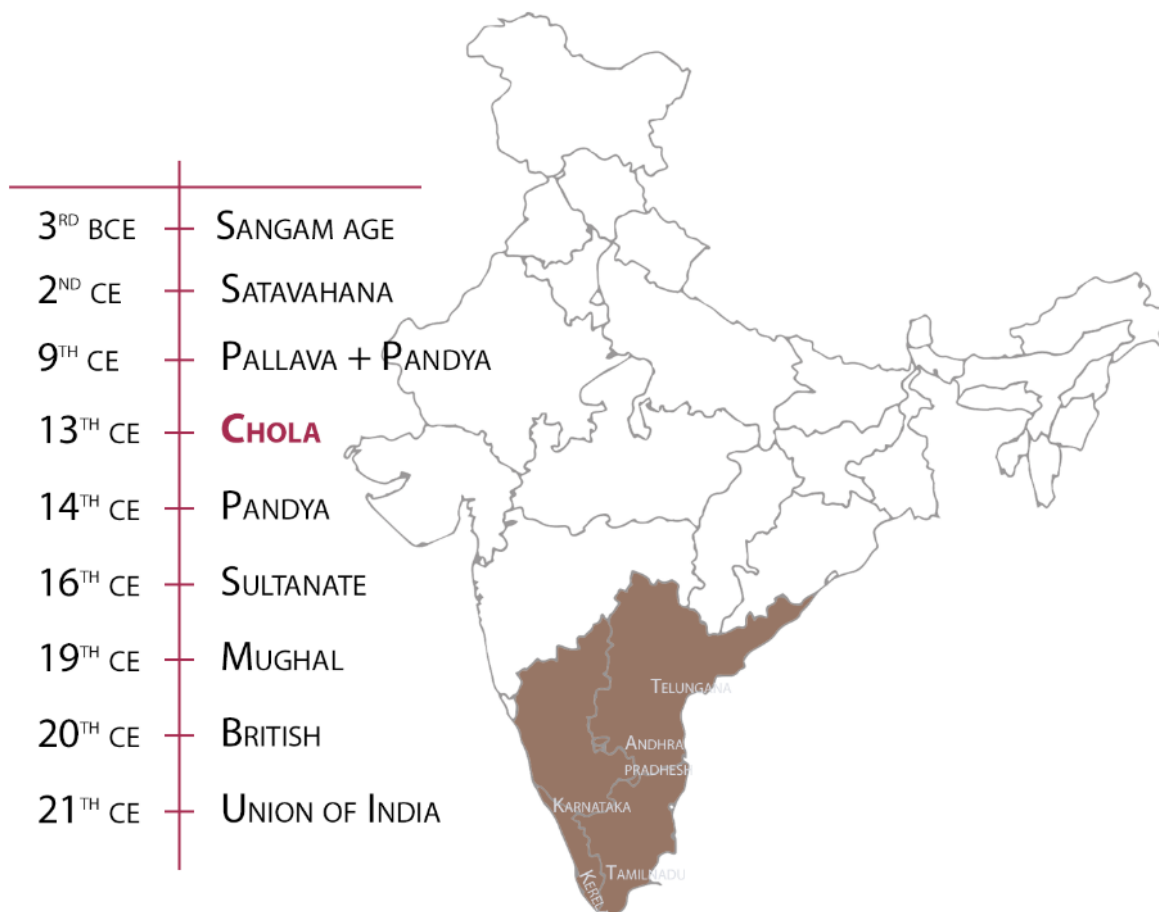


Figure 5. Spread of Chola Dynasty in 11th Century.

## 4. The Cholas and their Philosophy

### 4.1 Cholas in the World Arena

Thanjavur is also known as Tanjore (Pletcher, 2010, p.195), a rural town in the South Indian state of Tamil Nadu. It lies on the Cauvery delta region, about 46 miles (75 km) from the Coromandel Coastline. It became famous as an important city in the history of India's culture, art, and architecture. Around Tanjore lies the great Chola living temples, which are distinguished today as UNESCO World Heritage Sites. These temples were built by the kings of the Chola Empire, who were the most powerful monarchs in the history of South India. They were so successful as monarchs that they enjoyed 450 years of rule from the mid-9th century CE to the 13<sup>th</sup> century.

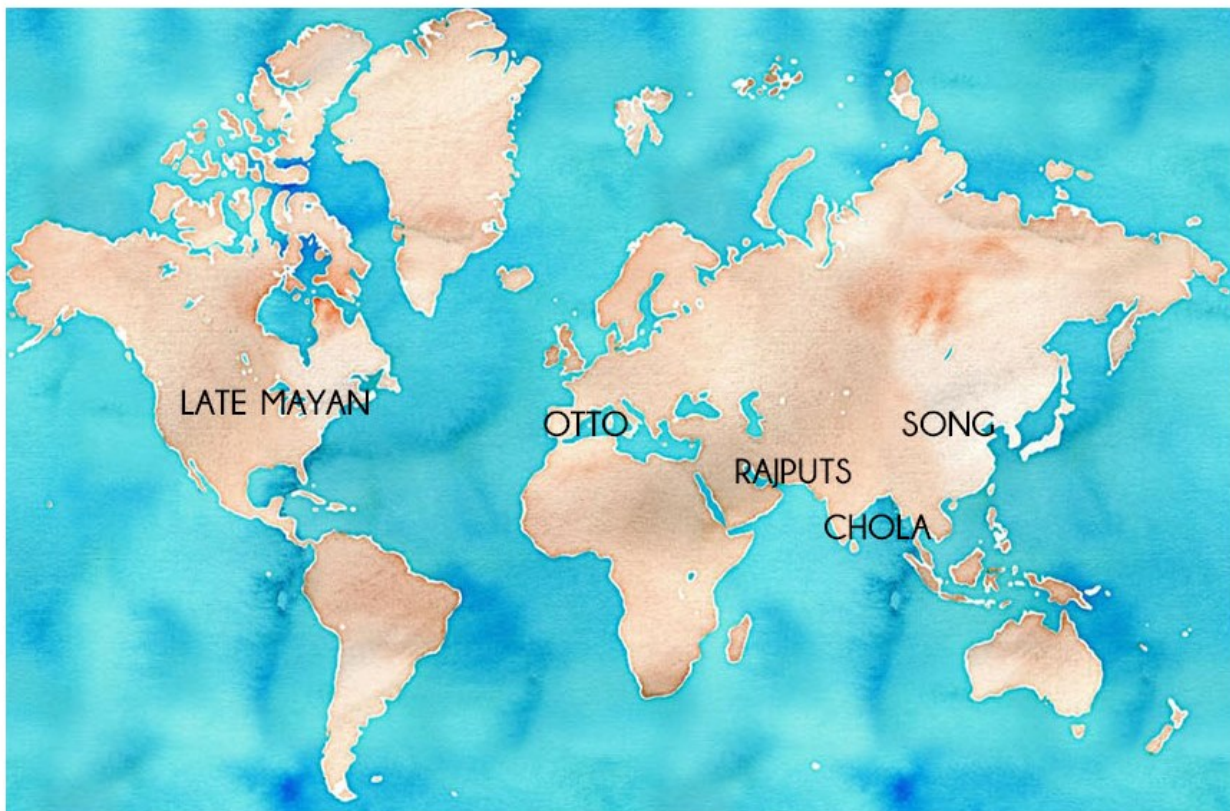


*Figure 6. Timeline of South India and Religion Spread in South India.*

In the early 11<sup>th</sup> century, the Chola empire was the most powerful Dynasty in Asia. During Rajendra's Reign, its territory spanned from Bengal in the north; Sri Lanka in the south;



Malabar coast in the west; and in the east Maldives, parts of Southeast Asia including Malaysia, Indonesia, Burma, Southern Thailand, Palembang, and Kedah (Figure. 2) (Cotterell, 2011, p.109). In November 2014, the Indian Navy along with National Maritime Foundation and the Tamil Nadu Government commemorated the 1000 years anniversary of the Coronation of ancient Tamil King Rajendra Chola with a series of activities for crediting his empire expansion across the seas. (Narasimhan, 2014). This event symbolized the achievements of the Chola Navy, whose ships navigated and conquered lands in Southeast Asia. The contemporary kingdoms during Rajendra's reign were Chalukyan Empire, Rajput's in North India, late Maya Civilization in America, Song Dynasty in China, and Otto in Rome. Also, Buddhism spread rapidly in Southeast Asia.



*Figure 7. World map Showing Medieval Kingdoms.*

## 4.2 Great living Chola Temples - UNESCO

The success of Chola is especially evident in the survival of three great temple complexes, about which UNESCO remarked:

*These three temple complexes, therefore, form a unique group, demonstrating a progressive development of high Chola architecture and art at its best and at the same time encapsulating a very distinctive period of Chola history and Tamil culture. The three properties are considered to pass the test of authenticity in relation to their conception, material, and execution. The temples are still being used, and they have great archaeological and historical value. The temple complexes used to be part of major royal towns but have remained as the outstanding features in today's mainly rural context. (Great Living Chola Temples, n.d.)*

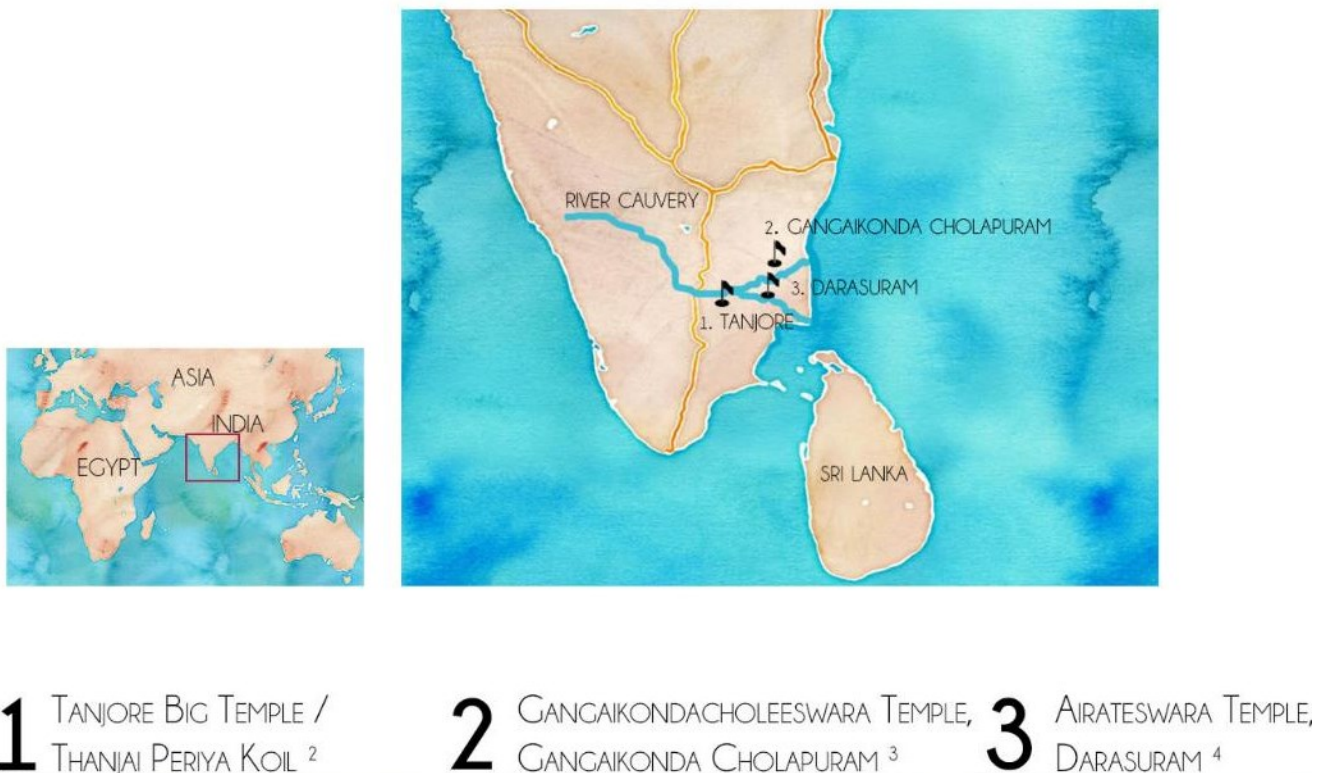


Figure 8. Locations of UNESCO Temples.



*Figure 9. Tanjore Big Temple in Tanjore City, Tanjore District (“The Brihadishvara Temple, Thanjavur (Illustration)—Ancient History Encyclopedia,” 2015).*

**Tanjore.** Tanjore, the headquarters of the district of the same name, lies 322 km from Chennai, a city along Coromandel coast. It is accessible directly by road or rail via Kumbakonam. Tanjore stands on the rich Cauvery delta area and is referred to as the **“Rice bowl of Tamil Nadu.”** Its main temple is the Tanjore Big Temple, which is located 15 km from Tanjore Railway Station. The Big Temple is the premier temple among the seven Great Living Chola Temples that Rajaraja Chola constructed in the 10th century (Sivaramamurti, 2007, p. 6).



*Figure 10. Gangaikondacholeesvaram Temple in Gangaikonda Cholapuram village, Ariyalur District (“Serene ambience delights tourists at Gangaikondacholapuram,” 2016).*

**Gangaikonda Cholapuram.** Today, Gangaikonda Cholapuram is a small village located in Udayarpalayam Taluk of the Perambalur District and is situated on the northern side of Cauvery delta, beyond Kollidam river. Gangaikonda Cholapuram lies 85 km to the north of Tanjore. The temple there is called Gangaikondacholeesvaram, which is a temple built by Rajendra I, son of Rajarajan Chola.

**Darasuram.** Darasuram, a small town in old Kumbakonam, in between Tanjore and Gangaikonda Cholapuram, and marks the royal settlement of Cholas. The temple Airavatesvara is the third temple situated in Darasuram 25 miles from Tanjore. Though this temple is not huge, it is a grand and impressive structure.

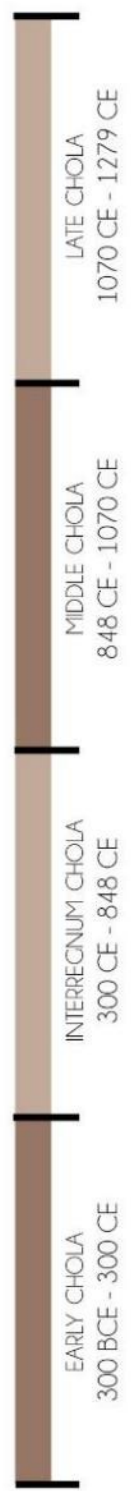
Because of their great beauty, these three temples are inscribed in the World Heritage list by UNESCO as *the Great Living Chola Temples*. The construction of these three temples are the results of the seventh to eighth century CE Bhakti Movement in South India that witnessed a significant temple activity throughout India. These Dravidian style temples remain authentic and have maintained their tradition and integrity for more than 1000 years. Of great importance to historians, the inscriptions by Cholas in all their temples enlightens us about their democracy, land reforms, land surveys, tax collection methods, and organization of society.



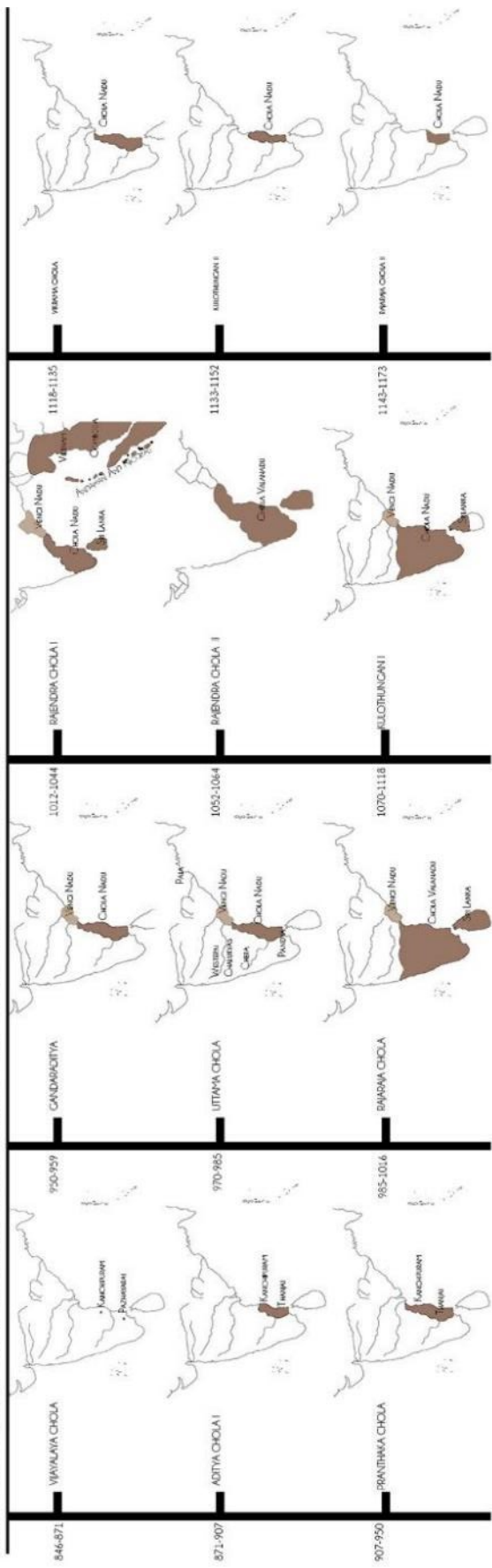
*Figure 11. Darasuram Temple in Kumbakonam City (Staff, 2018).*

# GENERAL HISTORY OF CHOLA

## CHOLA TIMELINE :



## RISE AND FALL OF MEDIEVAL AND LATE CHOLA (848 -1272 CE) :



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Figure 12. Rise and Fall of Chola Dynasty.

## 5. General History of Cholas

### 5.1 The Cholas of Tanjore

The ability to form marriage alliance with other dynasties (Marital alliance) contributed to the long reign of the Chola Dynasty the Cholas were also among history's mightiest builders, as noted by the fine stone marvels that they built in the Cauvery Delta area. The architectural style of the Cholas roots back to Pallava as their predecessors (Sivaramamurti, 2007, p. 8). The Chola architecture is much more evolved and matured than their predecessor.

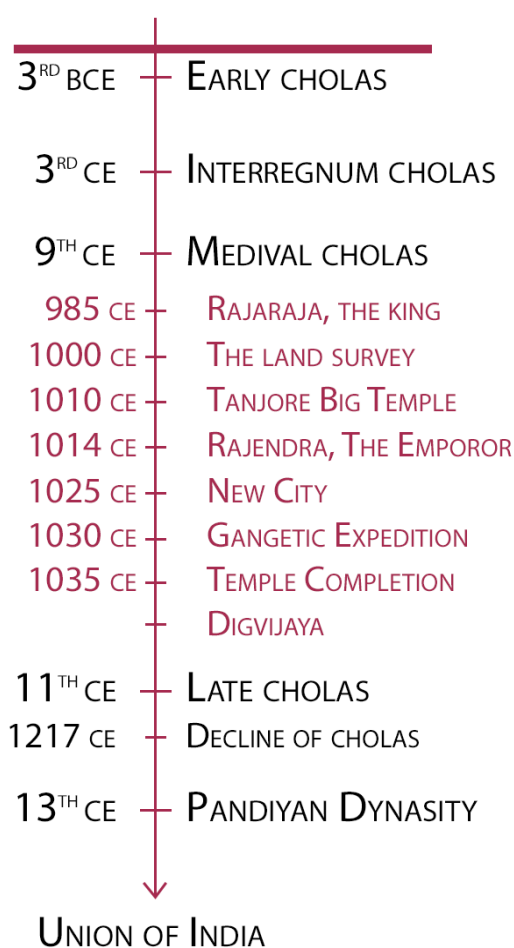


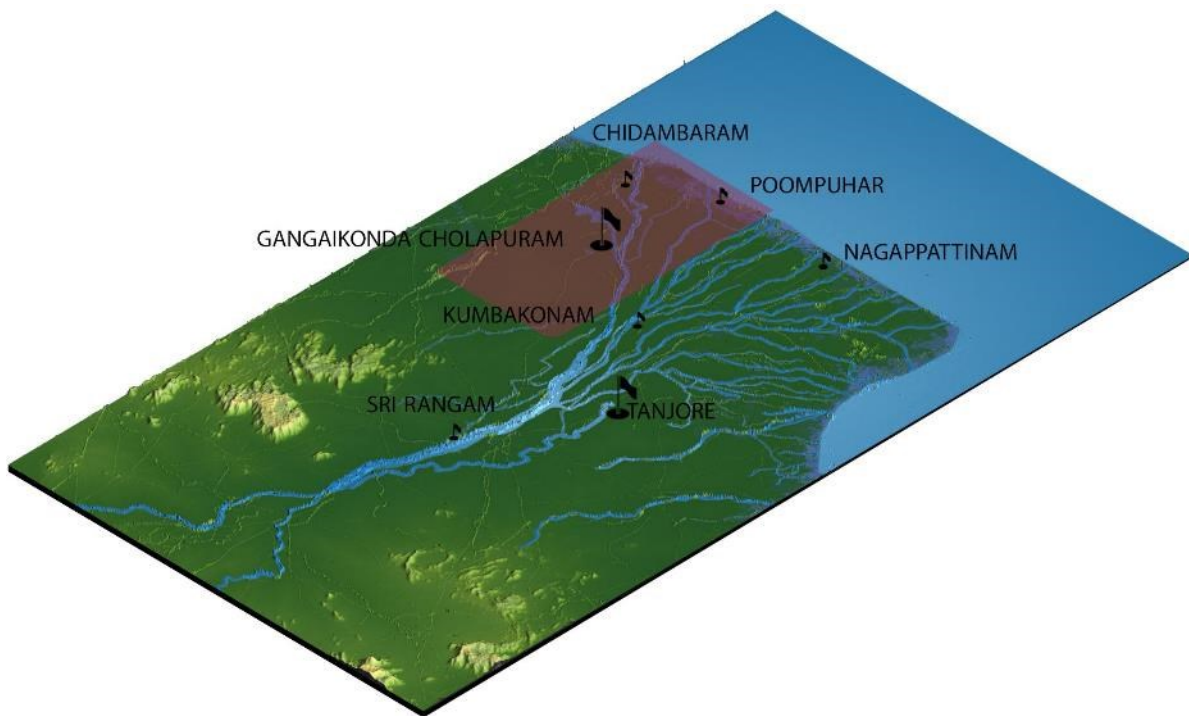
Figure 13. Timeline of Chola and Important Events.

The Chola Dynasty is classified into four categories that designate their periods of cultural development, namely the Early Cholas of the Sangam age (1400 BCE - 200 CE), the Interregnum Cholas (200 BCE - 848 BCE), the Middle Imperial or Medieval Cholas (848 CE - 1070 CE), and the Later Cholas (1070 CE - 1279 CE).

**Early and Interregnum Cholas.** Early Cholas are mentioned in Sangam<sup>11</sup> literature, which belongs to the second or first centuries of the common era. Likewise, although references to capital cities are few, they too are worthy of mention. They are: Poompuhar, Tiruvarur, Pazhayarai, Uraiur, and Kaveripattinam (Sastri, 1935, p. 36-45). Cholas after the Sangam age called the Interregnum Chola, were

<sup>11</sup> Sangam (a term that typically means confluence/meeting) was an ancient academy, where poets met periodically and published their work.

literally lost in the history of the Tamil Country<sup>12</sup>. This is the period when the Cholas almost dwindled into nonexistence. The Cholas were confined to a small village near Uraiyyur. This confinement lasted until 848 CE, when Vijayalaya Chola (850–870 CE) overthrew the Mutharaiyar (600-900 CE) of Tanjore and captured the Cauvery Delta Region (Nilakanta Sastri, 1935, p. 118).



*Figure 14. Map showing Important Cities of Chola.*

***Middle and Late Cholas.*** Vijayalaya Chola (850–870 CE) was the founder of the Middle Cholas or Medieval or Imperial Chola, when the Chola Dynasty grew to its zenith and glorified South India for 450 years. As a result of the conflicts between former kingdoms of Pandya and Pallavas, Vijayalaya Chola (850–870 CE) established an imperial dynastic line. The rulers who followed Vijayalaya (850–870 CE) were, at their best, conquerors and able administrators (Eraly, 2011, p. 67). The most important kings of the imperial Cholas were Rajaraja-1 (985–1014

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<sup>12</sup> Tamil Country as it was called during Chola Period.



CE), Rajendra-1 (1012–1044 CE), and Kulothunga-1 (1070–1120 CE). The capital cities that served the imperial Cholas were Tanjore, Gangaikondacholapuram, Darasuram, and Pazhayarai. Until the period of Rajarajan (985–1014 CE), the Cholas ruled from Tanjore, their capital city. Rajendra (1012–1044 CE) son of Rajarajan, shifted the administrative capital to Gangaikonda Cholapuram; and for the next 250 years, from 1025 CE, all the kings were crowned at the new capital, Gangaikonda Cholapuram, and from there controlled the affairs of South India (Nagaswamy, 1970, p. 11).

Since the Rajarajan (985–1014 CE), Cholas spread their kingdom rapidly. They were in a marital and political alliance with Eastern Chalukyas and established maritime routes with China's Song Dynasty, resulting in the Cholas controlling the Indian Ocean. According to John Miksic, the naval expeditions carried out by the Cholas are now considered the largest ancient naval attacks carried out in the Indian Ocean, recognized as changing the history of ancient Southeast Asian and China (Kulke, Kesavapany, & Sakhuja, 2009, back cover).

The marital alliance with the eastern Chalukya Dynasty helped the Cholas to rule South India for the next 200 years. Kulothunga 1(1070–1120 CE), an heir of Chola and Chalukya, ascended the Chola throne, which began the Later Chola Dynasty. After the 1100s, the Chola Dynasty suffered a decline which shrunk the size of the territory under the control of the Chola Dynasty. As often happens with the fall of a culture, the fall of the Cholas was accompanied by a civil war in the Chola state, which led to the emergence of the Pandya Dynasty and a series of new powerful rulers (Nilakanta Sastri, 1955, p. 545)

## **5.2 Art and Architecture of Cholas**

Tamil Country (Tamilakam) reached a new level of excellence in art, music, religion, and architecture, and the finest bronze and stone sculptures were made during the Chola Period. At the same time, there arose the emergence of Hinduism as the predominant religion in South India, which, in turn, gave rise to innumerable activities like literature works, origin of Carnatic

music and classical dance, and temple building activities. Architectural styles of Chola are derived from the Pallava, Pandya, and Chalukya Dynasties. But the Chola kings made a significant innovation in designing huge structures with evolving construction and aesthetic techniques (Champakalakshmi, 1996, p. 428). The stone movement that started with the Pallava Dynasty intensified and gave rise to mega monumental structures (Sastri, 1955).

Tanjore Temple and Gangaikonda Cholapuram Temple are exhibits of couple Chola architecture. Their unparalleled dimensions and distinctive architectural features (like the floors inside the tower; the sanctuary; presence of corridors; lateral steps adjacent to the tower). The destiny of the Chola Tanjore Temple which survived for seven centuries underwent *renovation* by the Nayak kings in 17<sup>th</sup> century. The fresco paintings on the walls of the hypostyle<sup>13</sup> room, were painted over; history considers it a desecration. Temples of Darasuram and Tribhuvanam shared this fate. The four temples referred to previously were the only temples of all 300 temples that were defaced because they were closely associated with the great Chola Dynasty (Pichard, 1995, p. 119).

These monumental structures were in the form of majestic temples, adorned with timeless stone sculptures. Especially noted for their ornamented facades, the architectural historian James Ferfussion observed the beauty of the structures and remarked that "*the Chola artists conceived like giants and finished like jewelers*" (James, 1847, chap. 23). Among the remains of the Chola art are the bronze statues of Buddha, Shiva – Nataraja (Figure 16), Parvati, Krishna Dancing on Kaliya, Rama, Sambandar, Brahma, Ganesha, Manikkavasagar, Shiva & Parvati, Nandi, and Vishnu. The Chola artists excelled in literature as well. A significant amount of literature (religious, secular, political, and art) was created. Ancient Agamas (Tamil literature) transcribed

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13 Hypostyle is a building having a roof supported by several rows of pillars.

these during the Chola period: 4000 Prabandham, Thirumurai, Periyapuram, Ramavatharam, Jivaka Chintamani, Virasoliyam, Yapperungalam, Yapperungalakkarigai, Nannul, Purananuru, Kalingathuparani, Rajarajeswara natakam, Rajaraja Vijayam, and a few Ula (a type of poem) composed by Ottakoothar (Sastri, 1932).

In another area of accomplishments, the Cholas were great administrators who became known for their tax system, government organization, city building, and village management. Nevertheless, they focused their skills on building magnificent temples, historians consider their cultural achievements. During the reigns of Chola kings Rajaraja and Rajendra, 80 temples including Tanjore and Gangai were built. (300 temples during the middle Cholas period from 850 and 1200 CE) (Pichard, 1994, p. 28).



*Figure 15. Nataraja bronze statue from the Chola period. ("Chola art and architecture," 2019).*

### **5.3 Understanding Medieval Cholas and their Philosophy**

Reconstructing this city of Gangaikonda Cholapuram requires understanding the geographical features, ideology, philosophy, impact of Hinduism in South India, sociology of Medieval Cholas, and Government policies. The impact of Hinduism is one of the main reasons that formed as the basis for construction of Chola cities in a way following Vaastu Sastra. The influence of Hinduism cannot be diminished along with others such as the Shaivism<sup>14</sup>, military conquest and administrative skills, financial and governmental policies shaped the architecture and city planning of the Chola Dynasty.

### **5.4 Geography of Chola Heartland**

The Chola Dynasty “success can be contributed to the prime location of the Chola capital” (Refer Figure 15). All the Chola capitals were located on river basins. The water management skills of the Chola is admirable still today. Tropical climate also a contributor. Rising populations, intensive agricultural regimes, a sophisticated water management system, far and wide trade networks, and powerful state level societies evolved. The Chola Dynasty shared its fate of being in a tropical region with other tropical kingdoms representation of a divergent path to Urban living. Ultimately, the range of vulnerabilities contributed to their collapse (Iannone et al., 2016, p. 2). Throughout the history of Cholas, - location, landscape, climate and management of their water resource were favorable (Sivaramamurti, 2007, p. 56).

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<sup>14</sup> Shaivism is a theology ranges from Shiva being the creator, safeguard, and destroyer.

# GEOGRAPHY OF CHOLA LAND

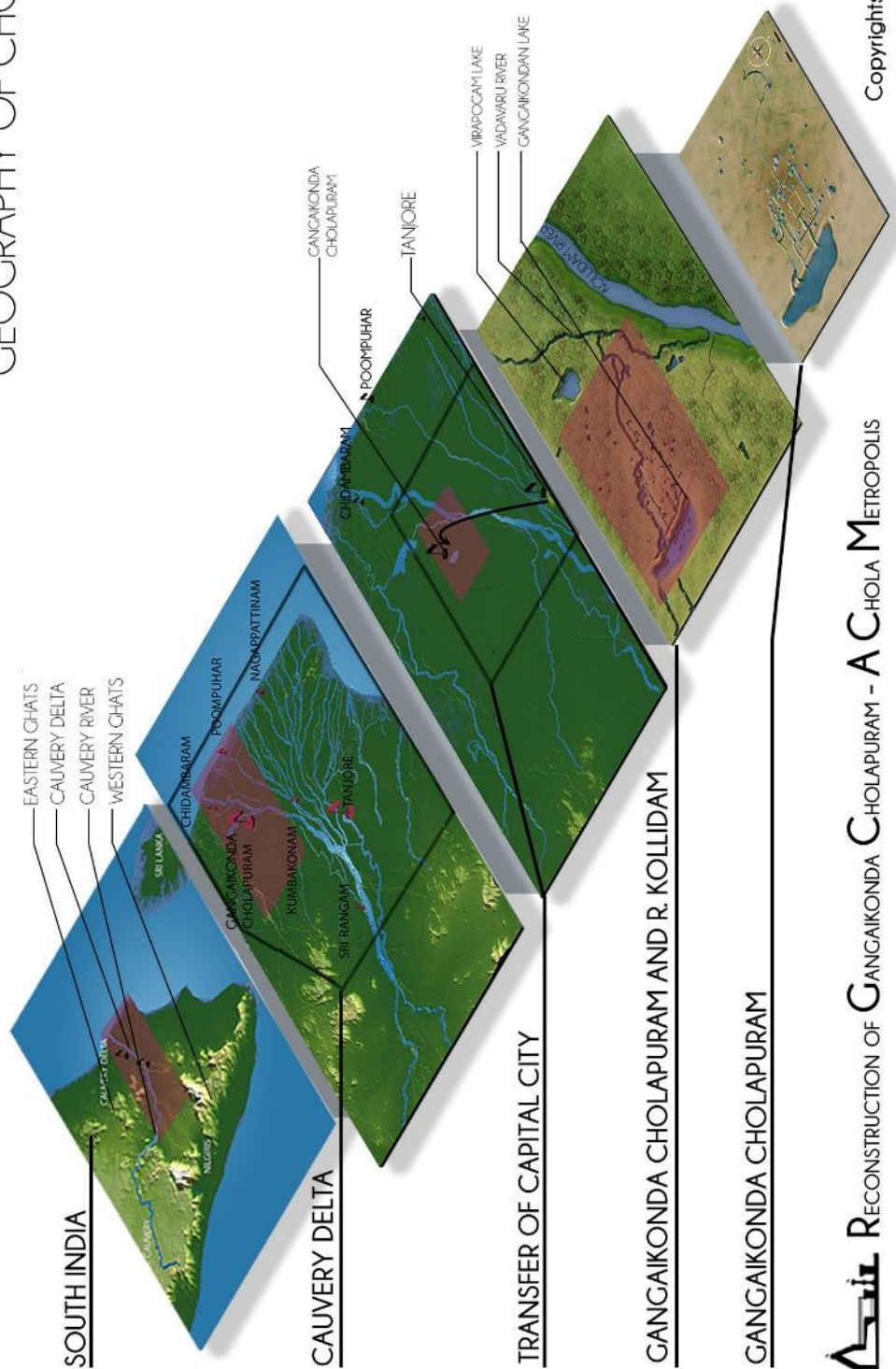


Figure 16. Geography of Chola Land.

***Importance of Geography.*** The ancient Chola Empire encompasses the contemporary states of Tamil Nadu, Kerala, parts of Karnataka and Andhra Pradesh. This part of South India is referred as the Peninsular India. These states have lasting legacies of a long history of human interaction. Peninsular India has two main Ghats<sup>15</sup> – The Eastern and Western Ghats. Eastern Ghats are discontinuous range of mountains along India’s eastern coast and Western Ghats are continuous mountains that runs along the western coast of the South India. These two Ghats meet at the Nilgiris Mountains in the northwestern mountains of Tamil Nadu. These formations are physical barriers which kept the heartland of Chola uninfluenced (majorly) by any external factors. After almost 2000 years since Vedic period<sup>16</sup>, around 7<sup>th</sup> century Hinduism dawned into South India.

***The river and the Chola Empire.*** An important source of water for the empire was the Cauvery River. The Cauvery River runs northwest to southeast, for 500 miles originating in the Western Ghats, crossing the Deccan Plateau and Eastern Ghats, and terminating in a delta in the Coromandel Coast. This river has 21 tributaries that spreads like a fan (Central Water Commission, 2015). The heartland of Chola Dynasty was located on the R. Cauvery and its delta region in the south of India. The river flats were favorable for agrarian civilization to cultivate rice. The population located on the rice plain. These became centers politically dominating populations dispersed over multiple river systems. The Cauvery River and its Delta were of great importance as it was favoring agrarian production and expansion. The Cholas were successful in harvesting the wealth from the Cauvery River, which reinforced the hegemony of the Chola Kings (Iannone et al., 2016, p. 20).

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15 a flight of steps leading down to a river.

16 Vedic period refers to 1500 BCE – 500 CE when the Vedas (ancient traditional texts) of Hinduism was composed. It refers to the birth of Hinduism

Tanjore is not one of the centers celebrated by the Bhakti<sup>17</sup> (religious movement) hymnists of the Śaivites<sup>18</sup>. It was the nucleus of a collection of agrarian villages at a high ground on the Cauvery, where the river begins to fan out into its system of tributaries, a vast resource base. It was captured by Vijayālaya Chola in the middle of the ninth century (Veluthat, 2017, p.20).

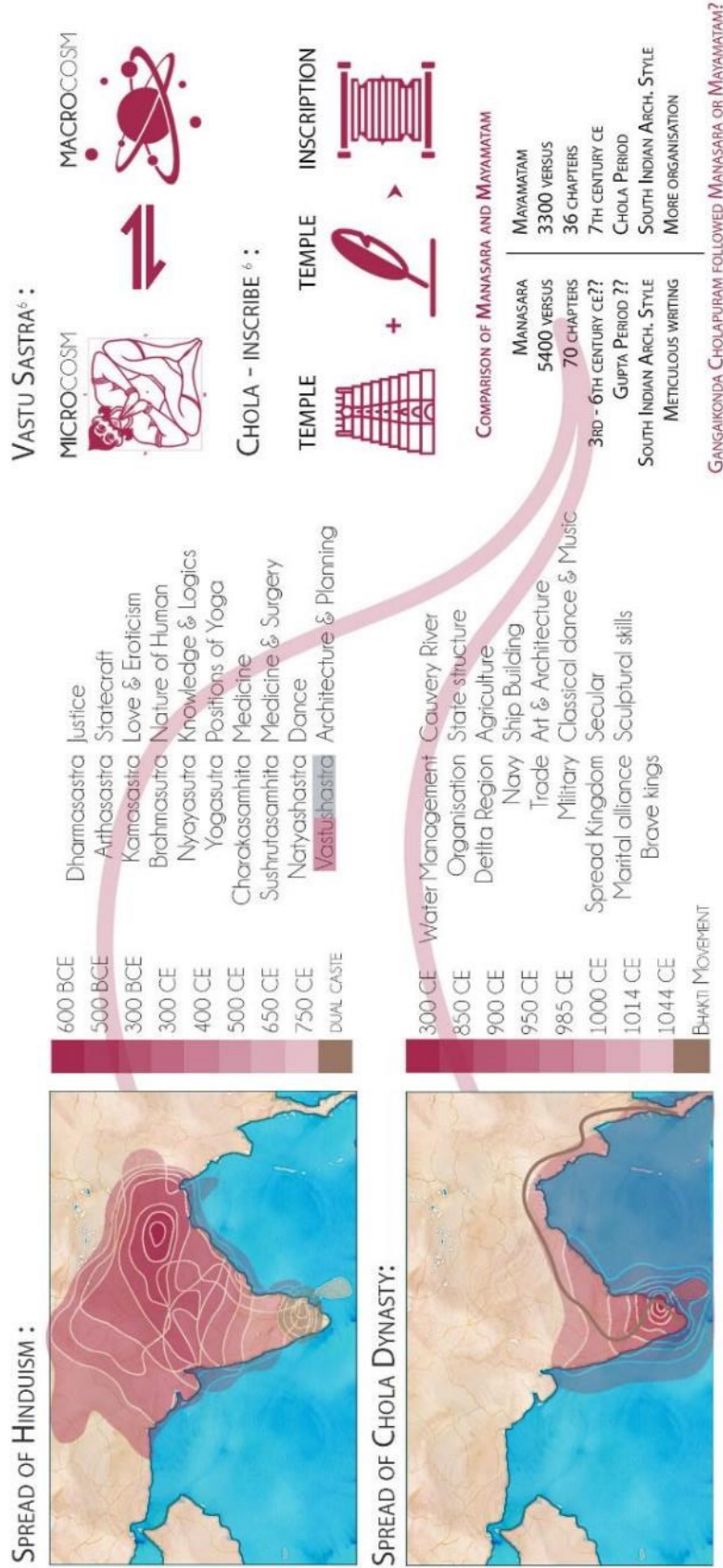
***Land, River, and Sea.*** The Cholas established connectivity through their adjacencies of land, river and sea which contributed to their spread, shaping their site selection, town planning and hence their architecture. They bridged the land and sea with the Cauvery River and established commercial centers. Markets and commercial centers located at the confluence of Cauvery River and its Delta region functioned as nodes on the landscape (Champakalakshmi, 1996, p. 44). These nodes acted as centers for international trade (more than royal centers). The Cauvery River acted as an important integrative mechanism, functioning like road system in the movement of both people and trade goods. This movement of goods made the maritime trade possible at a larger scale. Cholas took advantage of the geographical landscape, Cauvery River, plus their seacoast intensifying maritime trade, instrumental to the capture of overseas.

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17 Bakthi Movement refers to the theistic devotional trend that emerged in medieval Hinduism, originated in South India

18 Saivites are the followers of Shiva, a Hindu God.

# CHOLA AND HINDUISM



## RECONSTRUCTION OF GANGAIKONDA CHOLAPURAM - A CHOLA METROPOLIS

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### 5.5 Sociology of Cholas.

Cholas were Shiva followers, who erected many Shiva temples. They accepted other religions. Inscription shows that they had Buddhism, and Jainism settlements all over the Chola. This tolerance towards religion gave way for Hinduism, and its entrance into the politics. Hinduism spells out traditions for statecraft, economic policies, and military strategy. This ancient text of statecraft is called the Artha Shastra. The Pallavas were partially into Hinduism and Buddhism. As the Cholas grew to power in the mid-9<sup>th</sup> Century, along with it grew Hinduism, slow and steady.

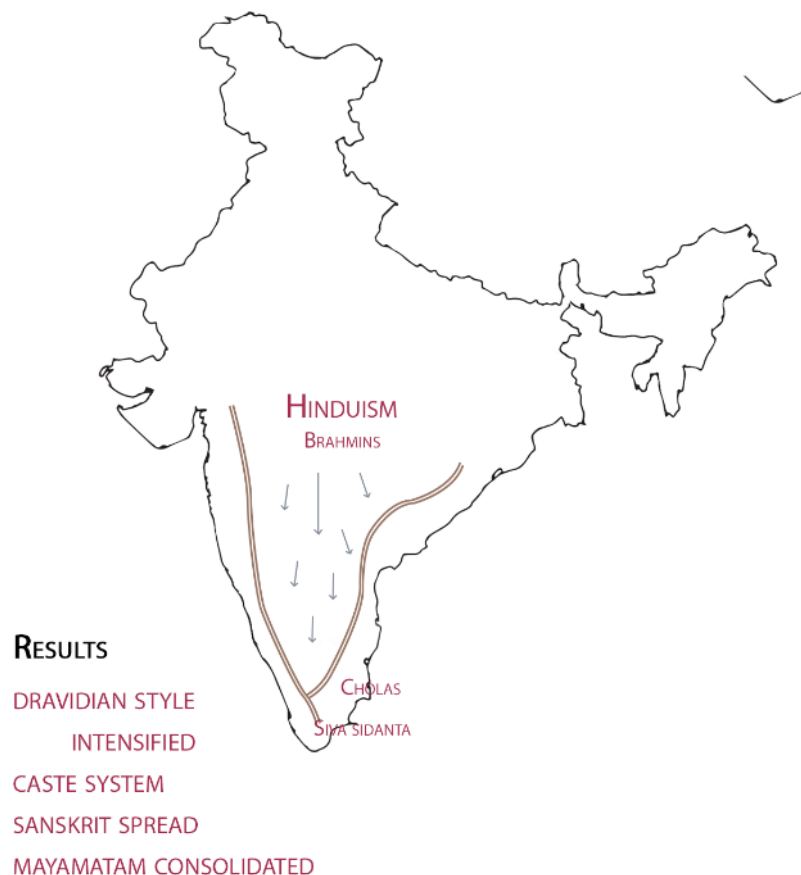


Figure 18. Spread of Hinduism in South India.

**Adopting Sanskrit Language as Chola State Language:** The migration of Northern Indians (Hindu Brahmins) introduced Sanskrit to South India around the seventh century CE. Until the seventh century Shaivism was predominant in South India, co-existing with Buddhism

and Jainism before the Bhakti Movement started. There is no evidence of Saiva Siddhanta<sup>19</sup>, written text for Shaivism (Sanskrit version) existing in South India before the tenth century. However, there are also suggestions that during the 10<sup>th</sup> century in Tamil Nadu, Saiva Siddhanta was connected to royal agents. Solid evidence for Sanskrit texts of Saiva Siddhanta existed during Rajarajan's period, when he used *Agamas*<sup>20</sup> both to create and maintain his imperial temple system, beginning with the central capital at Tanjore.

Thus, during the reign of the Cholas, it appears that the system of the Saiva Siddhanta (in Sanskrit) and the system of the imperial temples coexisted. Though the primary focus of these Sanskrit Agamas texts were on religious practices, they also spelled out in detail the organization of the temple cult, from the ritual procedures and architectural guidelines to the construction of temples (Prentiss, 1996, p. 234). Thus, Cholas accepted Hinduism, its philosophy and adopted Sanskrit as their official language. The adoption of Sanskrit, Hinduism, along with the Bhakti movement and rise of the temples helped form a strong Chola state (Veluthat, 2017, p.18).

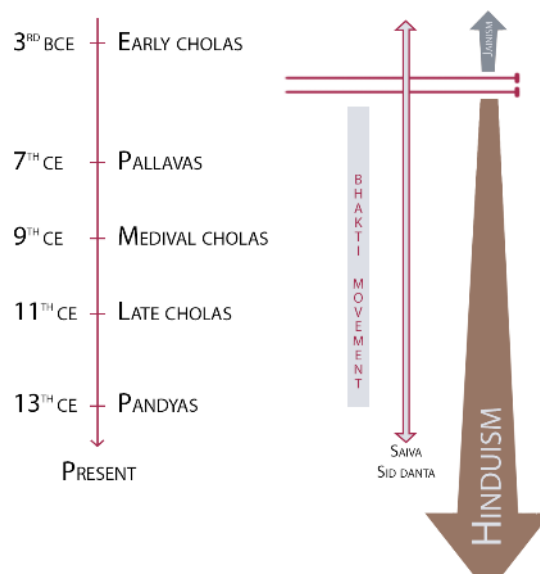


Figure 19. Timeline and spread of Hinduism, Bhakti Movement and Saiva Siddhanta.

19 Saiva Siddhanta is a theology practiced in South India in which Shiva is the ultimate power.

20 Agamas – Agama in Hinduism means collection of scriptures of several Hindu devotional schools.

***Hinduism and Chola State:*** The Chola Dynasty established a powerful monarchy; it is considered to be the author of the most stable state structure of pre-colonial India. This fact is contradicted by some of the historians (Stein, 1980). This stable structure was exemplified in its royal centers like Tanjore and Gangaikonda Cholapuram. The Cholas maintained their political visibility through religion and its institutions, the temples (Prentiss, 1996, p. 234). They accomplished it by implementing Saiva Siddhanta, a medieval philosophy developed in South India. This philosophy was accompanied by the Bhakti movement. Saiva Siddhanta translates as *to the end of knowledge of Siva*, meaning culmination of Siva knowledge. The term technically refers to Shiva theology written in Sanskrit and Tamil in South India (Prentiss, 1996, p. 232).

The rise of temples and a complex state system developed opportunities in the wider level of society. The services in the temple increased as the popularity of the religion increased. The deity was equated with the king himself in the Chola state. The recreation of a parallel world of authority in the realm went a long way towards legitimizing the state/polity (Veluthat, 2017, p.19). Thus historians see the use of religious institutions such as temples in the service of politics (Veluthat, 2017, p. 20) and as an extension of the royal court (Talwai, 2010, p.1).

***Introducing Caste System in South India.*** During this amalgamation of philosophy of Shaivism and Hinduism, a confused state prevails in all the historical study. A dual caste system along with Varnasrama Dharma<sup>21</sup> co-existed in the Chola society (Lekshmi, n.d.). The dual caste system prevailed in South India before the spread of Hinduism. Based on people's occupation the dual caste system referenced in inscriptions on the temples are Valangai (Right Group) and Idangai (Left Group)(Appadurai, 1974, p. 1). According to Varnasaram (caste system), society was divided into four caste groups namely Brahmins, Kshatriyas, Vaisyas, and Sudras. The

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<sup>21</sup> Varnasrama Dharma refers to the treatise of Hinduism on classification of people based on occupation.

people in the first three are beings with sacred intentions while the fourth (Sudras) are excluded from religious privileges (Macdonell, 1914, p. 235).

There were also corporate groups of people responsible for decision making at a local level. They were *Nattars*<sup>22</sup> from Nadu (state), *Nagarattar*<sup>23</sup> from Nagaram (city), *Urar*<sup>24</sup> from Ur (village), and *Brahmanas* from Sabhai (assembly).<sup>25</sup> These are assemblies at different levels – state, city, village, and gifted land. These assemblies functioned and met at a definite interval to make decision regarding particular localities (Heitzman, 1987, p. 3).

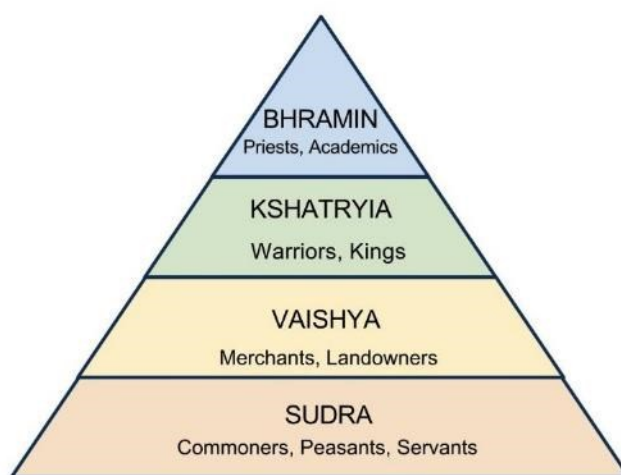


Figure 20. Hierarchy of Caste – Varnasrama in Hinduism (“Caste System of India, a Hoax,” 2016).

**Brahmins in Chola Dynasty.** Brahmins were given special status in the Chola state and granted land for their use. Such Brahminical settlements acted as the agents of Hinduism. This was main reason for Hinduism to spread in South India. Bramadeya, a concept from the Dharma Shastra<sup>26</sup> text, was manifested as the land or village donated to Brahmins. Brahmins

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22 Nattar are assembly of dignitaries, usually a group of villages within a common agrarian zone. They were usually responsible for tax collection. They lived in Nadu, the state.

23 Nagarattar are assembly of merchants who lived in Nagaram, the city.

24 Urar are assembly of people from the Ur, the village

25 Sabhai are assemblies of Brahmins from Bramadeyas, the donated land to Brahmins.

26 Dharma Sastra refers to treatises of Hinduism on Dharma (Universal truth to uphold by Hindus)

institutionalized Bramadeya by promoting agrarian expansion and organization, education, and by emphasizing religious ritual. These were created by ruling families and their subordinate authorities.

The Cholas also conceived this concept as the most beneficial in a society's setup, with Brahmin as leaders representing the highest caste, and is called the nucleus of Chola state. (Hall & Karashima, 2001, p. 60). The ideological importance of the Dharma Shastra dictum came about undoubtedly late to the creation of Brahmadeyas. South Indian kings appear to have been equally influenced by the Artha Shastra<sup>27</sup> prescriptions for agrarian expansion. As the Cholas expanded their Dynasty through conquering neighbouring countries, they moved people from their own countries to the conquered areas to cultivate virgin land, develop villages, setup Sudra agriculturists, and to evangelize Hinduism through Bramadeya. The Brahmins, teachers, experts in Vedas,<sup>28</sup> officiated at ritual sacrifices (Hall & Karashima, 2001, p .64). The Bramadeya played a significant role in the peaceful and stable extension of royal power. The Brahmin settlements were loyal to the king who created them in strategic regional positions to institutionalize and regularize local authorities to the Chola regime. This was a peaceful consolidation of the population under the royal ideology of legitimacy as subjects to the Chola

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27 Arthasastra refers to treatises of Hinduism on Statecraft, economic policy and military strategy.

28 Vedas – Most ancient hindu scriptures written in Sanskrit

Dynasty (Hall & Karashima, 2001, p. 61).

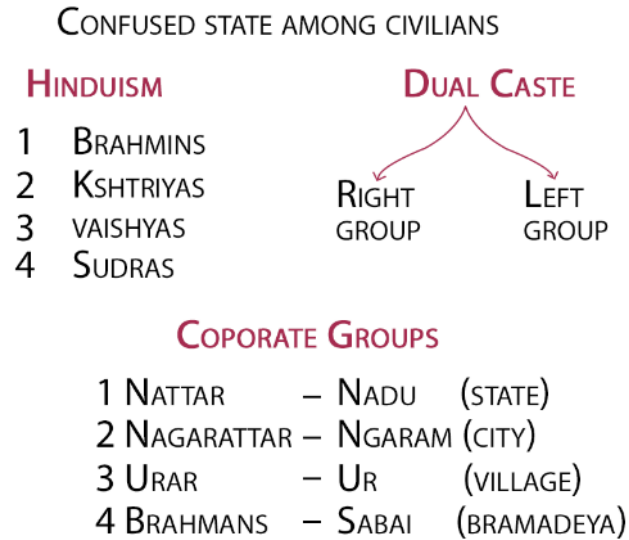


Figure 21. Groups and Caste in South India during Chola Rule.

## 5.6 Impact of Vaastu Shastra on Dravidian Style of Architecture

*Vaastu Shastra* is a treatise on dwellings; for Vaastu means *anywhere immortals or mortals live*, and Shastra means *Texts*. *Vaastu Shastra* follows the principle that every living being, its nest, must be in rhythm with the cosmic energy.

“Vaastu Shastra (traditional Indian architecture) edicts are based on the principle that microcosm (man-made built environment) must be in unison with macrocosm (cosmos) as its integral part. As such no interruption of microcosm should be contrary to the laws of cosmology both at gross and subtle level” (Gupta, 2017, p. 615).

Cholas were native to the Dravidian part of the Indian Peninsula. The Cholas followed the Dravidian style of architecture, which they had developed since the Sangam Age. Dravidian style of architecture emerged as the Hindu Temple Architecture in the southern part of India, which was at its peak during the Chola Period. Dravidian style of architecture is mentioned as one of the three types of architecture in *Vaastu Shastra*. The Bhakti movement, officiation of Brahmins along with the Chola rule, intensified the literature and consolidated the oral, written

and traditions. *Mayamatam* and *Manasara* are the two treatises defining Dravidian architectural tradition in *Vaastu Shastra*. These two books are a compilation of oral, written, and craft traditions (Jacob, 2007). Until the late 7<sup>th</sup> century *Manasara* and *Mayamatam* were transferred to generations only through oral tradition.

### 5.7 Manasara and Mayamatam

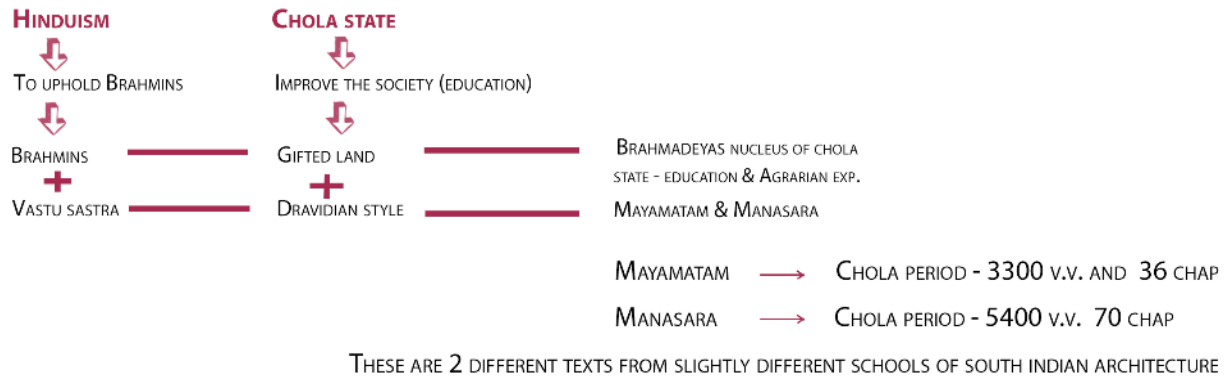


Figure 22. Evolution of Manasara and Mayamatam.

*Mayamatam* is a general treatise of *Vaastu Shastra* written in Sanskrit but originated in South India. It is a part of Saivite Agamic literature, which was drafted during the Chola Period by Mayamuni. *Mayamatam* is comprised of 3300 verses which are divided into 4 categories with 36 chapters. The 4 categories are - the earth (land), building (architecture), vehicle (transportation), and seats (furniture). Bruno Dagens transcribed and analysed the earth, the building, and vehicles (Mayamuni & Dagens, 2007, p. xl).

*Manasara* is a component of *Vaastu Shastra* treatise on architecture and iconography from the architecture discipline as *Mayamatam*. There are numerous parallels between these two works, but they seem to belong to two different schools of South Indian Architecture. They both have exactly the same overall plan; however, *Manasara* is 5400 verses long, with 70 chapters presented by P. K. Acharya, the editor, translator, and commentator of the *Manasara* in English. He dated the *Manasara* to the Gupta period (3<sup>rd</sup> to 6<sup>th</sup> century CE), but it is contradicted by recent historians, who place its date as late 7<sup>th</sup> century CE. Acharya opines that *Manasara* is one of the most complete of all texts dealing with architecture of the period in the sense that its

chapters are very specific. (Mayamuni & Dagens, 2007, p. xlv).

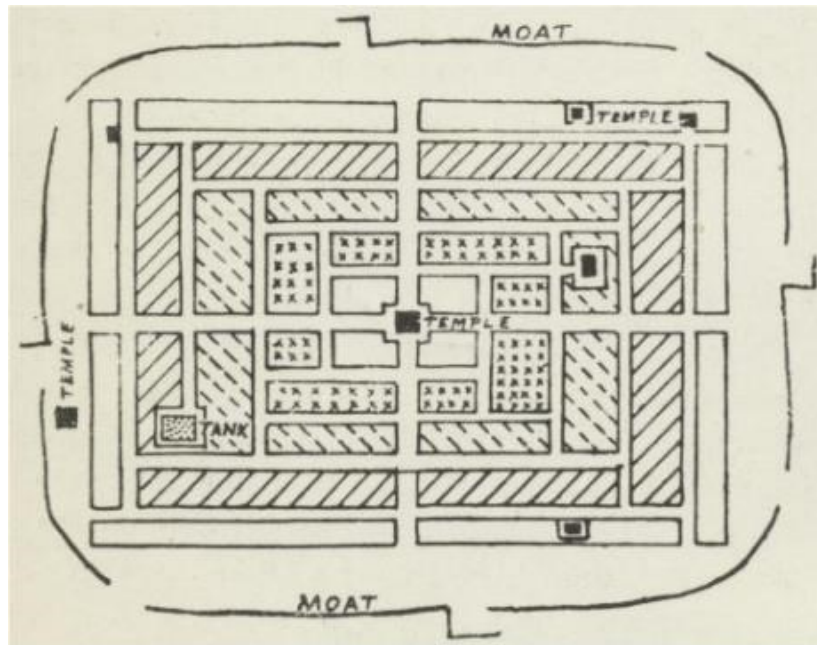


Figure 23. Nandyavarta, a town with various hash marks indicating castes as mentioned in *Manasara*. (Yonekura, 1962, p. 186).

The consolidation of *Mayamatam* in the Chola Period is one of the major factors to supporting that the Dravidian architectural style of Chola followed *Mayamatam*. Though *Manasara* and *Mayamatam* have similarities, they are different texts. The alignment of Chola architecture with *Mayamatam* or *Manasara* is a question. Architectural historians like Pierre Pichard based his detailed analysis of Chola architecture on *Manasara* but used *Mayamatam* for his analysis overall architectural planning of Chola architecture. *Mayamatam* spells out more appropriate proportions than *Manasara*, while *Manasara* presents more spatial organization.

#### COMPARISON OF MANASARA AND MAYAMATAM

MANASARA	MAYAMATAM
5400 VERSUS	3300 VERSUS
70 CHAPTERS	36 CHAPTERS
3RD - 6TH CENTURY CE??	7TH CENTURY CE
GUPTA PERIOD ??	CHOLA PERIOD
SOUTH INDIAN ARCH. STYLE	SOUTH INDIAN ARCH. STYLE
METICULOUS WRITING	MORE ORGANISATION

Figure 24. Comparison of *Manasara* and *Mayamatam*.



Since this thesis concentrates on the overall urban context of the Gangaikonda Cholapuram city, it is appropriate to assume that the developers of the city followed *Mayamatam* for planning and spatial organization.

## 6. Chola Metropolises

The most important cities associated with Chola are Tanjore, Vellur, Poompuhar, Uraiyur, Melakadambur, Pazhayarai, Tiruvarur, Anuradhapura, Polonnaruwa, Annai Mangalam, Gangaikonda Cholapuram, Chidambaram, Uttaramerur, Nagapattinam, and Mumudi Cholamandalam. Two of these cities, Tanjore and Gangaikondacholapuram, were the administrative capitals of the Medieval Cholas, where their kings were crowned and ruled for 450 years. Tanjore has no traces of the Chola Dynasty except for the palace complex area, the Big Temple, and a few streets that are referenced in inscriptions. Tanjore has constantly undergone changes due to urbanization, which clearly has eradicated the ancient structures. But Gangaikonda Cholapuram, now barren land, has not been urbanized since the 13th century (Vasudevan, 2003, p. 22). Therefore, artifacts and architectural structures, for the most part, remained untouched by the human beings. This in fact is a big advantage for researchers.

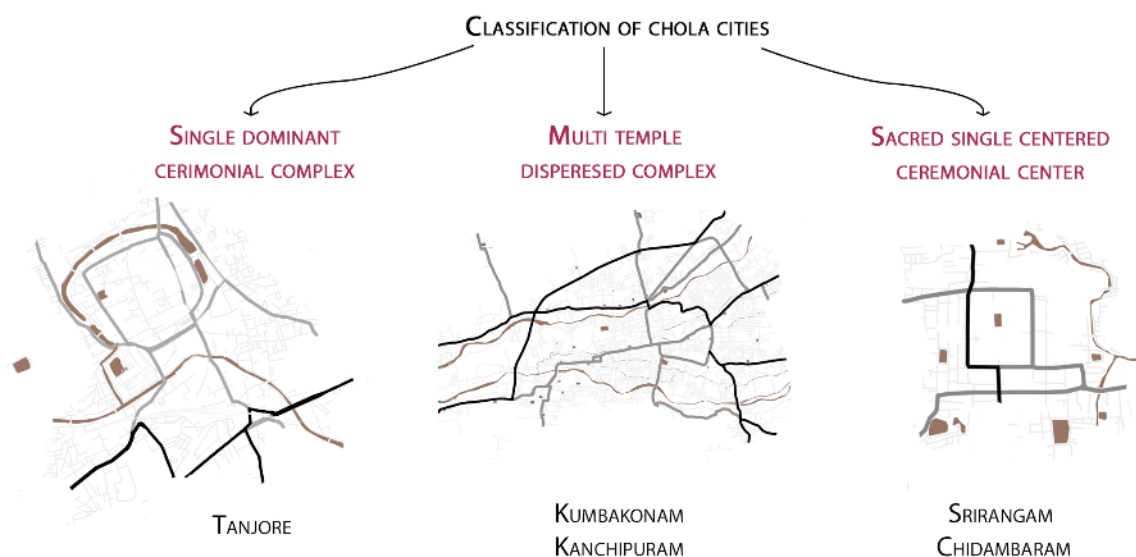


Figure 25. Classification of Chola Cities.

### 6.1 Classification of Cities

According to Champakalakshmi, the distinctive character of Tanjore is that it was an

established city created as an act of royal polity in imitation of a sacred Bhakti center.

Gangaikonda Cholapuram also had features of an established city as an act of royalty, except that it was a commemoration of the Gangetic Expedition of Rajendra Chola. These cities had a *single dominant ceremonial complex*. Others such as Pazhayarai and Kanchipuram are classified as multi-temple centers. As the growth of the population and agrarian expansion, additional temple centers that developed into *dispersed ceremonial/sacred center*. These types of cities were chaotic unlike Tanjore or Gangaikonda Cholapuram which were compact. The third type of city is *sacred centered*, with a dominant single complex around a single religious center. Classic example of this category is Chidambaram, Srirangam, Tiruvannamalai, and others. All three types of cities developed and had stages of growth which are reflected in the manifestation of the temple structure itself (Champakalakshmi, 1996, p. 437).

## **6.2 Sri Rangam, the Temple City.**

Sri Rangam, also known as Thiruvarangam Tirupati, is a city in Tamil Nadu, India. The city is still a buzzing city that dates back to Sangam period (3<sup>rd</sup> century BCE). The city survived various kingdoms and dynasties, that it spreads over 156 acres (63.131 hectares). According to UNESCO, it is the largest functioning temple in the world. The 450 years of Chola rule, contributed their part in developing the Sri Rangam through rebuilding and construction of Gopuram. Sri Rangam as a planned city is close to the *Sarvatobhadra* of Manasara. The features of the city are rectangle shape, seven concentric walls with Gopuram on four sides, streets inhabited with Brahmins, boulevard along the first five enclosure, streets planned for four major division, main streets with two rows of houses, and internal streets lined with single row houses. The south east has pavilions, rest houses, colleges and halls. The city plan of Sri Rangam follows Vaastu Sastra, but its not a complete work of Chola Dynasty like Chidambaram. The city of Sri Rangam can be a classic example of Dravidian style city planning, where the settlement lived within the temple complex (Ghosh & Mago, 1974, p. 377). Though this is a single religious

centered city, this case study could be used as a base to build on the city of Chola.

### 6.3 Scholars' Description of a Chola City.

Chau Ju-Kua (1170 – 1228 C.E.) gave a brief description of a city of Chola as follows:

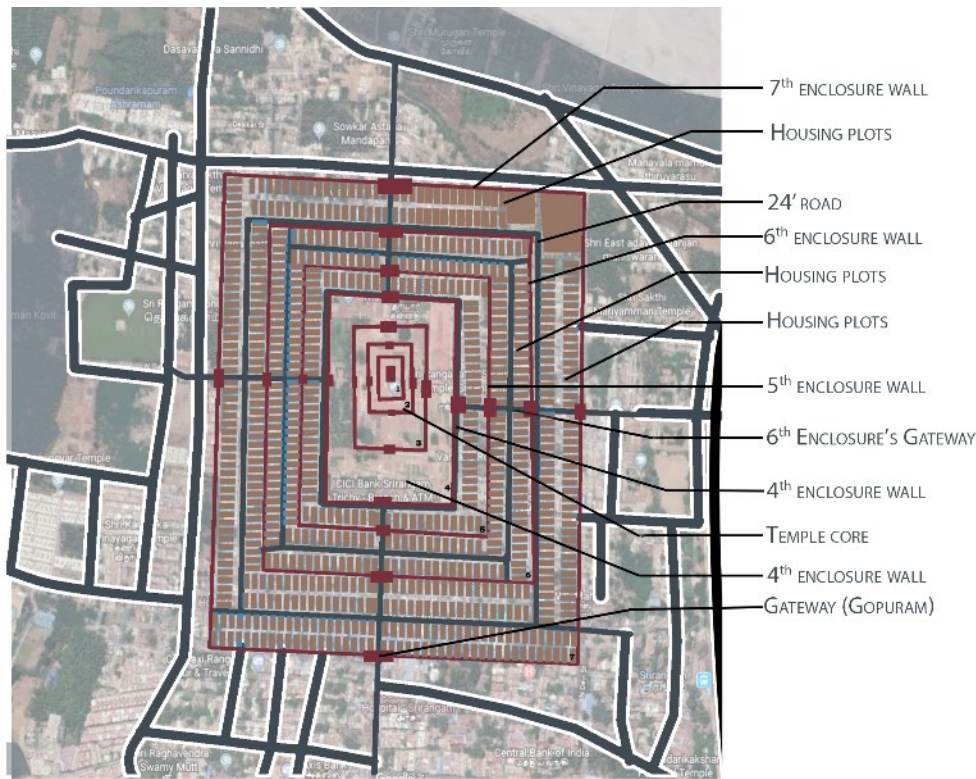


Figure 26. Sri Rangam City Planning.

*In this kingdom there is a city with seven-fold wall seven feet high and extending twelve li (6.7 km) from north to south and seven li (3.3 km) from east to west. The different walls are one hundred paces (400 ft = 122 m) distant from each other - Four of these walls are of brick, two of mud, and the one in the center of wood. There are flowers, fruit trees, and other trees, planted- [on them] (sic). The first and second walls enclose the dwellings of the people. They are surrounded by small ditches; the third and fourth walls (surround) the dwellings of the court officers; within the fifth dwell the king's four sons; within the sixth are the Buddhist (i.e., idol) monasteries where the priests dwell; the seventh wall encloses over four hundred buildings forming the royal palace. As the taxes and imposts of the kingdom are numerous and heavy, traders rarely go to the city. The country is at war with the kingdoms of the west. The government owns 60,000 war-elephants, everyone seven or eight feet high. When fighting war these elephants carry on their back's houses, and these houses are full of soldiers who shoot arrows at long range, and fight with spears at close quarters. When victorious, the elephants are granted honorary names to signalize their merit (Chau Ju-Kua as quoted in Sastri, 1939, p. 142).*

Chau Ju-Kua's description is not an exact match to the existing city layout of Chidambaram and Sri Rangam or any other temple city. Though the city of Sri Rangam has seven concentric walls, it does not have the palace complexes in its core. His description of seven concentric walls and 400 palaces can be only equated with the layout of Gangaikonda Cholapuram. The li units mentioned, 12 li x 6 li, in his notes converted into SI units are 6717.6 m x 3358.9 m.<sup>29</sup> Chau Ju-Kau's description is about a royal city in the Chola Dominion in the 12<sup>th</sup> century, which can only be the capital city of Gangaikonda Cholapuram. Additionally, the reference of war elephants carrying towers (houses) on their backs are typical of an elephantry unit of the Chola empire. The three materials that he referred to in his description are brick, mud, and wood. Mud and wood are temporary materials that could have disintegrated. While foundations of bricks could be revealed in future excavations. Therefore, one can infer that Chau Ju-Kua visited Gangaikonda Cholapuram, the capital of Chola which had seven concentric walls with 400 palaces in the center, which could have been wiped away in the future centuries. It is also unusual that he did not to mention the Gangaikondan Lake, if he had visited Gangaikonda Cholapuram. Only further detailed excavation or a GIS survey at the city's site can support the

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29 li system of units had various measurements throughout the history of China. Since Chau-Ju-Kau is from the Song Dynasty of 12th century,

1 li = 1800 chi

1 li = 559.8 m (Jun & Hargett, 1989, p. 14)

12 li = 6717.8 m; 6 li = 3358.8 m.

Chinese traveler's depiction.

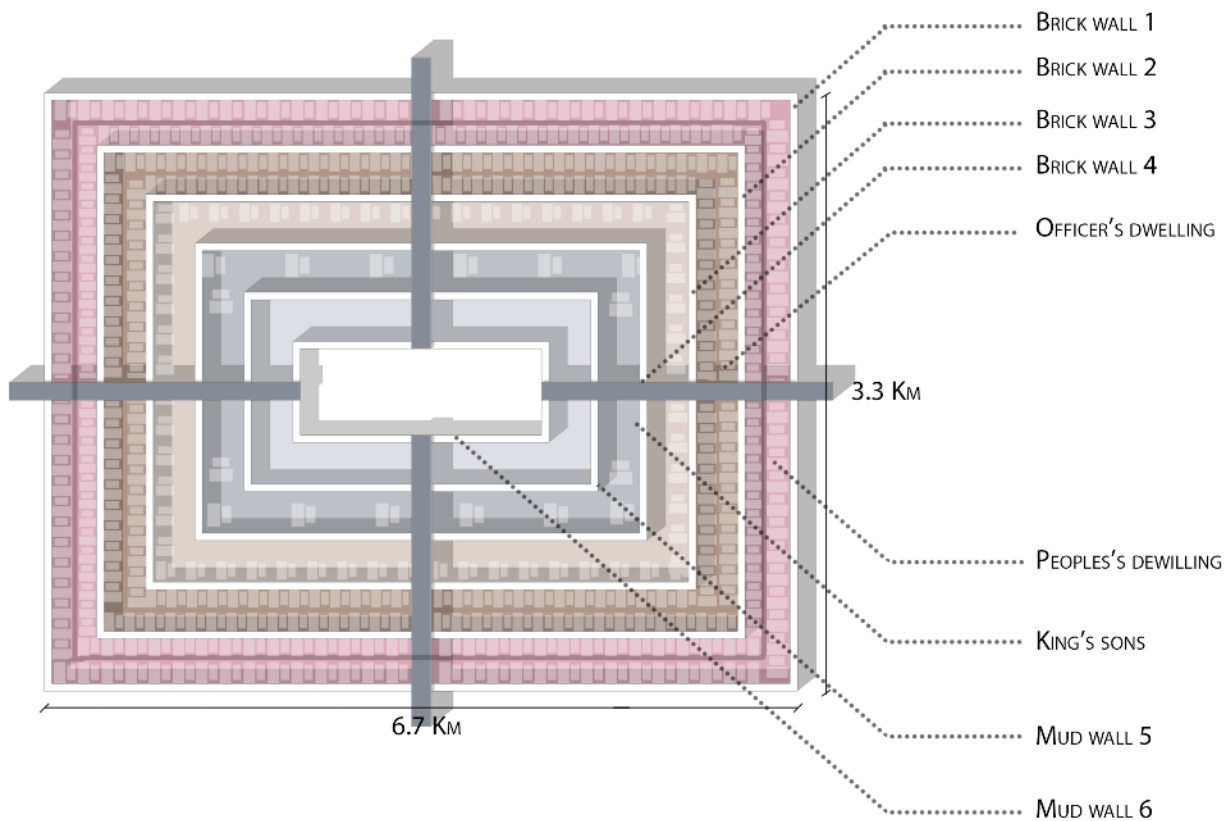


Figure 27. Graphic as described by Chau-Ju-Kau's Description.

## 7. Gangaikonda Cholapuram, the New Administrative Capital

For two centuries the Chola Dynasty was ruled from Tanjore, the capital city. Rajarajan Chola built the Tanjore Big Temple as a Hindu place of worship to validate his conquest and celebrate his power as the king. A few obvious things existed which revealed that the city of Tanjore existed even before Rajaraja (985–1014 CE). The Medieval Cholas Dynasty from its first ruler Vijayalaya Chola until Rajaraja Chola was crowned and ruled the Chola Empire from Tanjore for a period of 170+ years. When Raja Raja's son Rajendra became the king (upon his death), to commemorate his overseas conquest and validate his power as a king, he built his own city Gangaikonda Cholapuram along with a royal temple, thereby moving the Chola capital city to his city.

Today, Gangaikonda Cholapuram (lies to the north of Kollidam river in Udayarpalayam Taluk of the Ariyalur District, in Tamil Nadu). Gangaikonda Cholapuram, which once was a huge metropolis, is now mostly farmland and is a locale defined by its remoteness and abandonment. The only thing that is prominent here is the Gangaikondacholeesvaram Temple, whose tall profile makes it visible from a distance. The village is located in between Kollidam in the south, Vadavaru river in the east, and Gangaikondan lake in the west. A modern highway (National Highways NH 81) runs across the village today and connects Jayankondam and another highway (National Highways NH 36) that is slightly away from the village (Nagaswamy, 1970; Pg. 1) (Refer Figure. ). This village is distinguished by the abundance of original bricks half buried in the soil leftover from the ancient city. The residents today dig up the bricks utilized for current construction purposes (Kulke, et al., 2009, p. 96). The rise and fall of Gangaikonda Cholapuram from a buzzing capital city into a barren village begins with the death of Rajendra

Chola's father Rajaraja Chola.

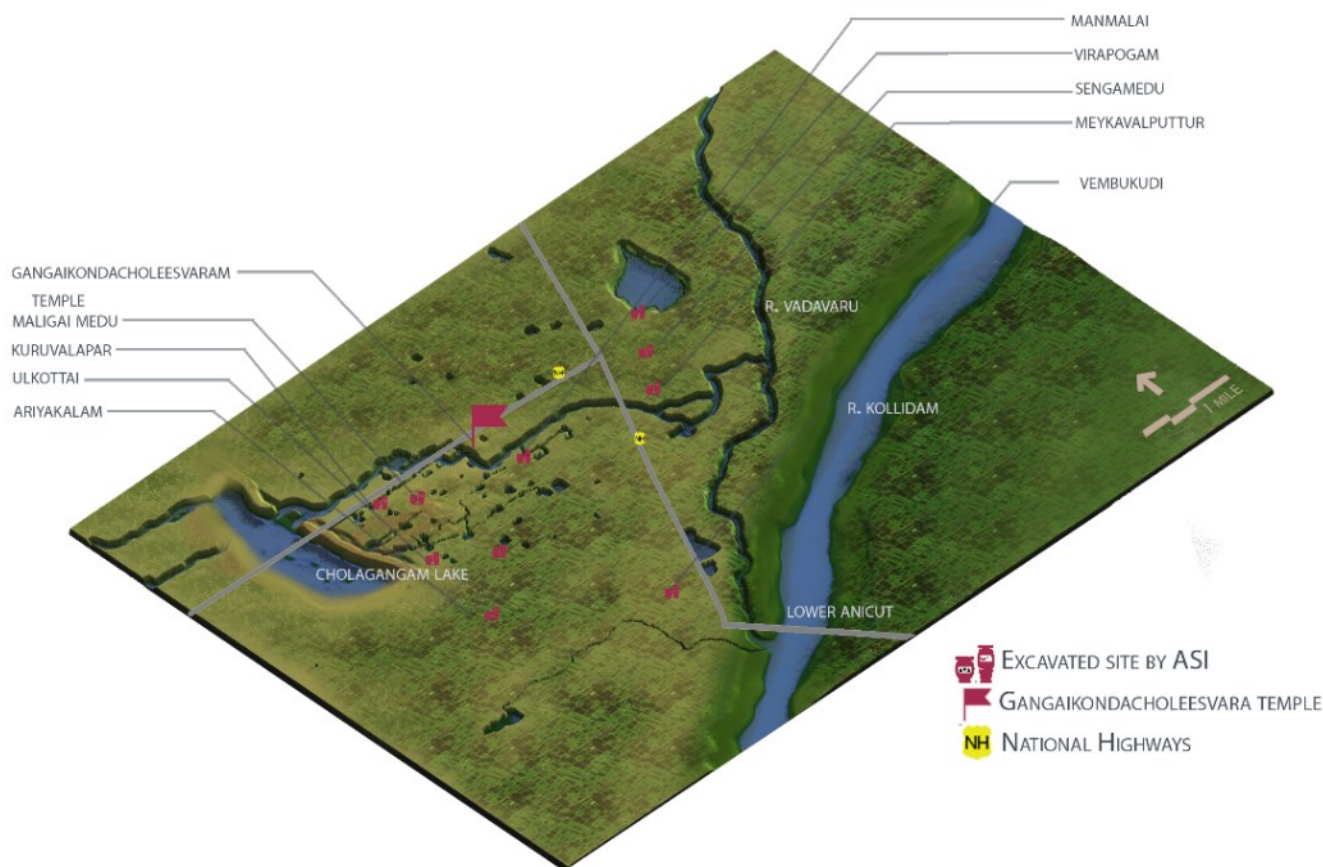


Figure 28. The present Gangaikonda Cholapuram and Excavation Sites.

## 7.1 Rajendra Chola

Rajendra was the son of Raj Raja through his queen Vanavanmadevi (also known as Tribhuvanamadevi). Rajendra was the General of Rajarajan's powerful army in his early twenties and grew to be the most powerful General in Tamil History under his father's regime. Rajendra was at his full capacity only because of his father's futuristic decisions. He was chosen heir apparent by Rajaraja between March 27th and July 7th of 1012 C.E. Nagaswamy (1970) writes,

*Rajendra fought many battles and won every one of them. For every victory, he gained he assumed a title, commemorating his victory. The moment he assumed independent sovereignty, he embarked on 'a conquest of the quarters' the Digvijaya (page 3).*

During this time the Chola army had 900,000 soldiers, which was the reason that the empire was able to expand across the Bay of Bengal within short span of two generations. Thus,



as a powerful General, he undertook many expeditions in all the directions. He also was able to capture most of South India and the Kingdoms along the Coromandel Coastline (Nagaswamy, 1970, p. 1).

## 7.2 Why a New Capital?

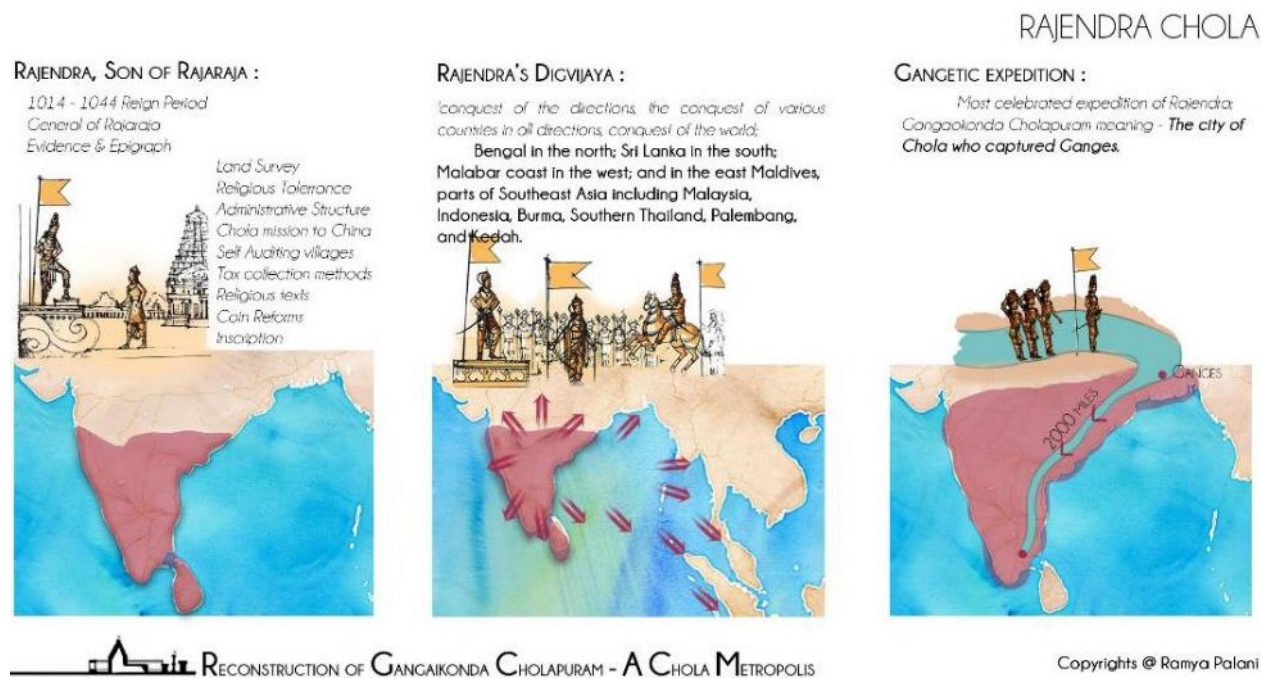


Figure 29. Rajendra, Digvijaya and Gangetic Expedition.

The foundation of Gangaikonda Cholapuram was laid by Rajendra Chola (1014-1044 CE). The conquests of the following kingdoms, Pandya, Chera, Sri Lanka, and Western Chalukyas, along with the marital alliance with Eastern Chalukyas that Rajaraja Chola (985-1012 CE) initiated, made it possible for the mighty emperor Rajendra Chola to reach the Ganges area and destroy the Pala Dynasty in the north (Kulke, Kesavapany, et al., 2009, p. 96). In order to commemorate his victorious march to the Gangetic Plain, Rajendra Chola conceived the idea for a new capital city along with a majestic Shiva Temple. Repeating history, just like a monument his father built, to be constructed (at the yet to be developed) village named Gangaikonda Cholapuram (Nagaswamy, 1970, p. 2)

There are a few hypotheses that revolve around the site selection of Gangaikonda

Cholapuram as the administrative capital. Even though these are traditional stories, their intent clear concerning the conception of a city: the construction of a great city to commemorate his victorious march to the Ganges. After the Ganges expedition, Rajendra Chola (1014-1044 CE) created the great lake of Gangaikondan in his new administrative capital city and filled it with water from Ganges (Nagaswamy, 1970, p. 13).

### **7.2.1 Gangetic Expedition.**

Rajendra's celebrated expedition was the Gangetic Expedition, an expedition to bring holy water from the Ganges to purify his land, when he defeated Mahipala<sup>30</sup> at the delta region of the Ganges. The auspicious (holy) water was carried in golden vessels on the heads of vanquished rulers. The Himalayas and the Ganges were considered holy sites according to Hinduism. Marching 1000 miles towards the Ganges was a laborious and prideful task then. Only one other king 1000 years previously is said to have achieved it in a similar fashion. Silappathikaram<sup>31</sup> mention a Sangam King, Sengkuttuvan who marched up to the Himalayas with an army to bring a stone to carve an image of his Goddess Pattini, which he enshrined in a temple erected in her honor. Sengkuttuvan was also opposed by two kings, but they were vanquished and made to carry the stone on their heads all the way down to South India.<sup>32</sup> To commemorate his celebrated victory, Rajendra assumed the title Gangaikonda Chola name given to his new capital and to his temple – Gangaikonda Choleswaram. Rajendra, the successor of Rajarajan, named his city after that expedition “the Gangaikonda Cholapuram,” meaning the city of Chola, which captured Ganges.

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30 Mahipala a notable king of Pala Dynasty rolled as far as Varanasi from Bengal. his role was hampered by the Gangetic expectation of Rajendra.

31 Silappathikaram is a Sangam literature, considered as one of the five great epics of Tamil Nadu (previously Chola land), written during second – third century CE.

32 Refer to '*Gangaikonda Cholapuram*', written by Nagaswamy for more details regarding the Gangetic expedition of Rajendra Chola.

### 7.2.2 Rajendra and Digvijaya.<sup>33</sup>

Thiruvalluvar copper plates give an account of Rajendra's *Digvijaya*. Rajendra under his father's regime captured the Pandian Kerala countries. He invaded the first half of Sri Lanka and second half of Sri Lanka. The Karandai plates mention Rajendra to cover the whole of Sri Lanka island and got it under Chola rule. The next expedition of Rajendra was the Gangetic expedition, when he marched all the way to Bengal crossing the Madura, Namanaikkonam, Masunidesa, Adinagar, Oddavisya, Kosalainadu, Tandabhutti, Takkanaladam, Ranasura, Vangaladesa, and Uttaraalam.<sup>34</sup> Rajendra after his Gangetic Expedition, sailed across the bay of Bengal and subjugated the Andaman and Nicobar islands, Singapore, Malay Peninsula, and the lower part of Burma, Kedah.<sup>35</sup> (Nagaswamy, 1970, p. 5)

### 7.2.3 Military Advantages of Gangaikonda Cholapuram as the Capital

In addition to his self-aggrandizement motive, researchers like Thiyagarajan and Nagaswamy have proposed military reasons. The great king Rajendra Chola, who launched several naval expeditions to Java, Sumatra, Kedah, and Vietnam, also established a trade route to China. Nagaswamy (1970) speculated that Rajendra might have chosen Gangaikonda Cholapuram as it was only 46.6 miles (75 km) away from the seaport town of Chidambaram, which was a perfect site to dispatch his navy and military (p. 4). The village, which was situated on flat terrain, was in a place that was perfect for training the Chola army, there could also be another reason for selecting this locale.

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33 Digvijaya means conquest of the directions (conquest of various countries in all direction).

34 Refer to 'Gangaikonda Cholapuram', written by Nagaswamy for the wars fought and land conquered during the Gangetic Expedition of Rajendra Chola.

35 Nilakanta Shastri has given a detailed report on the capture of Kedah (Kadaram) in his book 'the Cholas'.

Thyagarajan in his paper, suggests a convincing claim on this case. Gangaikonda Cholapuram is an unfertile and barren land, because of insufficient rain. Rajendra captured all the kingdoms along the coast of Bay of Bengal and overseas. For such a mighty expedition, Rajendra might have required an open land to recruit and train his army. In order to supply water for his training complex, creating Chola Gangam (Gangaikondan Lake) is justified.

Prior to Rajendra, Chola army recruited soldiers from the Chera country and south of the Cauvery River. After Rajendra, a new caste called Surutimans were recruited in the Chola army. These people belong to the mountain region of Kollimalai, Pachamalai, and Kalrayan regions. As they were people from hilly areas, they possessed hunting skills and great stamina. Records also indicate that the new recruits relocated in villages near Gangaikonda Cholapuram city. The creation of the lake, the proximity to the Bay of Bengal, the topography of land, the river as mode of transportation, and recruitment and relocation justifies the strategic site selection of Rajendra for his new capital (Pichard, 1994, p. 182 - 183).

These are the few hypotheses that revolve around the Rajendra's site selection. For an emperor who captured three-fourths of modern India, site selection was one of the most important decisions that dictated what he decided to hide and display. Rajendra, being the most talented of all Tamil kings decided to hide his wealthy delta region behind his huge capital city from his primary enemies in the North of India. One can assume that there was no threat from the south, as Sri Lanka, the east coastline of India, and the Bay of Bengal was under his control. The Chola Dynasty that ruled for 450 years long, came to an end long after Rajendra's Period. Certainly, the empire was not affected by foreign kingdoms however, future generations of people he captured, living in Chola State (Pandyas), gathered their forces together and overthrew Chola Regime, putting an end to the 450-year reign.

### **7.3 Excavations at Gangaikonda Cholapuram**

The importance of the Chola Temples remained unknown until early 20<sup>th</sup> century. Just

before the Independence of India, the British had started to notice the inscriptions on the Chola Temple and devised a way to read them. In independent India, it almost took 20 years for the researchers to read all the inscription and locate the systematic brick digging. The excavation opened in 1980 by the Department of Archaeology of Tamil Nadu under the direction of Nagaswamy, and then was continued by his successors until 2009, when they unearthed foundations of bricks on which rested stone pedestals. They also found the wooden pillars that supported timber buildings, as well as nails, iron hooks, and flat tiles (Pichard, 1994, p. 110).

With the help of epigraphs and inscriptions along with the news about bricks from the site, ASI decided to excavate the site behind the Gangaikonda Cholapuram Temple. Between 1980 and 2009, the excavation occurred in different villages in the Ariyalur district, namely Maligai Medu, Kalkulam, Kuruvalappar Koil, Cholagangam, and Manmalai. The excavation at Maligai Medu site started with a 4 m x 4 m plot. At a depth of 1.65 m, a T-shaped wall made of burnt bricks, along with pot shreds, Chinese porcelain, Celedan, iron nails, roof tiles, weapons, wooden column remains, laterite blocks, and stone pedestals were found. The excavation also revealed a sluice (structure), moat, fortified walls, hold-up hooks, decorative objects made of stone, animal bones, and elephant tusks. The excavation expanded from the original 4 m x 4 m plot to include 25 such plots. The result was unearthing of the palace and the city of

Gangaikonda Cholapuram (Natana, 1998).

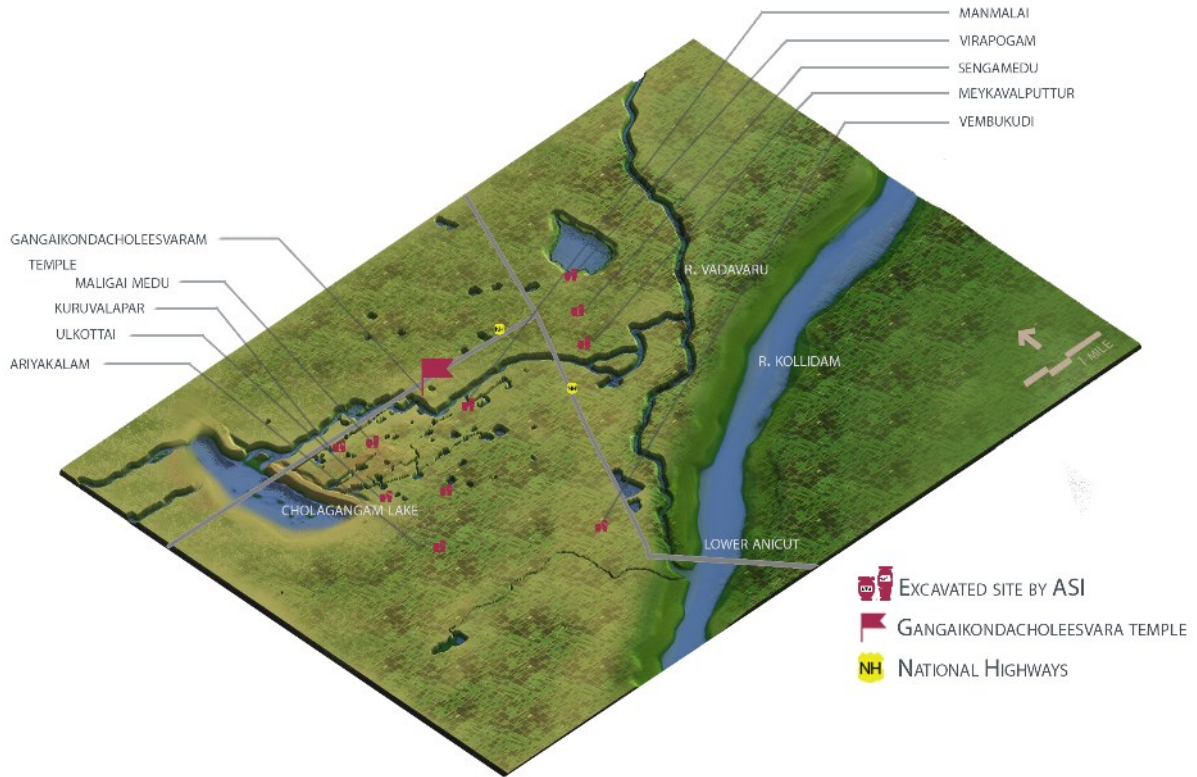


Figure 30. Showing Excavated Site.

### 7.3.1 Epigraphical Evidence

Gangaikonda Cholapuram and its palaces are important relics from antiquity. The primary source of information derived from inscriptions. Also, few surviving Tamil literary works like *Thiruvisaippa* by Karuvur Thevar, *Kalingathuparani* by Jayamkondar, *the Muvar Ula* by Ottakuthar, and *the Koil Olugu* by an unknown author. The *Vikramankadevacharita* by Bihana, a Sanskrit work, throws light on scholarly inquiries about the town of Udayarpalayam Zamin and offers some valuable information about the temple and the city (Nagaswamy, 1970, p. 43).

## 8. Urbanization / Planning

### 8.1 Gangaikonda Cholapuram and remaining structure.

Gangaikonda Cholapuram in its present situation is a heartbreak for historians who know about the city, as the Gangaikonda Cholapuram is nothing but a barren village with the tall towered Gangaikondacholeesvaram Temple. The excavation on the south western direction of this temple revealed the remains of the Gangaikonda Cholapuram City. Archaeologists found two concentric fortification walls made of burnt bricks. The Gangaikondacholeesvaram Temple lies on the outer enclosure of this fortification, in the northeastern direction.

### 8.2 City Layout

Nagaswamy writes,

*Judging from the available literature and the remains, we may conclude that it was an extensive city, carefully planned and laid in accordance with the architectural treatises to suit the needs of our capital. The city seems to have had two fortifications, one inner and the other outer. The outer was probably wider. The [current] villagers point to a mound running all around the palace as the outer fortification (1970, p.14).*

In contrast to Nagaswamy, Pierre Pichard said Gangaikonda Cholapuram city does not have any overall composition and that it was a juxtaposition of various elements connected by roads and streets lined with houses (Pichard, 1994, p. 112).

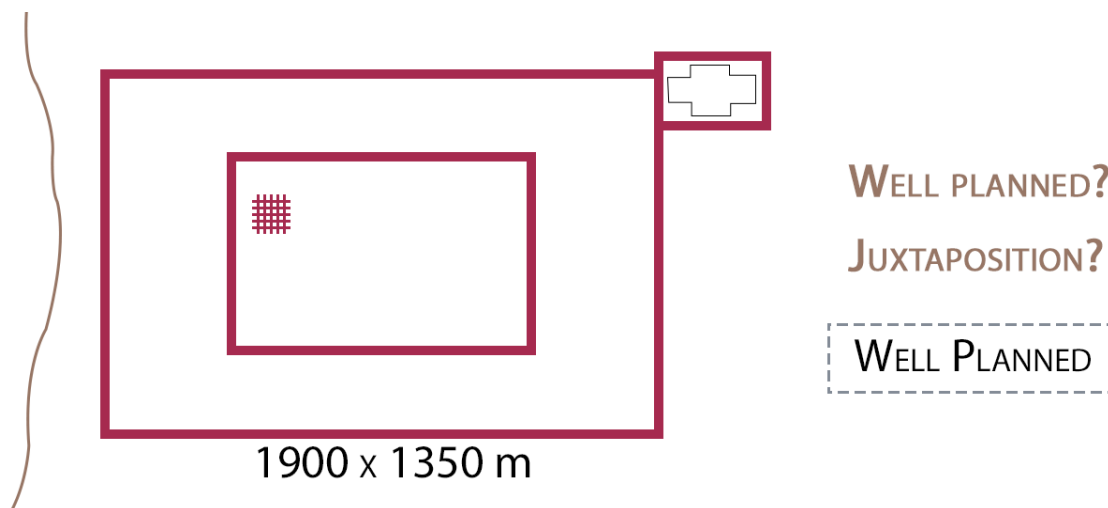


Figure 31. Gangaikonda Cholapuram according to Nagaswamy.

These are ideas of the archeologist during the preliminary stages of excavation, are now partially accepted. The study of Chola temple and recent excavation suggests a contrary ideology that the city was carefully planned according to *Agamas*. The greatest city of the era in South of India. The lesser but also religious important cities of Chidambaram, Sri Rangam, Tiruvannamalai had remained with a well-planned city layout. The greatest city of that era in South India, after the historical Gangetic expedition, built from scratch, seems unusual for it to be a juxtaposition of structures. The later excavation and epigraphy evidence have revealed the extensive water management system of the city, topographical mapping, water channel mapping and usage of construction materials. These evidences suggest that the city a planned city. Collectively, this evidence suggests the development of a well-planned city.

### **8.2.1 Design Principle of Planning Gangaikonda Cholapuram.**

The city of Gangaikonda Cholapuram seems to have followed the *Mayamatam* as the basic urban plan which was linked by roads and pathways. Though there are not any preliminary case studies for royal cities from Tamil Nadu, the houses would have bordered along the pathways with the palace at the very center, according to *Mayamatam*. This conclusion is also based on the case study of existing Chola cities like Chidambaram and Srirangam, which have maintained their original city layouts for more than 1000 years.<sup>36</sup> The texts also suggest proportions of the city fortification, with three gateways and one important median (at the midpoint of a wall) gate. In opposition to this idea, this capital city with the temple in the NE corner outside the walls of the fortification proposes a different idea offered by *Agamic* texts. This proposition suggests that every single component within the city was perfect as a separate component, like the temple on the east and the city itself with its protective walls.

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36 The author's analysis



### 8.2.2 Angkor Wat, Mandalay and Cholas

A comparative study with other Southeast Asian empires from the same era helps to understand the overall composition of the Gangaikonda Cholapuram. Angkor Wat, the ruins in Angkor, Cambodia, and Old Bagan, the ancient city of the Pagan Empire on the Irrawaddy River in Myanmar (present), have some similarities with Gangaikonda Cholapuram. Similarities (1) the moat around the fortification, (2) timber framed wooden posts, (3) hypostyle halls, and (4) mansions accessible by steep steps.



*Figure 32. Medieval Contemporary Royal Cities.*

Pichard (1994) suggests that Nayak palaces of Tamil Nadu – Madurai and Tanjore – have similar hypostyle halls where wooden columns with brick columns under vaults. Angkor Thorn and Bagan from the 12<sup>th</sup> century have an external enclosure square within it is the royal palace. Angkor has an external square enclosure 3 km by 3 km with internal enclosure of 600 m by 600 m. Old Bagan has 2 km x 2 km external enclosure with an internal enclosure of 700 m by 300 m (p. 111). All of the above cities were built in the same medieval period, and with Hinduism as their religion and philosophy. Only the sizes of the city vary.

***Old Bagan City's Interpretation of the Remains of Gangai.*** The Old Bagan city covers

400 hectares inclusive of a royal household, official buildings all within the citadels. Civilians live outside of the fort wall, in the south and southwestern direction of the citadel. The northeastern direction was occupied by religious servants. The palace within the inner enclosure was a juxtaposition of single-story buildings under high roofs supported by teak wood (Pichard, 1994, p. 111).

Gangaikonda Cholapuram illustrates palaces as separate main buildings, made up of timber hypostyle walls, with inner and outer enclosures that reminiscent of Mandalay. However, the space between the inner and outer enclosures must have been densely packed with row houses in a concentric plan with roads running from north to south and east to west. The civilian population lived outside the fortification, which suggests the reason for the Gangaikondacholeesvaram Temple being outside the fortified walls for not privileged use. The northeastern side was a reserved neighborhood dedicated for the servants of the temple like the priests, musicians, dancers, etc.

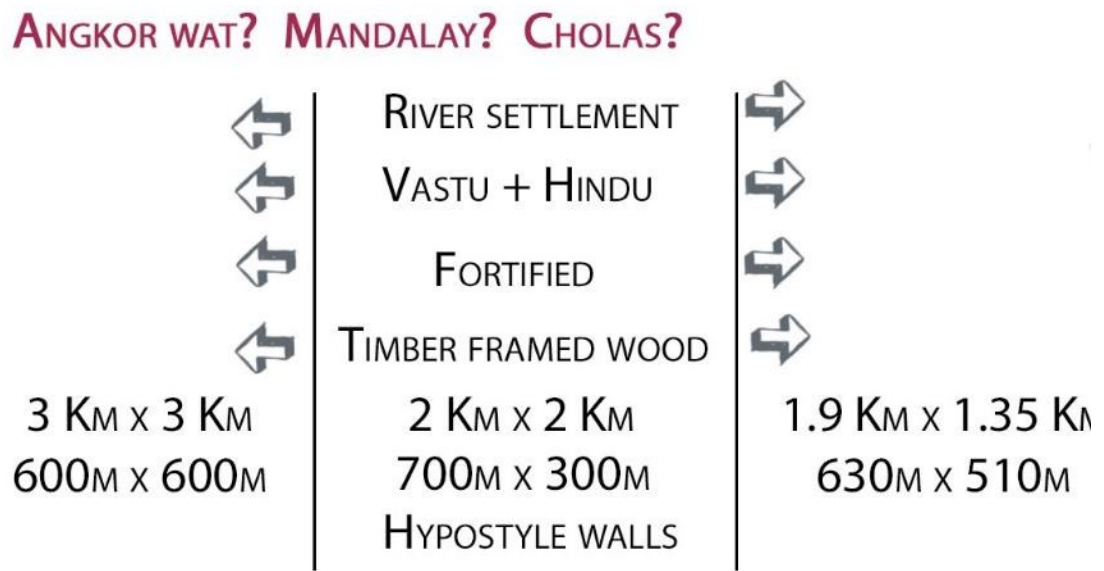


Figure 33. Analysis of Angkor Wat, Mandalay, and Gangaikonda Cholapuram.

### 8.2.3 Gangaikondacholeesvaram Temple and *Mayamatam*

*Dipuigama*, a classic draft for Shiva temple, mentions that it must be placed northeast of a city. *Manasara* specifies in the Rajadhani city planning that Shiva temple is placed in the northeast direction. On the other hand, these treatises do not specify anywhere that the Shiva temple must be implanted inside or outside of the city. Its normal position seems to be in the north (Acharya, 1995, p. XXIII). *Mayamatam* is more specific in the placement of a temple. *Mayamatam* specifies that Shiva temple can be placed on the northern side or north-eastern side of the city, or *Isa*<sup>37</sup> side. Moreover *Mayamatam* emphasises that the temples must be inside the enclosure of the city, for the Brahmans to access it (Mayamuni & Dagens, 2007, p. 73). But in Gangaikonda Cholapuram, the Shiva temple is situated on the outside, the outer enclosure. Even though the *Mayamatam* emphasizes that the temple must be inside the fortification, the planners of Gangaikonda Cholapuram placed the Shiva temple outside the outer enclosure. This seems they made a conscious decision to place the temple outside so that Brahmins and all classes of people can access the temple.

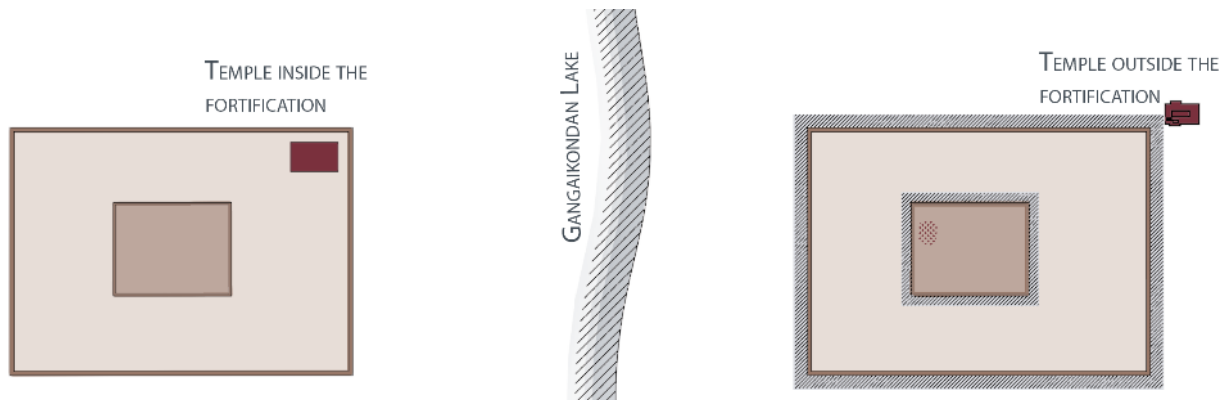


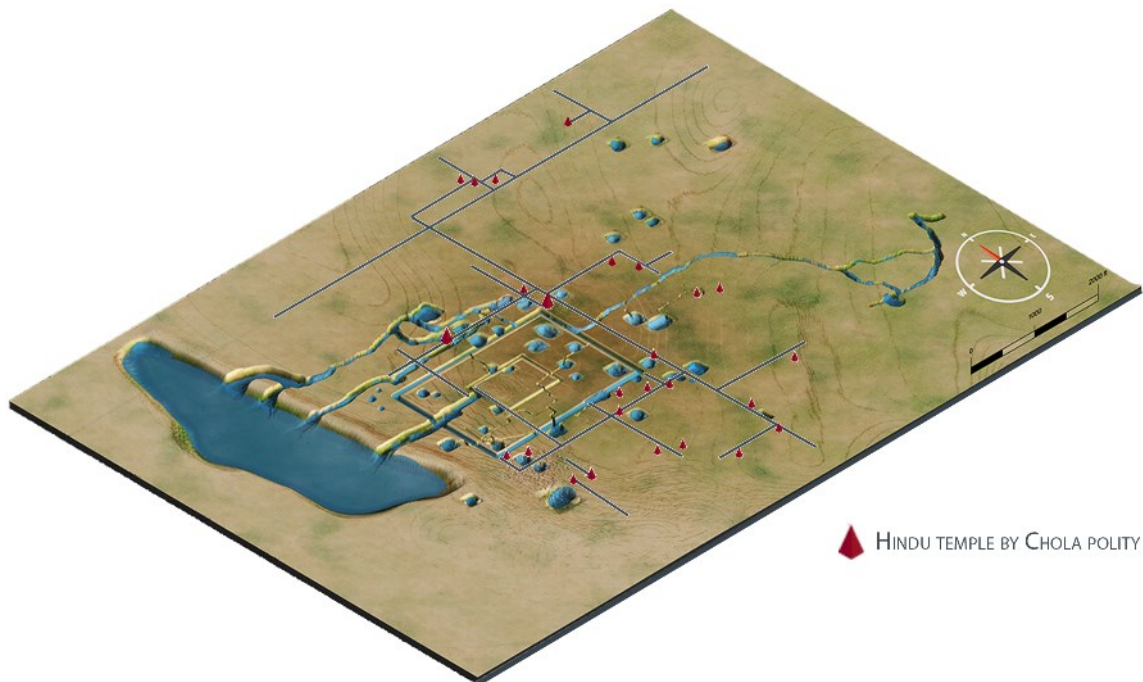
Figure 34. Showing *Mayamatam* (Left) and Gangaikonda Cholapuram comparison (Right).

### 8.2.4 Other Temples in Gangaikonda Cholapuram Following *Mayamatam*

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<sup>37</sup> *Isa* means the north-eastern direction.

The author of this thesis mapped religious structures for a radius of 2 miles from the excavation site, which revealed more than 45 religious' sites. These sites are classified into two categories. They are the Hindu temples and the Kula Swamy religious sites. There are 19 Hindu Temples, a result of Chola polite-ness and Hinduism adoption. The remaining 25 religious sites are Kula Swamy temples, a place where the people worship their ancestors according to ancient traditions. The mapping of these two types of temples revealed a pattern of the settlement. The mapping shows that the city was densely spread in south, east, and partially in north. The western side is obviously not populated as it had the huge lake.



*Figure 35. Mapping of Hindu Temples.*

The Hindu Temples were erected by Chola polity. The erection of a Hindu Temple, usually Shiva and Vishnu, denote the creation of a new village or settlement. The location and entrance of these Hindu Temples and certain Kula Swamy Temples denote the presence of a street or a settlement at that spot. One can also trace a few streets next to Hindu Temples that follows the *Mayamatam* standards. The Kula Swamy temples were erected by the settlers of the city in memory of their ancestors. These temples have names like Ayyanar, Periyandavar,

Muniyappan, etc. These temples are a representation of the Dual Caste System, in which brave ancestors are treated as Gods. These temples are identified as a characteristic of a military camp or settlement. The mapping of these Hindu Temples, and their respective streets helps to trace the old buzzing city of Gangaikonda Cholapuram (Refer figure 39).

### MILITARY AND TEMPLE :



Figure 36. Military Camps and Hindu Temples.

### 8.2.5 The Royal City and *Mayamatam*

Pichard's (1994) study has proved that the Gangaikondacholeesvaram Temple follows *Mayamatam*. But there is no study to prove that the city of Gangaikonda Cholapuram followed any Agamic texts. *Mayamatam* pronounces proportions for a royal city in Chapter 29. According to *Mayamatam*, royal cities are described as a city with a royal palace, surrounded by a town and/or by an entrenched military camp. The palace complex is placed on the western part of the town (Mayamuni & Dagens, 2007, chap. 29.1a-3). In the case of Gangaikonda Cholapuram, the description matches the royal city with enclosure and excavated palace remains on the western

side of the inner most enclosure. This certainly proves that it was a well-planned layout which followed Mayamatam.

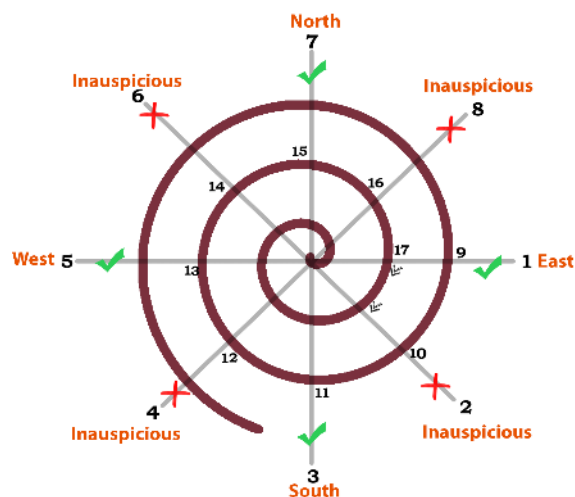


Figure 37. Graphic showing Ayadi System and its Direction.

*Mayamatam* also has a well-defined direction for a city or a village. Chapter 9 of *Mayamatam* explains the Ayadi System of Calculations for building any structure. This system is mentioned in various *Agamic* texts, likewise the *Mayamatam*. Remembering the principles on which the Vaastu Shastra lies, that every living organism is in rhythm with the universe. So, the Ayadi System has calculation developed involving all components (micro-organism to cosmos). This system is used to determine the auspicious direction on a plot of land on which the building's major axis must be placed. The factors involved are the perimeter of the building, the number of directions (8), number of months (12), etc. The final functions, in the series of calculations, are four different math problems, leaves us with four remainders. These remainders (refer figure 26) corresponds to eight cardinal directions on a graph, starting from 1 on the eastern direction (shown in the figure xx). In which 2, 4, 6, and 8 are considered inauspicious directions. So the alignment of any building along that direction has to be avoided (Mayamuni & Dagens, 2007, chap. 9.18b-24).

Having decided that it would be a fortified city, the Ayadi System was used to determine

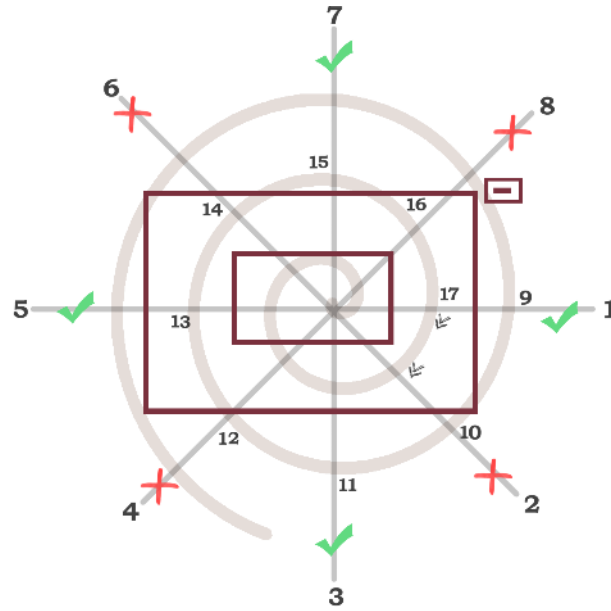


Figure 38. Gangaikonda Cholapuram on Ayadi system.

the major axis of the building (fortified wall). So, they followed this calculation of the Ayadi System,<sup>38</sup> the outer enclosure is considered as the building. The remainders are 4, 4, 12, and 18 respectively. One can clearly see that none of the remains in Gangaikonda Cholapuram are built along those auspicious (successful / holy) directions, avoiding any direction corresponding to those sides. The fortification, temple and even the palace foundations show they are strictly

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38 The perimeter of the outer fortification (1900 m x 1350 m) is considered as building.

Conversion of SI units into cubits:

As the Ayadi calculation is based on Poles and cubits system of measurements mentioned in Vaastu Shastra.

1 Cubit = 21" (Vaastu Shastra follows long cubits which is equivalent to 1 Hasta = 3 Pada)

4 Cubits = 1 Pole

1 Pole = 21" x 4 Cubits = 84"

That implies,

1900 m x 1350 m = 74803.15" x 53,149.61"

= 890.5 Poles x 632.73 Poles

Length = 890.5 Poles; Width = 632.73 Poles.

Perimeter of a rectangle = 2(l+b) = 3046.4 Poles

Step 1:  $\frac{P \times 8 \times 9}{12 \times 10}$  Q = 152; R = 4

Step 2:  $\frac{P \times 3}{8}$  Q = 1142; R = 4

Step 3:  $\frac{P \times 8}{27}$  Q = 902; R = 18

Step 4:  $\frac{P \times 8}{30}$  Q = 812; R = 12

along north-south and east-west directions.

### 8.3 Water Management in Gangaikonda Cholapuram.

The Gangaikondacholeesvaram Temple at Gangaikonda Cholapuram has wells, spouts, and a complex drainage system located within the temple complex. There is also a small lake outside the temple. Sophisticated water management of the city features irrigation and temple hydraulics contributing to a strong religious presence, a thriving economy all dependent on water management (Iannone et al., 2016, p. 75). Gangaikonda Cholapuram is often regarded as the microcosm of the larger Chola management system, specifically in water distribution (Iannone et al., 2016, p. 162).

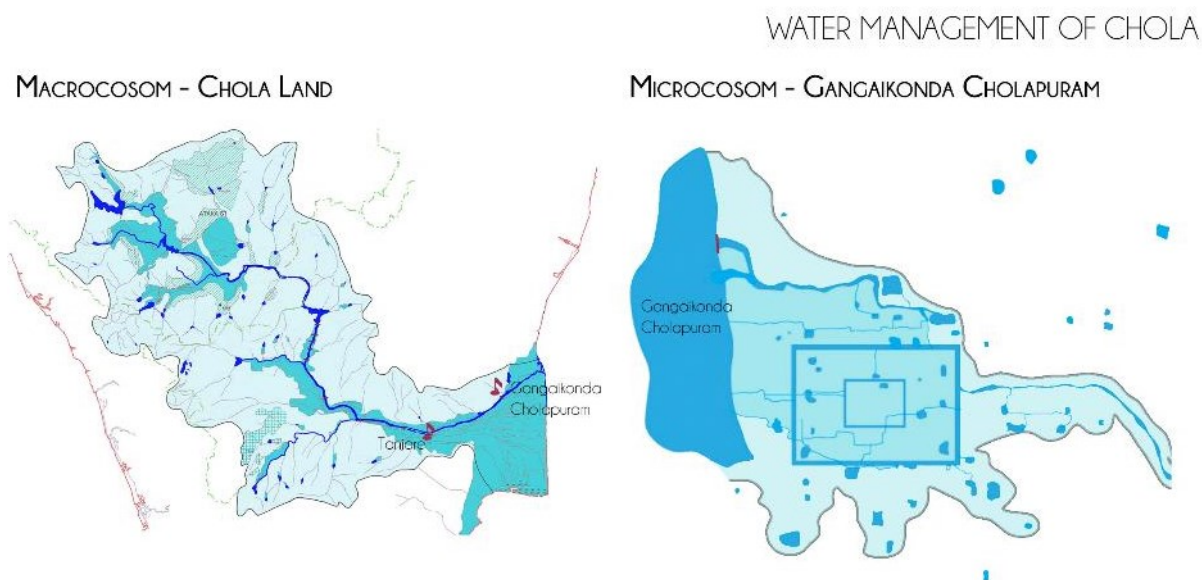


Figure 39. Water Management of Chola land and Gangaikonda Cholapuram.

**Gangaikonda Cholan Lake:** At the height of the Chola Dynasty, Gangaikonda Cholan lake (also known as Cholagangam) measured a little more than 2.5 miles long and about 1.2 miles wide (Pichard, 1994, p.112). Cholagangam lies to the west of the palace remains, along with the city. This lake was filled with Ganga water after the battle of Ganges with Pala Dynasty. A small channel from this lake is still evident in a very defined pattern that reaches the foundation of the palace's outer enclosure, where the moat was located. The Cholagangam acted as a water reserve for the city and was used for feeding the moat of the palace. Pichard (1994)



said that the urban design of the city utterly disregards the vast lake, which lies at a distance of 1000 ft from where the mighty city flourished and declined (p. 112). But the trace of canals that started from the banks of the lake and transported water to multiple storage basins around the city area are distinctly evident. These wide canals and basins with trees bordering are evidence of inclusion of water as part of the design motif of the urban cityscape.

***Chola Gangam Excavation - Sluice.*** The Lake of Gangaikonda Cholapuram is believed to have had six floodgates, of which only one of them remains today. During the excavation of the second floodgate, a brick structure was identified at the starting of the river. The brick structure acted as buttress holding the riverbanks. This bridge structure had a big tank measuring 11.8' x 2.6' (3.6 m x 0.8 m), and two brick structures measuring 4.75' x 2.3' (1.45 m x 0.7 m). During heavy rainfall when the lake, at its full capacity, the pressure on the floodgate increases. When the flood gates opened, the water flowed into the tank first and then on to the river. This prevented water from overflowing the banks and flooding the city. (Sridhar, 2009, p. 13).

***Ponds.*** There are three ponds mentioned in the inscription: Paakkulam,<sup>39</sup> Maadakkulam,<sup>40</sup> and Thithikkulam.<sup>41</sup> The use of Paakkulam remains unknown (Sridhar, 2009, p. x). Maadakkulam implies either an outdoor pond/water body lit with lamps or an indoor body of water in the upper story of a palace used by royal family. This might also be a pond for royalty bathing and swimming with surrounding walls/pavilions two-stories high. Thithakkulam may refer to a water source in sacred places or the water brought from sacred places,

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39 The purpose of this pond remains unknown.

40 Maadakkulam மாடக்குளம் = மாடம் + குளம்;

மாடம் – 1. a small niche in the wall of a house to keep an oil lamp; (or)

2. upper story (of a palace) with (lattice) windows

41 Thithakkulam (தித்தகுளம்) may be தீர்த்தக்குளம்

demonstrating the presence of sacred pond within the city. The inscription also mentions two lakes: Visaloor Lake and Sirngudi Lake. The locations of these lakes have not been identified.

**Water Channel.** Inscriptions also mention two water channels. They are Adhigai Naayan Vaikaal and Sandhana Vaaikaal (Sridhar, 2009, p. x). Adhigai Naayan channel. Both the words Adhigai<sup>42</sup> and Nayan<sup>43</sup> refer to Shiva. This channel of water should have been used exclusively for temples and sacred ritual spots. Leftovers would have reached the agricultural area. Sandhana<sup>44</sup> Vaaikaal Channel was probably a channel of water used for various purposes.

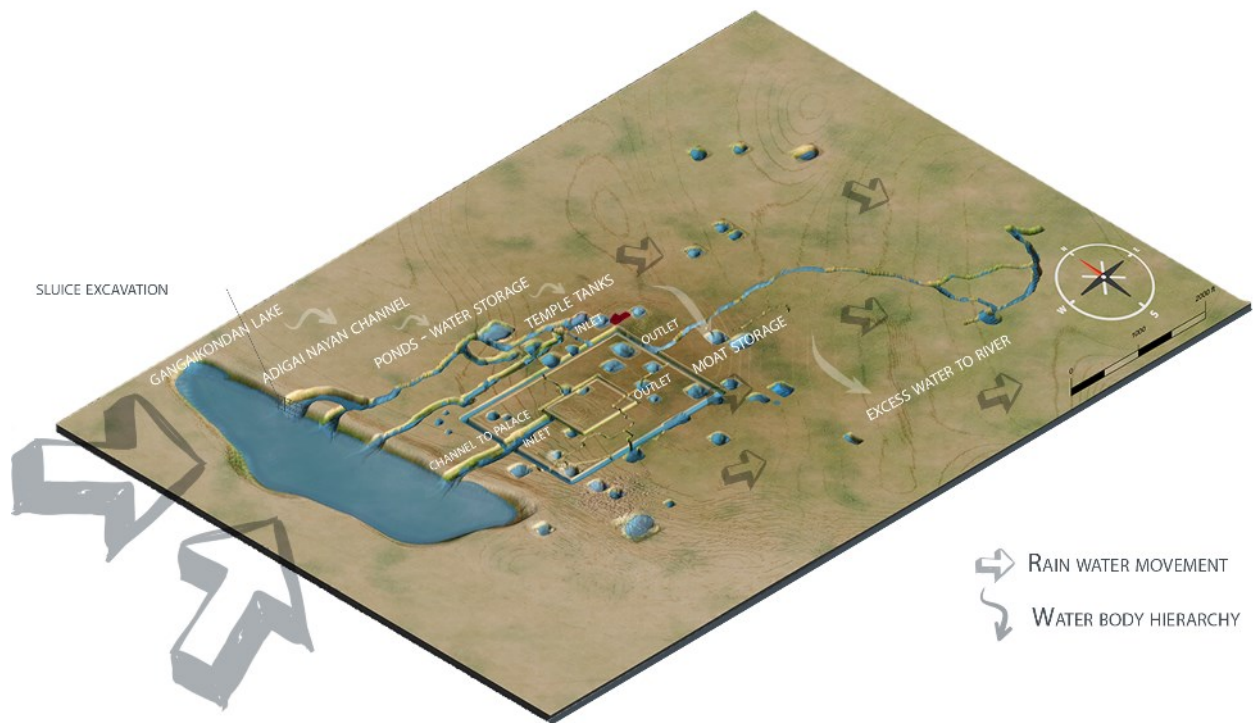


Figure 40. Gangaikonda Cholapuram Water System.

**Drinking Water Pond.** The pond, Kalkulam, is found on the northeastern side of Maligai Medu. An excavation was carried out at this pond. Even today, pot sherds, roof tiles, brick pieces

42 Adhigai (அதிகை) - siva shrine in South Arcot district where Siva is believed to have reduced to ashes the tiri-puram, one of atta-vīrattam.

43 Nayan (நாயன்) - a collective noun referring to the 63 Saiva saints

44 Sandhana (சந்தன) – Sandalwood

are found in large quantities. Along with these, granite slabs and red stones are found in large quantities. The granite slabs measure 33.5” x 15.75” (85 x 40 cm), which run in the north direction. These slabs are strengthened by laterite<sup>45</sup> blocks on the sides. The slabs along with the laterite blocks form a channel/path moving northward. Irregular stones are found on top of the granite blocks to avoid any leakage. This water channel runs exclusively towards the north, suggesting that there were dwelling units to the north. The water running through laterite has high medicinal values, suggesting it was the drinking water channel for people along the channel. This excavation was the first of its kind that emphasizes water management systems of Cholas (Sridhar, 2009, p.10).

## **8.4 Infrastructure of the Gangaikonda Cholapuram City.**

### **8.4.1 Enclosures**

**Fortification.** According to *Mayamatam*, there are seven types of fortresses: (1) mountain fort (2) forest fort (3) water fort (4) desert fort (5) mud fort (6) natural fort and (7) mixed fort. The fortification wall has to be one among the following shapes: square, rectangle, circle, elliptical, shape of a cock, shape of the temporal bone of an elephant (tusks), coiled snake, triangular, etc. (Mayamuni & Dagens, 2007, chap. 10. 36a-43). Based on these categories and if looked at from above Gangaikonda Cholapuram, the city’s natural fortifications notably two types of fortification: the water fortification and the desert fortification. The city was built between the two rivers. The rivers, Vellar in the north and Kollidam in the south, acted as the water fortification. On the west is the huge Gangaikondan Lake and on the east is the Bay of Bengal Sea. Any enemy would have to cross two rivers and one lake or the sea to reach the city. The green land with no trees in between the rivers and surrounding the city is almost like a

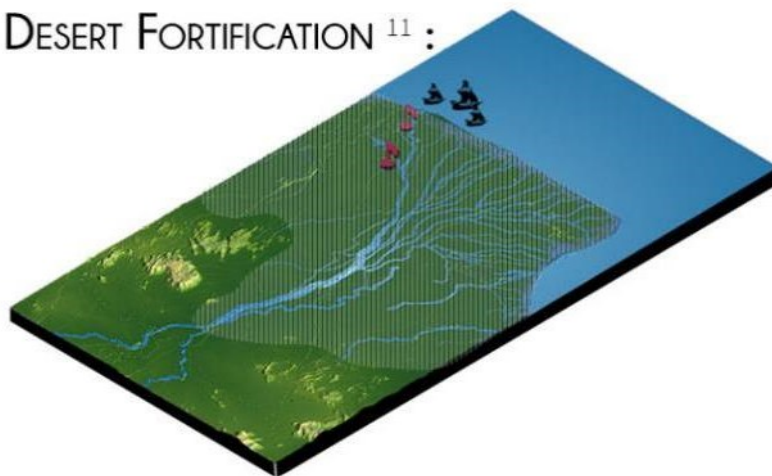
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<sup>45</sup> Laterite blocks a reddish clayey material, hard when dry, forming a topsoil in some tropical or subtropical regions and sometimes used for building.

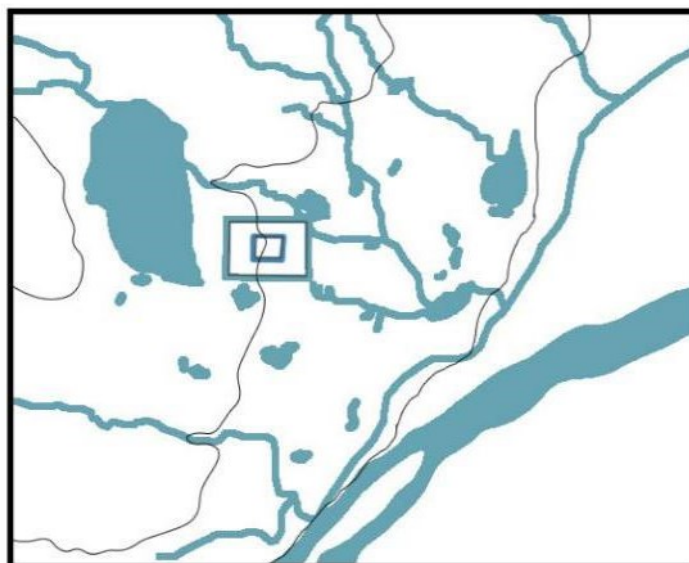
desert, guarding the city. Any enemy could be visible from a distance; and this green land was suitable for training the army.

FORTIFICATION :

DESERT FORTIFICATION <sup>11</sup> :

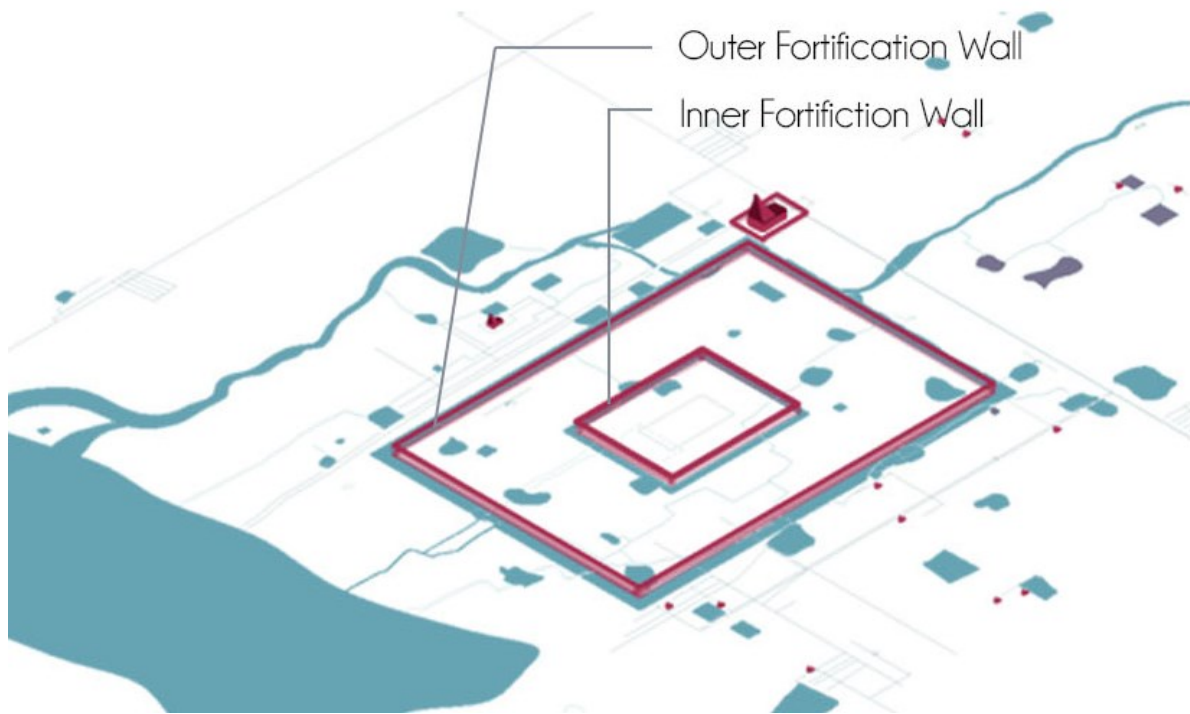


WATER FORTIFICATION :



*Figure 41. Desert and Water Fortification.*

Considering the man-made fortification, the outer wall is rectangular in shape with a concentric inner wall within the outer wall. To the south of Kuruvalappar Koyil Village and to the north of Maligai Medu, a huge depression and a mound was found by the ASI. This mound and the depression continued for 0.62 miles (1 km) towards the east. The excavation along this mound revealed the fortified wall's foundation made of laterite blocks. The wall runs from north to south and east to west. One can see remains at different spots along this rectangular mound and the depression. There are 7 courses of laterite blocks forming the foundation with a depth of 8 ft (2.5 m), and on top of it is the brick wall (Sridhar, 2009, p. 14).



*Figure 42. The Moat and Fortification of Gangaikonda Cholapuram.*

**Outer Enclosure Wall.** The outer enclosure of the city is about 6233.5 ft x 4430 ft (1900 by 1350 m = 250 ha in area), preceded by a large moat that is no more than a depression in paddy fields now. On the northern side of the enclosure, ASI unearthed the base of a wall of rubble of laterite of 8 ft (2.5 m = 4 cubits approx.) and 8 ft depth. There was a moat surrounding this exterior wall. Neither presence of bastions, tower foundation or door-base is distinguished, nor

doors situated at the end of crisscross avenues. This absence of any evidence for entry refuses to obey the classical texts of *Mayamatam* (Pichard, 1994, p. 110). Because the foundation for the entire perimeter of the city has not been found, ASI could not determine the number of entrances that was constructed through the wall.

According to the *Mayamatam*, the width at the foundation should be two or three or four cubits (86") (Mayamuni & Dagens, 2007, p. 91). The fortified wall unearthed at Gangaikonda Cholapuram is 8ft (2.5 m) which is approximately is 4 cubits. Here, long cubits<sup>46</sup> is used for calculation, as *Vaastu* has no reference to short cubits.<sup>47</sup> According to *Mayamatam*, a foundation of surrounding wall/fortified wall with 4 cubits base will rise to 12 - 24 cubits height with the

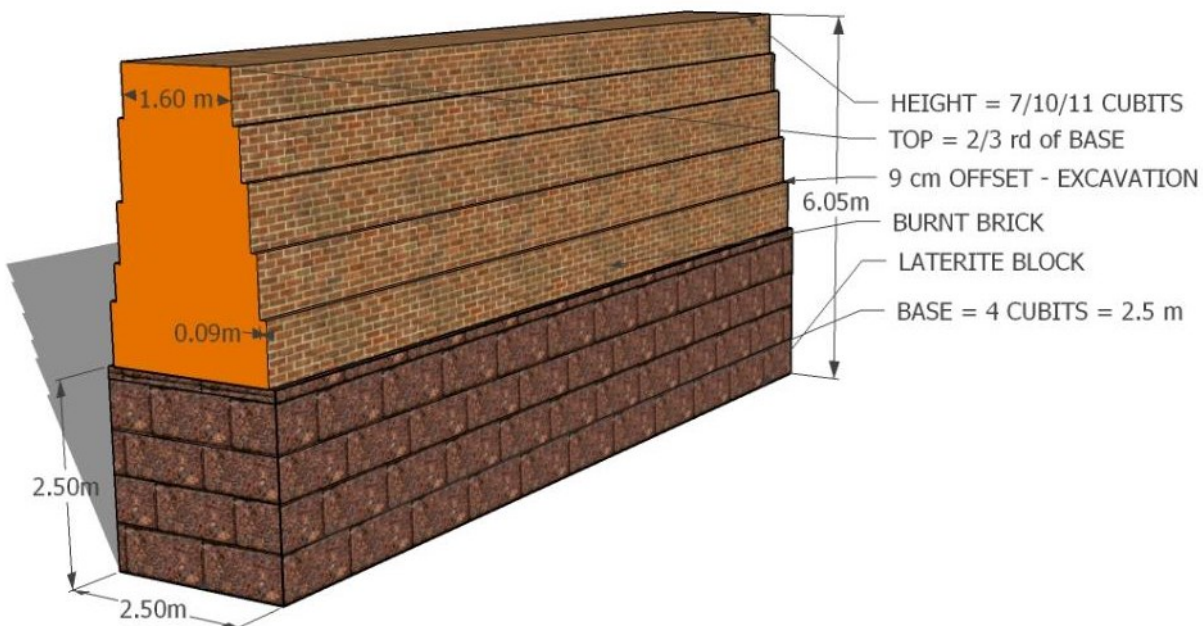


Figure 43. Fortification wall of the city as suggested by excavation report, *Mayamatam* and *Srirangam Case Study*.

topmost course of the wall 2/3 of the base. Thus, the height of the fortification wall could be suggested as 9 m (30 ft)<sup>48</sup>, with the topmost course reduced to 2/3 of the base, or 1.46 m thick.

46 Long cubit is the measurement from the shoulder to the fingertips of an out-stretched arm.

47 Short cubit is the measurement from the elbow to the fingertips of an out-stretched arm.

48 The height of Sri Rangam fortification is adopted as the height of Gangaikonda Cholapuram, as it is in the range *Mayamatam* spells (Mayamuni & Dagens, 2007, chap. 10. 44-46a).

***Inner or Royal Enclosure Wall.*** In the center of this enclosure was a rectangle of approximately 2066 ft x 1673 ft (630 m x 510 m = 32ha of area) which marked the beginning of the area reserved for the royal family with the pith.<sup>49</sup> The west most part of this rectangle is called the Maaligai Medu (the mound of the palace), which is possible to discern today because of the slight elevation of the soil (Pichard, 1994, p. 110). This is where the palace foundation has been excavated.

***Moat.*** A deep trench-like depression is found around the two fortified wall remains. The two continuous depression are of uniform width, which is just a paddy field now next to a few hamlets. These two are identified as the two moats running around the fortified inner and outer enclosure walls. The inner moat is 110 ft (33.5 m) wide while the outer moat is double the inner moat with a width of 210 ft (64 m). These moats also acted as the water storage system, receiving water from the Gangaikondan Lake through two water channels. This water channel at the northeastern corner right below the Shiva temple runs along the foundation of the outer

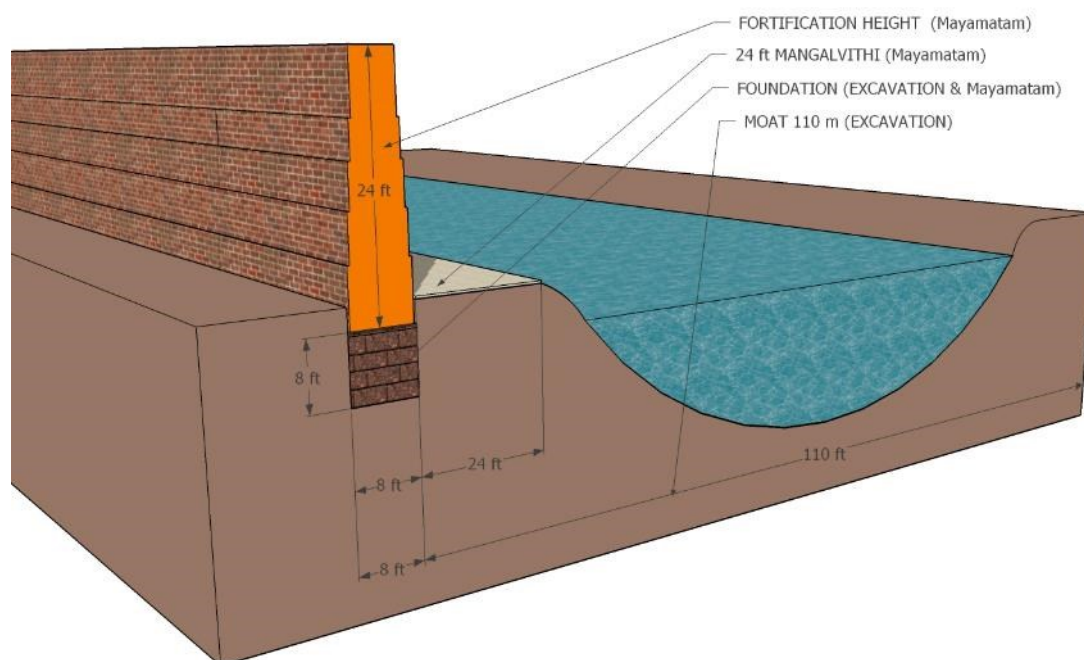


Figure 44. Moat and Fortification of Gangaikonda Cholapuram.

<sup>49</sup> Pith is the core of any building, where the X and Y axes converge.

fortification wall. These two moats are seen as the water fort that obeys the *Mayamatam*, as mentioned previously.

*Mayamatam* spells out specifics for moat and wall enclosures. According to which, the moat runs along the brick rampart with a road for carts to move around. The rampart's height should be a minimum of 12 cubits to 24 cubits or double the size of the foundation's base. The ramparts should be elevated on the earthen banks of the moat. (Mayamuni & Dagens, 2007,

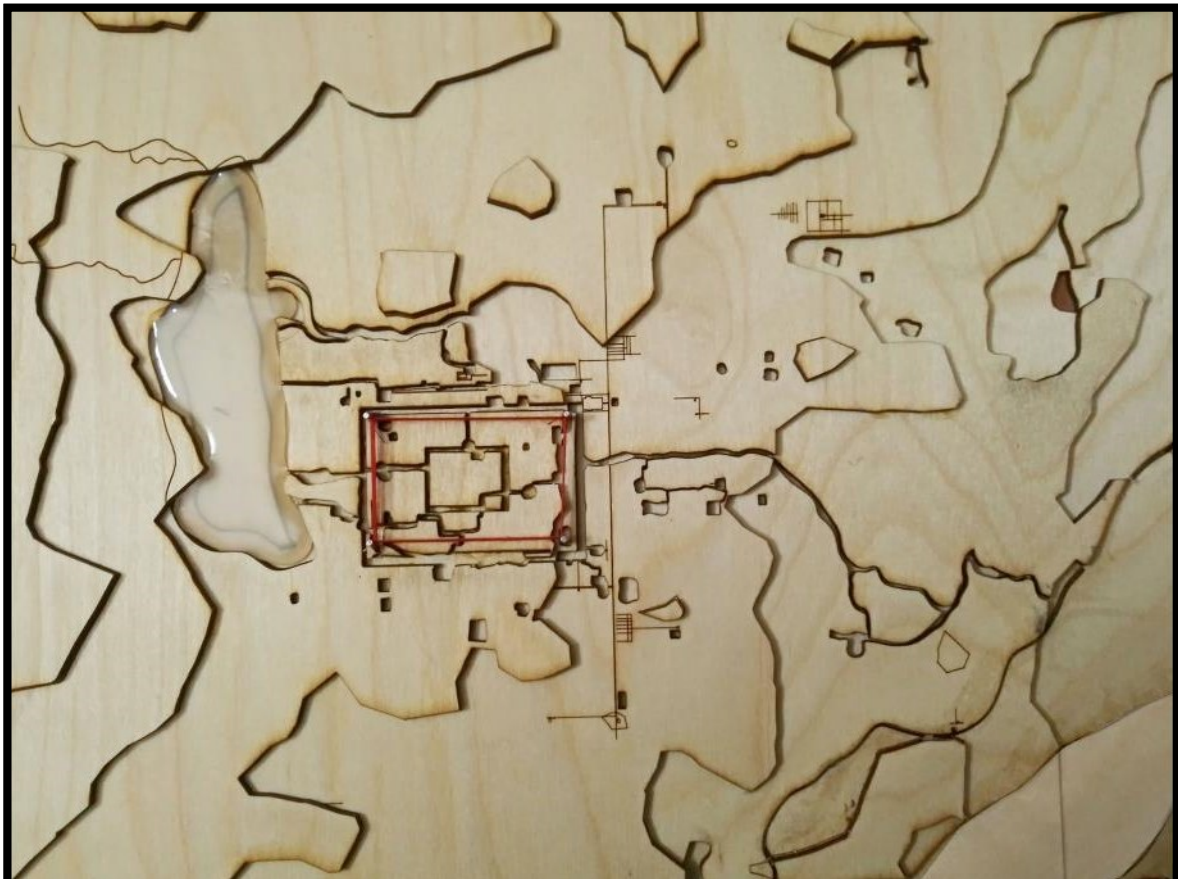


Figure 45. Contour Showing Gangaikonda Cholapuram City.

chap. 10. 44-46a). In Gangaikonda Cholapuram, the double walls have a 7-ft wide base (2.2 m = 4 cubits), which implies the walls should have been 12 – 24 cubits tall (21 ft to 42 ft).

***Inlet and Outlet.*** The water for the moat is fed through channels from the lake. The outer enclosure's moat is fed through the topmost channel of the fortification. This channel connects to the moat next to the fortification. The inlet to the moat of the inner enclosure is fed by another channel from the lake. But the outlet of this enclosure is not obvious. The topographical mapping



using the contours of the site point to the middle of the eastern wall of the outer fortification (Refer figure. 28). From the contours and topography, one can infer that the inner moat was connected to the outlet of the outer moat, which runs into the channel stream. Pichard (1994) believes that the moat was used as water storage and to keep the land wet even in the dry season. The main purpose of the moat was to safeguard the city from invaders. The purpose of the moat's outlet was twofold: to bring water to the farmland during the dry season and to take water away from the city during the rainy season. The excess water through the channel reached the Bay of Bengal through the Kollidam River.

**Gateways.** There is almost no evidence for the presence of a gateway on the fortified walls. The huge entry structures in the Gangaikondacholeesvaram temple and Tanjore's big temple stand as evidence of the presence of gateways. But there are no traces for the presence of gateways in the royal city fortification. But it is very certain that there was at least an opening guarded by soldiers. *Mayamatam* dictates that a royal city's fortification should have three gateways with a flat roof or a hipped roof, or a wagon roof (Mayamuni & Dagens, 2007, chap. 10.40).

#### **8.4.2 Palace Complex.**

According to *Mayamatam*, a royal capital is impregnable at the north or at the east (Mayamuni & Dagens, 2007, chap. 10.21b). Therefore placement of the king's palace has to be on the west side of the Brahma (the core or the pith of a building) (Mayamuni & Dagens, 2007, chap. 10.71-75a). Gangaikonda Cholapuram has its palace situated in the west, with a garrison on the southwest outside the fortified walls. Apart from the excavation location, inscriptions of Rajendra and his successors mentions Gangaikonda Cholapuram palaces, descriptions such as halls, thrones, galleries, etc., and there are sometimes phrases such as "on the northern side" (Pichard, 1994, p. 110).

**Palace #1 - Mudikondachola Thirumaligai.** Thyagarajan (1994), mentions an inscription

made in the 19<sup>th</sup> year of Rajendra I's rule. The inscription mentions, Mudikonda Cholan Thirumaligai (palace) at Gangaikonda Cholapuram city. The record refers to the palace area as *Kayil*, and states that the king, while staying on the northern side of the veranda of the palace, issued a royal order. The name of the palace denotes that it was built by Rajendra I and was named after his title, Mudikondacholan (Pichard, 1994, p. 179). This supports the theory a palace existed, and it had a veranda on the 'northern side'.

**Palace #2 - Gangaikondacholan Maligai.** Record of Rajadhiraja I dated in the 29<sup>th</sup> year of his regin (1047 CE), mentions a palace at Gangai. It refers to the palace as *Namvittinullal Gangaikondacholan Maligai*. This shows that the entire royal palace was called *our house* by the royal family. The record also contains the phrase "*vadakkil sobiinattu ejundaruli irundu*", which translates to the king was present in the 'northern part' of the palace on the sobana (usually a platform with steps) (Pichard, 1994, p. 179). Therefore, researchers conclude, that the palace had platform with steps exclusively for the king, probably with a court, in this palace.

**Palace #3 - Cholakeralan Tirumaligai.** This maligai at Gangaikomda Cholapuram is referred to in Virarajendra's 5<sup>th</sup> regnal year (1068 CE). This record records that the king issued a royal order while seated on the royal throne called Rajendra Chola Mavali Vanarajan in the palace, Cholakeralan Tirumaligai. The name indicates that this palace was built during Virarajendra's period and named after his elder brother Cholakeralan (Pichard, 1994, p.180). Therefore, this record indicates the presence of another palace with a royal throne in it.

**Gateway.** An inscription of Vikramachola (3<sup>rd</sup> year of his regin) records the gate of the king's palace guarded by soldiers who served at the palace's outer gate. The record indicates the presence of royal personages at Gangaikonda Cholapuram. The inscription records "*Korravasal*", which is the name of the gate at the king's palace (Pichard, 1994, p. 182). Though there are no excavations to support the presence of gateways in the fortification, and this inscription as well as logic opens the possibility for the presence of a gateway into the palace

grounds.

***Performance Space - Velimelai Rajadhirajan Mandapa.*** A record of Rajadhiraja dated in the 35th year of his reign (1053 CE) mentions a mandapa (a colonnade court) on the western part of the palace in Gangaikonda Cholapuram called Rajadhirajan Mandapa. The name of the mandapa denotes that is mandapa was constructed during Rajadhirajan's period. The inscription also mentions that the king was seated on a royal throne called Pallavarajan in the mandapa (Pichard, 1994, p. 179). This record indicates with a sentence, "*attattu Velimclai Mandapa,*" meaning the performance of an art. This implies the existence of an open-air space for performances and leisure activity within the palace quarters.

***Royal Bath – Thirumanjanam.*** There is also another inscription from Shivapuri Sivan temple that tells of a girl called Naatanam, who gifted gold for the purpose of sacred purification (pooja) for this palace specifically. This implies that there was active sacred ritual within the palace, and there was a specific spot for it (Sridhar, 2009, p.x). The word Thirumanjanam implies that water must be brought from a water body (pond) and used to clean/rinse the scared status deity while chanting hymns

The above inscriptions support palaces Gangaikonda Cholapuram were extensive structures: halls, thrones, galleries, separate palaces, future expansion spaces, staircases, northern side veranda, a place for coronation, court, royal bathes, gateways with guards, performance spaces with colonnades, and inhouse garrisons to protect the king.

#### **8.4.3 Palace Complex Excavation and Building Materials**

While the inscriptions give information on spaces in palace complexes, the excavation at multiple sites reveals the materials used in the construction of the palace. The palace area was made of temporary materials like burnt bricks and timber unlike the temples, which were made up of stone. Temples were constructed probably with stones to increase their longevity.

***Building Materials.*** The excavation reveals the extensive use of bricks, granite, timber,

iron, copper, bronze, and limestone (seemingly in abundance). Procuring of stone is still a mystery. Construction of such a huge temple and sculptures, hard granite was used. There are no source(s) for granite for a 40 miles radius.

The bricks were made of the river sand, which was close by, available. This part of Tamil Nadu is rich in limestone, useful for making mortar. The presence Western Ghats Mountain Range provided enough timber and other materials.

**Types of bricks:** The excavation revealed four different sizes of bricks. They are (1) 24.5 cm x 13.5 cm x 6 cm, (2) 23 cm x 11 cm x 5 cm, (3) 20 cm x 10.5 cm x 3 cm, (4) 19 cm x 14.5 cm x 4.5 cm. The first two type of bricks were used in the basement. For the header course, the biggest brick was used; and for the stretcher course, the second type of brick was used. The difference of one centimeter in these bricks, filled with limestone mortar confirmed the strength of building. The last two types of bricks were used for the construction of other floors of the building. The smallest of the bricks used for the construction of the uppermost floors and for the roofs. Excavators also found termite control paint<sup>50</sup> (Kaarai poochu) on top of these tiles (Sridhar, 2009, p. 7).

**Bricks and Binding Material.** The bricks of these palace ruins were made of burnt bricks. These were all even bricks made of mold and burnt in kilns. The bricks are arranged in the header and stretcher method (Sridhar, 2009, p. 3). This method was particularly adopted for its strength and non-cracking properties. The binding material was made with the juice of sugarcane (jaggery), kadukkai (yellow myrobalan/Haritaki), goose berry, black gram (lintel), and beleric (fruit) along with different types of herbs. The thickness of this binding material is around four centimeters. This is a natural binding material that holds the bricks in place.

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<sup>50</sup> Termite control paints are used in vernacular architecture of South India.

**Walls.** The temple near this archaeological site has double walls, which merge into a single wall. Comparing the temple along with this Gangaikonda Cholapuram, one can identify that these walls also would have been of similar construction like that of the temple. This also proves that the temple and the city were built in the same period. Though there were few additions by Rajendra's successors, the primary structures were built by Rajendra (Sridhar, 2009, p. 4).

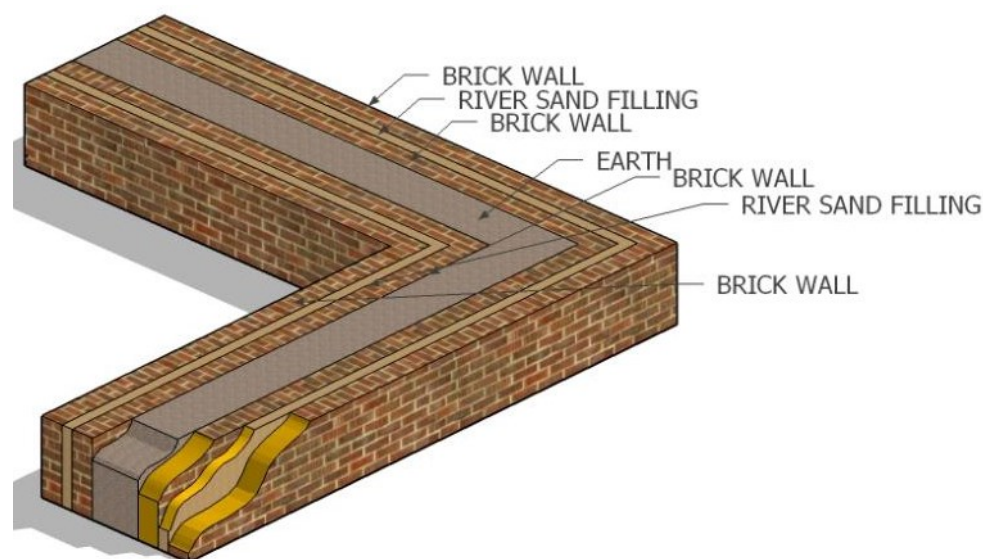


Figure 46. Parallel Wall Construction and River Sand as Insulation.

**Parallel Walls.** The excavation revealed that the brick wall was built with an engineer mind. Two sets of walls run parallel. One set of walls consists of two brick walls, which are 43 in (1.1 m) thick with a 21 in-gap (55 cm) in between them. Another set of similar brick wall runs parallel. These two sets of walls are separated by 8 ft (2.5 m) gaps in-between them.<sup>51</sup> These parallel walls run along south to north direction for 54 ft (16.5 m). Another set of such walls are also found in the east to west direction. The distance between this pair of two parallel walls is 54 ft (16.5) meters (Sridhar, 2009, p. 4). These were the foundation of the exterior walls of the

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<sup>51</sup> The excavation report on Gangaikonda Cholapuram gives a detailed report on the organization of this parallel wall.

palace. The 0.55 m gap filled with river sand was used as an insulation material for the building. The site is situated in a tropical area where the summer season is hot. One may speculate that this was a step to maintain the temperature within the palace.

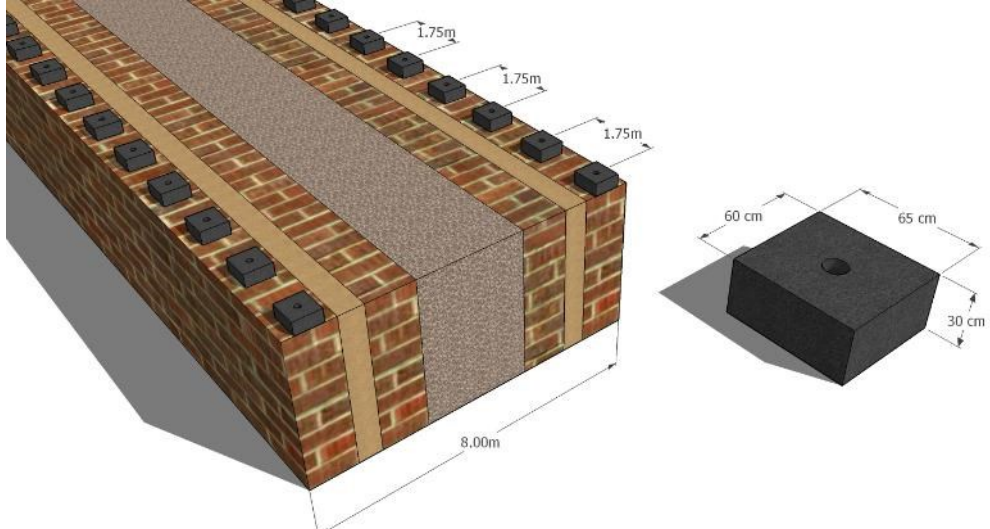


Figure 47. Showing Column Placement, Spacing and Column size.

**Wooden Column and Roof.** The excavation revealed black stones, granite sized 25.5 in x 23.6 in x 11.8 in (65 cm x 60 cm x 30 cm) of uneven surface placed at an interval of 70 in (1.75 m). These granite stones also had a small hole in the center. These stones provided stone

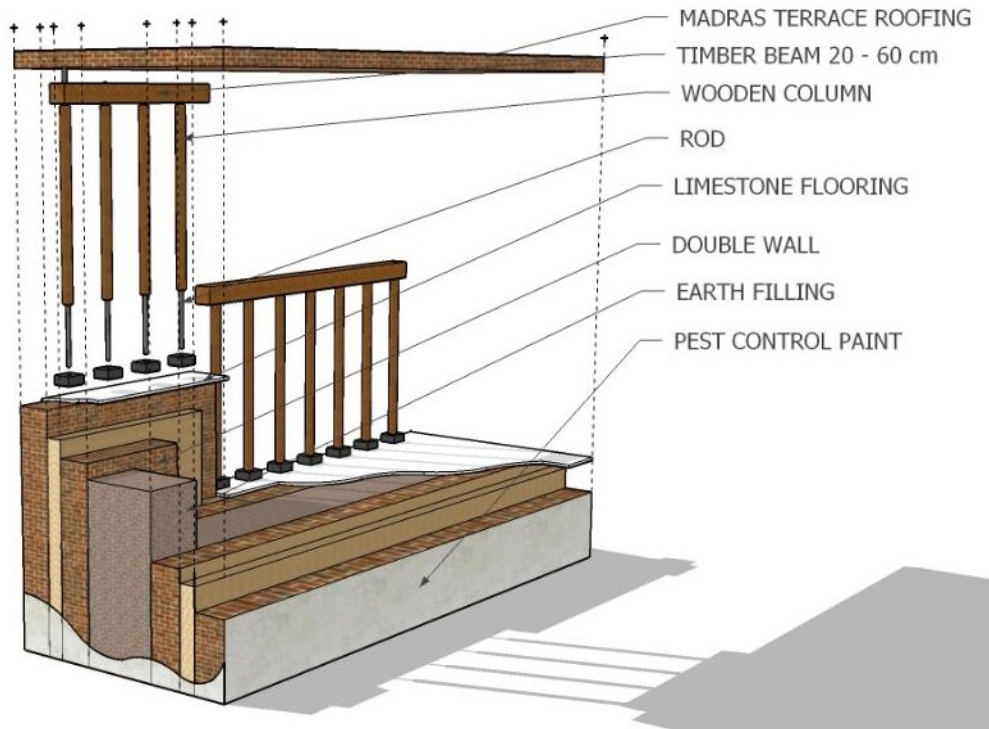
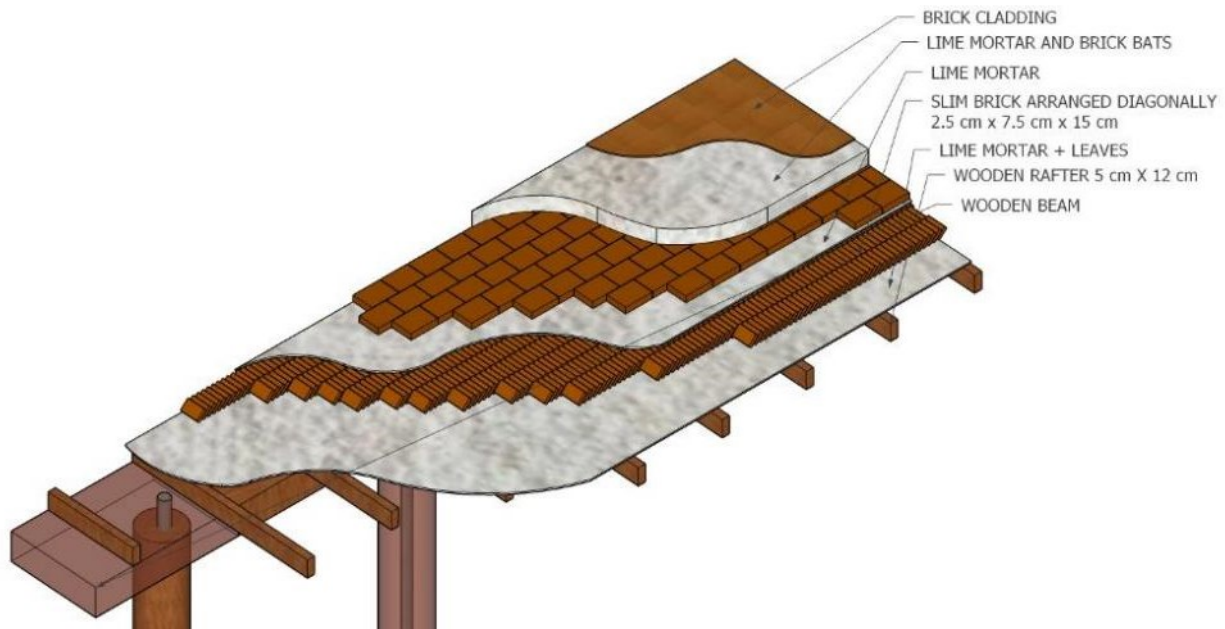


Figure 48. Showing the Column, Beam and Roofing.

pedestals on which wooden columns were placed. The vernacular architecture of Tamil Nadu uses wooden column on a stone pedestal, connected with an iron rod of 1-inch radius in the center that runs from the base of the pedestal to the capital of the column. The excavation also revealed rotten wooden columns. This excavated palace is believed to be a Mandapa, a colonnade made up of wooden columns (Sridhar, 2009, p. 4). Wooden beams with brick bats on top of it with limestone as the binding materials were used for the ceiling (Sridhar, 2009, p. 18).



*Figure 49. Madras Terrace Roofing.*

The presence of wooden, bricks with limestone suggests that Madras terrace roofing<sup>52</sup> was used in the structure. Madras terrace roofing is one such construction technique which involves wooden beams, brick bats laid in a linear fashion with limestone as the binding

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<sup>52</sup> Madras Terrace Roofing is a traditional roofing type from South India. Madhumathi and others explain the structure of Madras roofing as follows. Wooden beam of 45 cm to 60 cm in thickness, across the width of the walls are placed. High density and high strength clay bricks of size 2.5 cm x 7.5 cm x 15 cm are placed using lime mortar and leaves. These bricks are placed in a diagonal fashion along the width of the wall, this ensured the tensile strength. This layer is filled with another layer of lime mortar. Then for about 0.3 m, a mix of broken brick bats along with burnt brick of 1/3rd volume of heavy limestone mortar is laid. This layer provides compressive strength and load bearing capacity. The final layer of waterproof cladding tiles is laid on the limestone surface.

material. This roof time is especially used in warm humid climate to maintain the indoor temperature from 2° C to 4° C (Madhumathi, Radhakrishnan, & Shanthi Priya, n.d., p. 7). A layer of waterproof smooth limestone/ brick cladding is used to lay the final coat for the roof. The presence of wooden columns and stone pedestals another confirmation this palace is a double height and a hypostyle hall structure, and in compliance with Angkorwat and Bagan palaces.

**Ground Level and Basement.** The distance between the walls covered with a layer of uniform bricks. On top of the bricks a uniform layer of yellow clay, strong in nature found. A layer of sand glass and broken bricks were found on top of the yellow clay. This layer was again coated with the yellow clay. This part also has four to nine coats of paints, acting as a pest control, preventing the termites from attacking the brick and wooden structure.<sup>53</sup> The paint is called Kaarai Poochu<sup>54</sup> (காரை பூச்சு). At a uniform depth of 64 in (1.65 m), this coating was found. The conclusion is that this is the basement structure of the palace. The brick wall of this basement at the bottom most was 50 in (1.28 m). In all 50 in-thick walls forms the base structure of the palace. The thickness of the wall at the top measures 7 in (18 cm) less than its thickness at its base. (Sridhar, 2009, p. 4). The presence of brick, wooden rots, and nails prove us that the palace system in a wooden structure placed on a brick basement.

**Iron Nails.** There are different types of nails found at the palace's excavation site. They are cast iron nails used on the wooden structures; steel nails used on the limestone and other surfaces. The nails are between 0.7 in to 19.6 in (2 – 50 cm) in length. Some of these nails have a sphere at both ends or a square head on both ends. The use of cast iron and steel is found in

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<sup>53</sup> Although usually termites attack the wood, they are attracted to the vegetation (vegetables, fruits, leaves in the mortar) that is a part of the mortar.

<sup>54</sup> Kaarai Poochu is a traditional Pest Control method in India which consists of limestone, gooseberry, and jaggery. The juice off this mix is extracted and used as a paint the code the basement of the brick buildings.



abundance all over this area (Sridhar, 2009, p. 19). This supports the evidence of Chola's structures were made of wood and bricks.

**Roof Tile.** During the excavation, a large quantity of roof tiles were found. These roof tiles measures from 3.5 in to 10.2 in (9-26 cm) in length. These tiles are flat with a hook at the top. These tiles are of three different shapes: rectangle with semi-circular edge on the opposite end of the hook, rectangle with a triangle edge on the opposite end of the hook, and a diamond shape with no hook. Similar roof tiles are found in the painting of the Chidambaram Temple. Samples of these roof tiles have reminisced of limestone with impressions of wooden marks. The implication is that these roof tiles were used for the roof of the palace (Sridhar, 2009, p. 20).

**Decorations and Structure.** During the excavation of Rajendra Cholas Palace, few bricks and few coloured limestone mortars were found. The coloured limestone mortar was produced by adding green, yellow and red paint to the mortar. Thus, Rajendra Cholas Palace must have contained fresco paintings painted all over the palace (Sridhar, 2009, p. 14).

**Decorated Stone Objects.** There were stone objects found during the excavation. These stone objects are a lion with cubs, birds, human heads, and animals. These artifacts are highly decorated, on the walls. These decorated stone objects along with limestone and mud mix probably also placed in the outer side of the walls (Sridhar, 2009, p. 21).

**Decorative Bone and Tusk Objects.** Many objects made of bones and tusk were found at the palace's excavation site. These bones and tusks are of great importance as they were skilfully carved. There are yali, lion, and elephants carved in a very intricate manner. These objects are believed to be used to decorate royal household seating, beds, tables, and doors (Sridhar, 2009, p. 21). The excavation also revealed glass bangles, beads, pot shreds, Chinese porcelain, and Celadon (Sridhar, 2009, p. 21). The presence of the artifacts from other countries meant that the kingdom encouraged presence of dignitaries from other countries.

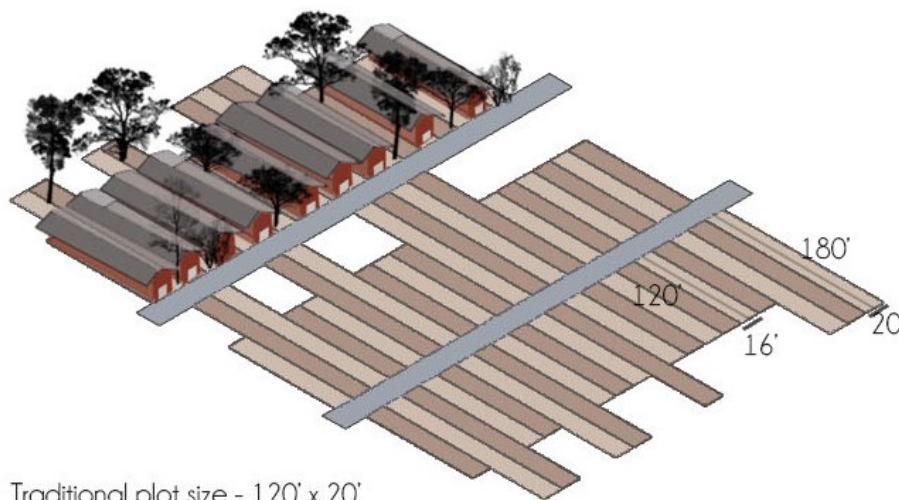
**Later Development.** The excavation (that occurred later in 2009) revealed few brick

structures, 40 cm wide, painted with limestone. The construction techniques reveal that the south of Maligai Medu had Chola construction. ASI believes that the later Cholas renovated these brick structures with clay walls and limestone pest control paint (Sridhar, 2009, p. 14).

### 8.5 Evidences for Other Spaces

The Chola Dynasty from its inscriptions seems to have had elaborate implemented state policies. The temples, as the nucleus, of its social structure, acted also as its governmental institution. The land survey conducted by Rajaraja was the first in medieval world history since the ancient Egyptians (2700 BCE) and Romans (3<sup>rd</sup> century CE) completed their surveys. The Chola Dynasty, with its elaborate measures, consolidated the kingdom and provided sophisticated features. All evident through the inscriptions. This city was of great importance for local communities rather than just a royal center. This became a node for larger inter-religion and international trade network (Iannone et al., 2016, p. 209). The domestic architecture relied on brick and mud construction (Vasanthi, 2009, p. 91). The Cholas' attitude towards living quarters suggests a certain lack of concern for their domestic quarters. Excavations of the

## HOUSING PLOTS :



Traditional plot size - 120' x 20'  
 Srirangam plot size - 160' x 16'  
 Mayamatam plot size - 180' x 20'

Average plot size - 120'-180' x 16' - 20'

*Figure 50. Showing Traditional Housing Plots.*

quarters found only a heaps of brick debris.

***Housing Plots (Manai).*** The 15th century inscription says that the person Thiruvangadamudaiyan Aakambaranathan donated (ஹஹஹ) a plot or a house on the Rajendra Chola Street for the guests visiting the temple. On the plot, a pavilion (mandapa) was built and named Aakambaranathan Mandapam (Sridhar, 2009, p. xii). This proves that the individuals had authority over their own land, with specific land use, and were able to donate it for specific purposes. Though there no evidence for the sizes of the plot, considering the Case Study from Sri Rangam and recommendations of *Mayamatam*, one can certainly discern the sizes of plots from a range of 120 ft – 180 ft in length and 16 ft – 20 ft width<sup>55</sup>. These housing plots are arranged in a concentric ring around the space between inner and outer enclosure.

***Temples - Gangaikondacholisvaram Temple.*** The Shiva Temple was also a community and governmental institution, to its religious importance. From observation, one can still find rooms on the surrounding walls of the temple that was previously used by the Chola governmental officials. The temples also acted as congregational spaces, with two story circumambulatory spaces that look down into the courtyard of the temple. All accessible by staircases. Remembering the location of the temple, (outside the fortification walls), These architectural features prove that the temple was accessible by most of the people, and certainly used for more than a religious structure.

Other temples built during the Chola period: the Perumal temple in the north, Vishnu temple in the northeast at a distance, and Vinayaka temple in the southwest corner of the

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<sup>55</sup> Also the traditional plot size of a typical village is from a range 120 ft – 220 ft in length and 20 ft width (Jayasudha, 2015).

fortification. This Vinayaka Temple is the first structure that the king built before building the whole city. Hinduism has the tradition of worshipping Vinayaka before beginning any task.

**Shopping Complex (Angadi).** The inscriptions mention the term ‘angadi’. The term ‘angadi’ denotes streets where shops are found, goods are sold. These shops named after the royalty. Merchants who belong to Periya angadi (big shopping complex) and Thirubhuvanamadevi<sup>56</sup> perangadi are mentioned in the inscriptions (Pichard, 1994, p. 188). During the period of second Rajendra, the city had Ullalai angadi. Ullalai ‘angadi’ translates to a shopping complex inside the enclosure, where one gets everything. (Sridhar, 2009, p. x). This shows that there were three shopping complexes. While the location of the other two remain unknown, the name itself denotes the third angadi, Ullalai angadi, within the walled enclosures, probably in the space between inner and outer enclosure.

**Mint.** Excavation of Gangaikonda Cholapuram revealed block coin moulds and coins everywhere. The coin moulds found mostly in a broken state. The mould has a spot at the top and a flat base for it to rest on the floor. The melted material is poured into the mould and pressed



Figure 51. Location of Mint in Gangaikonda Cholapuram City.

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<sup>56</sup> Thirubhuvanamadevi was a queen of Rajendra I

with impression. The same is done on the other side of the mould (Sridhar, 2009, p. 25). The presence of coin moulds proves that Gangaikonda Cholapuram had its own mint facility or at least, a spot for a mint within its royal premises.

**Arsenal.** Arsenal (Padai vedu) where armies were garrisoned. The existence of such military cantonments at Gangaikonda Cholapuram is recorded in the epigraphs. They are Malaiaran Padaiveedu, Utpadaiveedu and Ariya padai vidu (Pichard, 1994, p.184). *Ariya Padai vidu* is outside the southwestern boundary of the fortification. Ariya Padai vidu<sup>57</sup> is identified as modern day Aayudhakalam.<sup>58</sup> Ariya padai vidu means regimental force of 1000 personnel, and Ayudhakalam means a place where weapons are made. Today, Adyudhakalam Village is identified as the arsenal of Gangaikonda Cholapuram city. This village was maintained as a

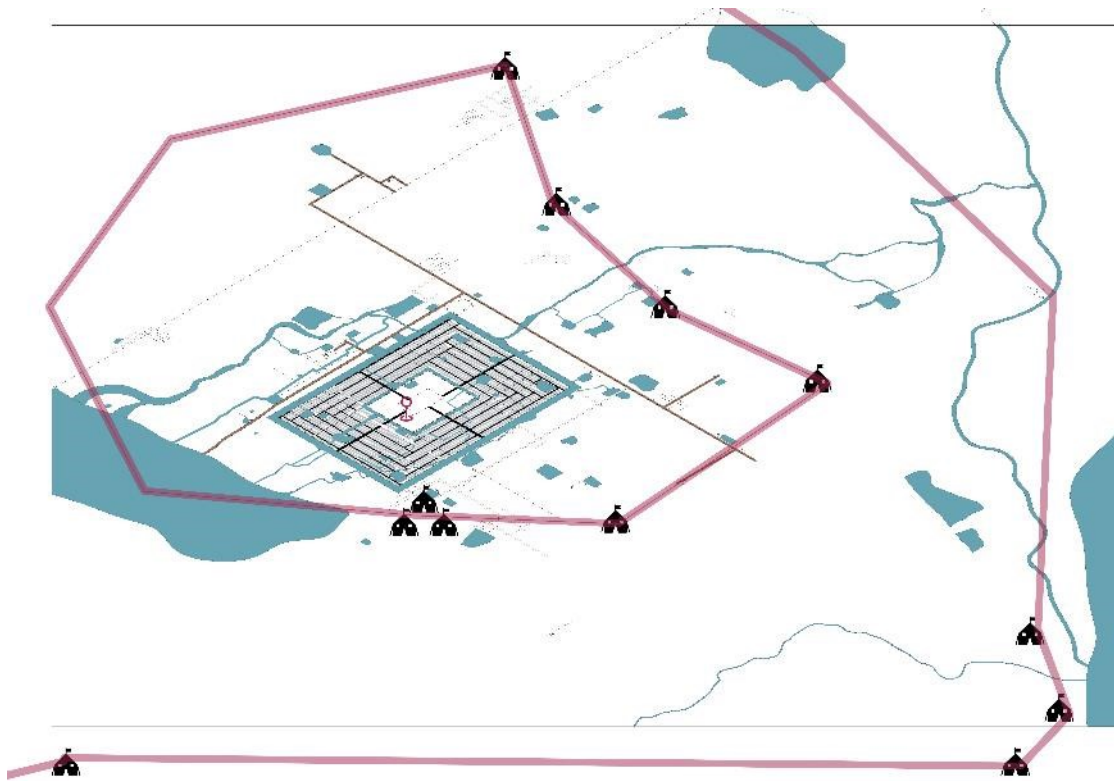


Figure 52. Military Camps of Gangaikonda Cholapuram.

57 Ariya – Ayira – one thousand; Padai vidu – regimental force.

58 Aayudham – Weapon; Kalam – Palace for specific purpose.

military garrison by the Brahmin officials (Pichard, 1994, p. 187). This military garrison was found on the southwestern part of the outer enclosure wall as dictated by *Mayamatam* (Mayamuni & Dagens, 2007, p. 93). This was the residence of the primary guards of the king or royals who resided in the palace.

***Regimental Military Camps (Velams).*** Velams are the quarters of the permanent forces (nilapadai) of the military establishment. Epigraphical evidence shows that these were residential quarters of the soldiers (Kaikolas) of the Chola army. Inscriptions mention such permanent forces at Gangaikonda Cholapuram under the following names:

1. Vikramacholan Velam
2. Mudikondacholan Velam
3. Palaya Velam
4. Pirantakan Agaparivaram
5. Uyyakonda Terinda Tirumanjanattar Velam

Inscriptions record that personnel of these velams were of great status and gave gifts to temples (Pichard, 1994, p. 184). Although the inscriptions mention these velams in the vicinity of Gangaikonda Cholapuram City, no record has been found that states their specific locations. There are religious sites that one can easily identify with the tradition of following the Dual Caste System, which is a strong characteristic of military settlements.

***Fortress (Kottai).*** Many villages near Gangaikonda Cholapuram carry the word *kottai*, meaning fortress. There are no epigraphical evidences of a fortification at these villages other than the Gangaikonda Cholapuram City's enclosure and the presence of a thick fort wall in the village of Aran Kottai.

These are located on the Vilangudayan Highway or (kulothunga Cholan Tirumadil). They are:

- (1) Tukkampattikottai, (2) Kilakottai, (3) Nakukottai around Vilangudi

(1) Amirdarayankottai and (2) Kandiyankottai – South of Gangai around Vembugudi and Cholamadevi

(1) Kanjarikkottai, (2) Koyilakkottai, (3) Selattankottai and (4) Arankottai near Sripurandan.

The fact that the word ‘kottai’ is part of the name of these villages signifies, military cantonments (Pichard, 1994, p. 185). The presence of religious sites in these villages also remphasizes the fact that the city was densely populated with soldiers and other faction of people.

## 8.6 Highways, Main Streets, Streets, and Under Ground Passages

### HIGHWAYS CONNECTING CITIES OF CHOLA

- SHOPPING STREET
- WATER WAYS -CORACLE
- UNDERGROUND PASSAGE

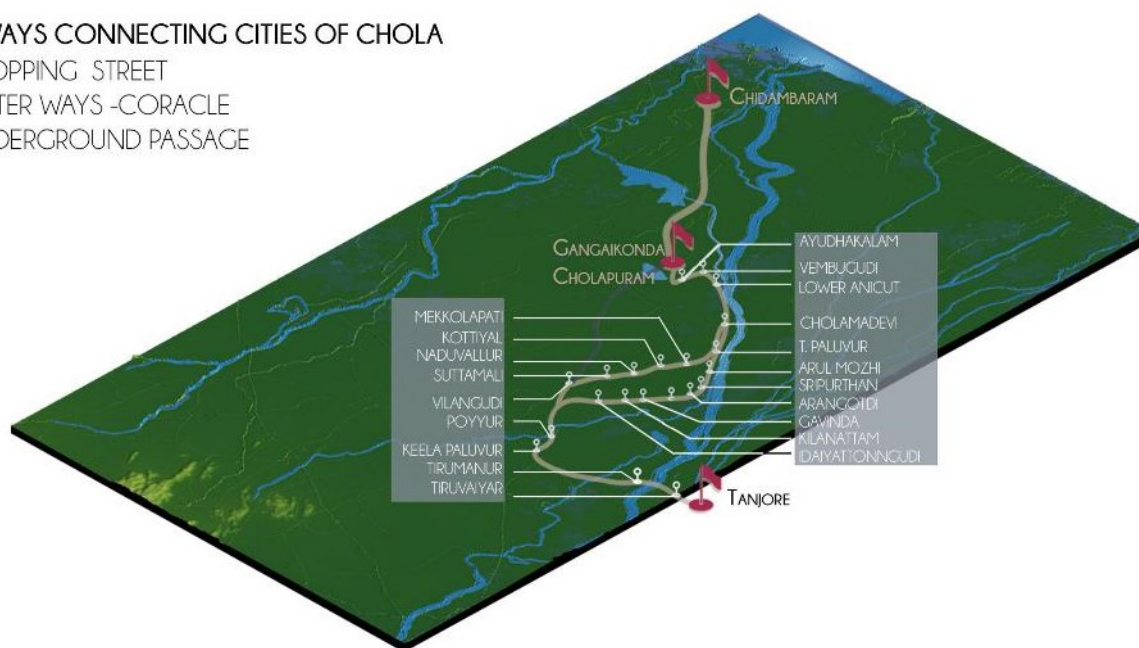


Figure 53. Highways of Gangaikonda Cholapuram.

Roads that linked Gangaikonda Cholapuram with other cities like Chidambaram, Jayamkondacholapuram, Paluvur, Vikramangalam (a subsidiary capital of the Cholas), Tiruvaiyaru and Tanjavur (Pichard, 1994, p. 191). There are four highways (*peruvali*<sup>59</sup>)

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<sup>59</sup> Peru – Grand / great / big; Vali – way

mentioned in inscriptions. They are Velangudaiyan Highway (Kulothungacholan Peruvai), Rajarajan Highway, Rajendran Highway, and Kuzhayanai Highway. (Sridhar, 2009, p. x).

**Highway #1 - Kulothunga Cholan Thirumadhil Peruvai.** The Velangudaiyan Peruvai, later changed to Kulothunga Cholan Thirumadhil Peruvai, ran from Kulothungacholan Madhil towards the south. Velangudaiyan is a village to the south 18.5 miles from the Gangaikonda Cholapuram fortification. This highway started from the fortification, through Ulkottai, Ayudhakalam, Velangudaiyan villages in the south but the destination remains unknown. This highway is believed to have been of great importance as it connected to Tanjore, the old capital city (Pichard, 1994, p. 189).

**Highway #2 - Rajarajan Peruvai.** A record from 12<sup>th</sup> century of Maravarman Vikrama Pandyan locates the highway Rajarajan Peruvai as the northern limit of Rajacholanallur, the modern Virapogam village. The boundaries of the village are Adigai Nayan Vaikal to the west, Kollapuram village to the south, and Vadavaru river to the east (Pichard, 1994, p. 189).

**Highway #3 - Tiruvasal Narasattu Kulai Yanai (dwarfed elephant) Pona Peruvai.** A record from 12<sup>th</sup> century of Maravarman Vikrama Pandyan mentions that a great road from the western limit may be identified with the present road. This was a major road that connected Gangaikonda Cholapuram to Chidambaram. This ancient route links Gangaividanga Nallur, Virabogam, Kattagaram (Kottagiiram), Virarajendrachelapuram (now Viranandapuram), Kannamangalam (today Kandamangalam) and Mannargudi (Viranarayana Chaturvcdimangalam) (Pichard, 1994, p. 191). Adding to the importance of the highway was the fact that it connected the new capital city with its seaport, Chidambaram.

**Greater or Main Streets (Perunteru).** Perunteru is the street where the merchant's communities lived. These also bore the name of the royal persons.

**Main Street #1 – Rajavichandira Perunteru.** Esalam copper plates mention an Arabian, probably a merchant who lived in Rajavichandira Perunteru of Gangaikonda Cholapuram. This



person was also in an official position in the Rajendra's court. This indicates that overseas trade between Gangaikonda Cholapuram and distant countries took place, as well as foreigners' influence in the royal court of the Cholas.

*Main Street #2 – Mudikondachola Perunteru.* Muddikondachola Perunteru is a merchant street where merchants resided. Another inscription of Kulothunga mentions a silk weaver (Saligan) who traded and lived in Mudikondacholan Perunteru. He built a temple near modern Kudavasal.

*Main Street #3 – Kulothunga Chola Perunteru.* Another inscription of the same king mentions another silk weaver, who lived in another street called Kulothunga Perunteru, when his wife donated to the temple at Rajendracholeesvaram. These two streets seem to have been the quarters of silk weavers and silk traders in Gangai. To the south west of Gangai, there existed two villages called Chintamani and Melchintamani. These villages are still identified with the same names.

*Main Street #4 – Darani Chintamani Perunteru.* These places are considered as merchant headquarters of Darani Chintamani. Darani Chintamani Perunteru is mentioned in the inscriptions of Gangai during the Chola Period as a large street (Pichard, 1994, p. 188). There is a village named Chintamani in the southwest direction of Gangaikonda Cholapuram, with Jain settlements. Jain settlements were encouraged in the history of South India until after the invasion of Hinduism. This village was the continuation of the Chola city's settlement pattern, which encouraged other countries and other religions to trade (Pichard, 1994, p. 188).

*Main Street #5 – Uttamacholan Perunteru.* The name of a large street called Uttamacholan Perunteru is mentioned in a record from Shiyali. This street was located on the northern side of the fortification wall, Gangaikondacholan Thirumadhil, which means that the merchant street could be protected by the city walls (Pichard, 1994, p. 188).

From the excavation and detailed documentation, Pichard (1994) believed that two roads

cut the inner moat in a north - south alignment are the traces of the old streets (p. 110). Looking closely, these two roads if treated as separate roads on separate accesses obey *Mayamatam* standards of roads that encircles the royal enclosure. It could be interpreted that during the decline of the city, these two streets merged into one.

***Shopping Street (Madigai).*** The inscription identifies main streets with markets called Madigai.<sup>60</sup> Such main streets are wide with shops. They are Darani Chintamani, Rajendra Chola, big street; Mumudi Chola, big street; and Mudikonda Cholan madigai, big street (Sridhar, 2009, p. x). The term Madigai denotes a place where the caravans or cartloads stay together (madangudal<sup>61</sup>) and where the goods are stored. Hence, the space hence will have an established stock centre for wholesale business and commercial distribution.

*Shopping Street #1- Viracholan Madigai.* Viracholan Madigai is mentioned in a fifteenth-year inscription of Rajendra 1 and talks about a ruby merchant and a oil merchant (mayiletti).

*Shopping Street #2 – Mudikondacholan Madigai.* A thirtieth year of Rajendra-1 inscription mentions Mudikondacholan Madigai, a merchant (chetti) who brought back the diadem of the Pandya.

*Shopping Street #3 - Gangaikondacholan Madigai.* An eighth-year inscription of Rajendra II refers to Gangaikondacholan Madigai and a merchant, who had a ruby necklace and offered it to the goddess at Tiruvarur.

*Shopping Street #4 - Madigai Teru.* Another inscription from the Chola period mentions Madigai Teru as a merchant (vyabari) who resided in this street. The name of the street denotes the presence of commercial warehouses.

It was tradition in Chola country to donate gifts to the government for official purposes.

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<sup>60</sup> Madigai translates to the bazaar (market).

<sup>61</sup> Madangudal – to fold and stay in a place.

The charitable activities of the members of these shopping streets (madigai - மடிசை) indicate that the merchants of the city enjoyed flourishing economic conditions to donate. (Pichard, 1994, p. 188). The presence of such elaborate wholesale market implies that it was a buzzing mercantile city.

***Water as a Mode of Transportation.*** Cholas seem to have used any form of water body extensively, whether it be sea, river, lake, pond, tank, well, drainage, water channels, basins, and watershed area. Cholas were pioneers in ship building, and undoubtedly used the river for transportation. The use of rivers was mandatory for quick transportation of their army, building materials, goods, etc. South Indian villages still today rely on the age-old tradition of using coracle<sup>62</sup> as a mode of transportation. Their use of coracles tie to the ancient history of South India that transported people and goods via rivers. This is also evident from the utmost maintenance of the water channels by the Chola government. All the use of and attention to the water ways supports proposes that rivers were a mode of transportation.

***Underground Passages.*** Nagaswamy (1970) mentioned six subterranean passages that connected the Gangaikonda Cholapuram with other major cities. A late tradition by word of mouth is that these underground passages connected the temple platform to the treasury of the temple. But the authenticity of this information remains a mystery.

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<sup>62</sup> Coracle is a small round boat made of wickerwork covered with a watertight material, propelled with a paddle.

## 8.7 Overall Gangaikonda Cholapuram Reconstruction

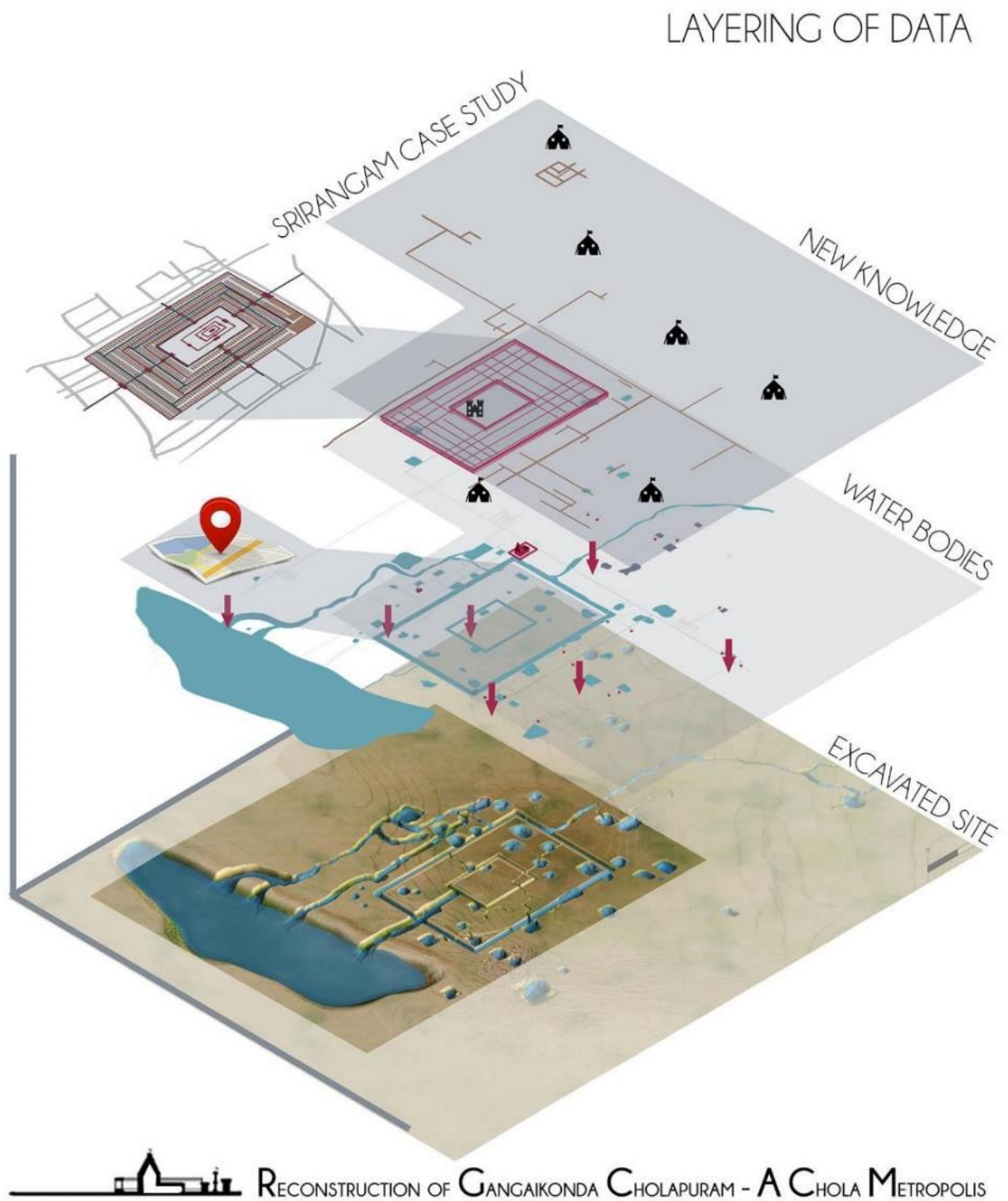


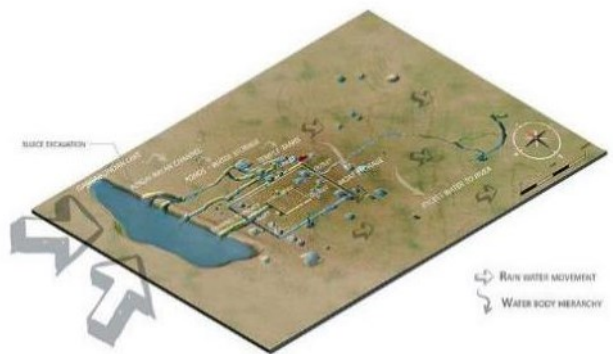
Figure 54. Layering of the Various Factors.

The figure 56 visualizes the Gangaikonda Cholapuram city for a radius of 2 miles, even though there are evidences for the city to expand for more than 2 miles. The figure 54 visualizes the consolidated evidences, scholar's description, suggestions from *Mayamatam*, conclusions drawn from Srirangam case study, topographical study and multiple site observations. The figure 55 details different layers like the city plan within the fortified walls, with four main gateways, row houses, water storage basins, moat, fortified walls, palaces complexes, roads of width 24 ft and 48 ft as suggested by above mentioned evidences, the Gangaikondacholeesvaram temple and a pith. These figures are drawn as per the evidences suggested in the whole thesis.

### EXCAVATION 7 :



### WATER MANAGEMENT :



### TEMPLE MAPPING :



### SRI RANGAM :

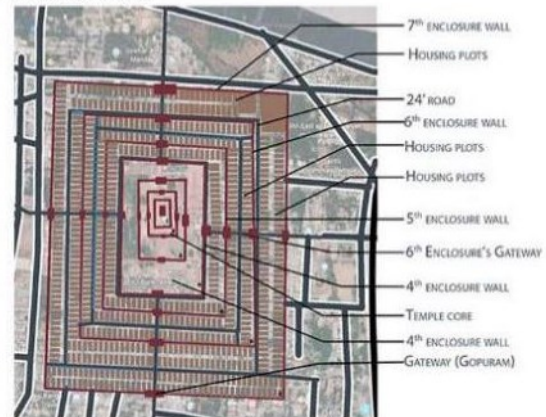


Figure 55. Major Factors that influenced the Reconstruction of Gangaikonda Cholapuram.

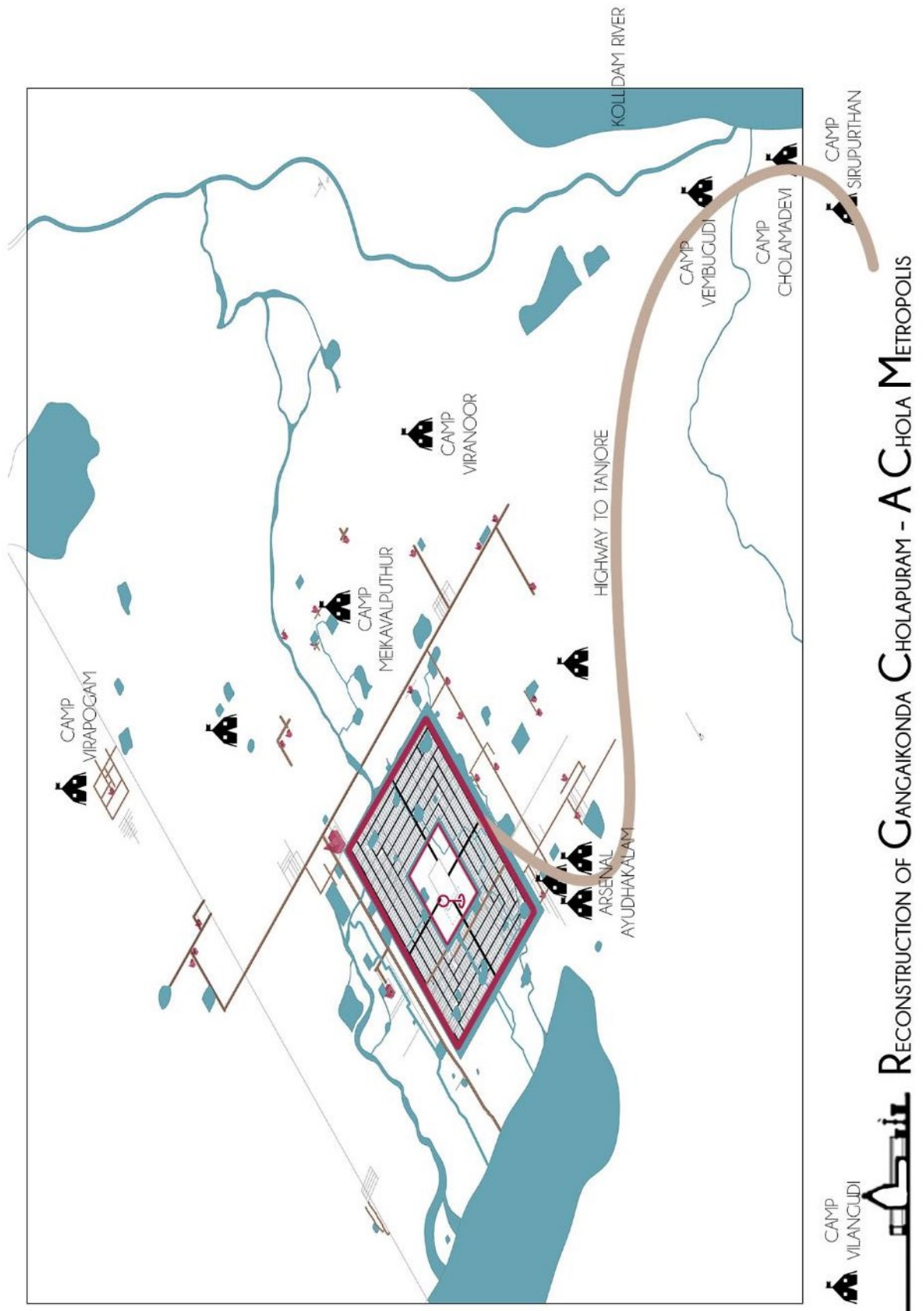
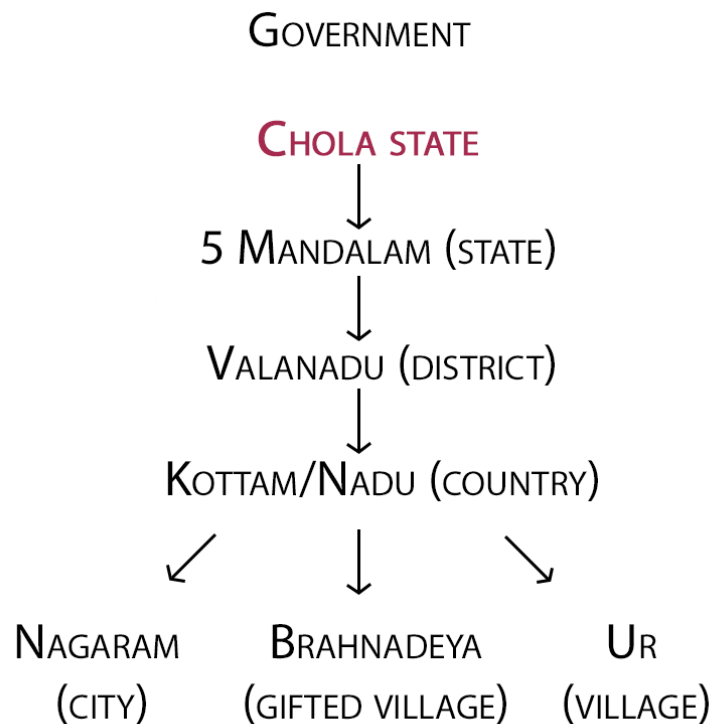


Figure 56. Overall Gangaikonda Cholapuram.

## 8.8 Government.

After the historically important land survey by Rajarajan, the whole of Chola land was divided into five mandalams (states). Mandalams were the largest of the Chola territorial divisions, which are as follows:

1. Chola Mandalam (the ancient Chola country)
2. Jayamkondachola Mandalam (The Tondai mandalam region)
3. Rajaraja Pandi mandalam (The Pandya country)
4. Mudikondachola Mandalam (Srilanka)
5. Nigarili Chola Mandalam (The Kongu and Mysore region)



*Figure 57. Organization of Chola Rule.*

The states (mandalam) was subdivided into districts (Valanadu). There were totally nine valanadu under the Chola empire. The system of valanadu was introduced by Rajendra in 1026 CE. One of the nine valanadu is Kadaramkonda Chola in the Chola mandalam, which is of great

importance because Gangaikonda Cholapuram, the capital city was located in the district. The valandaus were divided into smaller divisions (kottam/kutrams/nadu). The nadu constituted the villages (ur) based on the area. Bramadeya was a gifted land to Brahmans. These bramadeyas were villages with specific characteristics, which acted as a nucleus of education and agrarian expansion. There were cities (nagaram) within the district (valanadu). The structure underwent constant change for better management (Pichard, 1994, p. 198). The Chola government was a very complex system. The study of the Chola governmental system itself is a separate topic for academic studies and discussion, which is being researched by international scholars.

### 8.9 Fall of Gangaikonda Cholapuram

Beginning in the early 13<sup>th</sup> century, the decline of Gangaikonda Cholapuram began accompanied by the fall of the Chola Empire. Over the next century, the fall of Gangaikonda Cholapuram was instigated by many factors. A failed shift in agrarian techniques, invasions, political unrest, a weakening of the economic base, deteriorating hydraulic system, environmental change, and even natural disasters. The fall of the city resulted in the disappearance of the urban structures (Iannone et al., 2016, p. 75).

#### PANDYA INVASION <sup>9</sup> :

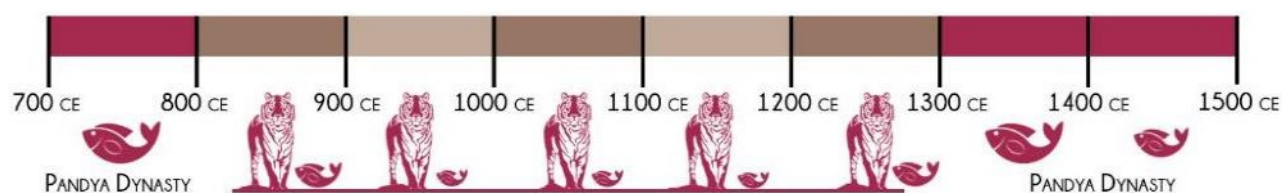


Figure 58. Pandya and Chola Co-existence.

**Pandya Invasion.** During the invasion of Pandya, the Chola Country met with destruction. All the Chola cities, including Tanjore, Uraiyur, and Chidambaram, were destroyed, but not for Gangaikonda Cholapuram. This indicates that the Chola king was present in the Gangaikonda Cholapuram capital during the destruction. Pandya's also have not mentioned Gangaikonda Cholapuram in its inscriptions about their destruction. Moreover, few of the later



Pandya inscriptions mention Gangaikonda Cholapuram after the fall of the Cholas as Gangaikonda Pattanam in their records. These facts suggest that the city was undisturbed during Pandya's invasion. The existence of many fortresses (thirumadil) referred to in the records (from Pandyan inscriptions) also strengthens the view that the city was undisturbed by invasion.

***Site Selection.*** There are opposing viewpoints about the site selection for Gangaikonda Cholapuram as the reason for the decline of Gangaikonda Cholapuram and the Chola empire. Some researchers today mistakenly believe that the site selection was one of the major reasons for the decline of Gangaikonda Cholapuram and the Chola empire. According to Pichard (1994), the topography of this city is not advantageous for supplying the city with water. Water supply for the city is from the dam Grand Anaicut, on the river Kollidam. This requires a water channel of 50 miles (p. 110). Rajendra Chola chose Gangaikonda Cholapuram capital city site in the heart of the human desert that stretched then between the two rivers, Kollidam and Vellar, because there were no cities or towns established in that area. Rajendra's aim to establish a lake, Chola Gangam (Gangaikondan lake) to irrigate the vast lowlands up to the coast, and to connect the city to the two rivers Kollidam and Vellar.

Contrary to Pichard's view, Thyagarajan (1994) says the site selection for the city was fixed in the heart where Rajendra recruited his troops. This area located on the banks of Kollidam and on the western hills provided a suitable place for training his army, but why Rajendra chose this precise site remains unexplained. The strategic reasons sometimes seem unconvincing. A political capital and a religious capital usually are not a military outpost. However, if Rajendra wanted to protect the rich Cauvery Delta from his rivals on the northern flank, then this is justified. This strategy worked for external invaders, but it did not protect the city from the internal civil unrest when Pandya King Maravarman Sundara rebelled in 1218 CE. But for Rajendra's, who had successfully captured all territories along the coast of Bay of Bengal and in Southeast Asia, fear of Pandya from the within seems unthinkable (Thiyagarajan as

quoted in Pichard, 1994, p. 113). One can only assume that Rajendra underestimated his rivals.

The only possible answer could be that training of his troops on a vast, vacant land and the ability to transport his troops down Kollidam River to the Indian Ocean blinded him about the any disadvantages of the site. Another possible explanation for Rajendra's shifting the capital from Tanjore to Gangaikonda Cholapuram could be to aggrandize his name in the history of Chola. Having observed that his father constructed the Tanjore Big Temple, along with the capture of the Ganges, he dreamed of a construction of a huge city, on barren fields.

## 9. Conclusion

Cholas and Gangaikonda Cholapuram occupy an important place in the history of India. The Cholas ruled from their capital city Gangaikonda Cholapuram during their extensive reign for about 250 years, since 1025 C.E. This epic Tamil Kingdom, along with its majestic rule, is a repository of information for historians, currently known only to world historians, archeologists, and to the architectural community. The monumental remains of the Chola Temples with their superior sculptural quality, and horsed inscriptions and Sanskrit texts, are essential tools, for historians to better understand Chola history, its contribution to South Indian Architecture.

Gangaikonda Cholapuram, a barren field until 1025 CE, an important capital city from 1025 CE until late 12<sup>th</sup> century, is currently again nothing but a barren land with few hamlets and the majestic Gangaikondacholeesvaram temple still standing. Though there are extensive study about the temple, the study about the city ceased with the historians and archeologists. This thesis from an architect / planner point of view studies, consolidates, and proposes new recommendations regarding the urban fabric of the Gangaikonda Cholapuram.

In this long-elapsed excavation by ASI (1974 – 2009) at the site, this study at this juncture could be another step with new perspectives. This study will open up the platform for discussion about the long-forgotten city, gaining attention among general public and academicians. Tamil Nadu (in South India) known only for its natural resources and temple architecture, will also be identified as a place from where Rajendra ruled overseas. This excavated palace site, along with the Gangaikondacholeesvaram Temple will be a value addition in reminding the Tamils of their stronger, and richer history.

To envision Chola capital: One must understand the Cholas with respect to their geography, philosophy, religion, history, governmental organization is mandatory to envision their capital city. The geography of peninsular India and climatic factors stand as an evidence that resulted in their agricultural expansion. The Cauvery River and its Delta region were an

important wealth that Cholas celebrated. The wealthy Cauvery Delta region along with smart consolidation of South India, accelerated their trade that led to the capture of overseas Southeast Asia. Cholas' belief in Shaivism, the Bhakti movement (architectural stone movement), the attitude of the Chola kings, with the wealth and the adoption of Hinduism is certainly the cumulative reason for the construction of such huge temples.

The adoption of Hinduism was in every aspect of Cholas Dynasty like the language, brahmin migration, Bramadeya establishment (village), governmental organization, architecture, art, dance, music, caste system, literature, and even city building. The evidence that *Mayamatam* was consolidated during the late 10<sup>th</sup> and early 11<sup>th</sup> century proves that the Gangaikonda Cholapuram city was built according to the rules dictated by *Mayamatam*. Gangaikonda Cholapuram, the new royal capital built in alignment with *Mayamatam*, stands as the example of single ceremonial complex type of city. Understanding the typology contributed majorly to envision that it was not a mere juxtaposition but a well-planned city. From the description of Chau-Ju-Kau a Chola city, it is more appropriate to assign this description was about Gangaikonda Cholapuram, as he mentioned about the palace, soldiers and taxation. No other Chola city had military outpost and the palace along with concentric plans.

The aggrandized motive and the need to train an army of 900,000 soldiers, justify the urge to shift the capital to a barren land. The parallel conquest of Ganges at the Bay of Bengal in the north, ascertains to the erection of water pillar (Gangaikondan Lake). The excavation at Gangaikonda Cholapuram revealed two fortification walls and palace site on the western direction which is compared with Angkor Wat, and Old Bagan city. This comparison, along with the presence of timber remains at the excavated site in Gangaikonda Cholapuram, suggests that the palace here is a hypostyle type of structure. Though the presence of Gangaikondacholeesvaram Temple is outside the fortification walls, which disobeys *Mayamatam*. This must have been a conscious decision. The mapping of other Hindu Temples

(for a radius of 2.5 miles) from the existing Shiva temple revealed the street pattern of the Gangaikonda Cholapuram city during its heyday. The topic ‘the royal city and *Mayamatam*’ in this thesis, demonstrates Gangaikonda Cholapuram follows the directions dictated by ayadi system mentioned in *Mayamatam*. The excavation of fortification walls revealed its foundation structure that was four cubits<sup>63</sup> wide, also the measurement dictated by *Mayamatam*. Equating this width with all other measurements as mentioned in *Mayamatam*, one can deduce the height of the fortification wall as 12 cubits and the topmost reduced to  $\frac{2}{3}^{\text{rd}}$  of the base. All these help to state that Gangaikonda Cholapuram followed *Mayamatam*. The consolidation of topographical, inscriptional and excavation evidence, is listed under the topic ‘Urbanization/Planning’. With this consolidated information, one can envision the city of Gangaikonda Cholapuram with its infrastructures. The information provided by historians’ documentation about the Temple and the Chola Dynasty are elaborate. While these studies about the Chola Dynasty are extensive, the physical structures (the Chola Temples) that remain are only widely appreciated by the general public. This historical site, if understood more as a whole city, would welcome visitors far and wide, contributing to economic vitality for the region thus helping the remains of ones Chola’s majestic capital to thrive.

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63 Cubits are ancient measure of length. One cubit is equal to the length of a forearm. There are two types of cubits. Long cubit = 21 in (the length of arm of a fully-grown man usually from shoulder to middle fingertip); Short cubit = 18 in (the length of arm of a fully-grown man from elbow to middle fingertip).

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