CHAPTER – 2

SANGAM AGE BRICK-STRUCTURES AT PUMPHUAR: WHARF? OR WATER LIFTING DEVICE?

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This paper intends to argue that two wharf structures excavated at Pumpuhar dated to be the 3rd. century BCE excavated one by ASI and other by Tamil Nadu State Department of Archaeology are possibly not the wharf but water lifting device based on the functional characteristics of the structure. For an introduction to the reader the same text given about the Brick Wharf by ASI and Tamil Nadu State Department of Archaeology are presented and later the argument that the structures could not have been wharf but possibly the water lifting device is presented.

Pumpuhar

Kaveripoompattinam, Puhar, Colapattinam and Kaberis Emporium all imply the same ancient port city Pumpuhar. It lies over 11° 08' 33" N latitude and 79° 01' 31" E longitude. The celebrated early Chola port city was situated at the river mouth of Cauvery (Fig. 1). This city had an excellent maritime contact with various coun-tries like Kaalaham (Thailand), Elam(Sri Lanka) in southeast Asia and Rome and Greece in Mediterranean region. From the evidences available, this could have been one of the biggest port cities on the east coast existed between 3rd century BCE and 3rd century CE. Literatures like *Pattinappalai, Chilappadikaram* and *Manimekalai* vividly explain the plan of the port city and the various trade activities that took place during those 600 years. The town was well planned one as suggested by the separate residential areas for different classes of people and industrial and trade activi-ties. The various aspects of plan of Pumpuhar and their day to day activities that took place in those days based on the literary evidences, Travelers notes and archaeological excavations are discussed below.

Literary Evidences

Sangam classics *Pattinappalai* elaborates this port city in a vivid manner. It mentions that the city is situated at the mouth of perennial river Cauvery which starts from Kudagumalaiin western Ghats. It explains about the wealthy Chola country where the fertile

lands which yield sugar cane, rice etc. The villages were studded with big mansions. The salt was carried to inland from the coast by boats. The banks of the river were full of green pastures.

It then mentions about the various groups of people and their food customs and characters. In the outskirts of the city the pigs, hens and goats used to play. The coast had a rotten smell where people take bath in the sea and then they dip in Cauvery to get rid of the salt. They played with the crabs and flowers which sprout in the shore area. The night scene of the coastal region where the fishermen lived is elaborately explained. The fishermen in the sea counted the light in tall buildings for the direction.

The tax collectors functioned honestly and guarded all the goods in the shops at coastal area. Imported goods from the big ships were transferred to land and then to the warehouse and in turn the export goods stored in warehouse were transferred to the ships after being stamped with the tiger emblem. The lambs and dogs played over the bundles of goods which were stored outside the ware house. It was studded with big mansions which had all the facilities and big shopping area was always busy. The different shops were identified with different kind of flags.

The goods traded were the imported horses, pepper, the pre-cious stones, sandalwood, pearl, coral, the product of Cauvery and Ganges delta and the goods from Ceylon and south east Asian countries. These goods were heaped in large scale. The agrarian society of Kaveripoompattinam never kills the cattle for their food as they were adopted to vegetarian diet. The people who visited various countries and learnt various languages were present in this town.

The late Sangam work *Chilappadikaram* also vividly explain about the plan of the city. The city was divided into two segments. The area near the sea called *Maruvurpakkam* where the fishing community and foreign traders were residing. *Maruvurppakam*, is narrated with absence of roofed building. The other area is called *Pattinappakam* where the king,ministers, business communities, farmers, the artists, artisans, astrologists and other service community very close to the king lived. In between these two major divisions there was a big shopping area called *nalankadi* (Day market) and *alankadi* (night market) where the commercial activity took place. *Yavanas* (foreigners) resided at *yavana irukkai* mingled with the sellers of lime, scent, the weaving community, the sect who weighs the value of precious stones, the grains and food sellers, people who were selling fish, salt, the people who are bronze smelter, carpenters, blacksmiths, gold-smiths, bead makers, the crafts men, the singers all stayed in these area. It also mention that the city had many temples and five *Chadukkams*.

Another interesting reference of the foreigners (mostly Roman) is found in the epic *Manimekalai* (107-108) (5th or 6th c. CE). It mentions how the artists of Avanthi and the *yavana* carpenters contributed to build the splendid city of Kaveripattinam. The word *yavanathachar* may be taken as carpenter or stone workers or architects (Raman 1968:238). It also mentions that the city was submerged in the sea (*Manimekalai*:25:177).

The other anthologies like *Agananuru*(18,222,378) also mention about the Puhar city. But the details are inadequate. The *Muththollayiram*(38) also mention that the harbour was

situated in the mouth of the river Cauvery. From the above descriptions one can visualise the plan of this ancient city (Fig.2).

The anonymous author of The *Periplus of Erythraean Sea* men-tions this city as 'Kamara', Ptolemy refers as 'Kaberis Emporium'. The Prakrit work *Milindapana, Abidammavatara, Buddavamsakada*, Buddhist Jataka stories all mention about Pumpuhar.

Excavations at Pumpuhar

During 1906's ASI has conducted the excavations in and around Pumpuhar and have published a report of the excavations. Besides during 1990's Tamil Nadu State Department of Archaeology has also conducted the excavations in these places. These excavations revealed the structures and antiquities dating between 3rd c. BCE and 4th c. CE. They range between solid brick structures to the antiquities like Rouletted ware, grey wares, ring stands, Chinese celadon wares, beads of varied size and materials, conch bangles, terracotta objects and copper objects (Soundara Rajan 1994, Subramaniam, 2007). The brick structures excavated at Pumpuhar for the present paper are only discussed below.

Wharf I (?)

The ASI report on the excavated wharf structure particularly the location and the structural details are briefed here (Soundara Rajan 1994:25-26). The site is in Kilayur village near Puhar, to the north of the Kaveri Stream. The excavated brick platform measured 18.28 m X 7.62 m (Fig. 3,4,5) : as in the report, Soundara Rajan 1994:24). The longer dimension is oriented north-east and south-west. It perhaps indicated then prevailing direction of backwaters. The overall height of the platform was 1.71 m.

The structural remains comprised of two stages, a provision for berthing boats in high tide. The brick platform or quay was having a channel of basal courses flanked by the high platform or pier. The channel was indeed intended to cut the impact of the breakers by allowing water to flow through the channel gap. It would seem that there had at least been two stages of erection of the wharf arrangement in this structure. The earlier stages was organised exclusively by series of rows of four strong poles in each line approximately 0.15 m diameter, a tall hard wood and tall character which was driven down firmly into the river sand for at least a couple of meters and should have in original state rising at least couple of meters above the then high tide level, so that it may serve as a boat-jetty , perhaps also provided additionally with cross planks of wood tied to the poles, for loading and unloading of merchandise.

The C^{14} dating of this structure suggests to the existence of this wooden specimen between 300 BCE and 200 BCE, although other antiquities points to the existence of this structure up to 100 CE. In that second stage, the jetty of poles was re-provided with solid brick platform enclosing a basal channel in between and since the poles were already in position and in continuing use, the bricks immediately adjacent to the layout of the poles were cut out along their edges to accommodate the diameter of the pole. This feature, seen consistently, furnished the additional precious evidence thus, of the poles being earlier than the brick wharf platform

stage which is also otherwise corroborated by the stratigraphy and confirm that the C^{14} determinations are referring only to the wooden poles of the earlier jetty stage which was clearly anterior by at least more than couple of centuries to the brick wharf platform stage extends up to the first century CE. The brick wharf itself had a further lease of life up to the 2nd century CE or even slightly later, and seemingly went out of use thereafter and there by sealing layers of top debris and clayey silt and humus. This site is water-bound in the rainy season and in other dry seasons, a crop of paddy is raised by the owner conveniently. Even the excavation had to be carried out only during the dry season when the water table was lower, though even at that time the bottom strata (of phase I of the wharf) was liable to be underwater. The bricks of the wharf measured 61 X 40.5 X 7.7 cm on an average.

The double platform wharf with a channel in between should have risen much higher when fairly intact suiting the high tide level of the lagoon anciently. The bricks were laid in lime/sand mortar and despite the vicissitudes of time had yet retained their compactness though they had suffered a slight tilt sideways by water action. It is also possible that this wharf was close to the high tide bank in water. It is not known that such a wharf arrangement was repeated at certain other points (Soundara Rajan 1994:25-26).

Indeed such a similar shaped brick structure has been excavated by the Tamil Nadu State Department of Archaeology (Subramanaian 2007). Though much excavation details is provided (Subramanian 2007), yet the structural details are sufficient enough for the present analysis which are given in brief .

Wharf II (?)

At Puhar in 1996 similar kind of wharf like structure has been unearthed by State Archaeology Department of Tamil Nadu (Fig. 6). This is situated about a kilometer to western side of the wharf excavated by ASI. The plan of the wharf structure is exactly similar to former and is made of bricks. But the size of the structure is smaller (Subramanian 2007). The wharf made measures 6.8 m in the east west direction and 6.2 m in the north south direction.

The channel section is oriented to 30 from north along north south direction. The structure is 0.9 m high in the front portion from the ancient floor level where the river/beach sand is observed. The wooden poles were also found near the structure as noted on the earlier excavation. The rectangular section measures 0.6 m wide and 0.65 m deep in the front portion. This channel tapers upward from the front up to 4.0 m where the depth was only 0.39 m measuring the gradient of 1:15.6. Front portion wing wall measures 2.90 m width and 0.8 to 0.9 m breadth in the western portion and 3.30 m width and 0.8 to 0.9 m in breadth in the eastern portion. The side wall of the channel running north south measures 0.7 to 0.8 m wide at top. About 4.0 m from the front side, the sidewall of the channel in the east direction is found missing and the end por-tion is dilapidated, probably for reuse, the bricks have been taken away. It is interesting to note that the eastern portion of northern side wing wall is found missing and the western wall is o splayed about 30 from its lateral axis.

The western sidewall is splayed towards north west-ern direction. The reason for such deviation is not clear. Two wooden posts probably of palm tree were noticed in the western side

wing wall at 0.60 m distance. Another wooden post about 4.5 m from the front portion was noticed at western end of the channel section.

Totally 9 layers of bricks were noticed in the front portion and the number of layers in the northern side is not known. Four sizes of bricks were used in the major portion of the structure. They are 60 X 35 X 7 cm, 50 X 35 X 7 cm, 45 X 45 X 7 cm, 45 X 30 X 7 cm and 35 X 25 X 8 cm. Of course, the broken bricks were also found used to retain the structure intact. Clay is the binding medium. A channel with the name *pazhangkaveeri* (old Kaveri), which is still used in this region. So the Kaveri would have run in this place. There is a possibility that both the wharves were located in the same course of the river as the position suggests. Adjacent to these wharves there are many habitation sites on both south and north. In the north ViiramaTTiruppu, maandtangkaaTu, maNTapakkaaTu and in the south Pallvaniicuvaram, Buddha Vihara is found. So the commodities might have been transferred from these locations. So it can be inferred that these two wharves were located along the river of Kaveri. There are also some other brick structures of small in nature unearthed in the excavations but nothing could be inferred as they are only in fragments (Subramanian 2007).

Discussion

Wharf or Water lifting Device?

Two similar types of brick structures wharf were excavated a Puhar. Quite likely, it may not be a wharf, but a structure for water lifting from the river for irrigation. As already discussed above, their shape and size no elaboration is needed. The following are the important aspects for the present argument.

At the end of the channel like structure, additionally walls were provided, normal to the channel on all four sides. In wharf (?) II they seem to be slightly splayed. The ends are generally abutted to reduce the slow damage of hydraulic structures. With the presence of the channels in both the structure and abutment, it can be clearly stated that the structure was at water front. And so the river would have flown near this structure in earlier period. If one scans the remote sensing imageries it can be seen that these structures are built in the course of the palaeochannel of river Kaveri[1]. Though one can argue over the age of the palaeo-channel as far as back to millions of years, there is also every possibility of the same palaeo-channel having been formed even yesterday. In the estuarine region of the rivers, it is not uncommon that the rivers change their course frequently. So it can be inferred that the structure was hydraulic in nature.

Channels and wooden poles are found on both the structures, however, the data pertaining to wharf II (?) lacks details on the channel and the wooden posts. So, the data provided by the wharf I (?) is used only where ever required to adduce the present hypothesis. In the wharf I (?) following are the outline of the structure. The length of the wharf is 18.26m. The channel is covered by the brick platform and floor is also made of brick. Three pairs of

wooden poles of 15 cm dia. were found planted in the channel, 3.5m centre to centre. On the both edge of the channel also found the two pairs of wooden poles.

The excavator view is that the channel was intended to cut the impact of the breakers (Soundara Rajan 1994:25). The author does not mention about in which direction the structure, to the backwater, is situated. Two phased construction of wharf is also assumed by the excavators. First primitive form of structure made of row of wooden poles, where boats with cross planks of wood tied to the poles, for unloading and loading of merchandise were made. Later, this was added with solid brick platform around the wooden poles.

First, if we consider the direction of boat jetty, in two possible way with respect to backwater, it would seem un likely, that it was not used to tie the boat for transfer of cargo. The basic function of a wharf or jetty is to allow the boat or ship to berth along it sides (Fig. 7,8). If we consider the external edges of the excavated structure, it can be easily deduced that such a facility does not exist and so no boat was berthed aside. It is pertinent to mention here that a boat jetty made of brick Structures were with the wooden poles along side of the structure was excavated at Muziris now called as Pattanam at Kerala (Cherian 2012).

On considering the direction of structure across and along the backwater the following can be visualised. If we consider that the longitudinal axis or the channel of platform is normal to the backwater, it can be inferred that for simple reason, water flow in either direction, will not allow boats to rest in single position. The same is the case with the channel faces the backwater. The wharf cannot serve its purpose, either near the bank or in the mid stream.

More to argue is that if the waves would have been powerful enough to damage the structure, the bricks for building structure wouldn't have been used, though they were laid with proper bonding (Athiyaman 1994) as they are liable to frequent dislocation. Based on these technical reasons the structure termed as wharf can be rejected. Then the function of this strange structure is to be ascertained.

Based on the evidence from the literature, the structure could be a water lifting device where in course of time the wooden materials perished. The water sweeps of Early Historic period at delta region is alluded in the literature (*puRa*:388.11-16, *matu*:89-93). And this water sweeping device is not found quoted for any well irrigation. If the structures excavated were water lifting devices, it could not have been in the backwater, as the water is brackish, instead this should be much interior from the sea. The archaeological investigations indicate the existence of structure in the sea for about 8 km from the shore (Tripati et.al. 1996). The so-called wharf I is about 3 km from the shore inland at present. So the structure was away from the influence of tidal backwater. So the position of this structure, to be a water lifting device, is not a hurdle.

It is interesting to note that a brick pillar structure is found near the one end of the channel. From that point the channel tapers upward. If we consider the all the wooden poles planted in a row then a picture can be visualised (Fig. 9). Towards the bank, the channel raises upward in the platform. During flood, the poles would serve the water lifting purpose and when water level lowers, successive poles would have served the purpose. When water is lifted in a

basket a man has to turn the basket so that the water is poured in the trough. When the level reaches very low, the last pair of wooden poles were used. Since there was no space for a man to stand and turn the water basket to the water trough, a pillar was built. In case, of second structure (wharf II ?) such a brick structure is not found near the channel entrance, but an extra wooden pole is found. From this a wooden a platform would have been fixed, so that a man can stand and turn the basket.

If we consider above factors, it can be said that the structure so called wharf is not correct but they are water lifting device only.

END NOTES:

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