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Original Research Article

Vanishing small water bodies: a case study of India's Chennai city

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ABSTRACT

We experience some of the worst global water shortages. But not so long ago, the majority of Indian villages and towns were able to provide for their citizens' water requirements on their own. Each location had a special technique for collecting water that was tailored to the climate, geography, altitude, rainfall, and soil types there. People in southern India also possessed solid knowledge and placed a high value on water collection. To successfully save water and use it for agriculture and other uses, they constructed canals and barrages beside water sources. Tanks, which are described as "a hole in the earth partly natural and partially constructed or entirely artificial designed to retain water of the rains throughout the year, or portion of the dry season intervening the wet seasons," were also very well-liked. Most of them were filled by the monsoon rains, however a handful held excellent water from springs. Throughout the summer, they dried up. All of their needs were met by water from these sources. But regrettably, the tanks were progressively ignored and allowed to degrade into a mess. Instead of being beneficial and useful, they became a hazard to the health of the locals as animals were washed in them and open defecation was practised along their banks. This paper examines Chennai's disappearing water bodies (India).

1. Introduction

In India, people value water in all of its forms, making it one of the few nations in the world that does so. The Ganga, Kaveri, Yamuna and rivers, among others, are revered as feeding mother goddesses. The benefits of water bodies are extolled in religious hymns, tales, and songs. Even today, people enjoy festivals and fairs as a way to give appreciation to them. But today, we are faced with a water shortage. India's swift population multiplication, industrialisation, economic expansion, as well as unplanned urbanisation, are factors contributing to water scarcity and contamination. Globally, we experience the worst water scarcity on the planet. The majority of Indian villages and cities, however, used to be able to meet the needs of their own populations for water. Every location has specialised water collection techniques that were tailored to the area's specific rainfall, temperature, altitude, terrain, and soil types. Here are some examples of well-known systems, the AharPynes endemic to south Bihar, the Baolis of Gujarat, the Khadin or Dhora of western Rajasthan, and the Phad system in Maharashtra [1].

People possessed excellent understanding and gave water harvesting the greatest priority in southern India as well. To successfully use water for agriculture and other uses while conserving it, they constructed canals as well as barrages beside sources of water. Tanks, which are described as "a hole in the earth partly natural and partially constructed or entirely artificial designed to retain the water of the rains throughout the year, or portion of the dry season intervening the wet seasons," were also very well-liked. Though smaller rivers or their tributaries may originate from the tank and the canals that feed them, in comparison of the catchment basin to rivers, the

former is smaller than the latter, so more confined in scope [2]. Various tanks, which are also known by a number of other names, likethataka, kere, theertha, cheruvu, kulam, madaga, etc. [3], were well-fitted to the region's unique features, like minimal rainfall, soil with little water retention and also steep slopes that generated quick run-off.

2. Tanks in Tamilnadu and their decline

Numerous tanks—also known as erys—were built throughout the state of Tamilnadu, mostly during the mediaeval era. Tanks are mentioned throughout the Sangam literature, which goes into great depth on the Marudham irrigation culture of the time. Tank building and upkeep were lauded achievements of kings and emperors. For instance, the Pattupattu extols KarikalaChola for clearing forest regions for habitation and enhancing his Kingdom's wealth by building many irrigational tanks.

"Kadu Konru Nadakki, KullamTottuValamPerukki"
(Pattinappaalai) [4]

Tank bunds were built in strategic locations to collect rainwater and store it for later use. There were extra structures and sluices for regular water release. Tanks that were fed by rivers and by rain were both used. They were regularly constructed in series and were usually separated a few kilometres apart in order to prevent trash from overflowing and to ensure that seepage from a tank in the series which is higher up was gathered in the next lower tank.

Additionally, canals and anicutswere employed in combination with the tanks. An anicut is defined as "used in the irrigation of Madras Presidency for the dam erected across



a river to fill and manage the supply of channels taken off from it; the central work in fact of the large irrigation systems" in the Anglo-Indian dictionary by Henry Yule and A.C.Burnell(1886). The word, known as the Tam., Comp., Anai-kattu or "dam-building," has recently gained popularity throughout India. [5].

The construction and operation of many of the tanks perfectly complement the most cutting-edge, advanced scientific methods. A famous example is the Panamalai tank, which King RajasimhaPallava built in 700 A.D. By connecting several local hillocks, the tank was created. Excess water was then directed by using a bed of unaltered rock formations. In fact, many of the old tanks that were built are as enormous as or even bigger than contemporary dams. For instance, the Veeranam tank's bund (embankment) is 16 km long. King Rajendran, I constructed the GangaikondaCholapuram pond, which is still standing today and has a 25-kilometer embankment.[6].

The tanks have historically served a variety of important functions, including (i) an important irrigation source for the cultivation of paddy, (ii) a device that manages flood and the device also restricts soil erosion as well as runoff waste throughout heavy rain, (iii) significant water storage and groundwater recharge structures, and (iv) an important role as a mini-ecosystem that influences the microclimate of the area.

The social and economic life of the nearby towns were likewise deeply entwined with the tanks. For instance, fishing was a significant source of money in the tanks. De-silted mud was utilised in pottery production and for building projects [7].

The local inhabitants looked after the tanks up until the British came. According to historical statistics from, for instance, the Chengalpattu district in the 18th century, 4-5 per cent of each village's gross production was allotted for the upkeep of the tanks and other irrigational works. Village officials who agreed to oversee and maintain the tanks were given the responsibility of managing manyams, or assignments of revenue-free lands. In an effort to increase land income, the early British reign witnessed several unsuccessful experiments with the system of land tenure. The massive governmental theft of village resources caused the traditional society, its economy, and its politics to collapse. As a result of the village communities' inability to sustain funding for tank upkeep, effective water-collecting systems started to deteriorate [8].

Since gaining its independence, the state administration has launched a number of programmes relayed to tank development as an initiative for larger irrigation development. Although it is progressively dwindling, tanks are still used as a supply of water. This is primarily due to extensive encroachments (both by governmental and private entities), structural deterioration, and vegetation infestation. More importantly, officials and the general public consider the tanks to be secondary water sources that are not as crucial as dams and canals. They are frequently regarded as wastelands that may be better utilised.

3. Chennai – A classical example of tank loss

Chennai city has only been for around 372 years, yet both its current site and the suburbs around it have long been of great historical significance. It is currently the fourth-largest metropolitan in the nation. The Kanchipuram and Thiruvallur

districts' surrounding territories plus the revenue district of Chennai make up the 1,189 square kilometres that make up the Chennai Metropolitan Area (CMA). The city has expanded over a strip of land that is 4-6 km wide and 14 km long along the seashore. Agricultural areas irrigated from tanks made up the majority of it during the British occupation and for a very long time. Old maps of Chennai and the surrounding areas portray the whole landscape as dotted with ponds and tanks. The Vysarpadi Tank, Long-Tank, and Spur Tank were only a few of the tanks that were fairly large.

Most of them were filled by the monsoon rains, however, a handful held excellent water from springs. Throughout the summer, they dried up. All of their needs were met by water from these sources. But regrettably, the tanks were progressively ignored and allowed to degrade into a mess. Instead of being helpful and beneficial, they stopped being used for open defecation and cow washing, which put the health of the nearby residents at risk [9]. In addition, the demands of urban growth, notably the housing industry, resulted in the increasing depletion of these priceless resources. This is still true today, even as Chennai is expanding in every direction. In the passages that follow, we'll look at a handful of the tanks that were demolished through many stages of Madras', right now Chennai's, development.

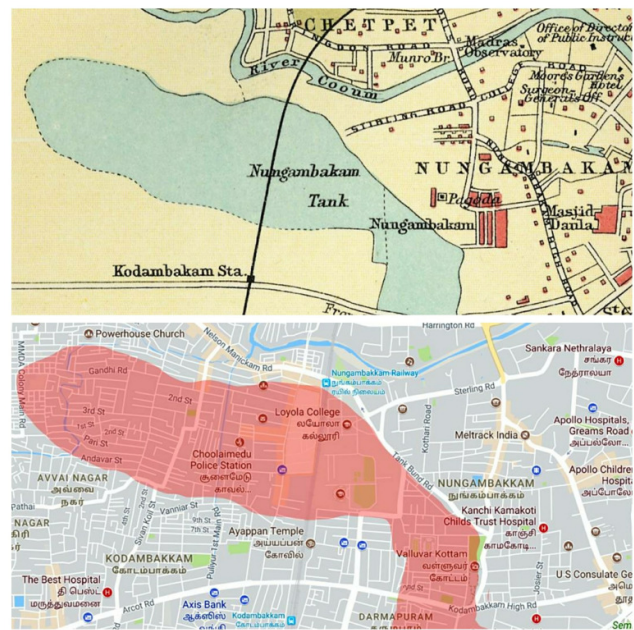


Figure 1. Old Madras Map of 1909 showing some of the tanks.

4. Long tank (Nungambakkam and Mylapore tanks combined)

Mylapore and Nungambakkam tanks were included in the Long tank, which was shaped like a crescent and spanned about 6 kilometres. It discharged into the river Adyar through the Mylapore tank, which also collected excess water from the Nungambakkam tank and its 2.81 sq. Miles free basin [10]. The Chennai Town Planning Trust sensed the housing scarcity and growing congestion in the city in 1923. The 1,600 acres of land that make up the Mambalam Housing Scheme were prepared. To obtain the majority of this land, both tanks were broken in the year 1930 [11].

In the year 1941, the Corporation of Chennai began transforming the area around the Nungambakkam tank into something like a developed residential neighbourhood to accommodate the city's steadily growing population [12]. (This explains why the "Lake Area" neighbourhood in Nungambakkam is still there despite the lake has long since dried up!) Right now, it ranks among the best areas of the city. Fr. Bertram, the institution's first principal, oversaw the recovery of a piece of the Nungambakkam tank to make way for the Jesuits' Loyola College's 54-acre site [13]. To build the ValluvarKottam, a built temple-cart honouring a renowned poet of Tamil named Thiruvalluvar, for a price of 99 lakhs rupees [14], the remaining sections of the tank were also reclaimed in 1974.

5. Vyasarpadi tank

Immediately to the west of the Vyasarpadi settlement was where you might find the Vyasarpadi tank. The tank was utilised to gather the excesses from twenty-eight upstream tanks, including the Madavaram, Korattur, Sembiyam and Ambattur tanks, as well as the drainage from its free basin. The Vyasarpadi Tank Group was created as a result of these [15]. Finally, in the Buckingham canal, the Vyasarpadi tank was allowed to be empty. According to reports, In (1772–1853) John Gantz, who set up the first lithography press in Madras, maintained a home close to the Vyasarpadi tank. In fact, he inspired the naming of a road, the Gantz Road [16]. However, the tank is no longer visible on maps of the city. The main cause was VyasarpadiNeighbourhood Scheme, which was implemented by the Tamilnadu Housing Board in the 1960s and 1970s [17].

6. Spur tank

A spur tank could be found (then Ellenbur) in the West of the community of Egmore. It was possibly given its name because it resembled a spur. For the sake of the neighbouring communities' welfare, the tank was crucial [18]. Early in the 19th century, tank water was reportedly utilised for drinking purposes [19]. Despite this, the tank, which was only topped out by rainwater for half the year, was progressively consumed by the city's and its population's fast development. In a portion of the tank expanse, earlier the T.B. Dispensary, now named as Institute of Thoracic Medicin, it was established between 1917 and 1920 [20]. Over time, further structures and buildings arose on the tank. The Spur tank is really the remains of the tank that are visible at the back of the Kilpauk College Hospital, albeit being dry most of the time [21]. Chetpet Lake is now present here. It's noteworthy to note that the Indian National Congress' 1927 Annual Session was held on December 26–28 at the Spur Tank grounds [22]. The term "Spur Tank Road" serves as a reminder of this big tank's existence in the present.

There were some other tanks that were originally part of Old Madras including the Perambur Tank, the Chetput Tank, and the Medavakkam Tank (near Kilpauk). And the urban sprawl has engulfed them all. All of these water bodies were reclaimed, though, when we were less conscious of the incredible links between human activity and the environment, such as the links between the redevelopment of lakes and the frequency of water shortages or floods. As a result of this rapid

loss of water bodies, it is now widely known that the amount of communal water harvesting in the city has dropped.

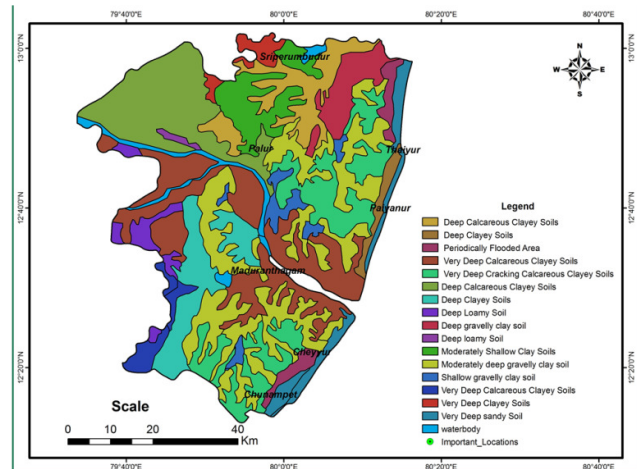


Figure 2. Soil map of study area of Chennai

As a result of the sharp decline in groundwater levels, we are now paying billions of rupees to desalinate seawater. The city's ability to handle flooding has also been significantly hampered by the disappearance of the waterbodies. The Corporation recognised the city's 36 flood-prone areas in 2007, including the reclaimed land at Nungambakkam's Mambalam, Vyasarpadi, Perambur, and ValluvarKottam. But regrettably, this is increasingly happening in the suburbs as well. Numerous tanks, to mention a few: Velachery, Madipakkam, Kilkattalai, Pallavaram, and Chitlapakkam, are under threat. They will likely lose out as a result of the hurried urbanisation process, which has already begun in many regions. However, many examples were there, where people's wisdom resisted such exploitation that was land-hungry, and it protected the city from long-term losses. Isn't it time for a large-scale effort to safeguard these eras? We are all required to respond.

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