

## GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES TEMPLE TANKS-THE ANCIENT WATER HARVESTING SYSTEMS AND THEIR MULTIFARIOUS ROLES

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### ABSTRACT

Temple tanks of south India are ancient water bodies that are integral components of temples. These tanks are a manifestation of a cultural sensitivity to water that is given a godly status within Hindu philosophy. Tanks are important for the sustainability of the environment and the economy of the village they serve. Temple tanks are the vital link in the water system and cater to the community scale of use, while the irrigation tanks cater to agriculture and the wells cater to domestic use. They harvest and store rainwater that is used for direct consumption through the year. However, their most important and often unnoticed function is providing percolation points with in the precincts of inhabitation of a town. Designed for recharging groundwater, they maintain the aquifer balance. The loss of this important environmental contribution is how being felt with urban tanks going dry. Temple tanks cater to various cultural, ritual, community and utilitarian functions. The connected temple tank of Chandrachoodeshwarar temple of Hosur exemplify this system. This traditional system gives us clues on how to improve our unsustainable urban water management mechanisms.

**Keywords:** *Temple Tanks, Ritual, Recharge, Water Harvesting*

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### I. INTRODUCTION

WATER has played a central role in Indian religious ritual and as a result many places worship have water bodies associated with them. The temple tanks are revered no less than the temple itself. Their water are believed to cleanse all sins. Infact, devotees are required to wash their hands and feet in the temple tank before entering the temple. The waters are also used to perform the deity ritual bath of the temple deity. Annual float festivals are conducted in the tanks, when the idol of the deity is floated around the tank on a decorated raft. There are nearly 1000 temple tanks in Tamil Nadu. An interesting aspect of temple tanks is their role in maintain ground water levels.

Temple tanks have many historical and spiritual references by linking a natural resource to a divine objective, temple tanks were protected by a code of conduct that bound everyone in their vicinity. They are still place of socio religious and cultural activity.

They are generally fed by precipitation and/or groundwater. These temple tanks have inlets which funnel excess precipitation, during the monsoon summer, to runoff into the tanks.

Temple tanks are treated with respect as they provide service, spiritual and cultural values such as

- Serving the temples rituals needs-pilgrims bath in the tank to cleanse themselves before going into the temple.
- Acting as percolation tanks that recharge groundwater.
- Reducing runoff and soil erosion.
- Restricting use of water unless there is a drought.
- Serving as places for cultural celebrations and social interactions for local people.
- Maintaining aquatic species. Some sacred tanks supports fish, which help sustain the cleanliness of the tank. Fish consume algae which would otherwise turn the water coldly.
- Curing several diseases- some pilgrims dip in these water to cure their diseases.

Some of the tanks are significant either on account of their shape, size, beauty or religious sacredness. Most of the temple tanks are no longer used, some have become sinks for sewage and garbage. Overuse of water extraction has led to many of them drying up, inlets have been blocked by construction activities, and population pressure resulted in some drained and used for other purposes.

## II. STUDY AREA

Hosur is located at 12.7409°N, 77.8253°E. It is the largest city in the Krishnagiri District of Tamil Nadu. It has an average elevation of 879m. Its most important land mark is the Sri Chandra choodesh warer temple dedicated to Lord Siva with the teppakulam. After a preliminary survey of the temple tanks in Hosur Chandrachoodeshwarer temple tank has been selected for the case study. The tank generally referred to as Pachaikulam. The tank meet the daily use of the public for bathing, washing the clothes and for other religious activities. Thus the water in the tanks keeps the environment very stable.

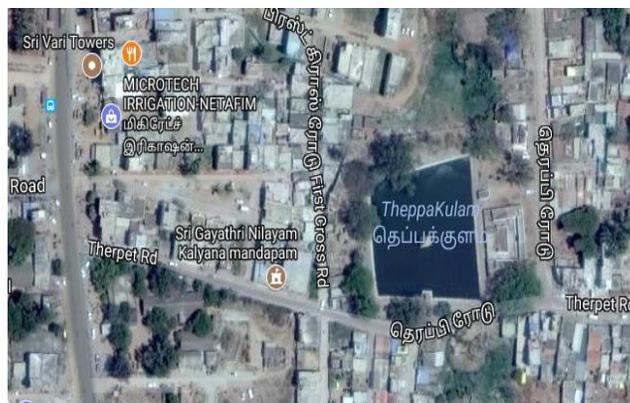


Fig. 1. Location of the study area-Hosur

## III. STRUCTURAL FEATURES OF THE TEMPLE TANKS –GENERAL

Temple tanks are either square or rectangular in plan, and are truncated trapezoidal in section, being staggered from top to bottom. Often, many temples have two tanks: one inside and the other in outside the temple building. Granite slabs are used for constructing the steps on all sides. Normally each step has a tread of one foot and a rise of half a foot. At every tenth step there is a landing of two foot width, having the same rise of half a foot, this gives additional stability to the structure. There is a structure known as Neerazhi mandapam situated in the center of the tank the main purpose is to house the deity during the float festival. It is constructed with granite stone.

Most of the tanks are having wells in their bed. Their presence is relevant in the present context and one can visualize a certain functional role for them. The wells link the aquifer and tanks and are supposed to serve for natural recharge. Thus the design of the temple tanks is ideal from the point of view of harvesting, storing rainwater and recharges the aquifer.

## IV. CHANDRACHOODESHWARER TEMPLE TANK

This tank been serves as storage for rainwater from the surrounding urban landscape and also a recharging medium for groundwater. This tank belongs to Chandra choodesh warer temple at Hosur which is situated in the heavily urbanized and densely populated area of the city. Fig.1 shows the location of the present study area. Fig 1 gives the plan of the temple tank. The tank can be filled to their capacity by having storm drains from the surrounding urban area directed to the tank. This tank has an area of 1500m<sup>2</sup>.granites slabs are used for constructing the steps on all sides. Each step has a tread of 300mm and a rise of 200mm. There is a perfect geometrical symmetry in the four sides and steps. In the center of the tank is an islet- like structure known as Neerazhi mandapam which is more an

elevated covered platform in granite slab. The Neerazhi mandapam gopura is constructed with bricks and decorated with suthai sculptures.



*Fig. 2. View of the temple tank*

## V. IMPORTANCE OF TEMPLE TANKS

The temple tanks not only serve an important focal point of this tradition settlement, but also in controlling the micro climate of the place helping to maintain the hydrological balance of the area. The purpose of the temple tanks not only the retention of water for celebrating the float festival, but also includes some larger purpose. Traditionally temple tanks seem to have played three hydraulic roles:

- As a storage, which acted as insurance against low rainfall periods and also recharges groundwater in the surrounding area,
- As a flood control measures, preventing soil erosion and wastage of runoff waters during the period of heavy rainfall, and
- As a device which was crucial to the overall eco-system. Further the natural tank bed permitted the growth of water plants such as lotus, lily, and water creatures such as fish and frogs.

## VI. TANKS TODAY

With the coming of the modernization and westernization, social and economic institutions in India, including those relating to natural resource management, have declined. Temple tanks today are struggling to overcome many obstructions that pose a threat to their survival. They are challenged with the task of fitting in to the ever-changing modernity that races ahead, leaving behind such traditional systems.

All water supply systems are mechanized. One of the serious and environmentally hazardous consequences of this is excessive ground water exploitation. Mechanized tube wells are being dug deeper into the ground in search of water. We are exhausting water that is believed to be almost seven thousand years old. As the agricultural, industrial and domestic reliance on such systems increase, the water tables have reached an all-time low. In addition to affecting the environment in general, this has caused the temple tanks to go dry, especially in most urban areas. Tanks are not able to retain the little water they collect. In addition, since cities and towns, and most villagers have water in the convenience the home, the reliance on wells and tanks is insignificant. Negligence has taken over due to the lack of use, and these spaces of prime religious importance have now turned into dump yards (Fig. 3).

Urban land pressures are causing construction over catchments leading to degradation of tanks. Open grounds that were used to harvest water, have now been indiscriminately built upon.

Moreover, most temples and their tanks were located in the hearts of villages that have now turned into cities. Prime urban land was occupied by temple tanks. With the tanks going dry for the various reasons, it tends to be reclaimed by the ever growing city.

Modern mechanisms of administration and governance are based on the theories left behind by the British Colonialism. This drastic change from the traditional administration systems and control mechanisms have contributed to the decline of such long established set ups that were in place for centuries. Similarly, the systems of temple administration today have also changed. Once in the hands of a local administration, all temples and their lands have come under a government board. The controls were removed from the users and the locals, and were replaced by a third party. The local bodies do not claim responsibility over the temple tanks as both the ownership and control belong to the third party, the State government in this case. On the other hand, this removed administration has its visible drawbacks. The sheer quantum of responsibility vested in the hands of the State, which has to administer and manage almost twenty five thousand large and small temples introduces an element of ineffectiveness. This situation of unclear responsibilities of ownership and control, as well as the state of disuse has compounded the problem for the temple tanks, leading to its degradation.



*Fig. 3. The pitiable state of temple tanks today*

Another factor that has aided this rapid downfall is the mindset of the modern society. A shift from a community based thought process to the individual, has gained priority. Urbanism has brought with it the breakdown of the community structure as it existed traditionally. However, a new mode of community formation is still in progress. The attitudes of society are also undergoing change, where a certain amount of loss is felt in terms of religious attachment. As one of the direct effects, the temple tanks do not receive patronage as they once used to. In the older days, patronage from the affluent that took the temple through, helping it flourish. We are at a time when we are struggling to keep stomachs from going hungry, and mouths from going thirsty. Priorities of people have changed from a mindset that was largely influenced by religion, philosophy and the community, to one that is wholly dependent on the economic survival of the individual.

## VII. CONCLUSION

This study has shown that the Chandrachoodeshwarer temple tank of Hosur, act as water conservation structure, apart from serving their traditional function. The tank can be filled to their capacity by having storm drains from the surrounding urban area directed to the tank. The tank breathes age old traditions and the skills of architects and sculptors. It can be seen that strategies for rehabilitation of the temple tanks have integrated a number of uses such as traditional functions, rain water harvesting structures, aesthetic value and limited exposure use for the public.

In these times of severe water shortages, we realize that it is the over exploitation of the aquifers that have caused our dire situation. Temple tanks could be looked upon as available infrastructure to help replenish the ground water

levels. If we could only drain the rainwater from the surrounding areas, with minimal filtration, the design of the temple tanks would encourage percolation, and in a few years, water tables would rise.

We need to change our outlook of tradition vs. technology into one that preaches ‘technology to aid tradition’. With the coming of modern science, traditional science has been disregarded. Instead of discarding infrastructure and knowledge that has been built over centuries, we need to use modern technology to re-link these distanced phenomena. The story behind temple tanks gives us clues and pointers to where and how we can save and improve our existing dire situation.

Some of the important points can be summed up as follows:

**Rainwater harvesting:** It is felt that, rainwater harvesting is the Mantra for the new millennium. There is no pollution, no transportation cost, less storage cost etc. has made this technique essential one. Rainwater harvesting provides an independent water supply during regional water restrictions, and in developed countries, is often used to supplement the main supply. It provides water when a drought occurs, can help mitigate flooding of low-lying areas, and reduces demand on wells which may enable groundwater levels to be sustained. It also helps in the availability of potable water, as rainwater is substantially free of salinity and other salts. Application of rainwater harvesting in urban water system provides a substantial benefit for both water supply and wastewater subsystems by reducing the need for clean water in water distribution system, less generated storm water in sewer system, and a reduction in storm water runoff polluting freshwater bodies.

**Water reuse:** Water shortage has become an increasingly difficult problem to manage. More than 40% of the world's population live in a region where the demand for water exceeds its supply. The imbalance between supply and demand, along with persisting issues such as climate change and exponential population growth, has made water reuse a necessary method for conserving water.

**Importance of Water conservation:** Fresh, clean water is a limited resource. While most of the planet is covered in water, it is salt water that can only be consumed by humans and other species after undergoing desalination, which is an expensive process. Occurrences such as droughts further limit access to clean and fresh water, meaning people need to take steps to reduce water use and save as much water as possible. In some areas of the world, access to water is limited due to contamination. People who have access to fresh water can take steps to limit their use of water to avoid waste.

**Educational resources for water conservation:** Teachers who wish to teach students about the importance of water conservation can find plenty of lesson plans and activities online. The lessons teach students the importance of saving water and provide tips for saving water at home or school

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