

Temple tanks – the ancient water harvesting systems of Kerala and their multifarious roles

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Kerala, the peninsular state of India is a typical cultural zone, with innumerable temples, about 5000 in number. Each temple, in most instances, has attached to it a sacred tank, into which surplus water is harvested during monsoon seasons. A closer look into these ubiquitous structures reveals that apart from serving as mere water harvesting systems, these have other important roles to play which are briefly enumerated in the present paper.

Keywords: Temple tanks, Traditional water harvesting systems.

Kerala state covers an area of 38, 863 sq km forming a long narrow strip nearly 550 km long, bordered by the Arabian sea on the west and western ghats on the east. It constitutes the southern half of the west coast of India and lies between 8° 18'–12° 48' latitude and 74° 52'–77° 22' meridian.

Kerala is gifted with nature's bounty of water resources, with its major rivers interconnecting backwaters and canals, and umpteen tanks and lakes of diverse areas and capacities. But the ever burgeoning population, disappearing paddy fields, coming up plantations of cash crops and erratic monsoons are likely to lead to water crisis in this millenium. This threat had led to different opinions among experts regarding water storage, one group believing in large storage in the form of reservoirs, while

the second group being ecologically sensitive, insists that small storage tanks make far more sense as they are less expensive and can be controlled by the local people. This second concept takes us to the traditional water harvesting systems present in every village of Kerala.

The Temple tanks/Sacred tanks

In Kerala, temples have historically played an important role in harvesting their surplus water in tanks; every village has at least one temple, associated with each of which is a 'Sacred grove' ('Kaavu') and a 'Sacred tank' ('Kulam'/'Thirtham'). For every pond, there was an unwritten dictum among the local folks, as to the traditional practice of maintenance of tanks, which sluice to be opened and how one would ration water in times of shortage. Apart from serving

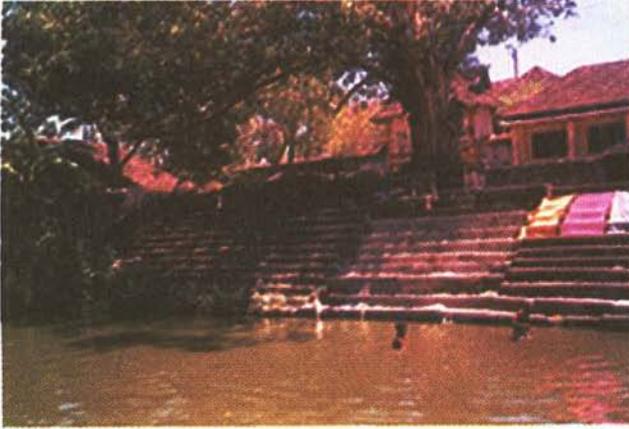


Fig.1 (Top)— A typical Kerala temple with a sacred tank.



Fig. 2 (Middle)— A temple tank - a potential potable water resource.

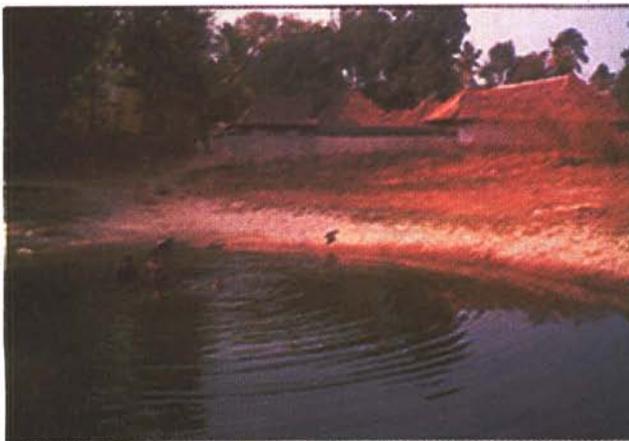


Fig. 3 (Bottom)— A sacred tank used as a swimming pool by the locals.

as water harvesting devices, these tanks are found to facilitate the growth of a wide variety of plants ranging from herbs to hefty tree species in the surrounding moist banks, as well as algal and other aquatic vegetation in the water.

The indigenous temple style of Kerala is characterised by its gabled roofs made of timber and tiles (Fig.1). The temple can be square, rectangular or circular in plan, based on which the shape and size of the tank is decided. Hence larger temples have larger tanks. Most of the larger tanks in the ancient times were found to have inlets and outlets, with sluices to control the inflow and outflow of water. This aided in the constant circulation of water, with a constant flushing out of polluted water and inflow of freshwater (rain/river water). Besides, there were also canals interconnecting a few tanks together¹.

With the advent of bore wells and modern water distribution systems, with the inlets and outlets clogged, walls dilapidated and overgrown by plants, many of the tanks have been reduced to mere functional legacies of the past. Consequently, the quality of water has also been reduced greatly due to eutrophication and growth of microorganisms.

Though the sacred groves of Kerala have been subjected to detailed investigations¹⁻⁵, the adjoining ponds have been least studied structures. And since Kerala has about 5000 temples, each one in most instances having a sacred tank attached, a project was undertaken to study the temple tanks of southern Kerala, on various aspects such

as hydrography, planktonology, biodiversity and economic importance of these structures. The present work enumerates some of the most important utilitarian values of temple tanks of Kerala.

Method of study

Extensive field trips were undertaken to survey and inventorise the temple tanks of 4 southern districts of Kerala, viz, Thiruvananthapuram, Kollam, Alapuzha and Ernakulam. Data were collected on the biodiversity of the tanks along with analysis of hydrographic parameters. Interviews with the local communities of people living in proximity to the tanks were conducted to gather information on the importance of the tanks in regard to their utilitarian aspects.

Importance of Temple Tanks.

The present study reveals that a temple tank, apart from being a religious relic and a mere water harvesting structure, has multifarious roles to play. Some of the most important aspects are enumerated here.

As sources of potable water—From time immemorial, temple tanks have been used as potable water resources, since many of these tanks, especially in the ancient days, were clean due to their restricted use. Studies⁶ show that many of the tanks can be converted into potable water resources for a few neighbouring localities after passing water through a simple and slow sand filter (Fig. 2).

As swimming pools—Many of the tanks, especially the larger ones have been used

as swimming pools by the local communities of people since ancient times, usually a separate bathing ghat being reserved for the priest of the temple. Thus these structures serve as grounds for social and cultural interactions for the local residents (Fig. 3).

As pockets of biodiversity—Most of the temple tanks having perennial water source help to keep the surroundings moist and cool and harbour dense and varied flora. Those tanks which dry up during summer also harbour a variety of previous annuals during the rainy season. Around huge tanks with granite walls are seen trees like *Vateria indica*, *Gagarcinia gummiguttata*, and lianes like *Piper nigrum*, *Tinospora cordifolia*, *Tiliocora acuminata*, etc. to name a few. A survey of more than 200 temple tanks of southern Kerala⁷ revealed that these tanks with their moist cool banks are repositories for different species of angiosperms (as many as 325 bank species and 20 aquatic species), ferns, fern allies, algae and other hydrophytes. The flora are in turn found to support various animals including visiting birds and butterflies, fishes, frogs, sponges, worms and zooplankton.

As pockets for preservation and multiplication of medicinal plant flora—The survey of the temple tanks of Kerala shows that the tanks shelter in their vicinity several medicinal plants of great value not only for primary health care of village communities, but also those important in pharmacopoeia. Table 1 enlists some of the commonly occurring plants in and around the temple tanks.

Table 1 — Flora of temple tanks — common representatives

A. Angiosperms	<i>Saraca indica</i> L.**
	<i>Nymphaea stellata</i> Willd.*
<i>Achyranthes aspera</i> L.	<i>Hydrilla verticillata</i> (Linn.f.) Royle*
<i>Alstonia scholaris</i> R.Br. **	
<i>Biophytum sensitivum</i> DC.	B. Pteridophytes
<i>Blumea wightiana</i> DC.	<i>Azolla filiculoides</i> Lam.
<i>Calophyllum inophyllum</i> L. **	<i>Lygodium microphyllum</i> (Caw.) R.Br.
<i>Cleome viscosa</i> L.	<i>Pteris vittata</i> Scop.
<i>Cyanodon dactylon</i> Pers.	<i>Salvinia molesta</i> Mitsch.
<i>Cyperus rotundus</i> L.	
<i>Eclipta alba</i> Hassk.	C. Bryophytes
<i>Ficus benghalensis</i> L. **	<i>Riccia</i> sp.*
<i>Euphorbia hirta</i> L.	<i>Anthoceros</i> sp.
<i>Hibiscus subdariffa</i> L.	<i>Funaria pulchra</i> Dix & P. Vard
<i>Holigarna arnottiana</i> Hook.f. **	
<i>Ipomea aquatica</i> Forsk.	D. Algae
<i>Leucas biflora</i> R.Br.	<i>Chara</i> spp.*
<i>Melochia corchorifolia</i> L.	
<i>Ocimum sanctum</i> L.	<i>Nitella polycarpa</i> Pal *
<i>Portulaca oleracea</i> L.	<i>Spirogyra</i> spp.*
<i>Phyllanthus amarus</i> Schum & Thorn	<i>Oedogonium</i> spp.*

*Aquatic species

**Trees

Information gathered from the local communities indicates that many of the tanks are several hundreds of years old and the medicinal flora of these structures have been used variously since antiquity, the information being passed on from generation to generation. Table 2

Table 2—Some medicinal plants around temple tanks and their uses

Botanical Name	Local Name	Important Uses
<i>Acalypha indica</i> L.	'Kuppameni'	Bronchial infections, Skin ailments.
<i>Aerva lanata</i> Juss.	'Balipushpam'	Plant diuretic; flowers in religious rituals
<i>Andrographis paniculata</i> Nees	'Kiriyaathu'	Whole plant in fever, roots and leaves anthelmintic, tonic
<i>Bacopa monieri</i> Pennell	'Brahmi'	Hair tonic, dried leaf powder for nervous disorders
<i>Biophytum sensitivum</i> DC.	'Mukkutti'	Plant as antiseptic
<i>Boerhaavia diffusa</i> Linn.	'Thazhuthaama'	Root purgative, anthelmintic, leaf juice for jaundice
<i>Cassia angustifolia</i> Vahl	'Nilavaaka'	Plant used as laxative, root antidiabetic, fruit aphrodisiac
<i>Cyanodon dactylon</i> Pers.	'Karuka'	Fresh juice used as diuretic
<i>Desmodium triflorum</i> (L.) DC.	'Cherupulladi'	Roots carminative, tonic, diuretic
<i>Eclipta prostrata</i> L.	'Kayyonni'	Plant as hair tonic
<i>Emilia sonchifolia</i> (L.) DC.	'Muyal cheviyan'	Herb used for diarrhoea & night blindness
<i>Heliotropium indicum</i> L.	—	Leaf juice on wounds, sores & boils, antiseptic
<i>Leuccas aspera</i> Spr.	'Thumba'	Plant as anti-insect poison; leaf juice in skin afflictions; flowers with honey for coughs and colds
<i>Mimosa pudica</i> Linn.	'Thottavaadi'	Whole plant as aphrodisiac, blood purifier
<i>Mollugo cerviciana</i> Ser.	'Parpadagam'	Herb as stomachic, antiseptic, flowers for fever
<i>Nelumbo nucifera</i> Gaertn.	'Thaamara'	Fruits, torus and carpels as tonic, digestive; rhizome paste against ring worm
<i>Ocimum sanctum</i> L.	'Thulasi'	Whole plant antibacterial, insecticidal, used in colds and coughs, leaf in skin diseases
<i>Oxalis corniculata</i> Linn.	'Puliyaarila'	Leaf infusion for fever, dysentery, dyspepsia.
<i>Phyllanthus amarus</i> Schum & Thorn	'Keezharnelli'	Plant decoction against jaundice'
<i>Physalis minima</i> L.	'Nnjottanjodian'	Fruit as tonic, diuretic
<i>Pistia stratiotes</i> L.	'Akaasa thaamara'	Leaves and roots as expectorant & diuretic; whole plant as bug destroyer
<i>Scoparia dulcis</i> L.	'Kallurucki'	Root infusion in treating urinary stones
<i>Saraca indica</i> L.	'Asokam'	Bark in uterine afflictions
<i>Sida cordifolia</i> Linn.	'Velluram'	Whole plant as hair tonic
<i>Zizyphus oenoplia</i> (L.) Mill.	'Kaattuvalli'	Root bark promotes healing of wounds

furnishes some of the medicinal plants associated with the temple tanks and their important uses.

Very rarely only temple tanks are exposed to industrial or sewage pollution, though mild pollution occurs in some

tanks, which are used for bathing or washing clothes. Many temples can boast of tanks which are reserved only for the rituals in the temples. And naturally the significant advantage of these plants is that they are growing in clean and

hygienic surroundings and hence free from contamination of heavy metals and industrial pollution.

As aesthetics—Last but not least, the temple tanks with placid water, lush growth of various types of plants around and cool breeze, act as a recreational grounds in the midst of concrete structures of the city, where the local residents are often found to sit and relax in the evenings.

Conclusion

The present study shows that the most neglected temple tanks have multifarious role to play such as being repositories of rich and varied plant species, which in turn support an assemblage of faunal population; as sources of potable water, aesthetics, recreational grounds and structures preserving medicinal flora.

The preservation of temple tanks involves two processes, viz. conservation of biodiversity, and maintenance of tanks and quality of water through periodic checking linked with eco-amelioration activities. And this can be probably achieved by encouraging active participation of local communities who are familiar with tank morphometry/architecture, and the changes that have happened down the decades.

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