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The Circuit of Life: Water and Water Reservoirs in Pre-modern India

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The problem of water availability was a pivotal facet of daily life, particularly in urban areas, where it had to be made perennially obtainable in large quantities. Thus, apart from river water, artificial water reservoirs of massive proportions, and also step wells were constructed on a great scale in most parts of the country. These reservoirs were replenished by the annual monsoons, and considerable efforts were made to manage water conservation and its supply to the city areas. European observers were struck by the remarkable architecture of these reservoirs and the role of the communities, officials, and individuals, in their construction and upkeep. Water could also become an instrument of conflict between European personnel and Indian officials; while its conservation brought to surface the rigid sociological and community problems related to the use of water.

The young English chaplain Edward Terry who was attached to the embassy of Sir Thomas Roe (1615–19), sent to the court of the Mughal emperor Jehangir, was a perceptive man. During his travels across Gujarat, Malwa and Rajputana, he took notice of the water sources at various places, particularly in the urban centres, and was struck by the widespread prevalence of artificial water reservoirs. Terry noted: ‘They have many ponds which they call tanques, some of them more than a mile or two in compass, made round or square, girt about with faire stone walls, within which are steps of well squared stone which encompass the water, for men every way to go downe and take it.’¹

Water from all kinds of sources—rivers, wells, streams, ponds—was a critical necessity in a population intensive country such as India. Contemporaries also observed that there were interesting variations in the preference for the water people drank. The English ambassador Sir Thomas Roe, who spent almost four years in India, remarked that the attitude of the Indians was governed by ‘constant received customes’, ‘where some drinke only raine-water, some of a holy river, some none but what is fetched by their own caste.’²

¹ Foster (1999: 299–300), Edward Terry’s Account.

² Purchas (1905: 417), Account of Sir Thomas Roe.

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The character and nature of water mattered a lot. There could, in fact, be a kind of ritualistic fetish about the water consumed by people in some regions. The particular preference and reliance on water from reservoirs, or tank water, as an option to river water and water wells, was due to the prevalent social belief in the Gujarat region that water that fell from the heavens had greater sanctity. Another English chaplain John Ovington who was posted at the Surat factory in the 1680s noted: 'The Bannian [or Hindus in general] seldom drinks of the common water of the wells or Rivers, only what falls from Heaven in the time of the Mussouns, which is preserved in large Tanques and Cisterns made on purpose to receive it, and keep it for their use the following year... he confines his Draught to those Heavenly Showers, which he esteems a more pure and Ethereal Liquor for descending from above.'³

This article focuses on the study of water storage reservoirs or tanks, particularly those appended to urban centres, which they served for their routine needs of water consumption. Some attention has also been given to the role of reservoirs as sources of agrarian irrigation in south India, where tanks played a very significant multi-purpose role. But the primary concern is to examine the dynamics of water conservation and its supply in the urban areas. In this context there is considerable information on Gujarat, which a large number of Europeans took notice of. Similarly, information also emerges concerning towns in Western India and the Deccan, located along the principal routes in the empire, which was reported by many travellers. This article also utilizes information available on the Qutubshahi capital of Golconda—Bagnagar, pertaining to water storage.

With reference to the role of water reservoirs, Irfan Habib points out that tanks were particularly in use in the Deccan, though water wells were the most ubiquitous source of supply in several parts of the country.⁴ An important recent study on tank irrigation during the medieval and the subsequent phase is by David Mosse, appropriately titled 'The Rule of Water', which pertains to South India. It studies the role of the state, regional elites and local communities in the construction and use of water reservoirs, which strongly influenced the pattern of their equations and relationships.⁵ We shall examine it briefly while studying the role of tanks in South India.

In upper India and the Indus basin, greater use was made of canals rather than tanks, since the Himalayan glaciers were able to feed extensive riverine systems, which could support networks of canal irrigation. In the context of the Punjab, which had leaner monsoons, Tripta Wahi refers to the agricultural activity as 'a gamble in rainfall'. Consequently she points out that the medieval state, from the thirteenth till the seventeenth century, sought to promote canal irrigation in Punjab. But a more extensive perennial system of canal irrigation was laid out in the

³ Rawlingson (1929: 183).

⁴ See Habib (1962: 28); Also see Habib (1999).

⁵ Mosse (2003).

nineteenth century, by the British to augment agricultural productivity.⁶ Similarly, David Gilmartin argues that in the Indus basin ‘the British built large new irrigation works to increase colonial revenues’.⁷ In this context D’Souza’s survey essay concerning water in British India is useful.⁸

In upper India, particularly in the Gangetic plains, water wells were used commonly and most extensively. Wells were particularly useful in areas of dense settlement as they provided easy and simple access, in comparison to rivers and canals, which were a little distant from habitation areas.⁹ The profusion of water wells in important cities, in a region where the water table was high, emerges from the account of Thevenot while referring to the imperial city of Agra in the 1660. He noted, ‘There are above eight hundred Baths in the Town’.¹⁰ The term ‘Bath’ here appears to be confusion in translation, and almost certainly refers to the water wells which were located in all the *Mohallas* or localities of the city as they catered to the copious daily needs of the town dwellers. The large platforms around the wells were used for sundry chores such as bathing or washing, which possibly led him to refer to them as baths.

David Hardiman’s study pertaining to eighteenth and nineteenth century western India also indicates a fair prevalence of water wells in the region. He points out that water was available from 12 to 15 metres depth, which was used to irrigate fields up to a distance of 2 to 4 *koss*, to augment productivity.¹¹ But Thevenot, who travelled around extensively in Gujarat stated on the contrary, that ‘Wells being rare in that Country, there is an extreme need of these public reservatories.’¹² By and large, evidence from contemporaries indicates that greater reliance was placed upon the community water tanks to satisfy the requirements of the populace, particularly in urban areas.

Good Tank Water

Tank water enjoyed a certain premium compared to river and well water in western India, which could become brackish in the coastal regions. Greater reliance was placed upon it due to its superior water quality and purity. Edward Terry was unequivocal about the preference for good tank water. He noted: ‘That most ancient and innocent drink of the world, water, is the common drink of East-India, it is far more pleasant and sweet than our water; and must needs be so because in all hot countries it is more rarified, better digested and freed from its rawness by the heat

⁶ Wahi (1997: 267–84).

⁷ Gilmartin (1994: 1127–49).

⁸ D’Souza (2006: 621–28).

⁹ Ibid.

¹⁰ Sen (1949: 48).

¹¹ Hardiman (2006: 323–61).

¹² Sen (1949: 10).

of the sun, and therefore in those parts it is more desired of all [waters]... and agrees with men's bodies'.¹³

Several factors necessitated and encouraged the construction and utilization of tanks as water sources, particularly in western and peninsular India. Many parts of the country were semi-arid, having limited availability of water particularly in the lean summer months, prior to the onset of the monsoons. The Italian Pietro Della Valle noted during his travels in Gujarat: 'Rivers are not in all places; and other running waters and springs there are scarce any, especially in the more inland parts remote from the sea.'¹⁴ This inadequacy led to the construction of huge water reservoirs which Pietro Della Valle found in several places such as Surat, Broach, Cambay, Ahmedabad and Sarkhej.¹⁵

While interior Gujarat was relatively arid, the Konkan coast received a considerable amount of rain. But still tank water was generally preferred. The English doctor John Fryer noted during his travels in the Bombay region in the 1670s: 'There are no Fresh Water Rivers or falling streams of living Water: The Water drank is usually Rain Water preserved in Tanks, which decayed they are forced to dig wells.'¹⁶ This was due to the fact that several of the coastal regions were afflicted with the problem of the river water being brackish due to the proximity and influence of the sea. The much travelled doctor Fryer had a similar observation to make about the east coast of India. Referring to the mega-port of Musulipattam in Northern Coromandel he observed, 'The water they drink they dig for, not they are without Rivers, but they are brackish.'¹⁷

The Tapti River which was the crucial lifeline of the town of Surat, was also known to be brackish, and it's water unfit for drinking. The Frenchman Jean de Thevenot who visited Surat in 1666, had the following observation to make: 'The River Tapti is always brackish at Surat and therefore the Inhabitants make no use of it, neither for Drink nor Watering of their Grounds but only for washing their Bodies'.¹⁸ Thus there were several categories and grades of water having differing levels of purity and utility—sea water, river water, well water and tank water. The essential purpose was to find readily available water in huge quantities, which was good and wholesome, and could be stored over long periods.

A comprehensive explanation about the problem of brackishness of the rivers, in the coastal areas, was provided by Pietro Della Valle, who studied this aspect during his travels from Surat to Cambay, and subsequently southwards from Surat to Goa. He noted that 'the Tide of the Sea at ebbing and flowing being here [along west coast] very strong and overcoming that of the Rivers, hence it comes to pass

¹³ Foster (1999: 100), Edward Terry's account.

¹⁴ Grey (1895: 32).

¹⁵ Ibid., pp. 67, 69, 96, 104, 119.

¹⁶ Crooke (1992: 173), Vol. I.

¹⁷ Ibid., Vol. I, p. 99.

¹⁸ Sen (1949: 37).

that it's hardly perceived whether they have any stream or no; and the water going very far into the land likewise comes to be salt.'¹⁹

In fact, even the rivers and rivulets which were inland in the Deccan region could become brackish, particularly in the pre-monsoon phase. The Englishman William Finch, who travelled from Surat to Agra, via the Deccan route passing through Burhanpur, in February 1609, was distressed with the water of the Buray River. He recorded: 'On the further side of Sindkerry [Sindhkhera] runneth a river of brackish water, with drinking whereof I got the bloody fluxe which accompanied me to Bramport [i.e., Burhanpur].'²⁰ Similarly Francois Bernier remarked that in parts of the eastern Deccan Bijapur region, 'the country on the side of the Great Mughals territories [had] ... scarcity both of forage and of good wholesome water.'²¹

Consequently greater reliance was placed on rainwater stored in large reservoirs or tanks, which was deemed to be fresher and more useful. This pronounced preference for rain-filled fresh water significantly influenced the pattern of conservation, and the architectural forms it would evolve. The management of water became a pivotal facet of everyday life, as well as of the seasonal cycles, which determined its accumulation, flow, retention and utilization. Moreover it became a matter of community enterprise, official initiative and individual philanthropy to construct and maintain water reservoirs, to serve people's requirements, particularly near urban settlements which had a greater population density.

It was not merely the mammoth physicality and the good quality of stored water of these tanks that impressed the numerous travellers and contemporaries. It was the conceptual purpose, the functional logistics, and above all the architectural splendour and their ubiquitous presence that made them remarkable and unique. There was hardly any foreign voyager who did not take note of them in their accounts. Della Valle described the reservoir near Ahmedabad as 'a great Artificial lake ... made of stone, with stairs at several angles about it; its Diameter was by my conjecture about half a mile. It hath about the middle an Island with a little Garden, to which they go by a handsome bridge of many Arches.'²²

Much money was spent in constructing the water tanks and bestowing upon them an aura of architectural extravagance and refinement. Writing about the famous water tank outside Surat, Thevenot noted that it was 'begun at the same time as the [Surat] Caste was, and the one cost as much as the other. It is certainly a work worthy of a king and it may be compared to the fairest that the Romans ever made for publick benefit.'²³

¹⁹ Grey (1895: 65).

²⁰ Purchas (1905: 31) Vol. IV, Observations of William Finch.

²¹ Constable (1972: 197).

²² Grey (1895: 102).

²³ Sen (1949: 35).

Artificial reservoirs were different from natural lakes and ponds, which were useful in rural as well as urban locations. The large artificial reservoirs were constructed by utilizing the topographical irregularities of the region and constructing dams to hold river water and rainwater, on a massive scale.²⁴ The stone paved tanks or reservoirs primarily depended upon the monsoonal rains to regenerate themselves, as did the massive agrarian reservoirs. The natural lakes were different as they were part of an ecological structure of wetlands, which were supported by seasonal rainfall, rivers and streams.

Natural lakes too attracted habitation and settlement in their vicinity. Tavernier recorded during his travels in the Deccan, 'Aurangabad was formerly only a village of which Aurangzeb has made a town which is not enclosed. He made this notable increase both on account of a lake of 2 coss [about five miles] in circuit, upon which the village was built, and in memory of his first wife who died there.'²⁵ The person Tavernier referred to was actually Aurangzeb's favourite consort Zainabadi Begum, who was 'buried at the end of the lake on the western side where the King has built a mosque with a splendid tomb and a fine caravanserai.'²⁶ The French director Francois Martin who passed by Aurangabad on his way to Surat in July 1681, described it as 'a new city that was well populated; there is a grand lake next to it.'²⁷

By and large in India natural lakes were not numerous; consequently, greater dependence had to be placed on artificial reservoirs that were necessary to augment and sustain the process of urbanization. In fact hardly any town of standing and substance was found without its water reservoir in close proximity to cater to the dense population. Edward Terry noted the connection between these two facets: 'These great receptacles of water are made near places that are very populous, filled when that long season, before spoken of comes, immediately before which time they cleanse them that water may be more clear and wholesome.'²⁸

The water tank was thus also a symbol of community involvement, and considerable care was taken to keep it clean, at the end of the seasonal cycle. The onset of the monsoons served to replenish and store water for the next annual circuit. No wonder the failure of the monsoons adversely impacted on society by creating water shortages, in addition to the macabre shadow it cast upon agrarian activity in the countryside. Water was the pivotal ingredient that turned the circuit of life. Hence it was necessary to store it in large quantities, with meticulous planning, season after season.

The building of a water reservoir was amongst the first major concerns in urban planning, particularly in places where a wholesome perennial river did not exist

²⁴ See Stein (1980: 23–25).

²⁵ Crooke (2006).

²⁶ Ibid.

²⁷ Martineau, *Memoires* (1931–34), Vol. II, p. 259.

²⁸ Foster (1999: 188), Edward Terry's account.

in proximity. Emperor Akbar made considerable efforts to provide water and to give a salutary ambience to Fatehpur Sikri, where environmental constraints, such as a rocky and semi-arid terrain were not conducive to facile urban growth. The Jesuit priest Father Monserrate who stayed there in the 1580s, some years after the fort-city complex was built, remarked upon the careful efforts made for conserving and managing water. He noted: 'To supply the city with water, a tank has been carefully and laboriously constructed two miles long and half a mile wide'.²⁹ Akbar took an active interest and gave directions in the construction work, similar to the role exercised by the ruler of Vijaynagar in tank building activity near the city.³⁰ 'The work was performed by the King's direction in the following manner. Across the end of a low lying valley which was filled with water in the rains ... a great dam was slowly built. By this means not only was a copious supply of water assured, but the discomfort of the climate was mitigated. For when the sun gets low in the sky, the heat which in Fattepuram is very great, is tempered by a cool and pleasant breeze blowing over the tank'.³¹ Thus massive water reservoirs also acted as a kind of environmental antidote to the harsh hot climate for the town dweller, and also a point of retreat and solace.

Ablutions and Water Culture

In India, which had a harsh tropical climate, the socio-cultural practices strongly favoured a pronounced water culture, characterized by elaborate rituals of bathing and washing. Water was constantly required in copious quantities due to the elaborate ritual ablutions, and the prescriptive hygiene norms of Hindu society, that were particularly binding on the so called 'upper castes', but were followed or emulated by all others. This pre-occupation with unusual hygiene rituals was remarked upon by several contemporaries. The Italian Gemelli Careri noted at Bassein in the 1690s that most of the inhabitants 'rubs his Teeth every morning betimes with a stick and spends two hours at that work according to the Custom of the country.'³²

Another Italian voyager Ludovico di Varthema of Bologna who visited India almost two centuries earlier, noted during his stay in the Malabar region, 'Early in the morning these pagans go to wash at a tank, which tank is a pond of still water. And when they are washed, they may not touch any person until they have said their prayers.'³³ Only after this ritual purification the process of eating and

²⁹ Banerjee (2003: 31).

³⁰ Sewell (1962: 244–45).

³¹ Banerjee (2003: 31).

³² Sen (1949: 168).

³³ Temple (1928: 60).

other routine functions began. Varthema's observation underlined the basic importance of ritual ablutions and of the water tanks in the life of people. Edward Terry similarly observed, 'Both men and women wash their bodies every day before they eat.'³⁴

An important compilation of traditional Gujrati sources known as the 'Ras Mala', highlighted the integral role of the water reservoir in the urban planning and the civic life of people. It states 'A river or large artificial reservoir is the usual accompaniment of every town of any consideration.' It states further: 'Brahmins and Bhagats [i.e., religious persons] are frequently under the vow to bathe before sun-rise, in which case as soon as they are risen, and have said their prayers, they either bathe in warm water at home, or set off for that purpose to the tank and the river'.³⁵

Thus in examining the pattern of 'la vie quotidienne', or the structure of everyday life, the proximate water sources were vital factors in the functioning of the life system. Thevenot who visited India in 1666 also remarked that a visit to the river was virtually mandatory for most of the able bodied town dwellers. He noted that many of the inhabitants of Surat went to River Tapti 'For washing their Bodies, which they do every morning as all other Indians do.'³⁶ However most of the women folk, the children, the elderly and several others did not go to the river but obtained their water requirements at home, to undergo the daily regimen of ritual washing. The English chaplain John Ovington who was very perceptive, in fact, remarked that the washing ritual was observed by all twice daily. He noted: 'They are constant in their washings, either in the River Tappy [i.e., Tapti] which runs by the walls of Surat, or in their own Houses before they stir abroad.... And all their Infants, even in their tender years, are washt all over both Morning and Evening'.³⁷

The Indian way of live with its daily rituals, and tenets of hygiene adherence was centred around the water culture. The pre-modern society which had limited access to dependable medical support systems, or remedies against disease, sought to create its own codes to counter such problems. And the solution to a certain extent was found in the fostering of a hygiene culture based on the usage of water. Ovington noted insightfully, 'Their constant Ablutions and daily washings, their Abstinence from Animals [i.e. meat] and wine had doubtless a prospect more than what was merely Religious in it; they were not imprudently designed upon a Civil Account to keep their Organs clear, their Spirits lively ... and to preserve their Bodies Neat and clean by Frequent Bathings and Lustrations'.³⁸ The 'Civil Account' or socio-civic codes that the English chaplain referred to were not based

³⁴ Foster (1999: 322), Edward Terry's account.

³⁵ Forbes (1994: 254).

³⁶ Sen (1949: 37).

³⁷ Rawlingson (1929: 174).

³⁸ Ibid., p. 186.

on strict religious injunctions, but rather had a strong cultural and customary sanctity, which were observed from birth till death. Ovington in fact remarked: 'For there is not one of those Customs which are fastened upon them by the Rules of their Religion, but what comport very well and highly contribute to their Health and Pleasure of their Lives'.³⁹

The tradition-bound structure of daily life nevertheless required water in profuse quantities. Rural society was possibly better equipped, in terms of availability of water resources. But the urban areas and the metropolitan cities depended upon a huge amount of societal input and organization to support such a water culture. The French merchant George Rocques who spent almost two decades in India in the service of the French company in the 1670s and 1680s in Gujarat, noted that a fair amount of family labour was apportioned for the procurement and management of water. George Rocques lived in several towns such as Ahmedabad, Broach, Baroda and Surat, where water came from tanks, step wells and the several water wells, where ecological circumstances favoured their presence.

George Rocques wrote scathingly and somewhat amusedly about the considerable amount of family labour involved in this. In the division of labour within the family, traditionally the burden of water procurement fell upon the women of the house in the middle class households. Rocques noted: 'She is quite occupied with the task of fetching water for the house. It is required in large quantities; the children and the elders wash their bodies before eating anything. This occupation and that of cleaning the house keeps her tied down with little time for other things'.⁴⁰

The management of water thus became an aspect of structured drudgery for the lady of the household, particularly in the middle class and lower middle class families where there was no support from menial workers to do routine chores. To alleviate the feeling of drudgery that could be involved, water conveniently became an object of deification and reverence. It was perhaps also intended to placate the womenfolk that this work function they performed was not a mere tedious chore but a noble act, akin to piety, which was tantamount to some spiritual service to God, and to the family and the household.

Domestic Water Tanks

It was an intensely basic human and social necessity to have water available in close proximity due to its constant requirement in daily life. A sense of command over water availability would distinguish a man of substance from the ordinary man whose routine ability to procure and store water was limited to a few metal or clay pots. But the richer urban citizenry spent well in conserving water for their needs. The French doctor Dellon who spent some time in western India in the 1670s noted while describing the city mansions of the bourgeoisie at Surat,

³⁹ Ibid.

⁴⁰ Rocques (1996: 30).

‘There are water tanks made of remarkable stone work in the houses of the rich, and even the common people; they serve the Indians in their religious rituals and for moderating the harshness of the climate.’⁴¹ What Dellon meant by ‘common people’ referred to the middle class—traders, brokers, officials—and not to the working class or artisans, who lived in houses of mud and thatch and were scarcely in a position to have water tanks of their own.

In most parts of India the affluent and influential segments of society laid considerable stress on facilities of water storage in the form of tanks or wells. In Europe by the late medieval phase the water wells had become an important part of the houses of the rich: ‘Some houses had private wells which obviated the need for the women of the house to fetch water from a spring, river or fountain.’⁴²

In India the water tank was an integral part of urban architecture and the house plan in the mansions of the wealthy. John Fryer was extremely impressed by the water reservoirs in the houses of the Muslim gentry at Masulipattam on the east coast. Describing the house interior he noted, ‘Within a square court, to which a stately gate house makes a passage in the middle whereof a Tank vaulted [having descending steps] with a flat roof above and on its terrace walks are framed, the one to wash in, in the heat of the day, the other to take the air in the cool of the day; the whole fabrick intire within its self, cover atop Taber like.’⁴³ These tanks were evidently of considerable size which was surmounted by pavilions with pathways for the inmates, particularly the ladies of the household to walk about.

The roof probably also served as a collection point to harness rain water and funnel it through ducts and pipes into the tank to replenish it for a considerable period of time. The storing of water became a great preoccupation in regions where it was scarce, as in parts of Gujarat. The Italian Pietro Della Valle noted that at Cambay urban architecture devoted serious attention to the problem of water storage by trapping it on the roof of houses. While the precise architectural style and method of storage is not fully clear, nonetheless the importance of conservation is evident from Della Valle’s observation, ‘The Houses are roofed with coverings of Tiles and Cisterns, which is the custom in India for the provision of water which falls in such plenty during those three months of the great summer rains.’⁴⁴

The harnessing of rainwater in cisterns made sound sense, to create storage capacity, at the level of the individual households for various purposes. The Dutch Van Linschoten writing in the late sixteenth century about the Indo-Portugese settlements in western India noted, ‘In their gardens have many Cesternes or ponds of water (beautiful of cut stone) wherein they take their delights to swimme and

⁴¹ Dellon (1685: 81).

⁴² Duby (1988: 425–505).

⁴³ Crooke (2006). Book I, 1992, p. 80.

⁴⁴ Grey (1895: 67).

to bathe'.⁴⁵ The European adapted to Indian climatic and environmental conditions by emulating the life style and facilities utilized by the Indian elite. John Fryer noted that the compound of the famous English factory house at Surat was equipped with elaborate water storage features. Inside the spacious factory were 'pleasant tanks, yards and an Hammam [i.e., bathing room] to wash in.'⁴⁶ In fact no affluent habitation space could be conceived of without the water tank and little torrents of water to cool the house interiors. Fryer, referring to the interior house plan of the rich at Surat, remarked that the gateway led to *choultries* or saloons which 'open to some tank of purling water,'⁴⁷ to provide a congenial ambience in the harsh tropical climate.

But only a small part of the citizenry was privileged to have their own water tanks. The overwhelming bulk of the towns-folk relied upon the town reservoir or the community step-wells for their daily needs and supplies of water. And their needs for water were amazingly copious given the elaborate hygiene rituals and customary practices of sanitation, bathing and washing.

The Monsoons

The monsoons served as the lubricant that made the entire circuit of life flow in India. This annual short season of sharp rainfall filled up the numerous river systems and the innumerable rivulets, lakes and reservoirs; charged up the entire water table and the water wells across the continent and replaced the arid sunburnt landscape with a verdant cover, thus enabling the land to sustain high agricultural productivity. As the English company man William Methwold noted, 'violent and long continuing showers cools the earth and revives the parcht roots of the sunburnt plants of the earth.'⁴⁸ The perceptive Italian Pietro Della Valle pointed out, 'were it not for this good rain, India would be in regard of the great heat and drought at this time uninhabitable.'⁴⁹ In fact it was the monsoon that 'render it [India] not onely habitable, but also fertile and most delicious.'⁵⁰ The problem with the monsoons was that 'Rain likewise is very seldom during the whole year saving in that season,... the time of the rain being about three months, beginning about the middle of June.'⁵¹ It was the overwhelming dependence on the rainy season that made it necessary to conserve water for the long dry seasons, to nurture, and to sustain the circuit of life.

⁴⁵ Burnell (1997: 233).

⁴⁶ Crooke (2006). Book I, 1992, p. 214.

⁴⁷ *Ibid.*, p. 325.

⁴⁸ Moreland (1931: 7).

⁴⁹ Grey (1895: 33).

⁵⁰ *Ibid.*

⁵¹ *Ibid.*, pp. 32–33.

Thus, there existed a fragile relationship between the available water resources and the vast requirements of a society that was very populous and highly consumptive in its water needs. This was particularly so in regions which had larger urban components and greater concentration of artisans. In areas that were somewhat arid, a sizeable amount of water needed to be stored. In fact there could be serious problems since ‘the Country is in some parts so scarce of water, many Cities and inhabited places have no other but the rain-water gathered in these great Cisterns which are is capacious that one of the suffices a City for a whole year and more.’⁵²

The Cistern or water tank was an extremely vital component of community life, particularly in places where there were hardly any alternative or supplementary sources of water. As Della Valle pointed out: ‘it not only affords drink to men and animals but also they wash clothes and beasts in it... whereby it comes to pass that in some places the water they have is not over clear; and the rude Indians care not for such delicacies.’⁵³ The Frenchman Thevenot however, differed that there was neglect or an uncaring concern towards the maintenance of the water tanks, which shall be discussed later. But it is correct that rain water stored in the open for a period of 8–9 months tended to deplete severely and spoil in its quality, by the pre-monsoonal phase. John Fryer during his travels in the Maratha country in Junnar, stayed at an old fort, which though well provisioned and garrisoned, suffered severely due to the decaying of water in the tanks. He noted ‘There are other Tanks or Cisterns for water which look nastily Green, Yellow and Red being distilled in the Rains, and in the Heats evaporated to a consistency in some of these Gurs [i.e., Garhs or forts] that water is so bad that they use Onions to correct its unsavoriness.’⁵⁴

Maintaining a tolerable level of cleanliness and purity was a problem, given the fact that a prolonged phase of the hot season intervened till the arrival of the following monsoons. The French director Francois Martin during his overland journey from Pondichery to Surat in the summer of 1681 also remarked about the poor quality of water. Upon reaching the temple town of Manglagiri on 17th June, Martin recorded, ‘We halted in the compound of a grand pagoda; in the forefront was a very beautiful and deep step-well, paved all around with well cut stone. We descended down 80 steps upto the base of the well, the water had a rancid taste and was quite disagreeable to drink. In many part of India travellers suffer greatly due to the bad quality of the waters.’⁵⁵

The ubiquitous water storage tank was a vital component of the urban landscape, and was a critical adjunct of the habitation areas, just as the water-pond was an essential facet of rural society and its habitation spaces. Jean de Thevenot who travelled across Gujarat and the Deccan region noted their presence everywhere and also remarked that considerable care was taken for the maintenance and upkeep

⁵² Ibid., p. 33.

⁵³ Ibid.

⁵⁴ Crooke (1992: 337–38), Vol. I.

⁵⁵ Martineau, *Memoires* (1931–34), Vol. II, 1670, p. 238.

of the tanks. He noted: 'These Tanquiez are Standing Ponds or reservations of Rain-water; there are many of them in the Indies, and commonly there is great care taken in looking after them, because wells being rare in that country, there is an extreme need of these public reservoirs by reason of the continual thirst which the heat causes in all Animals there, and some of them are as big as lakes or large Ponds.'⁵⁶ Thus quite clearly, as Thevenot pointed out, a considerable amount of community effort and care was taken to keep the water tanks in good state of maintenance, to ensure that water was available in good condition. But the harshness of the weather and spells of drought could completely undo community efforts and social purpose in keeping the water wholesome. It was only the bounty of the monsoons that could ensure the plentiful recharging of good water for all.

Geography of the Water Tanks

The requirement for good water was all pervasive. In fact the well-being of a region and the very existence of a town depended upon the nature and quality of its waters. In describing a region and its settlements, contemporaries frequently referred to its water sources as a crucial factor in gauging its worth. For example the English traveller Ralph Fitch (1583–91) describing the capital city of Golconda noted, 'It is a very faire Towne, pleasant with faire houses of Bricke and Timber, it aboundeth with great store of Fruits and fresh water.'⁵⁷ In fact travellers diligently sought information and recorded the availability of good water at places which became reputed as desirable destinations or halting points on their journey. William Finch during his onward journey from Lahore around 1610, wrote about the town of Hassan Abdal in the Afghan country that it was 'a pleasant Towne with a small River and many faire Tanks, the water so clear that you may see a penny in the bottome'.⁵⁸

By and large the presence of tanks also symbolized the presence of fresh water. The absence of tanks indicated, to some extent, the inadequacy of the region and its environmental resources to harness fresh water. The young English Company-man, Nicholas Withington who was in India between 1612 and 1616, made a tough overland journey from Sindh to Gujarat across the desert route. After leaving the town of 'Nagar Parker, another six *koss* further they came across a tank or pond of fresh water, where they halted at night. Thereafter they only came across deep wells with brackish water which he drank, with great difficulty, mixed with buttermilk.⁵⁹ The water tank virtually constituted the frontier sign post between habitational comfort and the rugged difficult terrain.

Water was stored in all kinds of places due to its constant requirement, and put to many kinds of uses due to its multi-faceted value. The deep and wide moats

⁵⁶ Sen (1949: 10).

⁵⁷ Purchas (1905: 172), Observations of William Finch.

⁵⁸ *Ibid.*, p. 58.

⁵⁹ Foster (1999: 209–10), Account of Nicholas Withington.

that marked the perimeter of several of the large Indian forts, served as valuable water conservation spaces for their inhabitants. Thevenot's description of the great fort of Golconda illustrates this important facet of water conservation. He noted: 'This fort is of large compass and may be called a Town; the walls of it are built of stones three foot in length and as much in breadth and are surrounded with deep ditches, divided into Tanquies, which are full of fair and good water.'⁶⁰

Water tanks were found everywhere and used for an unusual variety of functions. Dr John Fryer recorded that on the outskirts of Thana, in the Maratha country he rested in the compound of a mosque which had 'Four substantial Pillars of Timber well carved and the Roof all wood....Underneath are fine cool Vaults and stone stairs to descend to a deep Tank where the priest was following the occupation of making such paper as they use.'⁶¹ Fryer described the process of paper manufacturing: 'after he had steeped Cotton rags in water, he by beating brought it into the form of Paper and cutting or slicing the Mass into Sheets were pasting them upon on the Stone sides of the Mosque, next the sun to dry, after which they are polished and glazed, and so made fit for their use'.⁶² Thus the tank built under the inner vault of the mosque which served the pious believers in offering their prayers, also served the faith in making paper for some holy or scriptural use.

The preservation and provision of water in reservoirs of all kinds was an important factor in India and care was taken to cater to the requirements of the urban populace. The cities in Golconda were well served by their hydraulic engineers who could channelize water over long distances, making it available at the palaces and mansions, even piped to the upper storeys. Thevenot observed that at the city palace at Bagnagar, the water rises to the highest apartments. The reservoir of that water which was brought a great way off was in the four towers from where it was conveyed into the house by pipes.⁶³

Water tanks of varying sizes were found everywhere. The Courts of Justice and the prison which were located in the centre of Bagnagar, had two large water ponds facing them to provide solace to the criminals and the prisoners in appropriate symbolism.⁶⁴ Thevenot was impressed by the quarter comprising the caravanserais and the King's Garden which had a large basin [tank] where the Mahometans perform their Ablutions.⁶⁵ Francois Martin who visited Golconda in 1670 also remarked 'these gardens are beautiful, by the standards of this country, are well maintained with their water ponds and water jets.'⁶⁶

⁶⁰ Sen (1949: 137).

⁶¹ Crooke (1992: 351–52), Vol. I.

⁶² Ibid.

⁶³ Sen (1949: 133).

⁶⁴ Ibid., p. 132.

⁶⁵ Ibid., p. 133.

⁶⁶ Martineau, *Memoires* (1931–34), Vol. I, pp. 268–69.

The Grand Tank of Surat

The water reservoir of Surat was a remarkable work of art and science, which formed a strong impression upon the minds of all contemporaries. In the growth of a city, the easy availability of good water, or the lack of it, played a crucial role in determining the urbanization process. The emergence of Surat as an important commercial centre was facilitated by the construction of this grand water tank by a Brahmin official called Gopi, who served in the reigns of Sultan Mohmud Begada, and Sultan Muzaffar in the sixteenth century.⁶⁷ The 'Gopi Tank', as it became known, was one of the signature landmarks of the emerging commercial metropolis in western India. When the English Company's factor John Jourdain reached the city in September 1609 he recorded, 'wee came neere the walls of Suratt near unto a faire tanke or sestron [i.e., cistern] of a mile aboute, full of water, with manga trees rounde aboute it very pleasant.'⁶⁸

The English ambassador Sir Thomas Roe was quite fascinated by the water reservoir at Surat which had unusual and remarkable architectural features. In a letter written to his friend Lord Carew, he wrote in January 1616, 'At Surat there is a tanke for water of free-stone in a polygon forme, of above an hundred sides, every side eight and twenty yards; it hath staires on every side for men to descend, and many stopes [i.e. slopes or descents] for horses. It is a wondrous worke, both for the hugeness and for the brave building.'⁶⁹ The bold and ingenious architecture of the tank led Thomas Roe to refer to it as a brave building. These huge water reservoirs cost enormously to build. But the fact that tank building was viewed as a truly valuable work of piety, suggested that there was no dearth of philanthropic motivation on the part of individuals, representatives of state and religious bodies. As the Italian Pietro Della Valle observed: 'They are made in divers Places by Princes, Gouverneurs of Countries, or other wealthy persons, for the public benefit and works of charity.'⁷⁰

Pietro Della Valle who visited Surat in 1623–24 gave a detailed description of this tank. He noted, 'Of the remarkable things without the city, there is on one side a very large cistern or Artificial pool surrounded with stone-work, and with many sides and angles at which there are stairs, leading down to the surface of the water. In the midst stands a little Island.....The Diametre of this Artificial Lake is two good furlongs.'⁷¹ The principal tank constituted the hub around which several other structures and another water-body existed. Della Valle noted, 'The cistern or lake of Surat hath a great trench adjoynd to it on one side, long large and deep, over which certain small bridges are built; and it falls into another less Cistern a

⁶⁷ See Sen (1949: 32–35).

⁶⁸ Foster (1992: 129–30).

⁶⁹ Foster (1926: 90).

⁷⁰ Grey (1895: 32).

⁷¹ *Ibid.*, p. 32.

good way off, which thought but small here comparatively, would yet be very large in our parts, tis built with many sides of stone like the former, as also the banks of the Trench are Between the great Lake and the less, upon the Trench, stands a Cupola or arched structure, made for the sepulchre of some principal Mahometons of the Country.⁷²

The rapid growth of Surat and the expansion of the city, in the first half of the seventeenth century, created some stress on the existing water supply system. A metropolis such as Surat required several kinds of water sources to sustain itself, due to the constant and large scale requirements of a growing populace. By the time Jean de Thevenot visited the city in 1666, other water sources had also been created, and the grand reservoir fulfilled part of the city's requirements. Thevenot noted, 'the five wells which at present supply the whole town were not found out till long after it [the tank] was built.'⁷³ One of the large step-wells of Surat, which served, the proximate area was described by Thevenot, which he found similar to the grand step-well of Ahmedabad. He wrote: 'Towards the English Burying place there is a great well; a Banian made it for the convenience of Travellers and is of an oblong square figure, like the Well of Ahmedabad.'⁷⁴ Thevenot's description indicates that considerable architectural inputs and expenditure was incurred in their construction. 'There are over it diverse Brick-Arches at some feet distance one from another. Several stairs go down to it, and the light enters by the spaces that are between the Arches, So that one may see very clearly from top to the bottom.'⁷⁵ Inevitably worship and religiosity tended to become associated with water sources since they were nourishers of life. 'On the outside there is the figure of a Red-face but the features are not to be distinguished. The Indians say that it is the Pagod of Madeo [probably Mahadev or Lord Shiva] and the Gentils pay a great Devotion to it.'⁷⁶

Thus the process of urbanization and the demographic growth of Surat, which emerged as the primary commercial metropolis in India, made it necessary to build new water sources. But the aura and grandeur of the grand Tank continued to be remarked upon by subsequent visitors to the city, which also served as a religious site for the Hindu populace. The young French doctor Jacques Dellon who visited Surat in 1670 noted : 'It is of vast extant, one descends by very convenient steps and in the middle of it is a small Pagoda or Temple consecrated to the Gods of the Gentiles : and those who go there for a bath perform these prayers after wards'.⁷⁷

⁷² Ibid., p. 33.

⁷³ Sen (1949: 35).

⁷⁴ Ibid., p. 34.

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Dellon (1685: 85–86).

The Surat water tank continued to address the daily needs of the human and animal population despite the creation of other water sources. The English doctor Fryer who spent a long tenure in the city in the 1670s recorded that near the suburb called 'Pulparra,' 'Is a great Tank without the walls of Surat, a Mile in circumference, walled all about with descending stone steps. In the middle on High Place of the Heathens.'⁷⁸ The water tank was also associated with Islamic buildings in its immediate proximity, without involving any sense of social disharmony. The secular waters of the tank seemed to happily reconcile different religious traditions. Fryer noted 'Many sumptuous [Muslim] Mausoleums are erected near its Brink with Acqueducts to convey water, with which were it filled, the best ship that sums in the sea might ride in it.' The basin below the aqueducts served as a reserve reservoir, which itself was so huge that it could accommodate a large sailing ship. The tank also served as a kind of huge religio-cultural space where people congregated from time to time, on its majestic descending steps. Fryer recorded, 'It looks now more like a circus or Gymnasium, able enough to contain as many [persons] as such spectacles would delight.'⁷⁹

It was not as if extraordinary large numbers of humans and animals lined up at the water reservoirs or wells for their daily requirements of water. In fact, a fairly efficient system of transporting water to the houses of the town dwellers existed in large towns to facilitate this huge requirement. Ironically the sturdy buffalo which according to Hindu tradition was the vehicle of the 'Yamraj', the lord of death, was usually employed to carry water—one of the basic requirements of life—to the households. Edward Terry noted: 'These buffaloes are much employed in carrying large skins of water (for they are very strong beasts) which hang on both sides of them, unto families that want it.'⁸⁰

Apart from the routine daily requirement of water for various purposes, many houses had their own water tanks, in the courtyards or compounds, which were of considerable size. These water tanks needed to be replenished from time to time. For all these massive requirements of water, the buffalo proved very serviceable. As John Ovington pointed out: 'The Buffolo is generally larger than an Ox, but a very sowl intractable Animal, by which means he is useless to the Natives in the convenience of Riding, or of Hackeries, and it generally employed in carrying large Bags of Fresh Water on each side, from the Tanques to the Houses.'⁸¹ But in several parts of India, such as Coromandel, oxen were also used to carry water. Francois Martin pointed out that at Masulipattam the European factories obtained

⁷⁸ Croke (1992: 261), Vol. I.

⁷⁹ Ibid.

⁸⁰ Foster (1999: 88), Edward Terry's account.

⁸¹ Rawlingson (1929: 151).

their water supply on ox-back.⁸² The English factory records for Masulipattam pertaining to the 1670s, also bear this out.⁸³

Water tanks were an equally important feature of the large number of private and public gardens that were located in the outskirts, or the proximate suburbs of cities, such as Surat. They served as spaces of retreat and pleasure for the gentry, who sought the open atmosphere, away from the suffocation and din of the towns. Many of Surat's merchants maintained gardens of their own. Ovington remarked: 'when they take Air, either in Palanquins or otherwise, they usually frequent the coolest Groves, and the pleasant Gardens adjacent to the city, refresh either by the River Tappy or by water conveyed into their Tanks or Ponds.'⁸⁴ The singing and dancing sessions performed by professional entertainers were usually held near the water tanks in the gardens. 'And here the Dancing Wenches or Quenchenies [i.e., Kanchani or Nautch girls] entertain you if you please with their sprightly Motions and soft charming Aspects,' as noted by the perceptive Protestant chaplain.⁸⁵

The water tank also conferred a sense of serenity to the cemeteries and memorials; the final resting places of people. Fryer noted that a mile out of Surat on the way to Broach, were the burial places and cemeteries of the Moors as well as the Europeans. Also 'by the side of a Tank on an ascending Mount' were 'round rising Tombs' or 'Chattris' (Memorial platforms with canopy) of the notable gentiles, and the image of soles of their feet engraved on platforms. These were symbols usually associated with religious personages in Hindu and Jain traditions. The water tank in their proximity imparted tranquility as well as a sense of grandeur to the departed and the dead.

Tank Country: Western India

The entire western Indian macro-zone, particularly Gujarat, was associated with water reservoirs of several kinds. The ubiquitous water storage tank was a vital component of the urban landscape, and was a critical adjunct of these habitation areas, just as the water pond was an important facet of the village and the rural habitational areas. European contemporaries were quite struck with their constant presence, during their travels, since they needed water; and also because these tanks served as good camping sites. Thevenot noted during his voyage from Broach towards Ahmedabad, at Petnad there were 'two great Tanquiez'. He stated, 'there are many of them in the Indies ... because wells being rare in that country [Gujarat] there is an extreme need for these publick reservatories.'⁸⁶

⁸² Martineau, *Memoires* (1931–34), Vol. I, pp. 275–76.

⁸³ Fawcett (1952: 202–05), Vol. I.

⁸⁴ Rawlingson (1929: 152–53).

⁸⁵ *Ibid.*

⁸⁶ Sen (1949: 10).

The city of Cambay was full of water bodies and tanks, though it was in a relatively arid zone. In fact, every region in India had its own kind of contribution to make towards the management of water and the aesthetics related to it. Pietro Della Valle noted that towards the seaside there was a royal garden built by the Gujarati Sultans, whose water channels fed the storage tank of the city. He reported: 'There is running water, which at the entrance falls from a great Kiosk, or covered place to keep it cool, standing upon a great Piscina or Lake contiguous to the Garden on the outside, and serving like that of Surat to the common uses of the City.'⁸⁷ It was perhaps the combination of freshwater rivulet and stored rainwater that fed this lake garden complex, to cater to the requirements of the traditional metropolitan city of Cambay.

Water sources were such a vital necessity that several could be found in a major city. When Pietro Della Valle returned to Cambay after a visit to Ahmedabad in February 1624 he recorded seeing 'another goodly cistern or Lake without the city, formerly not seen, of a square form, and of a sumptuous marble structure, with stairs, about it like the other which I had seen elsewhere.'⁸⁸ Cambay, which had been the principal port for western India during the fifteenth and sixteenth centuries certainly needed an elaborate infrastructure to cater to its vast international clientele of merchants, sojourners and travellers.

As pointed out earlier, water tanks were frequently associated with religious sites, belonging to different faiths and traditions. The lake garden complex on the outskirts of Cambay, near the seaside, also had its alter-ego in the form of a religious shrine on the other side of the water reservoir. Della Valle recorded: 'We went to see upon the same Lake a Meschita [i.e., Masjid] or Temple of the Mahometans, whereunto there is continually a great concourse of people... not only Mahometans but likewise Gentiles.'⁸⁹ What Della Valle referred to was probably a 'dargah' or a shrine and not a prayer mosque. Shrines usually associated with holy personages such as 'sufis', did not have strong formalistic rituals, binding the process of worship. Consequently they attracted an eclectic mix of worshippers belonging to different faiths, and to different stratum of society, who felt quite happy in performing what Della Valle referred to as 'ridiculous and foolish devotions', unhindered by strictly prescriptive rituals or regimen of formal worship.

Similarly Della Valle noted that on the outskirts of Broach he came across 'a handsome structure standing upon a famous Sepulchre', and several lesser tombs in its vicinity'. The former was associated with an eleventh century Saint called Rahan Sahib which was worshipped by the Moors as a sacred thing. This Fabrick

⁸⁷ Grey (1895: 68–69).

⁸⁸ *Ibid.*, p. 104.

⁸⁹ *Ibid.*, p. 69.

is pleasantly seated amongst Trees, something elevated upon the side of a little Lake or great cistern.⁹⁰ Water seemed to have a bonding with spirituality and devotion.

The capital city Ahmedabad and its vicinity, virtually witnessed a celebration of architectural activity and creative beauty associated with the building of reservoirs, step-wells and mausoleum complexes, adjoining many of these water bodies. This architecture was by and large secular in nature, meant to create buildings and structures of common public utility, other than the mausoleums. State patronage, as well as initiative provided by the nobles and merchants ensured that they were built with taste and imagination. Thevenot noted at Ahmedabad, 'I saw a very spacious Reservoir that hath in the middle a lovely Garden fourscore Paces square, into which one enters by a bridge four hundred paces long.'⁹¹ This tank known as Hauz-i-Qutub built in memory of Sultan Qutub-ud-din of Gujarat was completed in A.D. 1451. It was extremely large, and in a remarkable shape having 34 sides, each of which was 190 feet long.⁹² This striving for maturely evolved architecture was also seen in the case of the Surat reservoir which Sir Thomas Roe noted had 'above an hundred sides, every side eight and twenty yards.'⁹³

Pietro Della Valle was very impressed by Ahmedabad's 'Artificial Lake' which was half a mile in diameter with a garden in the middle reached by a 'Bridge of many Arches very well built; upon which I believe two Indian Coaches may go a breast.'⁹⁴ After seeing the aesthetic beauty and architectural grandeur of this tank he observed, 'Indeed these Indian Lakes are goodly things, and may be reckoned amongst the most remarkable structures of the world.'⁹⁵

Apart from the water reservoirs, the step-wells were another major marvel of hydraulic engineering, architectural accomplishment, ecological value and social utility. The 'Great Market' area of Ahmedabad reflected this combination of facets. Pietro Della Valle noted: 'In the middle is a structure of stone athwart the street, like a bridge with three Arches, almost resembling the Triumphal Arches of Rome. A good way beyond this bridge in the middle of the same [street] is a square Piazzetta a little higher than the ground.'⁹⁶ The vast elevated platform around the well conferred some functional space to this public utility, which permitted users to congregate in large numbers. As Della Valle pointed out, 'The water of the Well is of great service to all the city, and there is always a great concourse of people

⁹⁰ Ibid., p. 119.

⁹¹ Sen (1949: 11).

⁹² Ibid., p. 284.

⁹³ Foster (1926: 90).

⁹⁴ Grey (1895: 102).

⁹⁵ Ibid., p. 102.

⁹⁶ Ibid., p. 96.

who come to fetch it'.⁹⁷ The well was an important social institution, particularly for the womenfolk as it provided routine social interaction, a kind of functional life rhythm and physical mobility that was perhaps necessary and meaningful. As the French Company man George Rocques pointed out women had a pivotal role in the management of water resources for the family needs.⁹⁸ The water well created an infrastructure for socialization, and provided a kind of dignified escape from the drudgery of household activities, for the women folk particularly. It was accorded the privileged status of being a sublime chore that gave birth to songs, poetry and simple gaiety in most cultures.

Thevenot who was very impressed with the architecture of the water wells in the region gave a glowing description of one of these. He noted:

Without Ahmedabad there is a lovely well, the figure of it is an oblong square, it is covered with seven Arches of Freestone, that much adorn it: There are six spaces betwixt the Arches that let the light in, and they are called the Mouths of the well. It is four fathom⁹⁹ broad and about four and twenty long. At each end there is a Stair case two Foot broad to go down to it with six stories or landings supported by Pilasters eight foot high: Each Stories hath a Galleries or place of four Fathom extent, and these Galleries and Pilasters are of Freestone. Sixteen Pilasters support each Gallerie, and the Mouths of the well are about the same length and breadth as that the Galleries are: The Figure of the third Mouth differs from the rest because it is an Octagone and has near it a little turning Stair-case that leads down to the well; the water of it rises from a Spring, and it was upto the middle of the fourth story when I came down several little Boys at that time swimming in it from one end to the other amongst the Pillars. The Indians say that the well was made at the charges of a Nurse of a king of Gujerat.¹⁰⁰

The constant need for water, in a water scare society made it virtually an object of veneration. An expression towards valuing and appreciating water was the creation of several storage structures, which were not merely functional utility systems. They were at the same time marvels of architecture, embodiments of functional aesthetics which symbolized great respect and awe for that precious element—water. No wonder Edward Terry remarked, 'Amongst their buildings I must take special notice of their wells and tanks upon both which in very many places they bestow much cost in stone-work.'¹⁰¹ Surat had five major step-wells of which, one was particularly impressive and similar to the one at Ahmedabad.¹⁰²

⁹⁷ Ibid.

⁹⁸ Rocques (1996: 30).

⁹⁹ Fathom (nautical distance) = Six feet.

¹⁰⁰ Sen (1949: 16).

¹⁰¹ Foster (1999: 187).

¹⁰² Sen (1949: 34–35).

The water reservoir was sought for providing solace and life-support during one's lifetime, and also in the afterlife. The stately mausoleums and the tomb—the final resting places of the grand and the mighty—were usually near the water bodies. The English chaplain Edward Terry noted: 'Every Mahometan of qualitie in his lifetime provides a faire sepulcher for himself and kindred, encompassing with a firm wall a good circuit of ground, neere some tanke (about which they delight for to burie their dead) or else nigh springs of water that may make pleasant fountaynes.'¹⁰³

Mausoleums built near water bodies were found in several parts of the country. Tavernier, who passed by Sassaram on his way to Bengal was quite impressed by the tomb of the Afghan ruler Sher Shah, who had defeated and ousted the Mughal emperor Humayun. Tavernier noted that at Sassaram, 'there is a large tank. You see a small island in the middle, where there is a beautiful mosque, in which there is a tomb of a Nawab named Salim Khan [i.e., Sher Shah] who had it built during the time he was the governor of the province. There is a fine stone bridge to cross into the island which is all flanked and paved with large cut stones. On one of the sides of the tank there is a large garden, in the middle of which there is another beautiful tomb of the son of the same Nawab [i.e., Islam Shah].'¹⁰⁴ The grandees selected the sites and built their mausoleums in placid surroundings, which became the family burial place.

Tavernier's description of the mausoleum of Aurangzeb's favourite consort Zainabadi Begum at Aurangabad, which was built near the huge lake, indicates that a lot of money and effort was needed for building these memorials. He noted 'The mosque and the tomb cost a large sum, because they are covered with white marble, which was brought by wagon [from Rajputana] and was on the road for nearly four months. One day, when going from Surat to Golconda, I met at five marches from Aurangabad more than 300 wagons laden with this marble, the smallest of which was drawn by 12 oxen.'¹⁰⁵ Thus the lake, the mausoleum, the mosque and the caravanserai built alongside, became the focal point of the process of urbanization, at the core of which was the water body, that inspired it and made it all possible.

Similarly the town of Sarkhej near Ahmedabad was famous for its water reservoir as well as the royal tombs of the Gujarati Sultan's family. It was constructed by Sultan Mahmed Begada 'on the sides whereof are the tombs of Kings, Queens, Princes and Princesses of Gujarat, to which they descend by several steps of very lovely Stones.'¹⁰⁶

¹⁰³ Foster (1999: 315–16), Edward Terry's account.

¹⁰⁴ Crooke (2006: 89–99).

¹⁰⁵ *Ibid.*, p. 119.

¹⁰⁶ Sen (1949: 15, 285).

Tank Country: Western and Central India

In the Western and Central Indian regions of Rajasthan, Malwa and the Western Deccan were located many prominent fort cities where water conservation was very significant, due to the less than adequate rainfall they received. Several contemporary travellers took note of this facet of water conservation. Jean-Baptiste Tavernier mentioned that travelling from Ahmedabad to Agra via the Rajputana route, he passed by the fort town of Jalore. 'Chalaour is an ancient town upon a mountain surrounded with walls... There is a tank on top of the mountain and another below, between which and the foot of the mountain is the road to the town'.¹⁰⁷ Water was a precious element that sustained cities and settlements; hence it was cherished and preserved. The Englishman, William Finch recorded more precisely about 'Jeloure or Jalore: 'Some half a Cose within the gate is a goodly Tanke four square, cut directly down into the Rocke, affirmed to be fiftie fathome deep of cleare and good water.'¹⁰⁸

William Finch in fact based his observations on reports received from his subordinate Nicholas Uphet who travelled from Agra to Surat via Ajmer and Chittorgarh. Much care was taken to report about the water sources, along with the trade routes, the towns and the economic facets of the region. For example it was reported that the fort city of Ajmer had 'many Antiquities, amongst which some 2 cos towards Agra is a very faire Tanke.'¹⁰⁹ Further, the place was famous for the 'sepulchre' of Salim Chishti, a saint much respected by the Mughals. Sacred and spiritual spaces were usually appended with water reservoirs to confer a sense of tranquility and holiness to the environs. Accordingly, in the vast courtyard of the shrine, 'on the left is a very faire tanke enclosed with stone. On the East side stand three other courts, in each a faire tank.'¹¹⁰ The route further led to the town of Meartha which had a stone castle, 'a faire Tanke and three faire Pagodas richly wrought.'¹¹¹

The English ambassador Sir Thomas Roe who spent four years (1615 to 1619) in western India, travelling along with the imperial court of Jehangir, had much to report about the places he saw, and about their water sources. Thomas Roe followed Jehangir who moved from Ajmer towards one of the Mughal's designated imperial cities, Mandu, in December 1616. He recorded that on 7th December the emperor halted at Todah which 'stood at the foot of a great Rocke very strong, had many excellent works of hewed stone about it, excellently cut, many Tanks arched,

¹⁰⁷ Crooke (2006: 71).

¹⁰⁸ Purchas (1905: 63), Observations of William Finch.

¹⁰⁹ Crooke (2006: 71).

¹¹⁰ Purchas (1905: 61), Observations of William Finch.

¹¹¹ Ibid.

vaulted and descents made large and of great depths.¹¹² These water tanks constituted a kind of socio-cultural hub, as well as a valued environmental space around which revolved many little worlds. Thomas Roe was quite taken up by the atmospherics of this tank–garden–temple complex on which he commented: ‘By it stood a delicate Grove of two miles large, a quarter broad, planted by industry, with Mangues, Tamarinds, and other fruits, divided with walkes, and full of little Temples and Altars of Pagodas and Gentilitial Idolatry; many fountains, wells, tankers, and summer houses of carved stone curiously arched.’¹¹³ The soothing pleasurable impact of water tanks, temple architecture and the garden so impressed the English ambassador that he wrote: ‘I must confesses a banished Englishman might have been content to dwell here.’¹¹⁴

The nature loving emperor Jehangir was also quite attracted to water reservoirs, lakes and tanks. During the onward journey to Mandu, Thomas Roe noted that Jehangir frequently went in boats in the water bodies to pursue his favoured sport of ‘hawking’ involving the skilful handing of these birds of prey, also referred to as falconry. The emperor also preferred sitting by the lake side even in the cold wintry evenings. Thomas Roe recorded that on 8th December he went to meet the emperor, who as per custom held a restricted court in the evening. ‘I found His Majestic so neere drunke... that I had not opportunity to move business to him. He sate by a fier in fures by a tancke syde.’¹¹⁵ Undoubtedly a few stiff drinks by the side of a water reservoir, on a cold watery evening, was not very conducive to conduct the affairs of state.

The Ruined Imperial City of Mandu

Water became a seriously contentious issue, and an object that invited the manifestation of authority by the grandees of the Mughal court, at Mandu. When Jehangir’s colossal imperial camp reached Mandu in March 1616 there was a massive problem of water availability. Ironically Mandu was one of the designated imperial capitals of the Mughal dominions.¹¹⁶ Thomas Roe remarked that though the fort city had ‘Aire very pleasant upon the edge of the hill,’ it was half ruined, ill-managed, badly provisioned and faced a problem of severe water scarcity. The English Amabassador noted that there was ‘no water and that men and cattle were like to perish’.¹¹⁷

The imperial fort city of Mandu had been a victim of neglect since its incorporation in the Mughal Empire. The Jesuit Father Monserrate who passed by

¹¹² Foster (1926: 324).

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

¹¹⁶ See Foster (1999: 180), Edward Terry’s account.

¹¹⁷ Purchas (1905: 396–97), Account of Sir Thomas Roe.

Mandu in the early 1580s was in fact quite impressed by its system of water conservation. He noted, 'It [Mandu] can never lack water, as there are many tanks and springs in it, as well as never failing wells of abundant sweet water.'¹¹⁸ William Finch who passed by Mandu in March 1609 was impressed by the city despite its atmosphere of decay, and by its system of water conservation. He noted: 'Aloft on this Mountains are some sixteen faire tankes here and there dispersed about the city.'¹¹⁹ John Jourdain who halted at Mandu in January 1611 warned that the water provision there was precarious since it was the only source. 'It hath within the cittie sixteen standing tanks or sestrons of water, because it standeth so high upon a hill there is no water than what is of the rains in these sestrons.'¹²⁰ The English Chaplain Edward Terry who stayed at Mandu for five months (April–September 1616) along with Thomas Roe, also remarked that it had 'more ruins by far about it than standing houses.'¹²¹ In fact a large deserted mosque with a compound was 'gotten for my Lord Ambassador and his company to lodge and be in.'¹²²

A serious water crisis erupted when the vast Mughal camp arrived at Mandu. Thomas Roe recorded bitterly and sarcastically complaining about the lack of foresight and planning by the imperial establishment: 'For we were brought to a hil with a multitude of people (so great is the foresight, so good the policie) where was no water.'¹²³ To make the available water secure for the nobles and officials, harsh deterrent orders were implemented. 'The poore forsooke the citie, and by proclamation many were commanded away,¹²⁴ or simply turned out of the city to fend for themselves. Since the colossal numbers of transport animals and the horses could drain the scarce water resources in the summer season, 'all horses and cattle [were] forbid' to stay in the city.¹²⁵ Many of the large number of persons associated with the imperial camp 'departed some two three and foure course off, to the extreme trouble of all men and the terrible rising [prices] of provisions.'¹²⁶

Thus bad planning and poor provisioning of water created conditions of a kind of drought in the fort-city. In this situation some of the grandees of the court impounded and appropriated some of the water tanks of the city to their exclusive use, thereby aggravating the water crisis. Thomas Roe pointed out 'that little [water] that was in the Pooles some great men possessed and kept by force'.¹²⁷

¹¹⁸ Banerjee (2003: 16).

¹¹⁹ Purchas (1905: 34), Observations of William Finch.

¹²⁰ Foster (1992: 147).

¹²¹ Foster (1999: 183), Edward Terry's account.

¹²² Ibid.

¹²³ Foster (1926: 354).

¹²⁴ Ibid., p. 354.

¹²⁵ Ibid., p. 355.

¹²⁶ Ibid.

¹²⁷ Ibid.

Thomas Roe's establishment also had no water named he had to send his men upto ten koss away to the river Narmada to fetch water.¹²⁸ He recorded his plight in simple terms, 'I knew not what to do... I wanted water, so rode myself to seeke some and found a great Poole possessed by Chan [probably Asaf Khan] which was given by the King... who granted me four load a day which satisfied me'.¹²⁹

The English traveller and man of words, Thomas Coryat, who was a part of the group of witty persons at the famous Mermaid Tavern in London, which included Ben Jonson and others, also happened to stop by at Mandu in this period. He also reported about the scarcity of water due to its monopolization; 'the custome being such that whatsoever fountaine or tanke is found by any great man in time of drought, he shall keep it proper and peculiar to himself, without the interruption of any man whatsoever'.¹³⁰ Consequently the poor and the camp followers were denied habitational space in the city. In fact Thomas Roe wrote to the Surat factory on 6 June, when the summer was at its peak; 'The miserye of others is pitiful; water sould in the streets at an incredible rate; many perishing for want; all begging that [water] only as almes'.¹³¹ Fortunately the young Englishman Thomas Herbert discovered a spring in the hillside, which the English took control of, which saved them from a worse predicament.¹³² The English Ambassador recorded with a sense of agony and chagrin, 'There was not a misery nor punishment, which either the want of Government or the naturall disposition of the Clime gave us not'.¹³³ Thus the might of the grand Mughal seemed meaningless due to his inability to provide water to his soldiers and camp-followers, in one of the designated capitals of the empire. But perhaps for the medieval monarchs and grandees, such things did not matter too much.

Tanks on the Travel Route

The Deccan route from Surat to Agra, via central India, also amply illustrates the widespread prevalence of water reservoirs or tanks in the townships that lay on the way. The young Englishman, William Finch who spent three years in India (1608–11), was a subordinate official, when Captain William Hawkins (1608–13) was sent to the Mughal Court at Agra.¹³⁴ Finch, on being summoned by Hawkins left for Agra in April 1610, and took the central route. While the distances between

¹²⁸ Foster (1999: 277), Account of Thomas Coryat, 1612–17.

¹²⁹ Foster (1926: 355).

¹³⁰ Foster (1999: 277), Account of Thomas Coryat, 1612–17.

¹³¹ Foster (1926: 355).

¹³² Ibid.

¹³³ Ibid.

¹³⁴ See Foster (1999: 60–187), Account of Thomas Coryat, 1612–17.

the townships mentioned by the travellers were usually imprecise, nonetheless the information pertaining to whatever they encountered was usually quite dependable.¹³⁵

William Finch travelled via Karod to the town of Viara, which had 'a great Tanke, and a pleasant Grove.'¹³⁶ Tavernier travelled on the alternative route that went via Bardoli to Balor (24 koss): 'a large village situated close to a tank which is about a league [i.e., 2¼ miles] in circuit and upon the margin of it there is a good fort.'¹³⁷ Most of the grand tanks usually had a religious or secular building, in their vicinity, which also served to facilitate the maintenance of these reservoirs. Three days later Finch reached Nundurbar which had many 'many Tombes and houses of pleasure with a castle and a Faire tanke.'¹³⁸

After falling ill and recuperating during a halting march, Finch reached two months later the 'Strong and invincible Castle of Hassere [Asirgarh] seated on top of a high Mountaine, large and strong, able to receive (as is reported) forty or fifty thousand Horse. And on top are many faire Tankes and good pasture grounds.'¹³⁹ The Indian fort-complexes were extremely large and could support sizeable populations comprising court personnel, and their dependents, garrison soldiery, troupers, and service personnel. They were constructed bearing in mind the vast requirements of water that had to be provided for which water reservoirs were quite serviceable. Elaborate water tanks were constructed as they were critical to the holding ability and survival of these massive strongholds. Asirgah was captured by Emperor Akbar in 1600, after a prolonged siege; it eventually capitulated due to the problem of its water resources becoming contaminated. William Finch recorded: 'it is said that there bred such innumerable sort of Emmets [i.e., ants] or other small Wormes in all the waters, that the people swelled and burst with the drinking thereof; which mortality caused him to compound and deliver it, being by mere human force invincible.'¹⁴⁰

The following week (on 8 March 1610) Finch reached Mandu, whose water reservoirs impressed him greatly as pointed out earlier, despite the dilapidated state of the city. In the Deccan region considerable efforts were made towards water conservation. En route, Finch noted that the *sarai* town of Luneira had 'a goodly Tanke inclosed with stone and a banketting house in the midst.'¹⁴¹ Another half a koss beyond were 'four or five faire Tankes with a great Pagode, a very pleasant

¹³⁵ This route was also followed by John Jourdain, Sir Tohmas Roe, Peter Muny, Jean Baptiste Tavernier; but William Finch was more perceptive in referring to water tanks.

¹³⁶ Foster (1999: 136), Account of William Finch.

¹³⁷ Crooke (2006: 40).

¹³⁸ Foster (1999: 136), Account of William Finch.

¹³⁹ *Ibid.*, p. 140.

¹⁴⁰ *Ibid.*

¹⁴¹ *Ibid.*, pp. 141–42.

place.¹⁴² The route next led to the Malwa region where Ujjain was the major town. Further Sunera had 'a great Tank full of wild fowle.'¹⁴³

The central India region had several older townships which had been overrun and rehabilitated several times, as they lay on the vital north-south route. Tavernier recorded that at Narwar, about 44 miles south of Gwalior there were 'Several large tanks around the town [which] were formerly lined with cut stone but they are now neglected.'¹⁴⁴ The huge fort at Gwalior had 'several ponds formed by the rains, and what they cultivate there is sufficient to support the garrison.'¹⁴⁵ As seen in the case of Asirgarh and Mandu, considerable efforts were made to keep adequate provisions of food and water to withstand a long siege. Similarly William Finch remarked that the fort at Gwalior had 'very good ground with three of four faire Tankes, and many other faire buildings.'¹⁴⁶

Gwalior was practically the gateway to the imperial cities of Agra and Delhi. The Augustinian Friar Sebastian Manrique who travelled from Agra to Lahore and onwards in 1641 mentioned the presence of large water reservoirs in several places on this route. When he left Agra he was accompanied by the Jesuit fathers Oliveira and Cruz upto the grand Agra tank 'half a league beyond the city to where a magnificent Reservoir stands full of sweet clear water. It is constructed of fine hewn stone, and is of handsome design.'¹⁴⁷ Travelling persons were usually escorted quite some distance by friends, who sat together by the waterside for refreshments and the final parting before the long journey ahead. Peter Mundy who visited Agra in 1632 also mentioned this 'Tanck a mile without the city, the accustomed place of parting.'¹⁴⁸

After passing by Agra and Mathura, William Finch came across a deep stepwell at the small *sarai* town of Hodal, which he described as 'a faire fontaine three stories, and one hundred steps.'¹⁴⁹ He continued his journey from Delhi to Lahore, stopping by at Thanesar which had a 'goodly Tanke and by its Pagodas much revered by all Gentiles throughout India.'¹⁵⁰ The grand tanks usually became the sites for temples, religious shrines and pilgrimages, which were occasionally rooted in antiquity and surrounded with mythological linkages. Manrique who passed by Thanesar wrote dismissively of this 'well known Reservoir holding

¹⁴² Ibid., p. 142.

¹⁴³ Ibid., p. 143.

¹⁴⁴ Ball (2000: 51).

¹⁴⁵ Ibid.

¹⁴⁶ Foster (1999: 145), Account of William Finch.

¹⁴⁷ Luard (1927: 179), Vol. II.

¹⁴⁸ Ibid., Vol. II, p. 179.

¹⁴⁹ Foster (1999: 155), Account of William Finch.

¹⁵⁰ Ibid.

fine crystalline water surrounded by many pagodas or idolatrous temples full of various monstrous idols which that Barbarous Heathendom superstitiously worships.¹⁵¹

The town of Sarhind, located further along the route was equally, or perhaps more renowned due to its grand tank complex. Father Monserrate passed by this town in the 1580s while accompanying Emperor Akbar during his military campaign against Mirza Hakim. He noted: 'Sarindum is situated in a very broad plain, beautified by many groves of trees and pleasant gardens. This plain is dry; but the inhabitants have met the difficulty of lack of water by the making of a deep artificial lake on the southern side of the city. Care is taken to fill this lake during the rainy season by means of irrigation channels.'¹⁵²

The Sarhind tank was not really associated with any religious institution, but had a civic cum environmental purpose that was perhaps built and maintained with community involvement. It served as a kind of socio-cultural hub and had remarkable architectural features. William Finch noted that the town 'hath a faire Tanke with a Summer-House in the midst, to which leads a Bridge of fifteen stone arches very pleasant. From hence is a small river to the Kings Garden, a corse distant with a causey of forty foot broad, planted with trees on both sides of it.'¹⁵³ Frey Sebastian Manrique was also very impressed by this tank complex and recorded, 'In this city [Sarhind] also stands a most magnificent Reservoir, constructed of fine cut stone and full of clean spring water. From the Centre rises in circular form the foundation of a round shrine of great beauty'. It was reached by 'the most beautiful bridge, built of the same hewn stone, and supported upon fifteen fine great arches.'¹⁵⁴ Thus, the entire north-western region of India was hugely dependent on tanks for its common requirements.

Tanks in South India

In southern India, the construction of water tanks on a massive scale took place in response to the ecological needs, to cater to the agricultural as well as the routine requirements of society. Water reservoirs of different kinds were an essential component of any village or township. Contemporary descriptions define a village as the *Ur-nattam* or a human settlement having 'the temples, the ponds and the channels passing through'.¹⁵⁵ As an illustration of this long tradition of dependence on the tank culture, the French priest Abbe Carre in his overland travel from Golconda to Madras, across the Andhra country, noted its widespread prevalence and usage.

¹⁵¹ Luard (1927: 181–82).

¹⁵² Banerjee (2003: 1002).

¹⁵³ Foster (1999: 49–50), Account of William Finch.

¹⁵⁴ Luard (1927: 182–83).

¹⁵⁵ Hall (1980: 59).

Carre' who travelled in March–April 1673, in the pre-monsoonal season when the water level tended to recede, marvelled at their utilization of conserved water. He noted: 'these country folk cultivate with admirable care, with the help of a number of small tanks from which they get water in a very wonder full way.... This is the only way of cultivating the earth for nine or ten months in the year, when the heat is unbelievable without a single drop of rain.'¹⁵⁶

The task of constructing water reservoirs, and for augmenting agrarian productivity throughout the year remained a major preoccupation of the state and its socio-political elites. Burton Stein points out that tanks or embanked reservoirs which are spread throughout southern India were constantly rebuilt and upgraded. The system of agrarian water conservation and the general 'peasant ecotypes' remained fairly unaltered from the ninth till the nineteenth century.¹⁵⁷ In fact the grand Anicut masonry dam near Thiruchirapalli which was over a thousand feet long and sixty feet thick, even preceded the Chola period. In his subsequent work 'Vijaynagara' Burton Stein points out that, 'The opening of the extensive dry zone of the central peninsula—homelands of the Hoysalas, Kakatiyas and later, Vijaynagara—was critically dependent upon tank irrigation.'¹⁵⁸ He further states that, 'By late medieval times state building and tank building had become a single process, both were additionally linked to the raising of temple towns.'¹⁵⁹ Similarly, Kenneth Hall also reports that the primacy accorded to maintenance of tanks in the Chola period is evident from the fact that the office of 'tank accountant' was assigned revenues from certain lands of the *nagaram*.¹⁶⁰

K. Satyanarayan, while examining the ecological basis of the economy and society under the Kakatiyas of Warrangal, highlighted the crucial role of the state in constructing tanks for irrigation. Massive earthen work dams were built to construct the Bhongir, Pakal, Laknavaram and Ramappa tanks, which prompted the inscriptions to describe them as *Samudram* or the seas.¹⁶¹ Satyanarayan also indicates that considerable community involvement and effort was witnessed in the looking after and the regulation of these tanks, which had immense value for the general populace. He points out that several inscriptions refer to the system of *meras* or the contribution of grain by villagers for the maintenance of the water reservoirs.¹⁶²

During the medieval phase, the prosperity of a kingdom, and the glory of its cities was also judged by its possession and command over water resources. Describing the grand imperial capital city of Vijaynagar, the Portuguese chronicler

¹⁵⁶ Fawcett (1990: 359).

¹⁵⁷ Stein (1980: 24–25).

¹⁵⁸ Stein (1994: 21).

¹⁵⁹ *Ibid.*, p. 24.

¹⁶⁰ Hall (1980: 59).

¹⁶¹ Satyanarayan (1983: 27–30).

¹⁶² *Ibid.*, pp. 340–42.

Domingo Paes remarked that it had 'very beautiful buildings made after their manner with flat roofs. There live in this [city] many merchants, and it is filled with a large population.... and there is much water in it.'¹⁶³ Control over water was an indicator of the ability of the state and society to optimize its agricultural output, and to effectively sustain its structure of social urbanism, since water was a critical prerequisite for its well-being. When Domingo Paes visited Vijaynagar around 1520, he recorded that the king built a grand reservoir of the size of a 'falcon-shot', 'Water comes to it from more than three leagues by pipes ... from a lake which itself overflows into a little river.'¹⁶⁴ This tank complex was used to irrigate fields, and also provide water to the city for its uses.

The construction of the tank complex was a matter of major significance for the king and nobles who directly supervised its construction. Paes who witnessed the process of construction noted, 'In the tank I saw so many people at work that there must have been fifteen or twenty thousand men, looking like ants, ... this tank the king portioned out among his captains, each of them had the duty.'¹⁶⁵ The massive task which involved meticulous engineering skills was obstructed due to the bursting of its embankments on two or three occasions, which necessitated the advice of the Brahmins and the soothsayers. Upon their counselling that the enterprise could be facilitated by offering some ritual sacrifice, the king forthwith commanded the prisoners undergoing imprisonment be brought and 'that the heads of sixty men should be cut off, and of certain horses and buf-faloes, which was at once done.'¹⁶⁶ Thereafter the work proceeded smoothly and the task was accomplished satisfactorily.

Another Portuguese chronicler, Fernao Nuniz, who visited Vijaynagar in 1536–37 also confirmed that to please the idols, who the Brahmins felt were not satisfied with the progress of tank construction, several prisoners were beheaded 'and with this the work advanced.'¹⁶⁷ The observance of this macabre ritual by the king, high priests and nobles clearly indicates the primacy the tank project had in the concerns of the state. Nuniz noted: 'By means of this water, they made many improvements in the city and many channels by which they irrigated rice fields and gardens'.¹⁶⁸ The tank complex was greatly valued as a kind of infrastructure life-line to the imperial city and its proximate areas, and was always kept well-guarded.¹⁶⁹

David Mosse in his study on the role of water and tank irrigation in south India also attaches importance to the fact that it was vital for the process of state building

¹⁶³ Sewell (1962: 244).

¹⁶⁴ Ibid.

¹⁶⁵ Ibid., p. 245.

¹⁶⁶ Ibid.

¹⁶⁷ Ibid., p. 364.

¹⁶⁸ Ibid., p. 365.

¹⁶⁹ Ibid., p. 366.

and political legitimization. He argues: ‘Tank irrigation development can itself be considered as having long been a part of a strategy to forge upward links between local Maravar chiefs and their political overlords and reigning kings, from whom they secured titles, water rights, grain shares, honors and political legitimacy. Tank and channel building both underpinned and legitimized state power’.¹⁷⁰ Thus water and water tanks were strongly identified as important props and instruments of the economic strength and prosperity of the state and of its several constituents.

The Qutubshahi Dominions

The water tanks and reservoirs were an important and prominent feature of the agricultural landscape in the Deccan and Coromandel region, which was somewhat arid and quite fertile at the same time, because of efficient water management. Thevenot who travelled from Surat to Golconda in 1666 was deeply impressed by the agricultural profile of the region. He observed: ‘there are few or no countries that delight travellers with their verdure more than the fields of this [Qutubshahi] Kingdom because of the Rice and Corn that is to be seen every where, and the many lovely [water] Reservatories that are to be found in it.’¹⁷¹ The innumerable water conservatories, large and small, that dotted the landscape, had the ability to overcome the long rainless seasons and generate agricultural abundance. They were found everywhere. Jean-Baptiste Tavernier who was a prodigious voyager, noted, ‘Wheel carriages do not travel much between Golconda and Masulipattam, the roads being too much interrupted by high mountains, tanks and rivers.’¹⁷²

Tanks proliferated in this populous eastern Deccan circuit to bolster productivity. The French priest Abbè Carrè during his journey in the Andhra region in 1673 noted at the village named Bagnnapale: ‘The inhabitants here water their gardens with numerous little runnels drawn from the tank, which they close and open as needed, so that grain, rice and vegetable are produced in abundance.’¹⁷³ It is important to note that Abbè Carrè travelled on this route in the month of March–April, which constituted the lean water season, but the tanks still held considerable amounts of water. He noted the large reservoir was ‘Surrounded by a very high embankment shaded on both sides by fine ever green trees,’ which made it possible to conserve water for long periods and ‘rendered the place very pleasant by their shade.’¹⁷⁴

The large holding capacity and tremendous reach of tank irrigation further emerges from Abbè Carrè’s narrative further along the Golconda coast on the way to Madras. He noted: ‘During the next two days we passed through heavy

¹⁷⁰ Mosse (2003: 66).

¹⁷¹ Sen (1949: 131).

¹⁷² Crooke (2006: 142).

¹⁷³ Fawcette (1990: 357).

¹⁷⁴ Ibid.

fields sown with ricefull of water brought from tanks five or six leagues [i.e., 15 to 18 miles] away, the land being so flat and low.¹⁷⁵ Such a structure of water channels going 18 miles distant from the tank is indicative of a highly evolved system of irrigation, and the efficacy of the water reservoirs. But such an elaborate system of tank irrigation could only be sustained by considerable engineering skills and bountiful regular monsoons. Two to three inadequate monsoons could spell disaster, and push the region into the grip of famine.

Some of the reservoirs in the Deccan–Coromandel region were so huge and with such high embankments, that they could pose problems at times. The violent cyclonic storm of December 1674 broke down the embankments of the large reservoir near the Dutch settlement of Sadraspattm. Francois Martin who at that time was posted at the newly founded French settlement of Pondicherry recorded: ‘water inundated the entire neighbouring countryside and swept away many villages, human beings, and diverse kinds of animals’.¹⁷⁶ Much debris was carried by the surging reservoir waters up to the new French settlement which was a long distance away. Martin complained, ‘It is unbelievable the quantity of serpents and grass snakes that were brought along with the debris, and many other kinds of insects that were unknown to us until then.’¹⁷⁷ No wonder the indigenous inscriptions of the earlier period referred to the enormous water reservoirs as *Samudram* or the seas.

The temple institutions and town complexes in Southern India also contributed significantly to the conservation of water by constructing large tanks in their premises or in proximity. The Spanish priest Domingo Navarette who travelled from Madras to Golconda and onto Masulipattam in 1670–71, was quite impressed with the ‘Temples of the Natives and wonderful large deep and wide ponds with artificial Islands in the middle, curiously contrived’.¹⁷⁸ The English sailing Master Thomas Bowrey who spent a long tenure in India in the 1670s and 80s also noted that the numerous stately pagodas in southern India usually had their ‘great pond or tanks where they frequently wash themselves all over before they assume to enter the Pagod’.¹⁷⁹ The ponds in the temple complexes also created a fine ecological ambience to soften the effect of climatic harshness during the hot season. Bowrey remarked that in the Gingeli region, north of Coromandel, in proximity to the Orissa Coast, ‘They have many delicate groves, tanks of water and large Fabrics of Stone called Pagods’.¹⁸⁰ The trees and the water reservoirs tended to provide a sense of solace to the spiritual pursuits of the devotees and the pilgrims.

¹⁷⁵ Ibid., pp. 357–58.

¹⁷⁶ Martineau, *Memoires* (1931–34), Vol. II, December 1674, p. 121.

¹⁷⁷ Ibid.

¹⁷⁸ Cummins (1962: 300–01).

¹⁷⁹ Temple (1905: 7).

¹⁸⁰ Ibid., pp. 126–26.

There were reservoirs of all kinds and sizes to cater to the needs of a society where storing and provisioning of water were imperative till replenishment was done by the annual monsoonal cycle. During his voyage from Madras to Golconda Domingo Navarette came across a very large number of 'Stately Ponds all of stone; when it rains they fill up to the top, and that water lasts all the dry season; there Travellers stop, rest, drink and water their Beasts'.¹⁸¹ The requirements of water were indeed phenomenal because the large animal population all needed to drink in huge quantities. Navarette in fact noted, 'It is wonderful what numbers of great and small cattle we met with in the fields.'¹⁸² Also, as Navarette noted the entire route and the highways and in the towns on the way there was 'a mighty concourse of Passengers, Horses, Elephants, and abundance of Camels, which in that country carry all the burdens'.¹⁸³

Given these multiple requirements for water round the year it became an urgent aspect of social concern, and individual as well community philanthropy that water had to be conserved. Consequently the state, its officials, the temples and monasteries, the wealthy patrons, and the ordinary citizens all contributed towards the task of water storage, in the form of individual, community or state enterprise. Upon inquiring, Navarette was told, many of these tanks 'were the work of great and rich Heathens who being moved to compassion seeing there was no water for travellers in several places had caused these ponds to be made to supply this defect and want'.¹⁸⁴ The water tanks were built with a kind of missionary zeal since they provided solutions to several requirements of daily life, and brought salvation to their builders in afterlife. The water tank came to acquire a ubiquitous presence in most parts of peninsular India, giving it the semblance of a hydraulic society where water and its conservation in reservoirs was a very vital facet and factor of existence.

Politics and Sociology of Water

Water was stored constantly for domestic and community use, in all kinds of ways. The Dutch factory at Masulipattam used the traditional indigenous method of water usage on a massive scale. Since Masulipattam was surrounded by a marshy terrain the quality of fresh water in the city was not satisfactory; it was procured from wells located in the interior.¹⁸⁵ It was stored in considerable quantities in the factory compound, since the local officials used water as a pressure point or leverage, by occasionally obstructing or stopping its supply to the European factories, to arm twist the European Companies on some contentious issues. In this context

¹⁸¹ Cummins (1962: 308). Domingo Navarette completed this journey in 24 days.

¹⁸² Ibid.

¹⁸³ Ibid.

¹⁸⁴ Ibid.

¹⁸⁵ Crooke (1992: 99).

the French official Francois Martin noted in his *Memoires* in March 1675, that the Danish factory at Tranquebar was blockaded and its food and water supplies were obstructed by the local authorities over some dispute. Accordingly Martin remarked: 'It is the only method left to these petty princes to insult the Europeans who have their fortresses in their territories.'¹⁸⁶

Water was thus an important instrument of political manoeuvre between the Europeans and the local officials; and was stored as a precautionary measure. Francois Martin noticed at Masulipattam in 1672 that the Dutch factory 'ordinarily had three or four hundred large country jars always filled with water, which are replaced from time to time, and are refilled in the same measure that they become empty'.¹⁸⁷

Water was also afflicted by considerations and prejudices of race and caste, in keeping with the social attitudes and practices of the time. Referring to the numerous water jars kept in the Dutch factory, Martin remarked: 'As the communities in India—Mores and Gentiles—differ from the Europeans in their customs; moreover the Gentiles differ among themselves according to their castes or tribes, there are jars which are kept for them—sealed, whose keys are given to them, which no one touches other than these people. Those which are reserved for the Hollanders are kept apart'.¹⁸⁸ Thus there virtually occurred the social stratification of water amongst the different communities, caste and racial categories. Water was guarded exclusively and used specifically by particular social groups in accordance with ritual norms.

The system of water conservation itself thus became the instrument of perpetuating divisive social tendencies. This excessive fetish pertaining to caste exclusivity and purity rituals was also remarked upon by the English chaplain John Ovington, pertaining to western India. He observed 'They never drink out of the same cup with a Christian, or any person of a different set; nor defile their Lips with the same water that has been touched by any stranger; whereby all their water-pots are reserved entirely for their own use, nor are ours ever desired by them'.¹⁸⁹

An important dimension of the system of water conservation in the European factory houses was that it became an important factor in the politics of trade, involving the European Companies and the Indian officials. Friction erupted, from time to time between the local potentates on one hand and the European establishments on the other. The Europeans routinely claimed various trading privileges some of which were legitimate, while many other were contrived or fabricated, in keeping with the aggressive mercantilist attitude of the companies. The fault could

¹⁸⁶ Martineau, *Memoires* (1931–34), Vol. II, p. 11.

¹⁸⁷ *Ibid.*, 1931–34, p. 313.

¹⁸⁸ *Ibid.*, Vol. II, pp. 313–14.

¹⁸⁹ Rawlingson (1929: 174).

lie on one side, or the other. In such situations of daring-do jostling and posturing, the supply of water to the European establishments became the first target by the local officials. Consequently, the Europeans took basic precautions and stocked water, as well as food, to tide over the problem. As Francois Martin pointed out with reference to the Dutch Company: 'All these precautions that they undertook enabled them to resist the governor who would not dare to attack them with his forces inside the Dutch factory, even through he threatened to do so, and even create the appearance of launching an attack.'¹⁹⁰

Disputes involving the supply of water did occur from time to time. The English factors recorded that at Masulipattam on 13 September 1670 there took place a serious altercation between the French factory lodge and the local governor, since the French had imprisoned an Indian representative Marcara, who was of Armenian descent. Marcara enjoyed considerable leverage amongst the Indian officials and nobles, due to his connections with the sizeable Armenian merchant community at Masulipattam. Consequently the Governor's men encircled the factory and seized an ox that was bringing water into the French lodge. In response the French company's men made a sally and secured the release of the ox. But in the melee a young French official called Fromentin was killed.¹⁹¹

The second in charge of the French factory at that time was the young Francois Martin who recorded in his Memories: 'Around four or five hours in the evening, at fifty paces from the factory lodge, one of the oxen, that fetched the water from outside, which it was carrying, was stopped. The servant accompanying the ox was manhandled in full view of us.'¹⁹² Martin recorded that five Frenchmen, including himself, had a heated argument with the *Kotwal*¹⁹³ leading to an exchange of a volley of shots, and arrows. In this skirmish a young French Officer called Fromentin was killed. The French made a second sortie in which Martin was wounded. But they managed to retrieve the corpse of their deceased compatriot Fromentin, after killing or injuring almost 20 of the governor's and Marcara's men.¹⁹⁴

The politics of water again erupted at Masulipattam in November 1672, this time between the English Company and the new governor, who was high-handed and overtly extractive vis-à-vis the Europeans. The genesis of the problem was partly caused by the Qutubshahi system of administration which was characterized by the auctioning of many of the posts and public offices to the highest bidder. The previous governor of Masulipattam, who was more genial, had fallen into

¹⁹⁰ Martineau, *Memoires* (1931–34), Vol. I, p. 314.

¹⁹¹ Fawcett (1952: 202–05).

¹⁹² Martineau, *Memoires* (1931–34), September 1670, Vol. I, pp. 275–76.

¹⁹³ Kotwal, a police superintendent in charge of law and order.

¹⁹⁴ Martineau, *Memoires* (1931–34), Vol. I, pp. 275–76.

severe arrears with the Golconda court. Consequently his governorship was abruptly terminated and he quietly left in disgrace at night, because he had not been harshly exploitative in generating larger revenues.¹⁹⁵

The next governor was soon replaced by another in September 1672, by a slave of the *Wazir* Sayyid Muzaffer, who was ruthless in his demands. In view of the new demand for *peshkash* to the Europeans, and the hesitation of the English Company to comply, in December 1672, the supply of water and provisions to the English factory were stopped completely. In the ensuing hardship several peons and some others at the English factory left Company service due to the shortage of water. In the interim period, the English sought the help of the French to get some water, which too proved difficult. In these circumstances, the English had no choice but to pay some *peshkash* or money grant to the governor to allow for the restoration of normal provisions, water and food supplies to the factory.¹⁹⁶ But quite clearly, the politics of water was a troublesome facet, and a bargaining lever used by local authorities to press their demands—legitimate as well as extra-legal—to the European Companies.

Concluding Remarks

Water and its nature and character mattered a lot. It was a pivotal factor in the everyday life or 'la vie quotidienne', due to its urgent and phenomenal requirements for drinking, washing, ablutions, cleaning, watering gardens, bathing—from pre-sunrise to post-night-fall. A lot of planning and human endeavour was involved in creating the infrastructure for the accumulation and retention of water, in accordance with nature's seasonal cycles. Much effort and attention was devoted to the creation of several systems of water conservation, with their varying architectural patterns; the dimensional scales of the repositories; and the manner of transporting water to households, suburbs, gardens. Water repositories became associated with community work, philanthropy, religiosity and festivity. They were the focal point of community congregation. In a nutshell, water was a vitally integral factor in the entire circuit of life and of human activity.

Water tanks were strongly associated with sacred spaces, near or within temples, mosques and pagodas, perhaps because they facilitated communication with the spiritual realm. The Italian voyager Ludovico di Varthema who visited Malabar in the early sixteenth century, was deeply impressed by one such water-temple complex which he described: 'Near to Calicut there is a temple [of Srivilaynad] in the midst of tank, that is in the midst of a pond of water.... Around the margin of the said tank there is an immense number of trees, all of one kind, on which trees are lights so numerous that it would be impossible to count them. And in the

¹⁹⁵ Fawcett (1952: 219).

¹⁹⁶ *Ibid.*, pp. 228–29.

like manner around the said temple there are oil lights in great abundance.’¹⁹⁷ Varthema further noted at the time of the new year, ‘all the people for fifteen days’ journey around... come to this sacrifice [i.e. festival]... they all wash in the said tank,’ and offer ritual prayers. The scale of congregation was such that Varthema remarked, ‘In truth, I never saw so many people together at one time excepting when I was at Mecca.’¹⁹⁸

Several types of rituals were associated with water and water tanks, in all parts of the country. John Fryer who visited the temple town of Gokaran on the Canara coast in the 1670s, was fascinated by the ritual of bathing the deities, as a routine facet of temple life. He recorded, ‘They fetch water for the “Duels”’¹⁹⁹ from the tank with loud Musick and the Dancing Wenches, three or four times a day (the Brahmins waiting in course) and those dancing Wenches and Boys set apart for that service.’²⁰⁰ Water from the tank was considered appropriately sacred for bathing the Gods and conferring upon them the purity that they desired or required.

Water brought joy and purpose to travelling people, from kings to commoners. Edward Terry who accompanied emperor Jehangir in his march to Mandu, noted that whenever he came to a place that ‘affordeth plenty of good water, he would usually stay there three or four days, or more; and.... find out pastimes to which end he always carried with him divers kind of hawks, dogs and leopards, which they train up to hunt with.’²⁰¹ Similarly the French priest Abbè Carrè during his voyage in the Coromandel region, halted at the village of Bagnapale, which was close to a huge water reservoir. He noted, ‘The tank, its borders and the gardens around it are nearly all swampy, and were so full of ducks and other water fowl that two of my servants who went to shoot them returned in less than half an hour with a great many delicious birds.’²⁰²

The several properties of water were cherished in all kind of ways. While efforts were made to imbue a sense of architectural aesthetics to the tanks and wells, care was also taken to sweeten the acoustics of flowing water. This interesting facet was observed by Edward Terry while referring to the garden-tank complex, where Sir Thomas Roe stayed for three months, at Surat. Terry noted: ‘The water that is conveyed into these small tanks usually runs down broad stone tables that have many hollows made in them like to scallop shells, which water in its passage makes such a pretty murmur, as helps to tie their senses with the bonds of sleep, in the hot seasons of the year when they constantly keep [within] their houses; and then they lie down near them on their carpets, to be lulled asleep.’²⁰³ Similarly

¹⁹⁷ Temple (1928: 70).

¹⁹⁸ Ibid., p. 70.

¹⁹⁹ *Duels* from *dewal*, an indoor temple: See Crooke (1992: 33).

²⁰⁰ Ibid., p. 39.

²⁰¹ Foster (1999: 402–03), Edward Terry’s account.

²⁰² Fawcette (1990: 375).

²⁰³ Foster (1999: 89), Edward Terry’s account.

Fryer too noted that the *choultries* or inner pavilions in the mansions of the elite at Surat, had adjacent to them tanks of 'purling water' which were meant to soothe the senses.²⁰⁴ Apparently, flowing water and tanks in the houses and gardens, had some kind of therapeutic qualities which were greatly valued.

The water tanks inspired religiosity, and themselves became the hub of religio-cultural activity, on a grand scale. John Fryer was deeply impressed by the pleasing ritual observed by Surat's Gentile community during festivals at the grand tank, following the sunset prayers. He noted: 'In their great Solemnities it is usual for them to set it around with Lamps to the number of two or three Lecques [i.e., lakhs] which is so many hundred thousand in our Account.'²⁰⁵ Truly an awesome sight to please the Gods. It conferred a sense of holiness upon the water reservoir by recognizing it as a precious space and utility that was of immense value to people. Streyntsham Master, who later became the governor of Madras, wrote to one of the English company's directors from Surat in January 1671 about the social and religious practices of the Indians. Writing about the Hindoos he stated: 'They are gross Idolaters and worshipping many inferior Deities and Representations, even all things in heaven, Earth, the Waters, and things under the Earth and Waters.'²⁰⁶ This attitude of deification towards the waters and also the water sources was perhaps due to the recognition that, as with most venerable things, water too, needed and deserved to be worshipped.

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²⁰⁴ Crooke (1992: 235).

²⁰⁵ *Ibid.*, p. 261.

²⁰⁶ Yule (1888: 331).

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