



Chapter 3: Tamil Nadu: Of eris and ooranis

From a jet, I might be forgiven for thinking I am flying over a giant fish. At 36,000 feet, the basin of the Vaigai river in south Tamil Nadu looks like its got scales on both sides. Giant blue scales. The scales are uniformly crescent-shaped, made against the slope of the land from west to east. On the ground, the story is very different.

The scales become water tanks, or eris. Each is semi-circular, that approximates a crescent shaped. Earthen walls sometime lined with stones make up two-thirds of the sides of an eri; one-third is open, facing the slope from where rainwater flows in to fill it. The overflow of one eri fills the next and the next one's overflow fills the next – these series of eri called system eri is what I see as scales from a few miles up.

Eris as much part of southern Tamil Nadu's landscape as masala dosa and idlis. They have been around for a tad longer. Eri construction is recorded as early as the 3rd century BC but most that are still around are probably a few centuries old. The average age would be 700 years, though inscriptions near the walls of some make them older, going back to the Pallava dynasty that ruled this part of the country between the 9th and 13th centuries.

Eris were the mainstay of rural Tamil Nadu. They provided drinking water and irrigated crops – they were the centre of village life. Most eris were built by the rulers, either the king of the local chieftain, and looked after by the villagers. Some were built by the villagers themselves. They evolved a sophisticated system of sharing water that depended on the crops, amount of rainfall, height of the eri walls and area to be irrigated. This micro-level planning was possible because the village was administrative unit and everyone in the village was involved in the process.

My train, the Nellai Express, pulls into Madurai, the industrial and political capital of south Tamil Nadu, on schedule at 9 PM. The hotel is a stone's throw from the station, the pretentiously-named Madurai Residency. Situated in a small alley off one of the many radial roads that lead to the town's Meenakshi temple, Madurai Residency has a commanding view of the station. It also overlooks the main bus stand of the city; these two assets ensure that my room gets its share of city noisy 24 by 7. The view from the rooftop restaurant compensates for this though – at night, I get a spectacular owl's eye view of the city and the Meenakshi temple. It's all less impressive in the day, somehow.

Madurai has a temple in every street with garishly-painted spire adorned with religious figures – garudas, apsaras and gods selected from the Hindu pantheon – and monsters. The town is dominated by the 12 gopurams (towers) of the Meenakshi temple. Once, they were the only thing on the skyline; sadly, that's not true anymore with hotels like mine springing up a few hundred metres away.

The western gate is a 15 minute walk from the hotel through narrow streets with shops cheek by jowl selling everything on earth, and even things for the afterlife. There are as many beggars as there are sellers; both do brisk business from pilgrims on their way to experience god. At the western gate, a rapacious shoe keeper demands that I put my shoes in his, and only his, care. Irritated, I leave them next to the gate and walk, thinking that they are too old to be stolen.

“You can spend money to get here but can’t give me five rupees,” he rants after me.

The Meenakshi temple is dedicated to Shiva. Its complex sprawls over 6 hectares and has a massive central temple complex, a pond and innumerable smaller shrines. There is a wide walkway inside between the main outer wall and the inner temple walls. Each gopuram is richly carved with an assortment of celestial beings and the lesser gods. These are painted in all colours of the rainbow. Standing under one and looking up, I get the impression of staring at myriad painted pebbles with the occasional hand or head poking out against a blue sky. Pigeons abound and seem to nest in every crevice in the gopurams, decorating the heavenly bodies with their shit. Nobody minds – not the priests, the temple keepers, the pilgrims, the pigeons nor the statues. I fancy they have a nightly discussion after closing hours on the futility of keeping the birds away. The stucco figures have to be redecorated and consecrated every 12 years, which is why the paint doesn’t look as old as the temple.

Entry to the temple is free. Under the massive gopuram is a relatively modest wooden gate of indeterminate age. The temple’s website says it was originally built by Kulasekara Pandya, but it owes its current grandeur to the Nayaks who ruled the city between the 16th and 18th centuries. The complex is rectangular and entry is from four gopurams – north, south, east and west. The south gopuram is the tallest, at 1700 feet; the others are around 1630 feet high.

I walk around to the north side. Inside the north gopuram is a small shrine with a nandi bull next to it. Its built around a kadamba tree under which Indira is said to have worshipped a shivling. The said shivling is under the tree, a rectangular wall surrounds it. On either side is two metal railings – worshippers have tied many little yellow cots to these. They reflect the desire for a son. An endless stream of people flows clockwise around the shrine, genuflects and repents at one end and goes about its business.

Further east is the hall of a thousand pillars. It’s actually 985 pillars, each carved. The hall houses the museum with its impressive array of statues, pillars, paintings and carvings, that reflect a millennia of history. Unfortunately, the lighting in the museum leaves one helluva lot to be desired – it’s too poor to photograph in and flash photography isn’t allowed. Nor am I allowed to use a tripod. It’s hard enough to see the rare sculptures; taking pictures is doubly hard. The only saving grace is the reasonable entry fee.

The east side also has a hall, the Meenakshi Nayaka Mandapa, where there are shops selling odds and ends for people visiting the temple – flowers, incense sticks, candles, lamps and cloth. There is a brass lamp holder that holds 1008 lamps which is lit on festivals. I imagine it’s a sight to see, but at the moment only a few are burning. High

up on the pillars, near the roof, a series of sculptures depict Meenakshi's life as the queen of Madurai and Shiva's miracles.

The story goes that a king of Madurai, Malayadwaja Pandya, who was childless, did a series of sacrifices (yagnas). Finally, his efforts were rewarded – a 3-year old girl emerged from the flames and the king adopted her. But she had three breasts. The divinity who gave the girl assured the king that the third appendage would disappear when she met her consort. Meenakshi, as she was called, grew to be a brave and beautiful princess. She met Shiva on the Kailash battlefield and the third breast disappeared because she was an incarnation of Parvati, Shiva's wife. They both settled in the temple as Meenakshi and Sundareshwar.

An elephant – its live but looks like another sculpture – greets me at the temple's entrance, to the east. I enter another hall, this one with 110 carved pillars. I walk around this and exit to the south. There is a small corridor that leads me to the temple tank, surrounded by a pillared walkway. The temple trust's office is to the right as I exit.

I perambulate the pond, called the golden lotus pond. It is said that Indira entered the tank and filled it with golden lotuses. Its steps are full of people, tired from walking around the temple, soaking in the evening atmosphere. There is a golden pillar in the centre and a large golden lotus to one side. A water treatment plant completes the equipment in the pond. As with all temple tanks in Tamil Nadu, this one too is fed by an underground stream. How that gets to the tank, in the temple, in the middle of the city is beyond me. Even the temple watchman, who catches me taking pictures and whisks me off to pay for using the camera at the trust office, is clueless.

“It is the work of god. This IS a temple, you know,” he says.

The relationship between religion and water is clearest in the temples of Tamil Nadu. Each one has at least one large tank where devotees bathe before and after prayer. Bathe is a misnomer – in a public place, they rinse their feet and hands and wash their face as a substitute for a bath. The water in the Meenakshi temple is filthy – too many bathers and too little flow of fresh water.

In times past, the Tamil Sangam, the ancient academy of Tamil poets, used to congregate around this tank. Legend has it that the Sangam dates from when the gods roamed the earth. The tank was the testing ground for new poets. A new work of poetry was thrown into the tank. If it sank, it was worthless. If it floated, it was worthy of their consideration. Poetry was given divine sanction.

The story about Madurai is also linked to water. When Meenakshi and Sundareshwar got married, he arrived without any pomp and show, with just a dwarf called Gundodhara in tow. Meenakshi complained that they had put up a splendid show and retinue, while Sundareshwar had only produced a gnome. Sundareshwar suggested his gnome was a match for the entire queen's retinue. He should be fed, Sundareshwar said.

Gundodhara ate everything the town had to offer and drank all its water. He cried for more but there wasn't anything to be found. Shiva called Mother Annapurneshwari to

satisfy Gundodhara's hunger and Ganga, his thirst. Sundareshwar told the dwarf to place his hands on the ground and directed the Ganga to flow to that spot (Ganga had descended from heaven to earth on the tresses of Shiva). That river became the Vaigai river, that rises in the Western Ghats and flows east through Madurai to the Bay of Bengal.

The road from Madurai to Ramnathpuram is allegedly a national highway number 49, part of former prime minister Atal Behari Vajpayee's golden quadrilateral project. It's an apology of a highway, with just a single carriageway that permits us to overtake if there isn't any on-coming traffic. We head south-south-west out of Madurai to see the fabled centuries-old eris and the water keepers of Tamil Nadu, the neerkattis. We are on the way to Mudukulattur where Dhan Foundation has a field office, about 100 KM away.

There is an abundance of tanks in Tamil Nadu, quite evident the moment we get out of Madurai. They are easy to spot and soon, I am an expert eri-spotter.

M. Gurunathan of the Dhan Foundation, a large non-profit organization based in Madurai, reels off impressive figures. "There are 150,000 tanks, ponds and dugouts in peninsular India used for irrigation, drinking water and animals, respectively. This excludes the temple tanks.

"Tamil Nadu has 39,000 tanks, Karnataka 30,000 and Andhra Pradesh, 75,000. The tanks provide water for irrigation and drinking, and recharge the ground water, that people extract to drink through wells and hand pumps."

Looking out of the Sumo's windows, it's easy to believe him. The crescent-shaped structures rise out of the ground outside nearly every village. Some are clearly in use as they are clean and their embankments clear of weeds and undergrowth. Others are overgrown with weeds as the villagers have probably found another source of water – they have fallen on bad times. The command area of an eri is called an ayacut and farmers who cultivate the area, ayacutdars. The eri's embankments are called kanmoy.

The villages themselves are neat. Thatched houses made of either bricks or wood line streets, usually at right angles to the highway. Speed breakers before and after, and sometimes in the middle of, the villages ensure that nobody charges through, endangering humans and animals. The area is green with trees, though I am there at a time when there is no farming so farmlands are a desolate brown. We drive through many kilometres of acacia forests.

J Elamurugu is a team leader with Dhan Foundation in Madurai. He is also my guide on the journey to the eris. He says, "The forests are grown on wasteland and village commons. Farmers sell the wood to a wood-based power plant. They are assured of a regular income without having to work."

We reach Mudukulattur and the driver pulls into an impossibly narrow gate. Years of practice or sheer luck see the fat Sumo through and we disembark. The office is on the first floor. There is a large communal hall, a kitchen and toilet area and the actual office room with desks, chairs and steel cupboards. The walls are bright blue, and the lower half is painted a dark green with enamel paint. Elamurugu has called a well-

known neerkatti, Ganesan, to speak with me. He is from Madeyini, a small village close by.

Neerkattis are the water keepers of the eris. Each eri has at least one to maintain it and distribute water. Neerkattis have been around as long as the eris. Their tradition is handed down from father to son – once a neerkatti, always a neerkatti. It's an obligation on the neerkatti's family to manage the eri's water for the village. A neerkatti's decisions are never questioned, even by the upper castes, even though most come from the lower castes. Most are descended from the servants of the erstwhile zamindars. Neerkattis are pivotal to the success, or failure, of an eri in a village.

“Why is caste such a determinant?” I ask Elamurugu.

“If a neerkatti is from an upper caste, his decisions on water can create problems. Upper castes are also the land owners so a neerkatti from them will appear biased. Having a low caste person as a neerkatti gets around this problem because traditionally, they have never owned any land. Their decision on water is taken as final and unbiased by everybody,” he says.

“So traditionally they are all from the lower castes?”

“Usually from the lowest, the shudra caste. Some are even scheduled castes,” he says.

It's strange that the most downtrodden should be chosen to control the most critical resource in villages, water. And everybody in the village should abide by his decision. There is no hard and fast rule that says only these people can become neerkattis; anybody from any caste can. Elamurugu's analysis makes sense but the neerkatti's word as gospel truth does not. However, that's a tradition and I let it pass. A neerkatti worth his water knows that effective tank management is key to social harmony.

Neerkattis know their village topography inside out. They know all the slopes and drains that the rainwater flows through. They know the distance from the eri to the fields and the amount of water needed to irrigate each field. They know which sluice to open in order to reach the furthest field. Years of experience has taught them the order in which to water the fields. They can suggest which crops to grow based on the amount of water. Some legendary ones even predict the amount of rainfall in a particular year even though weather prediction is an uncertain craft.

There are as many ways to appoint neerkattis as there are eris. Some have been hereditary. Others are selected by the village committee. Still others are appointed by the government. The common thread is their command over water – its sources, requirements and distribution – in their eri.

Neerkattis have a mile-long job list, even though their work is concentrated around the monsoons and the kharif crop season. In villages, with agriculture as the mainstay, water is the most critical input and the man controlling it, of prime importance.

“I have been born and brought up in Madeyini Patti,” says Ganesan. “I know every inch of the land, every farmer and what he grows.”

Madeyini Patti is a small village in the Madurai district. It's a few kilometres from where we sit in Dhan Foundation's office in Mudukulattur. The village runs along the eri, a long meandering crescent shaped structure with a very solid bund along its sides. The bund has many old tamarind trees and is remarkably clean. A group of women lounge under one, catching up on the gossip in the afternoon. The village stretches off to one side. The main access is the road along the eri's bund and the village lanes lead off at right angles. It's a small village and beyond the houses are the fields, dusty and ploughed, waiting for the rains.

In season, Ganesan has no time to talk to itinerant writers but in late May and just before the rains start, Ganesan is free. He is a wizened white haired man of around 65 who's spent his years tramping around his village fields, ensuring they are watered, guarding them when needed and collecting his 'pay'. Ganesan does not own any land so in the lean season, he works as casual labourer on construction sites, a huge comedown for a man who is so plugged into the local water scene.

Elamurugu says, with a degree of pride, "He can predict the rains also."

Neerkattis maintain the eris in their charge. This involves mending the dykes (bunds) and checking and replacing the sluices. If the concrete base of the sluice is damaged, it needs to be fixed. Most importantly, maintenance involves clearing vegetation from the eri bed and deepening the eri so it can hold more water. As water in the eri dries, its bed is used for cultivation – farmers leave the stalks behind and these need to be cleared. Even when the eris are not cultivated, weeds and acacia grow fast and need to be cleared lest they take over completely. Then, rainwater flowing into the eri carries a heavy silt load that fills up the pond and needs to be excavated every so often. However, this has to be done so that the eri's holding capacity isn't more than what the dykes will bear – greed and be the undoing of the entire village if the bunds break.

In addition to the eris, Ganesan has to clear the water channels that feed the tank. These often flow through the village and people dump garbage into them during the dry months. Ganesan has to clean all this out so the water from the rains that reaches the eris is clean and the eri doesn't get polluted with garbage. He also has to make sure that human and animal shit along the channels is cleared. In short, he has to tour the village and make sure that it is clean so the water entering the eri is also clean. Ganesan sometimes hires labourers to help with this if his family isn't available. He pays Rs. 80 for half day's work and Rs. 100 for a full day's work to each labourer.

"It is in my interest to involve my family," he says. "Otherwise, it affects my income."

He has a small family. One son works in a hotel and the other studies. Both chip in when needed, but their help is sporadic. Ganesan is quite sure he is the last of the neerkattis from his family. The village will have to appoint another when he dies. His forefathers were appointed neerkattis by the person who built the tank.

"Some 600 years ago, the tank was built probably at the behest of the local ruler. He appointed my ancestor as the neerkatti. It has been in the family since then," he says. From the original neerkatti, a clan of 20 families has descended. Each family gets to

be neerkatti by turn, once a year. That means Ganesan's family gets its chance once every 20 years.

“Not quite. It's more frequent than that because others give up their right. Some work in government jobs and aren't interested in being neerkattis anymore. So I get my turn more frequently,” says Ganesan. In lean years, he becomes a casual labourer. Sometimes, another neerkatti family hires him and gives him a share of their income. When his turn comes, he returns the favour.

On the output side, the first thing he checks is the sluices. These comprise a large conical stone that fits snugly inside a concrete hole, that is the water outlet. A rope attached to the top of stone lets Ganesan pull it up and open the sluice. It's a simple mechanism but prone to breakage because when he closes it, the stone usually cracks the concrete. The higher the stone is pulled, the more water the sluice lets out. He fixes the stone in place by pushing sticks between it and the hole. Ganesan also needs to clean the holes through which water flows out into the fields. If a sluice needs repair, it can cost up to Rs. 2,000. Dhan pays Rs. 500 and the village association pays the rest.

His eri has two sluices, one above the other. When the eri is full, he opens the upper sluice to water fields that are at the tail-end of the command area of the eri. Then fields nearer the eri get water. The lower sluice is opened only when the water falls below the level of the upper one. Then only fields near the eri can be watered by that time – the more distant ones have got enough water for the entire crop. The soil in this part of the country is black cotton soil which is very clayey and non-porous – crops don't need much watering to grow. This characteristic of the soil also makes eris successful here as water seeps very slowly into the ground.

Ganesan decides on his own whether to water fields tail to head or head to tail. Sometimes, farmers ask him to water their fields in a particular order and Ganesan has to factor in these requests. Ganesan has figured out how much time it takes to water each field in the eri's command area. There is a complex system of channels that lead from the sluices to the fields. Ganesan 'opens' a 'gate' in a channel by the simple expedient of breaking the channel's mud wall and letting water into a field. When it has been watered enough, he closes the 'gate' by putting a few stones and mud and reconstructing the wall. Then he repeats this for the next field. Simple, but effective.

“How do you know when a field has enough water?” I ask.

He shows me his hand, a very wrinkled one with deeply etched lines. The veins stand out like small hill ranges on the back. These hands have watered countless crops for many decades.

“If the water is more than one hand deep, the field has been watered enough,” he says. Water regulation is needed only after paddy has been transplanted.

“Does that apply for all crops?”

“No, it's for paddy. The other crops don't get much water and they don't need much water,” he says.

Farmers grow mainly paddy in the first crop. If the rains have been good and there is water left, they plant gram and ragi as a second crop, neither of which needs a lot of irrigation. Paddy is water-intensive and the water distribution expertise of neerkattis is tuned to the needs of this particular crop.

Ganesan does not get any money for his work. He can hire people to help with cleaning the water channels, but he has to pay them – the village will not. Ganesan gets paid in kind, as have countless generations of neerkattis before him. He gets 7 KG of paddy for every 60 cents of sown paddy. An acre has 100 cents. He also gets 4 KG from each farmer for operating the sluice gates. He also gets paid from the second crop, whenever there is one, but this payment is not fixed; farmers are free to pay him what they want. Ganesan earns a little extra by watching over the fields.

This rate was fixed much before Ganesan became a neerkatti and was accepted as a fair price for his labour. Madeyini's farmers pay him 10 bags of paddy every year, totaling 700 KG. He can do what he wants with the paddy – sell or eat it. That is a little less than what he should get as they farm a total of 60 acres of paddy. However, not all fields are sown with paddy every year. It sounds like a lot till I realize he had to feed and clothe his family from this; then it's not a lot. Then, if he hires labourers to help with the channel and eri cleaning, he has to pay them himself. Ganesan barely makes enough to get by between the paddy, his casual labour and his wife's work weeding fields. She makes just Rs. 30 a day for working in the hot sun. But he would not be anything but a neerkatti.

"I'm paid only if the crop is good. If it's bad, and the farmers have no surplus, they don't pay me. Then, I have to find work as a construction labourer to make ends meet." He says. "Sometimes, farmers don't pay even if the crop is good. When that happens, I don't water their fields the next season. I cannot fight with them," says Ganesan.

The eri's walls are made of mud with a stone covering in places where it has to face the direct flow of water. This makes the walls porous. When the eri is full, water seeps through into the adjoining fields. But this isn't cause for concern for either the farmers or Ganesan. They know it keeps the fields moist and helps with crop growth; it also reduces the actual irrigation required. The water is deep and Ganesan has to swim to raise or lower the sluices because there are no steps down to the gates, nor a place to stand.

Each eri state has its own little shrine. Some are regular temples with a small garish tower that seem like wannabe Meenakshi temples. Others are little triangular constructions under a large tree, preferably peepul or a banyan tree, with a small platform in front. The idea wasn't so much to pray as to purify the water and keep people from shitting or pissing in the eri's catchment.

Elamurugu says, "In some places, the irrigation department has cemented the eri's walls to strengthen them and increase water storage. This has not gone down well with the villagers because water seepage stopped. Their fields have gone dry and need more irrigation. The department also constructed cement channels from the eri's

sluices to the fields. Even this wasn't welcomed because it makes watering fields more difficult."

Ganesan says, "Earthen channels are easy to use because I just need to break a portion of the wall and then fill it up with stone and mud later. A concrete channel is hard to break and block again."

Ganesan won the Best Neerkatti Award, handed to him by then President of India, K R Narayanan. He wears his fame nonchalantly.

Concrete channels do serve their purpose – they ensure that fields at the tail end of the system get water. This increases equity and where it has proved beneficial, villagers have welcome it. In most cases, though, they have not been happy with concrete channels.

Neerkattis are not always appointed in the same way nor is his functioning always autonomous. In Madeyini, it is hereditary and Ganesan knows what to do. In Aiyankoila village of Madurai district, the farmers tell the neerkatti how they want their fields irrigated. Periyarswamy the neerkatti is responsible for three eris though typically, it is one neerkatti per eri. The village has three hamlets and each one has its own eri. Once he has been told the pattern, he irrigates fields according to his own assessment of water needs.

"I've been a neerkatti for 40 years," he says. "My family has been neerkattis for many generations. We are responsible for irrigating the entire ayacut of the three eris."

His job is similar to Ganesan's – he closes the sluices before the rains and cleans the eris and the channels. Here, though, the farmers share the cost of cleaning, unlike in Madeyini. Periyarswamy oversees the work but does not pay from his pocket. Unlike Ganesan, Periyarswamy convenes village meetings – he is something of a village secretary. He guards the ayacut and keeps cattle off the fields. When he needs additional manpower, he hires his sons but never gets non-family to help. In Aiyankoila, neerkattis do not work by rotation as Periyarswamy's is the only family in the village in this line of work.

Sometimes, Periyarswamy has to settle disputes over sharing of water because the feeder channels for the three eris are common. Ayacutdars of one want theirs filled before the next one; the neerkatti's word is taken as final in these disputes. The ayacuts for the three eris are different – there is no overlap.

"There was a dispute a few years ago between different groups of ayacutdars. One group diverted the feeder channel to their tank. I brought the two groups together and we worked out a compromise," says Periyarswamy.

Periyarswamy earns considerably more than Ganesan. The pattern is the same as Ganesan's but the cultivated area is more, at 100 acres. He makes 1,500 KG of paddy in a good year.

We drive along a long, narrow winding road in Madurai district. On one side runs the Sowdarpatti tank, an enormous expanse of grass and stone. On the other side is a

series of villages. An impressive banyan tree dominates a turn in the road – the builders decided to go around it rather than cut it down. The wall that the road runs over is made of stone, two sides are bounded by hills and the third is where the water enters from. There is a small puddle in the middle of the tank – the rest is dry. It's an impressive tank that must be several centuries old. The outlet at the far end has a series of four sluices. The tank is very much in use; it's not been cleaned yet to store water but will soon be.

Sowdarpatti is a village named after the tank. We stop on the road under the tree. Elamurugu and I walk down a lane to find Dorai Pandi, the head of the village TFA. His house is unpretentious; a single storeyed building made of bricks, plastered with adobe and covered with corrugated iron sheets. The sheets come way down so I have to bend double to get into his verandah, where there is some more head room. The main door is painted a bright blue that contrasts with the white of the wall. The door's locked but a young man appears under the roof sheet at that moment.

“Where is Pandi?” asks Elamurugu.

“He has gone to the town. He'll be back in a little while,” says the youth.

We decide to wait under the banyan tree as it's hot in the verandah. The youth is packed off to get Pandi from the town. He pedals off. I look around – there are a few outhouses that accommodate labourers. Dorai's fields stretch beyond them for a great distance. His house is somewhat removed from the village as is sometimes the case with village headmen or zamindars. The village is typical, with fairly clean swept streets and houses made of stone, adobe and thatch. It's late morning and most people are in the fields, preparing to sow. The odd dog or child are the only occupants of the village.

“He will take at least an hour. Should we wait?” asks Elamurugu.

I wiggle my head, in the south Indian equivalent of a nod. We get into the Sumo and drive to the banyan tree.

The youth returns before the appointed time is up with Dorai in tow. Dorai is clad in typical fashion, white shirt with a white lungi.

Elamurugu introduces me. Dorai is obviously a man of some importance in these parts. We sit on the tank's wall to chat. Dorai says the tank irrigates six villages. That's easy to believe given its size; when it's full of water after a good monsoon, it looks like a lake. The neerkatti tradition here is different, in keeping with the needs of water.

“So you must have more than one neerkatti to manage so much water,” I ask.

Pandi wiggles his head. “Four families are selected out of 20 neerkatti families by a draw of lots every year. Each family gets its turn once every five years. We need so many to control the water from the tank. Each neerkatti controls one of the sluices. The heads of the other villages have a meeting here every year to chart out the neerkattis' duties.”

Sowdarpatti, a Brahman-dominated village, is also headed by a Brahman family. This family has been responsible for perpetuating the neerkatti tradition. The neerkattis for the tank have always been from Sowdarpatti village and not from any of the other five that it irrigates. The 20 families live in hamlets scattered through the village. They are all scheduled castes, in keeping with the general neerkatti pattern, and have been neerkattis for centuries.

This happy picture gives way to one of utter desolation a few kilometres on. We drive off the road and bounce along a dirt track through picturesque countryside – ancient granite rocks perched atop red rock mounds, with gnarled tree trunks making a living on their burning sides; elephant grass growing on the margins of small ponds; a little stream dancing through large rounded pebbles. We emerge on a small plain bounded at the far end by a low ridge. To the left is a smallish tank with grass reaching to its edges. This is the Chinna Veer Sudamanai tank. Cattle graze and buffaloes wallow in the pond. I walk to the ridge.

It's the checkdam that created the Peri Veer Sudamani tank, near a village of the same name. The Peri tank (larger of the two) is of great antiquity – two carved stone pillars stand a little distance from the checkdam that is actually a pile of rocks that has become a little ridge over the centuries. The granite pillars have inscriptions on them.

Elamurugu says, "These tell of the builder and lay down rules for the use of water. The tank's builder had made rules that villagers needed to follow when using water and maintaining the tank. There were punishments for violating them. There were rules for appointing neerkattis as well. I don't know what the inscriptions say exactly, but that is their meaning."

The pillars were connected to the checkdam once, as I can see from the slabs of rock lying at the bottom of the tank. There are other carved stones scattered on the bed of the eri so there was probably a building in times past. The bed of the tank is red rock, sloping upwards to a row of low hills on the far side. To the right, the edge of the tank merges into a little forest that separates it from the village named after the tank. The tank must hold water for several months and water an enormous area. A group of village girls frolics in the water some distance away, quite unabashed by the men working the rock quarries some distance away.

The Peri tank is used by humans for washing and bathing. Elamurugu tells me there is a well on the far side from where villagers draw drinking water. The Chinna tank, that gets the overflow from the Peri tank, is used by animals for bathing and drinking. It's easy to see why – animals would find it hard to scramble up the steep slope of the checkdam. From this one, water is released into the fields beyond.

It's a pretty picture and all would be perfect. But for the rock quarries on the hills across the tank. Hammers falling on anvils and rods make a rhythm that would do a jazz drummer proud. Here, though, they are sounding the death knell of the two tanks. In a few years the hills that are the tanks' catchment area will have disappeared under the greed of the miners and the government's stupidity in granting mining concessions. In just a few years, the miners have substantially whittled down the hills. The legacy of centuries is being hammered away at the Sudamani village. The

villagers are part of this plunder, having abandoned farming – and use of the tanks – for short term gains from the mining. After these hills are mined into the ground, there will be others, then more.

In many places, eris are linked through channels that follow the contours of the land. The overflow from one fills the next, then the next and so on. These are typically called system tanks or cascades. Its another show ingenuity in tapping rainwater and not letting much escape – an eri's capacity is limited but by building a set of them along a natural drain, people have managed to maximize the impact and multiply the quantity of water that can be stored.

Saviourpatnam, a Christian village around 20 KM south of Ramanathapuram, has an eri and two ooranis. Ooranis are smaller than eris, usually rectangular in shape about 30M by 20M. They are fenced with barbed wire and gated to keep animals out. Most that I see have been recently built and have steep mud walls on three sides. Ooranis are built on the surface of the land, not excavated, by raising walls. The walls are 6 – 8 feet high. The fourth one, nearest the gate, slopes gently to the water or a well at the edge. People collect water from here. The International Water Management Institute in Sri Lanka has listed ooranis as one of six most innovative water management practices globally.

Ooranis are exclusively used to store drinking water for humans. Unlike eris, that have feeder channels to collected rainwater from a large catchment area, ooranis have high walls and no channels. They only collect rainwater that falls directly into them. As they are on the surface, there is no chance of water from outside seeping through the walls to contaminate what is within. The fences ensure that no animals get into pollute the water. Animals and human shit cannot be washed into the ooranis either. The water is reasonably free of bacteria and people drink freely from a well-kept oorani.

The clayey soil of the region ensures that the water does not seep into the ground in a hurry. Villagers determine their drinking water needs and the size of oorani needed to meet them. Sometimes, a village can have more than one. Elamurugu says this ensures water security; I suspect caste equations in the village necessitate construction of more than one oorani.

The clayey soil is a blessing and a curse. It keeps the water on the surface, where people can use it. It also makes the water extremely turbid. I draw a bottle of water from the oorani. It's got so much suspended clay that I cannot see through the bottle. A woman draws water from a well to one side of the oorani. I peer into the well – the water is as murky as that in the oorani. The oorani is fairly new, a couple of years old. The fence wire still has a shine and is good repair right around. A gap in the fence suffices as a gate; villagers take it upon themselves to keep animals out. We have parked next to the oorani. Across an open patch of land is the village church, an old tumble-down structure. Next to the oorani is a large spreading tree, the therran.

Elamurugu says, “The well doesn't filter the water much, only a little. It is easier to draw from the well so we built a concrete slab on which people can stand and draw water rather than walking into the oorani to draw water. It keeps the water cleaner.”

“How does anybody drink this? They will get all sorts of diseases.” I say.

A group of men has gathered in the few minutes we have been there. Most have only multi-coloured lungis. One has a white lungi and white shirt. A couple are in trousers. One of them is Xavier, an oldish man of some authority in the village, who gives me a toothless grin. He rattles something in Tamil to a man, who returns a while later with a mud pot and a few dried seeds. They are blackish-brown, hard and oblong, about 1 CM at the longest. Xavier soaks one seed in the water for a minute and then rubs it against the pot's side for another. He pours in the water and swirls it around; then he sets the pot on the ground.

“Wait 10 minutes,” he says in good English. I am taken aback. He used to be in the army but left after five years to farm. The seeds are from the Therran tree.

Nothing seems to happen immediately. In a couple of minutes, the water looks like spoilt milk, albeit slightly yellow. The coagulant in the seeds is working in real time. The flecks of coagulating mud get bigger and bigger, and then the process slows down. They settle at the bottom. The water is still somewhat murky when we set the pot down and walk off.

There are two such ways to coagulate floating impurities in water and the people of this region know about both. One involves local trees and is extremely simple – wet the seeds, rub them on the inside of the pot a little, pour in the water, wait a few minutes and decant the reasonably clear liquid into another container.

That spreading tree is the Therran, one of the order of Loganiacea of plants. The tree is native to the Coromandel coast. Botanically, it is called *Strychnus Nux vomica* – homeopaths may find that familiar. Other varieties of *Strychnus* trees also produce the deadly poison curare, that was used to coat tips of arrows and spears to kill an enemy. *Strychnus Nux vomica* produces *Nux vomica* and strychnine, alkaloids that are extremely poisonous but are also used as a medicine. According to the *Eclectic Materia Medica*, in small doses they form a bitter general tonic. In larger doses, they act stimulate and tone the body. In regular doses, they increase reflex action, enlarge lung capacity and raise the pulse rate. In higher doses, they can kill.

When he wet the seed and rubbed it, Xavier released the alkaloid that helped the mud floating in the water to coagulate. This principle of using proteins for coagulation has been well-researched and there are at least 10 known plant sources of coagulants. Another popular one is the seeds of *Moringa oliefera*, locally known as the drumstick tree. It produces long, thin and ridged vegetables that are used primarily in sambar in Tamil Nadu. The fleshy insides are a tasty treat. The locals also cook its leaves as vegetables.

These are cheaper than the chemical-based way that uses chemicals such as alum for commercial water treatment. The seed process produces no toxic sludge. Sludge from *Moringa*-treated water is only 20-30% of what is produced from alum-treated water.

I walk around Saviourpatnam. The village does not have a tarred road – a dirt track is the main road of the village. On either side, single storeyed houses open onto the road that ends at the square between the church and the oorani. Beyond are the fields and an eri. Most people in Saviourpatnam are farmers, growing the typical single crop of

paddy and the occasional crop of gram or coarse millets. I would not call them poor, though by urban standards they would be. Nearly everybody is well clothed and fed. The houses are made of bricks and thatched with straw. The village is clean even though the road is muddy in patches. Saviourpatnam grows enough to provide for itself and has a healthy surplus.

“In a good year, each family grows enough to last for two years. So if there is no rain the next year, we can all manage easily,” says Xavier. He takes me to his house, a rambling single storeyed structure with a large courtyard in front. The courtyard is swept clean and has been recently plastered with a mixture of cowdung and mud. I take off my shoes at the entrance and walk across to his house. We sit on cane chairs in the shade of his verandah.

He points to a room behind us. It’s full of sacks of rice – his bank. There is enough for his family of three for the rest of the year to eat and buy other stuff with. It’s farming time from the onset of monsoons till winter, then harvest time and getting the paddy to the market. The early part of the year is the slow time, full of festivals and leisure, unless they have water for a second crop. It’s also a time of uncertainty – will the rains be good, what will summer be like, will we have enough water to tide over the hot season. At this time of year, people migrate to towns and cities for work or rear goats and poultry to earn a little extra.

“Last year, we decided to build another oorani because this one isn’t large enough,” he says. “We have raised our own money and are building it on our initiative. We have not taken anything from the government or Dhan.”

Tractors and bullock carts ply up and down from the oorani’s site, bringing in mud to build the walls. The rains are only a few days away so work has to be completed soon.

“We will be ready in two days,” says Xavier.

I look at the frenetic activity and believe it is possible. We return to the mud pot under the Therran tree. I peer in, expecting to see murky water, and almost drop the pot in surprise.

The water has completely cleared up, and at the bottom of the pot are a few blobs of congealed mud, looking like mud-coloured yoghurt. I put my hand in and shake them – they float up momentarily and settle down again. I pour the water into the plastic bottle that has a little bit of oorani water still in it. The turbid water swirls up into the clear liquid but the mud quickly coagulates and settles at the bottom. The water is faintly yellow but tastes nearly as good as the bottled water I have along with me from Madurai. The coagulated mud is left behind in the pot – Xavier throws it away.

The process depends on people using the right sort of pot. You cannot use the seeds on water stored in plastic pots or metal pots. The coagulation does not work in either case. It only works if water is stored in earthen pots.

Elamurugu explains. “We make the paste by rubbing the seeds on the side of the pot. Only earthen pots are rough enough to let us make a paste. Plastic and metal pots are

not. In addition, the commonly used metal is copper. The chemical in the seed would react with that to form a compound that tastes bad.”

I see little evidence of earthen pots. The woman who was drawing water a short while ago from the well at the oorani was filling a yellow plastic pot. Most others carry multi-coloured plastic pots, with the occasional metal providing relief. There are no earthen pots. The reason is simple – plastic is lighter and cheaper and they don’t break as easily as mud pots.

In the event that people are switching to plastic pots – I saw this in all villages in the region – it is necessary to find other ways to clean oorani water. Dhan Foundation has adapted a Canadian filter design. This contraption has a small container on top, the filter in between and a container at the bottom with a tap. The entire thing is fitted in a cement cylinder. You pour the murky water into the container on top and collect filtered water at the bottom. They are fairly cheap to make and each household is supposed to get one under a programme of the Foundation.

“Why not adapt the Therran seed paste instead?” I ask Elamurugu.

He shrugs. “It’s hard enough to get people to contribute to the upkeep of ooranis and eris. They want time-saving devices and feel that collecting, drying and then using the seeds makes no sense. Then, you need to get the proportions right – a little bit of Therran seed paste for a whole pot, no more, else you can fall sick.”

That in spite of the fact that Therran seeds have been used in alternative medicine for millennia and are free. The Canadian filters won’t be.

Nearby, in the Pusari village, the oorani used to hold enough water for the entire village for just seven months. Villagers went thirsty for the rest of the time. They asked the government for a desalinization plant that was set up and it worked for a while – the groundwater is saline here because of the ingress of seawater. When that broke down, they had nowhere to go because in the years that the desalinization plant worked, they let the oorani and the eris go to seed.

What happened next is typical of the tank revival movement that has quietly crept across large parts of Tamil Nadu.

Dhan Foundation promoted a Tank Farmers’ Association (TFA). This includes people from all families of the village, regardless of caste. The TFA decided to revive the oorani and eri. The total cost was Rs. 105,000 including labour and material. Dhan gave the TFA Rs. 75,000; the villagers contributed their share in kind as labour or by sending their tractors for earthmoving work. Each family contributed between Rs. 80 and Rs. 140 a day. In five days, the eri and oorani had been restored.

Dhan Foundation works on the principal that a third of the total cost has to come from the village; they chip in with the rest. Villagers can contribute in kind or cash. If they contribute in labour, it’s called This 25:75 ratio applies to all tank rehabilitation work in the region. Restoring a tank costs just a fifth of what making a new one does. It is faster and more practical than constructing a new tank. Restoration also makes sense because most villages don’t have the land for new tanks.

“It gives the people a stake in the work so they maintain it when we leave. It breaks the cycle of dependency on an external agency. It also changes their mindset that ‘the government will provide’. The government has not provided and people have started realizing that their contributions have revived their water structures,” says Gurunathan.

Dhan Foundation raises some of the money from the District Rural Development Agency or other government sources. These wings have money for minor irrigation schemes, that the eris fall under. Dhan has catalysed these funds and mobilized the villagers – its acted as a catalyst.

Gurunathan says, “We have tried to revive the traditional social structures that existed before the arrival of the British. For this we have promoted Water User’s Associations (WUAs) that map onto the village assemblies as they have representatives from every household in the village. This is the first step towards reviving traditional water management systems. It can take us up to six months to mobilize people and set up a WUA.”

That is after Dhan has worked in the region since 1994 to set up self-help groups (SHGs) that lend small amounts to individuals for starting businesses. In many places, these SHGs have been instrumental in setting up WUA or TFA in the same village. Once a TFA is set up, it can open a bank account to get funds for restoring eris or ooranis, depending on the village’s need. SHGs keep the TFAs alive during the dry season by meeting every month; the idea is to keep the organization going even when there isn’t a need otherwise it will fall apart. These TFAs are still nascent and villagers have not fully caught onto their utility.

The TFA determines what is needed in the village – revival or construction of eris or ooranis. Dhan helps it make a project proposal that is given to the DRDA. DRDA appoints a project manager who forms an implementation committee. The money from DRDA comes in installments into the TFA’s bank account. The final installment is released after the DRDA does a final assessment; sometimes this amount is less than what is actually needed for the project. In such cases, Dhan makes good the difference. The project lifecycle is usually 18 months.

Issues vary from village to village. In Kothaluthu village, upper caste farmers had encroached on the feeder channel for the eri. Others in the village had tried to move them since 1972 and succeeded five years later when the district collector intervened. The supply channel was cleared and the eri rehabilitated after that.

In Silamali, a man called Kurinchiyappa Gouder made the eri on 20 acres of wetland six centuries ago. It had been neglected for years in recent times. In 1997, Dhan formed a TFA, to revive the eri. It had 60 ayacutdars. They spent Rs. 120,000 to rehabilitate the tank; their own contribution was Rs. 24,000 and the rest came from the DRDA. The eri now irrigated 25 acres. I am surprised the people here remember Gouder as the man with a vision who built the tank. In most villages, all I get is a shrug when I ask who built their tank.

Rehabilitation work has helped soothe caste conflict in some cases, as in Manavaikudi village that is part of the Vallakulam cascade. It is dominated by the Servai caste, two groups of which fought over land for a temple. The scheduled castes of the village support one against the other. In the process, it was impossible to set up a WUA. It was critical to rehabilitate the village's eris as it was part of the cascade and affected the cascade as a whole. Dhan, neighbouring villages and the district administration jointly got the villagers to settle their differences and get on with forming the WUA. The process took two years but now all is quiet and people have enough water to farm rather than squabble.

Kadambankulam village, in the same area, has an eri that was renovated in 1997 with an ayacut of 60 acres. After renovation, the ayacutdars found they had more water and expanded the area under paddy. The eri is large enough to grow fish, that gives the TFA more income. Farmers now grow rice for their own use and chilli and cotton as cash crops. The eri was built by the local zamindar about 200 years ago. The zamindar ensured its maintenance with labour from the villagers.

In all these villages, a pattern emerges for Water Users Associations. WUAs work best if the population is about 200 families. Smaller villages don't have the critical mass needed to raise funds for eri maintenance but nonetheless have vibrant WUAs. They squeeze their requirements into what their WUA can afford to do. However, the system seems to break down in villages that have larger populations. If the number of households is much above 200, WUAs appear to be ineffective. This is perhaps because in larger villages, there is a higher percentage of people who do not farm – they are traders, craftspeople, or work in jobs. Their links to the land are tenuous and need for water is less than farmers'. They do need drinking water but see investments of time or money in eris and ooranis as unnecessary; they would rather get their water by tanker than put aside time or money to build something that will provide for them for free. The task of forming WUAs in larger villages has been harder for Dhan. However, the average village size seems to be 200 households and the model has worked well.

I recall this as a problem elsewhere in India. In Rajasthan's Alwar district too, where Tarun Bharat Sangh has worked to form village associations to build bunds and restore johads, the model has worked in small to medium sized villages. Large villages have not banded together as well to work for the restoration of water management structures.

The well-being of the village's water resources and the neerkatti depends on how vibrant the WUA or TFA are. The better the Associations, the better the village's tanks. If agriculture does well, so does the neerkatti. Conversely, if the Association and neerkatti are good, agriculture does well. In other words, if the modern Association has been mapped successfully onto the village association of yesteryear, things look up for the village.

The associations have well-demarcated roles. TFAs enroll farmers who own land in the ayacut, plan and implement development work such as rehabilitating tanks and build wells, undertake fish rearing and tree plantation or brick making to raise money that will pay for eri restoration and build up a corpus of funds to pay for tank maintenance.

To reinforce its work at the village level – reconstituting WUAs and TFAs, Dhan has banded groups of TFA together into Tank Cascade Associations (TCAs). Cascades are a series of interconnected tanks – the success of restoring one depends on the others and there are frequent problems of water sharing between villages. Cascade associations are a way to resolve these disputes. They also clean and repair feeder channels, mobilize funds across villages to improve tank irrigation systems and provide better services on agriculture and water management.

Another step up is setting up Tank Farmers Federations (TFFs) as apex organizations. These are groupings of TFAs at the district level. For example, the Madurai federation has 100,000 members from 198 villages. The federations mobilize funds from the DRDA and other sources, organize training programmes for their constituents and monitor the operation and maintenance of tanks systems. These federations are registered under the Societies Act, giving them a legal status.

The movement to rehabilitate eris is two-pronged, therefore. On the one hand, it involves restoring physical assets.

Gurunathan says, “These can be divided into three activities – acquisition of water, system restoration and improvements in water use efficiency.”

The first includes removing encroachers, cleaning and desilting feeder channels and clearing vegetation from the tank’s bed. The second includes rebuilding tank bunds and strengthening them to withstand heavy rains or floods; repairing water regulation machinery such as sluices and surplus weirs to reduce water loss; involving the landless under wage employment and; planting and preserving fodder, fuel and other plants. The third activity involves replacing damaged or missing shutters in sluices and restructuring the water distribution channels to improve the efficiency of the water distribution system.

On the other, it involves rebuilding village-level social structures such as village associations that, in centuries past, were the mainstay of rural organization. They ran the village, made rules and maintained the eris and ooranis. Under this system, the village was considered an administrative unit and paid taxes as a whole, collected on behalf of the ruler by the village headman.

The British undid this system with the simplicity of genius that only rulers intent on maximizing gains can display. They levied tax on individual farmers rather than the village. In a single stroke, they drove wedges into the village republic to prise this socio-economic unit apart. One of the fallouts was that they appropriated control of water resources and made water a commodity, to be paid for. This implied that farmers who had maintained their own water structures no longer had a stake in doing so; they also had to pay to use the water. Gradually, the traditions that bound village communities to their water resources withered away.

The network of eris and ooranis in Tamil Nadu, and elsewhere in India, is so intricate that no centralized system can effectively look after it. It survived only because villages looked after their own systems because they saw value in it and water a common good. By making water a government service, the British, and later the

Indian, governments alienated local communities. On the other hand, they did not allocate enough money to pay for the upkeep of this network. Villages could manage with extremely small investments comprising chiefly of labour. The government had to contract everything, including labour – this pushed up its cost of maintenance. As with all government systems, corruption ensured that most of money never reached the eri. Centralised management of water resources still remains the cause of India's water crisis.

Over the past 200 years the network slowly decayed till the early 1990s when organizations such as the Dhan Foundation decided to reverse the rot. During the first phase from 1992 – 95, the Foundation rehabilitated a few tanks to increase their storage capacity and improve the reliability of water supply. This gave it the experience and the confidence to launch a second phase from 1996-99. During this, the Foundation executed 500 development works including tank restoration, digging wells and providing drinking water. They covered nearly 56,000 farmers.

The ancestors of the people of Madurai and Ramnathpuram certainly had the right idea when they started digging eris and ooranis. Rainfall is erratic and agriculture here is completely dependent on this making it a game of Russian roulette. Eris and ooranis evened out the rough spots by making water available for most of the year. This helped farmers tide over drought years and avoid famine as they could grow enough in a season of good rainfall to last them a couple of years.

Eri builders studied the contours of the land before picking a spot to make an eri. The size of the eri, the height of its bunds, the ayacut and command area were an integrated package, each designed to maximize the irrigated area while minimizing the submergence area. None of the tanks were made with sophisticated measuring or construction equipment, which makes them all the more remarkable. They were so successful that eris once irrigated a third of all land in the state.

The ray of hope for eris and ooranis comes from the government's inability to provide water. Rainfall has become more erratic in recent years. It has finally dawned on the local people that they have to revert to the wisdom of ages to make ends meet if they want to live in the land of their ancestors. Else, they have little option but to find greener pastures in the slums of Madurai, Chennai and other cities. The movement started by the Dhan Foundation has gathered speed – it is spreading across the state and to other parts of Peninsular India, bringing with it renewed hope for eris and ooranis.