

# WATER – THE ELIXIR OF LIFE IN AND AROUND SIVAKASIANS

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*Due to shortage of water in Sivakasi, water supply through pipeline by Sivakasi Municipality has been supplied once in eight to ten days. Usually it was supplied once in four days. Recent summer and lack of rain in the town resulted in decreasing ground level water. The town and rural might face even more water shortage, if monsoon rain fail. Sivakasians for several years are heavily dependant on private tanker lorry supply as the water level in their borewell has dipped. Sivakasi Municipality has also reduced water supply by decreasing the duration of water supply and supplying water once in 10 days. One kudam of hard water supplied for Rs. 5, soft water for Rs. 7 and mineral water for Rs. 15, by Private water suppliers. Sivakasians everywhere noted that the cost of hard and soft water had drastically increased over the past few months as the water crisis worsened. As the town and rural facing water shortage problem, Sivakasians were seen carrying water pot on their head and in cycles. Sivakasians expecting a super rain in monsoon season to tackle severe water crisis.*

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## INTRODUCTION

Water is literally, the source of life on earth. About 70 per cent of the earth is water, but most part of it, is ocean. Practically, only three per cent of the total water available on earth is freshwater. Out of the three per cent, only one per cent is accessible surface freshwater whereas the rest two per cent is locked away in the form of ice caps and glaciers in the polar regions, far distant from human habitation. The one per cent surface freshwater is regularly renewed by rainfall and other means and thus available on a sustainable basis and easily considered accessible for human use. The human body contains 70 per cent water. Even at the loss of one per cent body fluids, a human being feels thirsty with near 10 per cent loss, there is risk of death. Without freshwater survival of human life is impossible except for a few days. Water is the biggest crisis facing the world today. In India the crisis in terms of spread and severity affects one in three people. Today about 200 million people in India do not have access to safe drinking water.

India has a long tradition of managing water, but increasing demands due to population and industrial growth and agricultural development pose new challenges. The quantity and quality of available water is decreasing, aggravating the already serious situation. According to the Ministry of Water Resources, water shortages in India will become even more pervasive by 2025 and stress human and economic development. Appropriate management of water resources is crucial for future economic development and protection of human health and life itself. Considerable investments are required to provide clean water. A time bound programme must be initiated to ensure sustainable use of invaluable water resources.

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## WATER CRISIS IN MINI JAPAN

Sivakasi's water supply is poor. Many people do not have a reliable source of drinking water. There is very little rainfall in Sivakasi due to its geographical location which causes the sources of water to dry up. It is a big problem for the town.

The Vaippar river is an important source of water for Sivakasi that normally provides the town with around 15 lakh liters per day. However, at the moment the river is so dry that no water can be taken from it.



## VENBAKKOTTAI DAM

The other large source of water is the Vembakkottai Dam. This is not completely dry at the moment, but is only providing 10 per cent of the volume of water that is normally does. Six wells are currently using to draw drinking water which are all 10km-20km away from the town.

Water is being brought into the town by lorry and distributed to the people of Sivakasi. The water provided in this way is free, but there are also private lorries in the town which are selling water to make a profit. The combination of these supplies means that most people are still getting sufficient water but transporting water into the town by lorry is not ideal.



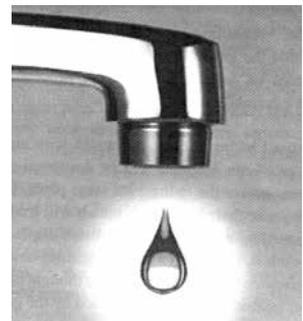
In 2003 the Sivakasi Municipality started to implement the Mannur Combined Water Supply Scheme. The scheme involves piping water from River Thamirabarani to Sankarankovil to Tiruvengadam then to Sivakasi. This is scheduled to be completed in 2005 and should solve the town's water shortage problems. Fifty lakh liters of water will be provided to Sivakasi every day all year round. So no one should be short of water even when the weather is dry. The future looks very hopeful as the people should see and end to water shortages.



The water scarcity is so great that the people of Sivakasi are very aware of the problem. Schemes such as Rain Water Harvesting are carried out by the people of the town to try to preserve what water supplies they have.

## Why Less Rain in Sivakasi?

"Why less rain in Sivakasi?" is a question which remains on lips of all inhabitants. The lack of rain, and subsequently water, has meant a crisis for countless farmers and industries, causing many to seek alternative ways to counter the problem.



According to experts, the lack of rain arises simply for two reasons: the location of Sivakasi and the rain shadow effect. The actual scientific explanation of the rain shadow effect is where precipitation amounts drop significantly on the leeward side or behind of a mountain. The area tends to be dry because, as moist air rises to top of a mountain range, air cools and water vapour condenses as rain, which then falls on the windward side or top of a mountain. This effect in turn, results in the creation on the leeward side, of an area with descending dryness and warming air, amid a distinctly arid climate. Thus when describing the consequences of the effect, the old English proverb of “the grass is always on the other side of the fence” couldn’t be more pertinent. This is a particular problem for Sivakasi due to the town’s deep inland positioning east of the Western Ghats. During the months of July to September, the monsoon from the southwest condenses above the mountains resulting in the lack of rain. Alternatively, due to Sivakasi’s considerable distance from the Bay of Bengal, little rain manages to reach so far inland.

The lack of water in Sivakasi is no recent phenomenon and according to Uma Kawsalya, Co-coordinator of the Exnora, an international environmental organization, the lack of public awareness is a major contributor to the worsening conditions. As part of Exnora, she is committed to undertaking projects to assess the problem and seek ways in which to improve it. One of the problems lies in the unequal distribution of water between people. Countless people live without any water, and even when they are willing to pay, they are unable to receive any from the government. However, many point out to the fact that lack of water is in fact, more widespread than at only regional level. A further concern is held over the drainage and waste systems in the area. Kawsalya argues that if an adequate drainage system was in place, the water could then be treated and reused by industrial agents.

In order to combat the situation and increase awareness, a number of alternatives have been suggested by Exnora and other local authorities. The Tamil Nadu Water supply and Drainage Board has recently advised modern-day methods by which people may harvest rainwater. The methods have been classified under two categories, artificial recharging and rain water harvesting. The recommended practices are both proven to work, and simple to operate. The different techniques suggested can be seen in the table below:

Artificial Recharging	Rain Water Harvesting
Absorption Pit Method	Percolation Pit Method
Absorption Well Method	Bore Well with Settlement Tank
Well cum Bore Method	Open Well Method with filter bed Sump
Recharge trench cum injection well	Percolation Pit with Bore Method

Harvesting of rainwater is seen as a vital requirement, if Sivakasi is to manage the dire water situation. However, in order to achieve this, first the people must be educated as to the importance of doing so. At present, there is a general lack of understanding and as such the level of water wasted ranks high. Kawsalya believes that another way of helping the situation is with the involvement of the private sector in the treatment of water. It is believed that this would help provide the necessary funds to maintain as efficient water treatment centre, as opposed to what already exists. In addition, the funds which the private sector may bring, would allow further research into the topic, and the possibility to enhance technology so as to combat the dilemma.

## Future Scenario of Water

It is 2020. Within a space station a group of men and women have just finished their daily workout. They sip water from specially made bottles.

There is nothing very unearthly about all this, except that the water has been “reclaimed” from sweat, urine and even their exhalations. The space tourists do not grimace while gulping the water. They don’t have any yucky feeling since they have already been drinking such water down below on Earth.

This is no scenario from a futuristic sci-fi movie. Scientists predict that drinking water reclaimed from urine, sewage and sweat may become the norm in the next two decades. Over-exploitation of groundwater is already causing shortage of water and climate change will only add to it. This will leave people with no option but to reuse “grey water” as urine is called.

The National Aeronautics and Space Administration of the United States is conducting a major study with 50 volunteers on the psychological, chemical and biological reactions to consumption of water reclaimed from sewage including toilets. The European Space Agency is asking scientists on an Antarctica expedition to utilise recycled sewage water for drinking at its Concordia research station. This will give the ESA enough inputs for its proposed Mars mission by 2030. Nasa volunteers even “borrow” urine from others and drink it after putting it through a state-of-the-art treatment process.

Countries such as Singapore, Australia and the USA have also started experimenting with recycling of sewage and toilet water and are also supplying it in limited quantities to the population. Singapore mixes one per cent of treated sewage water with 99 per cent of natural water to reduce the yucky feeling among its citizens and Australian cities have taken up massive advertisement campaigns to sensitise people on the issue.

Many nations in water-scarce and drought-hit Africa have taken up similar projects with the assistance of the World Health Organisation and the United States. And in India, people have been even drinking “untreated” sewage water from polluted rivers and other water bodies. They might consider any sort of purification a blessing. Crores of people living downstream of cities like New Delhi, Patna, Allahabad, Nashik, Rajahmundry, Hyderabad and Vijayawada drink treated sewage water without a second thought.

The Musi River empties into the Krishna River near Suryapet in Nalgonda carrying the treated sewage from Hyderabad. The Vijayawada Municipal Corporation has set up half a dozen such treatment plants to treat and let out sewage into the three irrigation canals that serve as drinking water sources for lakhs of people downstream. Vijayawada discharges 66 millions litres of sewage every day from 31 outlets into water bodies while Hyderabad pumps more than 300 million litres per day into the Musi river through 18 outlets.

Though reclaimed sewage water has not yet been “officially” used for drinking in India, several civic bodies and industrial houses are utilising it for watering lawns and for other purposes.

The Greater Hyderabad Municipal Corporation, for instance, utilises the waste water for watering its avenue plantation on important roads and gardens. Big industrial houses such as Madras Fertilisers and Chennai Petroleum purchase waste water from Chennai Metro, recycle it and use the “purified” water in their cooling plants. Arvind Mills, Rashtriya Chemicals and Fertilisers, Kanoria Chemicals and Maruti Udyog are also known to use the recycled water for industrial purposes.

Naturally, a question will arise as to why people should drink treated urine and sewage water when rivers and lakes seem to be positively rippling with water. The simple answer is that there is not enough water to meet the future needs of the ever-growing population. Scientists point out that the quantum of water on earth is constant and this means that water cannot be created afresh. The only option is to recycle the available water to meet the increased demand.

As of now, civic bodies in many countries are supplying reclaimed water at subsidised rates to make people go for it. The Singapore government, in fact, takes tourists to many of its recycling plants to in a bid to create awareness on the importance of water conservation. “Soon water availability may be what will differentiate the haves from the have-nots,” says H. Subramanian, water management expert and vice-president of EverythingAboutWater. According to him, India will become a “water-stressed” country by 2025, with water availability declining to between 1000 and 1,700 cubic metres per person per year.

“The possibility of future wars over water is not science fiction,” he says. “It is very real. Increasingly, water is seen a strategic resource to be used with caution and managed with care.” Statistics support Subrahmaniam’s argument. The total precipitation including snowfall over India is 4,000 billion cubic metres and fresh water available for use is 1,869 billion cubic metres. This includes replenishable groundwater. However, the actual amount of water available is just 1,122 billion cubic metres, including 690 billion cubic metres of surface water. Of this, 80 per cent goes into farming leaving just 20 per cent to quench the thirst of 1.02 billion people. India’s projected population by 2025 is 1.39 billion. The per capita availability of water in the country has come down from 5,277 cubic metres per person per year in 1955 to 1,970 cubic metres in 2007. By 2025, this will further go down further. India will face an acute shortage of water and there will be no option but to use recycled sewage water.

The very thought of drinking treated sewage water or urine might make you want to throw up, but the fact remains that water reclaimed from sewage and toilets is as pure as treated potable water. In some cases, it is even purer. Several studies by the World Health Organisation and scientific agencies in the US, Japan, the UK and Australia have proved beyond doubt that treated sewage water is perfectly fit for drinking. Volunteers who participated in several “taste and tell” surveys were not able to tell the difference between tap water, bottled water and recycled water. Scientists say that recycled water can even be used for kidney dialysis. Scientists of the University of New South Wales used reverse osmosis system to treat water contaminated with pharmaceutical residues and found that it did not have even nominal traces of the chemicals.

However, some experts fear that some harmful traces might remain even after strict filtration. “When we use recycled water, we must ensure that micro organisms such as E coli and others should be within limits,” said Dr B. Ravishankar, senior medical gastroenterologist at Yashoda Hospital, Secunderabad. “Otherwise, it will open the door for infectious diseases.” There is also another factor — Indian toilets are dirtier than those of Singapore, Australia, the UK and the US.

“Most Indians are ignorant of the fact that more than 80 species of dangerous micro-organisms have been found lurking in toilets,” said Dr Vijay Punjabi, president of the Indian Medical Association. “There’s a likelihood of these germs making way into the recycled water.”

What exactly happens to urine, sweat, perspiration and sewage water that are treated? Scientists are simply aping Nature when they go in for recycling of waste water. In Nature, water from sweat, perspiration, faeces and urine go up into the sky through evaporation and later come down as rain.

Many of us consider rain water as pure and do not hesitate to drink it.

In the future, scientists will be using membrane bioreactor process for recycling. It will combine clarification, aeration and filtration in a single stage to ensure pure water. The low-cost and simple methods involve letting out the treated water into rivers, streams, lakes and tanks allowing it to get mixed with natural water. Later this water is purified and supplied to citizens. This indirect potable reuse is already being undertaken in Singapore. There are also other proven methods such as distillation, freezing, reverse-osmosis, electro-dialysis and ion exchange. Nasa plans to utilise its space technology to supply fresh water to countries that are hit by perennial droughts. "Sewage water can be recycled and reused for a dozen times," said senior physicist B. Raja Rao. "After that, the water quality becomes quite bad." Health experts such as Dr G.R. Srinivas Rao, however, argue that a country such as India which is endowed with natural sources of water need not use recycled water for drinking. "It may not be healthy since even a small loophole somewhere in the process can lead to an epidemic," he says.

## CONCLUSION

The current scarcity among Sivakasi and its surrounding regions suggest that without intervention, before long the problem will increase tenfold. Kawsalya predicts that not too far in the future, the price of water will begin to rise, rapidly until it reaches a possible scenario where water replaces gold as the object to quench ones thirst of object desire.

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