

# Scribbles

Bringing colour to your lives

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Issue No. 2

## From the Editor's desk...

### Dear Readers

We are glad to present an issue of Scribbles devoted to water.

Water covers 70.9% of the earth's surface.

The average human body has 50 to 65% water.

Conservation of water is a hot topic in every forum and also in this issue! We can't imagine our lives without water!

So, to write this editorial, I went back to my school days – started at the beginning and revised the properties of water. Here are the important ones!

### Properties of Water

1. *Cohesion - because of its cohesiveness, water remains a liquid at normal temperatures, rather than vaporising into a gas.*
2. *Adhesion - is a measure of water's ability to attract other types of molecules.*
3. *The high specific heat and high heat of vaporisation mean a lot of energy is needed to break hydrogen bonds between water molecules. Because of this, water resists extreme temperature changes.*
4. *Water may be called the universal solvent because it is able to dissolve many different substances.*
5. *Water is the only common compound that exists in solid, liquid, and gas phase under ordinary, natural conditions.*

These properties of water made me think – Aren't there lessons in management / leadership for us? Not just from the properties of water, but from water per se.

Let's take the journey of river water – from some small source in the mountain, it flows through rough terrain, along the way some other water bodies may join it (tributaries) and then finally the river finds itself joining its big brother or sister – sea or ocean!

The river reaches its goal – not necessarily through a smooth journey. In the initial part of the journey through the mountains, there is darkness, loneliness. Yet it moves on! There is no fear of the unknown. In fact, its path is not even defined. It has to find its own path and yet reach its goal.



# Water Special



Somewhere the river loses its energy and then comes a sudden drop, a waterfall, and it regains the energy. We need to identify these waterfalls in our lives too – at a time when we are or feel down! We need to rise up, like water does. From our fall, are lessons that can be learnt, and we can get only stronger, similar to the strength of the water at the bottom of the waterfall.

The river does not give up! It joins hands with someone if required. Teamwork pays to get better results!

Once it reaches its destination, its personal identity is lost – can we identify the Ganges in the Bay of Bengal? But the Ganges does not run away from doing its work, just because of this. It knows that it has a purpose in its existence and that it is part of a bigger purpose.

Rivers have a separate identity, but upto a point. After that they are subsumed in the bigger picture – in the bigger goal!

We seek a separate identity all the time. We want to be singled out in terms of our contributions, recognised individually for our performance, praised individually for doing a good job. I think it's worth a pause and think about the journey of the river.

Moving on – we've all read that water finds its own level. It settles down at a level that is comfortable to it. It is not ambitious to say that I must go the brim. Or I must overflow. Water realises that there is a limitation to how much it can occupy. Is it different for us – we all can grow to the maximum level at which we continue to remain efficient / competent.

The adhesion and cohesion properties of water make it work with other chemicals – there is a smooth bond. Some times when it mixes with other chemicals, water loses its identity. It does not mind. There are lessons in team work and cohesion in that for us!

Water resists extreme temperature changes – therefore its threshold levels are high.

Water exists in different forms – so much for adaptability, flexibility that is required these days to be successful.

Water can thus inspire us not to be rigid in our way of working – to learn to adapt, to be flexible to change.

Water is a great teacher that shows us how to move through the world with grace, ease, determination, and humility. It inspires us to be focused on our goal and constantly and consciously, keep moving to achieve the goal. It teaches us lessons on team work, adaptability and flexibility – competencies that are must-haves in today's ever changing world.

Let me end with an inspiring quote from a book by Sam Parker titled, "212 the Extra Degree"

*At 211 degrees...water is hot.*

*At 212 degrees...it boils.*

*And with boiling water, comes steam.*

*And steam can power a locomotive.*

*And, it's that one extra degree that...*

*Makes all the difference.*

The one Extra Degree counts. This can be practised every day.

Good luck and best wishes,

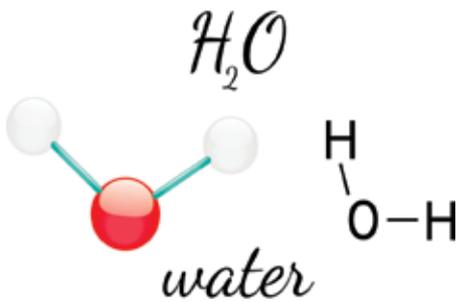
*Ananda Jagann*



# Water IS Life

## H<sub>2</sub>O

Water is a colourless and odourless substance found all over earth. Water is made up of billions of molecules. Each molecule is made of one oxygen and two hydrogen atoms held together by strong covalent bond. Water is found in three different forms - gas, solid and liquid.



Water on the surface of the earth is found mainly in its oceans (97.25%) and polar ice caps and glaciers (2.05%), with the balance in fresh water lakes, rivers, and ground

water. As earth's population grows and the demand for fresh water increases, water purification and recycling becomes increasingly important. Example - rain water harvesting at home, dishwasher - used water can be treated with sand/soil and used for gardening, etc. Saving water today would help our tomorrow.

M Rajesh Kumar, *Administration, SETL-Common, Karapakkam*

## Essential source

Water is essential for all living things. Riverbanks are the origin of all great civilisations.

There are many things that we can learn from water. The basic nature of water can guide us to earn success in life and career.



• Adaptability • Un-biased • Clarity

**Adaptability:** Water adapts to everything. It takes the shape it contains; it adapts to the colour it is mixed with. If we are also like water, ready to adapt to new changes and challenges then we will be more prosperous and help others too.

**Un-biased:** Water is the same to everyone in terms of taste or the way it quenches our thirst, be it rich or poor, black or white, lower or upper religion/ caste. It supplies energy to all seeds equally and is up to the seed to grow up to become a banyan tree or perish. Like water, we should treat everyone alike and give equal opportunity.

**Clarity:** Quality of water is measured by its transparency and clarity. If we have clarity in our thoughts and transparency in our action, it will boost our confidence. Success is like an ocean.

E Magesh, *Plant Services, Chemplast Sanmar, Mettur*



## Hot Spring

Hot spring is a place where groundwater is heated by energy created by the earth water from hot springs is said to have many beneficial properties. The Grand Prismatic Spring is the largest hot spring in the world.



## Water, Water, everywhere, Nor any drop to drink

For many years, perhaps even today, in Tamil movies, when the Hero makes his first entrance into “Pattinam”, the stock shots are of the Central Station and LIC. Perhaps they should have added another one – more recognisable – the picture of a blue water tanker with colour plastic pots on the road and a benevolent driver in Khaki dress standing by the side!

The main topic of the metropolis seems to be perennially centred around the single question “Unga edathila thanni kashtam unda” – taking it for granted that you should be having a problem – almost as if it is in the Sahara desert. But is it really so – or, more important – should it be really so?

- Chennai is the only major city in India blessed with two monsoons – SW and NE. In others words, there is always some chance of rainfall between June and December!
- The quantum of rainfall from both monsoons is 1250mm – almost twice the normal rainfall of the average in India and at least 40-50% more than most cities, barring the ones on the West Coast. In fact it is 60% of the normal rainfall of Colaba in Mumbai – an acknowledged high rain area.
- It is the only city to get water from three rivers – Cauvery through Veeranam, Krishna through Kandaleru (a.k.a Telugu Ganga scheme) and now from Godavari through the Polavaram link to Krishna.
- And, of course, being a littoral city, it has the whole of Bay of Bengal to tap into!
- It is said that 2018 was a bad monsoon year. Fact is that the average of the two main observatories showed 950mm (annual) – if it had rained just another 50mm Chennai would have had “normal annual rainfall” as per IMD!

### A brief look at the vital water statistics:

- With a population of about 7 million and a need of about 120LD per person, the total requirement is about 850 MLD or 12 TMCft per year.
- It is served with two desalination plants of 100 MLD each. A third one is at tender stage and will contribute about 150 MLD making a total of 350MLD or about 41% of total requirement when commissioned.
- Environment approval has been obtained for another 400MLD which would then take the entire supply from Desal to 750 out of 850 or 90%.
- Veeranam, if full and 50% is used for Chennai, will give about 100MLD
- The full capacity of lakes in Chennai is about 12 TMCFT – which means if the lakes are full, it can almost feed Chennai by itself without desal.

- Finally the Telugu Ganga is supposed to give about 15 TMC, which, after losses, is about 12 TMCFT – enough for Chennai for a year.

Hence the options are – if all the desal plants above are completed

- If no rain at all in Chennai – then Desal alone can provide entire water requirements with the lakes remaining empty throughout the year.
- If no rain at all in Chennai – then TG alone can provide water supply. Desal is a stand by.
- If it rains well, then lakes alone can supply – Desal is a stand by.

Ground water has not been added, nor is the treated water which is compulsory for all commercial and many residential units. Of course a more detailed study would also involve evaporation etc – but the above is a gist.

In theory, not only should we have no water problem, we should have a minimum of twice of what we need if no rains and thrice what we need if it does rain. We can actually water our roads to keep out dust!

Yet, we still look to the skies and pray for rains and, paradoxically, after 2015, have a section of people who pray it does not rain. Lord Varuna has to then ask himself in pure Shakespeare style - to rain or not to rain.

Will it rain in 2019? The department most hesitant of commenting on it is the IMD – they have opined that the NE monsoon is the most difficult to forecast and would prefer to give the “forecast” after the event!

Till then, in pure Chennai style, let us pray that all kinds of “Thanni” (no pun intended) are abundantly available.

MS Jagan H/o Sarada Jagan, HR, Corporate, HO



## A different perspective on water

Water as we all know constitutes the major portion of globe. It is a resource which is inevitable and talked about almost every day. There are heaps of articles talking about water preservation. Mother Nature has been so benevolent giving water in the form of precipitation and so it has protected the whole of flora and fauna.

Water can sometime be cruel to humans in the form of disasters. Water teaches us to nurture Mother Nature and also disseminates us some valuable corporate lessons. Corporate lessons that water would love to teach humans:

### 1) **Create dependability for self**

Water by its existence has always been able to create a high demand for itself by increasing the need. In the world of increasing competition, proving our worth is important and so is the necessity to develop unique skill sets that create dependability on us in an organisation.

### 2) **Turn into an inevitable resource**

Neither water nor can people be ignored. Every corporate employee has to improvise every other day to be resourceful so that he cannot be ignored or avoided much with water. The moment we transform into an indomitable force nothing can deter our growth.

### 3) **Staying balanced**

Water in excess or deficit is never going to help any one and so is our work. Staying balanced is pivotal for any productive work to happen. A balanced state of mind to work calls for a balanced temperament which also helps maintain work-life balance.

### 4) **Staying pure**

Contaminated water is as bad as its non-availability and so are contaminated individuals. Staying contaminated means the individual's absence would be of no impact to the organisation and eventually uprooting the individual is bound to happen.

### 5) **Camouflaged presence**

Water in spite of being deficit in potable form has a large stock that it can boast of in the non-potable form. This non-potable water has always given mankind a ray of hope that potable water could be made out of it with improving technology. When it comes to



corporate scenario it is penultimately a priority to hold a reserve of talents and transform it into a form which the situation calls for.

### 6) **Adapt and change to the conditions**

It is not possible to let water stay in a single state. The conditions around would turn it into either vapor, liquid or solid. Today's corporate world also calls for versatility existence rather than being the fittest. Survival becomes a reality only when we are versatile and it calls for constant updating to the changing needs.

Like how water goes through a vicious cycle, corporate life also goes through a cycle of peaks and troughs. There are lessons that water teaches explicitly and there are a few implicit ones like the corporate inputs it has got. It is up to us to derive great lessons from nature and use it for our betterment.

CD Nivas Kumar, Sales, AGCSL, Chennai

## Water through the ages

In “Eternal India”, Mrs. Indira Gandhi quotes a translation of Rig Veda’s “Hymn of Creation” thus :

“Then even nothingness was not, nor existence, what covered it ? In whose keeping ? Was there cosmic water in depths unfathomed? All of them was unilluminated water, that one which awoke at last, born of the power of heat.”

Dated back to hundreds of millions of years, it was a time then, as temperature of the earth’s surface cooled below 100, water vapour in the atmosphere started to condense as rains. In Oklo, W.Africa, the water streams surrounded “low enriched” uranium mineral deposits and a nuclear fission ensued, releasing considerable quantities of energy . When surrounding water evaporated due to heat of fission process, the chain reaction stopped. Subsequent ‘rains’ thereafter restored the chain reaction. This pulsating system was known as ‘Fossil Nuclear Reactor’. This was at a time when there were not fires as there was no vegetation.

The basic physico-chemical properties of water are dependent upon the temperature. The underlying chemical relationships between pH, alkalinity, hardness, the ratio of sodium to that of calcium and magnesium determines the buffering capacity, deposit formation and corrosive nature

of water. The level of dissolved salts in natural water is important since it determines the use of which the water is put viz., agriculture, drinking, horticulture, health spas etc.

According to the United States Geological survey most of the fresh water (84.9%) is locked up as ice in glaciers. Of the balance, 14.16% constitutes ground water, while that in lakes and reservoirs amounts to 0.55%. Another 0.33% is in the form of soil moisture and atmospheric water vapour. Thus, only a very small fraction of fresh water (0.0004%) flows through rivers and streams. The volume of sea water is 15 times greater than that of fresh water. Hence, the need for the conservation of available fresh water is obvious.

Because of the decreasing availability and increasing cost of water for industrial activities, it is very essential to recycle as much waste water as possible by a proper choice of effluent treatment, which will in addition, considerably reduce the discharge of pollutants into the environment.

**R Vanishree Shankari W/o VP Rajkumar, AGCSL,  
Chennai**

### Pond

A pond is a small area of still, fresh water. It is different from a river or a stream because it does not have moving water and it differs from a lake because it has a small area and is no more than 1.8m deep.



### Waterfalls

A waterfall is a place where water rushes down a steep ledge. The water flows from higher land, then it falls down a big step of rock to lower land of softer rock where it will continue its journey. Victoria falls is the largest waterfall in world.

# THE WATER CHALLENGE

## Magnitude of the problem

Cities faced various issues such as flooding, deficit rainfall, poor drinking water supply, encroached water bodies and untreated sewage, and all these were considered in the preparation of CWMI (Composite Water Management Index) by NITI Aayog.

Let us quickly remind ourselves of the magnitude of the problems and take steps to resolve them.

- **Overused Ground water:** 21 cities moving towards zero level
- **Contamination:** 200,000 people die every year due to lack of clean water
- **Mismanaged Sewerage:** Two-thirds of city houses lack sewage connection
- **Economic drag:** GDP to plummet 6% due to water crunch

What are we going to do to address the above and save our future?

Think about it and be quick. Soon, we won't be having much water left. Hurry up!

Hariharaprasath Chinnusamy, *GET, BS&B Safety Systems (India), Karapakkam*

## Twenty year challenge

**Interview: Present:**

**Employer:** Congratulations! We are pleased to give you a job in our organisation. You will be getting an annual package of 5 Lakhs. Are you willing to accept?

**Candidate:** Thank you. Looking forward to working with you. But could you give me a better package, say 6 Lakhs? I have a family to protect. It is going to be difficult otherwise.

**Future:**

**Employer:** Congratulations! We are pleased to give you a job in our organisation. You will be getting an annual package of 3 Lakhs and 15 l of water every month. Are you willing to accept?

**Candidate:** Thank you. Looking forward to working with you. But could you give me a better package. Keep the money to yourself. Instead give me 100 l of water every month. I have a family to protect. It is going to be difficult otherwise.

Funny, isn't it? Brace yourselves. Save yourself from this future negotiation and act smart.

Adithya Sampath, *Sales Engineer, BS&B Safety Systems (India), Karapakkam*



## Dead Sea

The Dead Sea is famously known for being one of the saltiest bodies of water in the world it is a salt lake bordering Jordan to the east and Israel and the West Bank to the west and certainly the deepest hyper-saline in the world, at a depth of 304m (997 feet).

## Challenges in Indian water sector

### Huge demand for food production

Our growing population is likely to increase to 1.66 billion by 2050. With the increasing population, the annual food requirement in the country will exceed 250 million tons by 2050. The total demand for grains will increase to 375 million tons including grain for feeding livestock by 2050. With the growth in the National GDP, at 6.8% per annum, during the period from 2000 to 2025 and 6.0% per annum, during the years 2025 to 2050, the per capita income is bound to increase by 5.5% per annum. This will increase the demand for food. While the per capita consumption of cereals will decrease by 9%, 47% and 60%, with respect to rice, coarse cereals and maize, the per capita consumption of sugar, fruits and vegetables will increase by 32%, 65% and 78% respectively, during the period from 2000 to 2050. This will create an additional demand for water. The requirement of water for livestock will rise from 2.3 BCM in 2000 to 2.8 BCM in 2025 and 3.2 BCM in 2050.

### Nationwide importance

India is not a water deficit country, but due to severe neglect and lack of monitoring of development projects, there is dearth of water. It is necessary to prevent this crisis by making best use of the available technologies and resources to conserve the existing water resources, convert them into utilisable form and make efficient use of them in agriculture, industries and home.

Sustainable water future for India begins with a vision. There is increasing awareness that our freshwater resources are limited and need to be protected both in terms of quantity and quality. The surface water and groundwater resources in India play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities, etc. Potential impact of global climate change on water resources include enhanced evaporation, geographical changes in precipitation intensity, duration and frequency, together affecting the hydrological parameters such as, discharge, soil moisture, etc.

Water demand is predicted to increase significantly over the coming decades. In addition to the agricultural sector, which is responsible for 70% of

### Over-exploitation of ground water

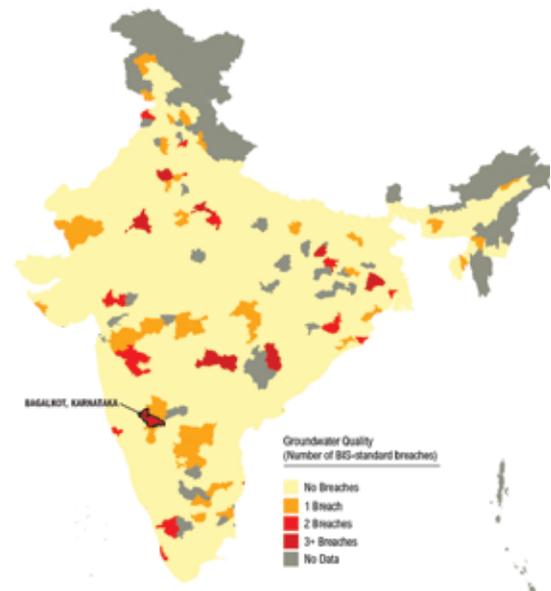
Presently, there are over 20 million wells pumping water with free power supply, provided by the Government. This has been depleting ground water, while encouraging wastage of water in many states. In many coastal areas, there has been heavy intrusion of sea water, making fertile agricultural lands unfit for cultivation.

### Inefficient utilisation

There is inefficient use of water because of distribution of water in open canals, flood irrigation and charging for water on the basis of area irrigated instead of quantity of water supplied. It has been estimated that over 70% of the irrigation water is wasted depriving irrigation to other dry areas.

M Jitendran, *Logistics, Chemplast Sanmar, Mettur*

More than  
**100**  
MILLION  
People Live  
in Areas of  
Poor Water  
Quality



water abstractions nationwide, large increases in water demand is predicted for industry and energy production. Accelerated urbanisation and the expansion of municipal water supply and sanitation systems also contribute to the rising localised demand. Climate change scenarios project an exacerbation of the spatial and temporal variations of water cycle dynamics, such that discrepancies between water supply and demand are becoming increasingly aggravated.

Water scarcity is influenced by global and local changes actuated by environmental factors, climate change and human induced changes. The rapid growth in population coupled with increasing economic activities has brought in new challenges.

S Sivananthan, *HR, Chemplast Sanmar, Mettur*

## H<sub>2</sub> Woe

India is facing a big or 'the worst water crisis in its history'. How bad is it?

Composite Water Management Index' (CWMI) says nearly 600 million Indians face high-to-extreme water stress where more than 40% of the annually available surface water is used every year—and about 200,000 people are dying every year due to inadequate access to safe water. The situation is likely to worsen as the demand for water will exceed the supply by 2050. The CWMI report findings are that 21 Indian cities including Delhi, Bengaluru, Chennai and Hyderabad – will run out of ground water by 2020, affecting 100 million people; 40 percent of India's population will have no access to drinking water by 2030.

It's time to act.

Farmers' suicides are a common occurrence. Studies say that even 1 cm increase in rainfall could lead to 7% drop in suicide cases. India is currently ranked 120 among 122 countries in global water quality index. Therefore, it is important to study and evaluate water risk and water management aspects at various touch points like watershed, river basin level or catchment areas. We need to adopt newer technologies, innovate and integrate it to achieve our goal of reducing wastage of water.

M Surendar, *Production, Chemplast Sanmar, Cuddalore*



## CAN YOU



**Civilisations were born along river banks. Rivers are known as lifelines in the areas in which they flow. How well do we know these rivers?**

# SPOT THE RIVERS OF THE WORLD?



**Send us the names of the rivers marked on the map shown. Contest is open to children of employees below the age of 16. Submit your entries to your location HR on or before 15-Mar-2019.**

**Attractive Prizes await the first three correct entries!**

# WATER CONSERVATION

## Rain water harvesting and us

*“Water, water, everywhere,  
Nor any drop to drink”*

*- Samuel Taylor Coleridge*

Home to Asia’s largest beach the Marina, singara Chennai, come this March, we would be like Coleridge’s sailor singing, “No water” tunes. The biggest irony of our state is our rivers don’t flow into the sea, but our rain water does.

Chennai faces acute water crisis situation only because, effective collection and storage of rain water has been ignored. In spite of receiving heavy rainfall in 2015, we have water scarcity. This is because the rain water is not conserved but allowed to drain away. Thus it does not matter how much rain we get, if we don’t capture or harvest it.

In 2003, Tamil Nadu broke new ground, when it made rainwater harvesting mandatory. Santha Sheela Nair, who was then the Municipal Administration and Water Supply (MAWS) secretary, was the brain behind the move.

But, what is rain water harvesting?

The technique of rainwater harvesting involves catching the rain from localised catchment surfaces such as roof of a house, plain and sloping ground surface etc. The rainwater that falls on these catchment is diverted into dugout ponds, vessels or underground tanks to store for long periods. Construction of small barriers across small streams to check and store the running water is also an example of small catchment water harvesting.

In scientific terms, water harvesting (broadly) refers to collection and storage of rain water and also other activities such as harvesting surface water, extracting ground water prevention of losses through evaporation and seepage.

In general, water harvesting is the activity of direct collection of rain water. The rain water collected can be stored for direct use or can be recharged into the ground water.

Many residents of Chennai religiously followed this rain water harvesting, for example residents of an apartment (Sabari Terrace) in Sholinganallur, who with their collective efforts started harvesting the rainwater on their own terraces. According to the residents, the harvesting facility has considerably reduced their dependence on Chennai Metro water, and they even put the excess water from the sump to use by letting it out to soak pits using valves. In return, the residents saved a lot of money in terms of buying water tankers for their needs.

Others like Sekhar Raghvan, who is fondly known as Chennai’s rain man, did his part in creating rain water harvest center and effectively harvested water for his neighborhood, in Besant Nagar.

Chennai is in dire need for more such people, to be smart citizens. As we know, Chennai will be among the 21 cities which will run out of groundwater by 2020. The potential of rain to meet water demand is tremendous. Unless people are involved in conserving rain water from individual households to big industries/institutions, it would be very difficult to meet the looming water crisis.



If we don’t act fast and save water we will have to depend on the fruitless desalination project or drink water from quarries. So let’s make Chennai a better place to live in and save water; every drop counts.

Leena Bose, Corporate Communications, Corporate, HO

## For a better tomorrow

On an average, a nuclear family uses about 2000 Litres of water per month only for their laundry routine. Usually after laundry, the domestic waste water is passed through the sewage. Instead, we can construct a separate underground sump and an overhead tank for storing this domestic waste water.

Facilities required: Separate underground sump and overhead tank for storing domestic waste water.

### Procedure

1. The outlet pipe of your washing machine shall be connected to the underground storage sump by a separate pipeline. This water shall be carried over to the overhead tank by a separate pipeline.
2. Collected water shall be connected to the flush tank of the lavatory. This water can also be used to clean your vehicles etc.

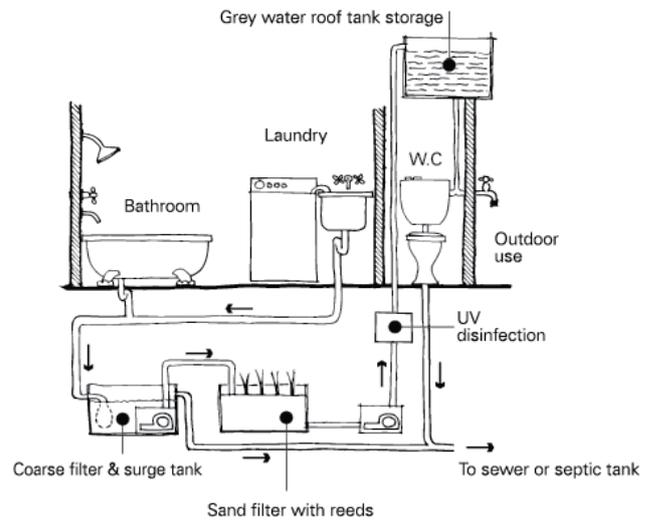
Three mantras to save any natural resource: Reduce, Reuse & Recycle

## Quintessential elixir of life

Water, an 'Aushadham' literally means a 'Universal Medicine', which our planet is running short of now. It has failed to rain thrice a month (maatham mummaari pozhithal) or even annually due to exploitation of nature.

Given below are few recommendations, which are already in practice in many residences,

1. Kitchen waste water and bathing water could be let into garden or a pit near the bore-wells or wells ensuring the water passes a barrier of kal vazhai (*Canna indica*) before entering the pit. *Canna indica*, grown as an ornamental plant, has a capacity to absorb chemicals from water.
2. The toilet flushed waters could be let into Sewage Treatment Plants (STP), which contains



This is just one 'reuse' method. Reuse methods are much more cost effective than recycling. This simple methodology should be made compulsory, like rain water harvesting, while constructing a house.

Chakravarthi BK, *Product Engineering, BS&B Safety Systems (India), Karapakkam*

bacterial flora near the bore-wells or wells. These bacterial flora and a man-made pit with gravels and sand would purify this water.

3. It will be more appropriate to plant one or more palm trees near the well or bore-well to retain the ground water level.
4. Avoid RO water as we lose more water than we use and our health too. For instance, for use of 11.3 litres of water, we lose 45.4 litres approximately.

"Think twice before you spend money and think wise before you use water"

Vanaja Mathan Raj W/o T Mathan Raj, *Production, SMML, Viralimalai*



## Tsunami

Tsunamis are giant waves or rapid rises in sea level. They're rare events, occurring on an average about twice a year somewhere in the world — about once every 15 years for the most destructive tsunamis, which can cover an entire ocean basin. 2004 boxing day tsunami was the worst hit tsunami till date

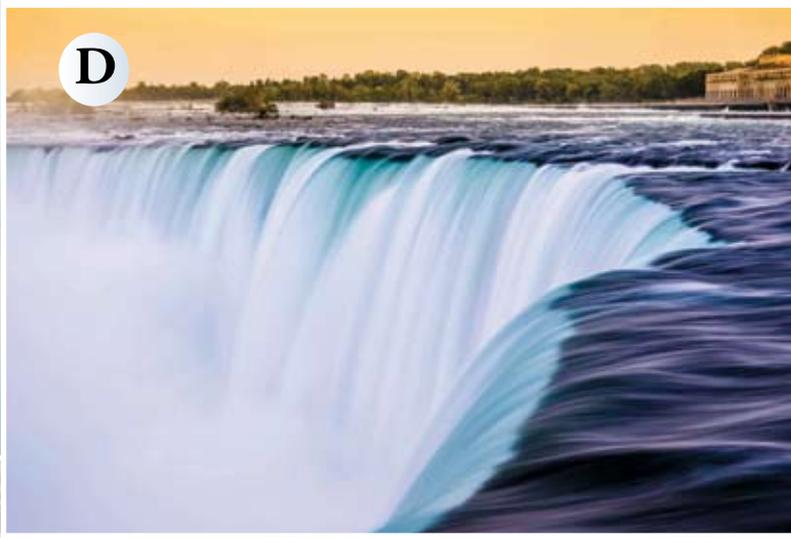
# WHO

Shown below are some of the popular rivers,



# AM I ?

**dams and waterfalls. Can you name all of them?**



Turn to the Eureka page for answers.

## Need of the hour

Water conservation refers to any beneficial reduction of water usage, loss or waste. It also includes the strategies and activities to manage and protect water resources to meet the demand for human consumption. It involves reducing the usage of water and recycling waste water for various purposes such as cleaning, irrigation and manufacturing. These improve the use of water resources to benefit people and the environment. Conserving water is important because water is a finite and vulnerable resource that sustains life, economic development and the environment. Tips to conserve water in,

### Kitchen

- Install water-efficient taps, trigger hoses and water flow restriction valves.
- Ensure dishwashers and other equipment meet high water-efficiency standards.
- Ensure kitchen sinks have plugs to conserve water when washing dishes and vegetables.

### Gardens, ground and water features

- Irrigate with high-quality recycled water, greywater or rainwater.
- Water the plants early in the morning or late in the evening to minimise evaporation.
- Use mulch in gardens and around plants to retain soil moisture.
- Sweep grounds and other hard surfaces with a broom instead of hosing.
- Clean water features less often. Using biocides will help to prevent microbial growth and reduce the need for cleaning.

### Reduce Your Consumption of Animal Products

- More than 90% of all the water consumptively used by our global population goes to irrigated



agriculture. As Arundhati Roy wrote in *The God of Small Things*, “More rice, at the price of a river.”

- Even more astonishing is the fact that more than a quarter of all water consumed in crop production – equalling nearly one-fourth of all water consumptively used in the world – goes into producing animal-based goods such as meat, milk, cheese, eggs, and leather. This is due to the enormous volumes of water required to grow animal feed such as hay, alfalfa, or corn.

### Stop Wasting Energy

- It takes a huge volume of water to generate electricity that we use in our homes and businesses. This is because water is used to keep coal, gas, or nuclear power plants from over-heating in the process of generating electricity. Much of this water is returned back to the river or lake after use in cooling, but this returned water is often much warmer and therefore harmful to aquatic life.

J Ramasamy, ZLD, Chemplast Sanmar, Mettur



## Reservoir

A reservoir is a man-made lake or large freshwater body of water. Reservoirs are great because they supply when water naturally occurring bodies of water, like lakes or rivers, run dry.

## A homemaker's perspective

Water is the elixir of life. We all know that our earth is covered by 71% of water; hence it is called a “Blue Planet”. In our daily usage, bathing occupies an elephant's share at an average of 55 litres per day.

Water is of such an importance in our life that John F. Kennedy once said:

“Anyone who can solve the problems of water is worthy of two Nobel prizes—one for peace and one for science.”



### How can we reduce water in kitchen practically?

1. Olden days, water was filled and kept in a bucket for washing vessels. But now, in modern kitchens running water is used for the same purpose. Conservation should kick start by using shower tap in the kitchen sink to wash the vessels.
2. Stop washing fruits and vegetables in the running water. Clean them in a pan of clean water.
3. Turn off water taps tightly to stop dripping. Check the same before leaving the room.
4. Boil water whenever there is a need. We can also store the extra boiled water in a flask to avoid reheating.
5. Re-use the water left over from cooked or steamed food to make soups.
6. Water used to clean rice, vegetables, fruits and grains etc can be collected and used for gardening.
4. Check for leaks in the taps and flush frequently.
5. While shaving and washing your face don't let the water run, instead fill the bucket and use the required amount of water using mugs.
6. When water from over head tank is dusty and rusty, use it to wash vehicles or gardening.

### Other ways of conservation

1. Make rain water harvesting compulsory.
2. Collect and use the rainwater from your roof to water your garden, to clean your vehicles etc.
3. Don't water your plants if the weather is wet.
4. Wash pets outdoors in a lawn area to save gardening water.
5. Reroute the gray water to trees and plants rather than letting it run into sewage line.
6. Buy washing machines which can save water.

All these basic tips can be easily followed. Every one in the family should have knowledge of water conservation.

Kayalvizhi W/o K Prabhakaran, *Personnel, SETL, Karapakkam*

### To reduce water in bathrooms and toilets

1. Wastage of water is high during long and lengthy showers. We can avoid it.
2. Stop flushing the toilet frequently, which is a habit of many people.
3. Install low water consumption toilets which will drastically reduce the wastage of water.



## River

A river is a large, natural stream of flowing water. Rivers are found in every continent and in nearly every kind of land.

## Precious gift of God

Existence depends on water. Although it is colourless, odourless and tasteless life is next to nothing without it. It takes nothing from us but sustains life to us. It has no shape but takes the shape of container we store it. We find it everywhere in rivers, seas, tanks, wells, ponds, etc but we lack clean drinking water. Three-fourths of our earth is full of water. However we need to conserve water as there is very less percentage of clean water.

### Why to save water

We need to save clean water and use it effectively. People at many places in India and other countries are facing a huge water scarcity. They have to depend on the government water supply by tanks or some natural water reservoirs at long distance. They have to go a long distance daily to fetch drinking water. They better understand the value of water than the people who have sufficient water supply in their areas. One gets to know the importance of having enough water only when there is nothing to meet the basic needs.

### Simple ways to save water

There are various simple ways to save gallons of water daily. Following are techniques which we must use to save water at home and other places:

- We should use shower heads with low-flow (also called as energy-efficient shower heads), low-



flush toilets and composting toilets (instead of conventional western toilets as they use large volumes of water) or dual flush toilets (it uses very less water than others).

- Keep the tap closed while washing hands, while brushing, during face wash, while washing dishes, etc. Repair all leaking pipes.
  - We should promote rainwater harvesting, use high-efficiency clothes washers, weather-based irrigation controllers, garden hose nozzles, low flow taps in wash basins, swimming pool covers, automatic faucets, etc for water conservation.
  - We should teach simple methods to save water to our children, women and other members of the family like turning off all the taps tightly after each use.
  - We should also practice keeping the river (especially Ganga) water clean and safe for future use and safety of water species.

Water saving techniques should be promoted among people living in the societies, communities, villages including business sections as they are the main water users in reckless manner. Farmers, children, and women should be taught properly about how to use and save water in an efficient manner. They must understand the value of water in their life. Clean water scarcity is not a problem of one country or continent; it is a global issue which needs to be solved globally by increasing awareness about it among people worldwide.

M Hemanth Kumar, *Quality Assurance, SSCL, Berigai*



## Lake

A lake (from Latin lacus) is a large body of water (larger and deeper than a pond) within a body of land. As a lake is separated from the ocean, it is not a sea. Some lakes are very big, and people in the past sometimes called them seas. Lakes do not flow, like rivers, but many have rivers flowing into and out of them.



## Well

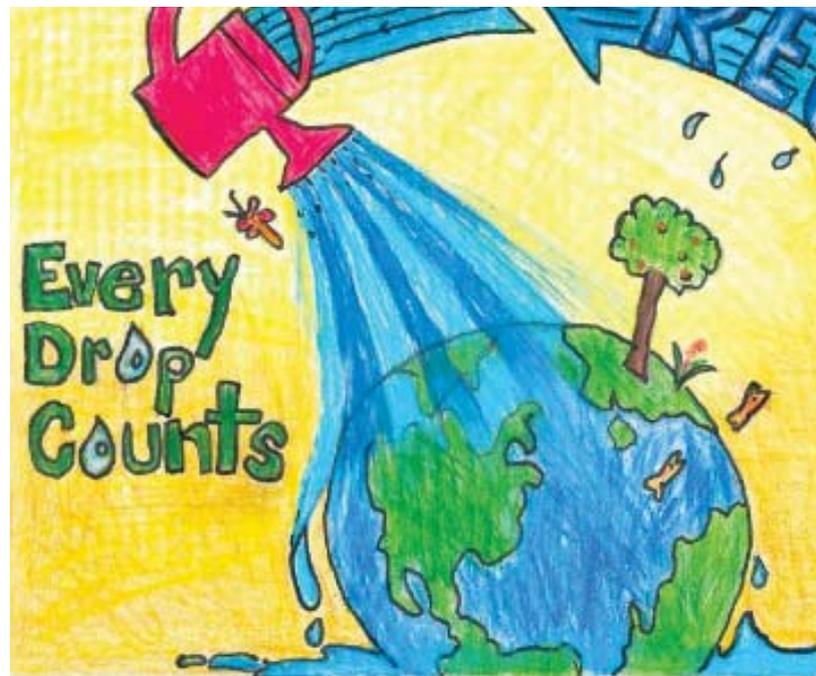
A well is a hole drilled into the ground to access water contained in an aquifer. A pipe and a pump are used to pull water out of the ground, and a screen filters out unwanted particles that could clog the pipe. Wells come in different shapes and sizes, depending on the type of material the well is drilled into and how much water is being pumped out.

## Every little bit helps

Easy ways to save water at home - without losing the lawn.

Water conservation expert Tracy Quinn of the Natural Resources Defense Council said that making just a few small changes to our daily habits can result in big water savings. "Every little bit helps."

- 1) Post reminder notes over all your sinks, beginning with the kitchen.
- 2) Don't rinse scraps of food down the sink after dinner. Scrape them into your garbage pail.
- 3) It won't kill you to do dishes in lukewarm water. Pretend you're "glamping."
- 4) Got ice cubes left over in water glasses after a dinner party? Toss them onto the lawn.
- 5) Fix that leaky kitchen faucet and any other leaks around the house. That drip, drip, drip may not seem like a lot but could waste hundreds of gallons a year, Quinn says.
- 6) Wait until you have a full load before washing clothes.
- 7) If your washing machine is old enough to drive, consider using a coin laundry. It just might save you money.
- 8) Use the Internet to check out appliance rebates offered by your water and energy suppliers.
- 9) Place a cup and refillable water bottle in the bathroom for tooth brushing.



- 10) Position a sturdy plastic bucket in your shower to collect the cooler water and then use it to fill a watering can for your potted plants, to clean the shower stall or to fill the toilet tank for flushing.
- 11) Use a kitchen timer in the bathroom to track your shower time. The timer function on your smartphone works too.
- 12) Don't flush the toilet bowl just to throw away stuff, like a tissue. That's what the trash can is for.

V Subramanian, *Plant Services, Chemplast Sanmar, Mettur*

## Conserve water, conserve life

97% of water is ocean which has salt water and is unfit for human consumption. But this view was changed in the recent year by the Tamil Nadu Government, which has put up two big desalination plants one at Nemmili, near Mahabalipuram and the other one at Minjur, northern part of Chennai and each of the plant contribute to 16% of the water demand of Chennai city, like the one in Gulf Countries.

When fresh water accounts for only about a meager 2.7%, nearly 70% of this occurs as ice sheets and glaciers in Antarctica and other inaccessible places, whereas only 1% of fresh water is available and fit for human beings. So it is very important to conserve water resources. And yet we are contaminating the existing water resources and water bodies with sewage, plastic bags, toxic chemicals, and other wastes. Encroachment of water bodies for new constructions also play a major role in destruction of these natural sources.

The Government made rainwater harvesting mandatory for all the buildings, both public and private in the state. We at Sanmar, practise water conservation by using effective latest technology effluent treatment plant and

reusing the same for growing plants and other usages at our Mettur and Cuddalore facilities. We have also planted a lot of trees inside the plants as well as in the colony area to preserve water resources and nature.

Water scarcity is another major issue that we face. There are different methods to deal with it - avoid cutting trees, by planting trees in the urban areas, by maintaining thick forest area and other vegetation cover to reduce surface runoff and recharge ground water. This can be done by creating public awareness programmes on water management and rainwater harvesting system in all cities in India.

Interlinking of rivers also will help the Government of Tamil Nadu to resolve the crisis to some extent in the areas of agriculture and drinking water.

We have to communicate clearly to every citizen to take care of the next generation. We are running out of excuses and time. By practising these simple steps, we can conserve water and ensure that these water resources are available to the future generations. Let our motto be "Save Water, Save Life, Save the World".

P Govindaraj, *Indirect Taxation, Corporate, HO.*

## Beaches of India

Goa



Andaman



Sea is a body of salt water that is partially or totally surrounded by land. So, a sea can be landlocked from all of the sides or from most of the sides. A sea may also be a body of salt water that is a part of one of the oceans of the world.

# The Indian Story

## Mettur Dam

Before joining Chemplast, I did not know the importance of Mettur Dam. Later, I understood that Mettur Dam is not only the lifeline of Tamil Nadu's agriculture, it is also the lifeline for our Mettur plants.

The FPS system of units is followed.

Mettur dam capacity is 90 TMC (Thousand Million Cubic Feet) which shows how big the dam is.

Approximately 12000 cusecs (Cubic feet per second) per day will be equivalent to one TMC!

As per IS 10500:2015, drinking water standard total dissolved solids should be maximum of 500 ppm. Since Mettur dam water is the river/rain water the maximum TDS will be 200 ppm. This shows, we at Mettur are blessed with good quality of drinking water. But unpredictable south west monsoon and questionable political decisions made the water level at the dam low. In 2013, Mettur dam level went up to 15.510 ft. Due to good inflow, the dam overflowed.

In 2017, PWD authorities did not allow us to draw water from Mettur dam even though dam level was



26 ft. This made our lives miserable. After our repeated requests, PWD authorities allowed us to draw a minimum quantity as we cannot manage without dam water even for a single day. This shows how important Mettur dam is to us. We took this opportunity to educate our team members our family member and contract people about water conservation, waste reduction and source reduction.

V Subramanian, *Plant Services, Chemplast Sanmar, Mettur*

Kerala



Kovalam



Chennai



Pondicherry



**Ganges:** Ganga is a river where the soul of India thrived for eons and still lives. It is a river that gives life to millions of Indians and it is a river where devotees prefer to take their last breath hoping to wash off all sins they committed. It is ever changing and ever flowing! The importance of Ganga cannot be truly captured in words. The mythological story about Ganga is an interesting read, of how Ganga had come on Earth.

**Facts about Ganga:**

- a) The point of origin of Ganga is Gangotri Glacier in Himalayas' southern slope and it runs through India and Bangladesh, covering a total distance of 1560 miles or 2520kms.
- b) Ganga is home for 140 different species of fish and 90 different species of amphibians, many of which are near extinction today.



**Godavari:** The Godavari River originates near triambak in Nasik District of Maharashtra in India and runs through the states Madhya Pradesh, Karnataka, Orissa and Andhra Pradesh. This river is supposed to be the second largest river in India, next to River Ganga and is also known as Dakshin Ganga. It travels through a distance of around 1500 kms and ultimately falls in to the Bay of Bengal.

Lord Brahma worshipped Lord Trivikram in Satya Loka (on earth) with the same holy water of the Ganges which came from his lotus feet. He wanted to get Ganges to come in the material realm and that Lord Shankar should hold it on his head, to flow. Brahma's benediction was fulfilled. However, seeing river Ganges in the form of a woman closely associating her husband Shankar, Parvati was unhappy. She planned to drive Ganges away from her husband. As part of the plan Parvati and her son Ganesh came to live in Gautama's Ashrama with Parvati's friend Jaya. There was a famine for 24 years and people were affected by pangs of hunger. Jaya took the form of a cow and was killed by Gautama. To wash away his sins, formed Godavari, as Ganga refused to flow out of Shankar's head.



**Yamuna:** Yamuna river rises from the great Himalayas and it is one of the longest rivers of the country, emerging from the glacier known as Yamunotri at a height of 6,387m that travels through Uttarakhand to Allahabad, where the Kumbhmela is held every 12 years.

**Facts about Yamuna:**

- a) The mythology goes that Yamuna is the daughter of the sun god; sister of Yama, the god of death; lover of Krishna; sister to that other great river goddess, Ganga. The Gods themselves, Brahma and Shiva, are said to worship her.
- b) The festival of Bhaiya Dooj is devoted to the love of Yamraj and Yamuna river.





**Narmada:** The Narmada originates at 3,500 feet in the Maikala Range in eastern Madhya Pradesh state. Hindus believe Narmada river sprang from the body of the god Shiva.

King Puruva asked a saint, “How can a person be cleansed of his sins and go to heaven without performing yajnas?” The sage said, “Only the river Narmada can do this, but she is in heaven and will have to be brought to earth.” Puruva performed a long penance to please Shiva. When Shiva appeared he requested him to bring Narmada to earth. Shiva asked Narmada to descend on earth. But Narmada needed a base from which she could emerge on earth. Shiva asked the mountains as

to who was capable of providing Narmada with a base. The Maikal range of mountains agreed to it. When Narmada ascends on earth, she flooded all the mountains and forests. She was asked to control her force. Then Puruva purified his ancestors’ souls by cleansing himself in the waters of the Narmada.



**Cauvery:** Cauvery the name itself generates oodles of emotions in the people of South India. Especially for the people of Karnataka and Tamil Nadu as Cauvery river forms their lifeline! She is a goddess, and she is everything for the farmers of her delta in both the states. Cauvery, as one of the holiest rivers in South India, is also known as the ‘Ganges of the South’.

During the wedding of Siva with Parvathi in Mount Kailas, the entire population, Devas and Rishis had gathered and hence the northern land dipped down, unable to bear the weight. Lord Siva asked Sage Agasthiar to go to the Podhigai ranges in the southern

land in order to balance the weight. (Agasthiar was very short in stature but his might was so great). Agasthiar was sad that he could not stay and witness the Lord’s wedding. Siva granted that he would still be able to see the wedding from the South. From within his matted locks, he took river Cauvery and filled it in Agasthiar’s kamandalam (spouted pot), bidding Cauvery to flow wherever Agasthiar pointed. Indran was troubled by a demon and so he prayed to Lord Ganesha for his help. Ganesha took the form of a crow and sat on Agasthiar’s kamandalam and toppled it. Agasthiar lifted his hands to shoo off the crow. River Cauvery, took it as a signal for her and began to flow.

**Mahanadi:** As the name goes, Maha means great or big and nadi means river. This is the biggest river that flows in Odisha. It forms a delta that starts from Cuttack and then the river flows into the Bay of Bengal.

#### Facts about Mahanadi:

- Hirakud Dam built on Mahanadi is one of the longest earthen dam of Asia.
- The delta built by the rivers Mahanadi and Brahmani is one in the largest of India.
- It is one of the most-active silt-depositing streams in the Indian subcontinent.



# WATER INSPIRES

## Save now

The leaky tap drips day and night,  
 Just fix it right or shut it tight.  
 It seems the earth with water abounds  
 But thinks it's every drop that really counts.  
 The tap is on, you brush your teeth.  
 The water flows, you soap your feet.  
 Just think of all the water lost!!!  
 To close the tap, what does it cost???

The water bottle you take to office,  
 The water in it is nice and cool,  
 You drink a bit, the rest you throw,  
 The water could help a plant grow.  
 So, save water,  
 And do your part,  
 It's not a game,  
 Let the water last!!!

Priyadharshini W/o Sampath Kumar R,  
*Safety, Chemplast Sanmar, Mettur*

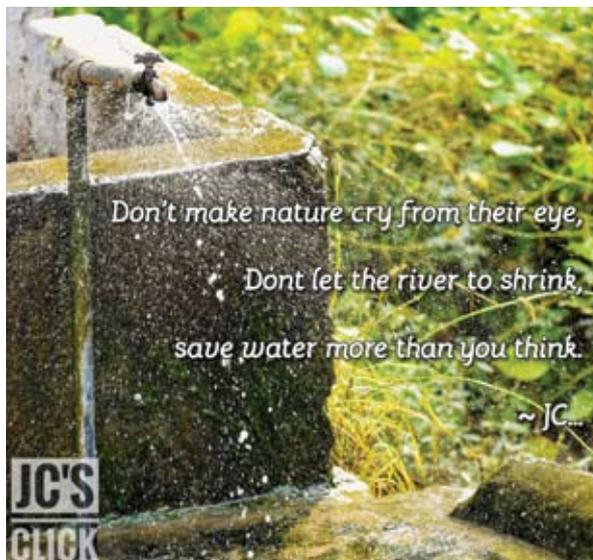


M Srinivasan, *Quality Control, Xomox Sanmar, Viralimalalai*

## Water matters

Oh! Water  
 Without you nothing will matter  
 If we have water more  
 Our life will be bore  
 If we have water less  
 Our life will be mess  
 If we have water enough  
 Our life will be full of laughter  
 Water is precious  
 We should be precautious to save water

S Vandana D/o V Subramanian, *Plant Services, Chemplast Sanmar, Mettur*



Jayachandran M, *Quality Control, AGCSL, Viralimalalai.*

## The Last or the Lost Drop

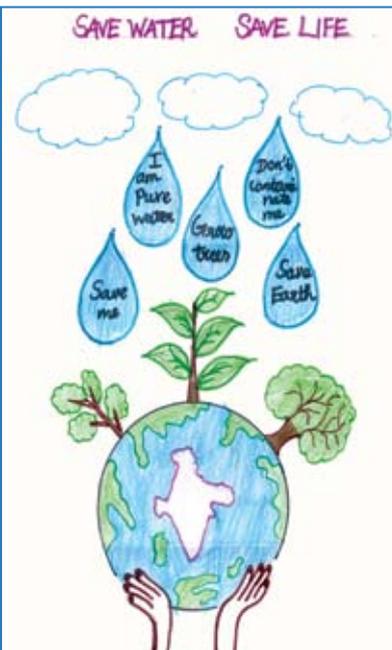


A Antlin Joe Vinoj, *HR, SETL, Karapakkam.*

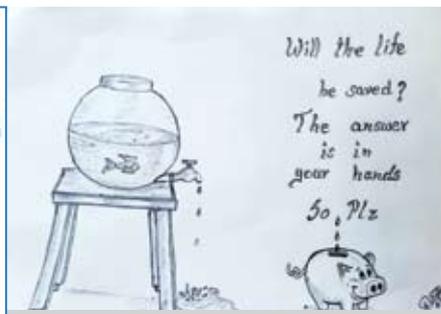


S Hemanath, *Product Engineer, Pacific Valves, Viralimalalai.*





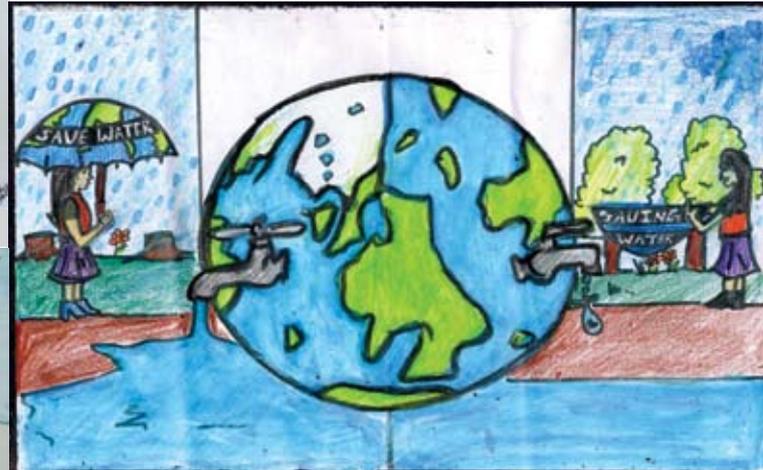
M Deepakkumar S/o Mahendran,  
Chemplast Sanmar, Mettur



T Prithivi, GET, Flowserve Sanmar, Karapakkam



Lakhan Periwal S, HR, Chemplast Sanmar, Mettur



S Gayathri Thangam D/o S Sivananthan, HR, Chemplast Sanmar, Mettur

## Aqua Yoga

Aqua yoga is a type of yoga in which the asanas are performed in water. This can be a warm water pool or more natural, open water such as the sea. Aqua Yoga is great for all body types and abilities. Those who had suffered stroke or cancer survivors, pregnant women, those with arthritis, wheel-chair or walker-bound, muscle and/or joint limitations, those who are overweight, or the senior adult community can reap the fruits of this unique Yoga method.

Aqua Yoga helps in,

- Stimulating the lymphatic system
- Strengthening the whole body and
- Improving range of motion and flexibility.

**The nurturing environment of the water provides:**

- Little to no impact on joints, especially knees, hips and ankles
- By improving balance issues, confidence and awareness are improved
- Weightlessness in the water allows for joint access, muscle strengthening and organ toning
- Strengthens pelvic floor and deep core muscles
- Practice can be enhanced with pool props such as noodles, floats and aqua bells
- Builds community and inclusion, as a variety of body types and physical abilities can practice safely alongside one another
- Fabulous medium for a restorative or meditative practice.

## The Benefits of Aqua Yoga

- Openness and stability of shoulder, knee and hip joints, as well as, minor joints
- Increased range of motion
- Greater awareness of how to improve breathing and correct erroneous breathing patterns
- Improving balance and core awareness
- Quieting the mind and soothing the nervous system
- Releasing tension and stress. Improved sleep

Aqua yoga is also considered beneficial on a mental, emotional and spiritual level. Bathing in water has long been considered a healing practice, and some say that it helps with pain relief, cultivates greater connection with the physical body and helps the yogi learn to “go with the flow.”



## Water Beauty tips

Everyone is well acquainted with the fact that water helps to lead you to a strong and healthy life, but did you know, it also helps to make you look beautiful? Yes, water can make you look beautiful naturally; it helps to discover the gorgeous self in you. Human body consists of water which helps to keep your body going. Besides the different healthy benefits, water helps you to get a flawless skin without a pinch of makeup over it. Drinking water is the beauty secret of many gorgeous celebrities too. So let's check the beauty benefits of water.

1. **Makes your hair healthy:** Only washing your hair with water keeps your scalp moisturised and also maintains the hydration value. It helps to flush out the unwanted dirt on the scalp and keeps it naturally healthy.
2. **Shiny hair:** If you want your hair to look shiny and lustrous, water is the best thing ever you could use. Simply washing your hair with water retains the essential oil on the scalp and makes them strong and shiny too.
3. **Cleanses skin:** Water is essential to keep your skin clean and healthy. It provides the vital vitamins and minerals to the skin and also replaces the damaged tissues and cell. Simply washing your face with water keeps your skin well hydrated and appears clean too.
4. **Combats wrinkles:** Wrinkles are mostly found on dry and none hydrated faces. People drinking lots and lots of water help to combat the visibility of



wrinkles and fine lines on face. Washing your face twice with cold water helps to trigger the blood circulation throughout the face which gives you a radiant and younger looking face.

5. **Tightens your skin:** This is the very ancient method practised around the world to tighten the skin naturally with water. You need to take a cloth and dip it completely in cold water. Squeeze the cloth and let the extra water drain down. Now put this cloth over your face and let it sit undisturbed for few minutes. This will help to tighten the skin naturally.

Water is a natural ingredient which helps to restore the proteins, vitamins and other essentials needed for the face. Keeping in mind the beauty and health benefits of water, we request you to drink lots and lots of water.



## Whirlpool

A small area of the sea or other water in which there is a powerful, circular current of water that can pull objects down into its centre. Saltstraumen maelstrom is the strongest in the world.

## Way to go

A **ship** is a large watercraft that travels the world's oceans and other sufficiently deep waterways, carrying passengers or goods, or in support of specialised missions, such as defence, research and fishing. Passenger ships range in size from small river ferries to very large cruise ships.



A **catamaran** (informally, a “cat”) is a multi-hulled watercraft featuring two parallel hulls of equal size. It is a geometry-stabilised craft, deriving its stability from its wide beam, rather than from a ballasted keel as with a monohull sailboat. Catamaran is from a Tamil word, kattumaran, which means “logs tied together”.

A **ferry** is a merchant vessel used to carry passengers, and sometimes vehicles and cargo, across a body of water. A passenger ferry with many stops, such as in Venice, Italy, is sometimes called a water bus or water taxi. Ferries form a part of the public transport systems of many waterside cities and islands.



**Coracles (Parisal** in Tamil) are small boats made of bamboo. They can be built in a single day and can be used for recreational boating in areas around waterfalls. The base of the parisal is made water proof using hides or sheets of plastic.

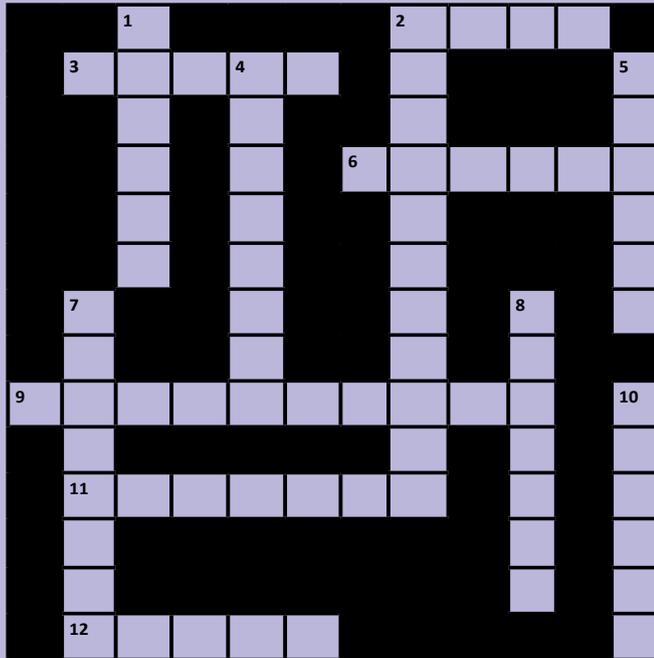
**Boats** are typically found on inland waterways such as rivers and lakes, or in protected coastal areas. Boats vary in proportion and construction methods due to their intended purpose, available materials, or local traditions. Lifeboats have rescue and safety functions.



## Brackish Lake

With less salt than sea water and more salt than freshwater, brackish water is the result of the mixing of these two types of water. Brackish water generally has around 0.5 to 30g of salt per litre.

## Crossword



**Across:**

2. River in North India, that rises in the Himalayas in Himachal Pradesh and flows into the Sutlej river in Punjab. In ancient history, this river stopped Alexander's entry into India.
3. The Holy River is also India's longest river. It flows from the Himalayas and through the plains of North India into the Bay of Bengal in Bangladesh.
6. Starting in the valley of Kashmir it flows into Pakistan. It is also mentioned as Vitasta in Rigveda.
9. Starting from Gaumukh in Gangotri glacier it joins the River Alaknanda to form Ganga.
11. It is the only river in India that flows in a rift valley, flowing west between the Satpura and Vindhya ranges in central India.
12. Originates in Tibet, flows through Ladhakh in India and forms the delta of Pakistan, which is referred to as Sapt Sindhu (Seven rivers) in the Rigveda.

**Down:**

1. Originating in the west in Karnataka and flowing through Karnataka and Tamil Nadu across the Deccan Plateau to empty into the Bay of Bengal.
2. One of the major rivers of Asia, it starts in Tibet, enters India in Arunachal Pradesh, flows thru Assam before entering Bangladesh.
4. Also known as Dakshin Ganga (Southern Ganges), it originates in the Western Ghats and is the longest river in South India.
5. The capital of India is based on its river bank.
7. The Hirakud dam is built on this river that flows through Chattisgarh and Orissa.
8. Rises in the Western Ghats in Maharashtra, flows through Karnataka and Andhra Pradesh into the Bay of Bengal. Vijayawada is the largest city on the river.
10. Longest of the 5 rivers that flow through the region of Punjab in India & Pakistan. The famous Bhakra dam is built on this river.

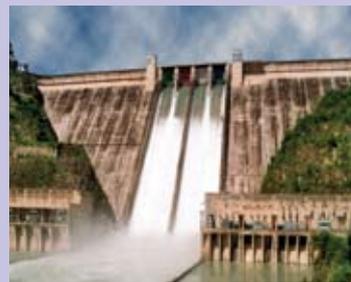
**Answers to Who am I Quiz**

- |                                |                                 |
|--------------------------------|---------------------------------|
| A. Amazon River, South America | G. Umngot River, India          |
| B. Colorado River, USA         | H. Yangtze River, China         |
| C. Yamuna River, India         | I. Nile River, Egypt            |
| D. Niagara Falls, Canada, USA  | J. Nagarjuna Sagar Dam, India   |
| E. Courtrallam falls, India    | K. Mettur Dam, India            |
| F. Jog Falls, India            | L. Thames River, United Kingdom |

## Sudoku

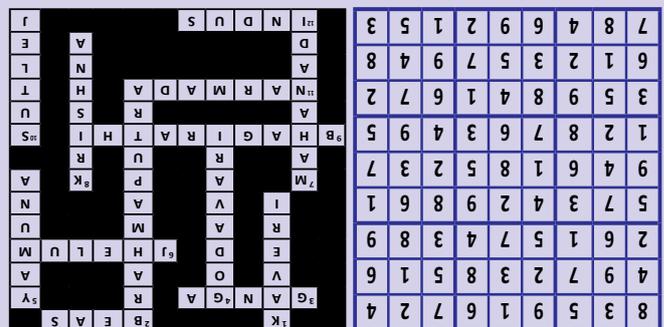
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## Guess What Where?!



Bhakra Dam is the highest straight gravity dam in the world. Built across the Sutlej River, the Bhakra Dam is Asia's second tallest at 225.55m (740 feet)

high. The Gobind Sagar, reservoir of Bhakra Dam, stores up to 9.34 billion cubic metres of water, which is enough to drain the whole of Chandigarh and parts of Haryana, Punjab, and Delhi. In terms of storage of water, the dam withholds the second largest reservoir in India.



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