Water

Water is a compound and its chemical composition is H_2O – Where H means hydrogen and O means Oxygen - Two atoms of hydrogen and one atom of oxygen come together to form water. It is the life of living things. Life is impossible without water. If you are thirsty and don't get water, you feel as if somebody is taking your life away. You will experience it, when you travel in a desert. A plant in a pot withers without water. But when you water it, it becomes fresh again. There is no life, without water. There will be desert everywhere. Hence water is regarded as life. We call it one of the '*Panchmahabhuta'* i.e. five basic powers or principles. We worship water. We also call it as blessing by 'water goddess or rain goddess.'

In the primitive ages, man was nomadic. Man used to wander in search of water and greenery. Man settled by building the settlements near the water sources to satisfy need of water for him and his domestic animals. Man used to do farming to produce food grains. Therefore we see that human civilizations are developed on the banks of rivers, such as civilization of '*Mohenjo-Daro'* and '*Harappa'* in the '*Sindh Valley'*, *Egyptian* civilization in the '*Nile Valley'*, South American civilization in the '*Amazon Valley'* and African civilization in the *Congo Valley*. In India, history tells us that human civilizations developed on the banks *of 'Ganga, Yamuna, Brahmaputra, Narmada, Godavari, Krishna, Kaveri'.*

Man is so much attached to water sources that he named them after God and Goddesses. As these sources are regarded as God and Goddesses he built temples and pilgrim places on the banks of the water sources. All the sources of water like rivers, lakes, tanks, seas etc. are the inseparable parts of human civilization. In our body metabolism, water is important. It is also important in health treatment.

No farming is possible without water. We need water daily for innumerable purposes; we know the utmost importance of water in our life.

Rain is the main source of water. We have studied the rain cycle of nature. Water from rivers, lakes, seas, oceans, gets heated due to the heat of the sun, turns into vapour, and goes up. It cools and clouds are formed. These clouds have vapour. During the day, lands get heated fast and the air on the earth travels upwards. To fill the void, winds start blowing from sea to the land. Water gets heated slowly and cools slowly. In comparison land heats and cools fast. Hence winds blow from land to the sea in the night. These winds carry clouds. These clouds are stopped by the mountains and it rains. Rainwater seeps through the mountain tops, into the ground and the sources of groundwater are formed. Rivers in the mountains, manmade lakes, wells are the main source of ground water. River water flows and meets the ocean and the water cycle continues to go on. *Krishna, Bhima, Godavari, Tapi, Vainganga* are the main rivers in Maharashtra. We mainly depend on these rivers for agriculture and drinking water.

Table1

Rivers in Maharashtra and their usable water

(T.M.C., thousand ten lakh cubic foot)

River	Usable water
Krishna Valley	769
Bhima Valley	309
Godavari Valley	404
Vainganga Valley	719
Tapi Valley	229
Water sources in Konkan	1670

The availability of surface water in Maharashtra is 4349 billion cubic foot. Out of it, 2468 billion cubic foot water can be used. Maharashtra depends 75% on this water.

No need to tell, how much we depend on water. Under the seasonal cycle we have season of monsoon. During this season the seasonal winds flow, these winds bring clouds. Hence we have rain from June to September. The whole process is very complex. Due to this, the rainfall can become heavy or less. If rainfall is less, we face drought condition, if it is more, we face floods. Rain gives water to the rivers. By constructing dams on the rivers for agriculture and drinking water, we can protect ourselves from the uncertain nature of rain. In Maharashtra, the annual average rainfall is not the same in different parts. It rains maximum in *Konkan* whereas it rains the minimum in *Marathwada*. Other places have medium rainfall. Nearly 112 lakh hectare land in Central Maharashtra and *Marathwada* is regarded as drought zone, where it rains minimum. Generally Maharashtra faces drought after every six years

Table 2

Maharashtra : Average rainfall (in m.m.)

The frequency of drought

Sector	Annual average	The frequency of drought
Konkan	2829	Once in six years
Central Maharashtra	998	Once in five years
Marathwada	838	Once in five years
Vidarbha	1101	Once in six years
Left over Maharashtra	1441	Once in six years

The natural existence of water on earth that is nature regulated water cycle, is in danger because of man. Changes are taking place in rainfall due to global warming. They are harmful not only to human civilization but also to the nature. Time has come to think, "How is the current water condition? How do we use water? What are its consequences? What will be the effects?"

Rainwater is pure. But it may be polluted due to air pollution. The air in the area near *Taj Mahal* is so degraded due to smoke from the factories that it can cause acid rain. It may adversely affect the historical structure of *Taj Mahal*. There has been such type of acid rains in some parts of the world. Our ancient sages and poets have imagined a bird called *Chatak*. This bird drinks only rain water and it eagerly waits for rain to fall. It may be drinking the rainwater as it is pure. If really such bird exists, then it will have to drink, the water polluted due to impure air. If the rainwater gets polluted or if there is acid rain, it can affect trees,

forests, wild animals and even the aquatic animals. Their existence can be endangered.

I can drink poison but not the water from this river.

In our childhood, we used to drink the water of river *Krishna* directly. Even if the river became dry in the summer, we would drink the water, after digging in the river bed. In the rainy season, the water would become muddy. We used to swirl alum, strain the water, to make it potable. Is it possible to drink river water today? River water is no more potable, unless it is processed. I started working in *Katraj Dairy* from 1985. Since then till 1990 we used to directly drink the water of *Katraj Lake*. Today we won't even dare to bath in that water. The quality of the water of the rivers and tanks has degraded. Why did this happen? What measures can we take?

First of all, we should ask a question. "How much water does a man need to drink?" A person may be drinking four, five or ten litres of water daily. Let us think of the water supply of the city. In cities, generally 135 litres of water is supplied to a person on an average. In a city like Pune it is 205 litres per person. This water is made potable. From the water sources, through canals or closed pipelines, it is sent to the water treatment plant. After the purification process, it is supplied to the buildings. From the lower tanks, it is lifted to the overhead tanks and then it is supplied to houses. At some places this supply is for limited period and at some places, it is twenty four hours. The point is that if ten litres of water per person are needed, then the rest one hundred twenty litres is used for other purposes like latrines, bathing, washing clothes and utensils, cleaning the floor, watering the plants etc. That means the water made clean and potable is made unclean by us. If such water is let in the river, then the river gets polluted. To avoid this, the sewage water should be processed and let in the river. But

as many cities don't have the facility of processing the sewage water, it is let in the river as it is. As a result, the villages next to such places get impure and polluted water and the purification process has to be done again.

This means, 90% of the expenditure of the water purification done for the first time is wasted. Again extra money has to be spent on the waste water treatment. Money is spent again and again for its purification. Due to the lack of proper planning, crores of rupees, spent for purifying the water are wasted. Can water supply be divided separately as drinking water and water for other purposes? Ten litres of water per person are needed for drinking and then only ten litres pure water should be supplied from the purification plant. The rest 125 litres of water should be sent to houses just by filtering. Due to this, the expenditure on purifying water may get controlled. Money may be saved. Qualitative use of water may be increased. If there are no separate pipelines for pure water and water for other purposes, pure water can be - supplied through tankers or can be made available in five litre cans. On the level of local administration, water is purified at the plant but filter and other instruments are used in houses again for pure water. And money is spent again and again on the same thing. If such expenses are avoided the money saved can be used for the planning of two different pipelines. Using pure potable water for other purposes than drinking is the misuse of pure water. At present, we are following the wasteful cycle of purifying the water - 90% water getting polluted, again purifying the impure water. If we plan qualitative use of water and accordingly follow the principle of water supply, then the problem of misuse of water may be reduced to some extend.

In my childhood, there were old styled latrines. The waste from it was carried and then disposed off in the fields. Nobody will advocate the system of carrying waste on the head. This system is very improper. I don't say, it should be started again. Nobody may say that. The human waste put in the fields turned into a good fertilizer; which was even better than the cow-dung fertilizer, producing good quality agricultural product. Today we flush the waste in the toilet, which flows through the drainage polluting the water. This makes the water impure. This polluted water is let into the river and it pollutes the river. Farms also don't get fertilizer. If we follow the old method of disposing human waste with the help of machines, to the farms, then the farms will get manure. Research should be done on it. This will avoid water pollution and agriculture also would be benefited.

People in the cities are very careless about the use of water. Nearly 40% of water supplied to the city of Pune is wasted through leakage. A new pipeline is put in a place, but the old one is kept as it is. Water keeps on flowing through public taps, given in the settlements of the poor. Nobody cares for the public taps. Many times, the taps are stolen and water simply flows away. In this way, water is wasted. Instead of public taps, if the connection is given in such houses, then it may save the wastage of water. In the house, the taps in the toilet, bathroom and kitchen are to be closed properly. The leaking taps are to be changed. While washing mouth, brushing teeth, shaving, the taps are kept open. Tanks in the houses leak. Showers are used for bathing. In some areas, water supply is for twenty four hours. Yet utensils are kept filled with water. This water is not used. It is thrown as stale water. In the same way, water is wasted in the areas where water supply is made every morning and evening. Is it proper to make such careless use of water, when water scarcity is increasing? Everyone should think of it and should use water sparingly.

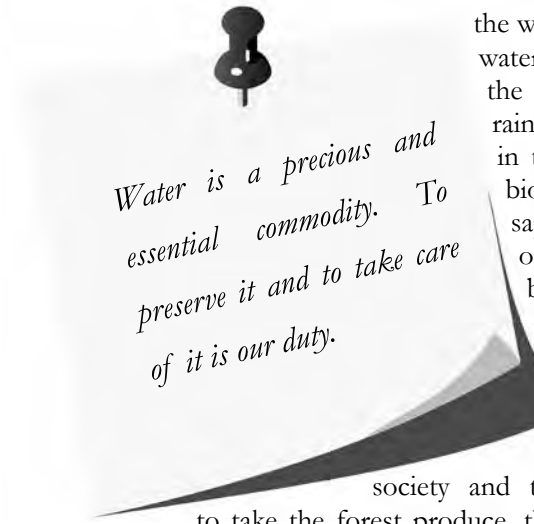
Stealing of water is one more important point. Illegal connections are given. The corporation and the officers from the corporation are responsible for this. These connections are not registered in the office. The pipelines of more capacity are installed illegally for eg. one inch connection is installed, in place of the permitted half inch. Naturally more water is taken.

This is theft of water. In big housing complexes or townships, swimming pools are built. Water is used for washing vehicles, for watering lawns, gardens etc. It is an offence to misuse the water, made pure from the purification plant. Water for constructions is acquired illegally. Many factories in the city area make illegal use of water.

Nobody thinks of how the water is acquired for constructions, how many water connections are illegal. Water is stolen in the rural areas also. Canals are dug to carry water from the dams. This water is misused. Hence it is necessary to control the use of water. In cities, water supply is not equal. Some areas get twenty four hours water, whereas some area only twenty four minutes. This inequality in water distribution may cause social unrest. For this, the water meters should be used. A meter should be installed for every connection. The water used should be measured and the bill should be given accordingly. If the bills are given with the help of meters, careless use of water may get controlled. Users will know water is not a free of cost commodity. There should be rationing of the dam-water. In Israel, every drop of water is used carefully as there is severe shortage of water due to scanty rainfall. Hence, despite the adverse conditions, Israel has made much progress in the international trade of agricultural goods. The water of river Jordan flows in closed pipelines. Planning of farming is done on micro-level. Planning is done as to which crop to grow. Such planning should be done in India. The areas with less water should be encouraged to grow crops requiring less water rather than growing sugarcane. Drip irrigation should be used.

In the olden days, there was a tradition of not saying no to someone who asks for water. People would feel that everyone should get water. Today there are disputes for water. Today villages argue for Water. There are discussions on the stealing of water. People are not ready to get their daughters married in a village, which has no water. As rural areas lack water, people are flocking towards towns. These are the consequences of inequality in the distribution of water. Many projects regarding the joining of four five major rivers may get completed in time, with the black money formed after the sixty five years of independence. This may avoid people leaving their cattle for the lack of water and migrate. We should think about it seriously. Today we hear the news of leopards and tigers entering the villages. These wild animals come in the human areas, mainly because the forests are destroyed and they don't get water. Animals also have the right to get water like the humans. Keeping this in mind, we should reserve water for them.

Storing water and making it available throughout the year and building dams are useful ways. People tend to build big dams. But I feel that instead of big dams, if small bunds are built in the valleys, innumerable litres of water can be stored. If small lakes are made, then the wild life can be safe. Water from the reservoirs will seep in the ground and



the wells in the areas will have water. Water coming from the mountain tops in the rainy season will be stored in these lakes. Thinking of bio-diversity, if we plant saplings of different trees on the mountains, the barren mountains will turn into green jungles. If the responsibility of preserving and growing the jungles is given to the local society and they would be allowed to take the forest produce, then employment will be created at the local level and more water will be available.

Today we see that many stone quarries are made by blasting the mountains. Rainwater may be collected in the closed mines. It can be used like small dams. This water can be used to make up for the loss of environment. Pisciculture can also be grown in this water.

Today windmills are built on the mountain tops which probably has an adverse effect on the rain. The change in the speed of wind and direction due to windmills doesn't have much effect on the clouds. Effect on the rainfall should be found out and the policy should be decided accordingly.

The ground water level is getting depleted. It has two reasons first due to less rainfall and less percolating of water in the ground and secondly, excessive use of groundwater by the bore wells.

Table 3

Annual usage of ground water in Maharashtra

Total annual replenishing of ground water	3.296, Ten Lakh hector
Total annual usage of ground water	1.508 Ten Lakh hector
Ground water for irrigation	1.509 Ten Lakh hector
The condition of ground water development	48.33 %
Use of ground water	14.2397 billion cubic meters

If the rainwater is channelized to the bore wells, it will seep into the ground and ground water level can increase. We have one such bore well in our *Raghavnagar* society. We have let the water falling on the terrace into the bore well by channelizing. We have been doing this task from last four to five years. There is no electric pump installed on the bore well, that means we don't take water from it. This is an effort to increase the ground water level. Such efforts can be useful. Why are big dams opposed? No doubt, more water will be stored; percolate into the ground, more areas will get water. Even today earth's crust is very hot. Due to this heat, ground water gets converted into vapour. Vapour needs more space than water. Hence perhaps it can become epicentre of the earthquake. If earthquake occurs in such place, there will be a great loss. Big dams displace the people. They lose their houses and lands. The problems of such people are not solved even today. Instead of displacing a large number of populations, small dams are useful anytime. In these small projects, people losing their lands can be rehabilitated in the same area. If they are allowed to do fishing and any such measures, the questions of the livelihood of the displaced can be solved.

Water should be regarded as national wealth. But today people have selfish attitude towards water. Due to this rivers are getting polluted with human waste, dirt etc. Thus cities pollute the rivers. This water doesn't remain fit for drinking to the next cities and villages. As the rivers are polluted, people have started going towards their origin. People on the plateau are getting ready to migrate to hilly regions. They are ready to invest there, thinking that they will get clean water and environment. *Lavasa* and Sahara cities project are the examples of this. No doubt, many such projects may come up in future. We should keep the water clean and use it sparingly. To keep rivers clean and safe is the responsibility as per law. Those breaking the rules should be strictly punished. Dead bodies are being floated in the Ganga so that the soul of the dead may get salvation. Such blind faiths should be banned by law.

Not only we, but the whole nature depends on water. Earth has 3/4th of water and 1/4th of land. But the water available for humans and other living things is only one to two percent. Hence water is a precious and essential commodity. To preserve it and to take care of it is our duty.

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