



Khadki Education Society's
Tikaram Jagannath College
Arts, Commerce & Science



E-MAGAZINE 2016-17

OUR INSPIRATION



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Down the lane they have supported, influenced and encouraged young minds. We acknowledge those ever inspiring words, thoughts and Course of action of aiming for the sky. Like a stone sets they ripples in water, they have spread the light of knowledge in the lives of enthusiastic young minds they have given a platform of encouragement for the budding computer genius. They are people of substances who have nurtured and shaped the destiny of many and are still in the process. They shoulder the trust and faith of many.

Hardworking encouraging, supporting, influencing, inspiring are the words synonymous to them. We extend a heartiest gratitude to the honourable trustees. We stand thankful to them for their contributions.

From the Desk of Principal



Khadki Education Society's, mile stone in the path leading stone to higher achievements and brighter future. Today there is increasing competition in every field and all anticipate the next shining moment and the opportunities it will bring. It is my pleasure to publish third E-Magazine of Tikaram Jagannath College.

Our nation is youngster's nation, our youth are also ready to face global challenges and grab various opportunities available in world. Our college will support all students to fulfil their dream .I feel proud to be a part of this institution, which creates graduates and post Graduates with depth of character and person beyond mere academic excellence.

I congratulate the complete editorial team on their successful publishing of E-magazine. I once again congratulate all of them for their efforts and wish them the best.

Dr. A. S. Mokashi

Principal

FROM THE DESK OF: STAFF IN CHARGE OF E-MAGAZINE

This year's theme for E-Magazine is 'Water'. The college team of E-Magazine and the students have compiled the different articles related with this theme giving plenty of information related to the subject as well as its importance in our lives and giving clear message to 'Save Water'.

It is an attempt to convey a very important message of Water Conservation. Along with the regular studies and or our professional life we should also give importance to social issues like water scarcity that was faced by our Nation this year. In this magazine we can find the information which will create awareness regarding this serious issue.

E-Magazine Team

Prof. Anita Chaudhari (**Team leader**)

Prof. Anagha Deshmukh (**Member**)

Prof. Mehanaz Kaushar (**Member**)

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CHAPTER 1.

INTRODUCTION OF WATER

Water consists of very small molecules. Each of them has two hydrogen atoms and one oxygen atom. The chemical formula of water is H₂O. Water can be a solid, a liquid or a gas, depending on the temperature it has. At 32° F (0° C) water freezes and turns into ice. It expands and becomes lighter. As a result ice floats on water. That is why we should let water out of pipes during the wintertime because it may freeze and burst the pipes. At 212°F (100°C) water boils and escapes as a vapour into the air. Between these two states water is a liquid. Most of the world's water is in liquid form. It can be found everywhere on earth. Water molecules always move. In ice they are very far apart from each other. They move very slowly or often not at all. Molecules in water vapour move very quickly.

Water covers about 70% of Earth's surface, makes up about 70% of your mass, and is essential for life. Planet Earth, taken by the Apollo 17 crew as they travelled toward the moon on December 7, 1972, shows an area of the planet from the Mediterranean Sea to Antarctica. Water is visible in the Atlantic, Indian and Southern (or Antarctic) Oceans, the south polar icecap, and as heavy cloud cover in the southern hemisphere and scattered along the equator. Water is the only substance that exists naturally on Earth in all three physical states of matter gas, liquid, and solid and it is always on the move among them. The Earth has oceans of liquid water and Polar Regions covered by solid water. Energy from the sun is absorbed by liquid water in oceans, lakes, and rivers and gains enough energy for some of it to evaporate and enter the atmosphere as an invisible gas, water vapour. As the water vapour rises in the atmosphere it cools and condenses into tiny liquid droplets that scatter light and become visible as clouds. Under the proper conditions, these droplets further combine and become heavy enough to precipitate (fall out) as drops of liquid or, or if the air is cold enough, flakes of solid, thus returning to the surface of the Earth to continue this cycle of water between its condensed and vapour phases.

Water in all three states makes a large contribution to the planet's climate. Water vapour is a greenhouse gas that traps energy radiated from the surface of the planet and helps to keep the planet warm enough to sustain the complex life that has evolved in this environment. Water vapour is responsible for more than half the Earth's greenhouse gas warming. On the other hand, clouds and ice fields on the surface reflect a good deal of the radiation from the sun, so this radiation does not reach the surface and warm it. The reflectivity of clouds and ice has a cooling effect on the planet. However, where the earth's surface has been heated by solar radiation, clouds help trap energy radiated from the heated surface and thus have a warming effect as well. Variations in the amount and form of water in the atmosphere have a complex relationship to our climate that is difficult to model and predict.

Pure water is colourless, odourless, and tasteless and so common that you probably never think about how unique it is and how essential to life. Most plants and animals contain more than 60% water by volume. Without water, life would not have evolved on Earth, and it is the presence of water on Mars and some moons of Jupiter and Saturn that causes us to speculate about past or present life there as well. Water has a number of unique chemical and physical properties that make it essential for life. One such property is familiar to everyone: solid water floats on liquid water. Almost all liquids contract when they get colder and reach a maximum density when they solidify. Water is different. As water cools, it contracts until it reaches 4 C, then it expands until it freezes at 0 C. Ice is less dense than water which allows ice cubes to float in a soft drink, icebergs to float in the ocean, and ponds and lakes to freeze from the top down so that aquatic plants and animals can survive in the unfrozen liquid below.

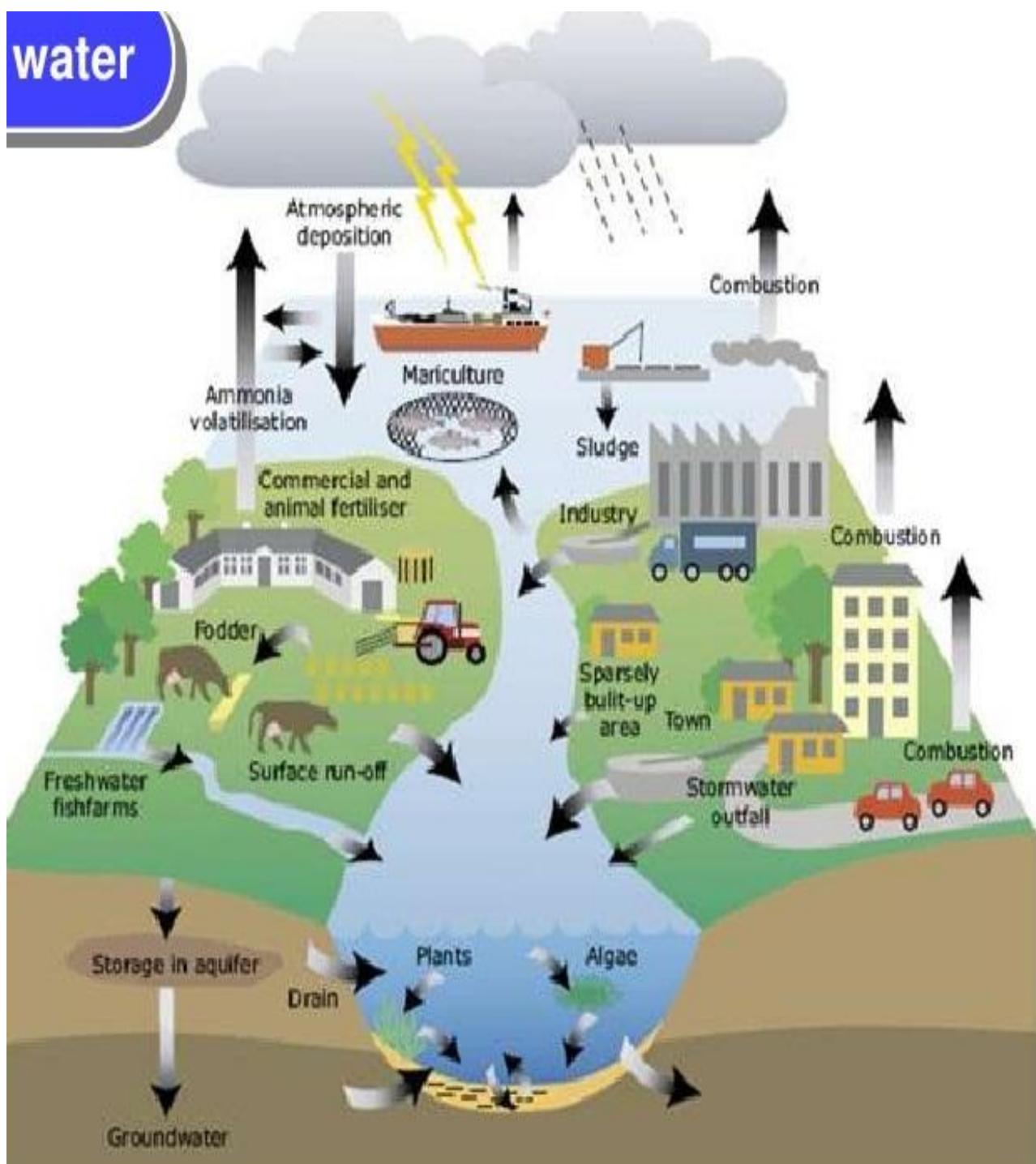
Water molecules have a simple structure: two hydrogen atoms bonded to one oxygen atom H₂O. This simple structure is responsible for water's unique properties. The bond between each hydrogen atom and the oxygen atom results from a pair of electrons shared between the two atoms. In water, the electrons in the shared pair are not shared equally between the hydrogen and oxygen atoms. The oxygen atom has a greater affinity for electrons than does the hydrogen atom, and the electrons in the O–H bond are more attracted to oxygen. Because electrons have a negative charge, the unequal sharing in the O–H bond results in oxygen acquiring a partial

negative charge (-) and hydrogen a partial positive charge (+). The H–O–H bond angle in water is 104.5 , which means that the molecule has a bent shape. This bent geometry and the accumulation of electrons on the oxygen side of the molecule cause the water molecule to have a negative charge on one side, the oxygen side, and a positive charge on the other side, the hydrogen side. Molecules with negative regions and positive regions are called polar molecules. Water molecules are polar molecules.

Polar molecules are attracted to each other. The attraction results from the negative region of one molecule, the oxygen atom, being drawn to the positive region of another molecule, the hydrogen atom. Opposites attract! The attractions between water molecules are particularly strong. Oxygen atoms have a very great affinity for electrons, and so the hydrogen atoms bonded to an oxygen atom acquire a significant positive charge. These hydrogen atoms are very tiny, so the positive charge is quite concentrated. This concentrated positive charge enhances the attraction of the hydrogen atoms in one molecule for the oxygen atom in another molecule. These attractions are represented by the green lines (highlighted by arrows) in the figure. This attraction is so strong that it has been given a particular name: hydrogen bonding. The energy associated with hydrogen bonds in water is about $20 \text{ kJ}\cdot\text{mol}^{-1}$, which is about 1/10 the strength of a typical shared-electron bond within a molecule.

- Vijay Pujari. & Sandeep Trimbake
T.Y.B.Sc. (Comp. Sci.)

water



CHAPTER 2

IMPORTANCE OF WATER IN OUR LIFE

In living organisms, water has a number of roles:

- Solvent
- Temperature buffer
- Metabolite
- Living environment
 - Lubricant to minimize friction (e.g. synovial fluid is encapsulated within the joints). The water amount in the human body constitutes about 60% of the body weight. Of this, 20% is extracellular body fluid which is made of 5% plasma and 15% tissue fluid. The tissue fluid and the plasma are in a steady state with the fluid inside the cells. There is a strict balance between water intake and water losses (homeostasis). The balance between daily water intake and water losses for the human body is given in percentages (from a total of 2.5 litres) per 24 hours.

❖ The importance of water to your body

Careful attention to adequate intake of fluids and electrolytes is important in preventing dehydration. Thirst is a good guide to when fluids need to be replaced, and water is generally the best choice. Caffeinated and alcoholic beverages can actually make dehydration worse, as they increase urine output.

- Always drink plenty of fluids during the day, especially when working or exercising in the sun.
- Make sure you are sufficiently hydrated before, during and after exercise. During exercise, it's recommended you replenish fluids at least every 20 minutes.
- Try to schedule all physical outdoor activities for cooler parts of the day.

- Flavour chilled water with lemon juice or mint leaves.
- Serve water at the table with meals, and try attractive containers and glasses they may encourage children to drink more.
- Carry a bottle of water with you wherever you go. Get a lap belt with a water carrier if you go running, walking or biking.
- Establish habits drink a glass of water before each meal, a glass on rising and another last thing before you go to bed.
- Water is used in every cell of your body. Water travels throughout your body carrying nutrients, oxygen, and wastes to and from your cells and organs.
- Water keeps your body cool as part of your body's temperature regulating system.
- Water cushions your joints, and protects your tissues and organs from shock and damage.
- Water acts as a lubricant for your joints, your mouth and digestive system in saliva, and in your nose, throat, eyes, and stomach as part of mucus.
- Water aids in digestion and absorption of food, as well as in the removal of wastes from your body.
- Water also helps you maintain a healthy weight.

-Rohan Katkar

-Kajal Patil

S.Y. (B.B.A)

❖ Replenish water in your body

- Drink plain water. Add a slice of lemon or lime. Drink non-calorie or low-calorie flavoured water.
- Eat foods with higher water content such as fruits and vegetables, like cucumbers, watermelon, other melons, lettuce, celery, grapes, oranges, bell peppers, broccoli and tomatoes.
- Drink non-fat milk.
- Add seltzer or sparkling water to small amounts of 100% fruit juice.
- Combine ice and fruit in a blender to create a slushy, cool and refreshing drink.
- Drink decaffeinated beverages. Caffeine is a diuretic that makes you urinate more often.
- Carry a water bottle in the car, at home, and at work.
- Ask for water when dining out.

Final tip: Do not wait until you are thirsty to drink water—you may already be slightly dehydrated. Thirst is usually an indicator that body fluids are well below required levels for optimal function. Drink water before you become thirsty or feel a dry mouth.

-Swanand Aswar

-Ashok Banda

F.Y.B.Sc. (Comp.Sci.)



CHAPTER 3.

WATER CONSERVATION & RECYCLING.

❖ Conservation techniques

Primary source of water in India is south-west and north-east monsoons. Monsoon, However, is erratic and as you have already studied the duration and the amount of rain fall is highly variable in different parts of our country. Hence, surface runoff needs be conserved.

The techniques for conservation of surface water are:

(a) Conservation by surface water storage

Storage of water by construction of various water reservoirs have been one of the oldest measures of water conservation. The scope of storage varies from region to region depending on water availability and topographic condition. The environmental impact of such storage also needs to be examined for developing environment friendly strategies.

(b) Conservation of rain water

Rain water has been conserved and used for agriculture in several parts of our country since ancient times. The infrequent rain if harvested over a large area can yield considerable amount of water. Contour farming is an example of such harvesting technique involving water and moisture control at a very simple level. It often consists of rows of rocks placed along the contour of steps. Runoff captured by these barriers also allows for retention of soil, thereby serving as erosion control measure on gentle slopes. This technique is especially suitable for areas having rainfall of considerable intensity, spread over large part i.e. in Himalayan area, north east states and Andaman and Nicobar islands.

In areas where rainfall is scanty and for a short duration, it is worth attempting these techniques, which will induce surface runoff, which can then be stored.

(c) Ground water conservation

Attributes of groundwater

- There is more groundwater than surface water.
- Groundwater is less expensive and economic resource and available almost everywhere.
- Groundwater is sustainable and reliable source of water supply.
- Groundwater is relatively less vulnerable to pollution.
- Groundwater is free of pathogenic organisms.
- Groundwater needs little treatment before use.
- There are no conveyance losses in underground based water supplies.
- Groundwater has low vulnerability to drought.
- Groundwater is the key to life in arid and semi-arid regions.
- Groundwater is source of dry weather flow in some rivers and streams.

As highlighted earlier, out of total 4000 BCM (billion cubic meters) precipitation that occurs in India, about 45 mhan (million hectares meters) percolates as ground water flow. It may not be possible to tap the entire ground water resources. The ground water potential is only 490 BCM. As we have limited ground water available, it is very important that we use it economically and judiciously and conserve it to the maximum.

(d) Adoption of drip sprinkler irrigation

Surface irrigation methods, which are traditionally used in our country, are unsuitable for water scarce areas, as large amount of water is lost through evaporation and percolation. Drip irrigation is an efficient method of irrigation in which a limited area near the plant is irrigated by dripping water. It is suitable method for any area and specially for water scarce areas. This method is particularly useful in row crop. Similarly sprinkler method is also suitable for such water scarce areas. About 80% water consumption can be reduced by this method, whereas the drip irrigation can reduce water consumption by 50 to 70 %.

(e) Recycling of water

The wastewater from industrial or domestic sources can be used after proper treatment, for irrigation, recharging ground water, and even for industrial or municipal use. If agricultural lands are available close to cities, municipal waste water can be easily used for irrigation.

❖ Conservation of water in domestic use

There is a large scope of conserving water at house hold level. A general awareness among the people about the importance of water and its availability, and need for conservation can help in minimizing wastage to a large extent. Losses during water supply also need to be prevented by reducing the leakages.

Some of the ways for improving the efficiency of water use at household level are:

- Reduce wastage-leaking pipes mean that lot of water never reaches to the people. Estimated losses are 35-40 %.
- Closing of taps while not in use.
- Better irrigation techniques – irrigation systems waste up to 70% water used. In drip irrigation water loss is significantly less.
- Use low flush toilets-reducing the amount of water used each time the lavatory is flushed.
- Build latrines and compact toilets which can turn human waste into clean, useful manure this is much cheaper than connecting toilet to a piped sewage line.
- Use bowls to wash vegetables, dishes instead of running tap.
- Greater use of recycled water ‘grey water’ in the home. Instead of using potable or treated water use bath and shower water for watering the plants.
- Use washing machine or dish washer when it is fully loaded.

-MANOJ KUMAR

-MAHUL SHAH

T.Y. (B.C.A)

❖ Reduce the loss of water

There are numerous methods to reduce losses due to evaporation and to improve soil moisture.

Some of them are listed below:

- Mulching i.e. the application of organic or inorganic materials such as plant debris, compost, etc., slows down the surface run-off, improves soil moisture, reduces evaporation losses and improves soil fertility.
- Soil covered by crops, slow down run-off and minimizes evaporation losses, hence, fields should not be left bare for long periods of time.
- Ploughing helps to move the soil around. As a consequence it retains more water thereby reducing evaporation.
- Shelter belt of trees and bushes along the edge of agricultural fields slow down the wind speed and reduce evaporation and erosion.
- Planting of trees, grass, and bushes breaks the force of rain and helps rainwater penetrate the soil.
- Fog and dew contain substantial amounts of water that can be used directly by adapted plant species. Artificial surfaces such as netting-surface traps or polythene sheets can be exposed to fog and dew; the resulting water can be used for crops.
- Contour farming is adopted in hilly areas and in lowland areas for paddy fields. Farmers recognize the efficiency of contour based systems for conserving soil and water.
- Salt-resistant varieties of crops have been also developed recently. Because these grow in saline areas, overall agricultural productivity is increased without making additional demands on fresh water sources. Thus, this is a good water conservation strategy.
- Desalination technologies such as distillation, electro-dialysis and reverse osmosis are Available

❖ Reuse of wastewater

Wastewater contains lots of nutrients. Its use for irrigation saves these nutrients. It improves the productivity of crops and soil fertility. General utilization of wastewater through reuse and recycling improves water use efficiency. In fact, wastewater is a resource rather than a waste since it contains appreciable amount of nitrogen, phosphorus and potash. Stabilization ponds can be used for fish aquaculture. The effluent can also be used for cultivation of short-term and long term, ornamental, commercial and fodder crops.

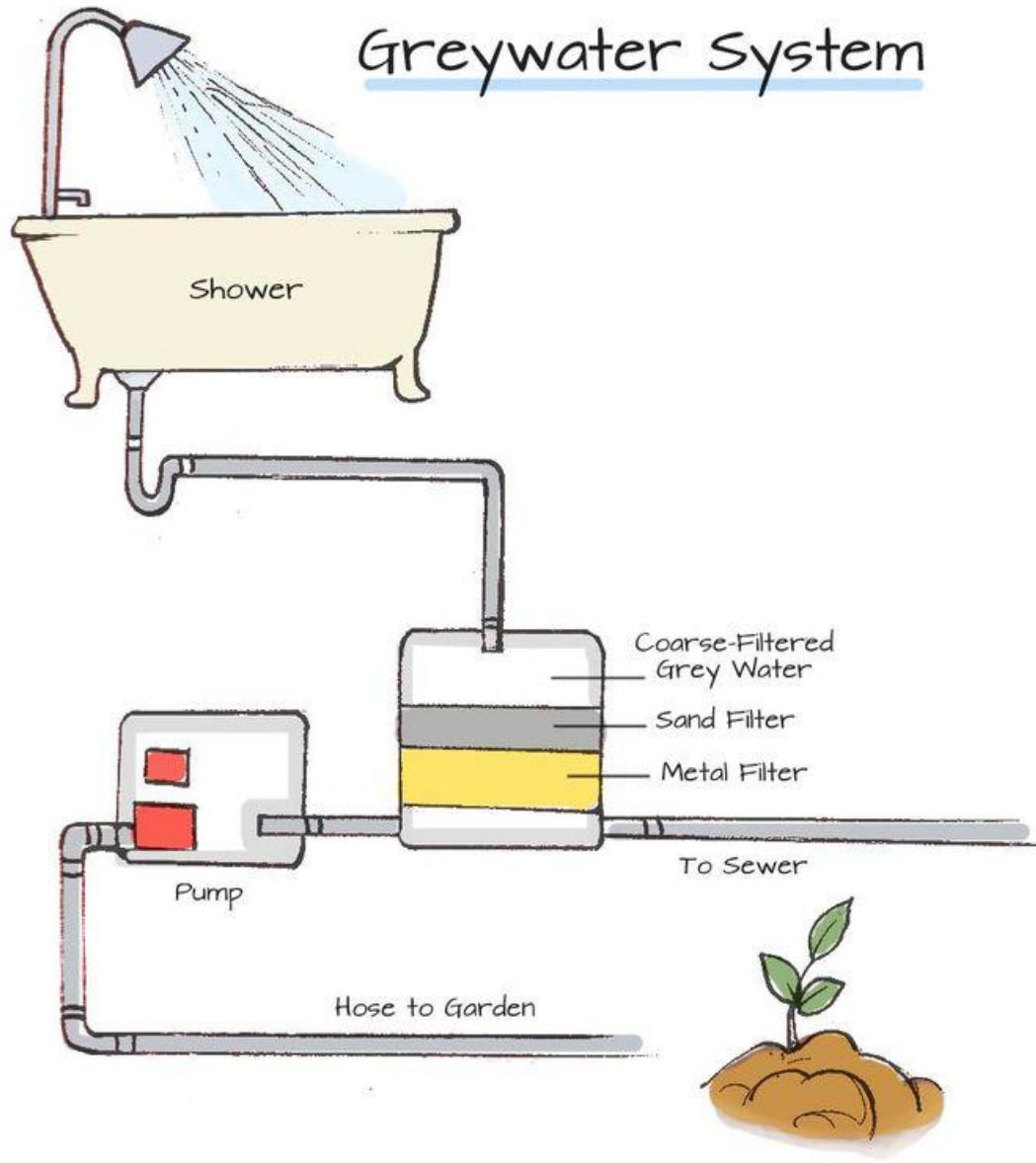
❖ Benefits of reuse

Practical experience has shown that wastewater reuse not only reduces the demand for fresh water but also can improve environmental quality; reuse of treated wastewater has the following benefits:

- Make up for the shortage of water supply (reduces demand on good quality water)
- Reduces the wastewater discharge thus reducing water pollution.
- Results in cost reduction.

- Kamble Ashutosh.
- Akshay Bhosale.
S.Y.B.Sc. (Comp. Sci.)

Greywater System



CHAPTER 4

WATER POLLUTION

Main causes of water pollution:

- Petroleum Pollution
- Sewage Pollution
- Solid Wastes
- Toxic Chemicals



❖ **Basic Facts of Water pollution**

When toxic substances enter lakes, streams, rivers, oceans, and other water bodies, they get dissolved or lie suspended in water or get deposited on the bed. This results in the pollution of water whereby the quality of the water deteriorates, affecting aquatic ecosystems. Pollutants can also seep down and affect the groundwater deposits. Water pollution has many sources. The most polluting of them are the city sewage and industrial waste discharged into the rivers. The facilities to treat waste water are not adequate in any city in India. Presently, only about 10% of the waste water generated is treated; the rest is discharged as it is into our water bodies. Due to this, pollutants enter groundwater, rivers, and other water bodies. Such water, which ultimately ends up in our households, is often highly contaminated and carries disease-causing microbes. Agricultural run-off, or the water from the fields that drains into rivers, is another major water pollutant as it contains fertilizers and pesticides.

- **Domestic sewage**

Refers to waste water that is discarded from households. Also referred to as sanitary sewage, such water contains a wide variety of dissolved and suspended impurities. It amounts to a very small fraction of the sewage by weight. But it is large by volume and contains impurities such as organic materials and plant nutrients that tend to rot. The main organic materials are food and vegetable waste, plant nutrient come from chemical soaps, washing powders, etc. Domestic sewage is also very likely to contain disease-causing microbes. Thus, disposal of domestic waste water is a significant technical problem.

Today, many people dump their garbage into streams, lakes, rivers, and seas, thus making water bodies the final resting place of cans, bottles, plastics, and other household products. The various substances that we use for keeping our houses clean add to water pollution as they contain harmful chemicals. In the past, people mostly used soaps made from animal and vegetable fat for all types of washing. But most of today's cleaning products are synthetic detergents and come from the petrochemical industry. Most detergents and washing powders contain phosphates, which are used to soften the water among other things. These and other chemicals contained in washing powders affect the health of all forms of life in the water.

- **Agricultural Run off**

The use of land for agriculture and the practices followed in cultivation greatly affect the quality of groundwater. Intensive cultivation of crops causes chemicals from fertilizers (e.g. nitrate) and pesticides to seep into the groundwater, a process commonly known as leaching. Routine applications of fertilizers and pesticides for agriculture and indiscriminate disposal of industrial and domestic wastes are increasingly being recognized as significant sources of water pollution. The high nitrate content in groundwater is mainly from irrigation run-off from agricultural fields where chemical fertilizers have been used indiscriminately.

- **Industrial effluents**

Waste water from manufacturing or chemical processes in industries contributes to water pollution. Industrial waste water usually contains specific and readily identifiable chemical compounds. During the last fifty years, the number of industries in India has grown rapidly. But water pollution is concentrated within a few subsectors, mainly in the form of toxic wastes and organic pollutants. Out of this a large portion can be traced to the processing of industrial chemicals and to the food products industry. In fact, a number of large- and medium-sized industries in the region covered by the Ganga Action Plan do not have adequate effluent treatment facilities. Most of these defaulting industries are sugar mills, distilleries, leather processing industries, and thermal power stations. Most major industries have treatment facilities for industrial effluents. But this is not the case with small-scale industries, which cannot afford enormous investments in pollution control equipment as their profit margin is very slender.

- **Effects of water pollution**

The effects of water pollution are not only devastating to people but also to animals, fish, and birds. Polluted water is unsuitable for drinking, recreation, agriculture, and industry. It diminishes the aesthetic quality of lakes and rivers. More seriously, contaminated water destroys aquatic life and reduces its reproductive ability. Eventually, it is a hazard to human health. Nobody can escape the effects of water pollution.

The individual and the community can help minimize water pollution. By simple housekeeping and management practices the amount of waste generated can be minimized.

- **Biochemical oxygen demand or BOD**

The amount of organic material that can rot in the sewage is measured by the biochemical oxygen demand. BOD is the amount of oxygen required by micro-organisms to decompose the organic substances in sewage. Therefore, the more organic material there is in the sewage, the higher the BOD. It is among the most important parameters for the design and operation of sewage treatment plants. BOD levels of industrial sewage may be many times that of domestic sewage. Dissolved oxygen is an important factor that determines the quality of water in lakes and rivers. The higher the concentration of dissolved oxygen, the better the water quality. When sewage enters a lake or stream, micro-organisms begin to decompose the organic materials.

Oxygen is consumed as micro-organisms use it in their metabolism. This can quickly deplete the available oxygen in the water. When the dissolved oxygen levels drop too low, many aquatic species perish. In fact, if the oxygen level drops to zero, the water will become septic. When organic compounds decompose without oxygen, it gives rise to the undesirable odours usually associated with septic or putrid conditions.

-Amit Hansker S.Y. (B.C.A)

❖ **Cause of Water Pollution**

There are many specific causes of water pollution, but before we list the toppers, it's important to understand two broad categories of water pollution:

“Point source” occurs when harmful substances are emitted directly into a body of water.

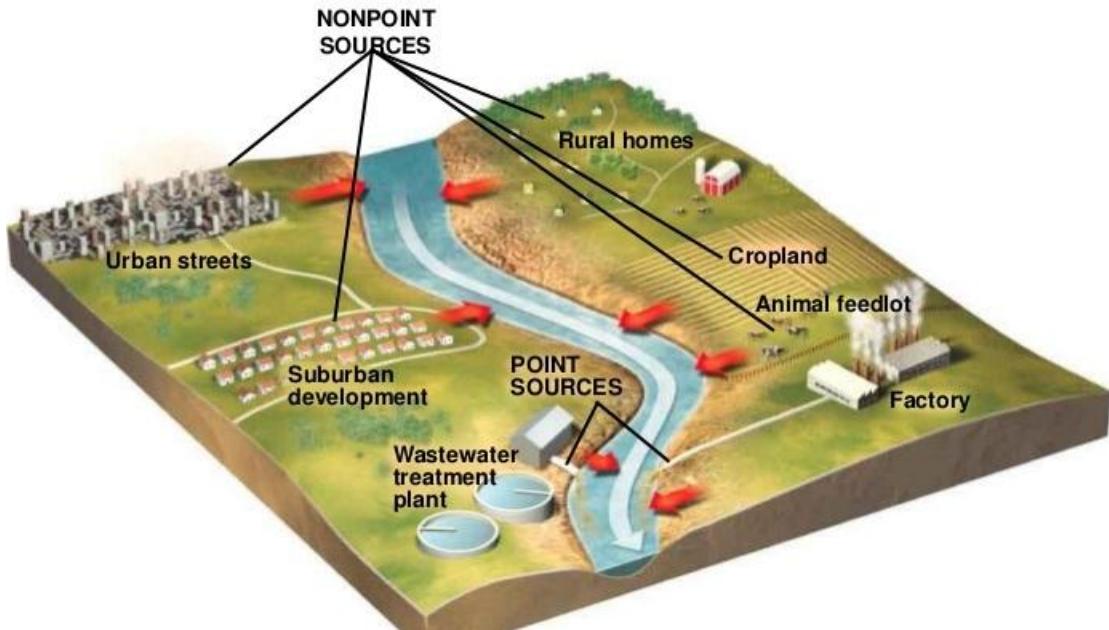
“Nonpoint source” delivers pollutants indirectly through transport or environmental change.

An example of a point source of water pollution is a pipe from an industrial facility discharging effluent directly into a river. An example of a nonpoint-source of water pollution is when fertilizer from a farm field is carried into a stream by rain (i.e. run-off).

Point-source pollution is usually monitored and regulated, at least in Western countries, though political factors may complicate how successful efforts are at true pollution control.

Nonpoint sources are much more difficult to monitor and control, and today they account for the majority of contaminants in streams and lakes.

Sources of Water Pollution



❖ Water Pollution Causes

1. Pesticides.

Pesticides that get applied to farm fields and roadside and homeowners' lawns run off into local streams and rivers or drain down into groundwater, contaminating the fresh water that fish swim in and the water we humans drink. It's tempting to think this is mostly a farming problem, but on a square-foot basis, homeowners apply even more chemicals to their lawns than farmers do to their fields still, farming is a big contributor to this problem.

2. Fertilizers

Many causes of pollution, including sewage, manure, and chemical fertilizers, contain "nutrients" such as nitrates and phosphates. Deposition of atmospheric nitrogen (from nitrogen oxides) also causes nutrient-type water pollution.

In excess levels, nutrients over-stimulate the growth of aquatic plants and algae. Excessive growth of these types of organisms clogs our waterways and blocks light to deeper waters while the organisms are alive; when the organisms die, they use up dissolved oxygen as they decompose, causing oxygen-poor waters that support only diminished amounts of marine life. Such areas are commonly called dead zones.

3. Oil, Gasoline and Additives

Oil spills like the Exxon Valdez spill off the coast of Alaska or the more recent Prestige spill off the coast of Spain get lots of news coverage, and indeed they do cause major water pollution and problems for local wildlife, fishermen, and coastal businesses. But the problem of oil polluting water goes far beyond catastrophic oil spills. Land-based petroleum pollution is carried into waterways by rainwater runoff. This includes drips of oil, fuel, and fluid from cars and trucks; dribbles of gasoline spilled onto the ground at the filling station; and drips from industrial machinery. Shipping is one of these non-spill sources of oil pollution in water: Discharge of oily wastes and oil-contaminated ballast water and wash water are all significant sources of marine pollution, and drips from ship and boat motors add their share.

4. Sediment

When forests are "clear cut," the root systems that previously held soil in place die and sediment is free to run off into nearby streams, rivers, and lakes. Thus, not only does clear cutting have serious effects on plant and animal biodiversity in the forest, the increased amount of sediment running off the land into nearby bodies of water seriously affects fish and other aquatic life. Poor farming practices that leave soil exposed to the elements also contribute to sediment pollution in water.

5. Plastics

Plastics and other plastic-like substances (such as nylon from fishing nets and lines) can entangle fish, sea turtles, and marine mammals, causing pain, injury, and even death. Plastic that has broken down into micro-particles is now being ingested by tiny marine organisms and is moving up the marine food chain.

Sea creatures that are killed by plastic readily decompose. The plastic does not it remains in the ecosystem to kill again and again.

6. Personal Care Products, Household Cleaning Products, and Pharmaceuticals

Whenever we use personal-care products and household cleaning products whether they be laundry detergent, bleach, or fabric softener; window cleaner, dusting spray, or stain remover; hair dye, shampoo, conditioner, or Rogaine; cologne or perfume; toothpaste or mouthwash; antibacterial soap or hand lotion—we should realize that almost all of it goes down the drain when we do laundry, wash our hands, brush our teeth, bathe, or do any of the other myriad things that incidentally use household water. Similarly, when we take medications, we eventually excrete the drugs in altered or unaltered form, sending the compounds into the waterways. Animal farming operations that use growth hormones and antibiotics also send large quantities of these chemicals into our waters.

Unfortunately, most wastewater treatment facilities are not equipped to filter out personal care products, household products, and pharmaceuticals, and a large portion of the chemicals passes right into the local waterway that accepts the treatment plant's supposedly clean effluent. Study of the effects of these chemicals getting into the water is just beginning, but examples of problems are now popping up regularly:

- Scientists are finding fragrance molecules inside fish tissues.
- Ingredients from birth control pills are thought to be causing gender-bending hormonal effects in frogs and fish.
- The chemical nonylphenol, a remnant of detergent, is known to disrupt fish reproduction and growth.

7. Air Pollution

We were doing WATER pollution causes! Well, surprisingly enough, air pollution contributes substantially to water pollution. Pollutants like mercury, sulphur dioxide, nitric oxides, and ammonia deposit out of the air and then cause problems like mercury contamination in fish, acidification of lakes, and eutrophication (nutrient pollution). Most of the air pollution that affects water comes from coal-fired power plants and the tailpipes of our vehicles, though some also comes from industrial emissions.

8. Heat

Heat is a water pollutant increased water temperatures result in the deaths of many aquatic organisms. These increases in temperature are most often caused by discharges of cooling water by factories and power plants.

Global warming is also imparting additional heat to the oceans. The impact on marine life is unknown at this point, but it's likely to be significant.

9. Noise

Many marine organisms, including marine mammals, sea turtles and fish, use sound to communicate, navigate, and hunt. The ever-increasing din of noise from ship engines and sonars has a negative effect. Because of this noise pollution, some species may have a harder time hunting; others may have a harder time detecting predators; still others may just not be able to navigate properly.

10. Death

Even the dead are a cause of water pollution. In India, if a deceased person's family cannot afford a funeral they may immerse the ashes of their loved one in the sacred Ganges River or they may put the corpse itself in the river, this is the most important factor of water pollution in our country not this sometime people directly immerse the death body of their pet Animal like Cow and Dog and like this another animal. One another factor is that we directly drop out our puja ka saman in rivers. (Materials for Religious).

These are some basic facts on Water pollution in India, and our responsibility is that we should try to save our water for future and motivate our community and our friends that the time is over now save water for future.

-Raviraj Satpal S.Y.(B.C.A)



CHAPTER 5

HOW TO CONTROL WATER POLLUTION

There are many approaches that could be adopted in water pollution control and management. It could be through prevention, practice efforts or join a project/program; Regulation and monitoring or engaging in control measures by reducing or minimizing waste.

Water pollution control includes the following ways:

- i. Wash your car far away from any storm water drains.
- ii. Don't throw trash, chemicals or solvents into sewer drains
- iii. Inspects your septic system every 3 – 5 years
- iv. Avoid using pesticides and fertilizers that can run off into water systems
- v. Sweep your driveway instead of hosing it down.
- vi. Always pump your waste-holding tanks on your boat.
- vii. Use non-toxic cleaning materials.
- viii. Clean up oil and other liquid spills with kitty litter and sweep them up.
- ix. Don't wash paints brushes in the sink.

Another way is to join or get involved with pollution prevention is to practice efforts on your own or join projects or programme. Regulation and monitoring is an effective way of pollution management.

Pollution control means to control the emissions and effluents into the air, water and land or soil. Without pollution control, the waster products from consumptions, heating, agriculture, mining, manufacturing, transportation and other human activities, whether they accumulate or disperse, will degrade the environment. Pollution prevention and waste minimization are more desirable than pollution control. However, pollution could be minimize by adopting these practices (i) by recycling (ii) by reusing (iii) waste minimization (iv) by mitigating (v) by preventing (vi) by compost. Apart from all these mentioned above, you can also use pollution control devices which include Dust collection system e.g. bag houses, cyclones, electrostatic precipitators, scrubbers

e.g. baffle spray scrubber, ejector venture scrubber, mechanically aided scrubbers, spray tower, wet scrubber, sewage treatment e.g. sedimentation (primary treatment), activated sludge bio filters (secondary treatment, also used for industrial waste water), aerated lagoons, constructed wetlands (also used in urban runoff); industrial wastewater treatment e.g. ultra filtration, API oil-water separators, bio filters, dissolved air flotation (DAF), powdered activated carbon treatment; the last but not the least are vapour recovery system and phytoremediation.

-Deepali Gandhat

-Swati Vanway

S.Y.B.Sc.(Comp.Sci)



Save Water

Every Drop Counts

Water is life ! It is a precondition for human, animal and plant life as well as an indispensable resource for the economy. Water also plays a fundamental role in the climate regulation cycle.

***** THE END *****

