



SCIENCE
CLASS-VII
Chapter-16 Water
A Precious Resource



St. Anselm's Pink City School, Jaipur
Affiliated to C.B.S.E.

Acknowledgement

First of all, praises and thanks to the Almighty Lord for his blessings throughout the working and completion of this graphic novel successfully.

‘Teamwork is the ability to work together towards a common vision’

This graphic novel is a product of teamwork. The following praiseworthy and eminent educationists have worked together in the development of this novel. Their contribution, whether directly or indirectly, is gratefully acknowledged.

Co-ordination:

Rev. Father Thomas Maniparambil (Principal, St. Anselm's Pink City School, Jaipur).

Training and ideation:

Mr. Sandeep Sethi (Director of Education M.S.M.S.II, Museum Trust).

Creative team:

Concept, Script and Dialogue : Ms. Nisha Choudhary

Language Support (Editing) : Ms. Vandana Luthra

Art Department : Ms. Simmi Sharma,
Ms. Madhu Gupta

Ms. Kamini Jain

Ms. Neetu Arora

Graphics and Layout : Ms. Suman Paliwal

Index

No.	Topic Name
1	Water: a precious resource
2	How much water is available
3	Forms of water
4	Groundwater as an important source of water
5	Depletion of water table
6	Water management
7	What role you play

Disclaimer:

No character has any real and fictitious resemblance with any real personalities.

PROLOGUE

Rahul and Riya were very sincere and good students. Their parents Raj and Meena were working with MNCs, so they enjoyed a luxurious life. They lived in a posh area and owned a big house with beautiful gardens.

Rahul was very intelligent and was quite sensitive towards the environment. He used to ask many questions related to environmental issues to everyone, may it be his parents, grandparents or his teachers. Rahul was mainly concerned about the issues related to water. Such as: its availability, scarcity and conservation. Certain questions that troubled him most were—

1. Is there enough water for the agricultural needs?
2. What happens to the living beings when they do not get water?
3. How we can save this important resource?
4. How can he motivate his family members to save water?

One day, Rahul noticed that his parents were disturbed. He heard them discussing problems related to the water supply in their area. In spite of paying the water bills on time, they will have to manage with limited water supply for a few days.



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To access the comic book and additional interactive digital content, download DIKSHA app from Google Play Store on your Android smartphone or tablet and scan the QR code using the DIKSHA app.

SOURCE

NCERT Textbook of Science (Class VII)

Chapter Name	Learning Objective	Learning Outcome
Chapter 16 Water : A Precious Resource	* Recall process that generate waste water that goes down the drains from sinks, showers, toilets, laundries etc. * Examine the role of plants in water management * List the means of access to water in order to trace their origin to the water cycle. * Describe infiltration i.e. seepage of water into the ground in order to define the water table and aquifer. * Construct a cause & effect model of depletion of ground water table. * Analyse the rainfall map of India in order to attribute reasons and factors leading to shortage and excess of water in major areas. * Recall the water cycle in order to describe the processes encompassed by it. * Suggest some (of his/her own) methods for recharging ground water table. * Suggest the steps for efficient water management at individual/community level. * Elaborate the steps to be taken by the public/private authorities for improved water supply. * Visualize the percentage of freshwater available on the Earth in order to conclude the need for water conservation. * Suggest some (of his/her own) methods for recharging ground water table. * Suggest the steps for efficient water management at individual/community level. * Elaborate the steps to be taken by the public/private authorities for improved water supply/debate on steps taken/to be taken by the Government for the supply of clean drinking water to people.	* Water is essential for all living beings. There can be no life without it. * Water exists in three forms: solid, liquid and vapour. * Though water is maintained by the water cycle, yet there is an acute scarcity of water in many parts of the globe. * There is an uneven distribution of water. Much of it has resulted from human activities. * Rapid growth of industries, increasing population, growing irrigation requirements and mismanagement are some of the causes for water shortage. * We need to be worried about the wastage during the supply of water through pipes, the leaking taps in buildings and other places. * Unnecessary use of water and overdrawing from groundwater should be avoided. * Recharge of water to the ground should be increased. * The need of the hour is that every individual uses water economically. * Plants wilt and ultimately dry-up if they are not watered for a few days.

CHARACTERS



Dadaji



Dadiji



Meena



Raj



Vandana (Teacher)



Rahul



Riya

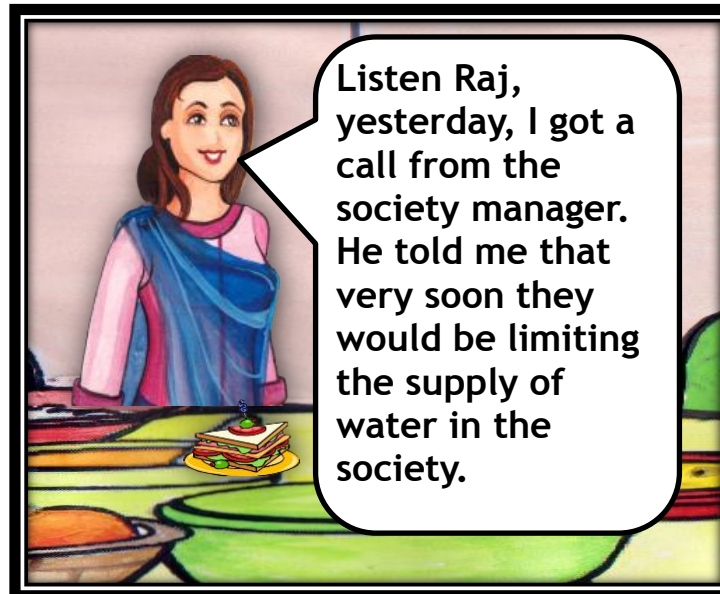
ALL FAMILY MEMBERS AT DINING TABLE HAVING BREAKFAST.



Rahul, Riya hurry up, you are getting late for school.



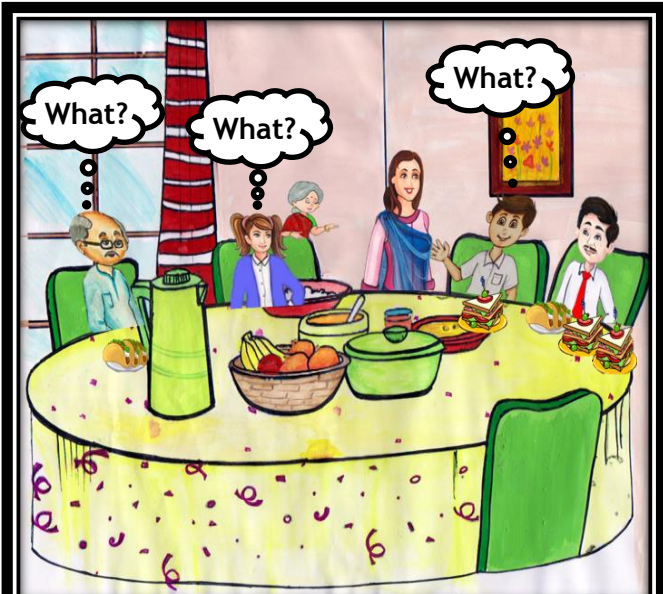
Listen Raj, yesterday, I got a call from the society manager. He told me that very soon they would be limiting the supply of water in the society.



What?

What?

What?



But we have paid all the bills on time, then why?



Yes, we did, but he said that the water supply from Bisalpur Dam has decreased.



Raj Beta, the entire world is facing the challenge of water scarcity. It's a global problem now.

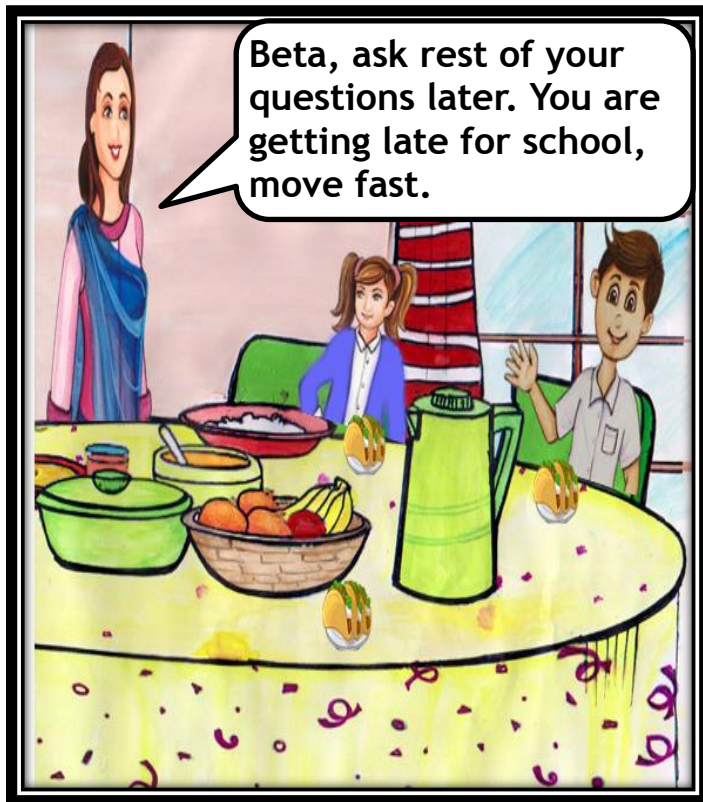


But dadaji, water is a natural resource. So, why do we have to pay for it and why is there a shortage of water supply?



Yes Rahul, years ago water was free but as the usage has increased, we have to pay a nominal amount for it to the government.





Is water actually going to vanish from earth?

St. Anselm's P.C. School

Bhai, what are you thinking? What has happened to you? Let's go.

Oh..... Nothing Let's go.

SCIENCE TEACHER VANDANA ENTERS THE CLASS. ALL STUDENTS WISH HER.

Good morning students, take out Science Book, we will start a new chapter L -16 'Water-A Precious Resources'.

ALL STUDENTS SMILE, ESPECIALLY RAHUL.

As you all know water is the most essential component of our life.

There are three forms of water- Solid ,Liquid and Gas.

Forms of Water

- Water can occur in 3 different states
- solid, liquid, gas



Solid water is frozen; ice is an example of solid water that has been frozen

Liquid water is wet and fluid (*flows*); this is the most familiar form such as waters, lakes, and rivers are all liquid water

Gas is the water vapor in the air that we can not see

Water makes up about 70% of our body weight and plays a vital role in all metabolic activities.

About 70% of earth's surface is covered by oceans and only about 2.6% of total available water is fit for human use.

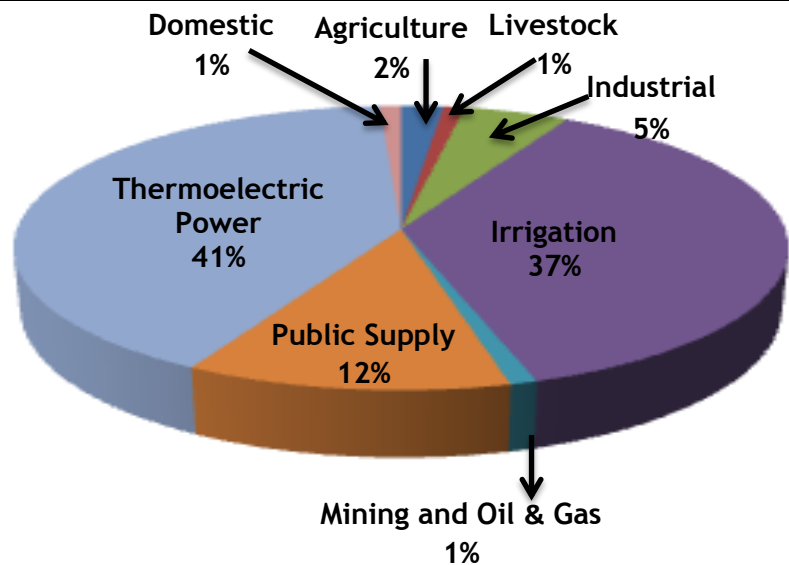
Really ma'am is that true! It seems that water may soon vanish from earth!

No-No, Rahul it's not that, it's not going to vanish, but yes, it is a fact that scarcity of water has already started.

You know India ranks at 133 in the world in terms of water availability per person - per annum.



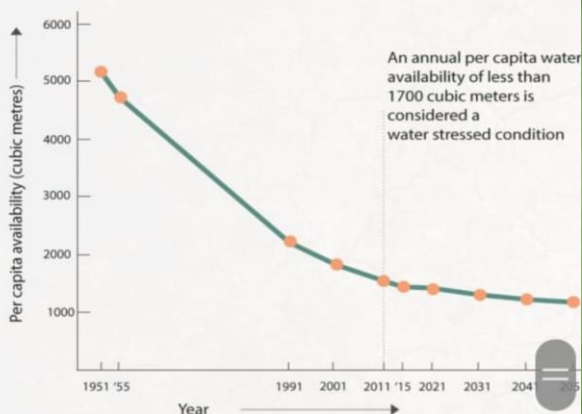
Percentage of Water Used by Category



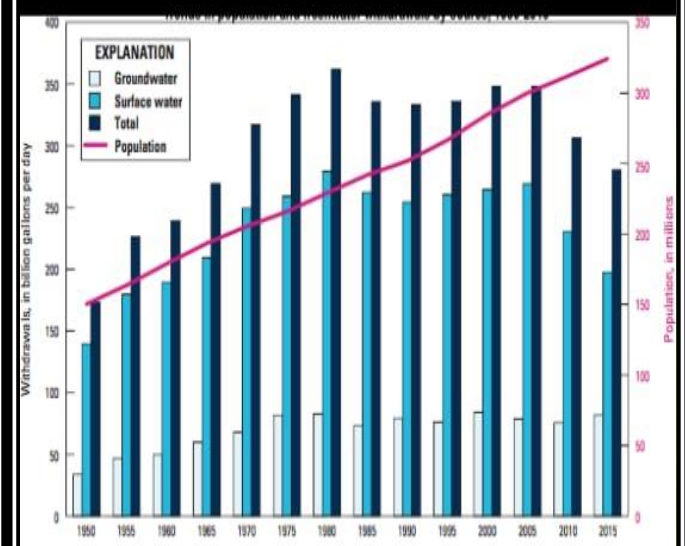
India's per capita availability of water is falling continuously, which is a matter of great concern.



India's per capita availability of water has dropped massively and will continue to fall



By 2025, it is predicted that India will join countries or regions having water stressed situation.



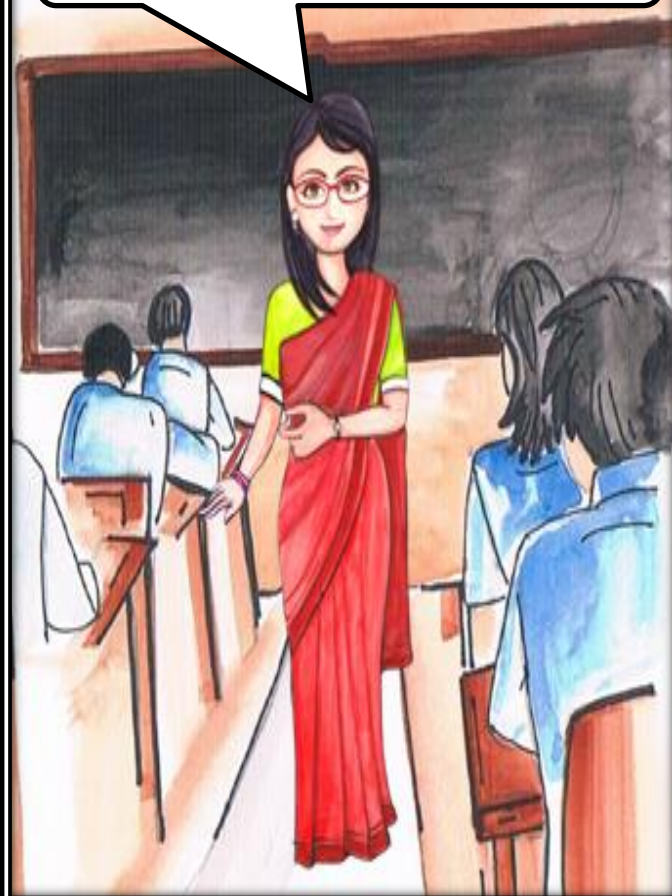
ALL STUDENTS LOOKED VERY ANXIOUS AND TENSED.



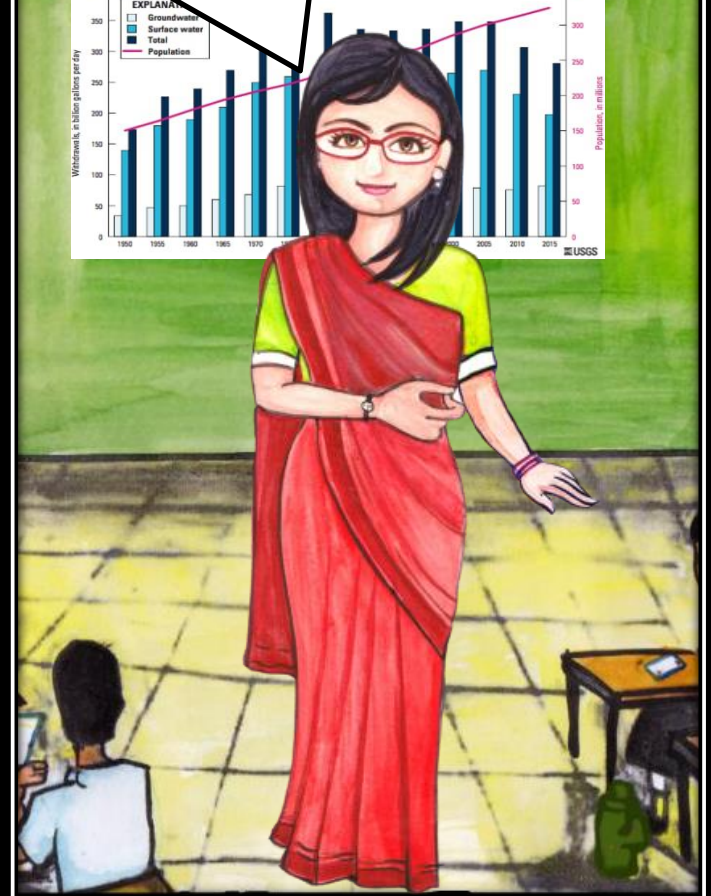
Ma'am, does this mean that we can't do anything about it?



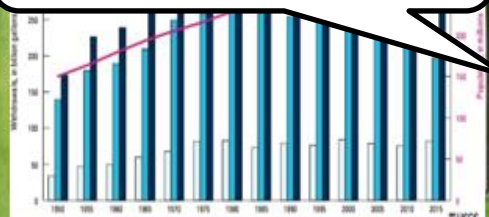
No, Dear Students a lot can be done to conserve water.



Conservation means "the wise and judicious use of resources"



Misuse or wastage of this precious resource should be avoided.



'Save Water' campaigns are needed to make people aware about the consequences of scarcity of water.

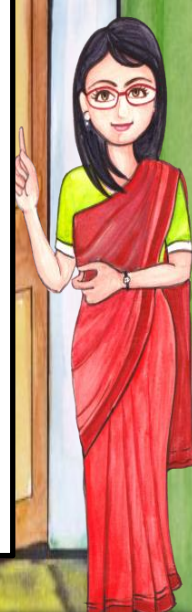


Ma'am, then, what are the main reasons for depletion of water table on earth?



There are many factors responsible for lowering of water table like -

- (i) **Increasing population** - Increasing population increases the demand of water. This, in turn, decreases seepage of water into the ground.
- (ii) **Increasing industries** - If the number of industries increases, then the water required by them will also increase.
- (iii) **Agricultural activities** - The water for agriculture is mainly utilised from ground water, rain water and canal water. This causes depletion of water table.
- (iv) **Deforestation** - Cutting forests to create land for housing, industries, roads, etc. also causes depletion.



Dear Students Now I will give you an interesting assignment and rest we will discuss tomorrow. Have a nice day.



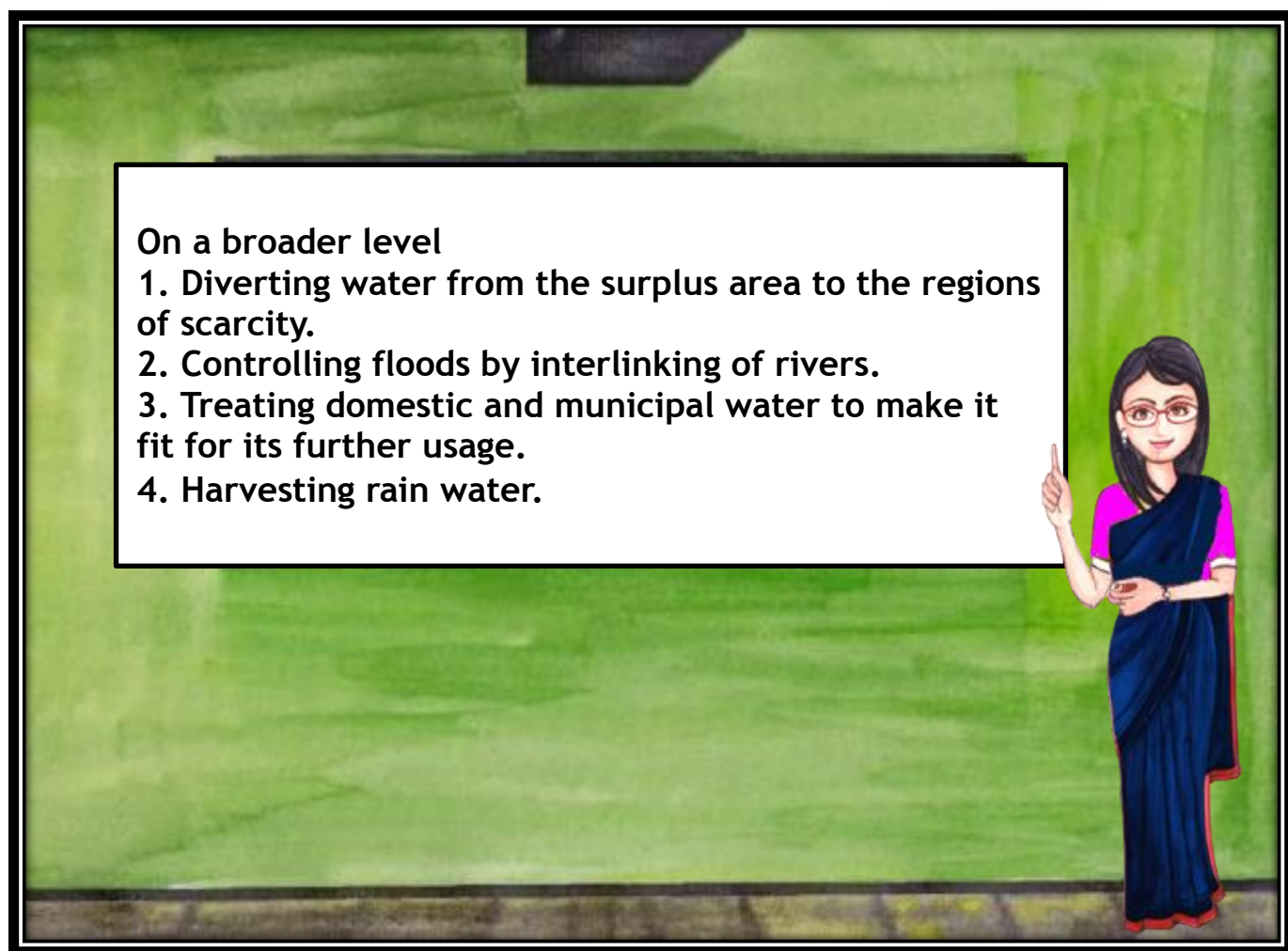
Exercise

Q 1. Write True (T) or False (F) against the following statements in the given brackets:

- 1. Rain is the major source of water for agriculture in our country. ()**
- 2. Water harvesting should be encouraged to conserve water. ()**
- 3. Level of water table at a place remains same throughout the year. ()**
- 4. Land areas without trees help in better seepage of water. ()**
- 5. Rajender Agarwal is known as 'the water - man of India'.**

ANSWER:

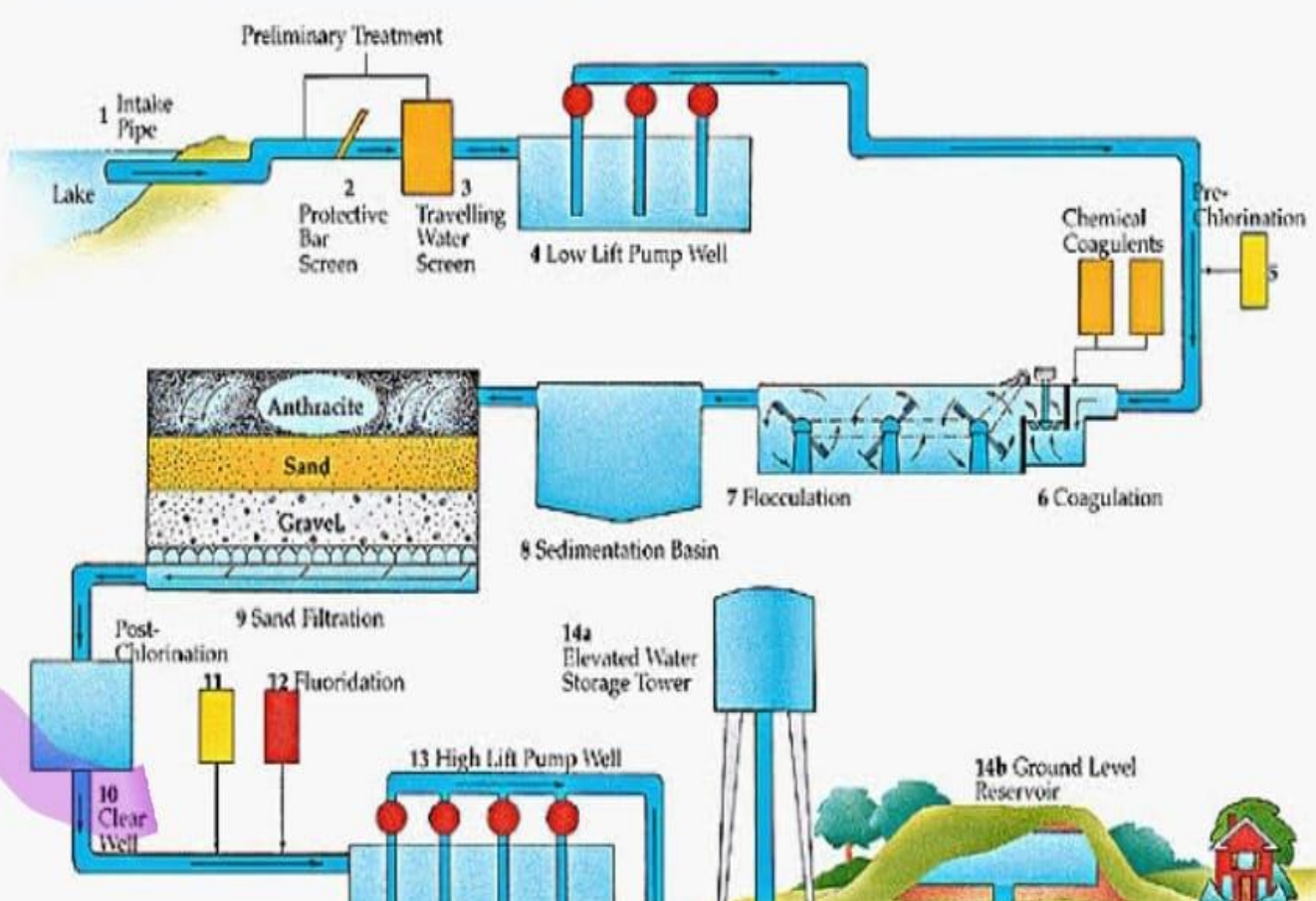
- 1. True**
- 2. True**
- 3. False. The level of water table varies according to the usage of water.**
- 4. False. Land areas without trees cause soil erosion, which decreases the ability of holding water. Hence, there is less seepage of water.**
- 5. False. Rajender Singh is known as 'the water man of India'.**



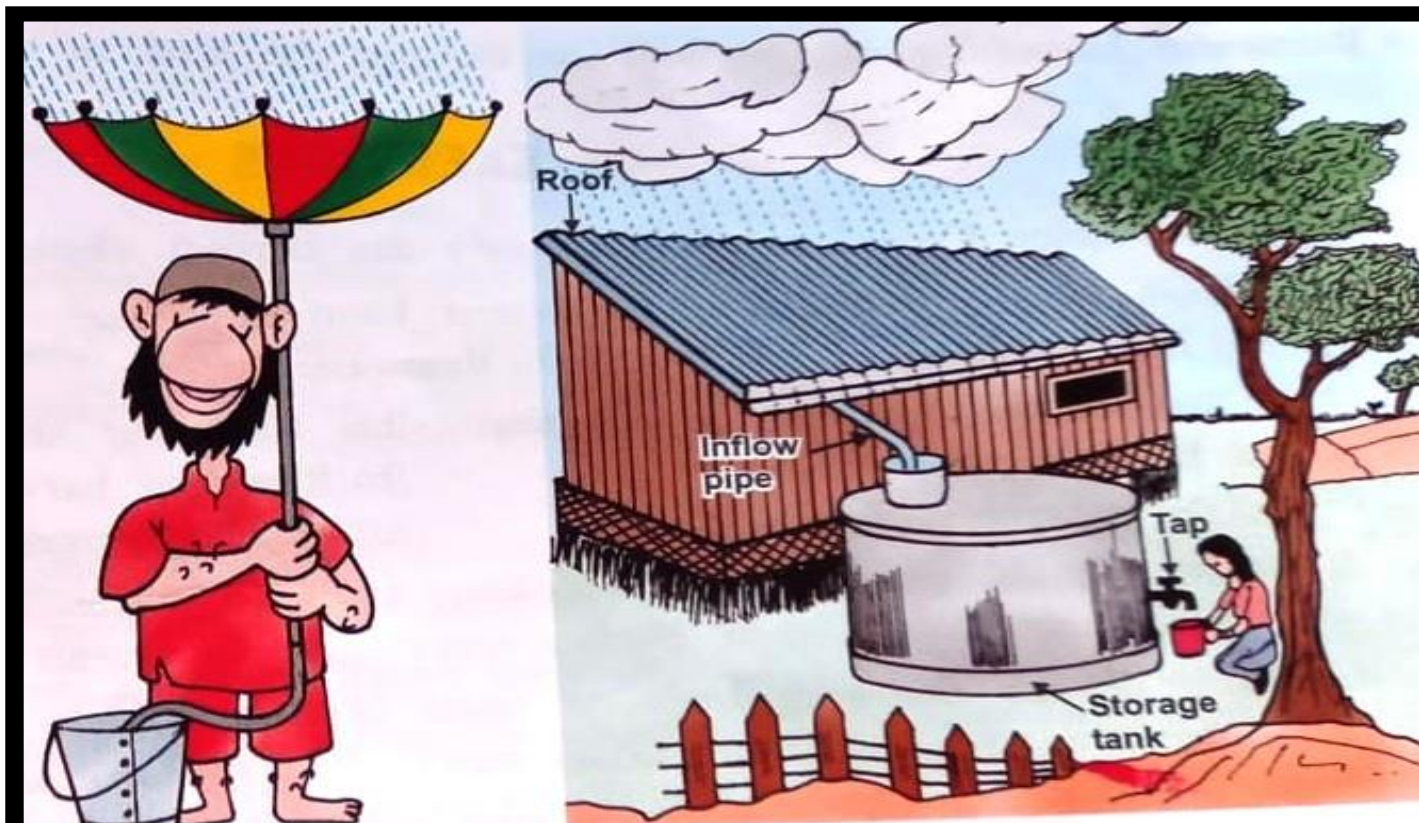


Channelizing water

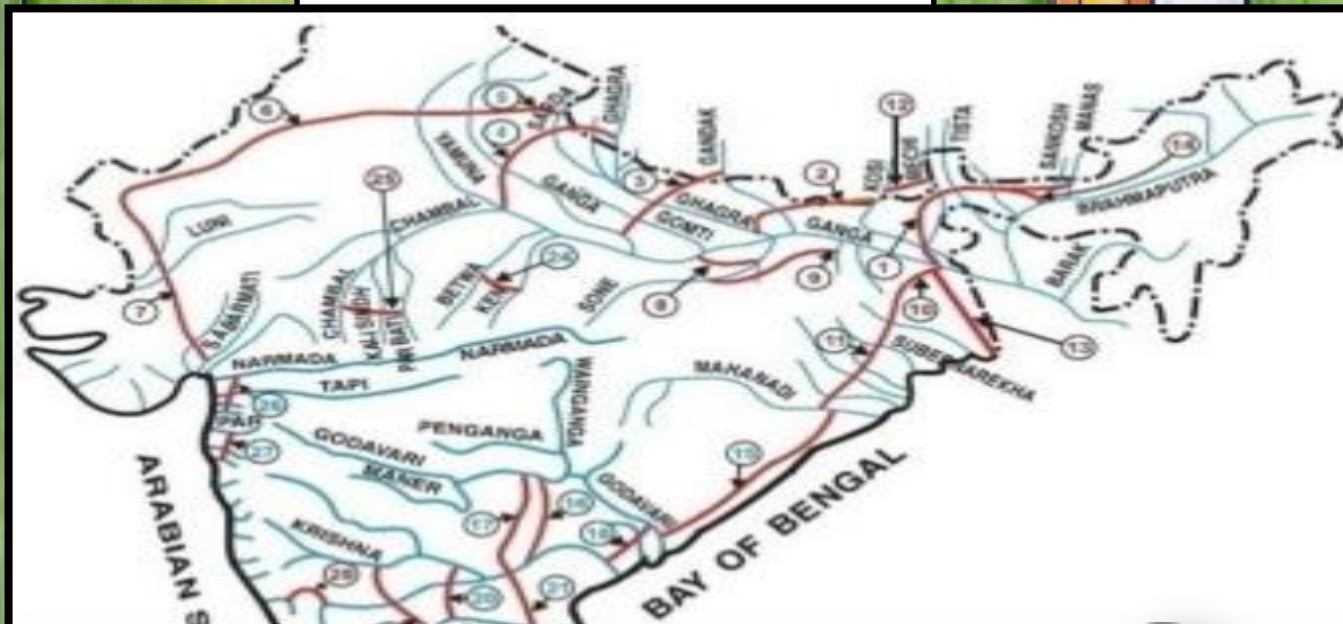
WATER TREATMENT PLANT SURFACE WATER SUPPLY



Water harvesting



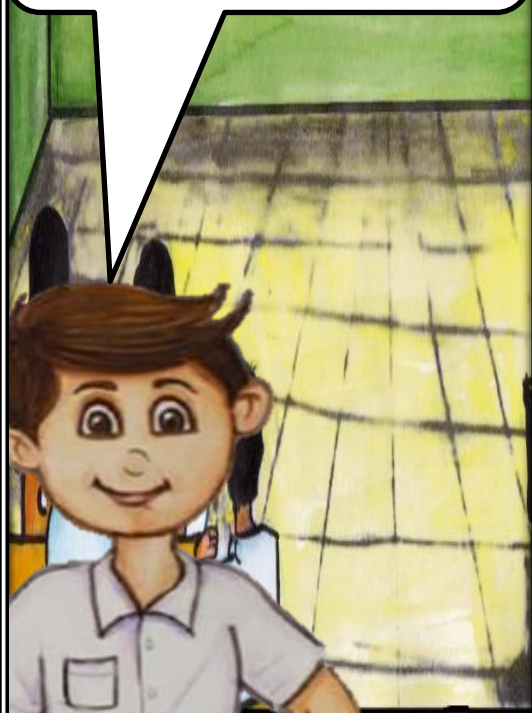
Water harvesting



Interlinking of rivers



Ma'am what is rain water harvesting? How is it done?



It is a method of collection and storage of rainwater. It can be collected from the rooftops and redirected to a tank or deep pit. Once the water reaches the groundwater, the water table rises.



I am providing you with two links to know more about rain water harvesting.

https://youtu.be/eJCTAXb_BWs
<https://youtu.be/CLnEjeyAqRU>



Dear Students as we have seen an interesting video by 'Anupam Mishra'. Now, let me check what have you understood --



Q1. Name the Golden Desert of India?

Ans – Jaiselmer.

Q2. Name the structure, the desert people use to harvest rainwater?

Ans - Kund or Tanka.

Q3. How much water is collected by a 'tanka' in one season?

Ans - Approx. 100 thousand litres of water is collected in one season.

Q4. Name the place near Jaipur, where Rainwater harvesting is being done since last 400 years.

Ans - Jaigarh fort.

Q5. How deep are the underground tanks built in different houses in Jaiselmer, to collect rain water? How much water do they collect?

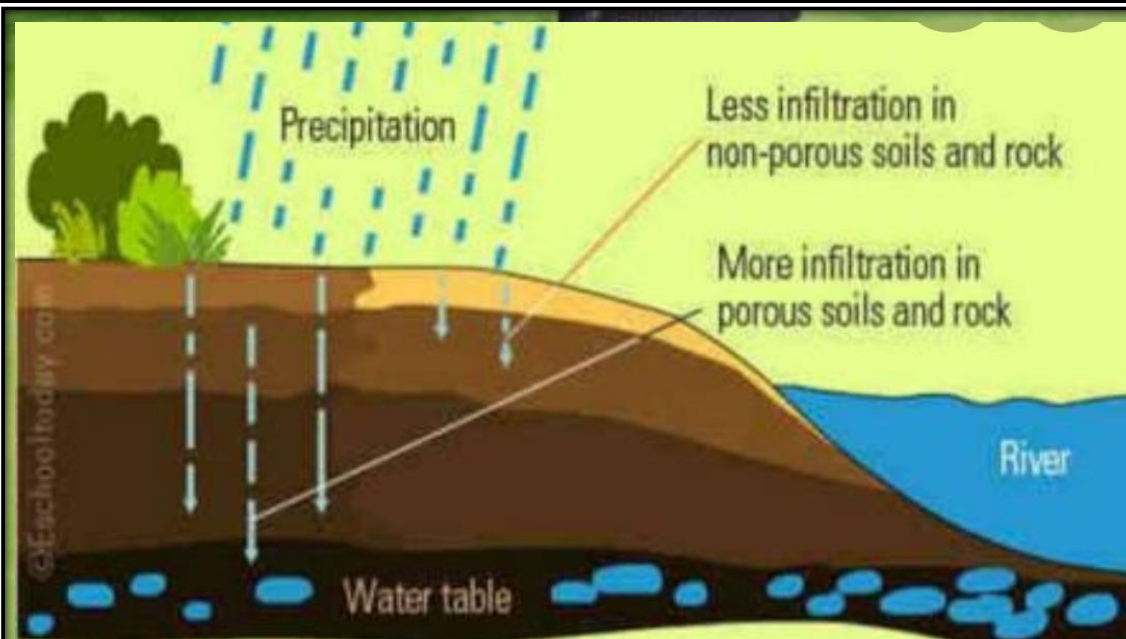
Ans – They are built approx. 15 feet deep and approx. 25000 litre water is collected in them during a good monsoon.



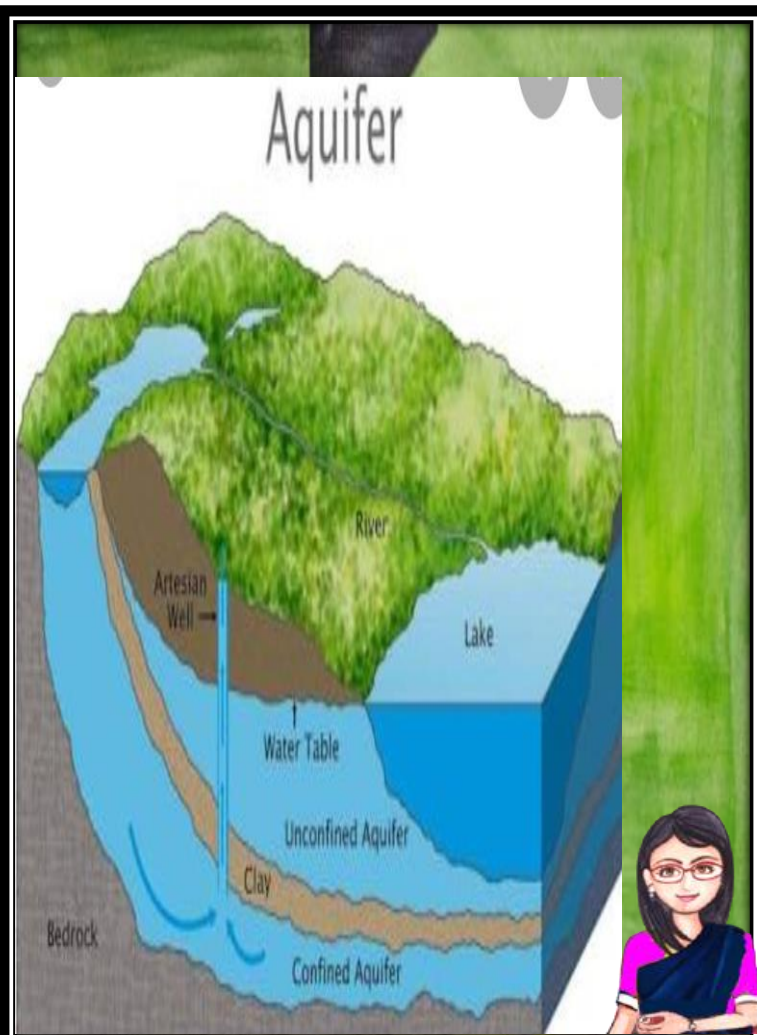
Ma'am, what is infiltration and aquifer?



Water from all the sources such as rain, rivers and ponds seeps into the soil and fills the empty spaces and cracks. This process of water seeping into the ground is called infiltration.



The groundwater, thus, gets recharged by this process. At places the groundwater is stored between layers of hard rock below the water table. This is known as an aquifer. Water in the aquifers is usually pumped out with the help of tube wells or hand pumps.



Now, let us discuss some practices that we can easily adopt in our homes to save water.



We should have rain water harvesting tanks at our homes. We should avoid having a bath under a running shower or in a bath tub rather we should use a bucket and a mug.



I know many people, when they brush their teeth or shave, they leave the tap running. We should ask our family members not to do so.



Ask your house help not to clean utensils under a running tap.



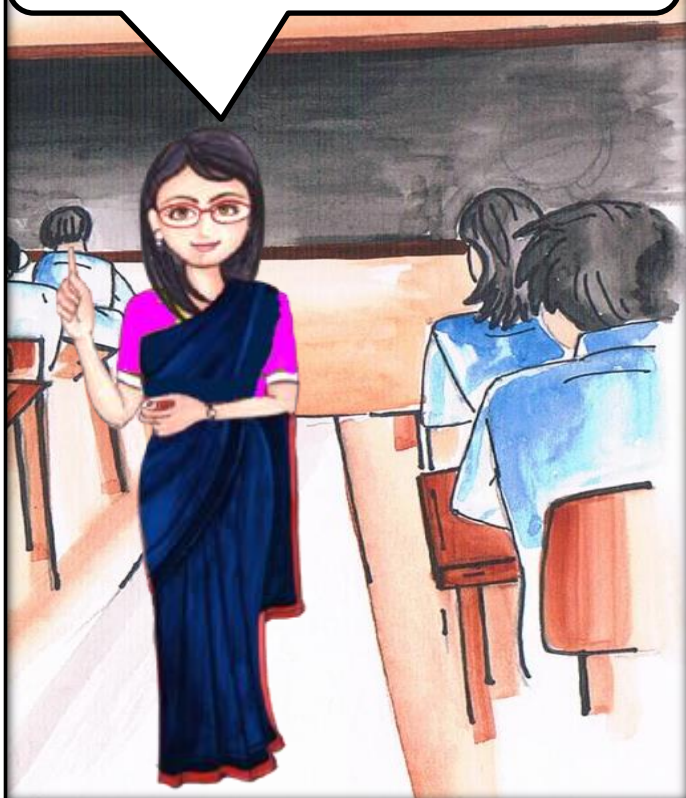
We should use broom and wet mop for cleaning courtyards and drive ways rather than flowing water.



We can use smaller cisterns in toilets to avoid extra water loss.



We must take care of leaking pipe lines and over flowing tanks.



So, dear students these are a few practices which can help us to save a lot of water in our daily routine. Make sure you share these measures with your family members, so that we all can make our contribution in this great movement.



Yes ma'am, sure. We will definitely share and follow the same.



That is great to know. Let's do some exercises to judge your knowledge.



Across

- # Down

-
- A crossword puzzle grid with 11 empty squares. The grid is composed of white squares with black borders. The starting squares for the words are labeled with numbers in black boxes: 1 (top left), 2 (top center), 3 (middle left), and 4 (top right). The grid is 11 squares wide and 11 squares high.

Answer:

- 22

QII. Choose the correct option –

- Q.1. In the present time, the uneven distribution of water has occurred due to:-
(a) geographical conditions (b) atmospheric conditions
(c) human activity (d) animal activity
- Q.2. In the palaces and forts of India, the structure for water storage is a
(a) tubewell (b) bawari
(c) handpump (d) Persian wheel.
- Q.3. The rocks in the aquifer have to be
(a) hard and porous (b) soft and permeable
(c) porous and permeable (d) soft and porous
- Q.4. Groundwater can be recharged by increasing --
(a) afforestation (b) concretization
(c) urbanization (d) industrialization
- Q.5. On which day the world water day is celebrated?
(a) 23rd March (b) 22nd March
(c) 21st March (d) None of these
- Q.6. Which of the following is a way to use water economically?
(a) Construction of bawaris (b) Rainwater harvesting
(c) Drip irrigation (d) Infiltration

QIII. Match the following:-

(i)	Solid	(a)	Water under water table
(ii)	Liquid	(b)	Traditional way of collecting water
(iii)	Gas	(c)	Water between the hard rocks
(iv)	Groundwater	(d)	Ice, Snow
(v)	Aquifer	(e)	Water in ponds, rivers, oceans
(vi)	Bawari	(f)	Water vapour

Answers

MCQ

- Ans. 1. (c) human activity
Ans. 2. (b) bawari
Ans. 3. (c) porous and permeable
Ans. 4. (a) afforestation
Ans. 5. (b) 22nd March
Ans. 6. (c) Drip irrigation

Match the following:-

(i)	Solid	(d)	Ice, Snow
(ii)	Liquid	(e)	Water in ponds, rivers, oceans
(iii)	Gas	(f)	Water vapour
(iv)	Groundwater	(a)	Water under water table
(v)	Aquifer	(c)	Water between the hard rocks
(vi)	Bawari	(b)	Traditional way of collecting water

QIV. Explain Drip irrigation (another way of saving water)



- The given picture is not depicting any kind of leakage in a pipe. It is indicating a method of irrigation known as "drip irrigation".
- This technique delivers water directly to the roots of a plant, where it seeps slowly into the soil (one drop at a time).
- It saves water as negligible amount of water is lost through surface runoff or by evaporation, and soil particles have ample opportunity to absorb and hold water for the plant.

QV. Which is the correct method of cleaning a car .

Answer-The correct method of cleaning a car --



- **Wiping the car with a wet cloth (method 'a') is the right option as this will avoid unnecessary wastage of water.**
- **Washing with a hose (method 'b') will waste tremendous amount of water.**

QVI. Fill in the blanks with the appropriate answers:

- (a) People obtain groundwater through _____ and _____.
- (b) Three forms of water are _____, _____ and _____.
- (c) The water bearing layer of the earth is _____.
- (d) The process of water seepage into the ground is called _____.

ANSWER:

- (a) tube wells and hand pumps.
- (b) ice, water and vapour.
- (c) aquifer.
- (d) infiltration.

QVII. Solve the puzzle:-



- 1. rudgon rawet
- 2. atooniaervp
- 3. acestoonnnid
- 4. duclos
- 5. tspratniaoinr
- 6. aitfinlronit
- 7. ntciepirtaipo

ANSWER:

- 1. Ground water
- 2. Evaporation
- 3. Condensation
- 4. Clouds
- 5. Transpiration
- 6. Infiltration
- 7. Precipitation

**BACK HOME LIVING ROOM
DADAJI, DADIJI SITTING ON
CHAIRS**

Rahul, Riya, welcome back,
go and change your clothes, I
will serve lunch to you both.



So, Rahul how was your day? What
were your queries yesterday about
water? Let's discuss now.



Dadaji, I was
just asking you
certain facts
about water
and you know
what, our
science teacher
also taught us
about water
and its
conservation.

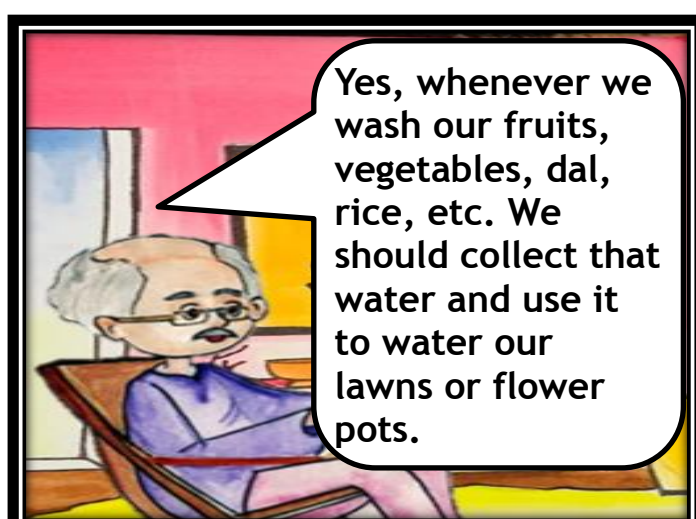


She told us many facts related
to water scarcity and some
simple ways to conserve water.



Can you also guide
us more about it?





You know Rahul in some areas there are large no of trees and plants whereas in other areas they may be sparsely distributed, depending on the availability of water.



You might have observed that in our garden, the plants often start drooping down if not watered regularly.



Then no life on earth will be possible without water! Right Dadaji! I will share all the given measures with my friends also and motivate them to save water.



A Case Study

Bhujpur in the Kutch area of Gujarat has a very erratic rainfall. The only source of freshwater lies underground because rivers in this area do not have water throughout the year. Over the years, demand for water has grown. The withdrawal of groundwater has far exceeded recharge. As a result the water table has gone down alarmingly.

In 1989, the villagers along with a non-governmental organisation, decided to harvest rainwater. Eighteen check-dams were built on the Rukmavati river and its many tributaries. The water so collected increased percolation through the soil and recharged the aquifers.

According to farmers, the wells have water now and the water that flowed into the sea and was wasted, has become available for irrigation.

Q1. Where lies the source of fresh water in Bhujpur and why?

Ans -The only source of fresh water lies underground because rivers in this area do not have water throughout the year.

Q2. Why do you think that the water table has gone down alarmingly?

Ans - The water table has gone down alarmingly because as the demand for water has grown a lot and at the same time the withdrawal of ground water has exceeded its recharge.

Q3. How many check dams were built on Rukmavati river and how it helped to harvest rain water?

Ans- Eighteen check dams were built on the Rukmavati River and its tributaries. The water so collected increased percolating through the soil and recharged the aquifers.

Glossary

- **Groundwater:** Water present inside the earth, as in wells and in springs.
- **Surface water:** Water present on the surface of the Earth, as in lakes, rivers, streams.
- **Rainwater Harvesting:** Collection of rainwater from the rooftops of buildings.
- **Water Table:** Topmost level of underground water.

Bibliography

Our references --

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- 2. Learning Elementary Science by Goyal Brothers Prakashan**
- 3. www.learncbse.in**
- 4. www.meritnation.com**
- 5. www.extramarks.com**

Application Used:

Microsoft PowerPoint, Microsoft Word, Paint and Photoshop.

Principal's Desk

I am extremely happy and privileged to congratulate our teachers for having brought out such a beautiful graphic novel, a new pedagogy proposed by CBSE and promoted through Art Integrated Learning projects. I am also happy that our science teachers have chosen a very relevant topic and a very good storyline to present to the students the science lesson 'Water Resources'.

I am grateful to the teachers for spending hours together to bring out this extra-ordinary piece of learning in the form of a graphic novel. Through the simple story of a school going child whose curiosity draws out new ideas of water conservation and optimum use of water in the houses and public places. The dialogues are set in such a way that the curiosity of students are satisfied effectively.

Water is a limited natural resource and it is the duty of every citizen to preserve it and teach others to make the optimum use of it. In this purpose this novel has gone a long way to inculcate water saving habits in our students with such attractive pictorial presentations.

I am grateful to Mr. Sandeep Sethi who inspired our teachers immensely to produce such wonderful novels. It is his constant support and motivation that made it possible for our teachers to do their best and finally come out successfully in this venture.

It is always a team work that makes beautiful works. The subject teachers in collaboration with the language teachers, Art and Drawing teachers and the I. T. teachers who blended their talents to produce this mater-piece on 'Water Resources'. Congratulations to one and all in the team.

Thank you,

Fr. Thomas Maniparambil

Principal

“Every drop counts.....”



Why is there going to be a cut in water supply? Is there actually water scarcity all around? Is water actually going to vanish from earth?



A few questions that troubled a young mind and what answers he got... let's explore



St. Anselm's Pink City School, Jaipur
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