Govt. Resolution No: Study - 2116 (Q. No 43/16) SD-4 dated 25.04.2016 in the meeting of the co-ordinating committee dated 29.6.2021 has approved this workbook from the academic year 2021-22

WATER SECURITY

STANDARD TEN

Workbook (Activity and Project Notebook)

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Name of the school: Model English High School

Class : ~~X~~ 10th Div. : C Roll No. : 1

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Preface

Dear students,

Welcome to Class X. You are studying various subjects as per National Curriculum Framework 2005, State Curriculum Framework 2010, State Secondary Education Curriculum 2012 and Restructured Secondary Education Curriculum 2016. As per Govt. misc. 2019 / S.No. (243/19) SD4, dated 8th August 2019, water security is a compulsory grade subject for secondary education level from the academic year 2020-21. We are very happy to handover you the 10th grade textbook and workbook on water security from academic year 2021-22. Studying various subjects from primary level till now has developed various abilities in your personality.

You all know that there are different kinds of problems in the environment. They are based on various factors. At the school level, the main objective of the curriculum is that the student should study the environment issues, suggest solutions and behave accordingly. The issue of water security has been framed with the same objective in mind. While studying the subject of water security, you have to carefully observe (analyse) the situation and the relevant factors around you. Understand the various concepts, principles, theories in this subject and relate them to daily practice. The major components of water education, water conservation, water management and water quality are covered in this textbook. The textbook has been deliberately based on information and activities while designing the topic of water security. You must apply the complete information of the subject through activities and projects.

Workbook is based on textbook, different activities and projects involved in it. Do activities and projects carefully for better understanding of different concepts, terms, principles with respect to water security. Try all these activities, experiment yourself to understanding the subject properly. Seek the help of your teachers, parents as you practice. Collect the knowledge you have learned with your daily life. This work will help not only in preparing educational material but also to develop and enhance the research aptitude.

In today's fast paced world of technology, you are familiar with computers and smart phones. Therefore, make proper use of information and communication technology tools while completing this water security workbook. Be careful while handling various apparatus, important materials while doing activities and experiments and tell others to be careful too. Also try environmental conservation while doing activities and observations. Take care that plants and animals are not harmed. While reading, studying and understanding this workbook, please let us know your favorite part of it as well as the difficulties encountered.

Best wishes to you for your academic progress.

(Dinkar Patil)
Director
Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune 4

Pune
Date : 04.06.2021

Water Security : Standard Ten

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Unit 1 : Water Education

Chapter 1: Environment and Ecosystem

Briefly...

The environment is a balance of biotic, abiotic, geographical and social factors that affect each other. The interaction between biotic and abiotic elements in the environment and the principles related to their interaction are studied under environmental studies.

Food, clothing and shelter are the basic human needs and are dependent on the environment.

1. Natural Environment : The various elements that are naturally formed on the earth's surface are part of the environment; e.g. water, air, soil, forest, animals, biological elements, climate, atmosphere etc. It signifies diversity in the natural environment. Such kind of variation is also seen in the structure of natural elements of Maharashtra state. Due to this variation, the *Sahyadri* in the west, the *Deccan Plateau* in the middle, the Coastal region of *Konkan* and the *Vidarbha-Khandesh* are some of the natural structures observed in the Maharashtra.

2. Man-made environment : Humans have made radical changes in the natural environment on the strength of their intellect. Such as settlement of human lives, transportation by various means like roads, airways, waterways, railways etc. along with industrial development and establishments of industries are going on rapidly. All these man made elements on this earth is collectively called as 'man-made environment'.

The relationship between Abiotic and Biotic elements and their interaction is called 'Ecosystem'.

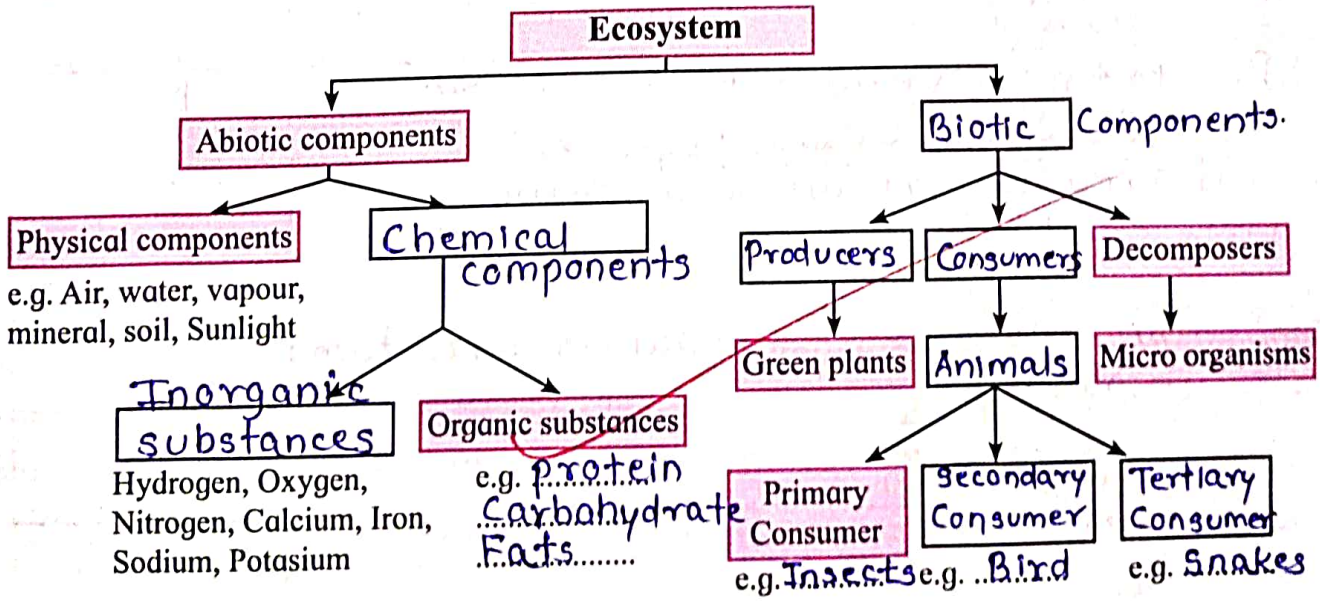
Relationships between the different elements like specific locality, area, size, climate, topography, rock - land, water flow system, etc. are responsible to define the types of ecosystem. Such as land ecosystem, aquatic ecosystem. Even a small watershed or lake can be a ecosystem.

1. Land ecosystem : Grasslands, Forests, Deserts.

2. Aquatic ecosystem : River ecosystem, Marine ecosystem, Lake ecosystem.

At present, however, human intervention is causing huge damage to the ecosystem. For this it is necessary to study it and take measures.

Activity : Complete given chart



Name of the activity : To study the impact of human intervention on the water resources/ water ecosystem in your area.

Purpose / importance of the activity :

1:...To..create..awareness..about..water..security..in..our.....
..surrounding.:.....
2:...Not..to..pollute..water.....
3:...To..create..a..balance..in..our..ecosystem../..environment:..
.....

Proposed time duration for the activity :

...To..do..this..activity...6-7..days..are..needed:.....
.....

Materials and apparatus required for the activity :

..Materials..required..for..activity..are..as..follows:..... .....
..①...Pen...②..Pencil...③..Notebook...④..Textbook..of..water....
..security...⑤..Mobile..with..internet..connection:.....
.....

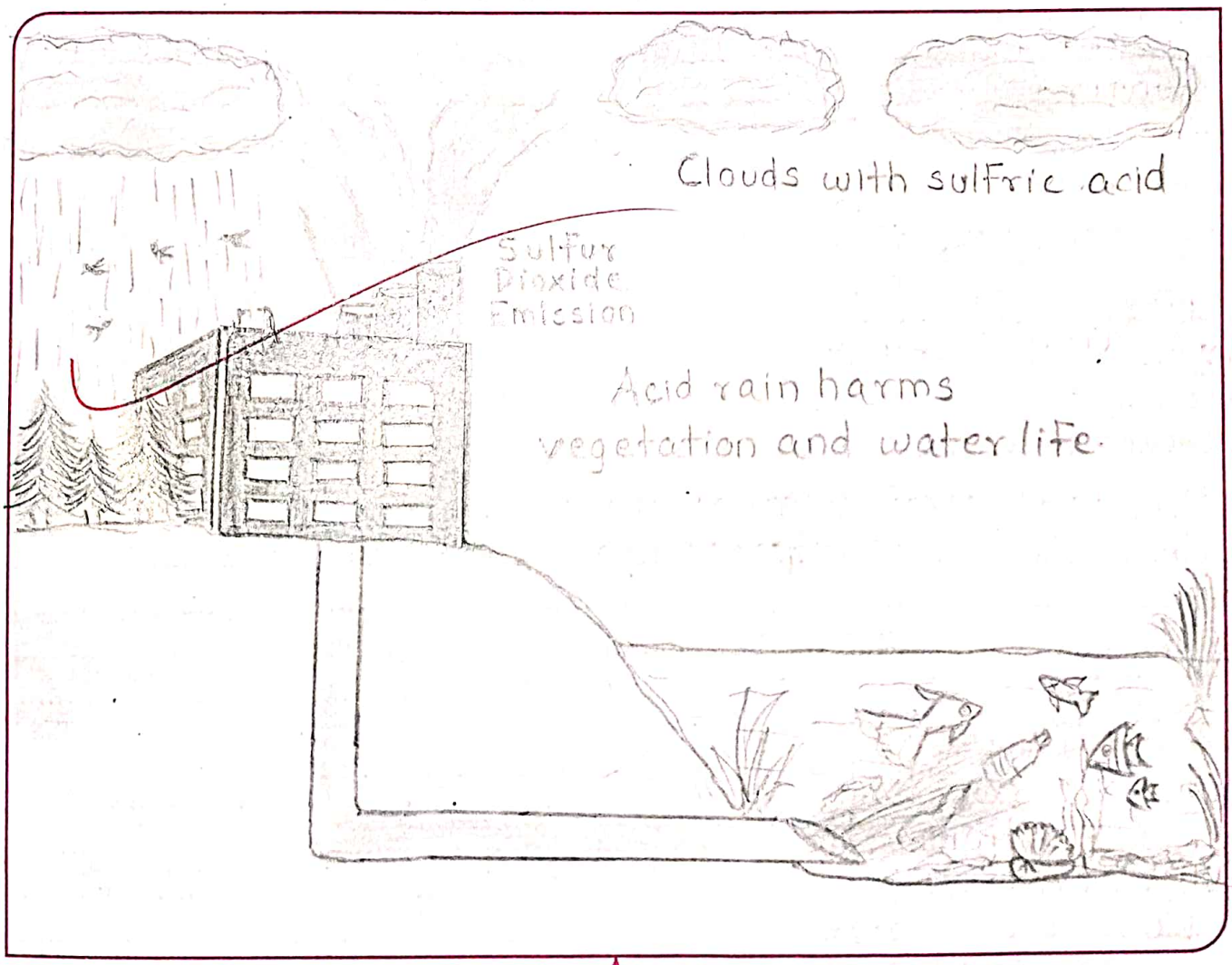
Methodology of the activity : Information with specific notes on damage of water ecosystem/ water resources due to human intervention and its effects.

..Specific..notes..on..damage..of..water..ecosystem../..water....
..resources..due..to..human..intervention..and..its..effects:
.....
(1)..In..rivers..and..lakes..in..rural..areas..people..due..to.....
..washing..clothes.,..utensils.,..washing..animals.,..cars.,.....
..~~use..wa~~..using..water..for..bathing..,..etc..due..to..this.....
..activities..water..or..river.,..ponds..and..other..sources..of...
..water:.....
.....
(2)..Due..to..this..several..activities..in..rural..areas..there.....
..water..sources..are..getting..polluted..as..a..result..,..In.....
...rural..areas..short..age..of..drinking..water..problems.....
...arise:.....
.....
(3)..Many..industries../..companies..are..dumping..there..
...was..in..rivers:.....
.....
.....
.....

(4) Industrial wasters are of chemical and other harmful are there due to which water is getting polluted and this water act as a slow poisen in our daily life.

(5) Due to this animals in rivers and animals which consume water from river are getting died.

Diagram / Photographs : Cause Of Water Pollution



Concepts that have become clear during the activity :

(1) From this activities we get known about reasons of water pollution.
(2) We understaod the use and importance of water in our daily life.

What new things did you learn ?

(1) From this activity learn to save water and not to pollute water.
(2) We get understand reasons of water pollution and wastage in our daily life.

Conclusion :

(1) We understand not to pollute water and what precaution we should take.
(2) Due to water pollution we can face water problems in future.

Write your own opinion / experience about the activity :

From this activity I understood the importance of water.

Cooperation from the parents :

(1) In this experiment parent had done important help in this activity.
(2) Parents help us in visiting places for surveys.

Opinion of the parents :

Due to this experiment the young generation can understand the importance of nature.

Persons who have helped you :

(1) In this activity many local people help us to give information.
(2) Parent helps us to take permission From Water Resource centre.

List of the reference materials :

(1) ~~Internet~~ We use mobiles to collect details information for better understand.

(2) We use maps for known water resources.

Activity : Two pictures are given below. What effect does human intervention have on the water ecosystem ? Write down their reasons. Which measures would you suggest to sustain the water ecosystem ?

Reason

Effect

(1) Wastage material of industries or dumping in river.

(2) Washing clothes, utensils, etc.

(3) Unwanted use of water

(4) Waste material increase in river and ponds.

(1) Due to water pollution aquatic animals or human.

(2) Unavailability of water for drinking purpose.

(3) Water is not available of needed people.

(4) Due to waste material water ecosystem is getting unbalanced.

4/5

Teacher's feedback and signature with date :

Unit 1 : Water Education

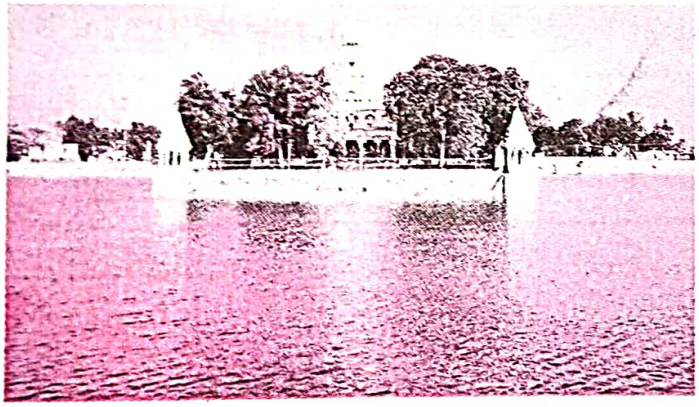
Chapter 2 : Cultural Heritage of Water Wisdom

Briefly ...

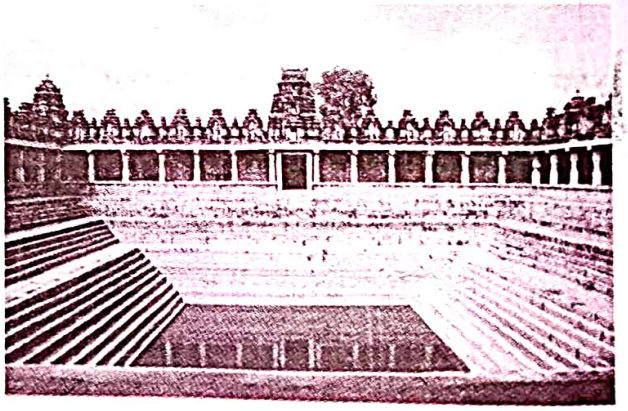
As water is one of from *Panchatatv*, just like human life water has a unique significance in Indian culture. There was plenty of water in ancient times. In the *Rigveda*, the *Yajurveda* and the *Atharvaveda* has mention construction of dams to block river water, construction of canals to supply water to remote areas, it is also recorded that wells have been constructed for ground water use.

While studying the cultural heritage of water wisdom, you have studied ancient water culture on the banks of the river Saraswati, as well as the writing *Varahmihir* and *Parashar Muni*. The culture heritage of water management is vast and you can study various structures from ancient times. These mainly includes ancient water distribution system, water storage systems (lakes, ponds, etc.). While studying cultural heritage of water management, you will also notice, that various ancient structures of water management have disappeared in recent time. Very few are exist. There must be some such examples all around you. To study them, you need to visit an ancient water managements/storage site in the area you know. Efforts must be made to revive them.

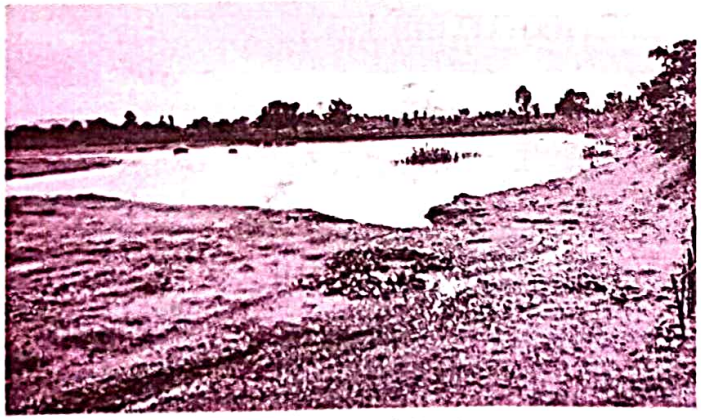
Some Examples of cultural heritage of water management/water storage :



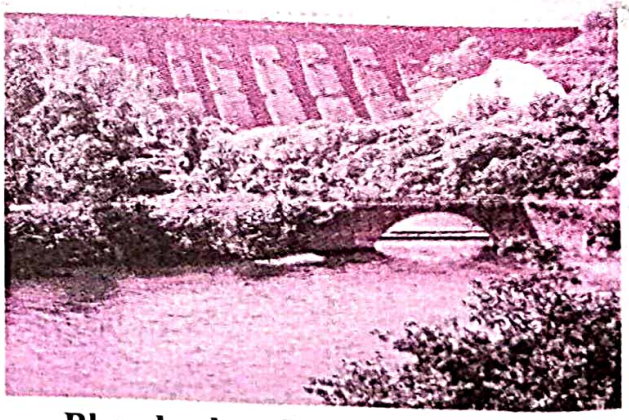
Mariyamman Teppakulam Lake



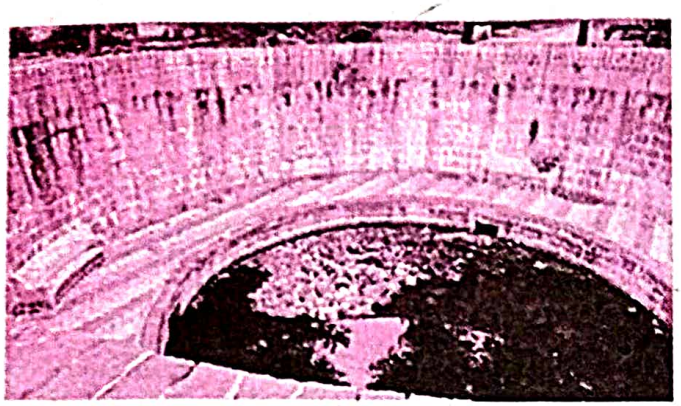
Pushkarni Temple Area



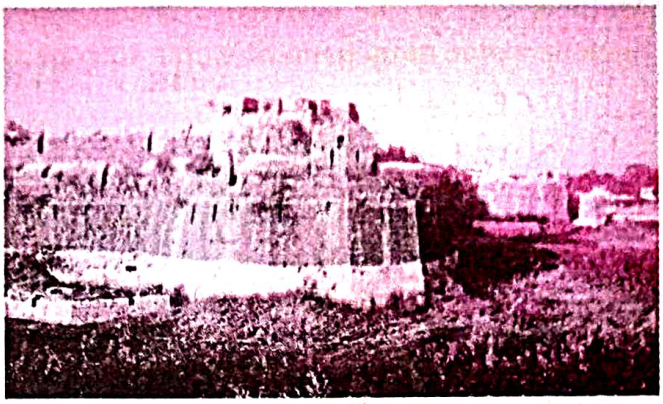
Malgujari Lake



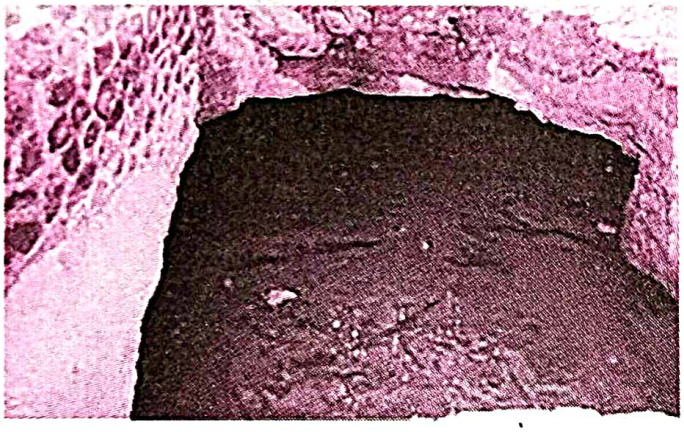
Bhandardara Dam (Wilson Dam)



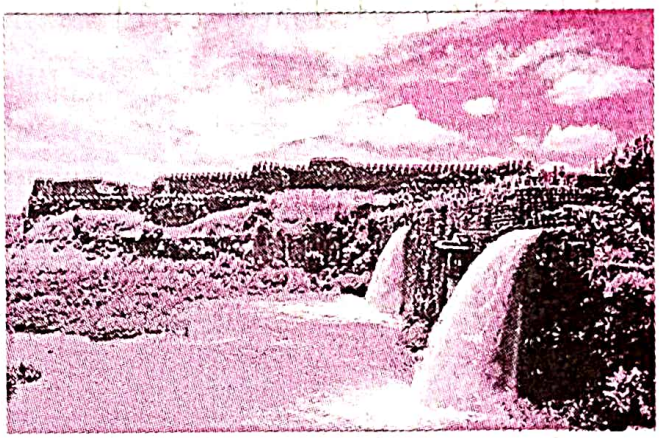
Khajina well - Beed



Trench around the fort at Kandhar in Nanded District



Water Devtake at Sinhgad District-Pune



Water falls due to water storage - Naldurg, District- Usmanabad

Name of the activity : **Studying an ancient water management/water storage system that you know or that is in your area.**

Purpose / importance of the activity :

1.:.To..study...ancient..water..management../..water..system:
2..Due..to..this..studies..we..can..Find..a..solution..for..water
..problem..in..Future:.....
.....

Proposed time duration for the activity :

...7...days.....
.....

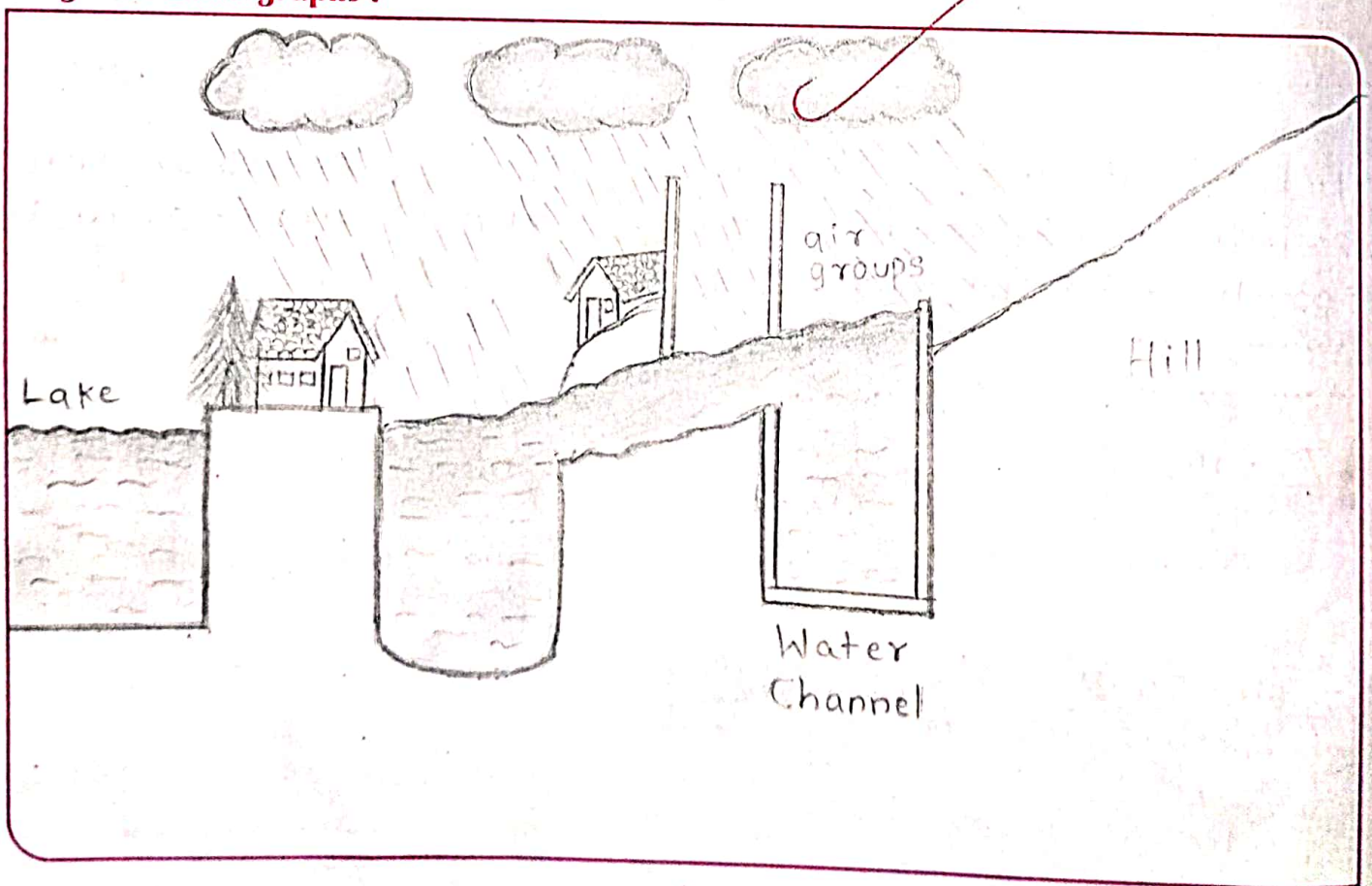
Materials and apparatus required for the activity :

..Planner..of..water..storage:.....
....Writing..material.....
..Interest.....
...Tool.....

Methodology of the activity : Detail information including location, arrangement etc. of ancient water management/water storage system in the area.

...Place :.....
...1) Water tank at Singhagad Fort in Pune this phase....
..is selected for activities.....
..2)...To go to this place we have to travel through bus.:...
..Water storage system / Management:.....
..3)...To go to this water tank we have to left from..
....Tanaji...monument...and right from left side of.....
..monuments.:.....
..4)..Water of this water tank is used for ~~drink~~ drinking
....purpose:.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Diagram / Photographs :



Concepts that have become clear during the activity :

(1:)Water storage of ~~Sigh~~ Singhagad water tank is done inside of ground:

2. Water of this water tank is clean and able to drink without processes:

What new things did you learn ?

(1) In this we learn several new types of water storage system and management:

Conclusion :

The water storage of Sinhagad water tank is done ~~in~~ inside the ground:

Write your own opinion / experience about the activity :

(1). During this activity: I had got an information about several water storage:

(2). I had get detail information about ~~Singhgad~~ Sinhagad fort by local people:

Cooperation from the parents :

(1) Parents helps us in travelling from one place to another.

(2), Collect information ~~pr~~ parents gives us ideas:

To

Opinion of the parents :

(1) Due to this ~~acit~~ activity childrens are getting knowledge about nature water storage and water management:

(2) Due to this they can use this for these:

Persons who have helped you :

(1) Parents helps us.
(2) We take help of local people of Sinhagad.
(3) We have taken help of archaealogist.

List of the reference materials :

(1) Chart
(2) Books
(3) Information Baards.
(4) Plans of sources.

Activity : Make a model for an ancient water management/water storage system you have studied. Which remedies you suggest for maintaining these water management systems in future, which you studied in present.

Remedies we will suggest for maintaining these water management system in future which are helpful are as follows :

(1) Don't do water pollution in any condition.
(2) Don't use water ~~inertia~~ extra without any use.
(3) Don't use water if there is no any need.
(4) Do not waste water.

Teacher's feedback and signature with date :

***

Unit 1 : Water Education

Chapter 3 : Measurement of Water

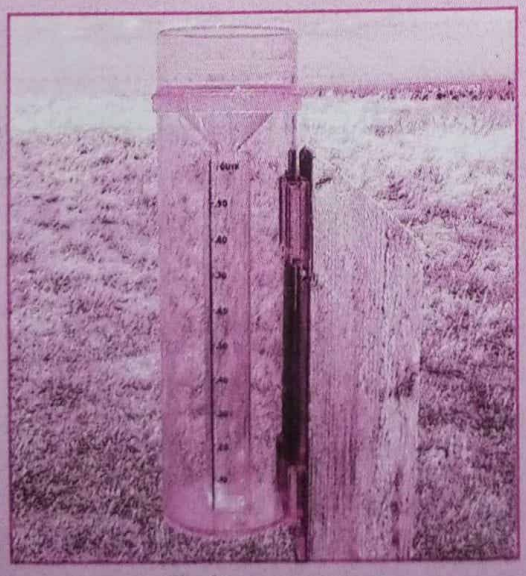
Briefly...

Groundwater resources need to be measured properly in order to be preserved properly. Since all groundwater originates from the water cycle, it is necessary to measure all the factors involved in the water cycle such as vapour, rain, flowing water, stagnant water and seeping water. 'The device used to measure rainfall is called a rain gauge.'

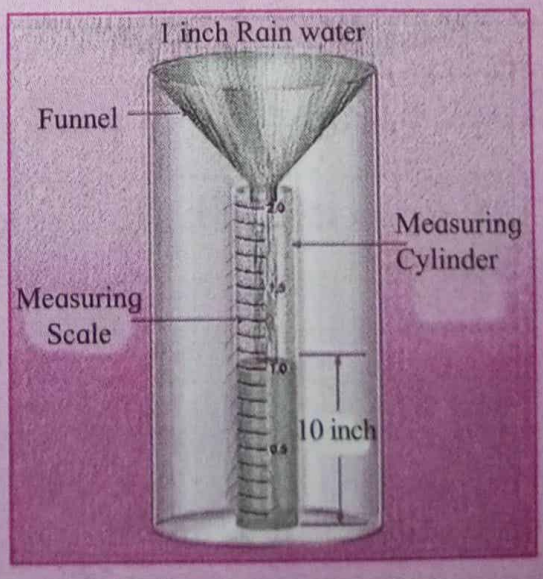
Rain - gauge structure

The rain gauge consists of a cylindrical flat bottom measuring cylinder. Some part of this gauge is buried in the ground. Part of this cylinder that stays on the ground has another cylinder inside which can be removed and placed in it. It holds a glass bottle to store water falling from the funnel pipe. The upper side is made up of funnel shape. The diameter of the funnel mouth is 127 mm (5 inches) and the height of an edge is 110 mm (4.5 inches). If there is wind during rain, the edge is sharp and high so that rain water does not flow out of the funnel. The top edge of the gauge is exactly at 30.5 cm (12 inches) above the ground. The rain water that falls on the mouth comes down through a narrow tube and collects in a cylindrical vessel or glass bottle. The diameter of the funnel pipe is made very small so that the rain water does not evaporate.

While measuring water, the height should be recorded by looking at the lower edge of its level. The height can be measured by dipping a water-proof plastic calibrated strip in bottled water. The water in the daily rain gauge is measured once a day at certain time (8.30 am as per Indian Standard Time). In some places such observations are made several times in a day. Similarly, weekly and monthly rain gauges have been made and the cylindrical vessels for storing water are of larger size. In addition, to measure water accurately, weighs the collected water and determine the amount of rainfall. Due to this method, the possibility of not to measure the amount of sewage and water sticking to the pots while pouring water from a pot into the container, is not there.



Rain - guage



Rain - guage structure

Name of the activity : **Make a Rain - gauge and record the rainfall in your area for one week in rainy season.**

Purpose / importance of the activity :

(1). To study the record of rainfall in our surrounding to know amount of rainfall.

Proposed time duration for the activity :

To do this activity 6-7 days are required.

Materials and apparatus required for the activity :

(1). Rain gauge
(2). Notebook
(3). Pen
(4). Pencil
(5). Mobile
(6). Bar Graph
(7). Scale

Methodology of the activity : **Detail information of rain gauge preparation and use with place and duration.**

Preparation:

(1). We use this for record for rainfall of our surrounding.

(2). To make rain gauge, First take one bawl of steel or one glass bottle for records of rainfalls.

(3). Place a plastic on ~~the~~ this top of glass bottle for record of rainfall.

(4). Stick all ~~the~~ this property with the help of scale tape.

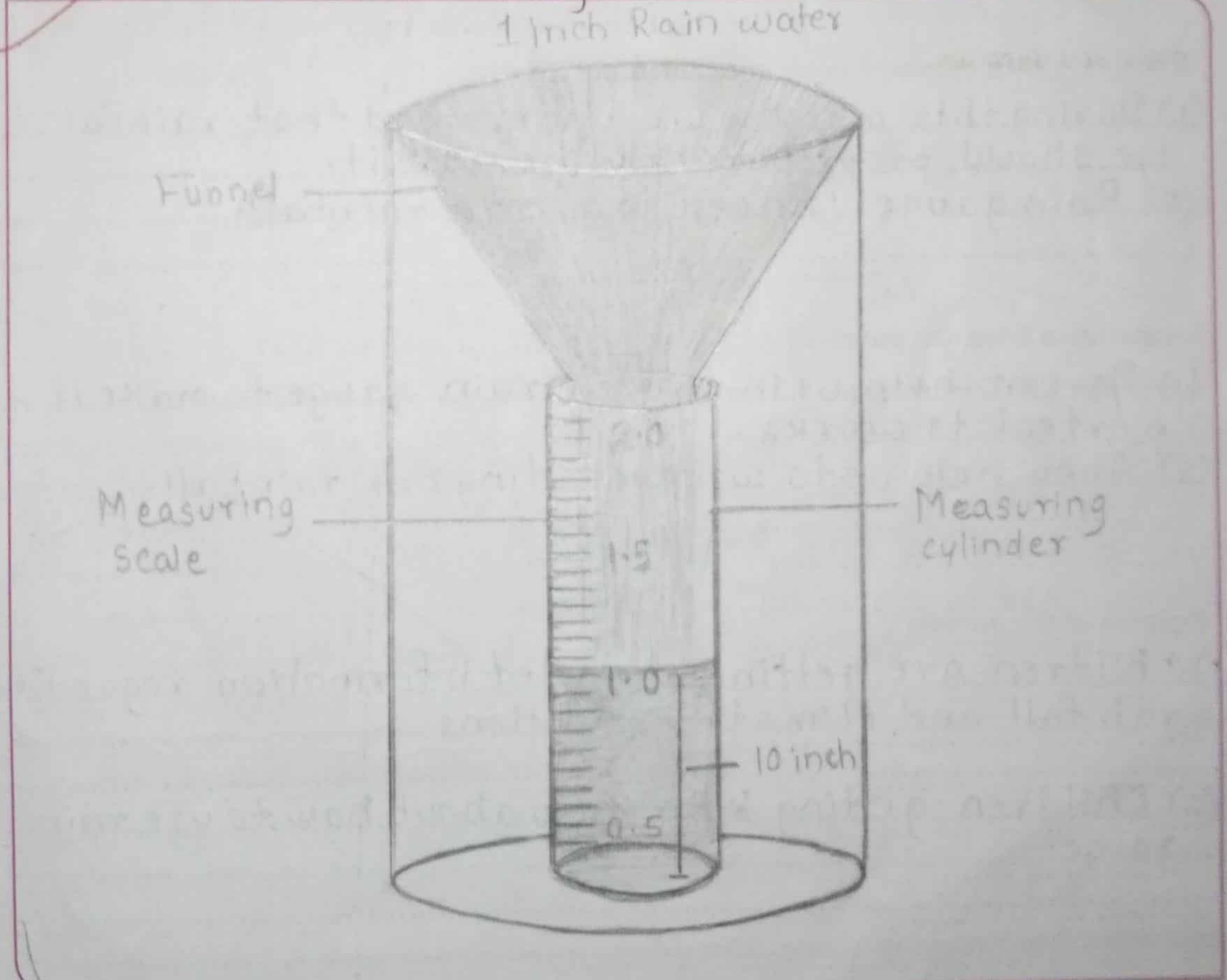
(5). Take care of that water is not entering inside the bottle.

Uses:

(1). We use rain gauge to record a rainfall of our surround to know the amount of rainfall.

(2). To record rainfall we use a to measure in metre or per square metre or milimetre to record rainfall in our surroundings.

Diagram / Photographs : Rain-Gauge Structure.



Concepts that have become clear during the activity :

...To..record...rainfall..we..have..to..take..measure..like...
..litre.....
.....

What new things did you learn ?

(1)..Water..is..life:.....
(2)..In..India..different..amount..of..rainfall..is..done.
.....
.....

Conclusion :

(1)..To..know..the..amount..of..rainfall..we..should..properly
...measure..it:.....
(2)..Rainfall..is..different..in..different..places..due..to.....
..different..climate..condition..to..that..areas:.....
.....

Write your own opinion / experience about the activity :

(1).During..this..activity..we..understand..that..rainfall....
...we..should..~~prepe~~..properly..measure..it:.....
(2)..Rain..gauge..is..need..to..record..rainfall:.....
.....

Cooperation from the parents :

(1)..Parent..help..us..in..making..rain..gauge..to..make..it....
....perfect..to..work.....
(2)...They..help..us..to..write..readings..of..rainfall:.....
.....

Opinion of the parents :

(1).Children..are..getting..detailed..information..regarding
...rainfall..and..climatic..conditions:.....
.....
(2)..Children..getting..to..know..about..how..to..use..rain..
...gauge:.....
.....
.....

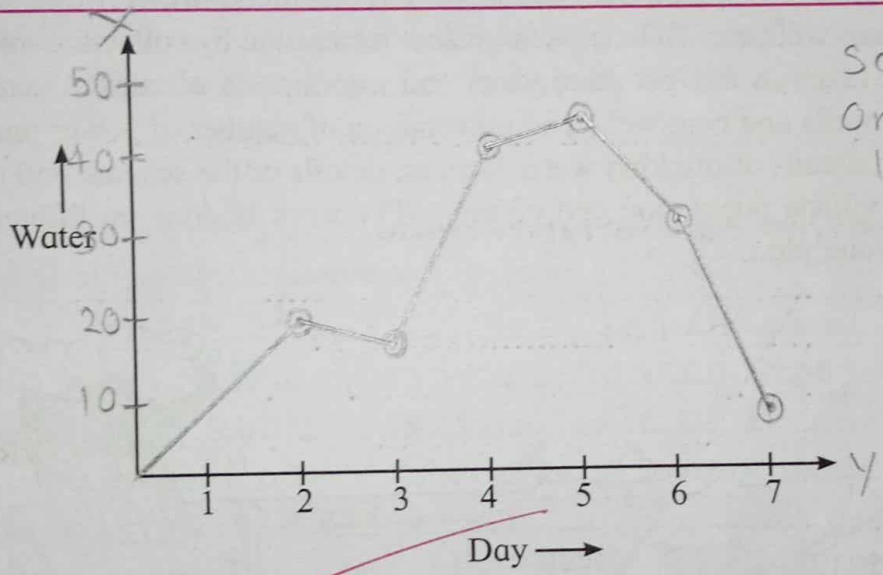
Persons who have helped you :

(1) Parents.....
(2) Friends.....
(3) Teachers.....
.....

List of the reference materials :

(1) We use the textbook of both 10th std water security.....
.....
(2) Textbook of the geography.....
.....

Activity : Draw a graph based on the rainfall records you take. Why the rainfall records are different for each student in your class. Write down the reasons.



.....
(1) Bar graph of record of rainfall :.....
(2) In different areas rate of rainfall is high or low.
(3) The speed of air get increased and decreased.....
.....
.....
.....

Teacher's feedback and signature with date :

.....
.....
.....

***

Unit 2 : Water Conservation

Chapter 1 : Water Plan

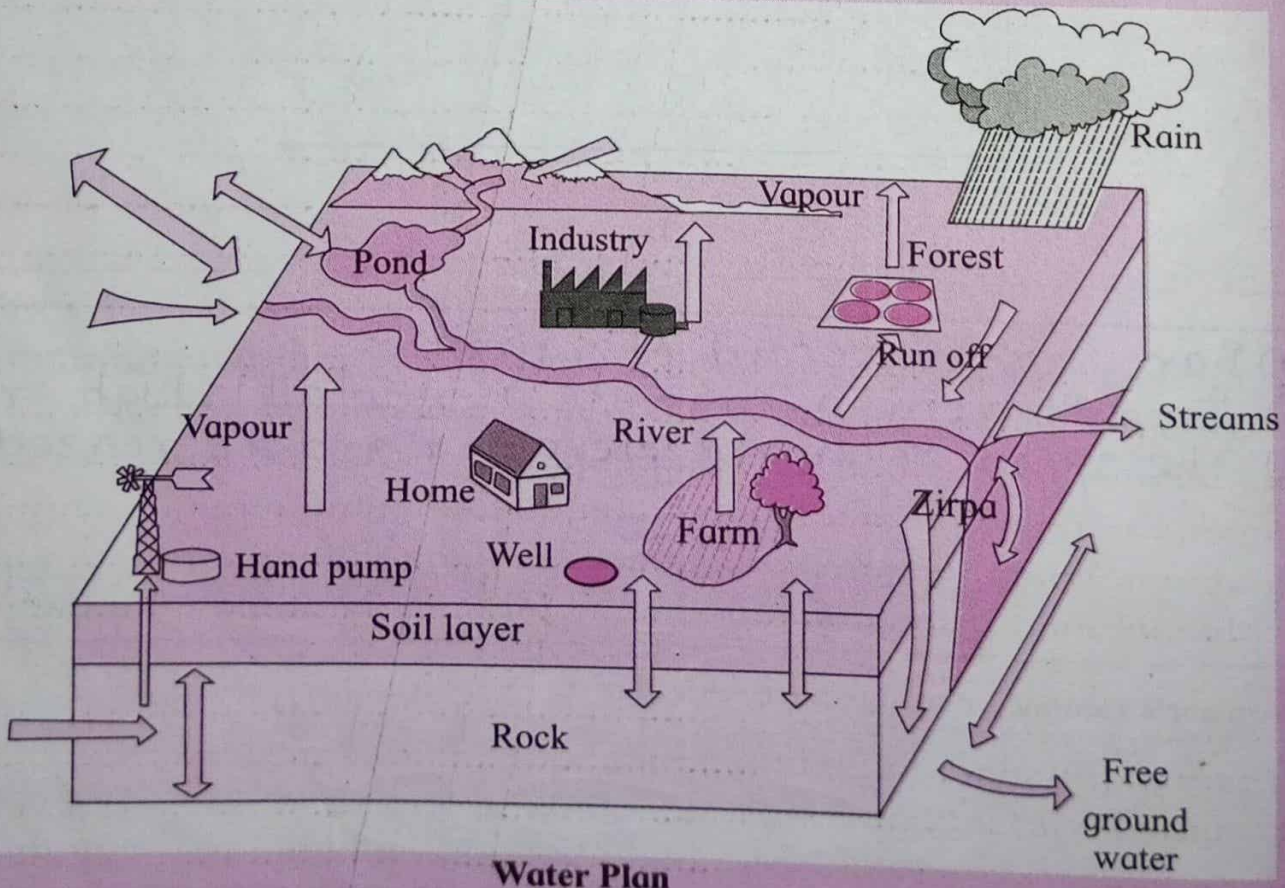
Briefly...

What is water plan?

How much water is blocked in our catchment area in each year? How much of that water seeps into the ground? How much is the evaporation of ground water? Exactly how much groundwater is extracted from the ground? How much water is available for human consumption? The calculation of all this means water plan.

Water plan set-up

To underline the information of measurement of rainfall in village, determination of observation for keeping ground water level records, fixation of wells obtaining a map of village and drawing of flow of stream (nale) on it, types of soil- rocks in village, places suitable for recharge, suitable place obstruction of river-rivulets -water flow, storage of surface water, well, bore well, etc. To be able to present water plan by collecting information of to know the crops taken in the last three years and information of current year's *kharif* crop, crops grown by wells and bore wells and information of number of power pumps used for it and horsepower, details of drinking water sources, details of the scheme and the water available through it, village population and animals. The work is done in different stages while preparing the water plan.



Water Plan

Name of the activity : Prepare a water plan for your village/area.

Purpose / importance of the activity :

It is important to estimate the water balance properly by taking ~~him~~ into account the ideas of water conditions, climate, forest area, distribution of birds and animals, etc.

Proposed time duration for the activity :

To know the crops taken in last three years and information of current Kharif crops.

Materials and apparatus required for the activity :

Determinate of observation for keeping ground water level records, fixation of wells obtaining a map of village and drawing of flow steam.

Methodology of the activity : Detail information of the stages and steps used to prepare the water plan, actual implementation and usefulness.

The first phase of water management should be started immediately after the rainy season stops after october In which the public meeting will be the first step. Procession in village / rounds in ~~villa~~ village, of collection of information measurement and conclusion should be completed with in a month. The available period from January to June - July before the rain should be reused for treatment based on the buildings of the balanced shut.

(1) Public / general meeting:

The main objective of the public / general meeting is - to get the help of the villages involved in the watershed area of water planning:

(2) Round in the village / procession in the village:

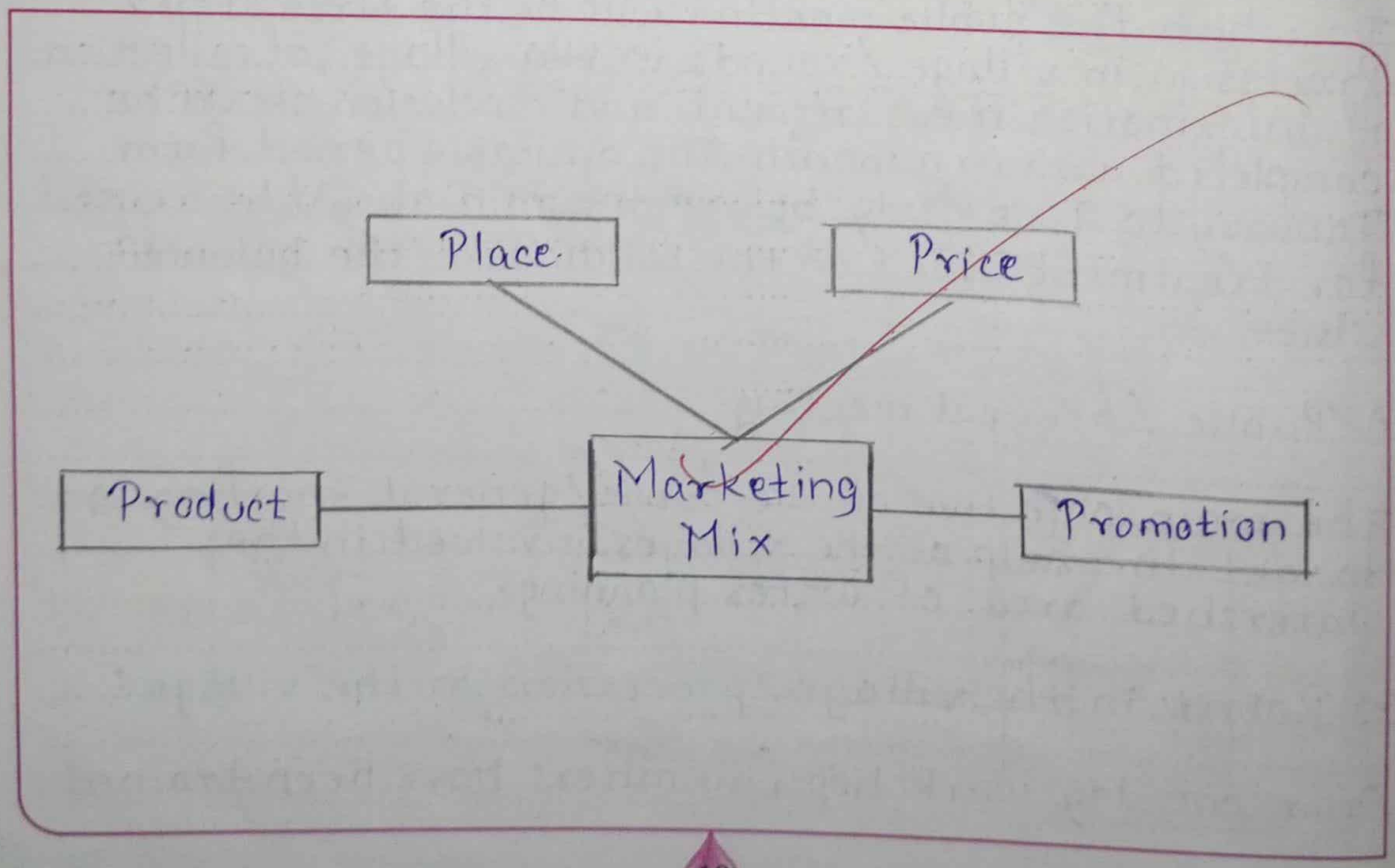
From one day workshop, members have been trained

...an...how..to..draw..groundwater..plan..and..have..experience ...in...village...have..a..procession....in..village.....

(3)..Mapping...and...registeration...of..collected..information:.

...This..leads...to..the...collection..of..information..at..different ...levels...In..addition.,..some..information..will..have..to..be.... ..made..~~as~~..available..to..the..members..by..taking..into..... ..consideration.....

Diagram / Photographs :



Concepts that have become clear during the activity :

...The..water..plan..is..important..to..estimate..the..water....
...balance...properly...by..to..taking..into..accounts..the..local..
....water..conditions.:.....

.....

What new things did you learn ?

....The..water..plan...and..water..plan..set-up.,..to..underline..
...the..information..of..measurement..of..rainfall..in..village-

.....

.....

Conclusion :

...It..is..important...to..estimate..the..water..balance.....
...properly...by..taking..into..account..the..ideal..water.....
...condition:.....

Write your own opinion / experience about the activity :

...I..have..seen..many..water..plan..set..up..in..my..village,.....
...I..had..seen..the..start..but..I..have..to..go..my..home..so..
...I..didn't...see..further:.....

.....

Cooperation from the parents :

...They...have..told...me..many..time..things..about..it..In..these..
...time..how..it..was..done...and..now..what..are..the..changes:..

.....

.....

Opinion of the parents :

...Government...should..take..more..projects..about..it..our.....
...school..should..take..tour..in..such..places..Teachers.....
...should...give..more..information:.....

.....

.....

Persons who have helped you :

...Parents.,..teachers.,..local..cooperation.,..has..helped..a..lot....
...in..this:.....

.....

List of the reference materials :

...I...collected...information..by..referring..previous..years.....
...books..and..also..searched..on..interest..internet..for.....
....more..information....with...pictures:.....

Activity : How much water is used daily in your home? Calculate the monthly water consumption. Make a balance sheet of domestic water use and list the excess/extra water you can use for any other purpose.

Water use incidents/ causes	How much is needed ? (In liters)	How much water is used? (In liters)
1. Household	60	80
2. Recreation	70	70
3. Industry	120 - 150	120 - 150
4. Agriculture	300	300
5. Therma Therapy	200	200
6. Hydro Therapy	200	200
7. Tanks	150	150
8. Dialysis	150	150
9. Cooking towers	700	700
10. Irrigation	300	300
11. Animal feeding	200	200
12. Dental procedures	190	150
13. Hydro electricity	700	700
14. Thermal power	500	500

At same place water is used properly but at some place water is wasted : Water is being polluted at some places 60 litres to 70 litres are used in each house : But because of wastage , more water is used : Water should be considered in every possible way :

Teacher's feedback and signature with date :

***

Chapter 2 : Development of Watershed Area

Briefly ...

Development of watershed area

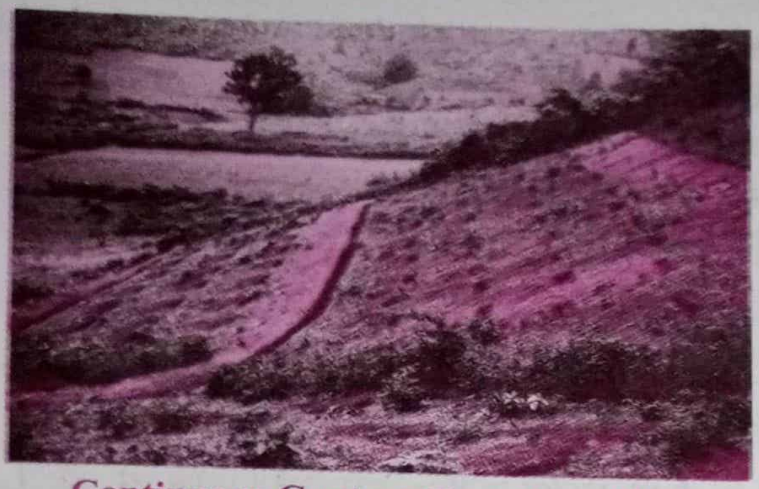
The whole farmland of the village is not flat. Many types of hilly lands are found in the village such as hillslop lands, ditches, flat lands. In short, water of this particular area which naturally flows from the mountains through small streams and flows through a nallah the whole area is called 'Watershed Area'. Such area can range from 50 hectares to 500 hectares or more depending on the elevation of the land.

The following factors are important to consider while developing the watershed area.

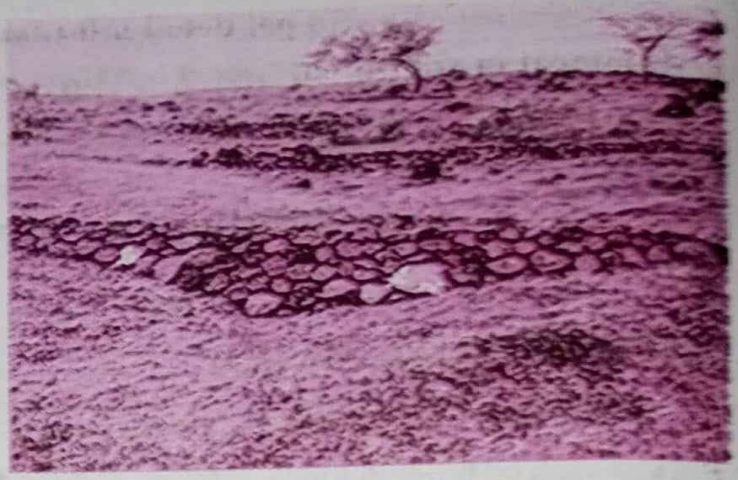
1. Rainfall and climate in watershed area.
2. Size, slope and structure of watershed area.
3. Network of rivers-streams, type and its proportion.
4. Type of land out of light, medium, heavy land.
5. The thickness of different soil layers found after digging of land.
6. Geological conditions, types of rocks, decomposition, cracks and joints in it.
7. Availability of spreading of groundwater.
8. The rate of water seeps into the soil.
9. Properties and scope of water retaining rocks.
10. Types of surrounding trees and shrubs, grass and shruds cover on the ground, types of forests.
11. Information on how and to what extent land is used and methods of land use.

Treatment methods for the development of watershed area

1. Continuous Contour Trenches -CCT
2. Loose Boulder Structure
3. Nala Bunding
4. Vanrai Check Dam
5. Gabion Check Dam
6. Loop Bunding
7. Farm Pond



Continuous Contour Trenches - CCT



Causeway of small stone

Grass planted in two trenches

Vanrai Dam

Nala Bunding - Cement nala Bunding

Loop Bunding

Net Gabion Dam

Farm Pond

Name of the activity : **To get detail information by visiting a work done under watershed development in your area.**

Purpose / importance of the activity :

The whole farmland of the village is not flat.
Many types of hilly lands are found in the villages
such as hill stop land ditches flat lands.

Proposed time duration for the activity :

It required 1 week for the activity.

Materials and apparatus required for the activity :

Trenches, drain plugs, check dams, nala binding
cement plugs, ponds, farm ponds, trees.

Methodology of the activity : **Detail information regarding the place, area, actual operation, duration, effectiveness etc. of a work completed under watershed development.**

(1) Rainfall and climate in watershed areas.

(2) Size, slope and structure of watershed areas.

(3) Network of rivers - Streams, types and its
proportion.

(4) Type of land out of light, Medius, heavy land.

(5) The thickness of different soil layers found after
digging of land.

(6) Geological conditions, types of rocks, decomposition
cracks and joints in it.

(7) Availability of spreading of groundwater.

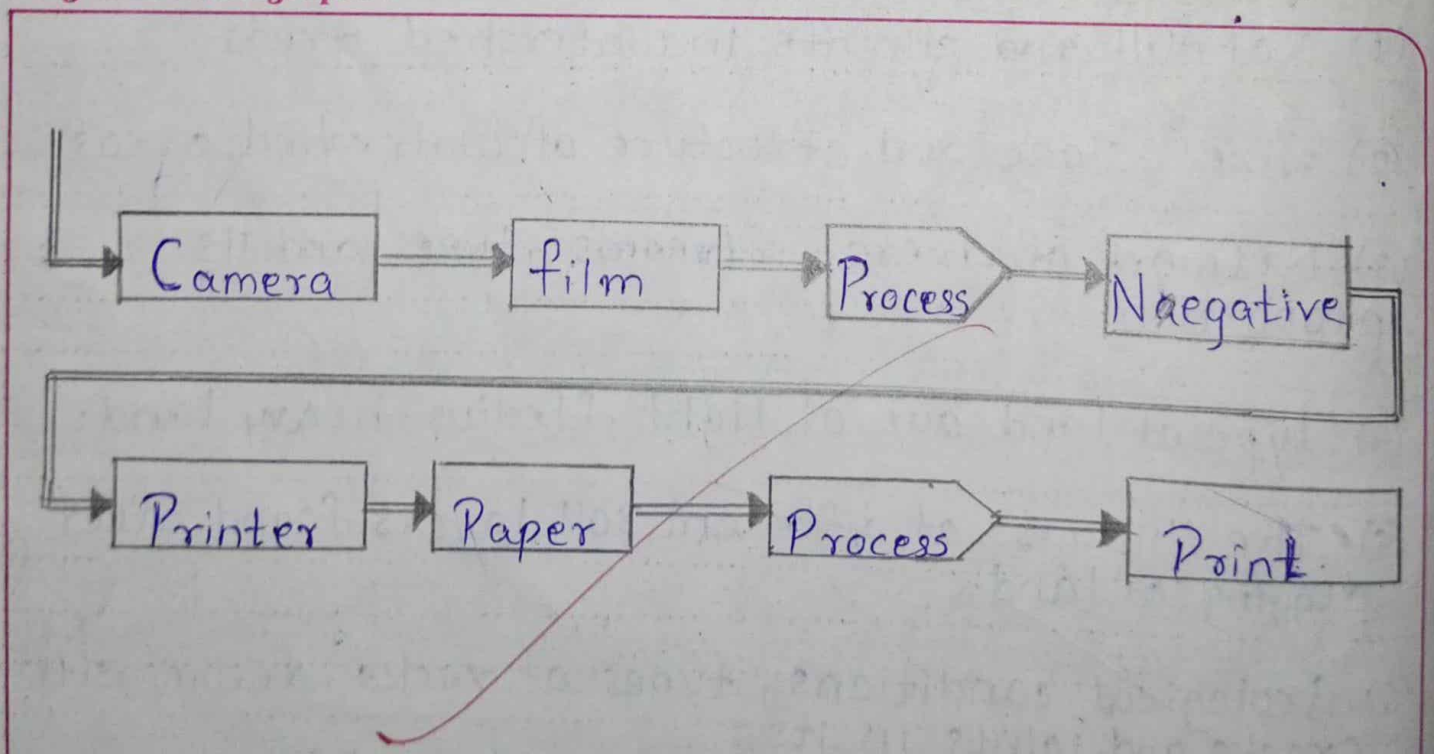
(8). The rate of water into the soil.

(9). Properties and slope of water retaining rock.

(10). Types of surroundings trees and straid grows & shrubs convexs on the ground types of forests.

(11). Information on how and what to ~~do~~ extend land is used and method ~~is~~ of land use.

Diagram / Photographs :



Concepts that have become clear during the activity :

In order to implement the watershed area development plan the small watershed area has to be considered as the first priority.

What new things did you learn ?

Various groundwater conservation works have to be carried out on all the lands in the watershed area to block the and redeem the work accordingly to the elevation.

Conclusion :

The watershed area has to be selected according to the geographical location of the land.

Write your own opinion / experience about the activity :

We get to know what kind of work is to be done in the watershed area, it is necessary, to what to be done in the watershed area.

Cooperation from the parents :

They told in order to carry out development work of watershed area, it is necessary, to first survey the entire area.

Opinion of the parents :

(1) Water of rainfall should store in large proportion.

(2) This activity will give more information for of water to children.

Persons who have helped you :

(1) Teachers :

(2) Parents

(3) Friends :

List of the reference materials :

Trenches, drain plugs, check dams, nala building, cement plugs, deepage ponds, farm ponds, trees and grass planting dams. It black and redeem water accordingly to the elevation.

Activity : Plant the same type of seedlings in small pots at your backyard. Keep watering a plant (pot) for a month by traditional method. Fill a small pot with water next to the seedlings planted in the second pot. (The pot should have a small hole in the bottom). After watering both the pots for a month. Write down what techniques you understood in terms of water saving.

Calculate how many liters of water you can save based on the above activity.

The seed of the tree is ~~seen~~ sown in a pit without using grafted trees for plants, ~~fruits~~ fruits trees. The seed is rooted throughout the year by filling the pit with a mixture of manure, organic manure and soil.

Teacher's feedback and signature with date :

***

Unit 2 : Water Conservation

Chapter 3 : Water Conservation and Public Participation

Briefly ...

The water is most important property on earth. Water is the origin of all living thing. In the life of an organism, water is next to oxygen. Therefore water is called 'life'. Although water is the natural source due to its uneven distribution-allocation, increasing demand and management, have currently being scarcity. Many water conservation schemes are implemented for public utility by the government. As well as the efforts are taken at local, collective and individual level. The schemes are implemented at state and central government level independently as well as it is also implemented with the joint participation of central and state government. The role of local self-government bodies is an important in implementation for these schemes.

Any problem or public work is not successful with the participation of one person or a small group for that, the help (time, labour, skills, financial support etc) provided by the villagers in various forms is important.

To solve such variety of problems, everyone should come together and investigate the problems, do proper planning, to do implementation, evaluate them from time to time and to get rid of the problem it means public participation.

- To be completed through the public participation

Public participation - inclusion and consideration of all

Step I - Public participation planning and preparation of action plan.

1. Activity - discuss on needs, importance.
2. to decides goals.
3. to make an outline of action programme.
4. to plan in detail.

Step II - Implementation of planning (Activity proceedings)

1. Give instructions to everyone
2. To explain the information
3. Distribute the work
4. To do actual action
5. To do control on action
6. To guide
7. To get review of completed work
8. Get feedback on the work done

Step III - Evaluate the activity and check the productivity.

1. Direct evaluation - inspection of work
2. Discuss and report
3. Give information on completion of activities to others.
4. Acknowledgement - Congratulations to the participants.

Name of the activity : By visit to collect information about a water conservation scheme/ project implemented in the area and work completed from it.

Purpose / importance of the activity :

...To..study...water..conservation..scheme..or..project.....
...implemented...in..Maharashtra.....
.....
.....

Proposed time duration for the activity :

....To...do...this..~~Activities~~....activity...4..-.5...days..are.....
.....needed.....

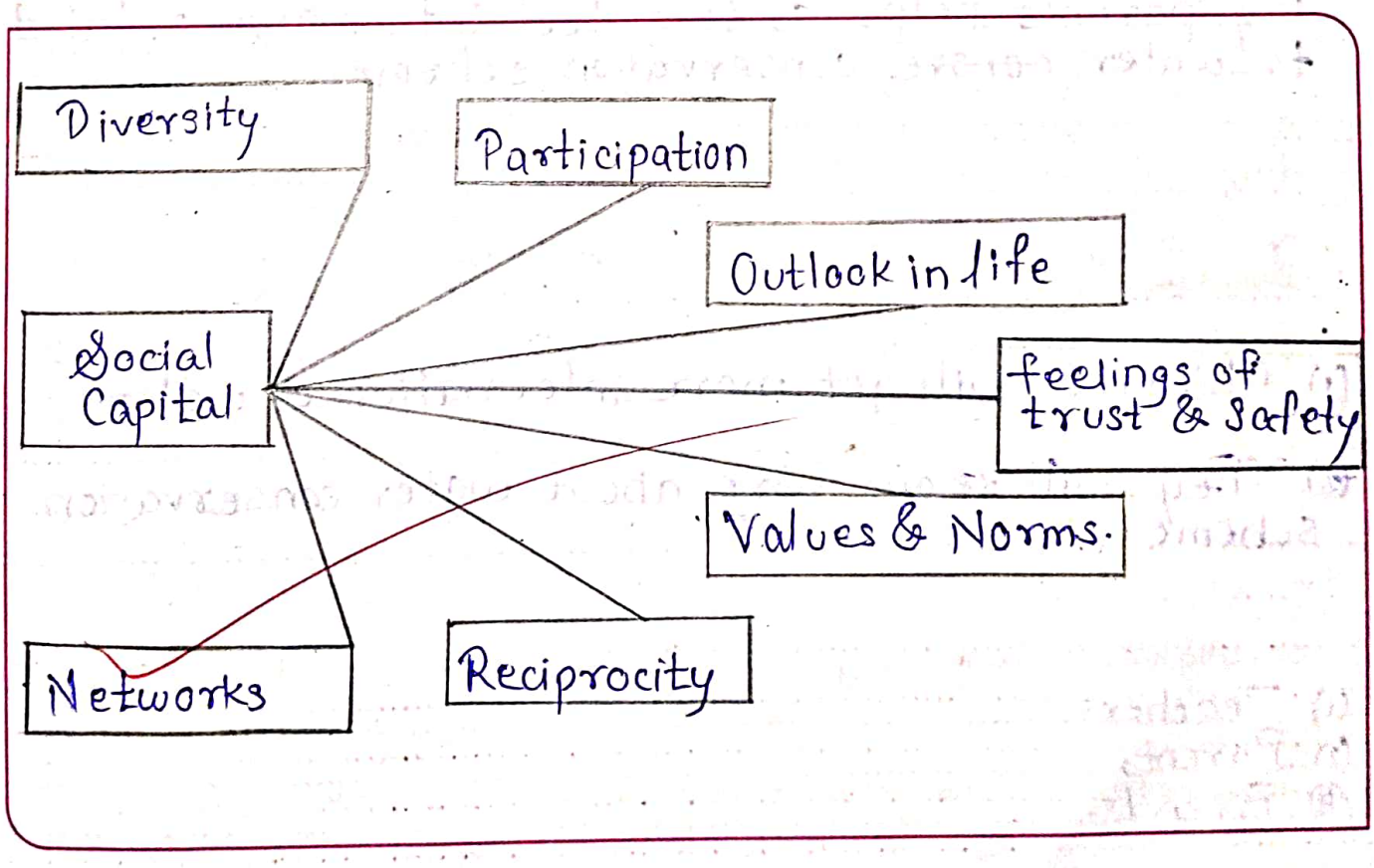
Materials and apparatus required for the activity :

..(1)..Notebook.....(3)..Pencil.....
..(2)..Pen.....(4)..Map.....
.....(5)..Mobile.....
.....

Methodology of the activity : Detail information about the objectives of the water conservation plan/project, implementation and need of completed work, place, area, usefulness, effectiveness.

..1.....
...Water....conservation..includes..all..the..policies..strategies..
...and...activities..to..sustainly....manage..the..nature..resource
...of...fresh...and..to...protect..the..hydrosphere..and..to..meet..
...the..current..and...future..human..and...~~po~~..population.....
...household..size...and..all..affect..how..much..water..is..used.....
.....
..Water...conservation...includes..all..the...policies..,..strategies..and..
...activities...to...manage...the..nature..resource..of...fresh..water..
...~~and..to..me~~...protect...the..hydrosphere.....
.....
...~~The~~..Water..is...most...important..property...on..earth..:..Water....
.....is..the...origin...of..t..all..living..things:..In..the..life..of.....
...organism..water...is..called....life.....
.....
.....
.....
.....
.....

Diagram / Photographs :



Concepts that have become clear during the activity :

....How the water conservation schemes or project.....
...implemented in Maharashtra.....
.....
.....

What new things did you learn ?

....I learn about water conservation scheme and....
....project in Maharashtra.....
.....
.....

Conclusion :

..Water scheme project and scheme helps to increase.
...water storage and ground ~~we~~ water level.....
.....

Write your own opinion / experience about the activity :

....I got idea about water conservation scheme or....
....project implemented in Maharashtra.....
.....
.....

Cooperation from the parents :

....My parents helps as to collect information related
...to water ~~conse~~ conservation scheme.....
.....
.....

Opinion of the parents :

.....
(1)...Children will get more information of water.....
.....
(2)...They will know more about water conservation...
...scheme.....

Persons who have helped you :

(1)...Teachers.....
(2)...Parents.....
(3)...Friends.....

List of the reference materials :

(1) Website
(2) Internet
(3) Conservation of water
(4) Visiting various places :

Activity : Prepare a detail flowchart of the work completed through public participation in the context of a work completed under the water conservation scheme project you have studied.

Step 1 - Public participation planning and preparation of action plan.

What you did ?
1. Discuss on needs importance :
2. To decide goals :
3. To make an outline of action
4. programme :
5. To plan in detail :

Step 2 - Implementation of planning (proceeding of project)

What you did ?
1. To give instructions :
2. To explain information
3. Distribute the work :
4. To do actual action :
5. To guide :

Step 3 - Evaluation of activity and checking its productivity.

What you did ?
1. Inspiration of work :
2. Discuss on Report :
3. Give information on
4. completion of activities :
5. Congratulations to participation

Teacher's feedback and signature with date :

.....

.....

.....

***

Chapter 1: Water Condition and Water Challenges in Maharahstra

Briefly ...

Maharashtra State – Rainfall

The Maharashtra state is in tropical region. The Arabian Sea which is in west of Maharashtra, latitudinal extent of Maharashtra, southwest and northeast monsoon and the eastern plateau region affects the climate of Maharashtra. Maharashtra receives the highest rainfall of 85% from southwest monsoon from June to the end of September. Monsoon starts to retreat in the month of September and by October, the mansoon is retreated completed. Therefore October is called 'Transitional Period'. It rains from northeast monsoon from October to January, it is called 'Retreat monsoon'.

If annual average rainfall is approximately 1360 mm of Maharashtra State, then also the rainfall in different region is varied. When rains occurs on the Sahyadri the winds begin to blow eastward as a result their evaporation rate increases, because of this rainfall speedily decrease on plateau and the region where the rain shadow is formed is called a 'Drought region'.

We get rain water for direct use of rain water in the form of surface water storage and for ground water reserves.

1. **Direct Use :** Used when it rains.
2. **Surface water reservoir :** Reservoir and ground water storage of river basins, ponds, dams, bands, sarovar and lakes etc.
3. **Ground Water reservoir :** Water that seeps into the soil during rains and when it is blocked and available for use through brooklets, wells, tube wells and canals etc.

Although surface water and ground water are considered to be the two main sources for human consumption, they are not really two different sources but are interchangeable. Therefore, in terms of planning they need to be accounted together. However, when the consumption is less than the availability of water, it is possible to think and keep separate accounts of water. But now the water consumption is increasing faster than the water availability. It is necessary to consider the interdependent availability of both the states together.

Water Challenges facing by Maharashtra State

1. Unequal distribution of water resources
2. Need to effective planning
3. Ignoring ground water and drought crisis
4. Increasing demand of water for civilization and industrialization
5. Inadequate utilization of irrigation capacity
6. Improper and excessive use of water
7. Water pollution

Remedies on current water crisis

Efforts need to be made to alleviate the water crisis in the state and provide adequate water to the agriculture industries and urban areas for consumption. Extensive public awareness is required to increase with the help of public participation in water conservation, ground water recharge, purify the polluted water with the help of process, drip irrigation, sprinkler, full utilization of irrigation, water auditorship, water literacy etc.

Name of the activity : Find out an innovative solution to face the water crisis in your area and study its effectiveness.

Purpose / importance of the activity :

...To..study..water..condition..water..challenge..and.....
....rainfall..in..Maharashtra:.....
.....
.....

Proposed time duration for the activity :

....To..do..this..activity...6-7..days..are..required:.....
.....
.....

Materials and apparatus required for the activity :

(1)..Textbook..of..water...~~seco~~.security:.....
(2)..Pencil.....(5).Notebook.....
(3)..Mobile.....
(4).Pen.....

Methodology of the activity : Detail information on the objectives, implementation and effectiveness/use of the measures implemented in the area.

.....
...Information..on..the..objectives..Implementation..and.....
....effectiveness..of...the..measures..impleted..in..the..area:
.....
.....
.*...Objectives:.....
.....
...The..Maharashtra..state...in..tropical..regian:..The..Arabian.
...sea..which...is..in..west..of..Maharashtra.,..latitudinal.....
...~~exet~~..extent...of...Maharashtra..southwest..and..northeast
..monsoon..winds...and...the..eastern..plateau..region..affects..
...the..Maharashtra..It..receives..of..85%..from..southwest.
..Monsoon...from..june...to..the..end..of..september:.....
.....
..Efforts..need...to..made..to..alleviate..the..water..to..crises
...In..the..state..and..provide..adaquate..water..to..the.....
...agriculture...industries...and...urban..areas..for..the.....
.....

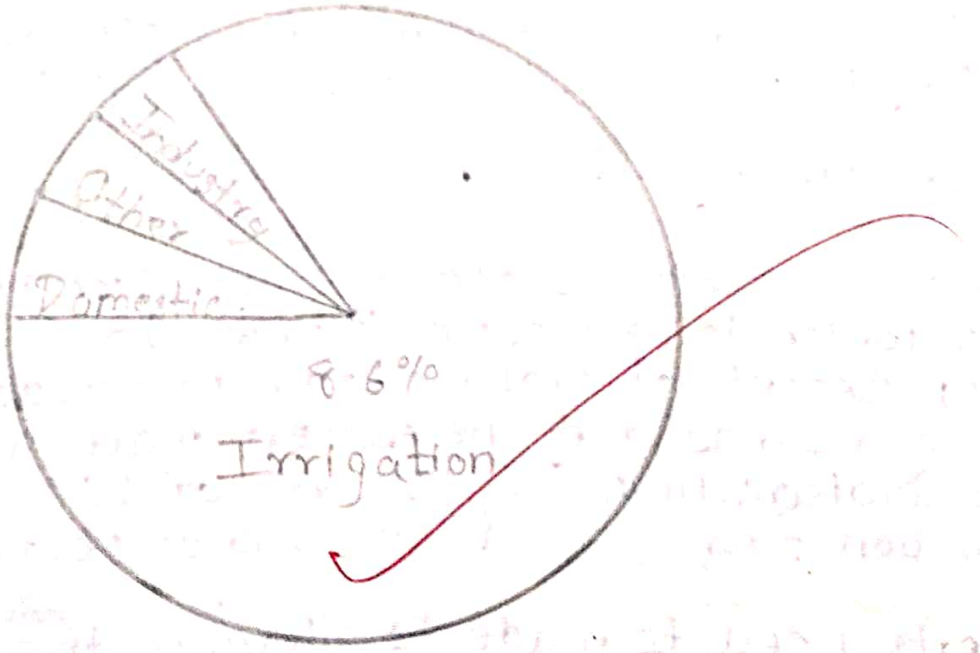
consumption ~~on~~ extensive public awareness is required to increase with the helps to ~~pu~~ public participate.

* Uses:

1: Used when it rains.

2: Reservoir and ground water storage and lakes etc:

Diagram / Photographs :



Sectors Pie Chart

Concepts that have become clear during the activity :

Following year of drought the rain river current water in dams and reservoir of groundwater has rained concerns over the long them availability of water.

What new things did you learn ?

I learn about 'Transitional period'. The october is a transitional period clean drinking water is made availability has for forcing active drinking water security.

Conclusion :

Organisation have help builded in all over Maharashtra these had helped problem instead of building large claims requires large space.

Write your own opinion / experience about the activity :

I was very happy to see that such small dams are so helpful to fight against water crisis.

Cooperation from the parents :

(1) They explained new procedure of building dams.

(2) Parents helps us while visiting sites.

Opinion of the parents :

1: Children should learn abaut water crisis.

2: They ~~get~~ should get proper knowledge about water.

Persons who have helped you :

(1) Teachers
(2) Parents
(3) Friends

List of the reference materials :

(1) Picture of dams
(2) Mobile

Activity : Future water crisis can be overcome by using water sparingly. How can water be used sparingly in support of this statement ? Write down points about it.

Where thrift?	How thrift ?	What are the benefits due to thrift? How ?

Teacher's feedback and signature with date :

***

Unit 3 : Water Management

Chapter 2 : Irrigation

Briefly ...

Irrigation

The process of giving excess water to crops other than rain water is called "Irrigation." Water from dams, lakes, canals or other sources of water, river water, ground water etc is used for irrigation. One thing to keep in mind, when water from all these sources is used for irrigation, actually very little amount of water is used for actual cultivation or farming, the amount of water that evaporates is very high. Some main points should be consider regarding irrigation.

1. To make water available for taking crops in seasons other the rainy season.
2. Successfully harvesting more than one crop in a year.
3. To make available adequate water for cash crops.
4. To get higher yield per hectare through proper irrigation.
5. To do protected farming by providing reliable and sufficient water.

Main method of irrigation

Different methods are used for irrigation in Maharashtra. Two methods are mainly use for irrigation.

1. Watering from the surface of the land.
2. Spraying water from certain height on land.

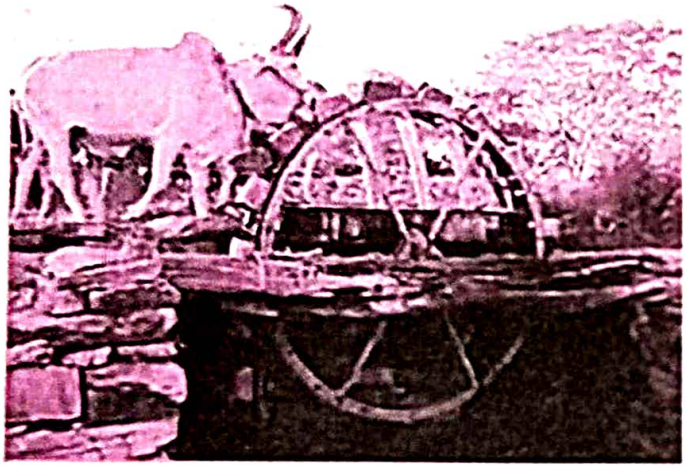
Some main types of irrigation in Maharashtra

1. Well irrigation
2. Lake/pond irrigation
3. Lift irrigation
4. Drip irrigation
5. Sprinkler irrigation
6. Canal irrigation

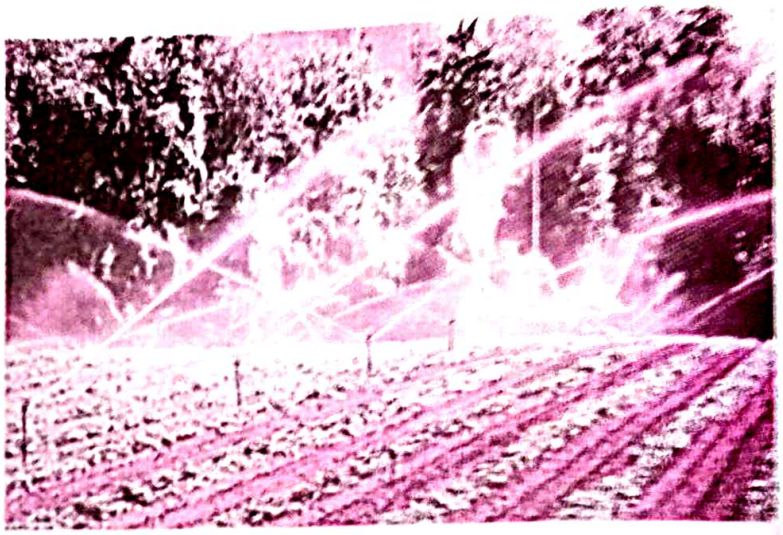
How irrigation done by using the different methods of water irrigation in your surrounding/area ? Why different methods of irrigation are used as per the need of water for crops, soil type etc ? How the help of animals resources taken and different tools/techniques are used for irrigation ? Why is the future planning of irrigation as per the increasing area under water irrigation ? So study of all this is essential.

Irrigation by 'Mot' system

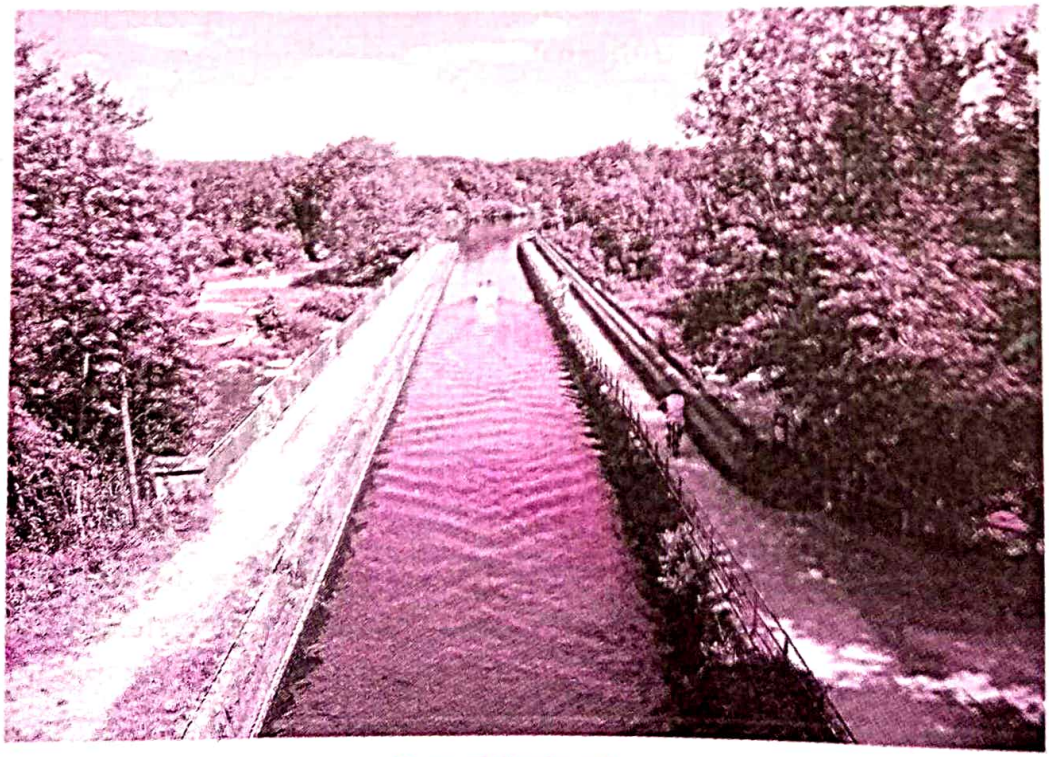
Drip irrigation



' Rahat'



Sprinkler irrigation



Canal irrigation

Name of the activity : **To study any two irrigation methods by visiting the farm in the area.**

Purpose / importance of the activity :

...To...study...Irrigation...the...importance...of...irrigation...is....
....is...to..get..knowledge..about..irrigation..system:.....
.....
.....

Materials

Proposed ~~time duration for the activity~~ :

....1:..Notebook.....4:..Pencil.....
.....3:..Pen.....
...2:..Mobile.....5:..Map.....

9. Time duration

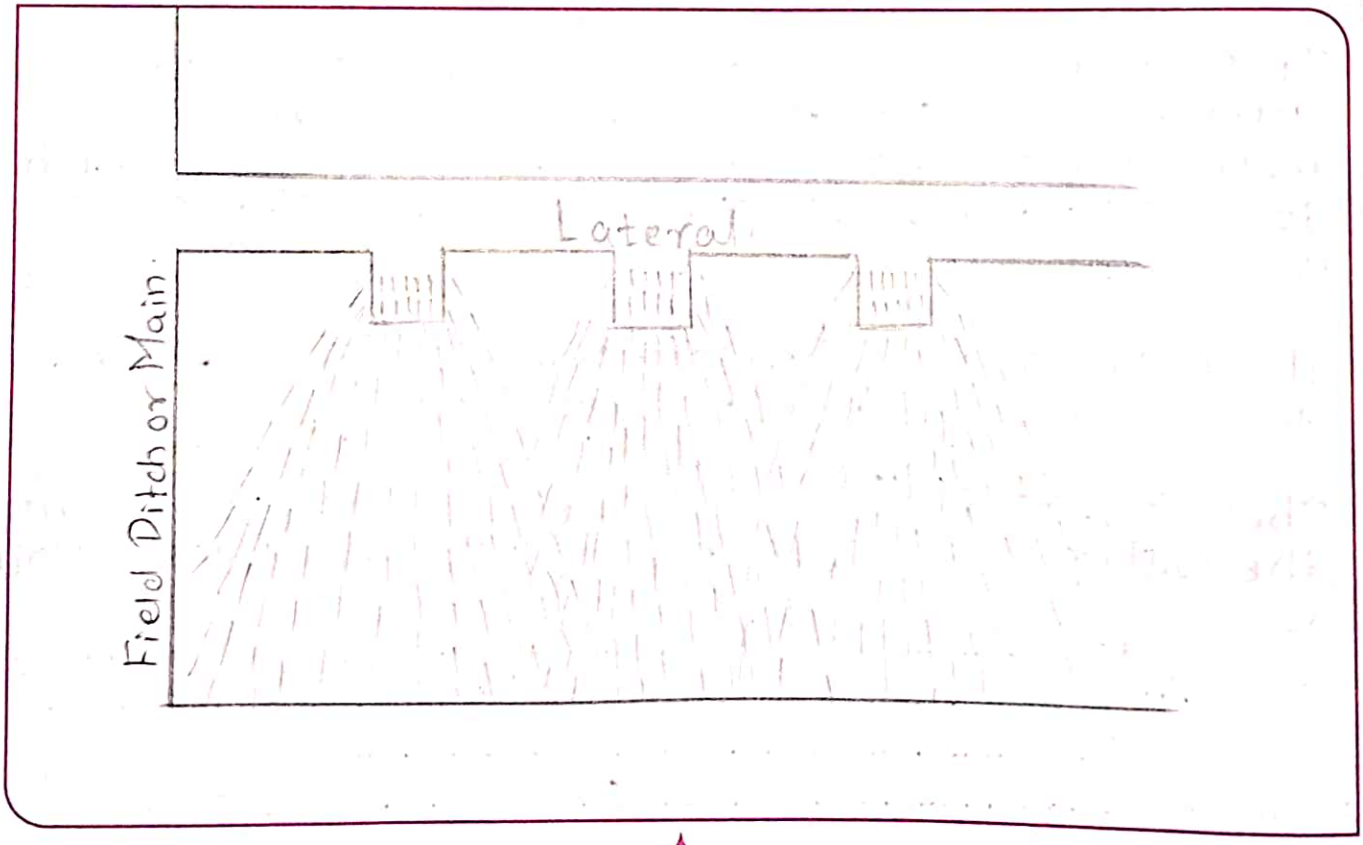
~~Materials and apparatus required for the activity~~ :

....To...do...this..a...activity..4..-5...~~days~~ days..are..needed:.....
.....
.....
.....

Methodology of the activity : **Detail information regarding the use of any two irrigation systems for agriculture, benefits with place, area, crop type, cost and product etc.**

...I..remate..area..of..Nashik..district..rural..area..of.....
....Nashik..district...eg:..we..can..see..many..people..having.....
....sprinkler..and...cannel..irrigation.:.....
.....
..In..sprinkler...irrigation...we..can..see..that..sprinklers..~~ar~~..
...ore..~~pren~~..present..in...the..farm..which..requires...less.....
..water...and...it..runs..on..electricity..but..in..places...which.
...is..close..to...dam..or..river.,..we..can..see..a..cannal.....
..irrigation:.....
.....
...These..cannal..irrigation...are..connected..with..these.....
....water..bodies..like..dam...or..river:.....
.....
...These..cannal...are..connected...to..water..bodies..and..bring
...the..water...to..the...form..throught..the..canal..irrigation.
.....
.....
.....
.....

Diagram / Photographs :



Concepts that have become clear during the activity :

Depending on type of crops and availability of water we can choose irrigation system.

What new things did you learn ?

The place which are near a huge water bodies generally use of canal irrigation we can see there.

Conclusion :

In our region different farmers used different types of ~~in~~ irrigation.

Write your own opinion / experience about the activity

I have enjoyed the activity. I was verry happy to see mere have farmers used different method to migrate the ~~forgo~~ format.

Cooperation from the parents :

They help us to travel and to visit several type of irrigation used forms.

Opinion of the parents :

The earlier days ~~there~~ therever using of ~~develo~~ different irrigation system is used., children should get known this.

Persons who have helped you :

(1) Teachers.
(2) Parents.
(3) Friends.
(4) Local people.

List of the reference materials :

(1) Han Means

(2) Internet

Activity : Prepare a drip irrigation device to water a plant planted in the house/yard/ backyard with the help of an empty saline bottle or an empty water bottle. Based on that calculate how many liters of water is saved if one plant is irrigated. Thus how many liters of water will be saved in an orchard of 1 acre area ? Write the features of this method.

Material : (1) Emt. Empty water bottle

(2) Injection

(3) Thin ~~rup~~ rubber pipe

(4) Taper

Procedure : Fix rubber pipe with the water bottle which should be open from ~~copper~~ upper part fix syringe to that rubber pipe keep the bottle at certain height so that water should flow in downward direction

Calculation of saving water : We use around one bottle of water to a plant daily but in this one ~~watt~~ water and ~~can we be~~ can be used to the water plant daily ~~bot~~ but in this ~~cause~~ case we can used ~~ti~~ ~~noday~~ only one batthe ~~par~~ per day this case we need one

Features : Drip Irrigation can save the amount of water which use waste in our daily purpose

Teacher's feedback and signature with date : Yes 14/11

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Unit 3 : Water Management

Chapter 3 : Water Acts and Rules

Briefly ...

Need of Water act and rules

The availability and proper use of water resources is the backbone of human development. With the growing population, the world's demand of water is also increasing day by day. The world population was 100 crore only in year 1750. It was 250 crore in year 1950. It's became 500 crore in July 1987 and its became 600 crore in year 2000. The prediction is that 800 crore in year 2025, so it will be 1000 crore in the year of 2050, but the area of earth is constant, so that generally the availability of water will remain stable. As 71% earth's surface is covered by water, although 1% of fresh water is useful to plants and animal on earth surface for drinking. On the other side, with growing population availability of water is decreasing per capita.

Water dispute with example

Water availability is decreasing due to growing population, industrialisation, and manufacturing. There is a dispute for water use in two countries or state. In last 50 years at international level there have been 1831 compromises agreements done. In future, as called the third world war can be occured in 21st century due to water. At present, the water problem become very intense in 60 countries in the world. Water disputes are created in many countries. The number of water disputes are growing due to growing population and increasing demand of water. Because of this the water conflict is unavoidable in 21st century.

Government policy

Government policy means that the government formulates profitable policies for the society in certain circumstances and issues order for their implementation through circulars. Water has been considered as national property in National water policy. The use of water is determined differently according to availability. To meet various useful demands water is a seasonal factor. Therefore, the water management code clarifies who can be involved in the use of water.

Sub-basin wise planning is done according to diffrerent rules as the status of each basin is different. While explaining the importance of government policies the policy of the government of Maharashtra is meant here. 39.13 lakh hectare irrigation capacity was created in state at the end of 2004. Out of this irrigation capacity of 16.97 lakh hectares i.e. about 43 % of the irrigated capacity was directly irrigated. Over the last seven years, the actual irrigated area has been around 43 % to 53 %. There is a big difference between the irrigated area and the actual use of area.

Government policy is of paramount importance in reducing unauthorized use of water,

increasing irrigation revenue, and implementing proper management of the irrigation sector.

Subjects included in Government policies water irrigation departments.

1. Available water and its equal distribution
2. Use of water for irrigation
3. Financial aspects of water resources
4. Water management
5. Use of ground water
6. Geographical difficulties occured in water resources
7. Crop structure
8. Water planning
9. Water tax
10. Organization for use of water and public participation

Name of the activity : **To study the water policy of Maharashtra state.**

Purpose / importance of the activity :

To get aware abaut water of Maharashtra.

Proposed time duration for the activity :

One day is required.

Materials and apparatus required for the activity :

A plastic ~~botthe~~ bottle, rubber, small rack, funnel, marker, cutter, etc.

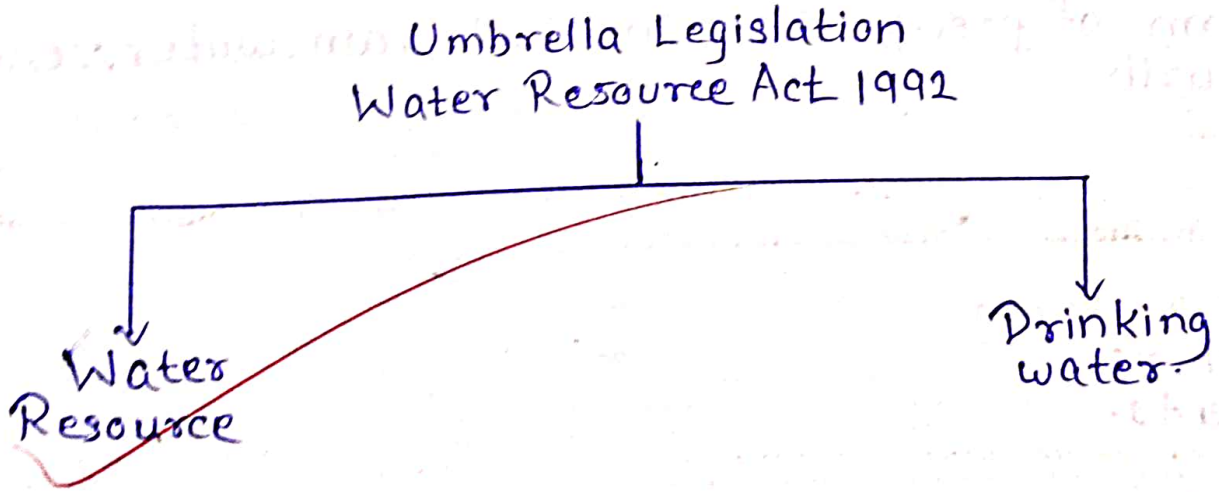
Methodology of the activity : **Detail information of water policies of Maharashtra state, its objectives, specific schemes and included highlights.**

1. Cut the top off a clear bottle as shown.
2. Use a ruler to mark measuring ~~the~~ increments starting
3. Starting about 2 from the bottles.

4. Place several small rocks in the bottom.

5. Then fill the bottle with water.

Diagram / Photographs :



Concepts that have become clear during the activity :

...Types..of..rain..gauges..:.....
.....
..Including...graduated...cylinders..,..Weighting...gauges.....
.....

What new things did you learn ?

....The..first..known...rainfall...records..were..kept..by..the...
.....ancient...Greeks.:.....
.....
.....

Conclusion :

....A..rain..gauge..works..by...catching...the..falling...rain..in..
....the..funnel.:.....
.....

Write your own opinion / experience about the activity :

..People..living...in..400..B.C.E...to..record..rainfall.:.....
.....

Cooperation from the parents :

...Helped...and...guided...me..to..do...the..activity.:.....
.....
.....
.....

Opinion of the parents :

....A...form...of..precipitation...in..which..rain..water..reaches
...the..earth.:.....
.....
.....
.....

Persons who have helped you :

.(1)..Teachers.....
.(2)..Parents.:.....
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List of the reference materials :

I collected information from my previous year books and also searched on internet.

Activity : Make your own rules for use of water in daily life as well as for irrigation, industrial use of water.

The motto of the rules .....

Rules

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....
9. .....
10. .....

Teacher's feedback and signature with date :

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Chapter 1 : Water Purification and Sewage (Wastewater) Management

Briefly...

Turbidity of water

When water flows through a river, it contains soil as well as other soluble substances. Particles of such substances are in suspended state in water. Therefore, the cleanliness, clarity, transparency i.e. quality of water is reduced. This is called 'Turbidity of water'. Water purification is done to remove this turbidiy, to purify water and useable it.

Different stages of water purification

1. Pumping of water from a water source
2. Air mixing in water
3. Coagulation
4. Flocculation
5. Sedimentation
6. Sandstone water filtration (Filtration)
7. Disease Disinfection

Some equipments used for domestic water purification

1. The use of ultraviolet radiation
2. Ion exchange
3. Use of ozone gas
4. Filter suitable for taps
5. Life straw
6. Candle filter

Name of the activity : To study the design and function of any one of the water purification devices for domestic use.

Purpose / importance of the activity :

.....

...Freshwater is fundamental to our health and well.....

....being:.....

.....

Proposed time duration for the activity :

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...It required 5 days for the activity:.....

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Materials and apparatus required for the activity :

A guide who will guide about purification of water, notebooks and pen.

Methodology of the activity : Detail information regarding the design, function, cost, utility, benefits of domestic water purification equipment.

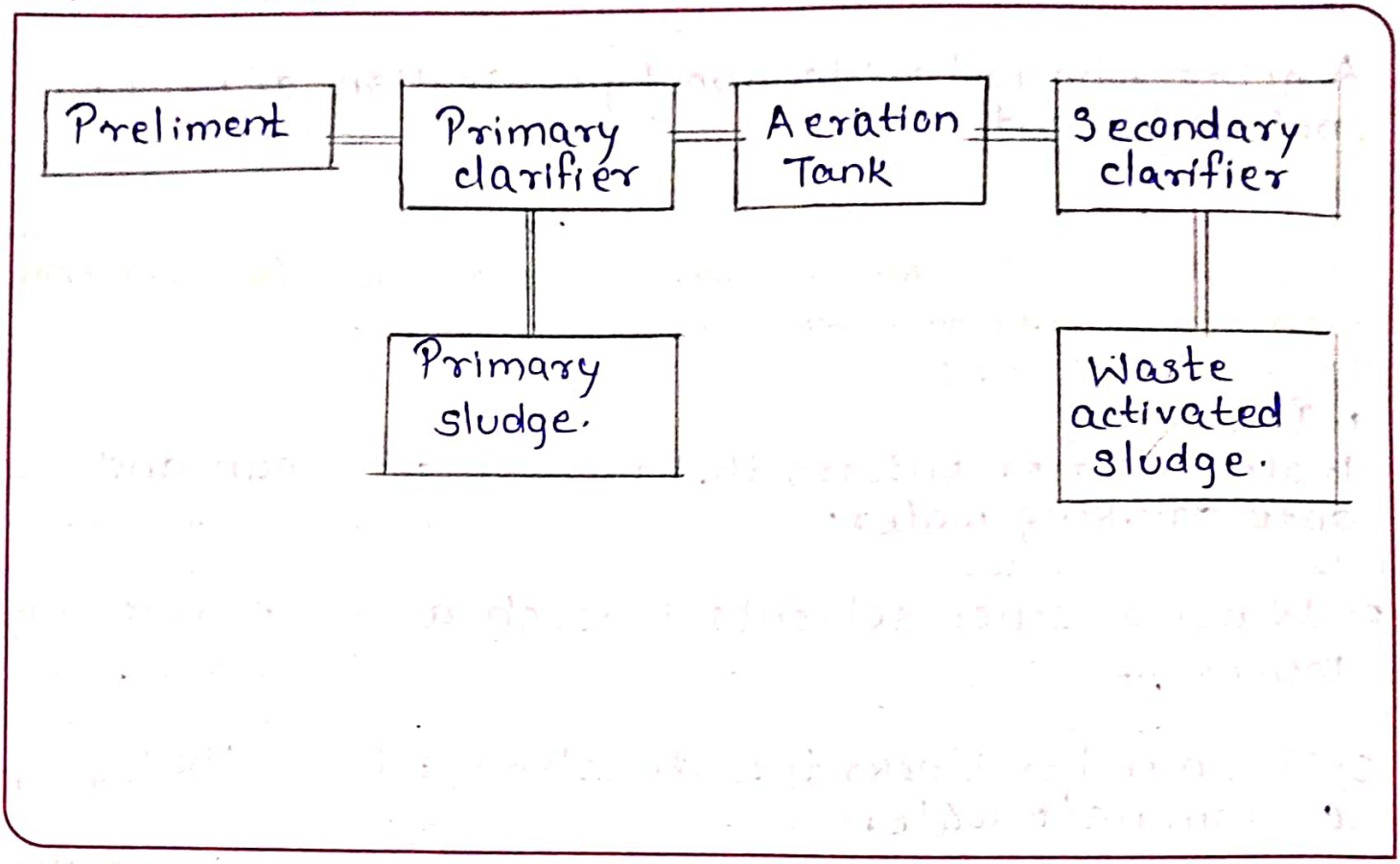
1: Domestic:
Water purifier ensures that you can get clean and safe drinking water.

2: Water or other solvents through a semipermeable membrane.

3: The member blocks the dissolved solutes that contaminate water.

4: This filteration process in one among the masts effective methods of water purification.

Diagram / Photographs :



Concepts that have become clear during the activity :

Filtering water and consuming good quality leads to good health.

What new things did you learn ?

The first rainfall records were kept by the ancient Greeks.

Conclusion :

A rain gauge works by catching the falling rain in the funnel.

Write your own opinion / experience about the activity :

People living in 400 B.C.E. to record rainfall.

Cooperation from the parents :

Helped and guided me to do all activity.

Opinion of the parents :

A form of precipitation in which rainfall water reaches the earth.

Persons who have helped you :

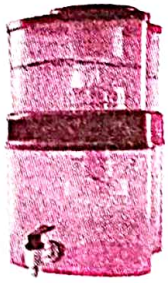
(1) Teachers
(2) Parents
(3) Friends

List of the reference materials :

I collected information from my previous year books and also searched on internet.

Activity : 1. Prepare a Sechhi disc to check/measure the turbidity of water. Do experiment of 'Secchi disk' under the guidance of an adult or a teacher.

2. Identify and label some of the household water purification devices given below.

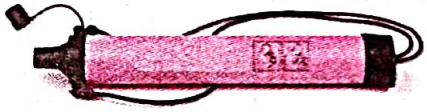


filter

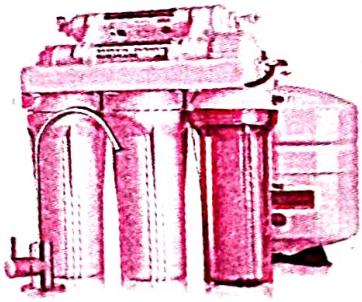
Brass pot

Earthern pots

Purifier.



Life straw



RO filter

Teacher's feedback and signature with date : Sus 14/6

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Briefly ...

Concept of Earth Overshoot day

Every year nature adds to our resources in various ways and man uses those resources to deplete them. Over the years, our usage of resources was less than the natural resources being added. Therefore there were abundant natural resources. This went on for many years. Then one day, we reached when we started using all that, nature has added. That is, there was neither growth nor reduction. But gradually situation changed and we started using more than what nature created throughout the year. Our balance in the bank of nature began to deplete. This is called 'Earth Overshoot Day'.

Events that pollute water

Event	Pollutants
Washing mouth in morning	Paste contains different chemicals like phosphate, carbonate, fragrance and multi-color chemicals. When we wash our mouth, these chemicals are released in the water.
Shaving in morning	Shaving cream or soap contains various chemicals like sulphate, carbonate, stearic acid, ethanol, amine, fragrance chemicals. After shaving these chemicals are mixed in water in the form of foam and polluted water.
Bathing	When making soap, we use about six to ten grams of edible oils, aromatic/ fragrant chemicals, dye, sulphates, carbonates, sodium, detergents. Sewage water after bathing mixed in pure water.
Washing Cloths	Different types of soap are used for washing clothes. These various soaps contain eight to ten grams of chemicals like phosphate. These chemicals mixed in pure water through foam and sewage.
Washing Utensils	These release near about 20 grams of chemicals into the pure water through sewage. Different chemicals are used for washing and cleaning the utensils like phosphets, carbonates, silica.
Toilet Cleaning	For cleaning toilet bleaching powder, acid, sulphate, chloride phenol are used. The sewage created from this mixed in pure water.
Use of cosmetics	Various types of oils, face powders, nail paints, perfumes, kumkum, scented sprays, lipsticks are used as cosmetics. It contains about 18 different types of harmful chemicals. Due to this 5 to 10 gm of chemicals mixed in water.
Rituals and Nirmalya	Incense, flowers and other pooja materials are used in Pooja/Worship and other religious rituals. On the second day of worship, it become nirmalya. Large water-insoluble idols of gods and goddesses, the artificial colors used to make those idols, and other substances (plaster of Paris) are released in water at the time of immersion.

Name of the activity : Recycling of wastewater that generated from domestic use of water.

Purpose / importance of the activity :

To check the suitability of water storage.

Proposed time duration for the activity :

It took around 1 day for the activity.

Materials and apparatus required for the activity :

(1) Mobile
(2) Pen
(3) Pencil
(4) Notebook

Methodology of the activity : Detail information on how and for what purpose the waste water generated from domestic use is recycled, its operation, cost, benefits, usefulness etc.

(1) We should not waste water. It should be stored in a clean place.

(2) Rains produce plenty of clean water running off roads, roofs & rocks.

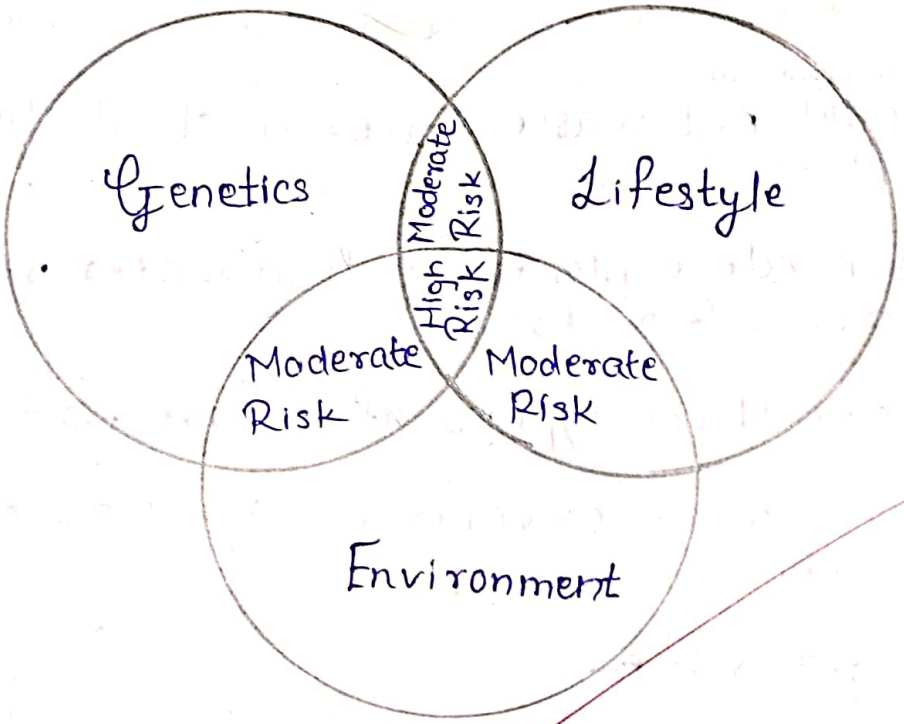
(3) There are three typers of storage namely.

1. Storage in reservoirs, such as earth dams and ponds.

2. Storage in tanks.

3. Storage in sites.

Diagram / Photographs :



Concepts that have become clear during the activity :

Fresh of purified water can quickly became re-contaiminated.

What new things did you learn ?

Fresh, clean and purified water should be used.

Conclusion :

Water should be stored in a cool, dark place.

Write your own opinion / experience about the activity :

To prevent recontamination, only clean storage containers.

Cooperation from the parents :

Helped and guided me while performing the activity.

Opinion of the parents :

In agriculture ~~world~~ water storage, water is stored for later use in natural water sources.

Persons who have helped you :

Mother helped me while performing the activities.

List of the reference materials :

I took help of internet and my previous standard books.

Activity : By which activity do we use water excessively while using water on an individual level in daily life ? And also harms the environment by polluting the water. List such activities and complete the table below accordingly. OMIT

Action	Water polluting factors	Remedy/measures	Water saving due to measures (in litre)

Teacher's feedback and signature with date :

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Unit 4 : Water Quality

Chapter 3 : Planning of Underground Saline Water

Briefly...

Desalinating the saline water of the sea : Need

We are all experiencing that the groundwater level in India is going down day by day. Water quality is also changing due to increase in pumping of groundwater. In addition, the water crisis is getting worse due to change in the monsoon period.

12 states and union territories of our country have long seashore. If the sea water is purified and desalinated at various places, the water crisis can be overcome to a great extent. Desalinating seawater is very expensive but with the advancement of technology, the cost has come down a lot. The water available due to the process of desalinating of seawater is suitable for drinking, agricultural and industrial use. Using seawater by desalinating it, is now becoming an option to address the world's water crisis.

Underground saline water

Saline water may not be just in the ocean, it may be underground. It is saline. There are two main reasons for this. The first reason is that salt water from the sea and creeks seeps into the shoreline. This type is found in the Konkan belt of Maharashtra. Excessive pumping of fresh water from the land on the coast creates cavities there. The saline water of the sea began to percolate to fill it. Once this process is started, it becomes difficult to use the fresh salt water for drinking and farming. This is because of the large amount of pumping of water by humans.

This saline water and the fresh water do not get mixed. This is because the density of these two waters is different. They have different layers. The lower water is saline water and fresh water is found in the upper layers of groundwater due to recharge. Therefore, sweet water is pumped out first and then saline water is pumped out. In such situation, it is possible to estimate after how much pumping the saline water will appear.

The second reason for this is that the natural condition of that area. Naturally in some underground places, there are saline water reserves. This area is called as saline water belt.

Now many states and countries taking efforts to use saline water from undergound reserves. Israil, Austrelia, North Africa, Carabian islands are leading countries in such type of projects. These type of projects are now started in Tamil nadu, Andhra pradesh also. The number of such projects in the country will definitely have to increase in the future.

Name of the activity : To study the work of any one state or country in recycling or management of saline water.

Purpose / importance of the activity :

To study the week of recycling or management of saline water.

Proposed time duration for the activity :

To do this activity 1 week is needed.

Materials and apparatus required for the activity :

1: Notebook 4: Pencil.
2: Mobile.
3: Pen

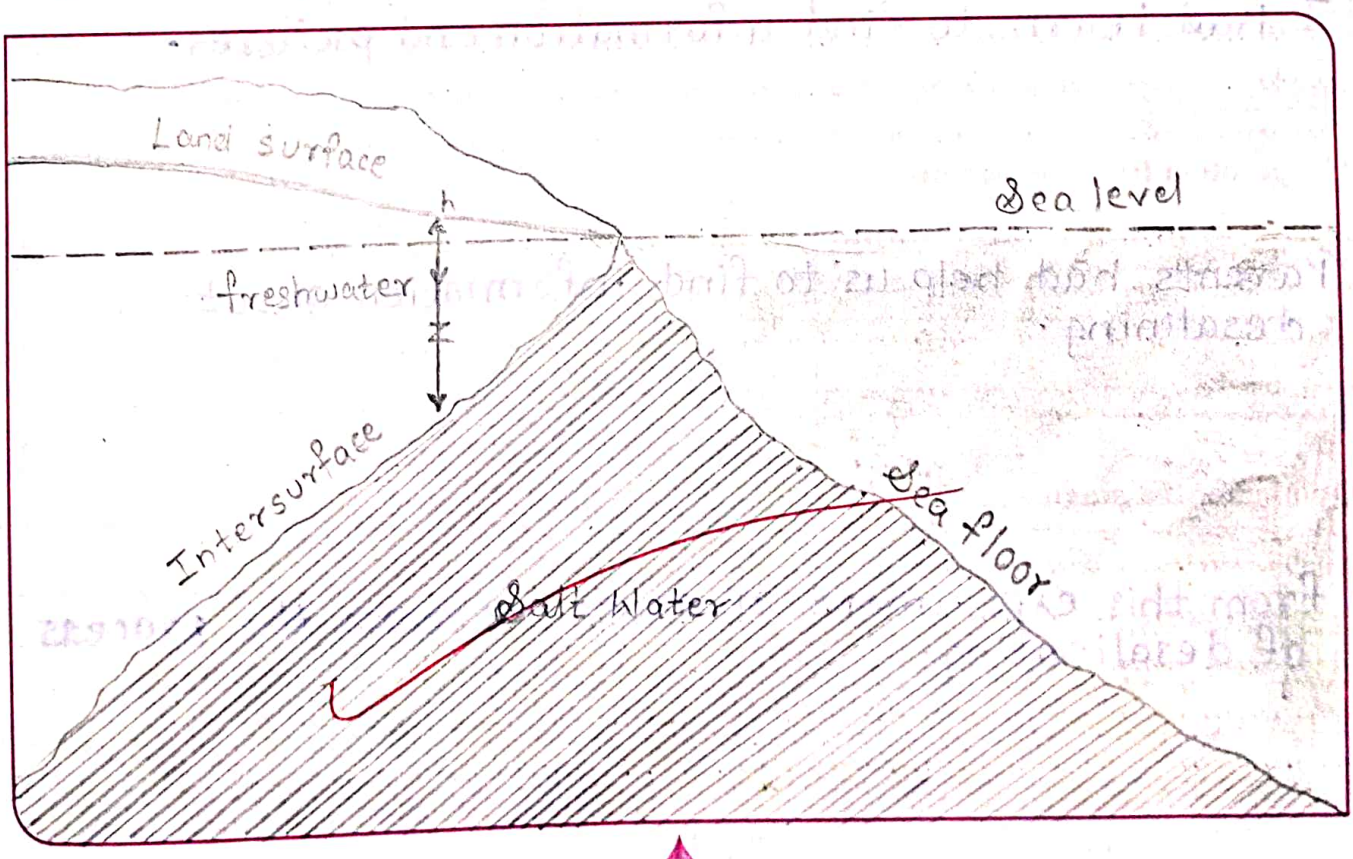
Methodology of the activity : Detail information regarding the plan, area, system, benefits etc of any one state or country regarding recycling or management of saline water.

Saral en sea water disalination plant is present in city.

It largest reuse of osmasis.

Making it capable of drinking then it will be best for that region.

Diagram / Photographs :



Concepts that have become clear during the activity :

Desalined plants can be used for making gold water

What new things did you learn ?

I learned about desalination of plant and if awaking:

Conclusion :

Desalination plants should be build by: countries

Write your own opinion / experience about the activity

I had learn to find information and pictures

Cooperation from the parents :

Parents had help us to find information about desalining:

Opinion of the parents :

from this experiment students can learn the process of desalinating:

Persons who have helped you :

(1) Teachers
(2) Parents
(3) Friends

List of the reference materials :

(1) Mobile
(2) Map, etc.

Activity : Check or find out the differences between saline water and fresh water based on scientific methods and complete the table.

Point	Saline water	Fresh water
Water component	$NaCl \cdot H_2O$	H_2O
Taste	Salty	Testless
Colour	Colourless	Colourless
Odour	No Smell	No Smell
Alkalinity	80-120 pm	100 ppm
pH	8.1	7
Method of Agriculture	Saline Agriculture	Fresh Water Agriculture
Use for animals	Cleaning	Drinking
Use for plants	–	Watering plants.
Industrial use	–	Feather industry.
Effect on land	Makes land to can infertility	Used for crops

Teacher's feedback and signature with date :

14/12

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Project Report

Four units are to be studied in the subject of water security for class X. The following is a list of four projects based on four units. Out of these four projects, one of the first two units is to be selected for the first term and one of the next two units is to be selected for the second term.

Name of the porject
Unit 1 : Water Education
Visit nearby dam in your area, collect information about dam preparation, water storage, watershed, water distribution and electric power generation from concerning officer.
Unit 2 : Water Conservation
Take interview of a person work as a expert/Jalyoddha/Jaldoot in development of watershed area or water conservation. Discus various components of water conservation with him/her.
Unit 3 : Water Management
Visit nearby agriculture office or water conservation department. Collect various type of information about irrigation and farming methods.
Unit 4 : Water Quality
Visit sewage management center / water purification plant in your city or village and study its working.

Project Report No. 1

Name of the project :

Water education and water conservation.

Need / importance of the project :

Watch Water education has multiple connotations. It traditionally refers to the formal to formal and non-formal education programs that build awareness and knowledge of a wide variety of water topics.

Hypothesis :

Conserving water helps us by supplies supplying more amount of water for longer usage.

Materials and apparatus:

An expert person who knows about water education a market and notebook.

Work Plan :

Collect information of preparation of dam water storage water side and water distribution from concerning officer.

Description of actual procedure : Detail information of visited places, process etc.

1: Government of India launched Jal Shakti Abhiyan in 256 water stressed districts of the country in two phases between july to november 2019.

2: Under the Jal Shakti Abhiyan, officers, ground water experts and scientists from government of India worked with state and district afficials in this district to pramote water conservation.

3: Ground water management is being implemented from 1st April 2020 in seven states namely Gujarat, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Rajasthan and Uttar Pradesh.

4: The well known water management ~~sc~~ scheme in India is implementation of national water mission.

Observations: Collected information, charts, tables, questionnaires, reference points for discussion etc.

Conclusion with the help of tables / graphs:

Inference :

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Suggested measures :

Reference material :

Self opinion :

Acknowledgement :

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Required diagrams / photographs :

Teacher's feedback and signature with date :

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Project Report No. 2

Name of the project :

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Need / importance of the project :

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Hypothesis :

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Materials and apparatus:

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Work Plan :

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Description of actual procedure : Detail information of visited places, process etc.

Observations: **Collected information charts, tables, questionnaires, reference points for discussion etc.**

Conclusion with the help of tables / graphs:

Inference :

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Suggested measures :

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Reference material :

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Self opinion :

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Acknowledgement :

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Required diagrams / photographs :

Teacher's feedback and signature with date :

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Student's name :....Purva Sandeep Bhabal.....

Class : 10th .....Division : ....C..... Roll No. : ....1..... Examination No. : .....

Evaluation Chart

Term	Activity proceeding	Project proceeding	Written/Oral exam	Workbook writing	Total marks
	1	2	3	4	Including 1 to 4
First Term					
Second Term					
Total marks (first term and second term)					
Grade					

Certificate

It is certified that, ~~Kumar~~ / Kumari ..Bhabal..... Purva...Sandeep.. Class X Division ....C..... RollNo.....1.....ExaminationNo..... has successfully completed the activities and projects listed in this workbook.

.....
Teacher's signature

Date: 11/01/23

School stamp

.....
Headmaster's signature

Date: