1. Introduction

1.1 About Udaipur

Udaipur is a city in the state of Rajasthan , India. It is the historic capital of the kingdom of Mewar in the former Rajputana Agency. It was founded in 1559 by Udai Singh II of the Sisodia clan of Rajput, when he shifted his capital from the city of Chittorgarh to Udaipur after Chittorgarh was besieged by Akbar. It remained as the capital city till 1818 when it became a British princely state, and thereafter the Mewar prvince become a part of Rajasthan when India gained independence in 1974.

1.2 Introduction About Ahar River

Ahar River is considered as a significant river in India, since the cradle of Udaipur Civilization was built. Ahar River flows from northwest to southeast in Ahar region through the eastern town of Udaipur. It is a tributary of Berach River, its origins are at the hills of Udaipur District of Rajasthan in western India, and it flows through the city of Udaipur before it joins the Berach. This river is connected to almost every lake and river of Udaipur including Pichola, Bada Madar, Chota Madar, Bedla River, Govardhan Sagar, Nela Taalab, Roopsagar, Fateh Sagar and Swaroop Sagar. Though ironically, this historically important river is at present functioning as the drainage body of the Udaipur city filled with sewage and garbage. Ahar River is known as the neglected Ganga of the Rajasthan.

2. Objectives

The main objective of this study was to learn about water quality testing. Along with that, I have decided

to carry a detailed study on water quality issues in Udaipur. I have formulated several learning goals

before I started my internship. They are:

- To understand about water quality parameters and standards
- To learn how to test water based on these parameters
- To discuss on water quality related issues in Udaipur
- To understand the preventive measures on the water issues
- To get experience in working in a quite different field
- To enhance my communication skills
- To achieve a professional experience
- To build a network

3. Preliminary Survey :-

- First of all we go to location (Small stretch of Ahar River from syphon to navratna complex) we saw river are flow to one side to another side .
- We see suspended solids , turbidity , colour , plastic , small pieces of wood , pieces of paper , fruit and vegetable skin in our location .
- Dumping of Garbage from houses , building and sewer .
- We saw animals , birds and plants .
- We saw crow are flying . That loke like crow are moving here and there .
- We saw parrot are seat on wire .
- We saw heron are swim in water.
- And we saw cow eats grass .
- We saw some trees like :- Neem , Banana , Palm .

4. Methodology

4.1 Location

One place is Udaipur Rajasthan which has a small stretch of Ahar river from Siphon to Navratna complex. In this place we go for some parameters regarding water quality. And the coordinates of that location are :-

Latitude – 24°37.2060’ N

Longitude – 73°41.4670’ E

Altitude – 523.9

Width – 8 m

Length – 400 metre

Figure 1 :- Image of location

4.2 Water quality parameters :-

4.2.1 Chemical Parameters Are :-

1. **DO (Dissolved oxygen):-** Oxygen enters river water by mixing of air into water. Mixing occurs when the water flows fast and waves are formed in rivers. In slow moving or stagnant water there is usually less oxygen.

   The amount of oxygen dissolved in the water depends on how much oxygen the green aquatic plants are releasing through photosynthesis during the day and how much is consumed for breathing by the plants and animals and for decomposition of materials in the stream. The temperature of the water also affects the maximum amount of oxygen that the water can have in a dissolved form. The capacity of water to have dissolved oxygen decreases with increase in temperature. Oxygen is also added from the atmosphere when the stream gurgles and gushes over rocks, waterfalls, etc. In a day, oxygen levels are at maximum in the noon due to the rise in levels of oxygen from photosynthesis since morning, and falls to a minimum at dawn.

   Dissolved oxygen is of major interest in water quality investigation. It is generally considered significant for the maintenance of fish and other aquatic life. Oxygen is one of the most important factors controlling the amount and kind of life present in water bodies like streams, rivers and lakes, as all organisms need oxygen for survival and it is present only in limited quantities in water. By adding domestic sewage to the water, we lower its oxygen content. This is how a free-flowing stream naturally recovers its oxygen level by natural processes.

   Oxygen present in the sample rapidly oxidises the divalent manganous hydroxide to its higher valence, which precipitates as a brown hydrate oxide after addition of sodium hydroxide and potassium iodide. Upon acidification, manganese rev back to divalent state and liberates iodine from potassium iodide, equivalent to the original DO content. The liberated lodine is titrated against sodium thiosulphate using starch as an indicator.

   Avoid turbulent water while collecting the sample.Do not allow the sample to get exposed to atmospheric air before conducting the test. The chemicals in this kit are

concentrated. Read the bottles labels carefully and avoid contact with the skin and eyes. In cases of contact wash with plenty of water for at least five minutes and see a doctor if irritation persists. . Wash hands and gloves after use.

Figure 2 :- DO Bottle

2. **Hardness :-** It is defined as concentration of multivalent metallic ration in solution. Multivalent metallic ions. most abundant in water are calcium & magnesium .

   Hardness is measured by using spectrophotometric techniques.

   sulphate, chlorids and nitrate of calcium and magnesium gives permanent hardness . It is also called non carbonate hardness This hardness can not be removed by simple boiling. It requires softening techniques .

   Hand water leads to leads to uses foam formative. Hence consumption of soup would be more.

   It leads to incrustation of pipes. It make food tartelers . Magnesium hardness with sulphate ion have lascative effect .

   Hardners is expressed as (aco, equivatent of Ca^{2+} and Mg^{2+} present in water in mg/litre .

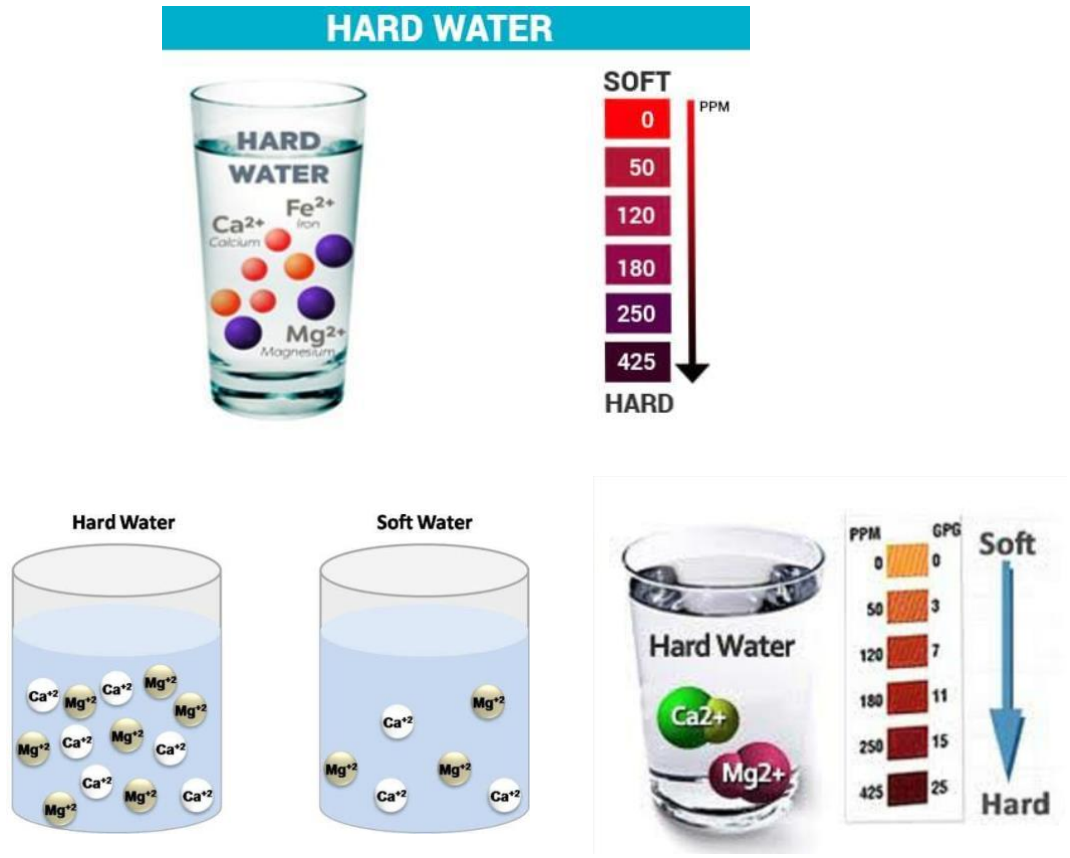


Figure 3:- Hard water and soft water

3. **TDS (Total dissolved solids) :-** Dissolved solids refers to any minerals salts, metals, cations or anions dissolved in water Total dissolved solids comprise inorganic salts (principally calcium, magnesium, potassium, sodium etc) and some small amount of organic matter that are dissolved in water .

   MEASURMENT → A direct measurment of TDS is by evoparating to dryness a sample of water . The resudial is weighted and represents the TDS.

   Approximate analysis is done by electrical conductivity of water. Electrical conductive to of water is done by di-ionic water test.

   Acceptable limit → 500 mg/l (Acc. To GOI)

   Care of Rejections – 2000 mg/l

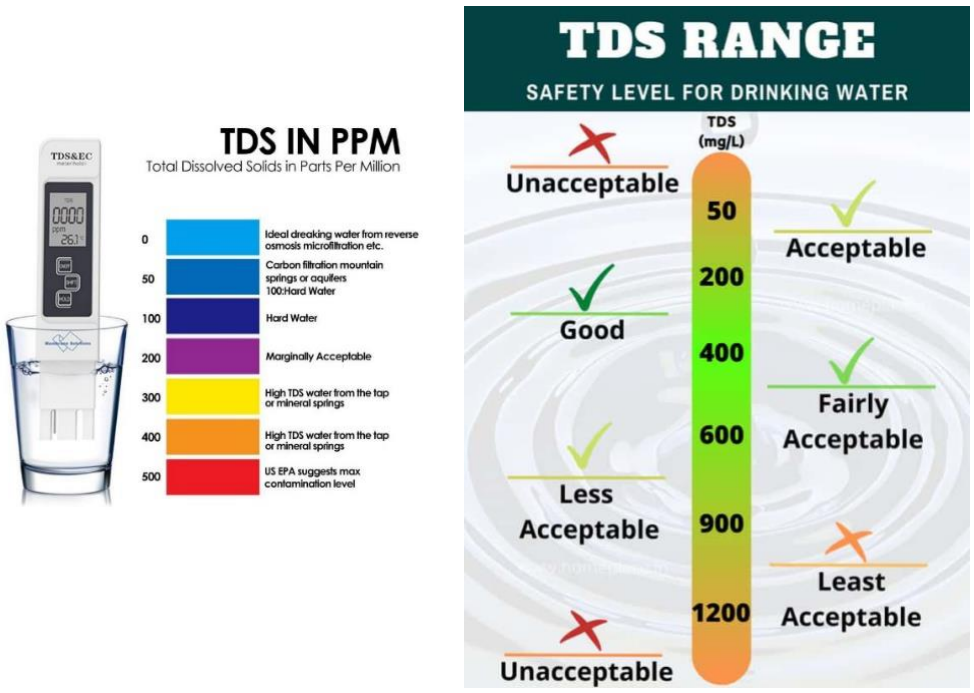


Figure 3:- TDS range & metre

4. **pH :-** pH value gives an idea of the intensity of the acidic or basic nature of a water sample . pH scale for aqueous solutions lies between 0-14.

The abundance of Hydrogen ion is what determines the acidity of a solution. More the hydrogen ions, the more acidic the sample is. Higher concentration of hydrogen ions give lower score on the pH scale while lower concentration of hydrogen ions give higher score on the pH scale.

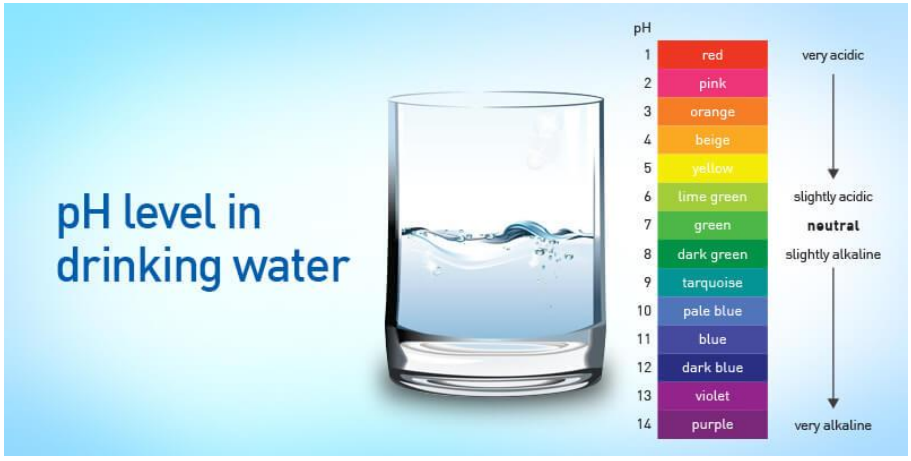
For every one unit change on the pH scale, there is a tenfold increase in the acidity or alkalinity. For example, a solution of pH 4 is 10 times more acidic than a solution of pH 5, and 100 times more acidic than a solution of pH 6.

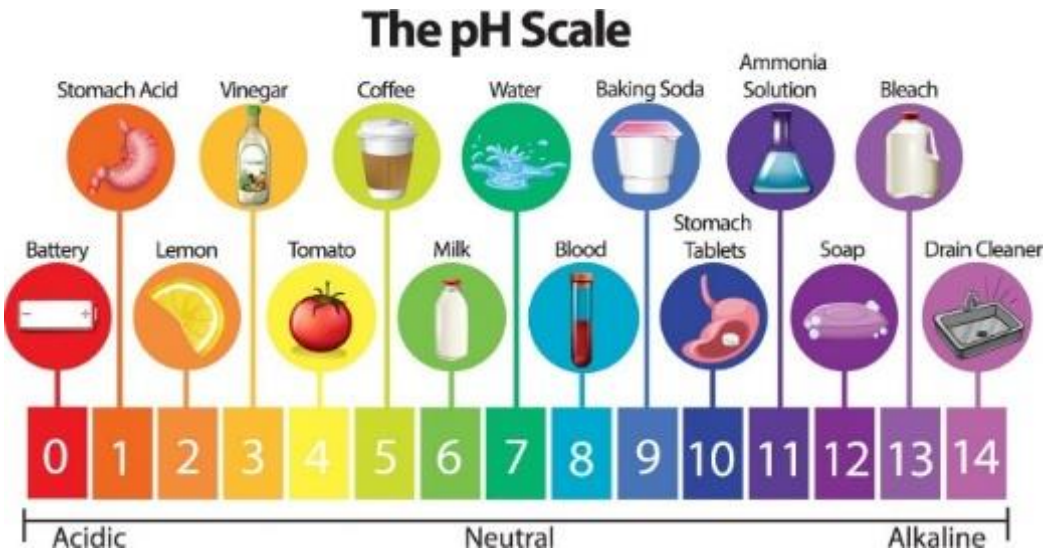
Water acquires acidic or alkaline properties depending on the type of substances that it .

Comes in contact with. This happens naturally or is sometimes man-induced.

Ground water for example, absorbs minerals present in the soil and acquires their characteristics. If the soil contains salt deposits, the water becomes alkaline.

Surface water often acquires its pH depending on the type of organic matter, minerals that it comes in contact with, Rain water absorbs atmospheric carbon dioxide and becomes slightly acidic due to formation of carbonic acid. Therefore the pH of natural rain water shows a range of pH 4.5-5.6.





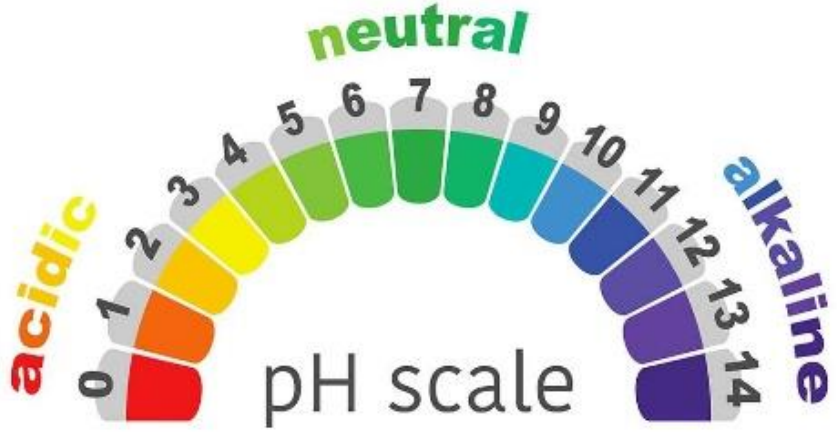


Figure 5:- pH scale & pH level in drinking water

5. Alkalinity :- Alkalinity is water's capacity to resist acidic changes in pH, essentially alkalinity is water's ability to neutralize acid. This ability is referred to as a buffering capacity. A water body with a high level of alkalinity (which is different than an alkaline water body) has higher levels of calcium carbonate, CaCO3, which can decrease the water's acidity. Therefore, alkalinity measures how much acid can be added to a water body before a large pH change occurs.

Alkalinity and water hardness are fairly similar--essentially they both come from sources in nature. Water moves through rocks (and picks up minerals as it does so) on its way to rivers and lakes. When limestone and dolomite dissolve in water, one half of the molecule is calcium or magnesium (the "hardness") and the other half is the carbonate (the "alkalinity"). This means that the level of water hardness and alkalinity in a place will be very similar. However, they are very separate measurements, and have very different importance.

Fish and other aquatic life require a pH range of 6.0 to 9.0, and because alkalinity buffers against rapid pH changes, it protects the living organisms who require a specific pH range. Higher alkalinity levels in surface water will buffer acid rain and other acid wastes, preventing pH changes that are harmful to aquatic life. Alkalinity is also in important considering the treatment of wastewater and drinking water because it influences cleaning processes such as anaerobic digestion. Water may also be unsuitable for use in irrigation if the alkalinity level in the water is higher than the natural level of alkalinity in the soil.

6. Chloride content :- Chloride levels in unpolluted waters are often below 10 mg/litre and sometimes below 1 mg/litre (4). Chloride in water may be considerably increased by treatment processes in which chlorine or chloride is used.

7. Nitrogen content :- Seawater contains approximately 0.5 ppm nitrogen (dissolved inorganic nitrogen compounds without N2). The amount is clearly lower at the surface, being approximately 0.1 ppb. River water concentrations vary strongly, but are approximately 0.25 ppm in general. ... Nitrogen mainly occurs in wastewater in this form.

8. phosphorous :- Phosphorus is an essential element for plant life, but when there is too much of it in water, it can speed up eutrophication (a reduction in dissolved oxygen in water bodies caused by an increase of mineral and organic nutrients) of rivers and lakes.

9. Fluoride :- Fluoride is found naturally in soil, water, and foods. It is also produced synthetically for use in drinking water, toothpaste, mouthwashes and various chemical products.

Water authorities add fluoride to the municipal water supply, because studies have shown that adding it in areas where fluoride levels in the water are low can reduce the prevalence of tooth decay in the local population.

Tooth decay is one of the most common health problems affecting children. Many people worldwide cannot afford the cost of regular dental checks, so adding fluoride can offer savings and benefits to those who need them.

However, concerns have arisen regarding fluoride's effect on health, including problems with bones, teeth, and neurological development.

10. Metals :- When a metal reacts with water, a metal hydroxide and hydrogen are formed. Calcium hydroxide is slightly soluble in water so once the solution is saturated, it starts to become milky as solid calcium hydroxide appear. The apparatus below is used to react calcium with water and collect the gas.

4.2.2 Biological parameters

1. Coliform :- Coliform bacteria are defined as Rod shaped Gram-negative non-spore forming and motile or non-motile bacteria which can ferment lactose with the production of acid and gas when incubated at 35–37 °C. Due to the limited ability of certain coliform bacteria to ferment lactose, the definition has changed to bacteria containing the enzyme β-galactosidase. They are a commonly used indicator of sanitary quality of foods and water. Coliforms can be found in the aquatic environment, in soil and on vegetation; they are universally present in large numbers in the feces of warm-blooded animals. While coliforms themselves are not normally causes of serious illness, they are easy to culture, and their presence is used to indicate that other pathogenic organisms of fecal origin may be present. Such pathogens include disease-causing bacteria, viruses, or protozoa and many multicellular parasites. Coliform procedures are performed in aerobic or anaerobic conditions.

Figure 6:- Coliform bottle before and after testing

4.2.3 Physical Parameters Are :-

1. **Temperature :-** Temperature is a physical quantity that expresses the degree of hotness or coldness of a substance. It is the manifestation of thermal energy, present in all matter, which is the source of the occurrence of heat, a flow of energy, when a body is in contact with another that is colder or hotter. Temperature should never be confused with heat.

Figure 7:- Temperature metre

2. **Taste and Odour :-** The senses of smell and taste combine at the back of the throat. When you taste something before you smell it, the smell lingers internally up to the nose causing you to smell it. Both smell and taste use chemoreceptors, which essentially means they are both sensing the chemical environment.

3. **Colour :-** Tintometer is a device to determine colour in water. The unit of colour measurement is TCU. 1 TCU is the colour produced by 1 mg of platinum cobalt in the form of chloroplatinate ions dissolved in 1 litre of distilled water.

4. **(S.S) Suspended solids :-** S.S comes from inorganic particles like :- silt, clay etc. Organic particles like :- plant fibre, algae etc.

5. **Turbidity :-** Turbidity is the measure of extent to which light is either absorbed or scattered by suspended material in water . it is not a direct quantitative measure of suspended solids .

4.3 Water quality standards

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 :- Parameters of water quality

No.	Characteristics	Unit	Acceptable limits	Cause of Rejection
1.	DO	ppm	4 - 6	
2.	Hardness	ppm	Soft water upto75 Moderately hard 75-150 Hard water 150-300 Very hard water above 300	
3.	TDS	ppm	0 < 500	< 2000
4.	pH		6.5 – 8.5	< 6.5 & > 8.5
5.	Temperature	°C	10° - 25°	

Table 3 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

4.4 Assessment of Pollution

1. Suspended Solid (S.S.) :-

Suspended solids is the amount of tiny solid particles that remain suspended in water and act as a colloid .

Suspended solids comes only surface water not ground water .

When suspended solids are left untreated , these can contribute to sewer pipe blockage and cause damage to other systems .

Figure 8.1 Sources of Pollution 1

2. Colour :-

It can be detected by necked eye , and it refers to age of waste water .

Waste water is usually gray or light brown .

Figure 8.2 Sources of Pollution 2

3. Turbidity :-

Waste water is normally turbid containing water from baths , pieces of papers , fruit skin , vegetable and etc .

4. Dumping of Garbage :-

Whole neighborhood of Ahar River (like :- Houses . Building and etc.) are dumping of Garbage .

Figure 8.3 Sources of Pollution 3

5. Construction Materials :-

In field we saw some construction material lying on one side.

Figure 8.4 Sources of Pollution 4

Figure 8:- Pollution sources

4.5 About Biodiversity :-

Birds :- **1. Heron**

2. Crow

3. Parrot

Figure 9:- Images of Birds

Animals :-

1. Cow
2. Dog

Figure 10:- Animals

Tree and Plants :-

1. Neem
2. Palm
3. Banana
4. Grass

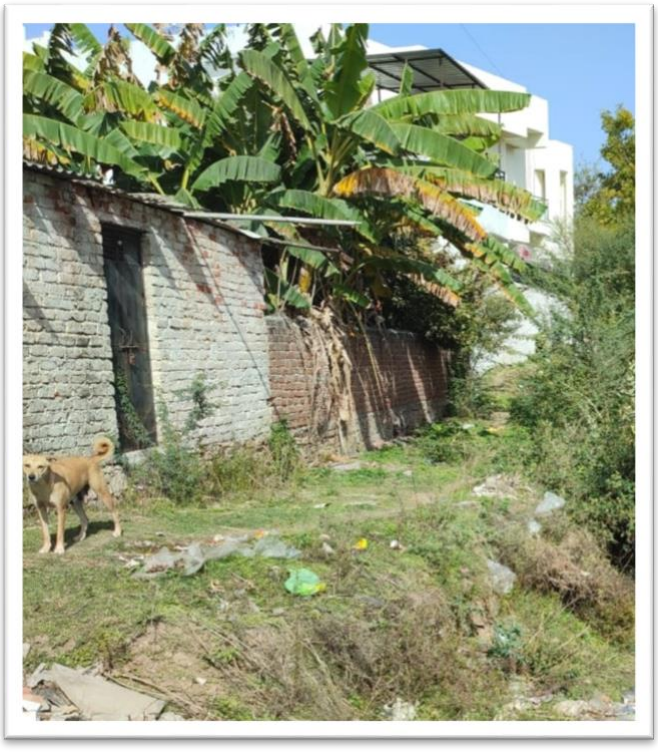


Figure 11:- Plant and trees

5. Training

5.1 Week 1 :- Introduction to water quality parameters - Class lecture

The internship programme was started with an some lectures which was held on 23 Dec 2021 at 11.00 am . In the environment lab at Vidhya Bhawna Polytechnic College. The class was conducted by Dr. Yogita Dashora and Er. Hardik Vashishtha . The Role of engineers and the need of internship etc. were discussed in the class. Those who attended the Class has registered for their one month internship programme . I, with my friend Mo. Asrar , Dharmesh and Pratibha has selected ‘Assessment of River Health’ as our internship topic. On the first day, I have been asked to submit Statement of Purpose (SOP) which describes why I had selected this topic. The first weeks was for Self-study. In the first week, I referred many books, and magazines to study about water quality issues, Its parameters and standards. The reference books include ‘Jal-tara’ in which we are study about water quality and it’s parameters . Based on my studies, I have Asked to prepare a report discussing the importance of water, Water quality testing, Water pollution, Water quality parameters and standards etc . I had submitted the report on 9 Feb 2022 .

In this week, I had asked to watch some videos , PDF and PowerPoint presentation which are helpful for my Studies. Hardik sir had sent me a lot of PDF which mention about the ‘Water Quality Parameters’, ‘Waste Water Characteristics’, ‘Water Quality Standards’, and ‘Bacteriological analysis of water’. I had gone through all these PDF . It was very informative. Here in this week I also visited the library section in our college with the help of friends . I Went through many research papers, and international journals which helped in my studies. Based on My studies, I prepared a presentation which described about all that I had studied. I also watched videos Such as ‘An introduction to water quality’, ‘How do we test water quality?’ and ‘Water quality: Sampling and analysis’ which gave a detailed description on water quality.

5.2 Week 2 :- Hands on traning with water quality testing kit

Figure 12:- Testing Kit

This week was for presentation. I met Hardik Vashishtha sir and had a detailed discussion on water quality. I Discussed about the presentations he had prepared. He introduced about the scientists related to this Field. The discussion was in the form of usual talk. I asked my doubts and Hardik sir cleared it well. He shared with me his experiences from the Udaipur water authority. The practical class was started on Wednesday afternoon itself. I was guided by Dr. Yogita Dashora and Er. Hardik Vashishtha , the Lab Chemist and her class was very interesting. During this week, I brought the water sample from my house and tested its physical and chemical parameters. (The methods are described are below) . I had tested Coliform , pH ,TDS , DO , Hardness , and Temperature etc. The testing of water samples was very interesting. I understood the problems in my water and decided to take remedial measures.

5.3 Week 3 :- Site selection & Sampling

First of all this week we went to a small part of Ahar river in which we took part of Navratna with siphon in which we saw a place in which work can be done easily. And after that we filled water in the sample bottle from there, then we went to the lab and checked its parameters . And talked about the result.

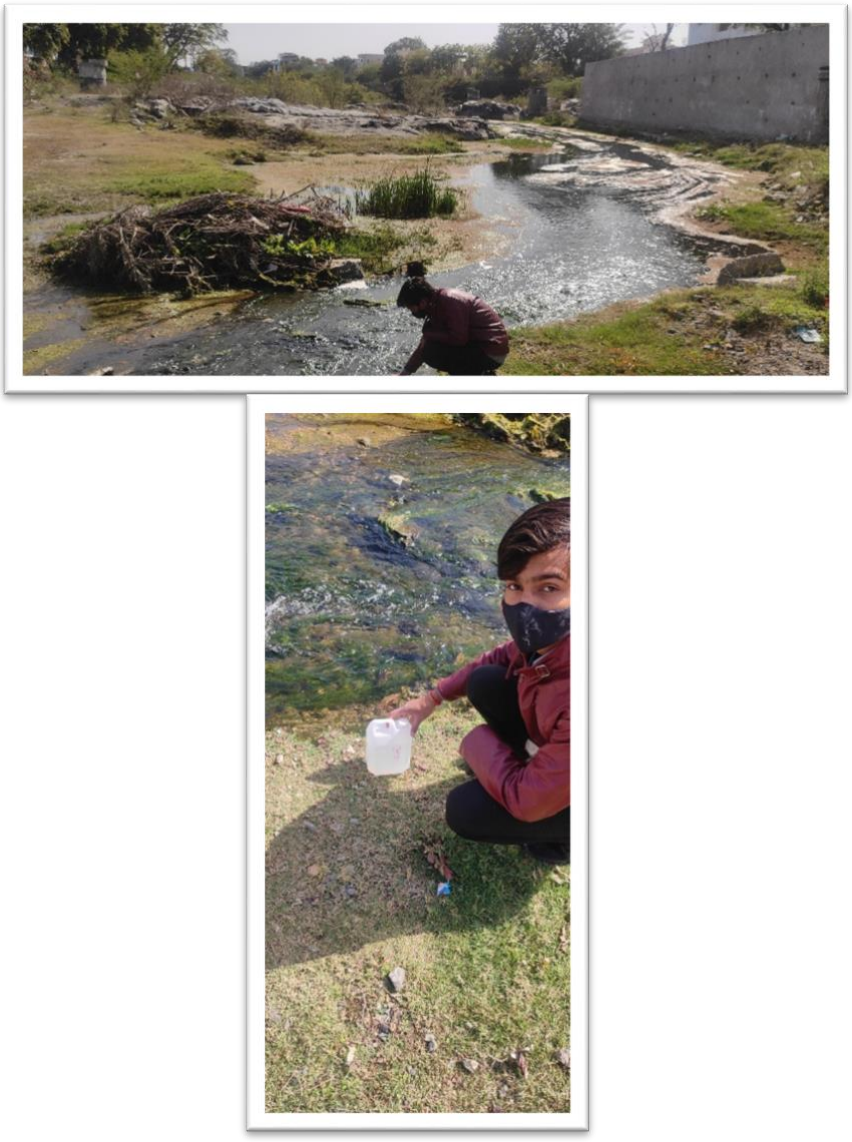


Figure 13 :- Sampling of water from site

5.4 Week 4 :- Water quality testing at lab and result and analysis

This week we first tested in the lab with samples brought from a small part of the Ahar river, in which we did these types of tests like DO, Hardness, pH, TDS, Coliform and Temperature, in which we took samples from different places. Wrote their different readings and got information about them, in which the teacher also helped us, which made us easy. And we did many such tests from different points from which we came to know what are the parameters of that water and then analysed it.

Types of Testing :-

1. DO
2. Hardness
3. TDS
4. pH
5. Coliform
6. Temperature

Procedure of Testing :-

1. **DO (Dissolved Oxygen)**

Equipment Required :-

A} DO Bottle

B} 1 ml syringe

C} Test tube

D} Manganous sulphate

E} Starch

F} Sodium thiosulphate

G} Alkaline potassium iodide

H} Phosphoric acid

Procedure :-

- Fill the DO Bottle without air bubbles and place the lid immediately within the water .
- Open the lid carefully and add 3-4 drops of manganous sulphate .
- And 3-4 drops alkaline potassium iodide .
- If content of DO Bottle overflows , remove the excess water by pouring in the waste collection bottle carefully (Replace the lid immediately) .
- Shake the bottle .
- Allow the suspension to settle for a minute .
- Add 6 drops of Phosphoric acid .
- Shake the bottle to dissolved suspension .
- Transfer 10 ml of solution into test tube .
- Add 1-2 drops of starch .
- Take 1 ml of sodium thiosulphate without air bubbles .
- Titrate till blue colour disappeare (if required take more thiosulphate to titrate).
- DO as mg/l = (volume of sodium thiosulphate consumed into 20) .
- About 5 mg/l DO is healthy for Aquatic life .

2. Hardness

Equipment Required :- A} Ammonia buffer

B} Sample bottle collection

C} 1 ml syringe

D} Eriochrome black-T powder

E} EDTA

F } Test tube

Procedure :-

- Take a test tube .
- Fill 5 ml of water sample .
- Add 1-2 drops of ammonia buffer raise the pH to 10 .
- Add a tinch of Eriochrome black-T powder .
- Take 1 ml of EDTA solution in 1 ml syringe without any air bubbles .
- Titrate till colour changes from wine red to blue . Note the amount of EDTA consumed to calculate the value of hardness in the water .
- Hardness as CaCo3 = (ml of EDTA consumed into 400) mg/l .
- Permissible limites of drinking water = 200-600 mg/l (BIS) .

3. TDS (Total Dissolved Solids)

Equipment Required :- A} TDS metre

Procedure :-

- First of all take sample water .
- Then put TDS metre into sample water .
- And note the reading .

4. pH :-

Equipment Required :- A} PH strep

Procedure :-

- First of all take sample water .
- Then put pH strep into sample water .
- And let dry for few minutes .
- Compare the colour with pH chart .
- And give the pH value .

5. Coliform :-

Equipment Required :- A} H2S strep

B} Coliform bottle

Procedure :-

- First of all we take sample water .
- Then we take coliform bottle insert sample water .
- And wait for 24 hours .
- And see the colour of water .

6. Temperature :-

Equipment Required :- A} Thermometer / TDS metre

Procedure :-

- First of all we take sample water .
- Then TDS metre into sample water .
- And note the reading in C° .

6. Results and Discussion

Table 4 :- Reading of tested water sample

No.	Test's	Reading	Acceptable limits
1.	DO	10	4 – 6 ppm
2.	Hardness	720	Soft water upto75ppm Moderately hard 75-150ppm Hard water 150-300ppm Very hard water above 300ppm
3.	TDS	726	0 < 500 ppm
4.	pH	7	6.5 – 8.5
5.	Temperature	21.1°	10 - 25 °C

1. **DO:**- 10 PPM

   The DO is not within the limits so that is not good for health .

   The dissolved oxygen is high so It is not good for Aquatic animals and plants .

2. **pH :-** 7

   The pH is within the limits so it is good for Health .

3. **Hardness :-** 720 mg/l

   The Hardness is do not within the limits so It is harmful for health .

4. **Coliform :-** Bacteria are present

   The bacteria is present in a sample water .

7. Conclusion

A 400 m stretch of Ahar River near Syphon Choraha was assessed for water quality, bio diversity and ecological health. Water quality testing was done to find out if it is suitable for drinking or not good for health. In this assessment we performed several experiments of water quality at field site using water testing kit. In this internship we learned about testing of various parameters of water quality and what are advantages of water quality assessment. This assessment has helped us to learn about assessing, measuring and surveying about biological and ecological health of stream with innovative ideas, set testing rules and imagination.

We have measured 6 parameters related to water quality and we compared them with the standards permissible limits given by Indian standard 10500 - 2012, Out of which Dissolved Oxygen, Hardness and Total Dissolved Solids were more than the permissible limit for drinking water. So it can be concluded from the results obtained by water quality testing of Ahar river water near Syphon Choraha it is not suitable for drinking. And we also assessed about biodiversity there, we have seen different species of animals, birds, plant and trees there. As a part of this internship we have also documented pollution due to dumping of garbage, plastic waste, sewage draining from houses directly into the river.

8. References

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