



# ANALYSIS OF DRINKING WATER IN RURAL FRINGER AREA OF KARANJA TALUKA

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**Abstract:** Ever since there is a living organism in existence on the earth, water has been the main thing for survival. Not only is it an essential thing, but also for consuming, watering, manufacturing, and many other purposes in fields. Humans are continuously polluting the water by dumping the waste into it with no environmental care. The Package Water Treatment Unit is design for drinking and irrigation through guidelines of the Bureau of Indian Standards and Food and Agricultural Organization. The PH, EC, TDS, TH, Calcium, Magnesium, Sodium, Potassium, Chloride, Fluoride, Sulfate, and Nitrate variables were considered. The groundwater samples were classified into ten categories Bore well and dug well. The results are discussing that the groundwater quality is poor to fair and the majority of samples have marginal water quality for drinking. The groundwater quality is quite good for irrigation and it ranges from fair to good type with maximum samples falling in the fair category. In the study area, the groundwater quality is considerably affected and found helpless in the pre-monsoon season due to intensive agriculture and anthropogenic activities. In the pre-monsoon season, many groundwater samples are found unsuitable for drinking. In the study area, few aquifers are found to be problematic and thus limiting their use for drinking and irrigation use. The Package Water Treatment Unit is an effective tool to assess the groundwater quality and communicate the health of water to multiple users. It gives precise results and water quality report in an easier way to the policy and decision-makers. Finally, the study confirmed that the groundwater quality is influenced by agricultural activities and an appropriate water management plan is essential to nurture precious groundwater resources.

**Index Terms – Groundwater Quality, Analysis of Water, Advanced Treatment**

## 1. INTRODUCTION

Life without water is not possible and water is the most important part of life after the air. In urban and rural parts of the world where surface water is scarce and is also utilized for agriculture, groundwater plays a significant role as the source of drinking water for many people. The majority of groundwater starts as meteoric water that is precipitated as rain or snow. Generally, groundwater quality depends on the amount of rain recharge quality of water, rock water interchange, and place of the residence time of water. The rate at which groundwater is being depleted has recently come to light as a worrying issue. The cause of this is groundwater extraction for domestic, commercial, and drinking purposes. This paper reports the study of ground water analysis and filtration of water through packaged filtration unit in it and as a result, we obtain the parameters within the limit.

### 1.1 STUDY REGION

Karanja is one of the major talukas in Wasim District of the Maharashtra state of India. The lifestyle of the people of this is good because it has numerous facilities including healthcare, education, water supply, sanitation facilities, business, infrastructure, electricity, employment opportunities, etc. Karanja City is mostly tackling surface water which will be uplifted from the Adan dam utilizing inspection galleries and jack well-constructed on the bank of the Adan River. Karanja has 91 Gram panchayat and 126 villages out of these 22 villages are getting water from Regional Rural Water Schemes 10 villages do not have a water scheme or it will non - function permanently. The Remaining villages of Karanja taluka have water supply schemes mostly on dug well or small water supply schemes on bore well.

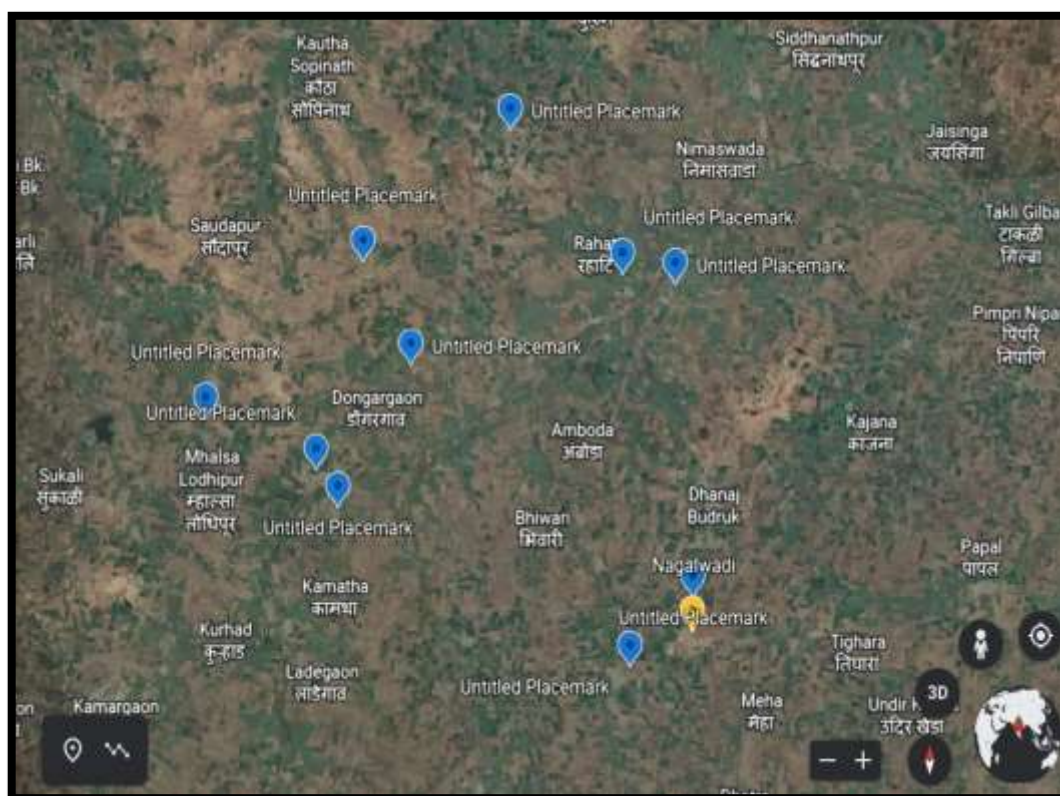


Fig. 1 Study Area

## 1.2 OBJECTIVES OF STUDY

- To evaluate the characteristic of drinking water collected in Karanja Talukas rural area in pre-monsoon season.
- To suggest appropriate recommendation and good practices to local bodies.
- To overcome issues and provide alternate solutions for drinking water.

## 1.3 CONDITIONS AFFECTING GROUND WATER QUALITY

- Impacts due to agriculture.
- Use of fertilizers
- Animal Husbandry activities.
- Deforestation of woods.
- Temperature.
- Pollution due to industrial effluents.

## 2. MATERIALS AND METHOD

For the purpose of this study is to determine the ground water quality of this region, the samples were collected during the pre-monsoon season from the adjoining areas of the Karanja taluka. The spot sampling was done of all the areas mentioned below. The temperature, ph, electrical conductivity, TDS, TSS, Iron, Fluoride were determined by the laboratory analysis of the collected sample using volumetric and spectrophotometric methods.

Table No.1 Rural Sources of Wells, Tube Wells

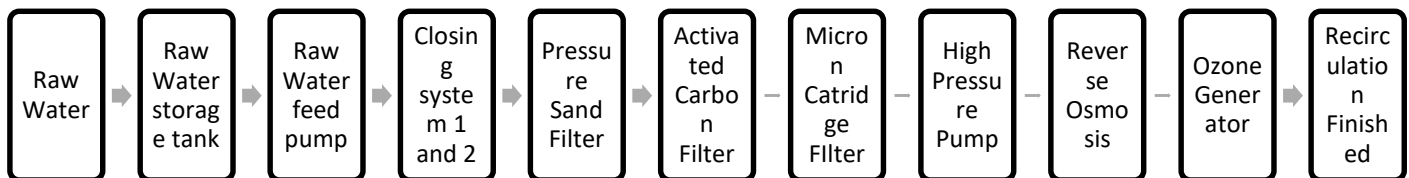
Sr. No	Name of Source	Location	Type of Source
1	Kamath	Water supply	Open well
2	Belkhed	Kishore wankhede house	Borewell
3	Dongergaon	In zopadpatti water supply	Open well
4	Bhamdevi	Water supply	Open well
5	Hinganwadi	Water supply	Open well
6	Rahati	Sarwajanik	Open well
7	Kamatha	Water supply	Open well
8	Mhasala	Water supply	Open well
9	Dongergaon	Water supply	Open well
10	Rahati	Water supply	Borewell

11	Nagalwadi	Baudhvihar	Borewell
12	Nagalwadi	Vasudevraoborkar	Borewell
13	Dhanajkh.	Bharat nirman water supply	Open well
14	Dhotrajaha	Water supply	Open well
15	Dhotrajaha	Water supply	Open well

## 2.1 ADVANCED TREATMENT FOR WATER (PACKAGE WATER FILTER SYSTEM)

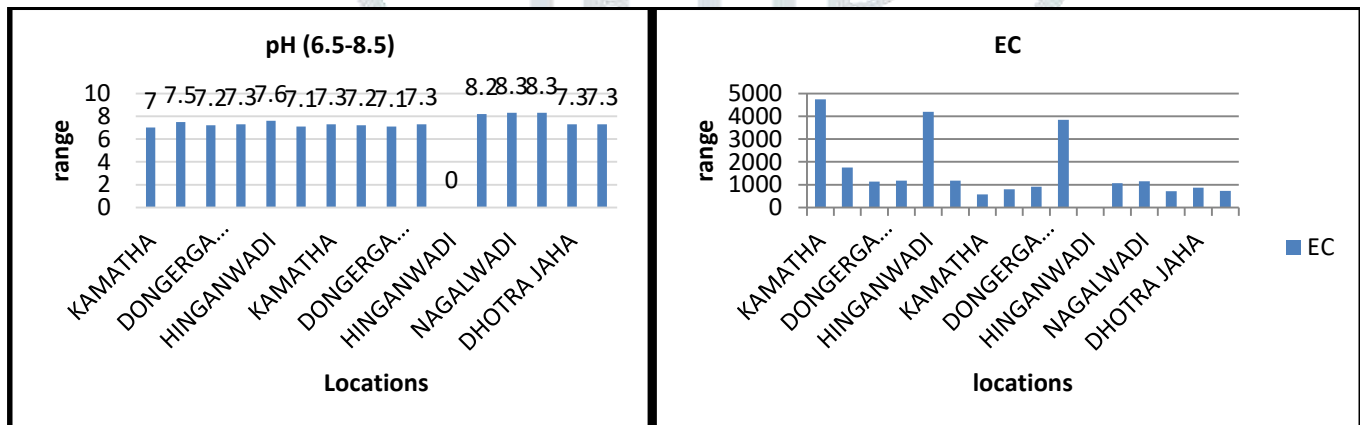
The advanced filtration system to be used is the Package Water Filter System. They are used in rural areas where the population ranges from 100-500.

### ❖ Treatment Steps



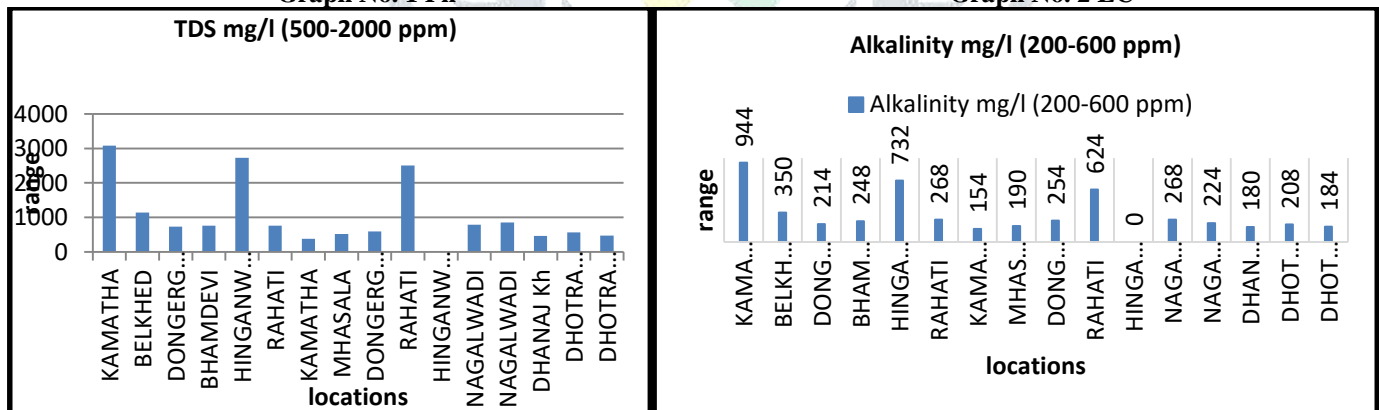
### 3. RESULTS AND DISCUSSION

### 3.1. PRE- TREATMENT SAMPLING PARAMETERS



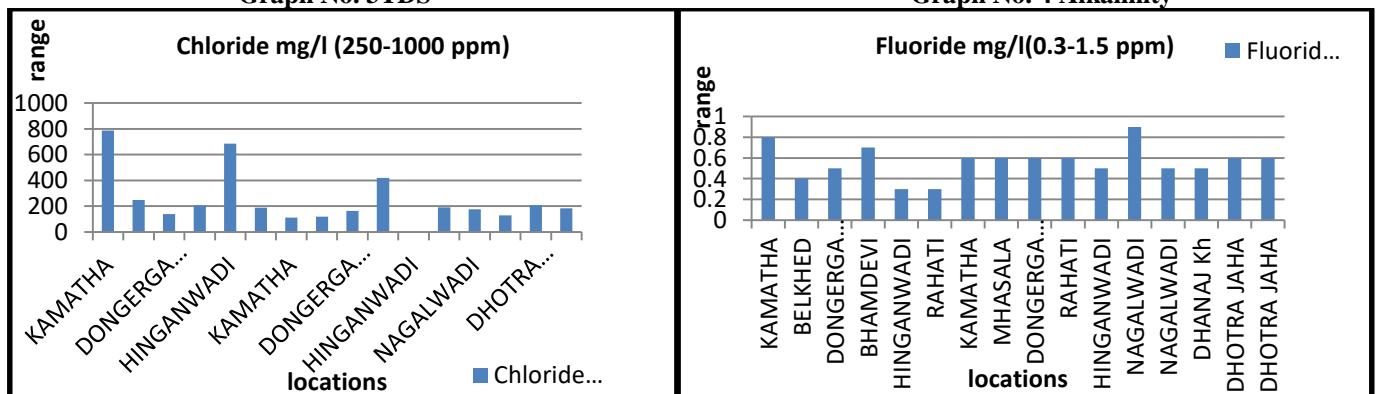
**Graph No. 1 Ph**

**Graph No. 2 EC**



**Graph No. 3TDS**

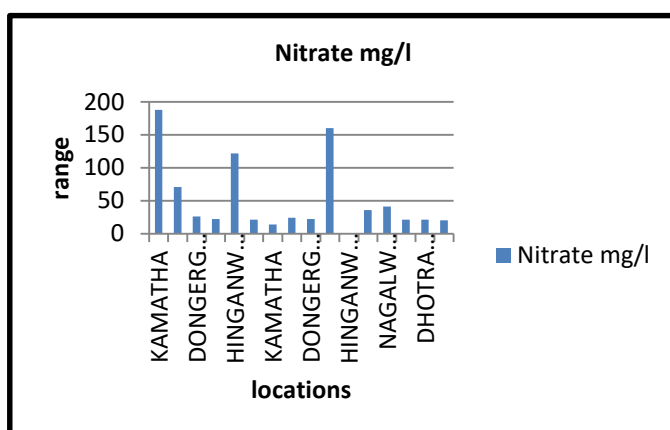
### Graph No. 4 Alkalinity



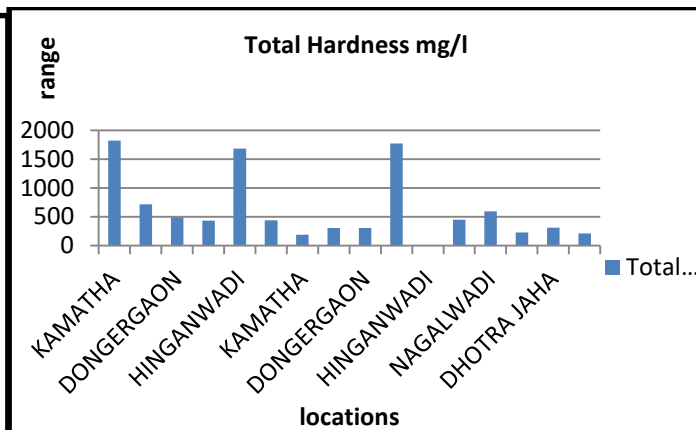
**Graph No. 5Chloride**

### Graph No. 6 Fluoride

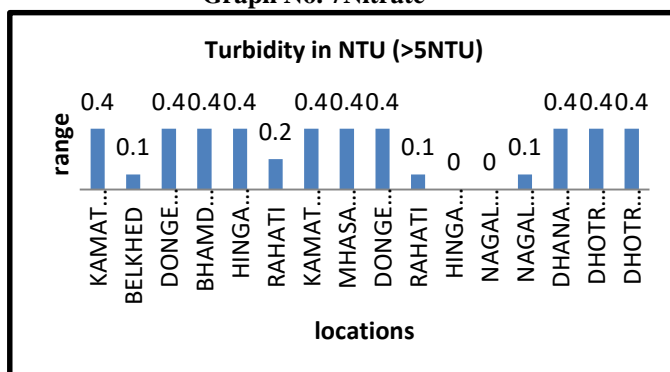




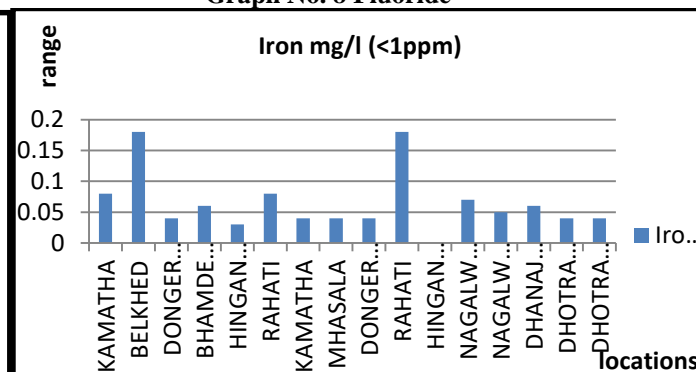
Graph No. 7 Nitrate



Graph No. 8 Fluoride



Graph No. 9 Turbidity



Graph No. 10 Iron

### 3.2 POST- TREATMENT SAMPLING PARAMETERS

Table No.2 Post Treatment

Sr No	Parameter	Turbidity in NTU (>5NTU)	pH (6.5-8.5)	EC (1500 uS/cm)	TDS mg/l (500-2000 ppm)	Alkalinity mg/l (200-600 ppm)	Chloride mg/l (250-1000 ppm)	Fluoride mg/l (0.3-1.5 ppm)	Nitrate mg/l (45 ppm)	Sulphate mg/l (200-400 ppm)	Total Hardness mg/l (200-600 ppm)	Iron mg/l (<1ppm)
1	SAWARGAON BARDE(Pre-treatment)	4	8	1200	2200	630	730	0.8	188	350	510	0.15
2	SAWARGAON BARDE (Post- Treatment)	0.1	7.5	430	240	210	248	0.1	71	112	180	0.02

From the above data the pre-treatment water having some of the limits exceeded and after the filtration of water with packaged filtration unit the results of the post treatment are under the permissible limit.

### 4. Conclusion

This present investigation shows that the use of the package filtration is efficient and suitable for the treatment of source water collected in pre-monsoon. The water samples from the rural area of the Karanja taluka in the pre-monsoon period are critically examined by performing ten types of examination tests. The Advanced package treatment plant is suggested to control the heavy metal such as nitrate, Total Hardness, Electrical Conductivity, and Alkalinity to the desired limit.

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