
Qualitative Analysis of Groundwater from Nandgaon Peth Village District Amravati, Maharashtra

¹Jaishree S. Karmore, ²Rajni Kant

^{1,2}Department of Mining Engineering, Ballaepur Institute of Technology, Ballarpur- 442701, Maharashtra State
Email: jayakarmore@gmail.com, rajnikantlog@gmail.com

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Abstract

The water quality of Nandgaon peth village of Amravati city, Maharashtra was studied for physical chemical and biological parameter like temperature, pH, conductivity acidity, Hardness, total dissolved solid chloride was found that water sample collected from Nandgaon peth village dug well sample. Most of the parameters, not observed within the permissible limits as describe by various agencies. The quality of water was useful for drinking and agricultural purposes. Water quality determines the goodness of water for particularly purpose. Water quality test give will information about the health of the waterway. The change of quality of water can be seen by testing water over the period of time. Parameter may be tested include temperature, Alkalinity, Acidity, CO₂, PH, Hardness, calcium ,and calcite chloride. An assessment of the aquatic micro invertebrates can be provided and indicates water quality of groundwater.

Keywords

Ground Water Quality, Biological Effect, Physico- Chemical Analysis

Introduction

Water quality is the term used to describe the chemical, physical and biological characteristic of water with respect to its suitability of a particular use of drinking and agriculture [15]. Nandgaon Peth village of Amravati District is suffering from shortage of groundwater due to lowering of water table, excess extraction of the same for domestic and agriculture purposes and localized occurrences of groundwater salinity [1]. The area is a small part of Purna and Pedhi river basin. The aim of the work is to interpret the groundwater condition, water quality and to prepare a detailed hydro-geological report for management of groundwater resource of the area [12]. The study was planned during the period of October 2017 to June 2018. The generated water use for irrigation of the field and vicinity of stream water [9]. These water characterize by different physic-chemico and biological parameters comparing the observation with standard prescription by the Central Pollution Control Board (CPCB) and World Health Organization (WHO), with regards quality of water for domestic and agricultural concerning parameters were pH , acidity, alkalinity, CO₂, chloride, calcium, hardness. All the parameters are independent, the water quality show the majority of the parameters are found within non-permissible limit, increasing the demand of water for irrigation exceed the available water supply. The present investigation is concerned with the routine practice of domestic and agricultural source of water [13]. Therefore, necessary to carry on physical- chemical and biological analysis of domestic and agricultural well water quality. The water sample was made by composite sampling method . The consecutive sampling site are at a distance of 2 kms from each others . Population of Nandgaon Peth villages are suffering from shortage of ground water. Need of water can't be fulfill by the only source of groundwater for entire population. The level of ground water decreasing in this duration of October 2017 to June 2018. The domestic and agricultural problems are created to the population in this villages [7].

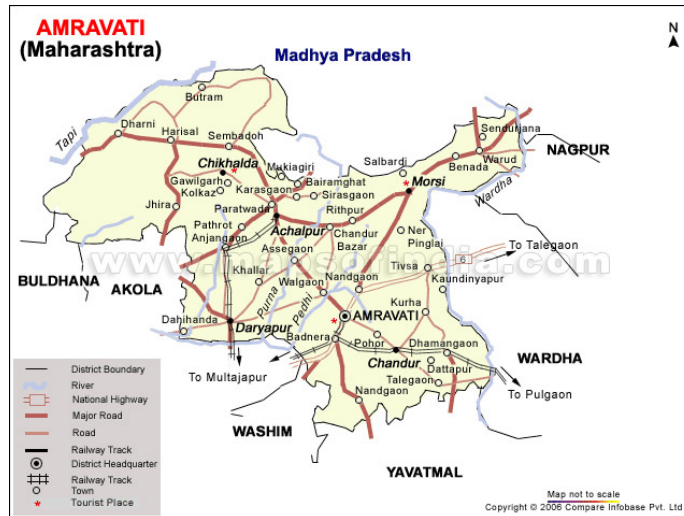


Fig 1: Map of the Amravati District Showing Location of Nandgaon Peth Village

Stratigraphy

The Purna river alluvial and Pedhi river basin is one of the intracratonic basins of India. Mainly filled by sand, siltstone, clay, boulder etc. the basin extends roughly in E-W direction for about 170km while its maximum width is 55 km along. The other end of the basin is a part of foot hills of Satpura and mostly demarcated by structural feature.

The sediment are also of the coarse grained nature i.e boulder beds. However, a general decrease of grain size is noticed toward the south. The entire basin is mostly surrounded by Deccan Trap. A few of the patches of Gondwana and Lameta are exposed in extreme.

Following table shown by Stratigraphy of Nandgaon Peth village.

General Geological Succession:

Age	Formation	Lithology
Pleistocene Boulder layer	Alluvium	Soil, Silt, Clay, Recent
.....Unconformity.....		
Upper Cretaceous To Eocene	Deccan Trap	Basalt
.....Unconformity.....		
Upper Cretaceous	Lameta	Limestone Clay, Sandstone
.....Unconformity.....		
Middle Cretaceous To Permian	Gondwana super group	Sandstone
.....Unconformity.....		
Proterozoic	-----	Feldspathic Gneiss

Table 1: Geological Succession of Village

Location of the Area

The study of area comprising of Nandgaon Peth village in Amravati District lying between Latitude 20.9927⁰ to 21.0217⁰ N and longitude 77.8379⁰ to 77.8239⁰ E and is covered in survey of India. This village lies at about 14 km north to the District headquarter Amravati (fig 1).

Methodology

Methodology followed includes collection of data on hydrology, well inventory and recharge condition, types of aquifer and depth of weathering. All this information were collected from ground water survey and development agency (GSDA) Amravati the laboratory data include determination of physical and chemical

parameters of 16 samples covering the entire area in a uniform manner. The physical evaluation includes. PH , and temperature whereas, later incorporates acidity , alkalinity, CO₂ , chloride, Calcium and hardness of water , temperature [2]. The analytical data and its graphical representation are provided in the table 2 and fig. 2 respectively. Sample collected by different places of Nandgaon peth village and analysis in different parameters are shown the result in table no. 2.

S. No .	Name of villages	Water table height (m)	pH	Temp. t ^o	Acidity mg/lit	Alkalinity mg/lit	CO ₂	Chloride mg/lit	Calcium mg/lit	Hardness mg/lit
1	Asaramandir	4.22	7.04	27.6	152	298	132	176.5	32.08	150
2	Telipura	5.6	7.02	28.6	60	267	56.8	185.7	16.07	173
3	Yawalpura	5.9	7.02	29.9	101	256	88	134.8	32.05	181
4	Gajanannagar	11.34	7.03	27.5	83	287	70.8	128.8	48.08	151
5	Bhuskale form	7.9	7.07	28.7	40	193	35.7	160.4	20.04	162
6	Chale form	7.19	7.01	26.8	53	160	44.5	113.8	16.07	150
7	Rathi form	7.14	7.23	26.7	80	182	70.4	142	12.08	150
8	Bhasmeform	4.7	7.36	27.2	85	200	70.3	106.5	57.13	141
9	Near police station	3.65	7.32	26.5	187	130	154.8	177.6	190	180
10	Gauri restaurant	1.55	7.05	28.9	142	254	124.2	156.3	174	190
11	Agrawal land	2.65	7.27	26.8	153	250	132.5	181.7	179	168
12	Borwar farm	4.75	7.25	26.6	93	235	79.2	106.8	134	170
13	Wankhade farm	3.3	7.42	27.4	56	200	44.2	134.7	120	130
14	Bobade Farm	2.78	7.06	26.9	90	160	70.4	184.9	12.09	122
15	KhanapurSquar	8.6	7.48	27.9	134	244	114.4	165.5	8.04	160
16	Bharat Petrol Pump	3.8	7.65	26.7	138	240	79.3	120.8	16.04	121

Table 2: Well Inventory Data and Analysis Data of Water Sample

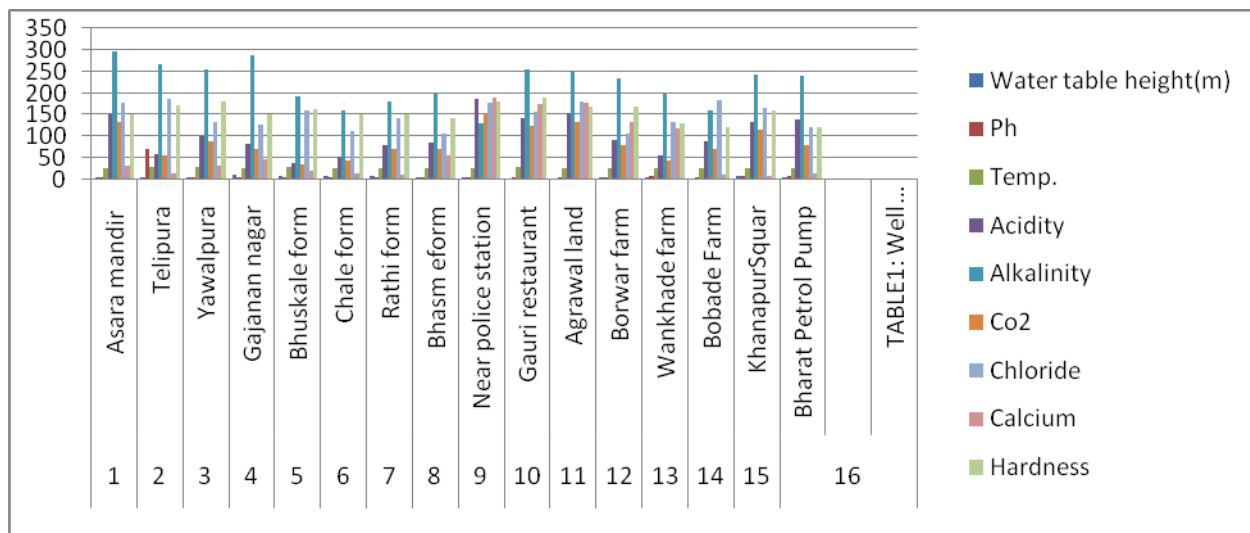


Figure 2: Histogram of Various Parameters Determined for Groundwater Samples Collected from the Study Area

Result and Discussion

Geological survey has been carry out to suggest the artificial and natural groundwater recharge structures suitable for host rock of sedimentary terrain. According to desalting different element in water samples. Chemical and physical changes are showing in parameters. Physical and chemical parameters of groundwater collected in the water samples for 16 dug wells. The highest p^h value is 7.655 and lowest value is 7.01. The temperature of the

water ranges from 26.5⁰ - 29.9⁰. Highest value of chloride observed is 185.7 mg/l, whereas, lowest is 106.8 mg/l. Calcium varies from 190mg/l to 8.04 mg/l Showing very high variation. Similarly, hardness ranges from 190 mg/L to 121 mg/l Indicating irregular trend because of variable nature of the host sediments. These values are exceptional high as compared to the standard recommended by [3]. These deficiencies in the water resources of those areas, the people are exposed to different type of diseases like blue baby syndrome, dysentery, jaundice, typhoid, kidney stone, etc.

Conclusion

The ground water in the study area are fluctuates in weathered jointed and fractured portion of dug well are shown by physical and chemical variation in water samples. Its indicating irregular trend because of host sediment. The source of drinking water are not good for people its harmful and exposed to different type of diseases like blue baby syndrome, dysentery, jaundice typhoid , kidney stone, etc.

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