International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878 (Online), Volume-8 Issue-2, July 2019

Evaluation of Bacteriological Quality Characteristics of Drinking Waters of few Village Sources in Coastal Areas of Bhimavaram region at West Godavari District, India

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Abstract: ***The essential requirement for human life to exist is water. After to the air, the other It has in various sources such as canals, ponds, rivers, lake, streams, reservoirs and etc. human settlers on the banks of major river systems at the earliest and has need water for drinking, bathing, cooking, laundering, and many more. But with the advancement of civilization the demand of water supply grately increased and now has such a stage to come that without well organized public water supply scheme, it is not possible to move the present human life and the develop the towns. Earlier has importance on quantity. And now today importance of quality comes to be recognized gradually in the later days. In this present study, numbers of water samples were collected various water supply schemes from 20 villages of bhimavaram region, West Godavari district, Andhra Pradesh. The drinking water samples are analyze its biological quality and it was found that some of the samples in the study area are exceeds or above the standard limit or permissible limit. On over all based on biological quality few drinking water sources located in and around different areas of Bhimavaram was seriously polluted by harmful bacteria and must need few treatment methods. So that need of attention not to use of supplied water and need to give suggestions and remedial measures to concerned local authorities of various disinfection treatment technologies or control measure to make supplied water free from pathogenic Bactria. Quality Assessment of drinking water from various sources (S Malhotra, S.K., Sndhu (2015), especially bacteriological quality should be periodically planned regularly to avoid and control waterborne diseases***

Keywords: Protected Water Supply, Over Head Tank, Drinking Water, Harmful Bacteria, Pre-Monsoon, Post Monsoon.

I. INTRODUCTION

Revised Manuscript Received on 30 July 2019.

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The river Godavari is a perennial and one of the biggest river. The river Godavari and its branch river flow through the states of Maharastra, Telangana, Karnataka, M.P., Orissa and A.P. in India. The river Godavari basin extends over with an area of 0.31 million Kms, River Godavari starts near Nasik about 1067 MSL and moves with a length of 1465 Kms before joining Bay of Bengal. At Dowleswaram, the river, divides into itself two branches named as Gowthami and as Vasista. Dividing the central area into an island, just 2.2 Km before joining Bay of Bengal, part of the river Vasista splits again into two parts, Vasista and Vainateyam, creating one more small island. Godavari is the major source of irrigation in the West Godavari district. In order to irrigate the delta area Sir Aurthur Cotton barrage was constructed across Godavari between 1850 and 1874 A.D. Due to this the canals which draw their supply from the Godavari have converted the delta area into one vast expanse of paddy fields construction of ayacut across the river and improvement of embankments of the river and irrigation canals and other developments made West Godavari district, an excellent agricultural land and rice bowl of Andhra Pradesh and India. The study area is the town of Bhimavaram, located in the interior of Godavari Delta region in West Godavari District, Andhra Pradesh, India. It is bout 20 km. from the Bay of Bengal. It is one of the largest town in West Godavari District and is divided into two parts i.e., the Eastern part, called as "One Town" and the Western part called as "Two Town". These two towns are separated by Enamadurru Drain, which flows through Bhimavaram Town and joins Upputeru River at 29th mile straight cut of Upputeru. Irrigation in West Godavari is carried on through a network of canals, namely main canal, the Eluru canal, the Kakaraparru canal, the Narasapuram canal, the Bank canal, the Attili canal, the Junction canal and the Gostanadi Velpur canal, is the main source of surface water for Bhimavaram people. The total length of these canals is about 369 Kms. cultivating about 5,19,782 acres of land in the district .welfare of public health. The drinking water schemes add disinfectants to destroy microorganisms which cause diseases in human beings due to Bacteriological contamination.

II. DESCRIPTION OF THE STUDY AREA

Quality assessment of samples of Present study area is about 20 villages, covering Bhimavaram region, W.G.

District, A.P. area is near to the River Godavari west , it falls into the Bay of Bengal. W.G. district was formed on 1925 Fifteenth of April, with Machilipatnam as its headquartering. The entire study area is geographically a plain land. It is situated within the geographic co-ordinates of $16^{o}32^{1}00$ northern latitude and $81^{o}32^{1}00$ eastern longitude, and spread over 25.60 sq.kms. Broadly the area is covered by black-cotton soil exhibiting the behaviour of clay soil. The soil has an extremely large surface area. It has fine pores, poor drainage and poor aeration. It has the highest water holding capacity. It is suitable for agriculture and aquaculture. It has a fertile land assured of irrigation facilities with less natural hazards.

Climate

The climate of Bhimavaram resembles the average climate of West Godavari district which is tropical. It has three distinct seasons i.e., summer (March to June), rainy season (July to November) and winter (December to February). Storms and depressions originate in the Bay of Bengal during the post-monsoon season. In the summer season, a thunder storm with heavy precipitation is likely to occur in the evenings. December to February is the winter season and foggy weather in early mornings may occur. The weather is pleasant from December to February. Throughout the year, the climate is characterized by humidity. Though the summer is oppressive, the seasonal rainfall is generally good. During severe cyclones, which occur at least three or four times in a year, the wind speed may be as high as 60 kmph .

Temperature

May is the hottest month of the year recording maximum of 450C and December and January months are the coldest months of the year and recording a minimum of 18°C.

Demography

The Bhimavaram Town has become commercial center and attracts the surrounding people to migrate, seeking better employment opportunities, and better education facilities.

Aquaculture

With a 16 kms. long coast and a number of other perennial water sources, fishing has become an important non-agricultural industry. The sources of fishery are the Godavari River, the Kolleru Lake, the Upputeru besides canals and a good number of tanks. The aquaculture industry has made deep inroads in the district Recently, Prawn culture was also started in many areas vigorously. With flourishing fish and prawn processing industries, a number of ancillary units like Ice plants are of recent emergence on a large scale in and around Bhimavaram. It is not only an agricultural town but also aquaculture producing town in our country and it is next to Cochin in exporting aquaculture products.

Drinking water sources

Gostanadi-Velpuru canal of the Godavari River is the main source of drinking water for the people of Bhimavaram. Besides, people also use openwells, ponds for a variety of purposes like drinking, washing, bathing etc. The municipal and rural water supply administration is providing tap water. Canal water is pumped to an overhead tank, from which the water is provided to individual houses through taps

Material

Drinking water available to people of Bhimavaram in form of canal water, pond water, domestic tap water through Protected water supply scheme, are given importance for study.

Sampling and Analysis Technique

Drinking water samples are collected from various 20 village areas, which can cover the Bhimavaram region, West Godavari district. The samples were collected in two different seasons of the year

1. Pre-Monsoon
2. Post Monsoon

III. OBJECTIVES OF THE STUDY AREA

- Assessment of Bacteriological Quality Parameters for Drinking Water at study area and
- To give suggestions and remedial measures to concerned local authorities of various disinfection treatment technologies or control measure to make supplied water free from pathogenic Bactria

IV. METHODOLOGY

For the Biological Quality assessment of drinking water, examination of E. Coli , which is very important and fundamental parameter of the indicator to know the weather, the water is biologically fit or not. Presence of E .Coli in drinking water may cause stomach pain and may have potential health risks. So that, it very necessary to checked out the E. coli may contain or not. And it should be zero or absent for drinking water supply. In this assessment, sample are collected according to American Public Health Association (APHA 2005) , (Methods of standards for examination waste water and waters) and analyzed the microbial parameters (MPN/100 ml) in two different durations of pre monsoon and post monsoon of 20 different villages of bhimavaram region.

V. RESUTS AND DISCUSSION

The results showed, quality of the drinking water varies from moderate contamination to large extent of contamination. Many of areas samples were observed and found presence of pathogenic bacteria. The temperature of many of water samples was are between 18^{O}C to 21^{O} C. Pre Monsoon (Jan.-July) sampling results of bacteriological test at the Study area of Bhimavaram region are shown in Table 1., Post Monsoon (Jan.-July) sampling results of Bacteriological test at the study area of Bhimavaram region are shown in Table 2. And Graphcal representation of Post Monsoon and Post-monsoon sampling results at 20 different villages - Bacteriological test at the Study area of Bhimavaram region shown in Figure 1.

Table 1. Pre-Monsoon (Jan.-July) Sampling Results - Bacteriological test at the Study area

Sl.No.	NAME OF THE VILLAGE (Sampling Collection)	H_2S VIALS	MPN 100ml
1	LN Puram	Negative	5
2	SC Bose Colony	Positive	12
3	Anadapuram	Negative	3
4	Gandhi Puram	Positive	14
5	Malavanithippa	Positive	10
6	Bondada	Negative	5
7	Jakkaram	Negative	8
8	Vempadu	Positive	10
9	Pedamiram	Positive	11
10	Kopalle	Negative	7
11	Tokatippa	Positive	12
12	Gutlapadu	Negative	1
13	Nagidipalem	Negative	2
14	Dayyalatippa	Negative	5
15	Dirusumarru	Negative	6
16	Taderu	Negative	7
17	Betapudi	Positive	11
18	Pedagaruvu	Positive	14
19	Vempa	Negative	6
20	Yanamadurru	Negative	8

Table 2. Post Monsoon (Aug.-Dec.) Sampling Result Bacteriological test at the Study area

Sl.NO.	NAME OF THE VILLAGE (Sampling Collection)	H_2S VIALS	MPN 100ml
1	LN Puram	Positive	11
2	SC Bose Colony	Positive	19
3	Anadapuram	Negative	2
4	Gandhi Puram	Negative	1
5	Malavanithippa	Negative	5
6	Bondada	Positive	10
7	Jakkaram	Negative	6
8	Vempadu	Negative	7
9	Pedamiram	Positive	12
10	Kopalle	Negative	2
11	Tokatippa	Negative	8
12	Gutlapadu	Positive	8
13	Nagidipalem	Negative	4
14	Dayyalatippa	Positive	11
15	Dirusumarru	Negative	4
16	Taderu	Negative	2
17	Betapudi	Negative	5
18	Pedagaruvu	Positive	12
19	vempa	Negative	9
20	Yanamadurru	Positive	15

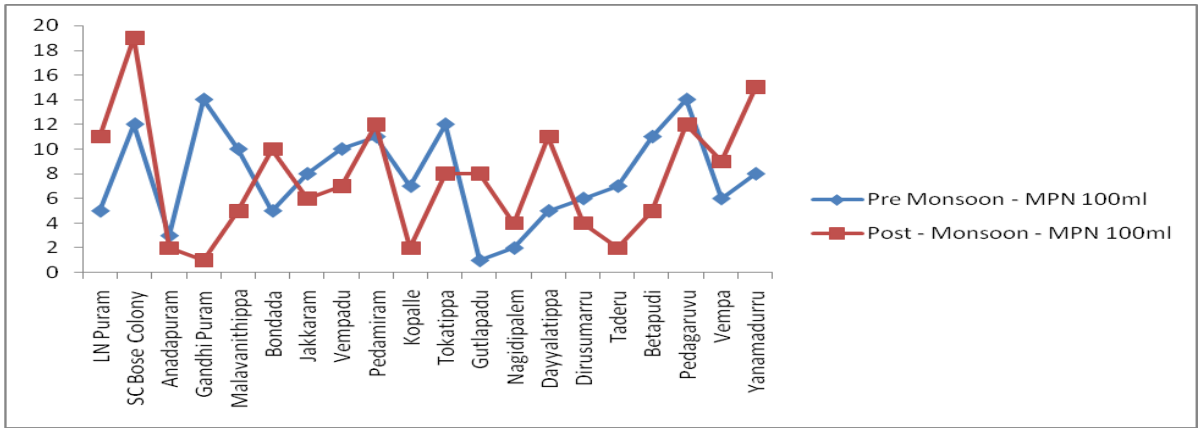

Figure 1. Graphical representation of Pre-Monsoon and Post-monsoon Sampling Results of various villages Bacteriological quality test at the study area

VI. CONCLUSIONS

- In few study village of SC Bose Colony , Gandhi Puram, Pedamiram, Tokatippa, Vempadu, Malavanithippa, Bondada, Jakkaram, Betapudi, Pedagaruvu, Vempa Yanamadurru, LN Puram are has high amounts microorganisms, So., it seems to unfit for drinking purposes and needed treatment
- And reaming village area has less number of infectious bacteria. Its seems contamination or water gets polluted at the time of Storage and transportation. i.e. thought distribution networks leakages, etc. So that those areas waters are also needed at least some preliminary treatment before utilization
- Most importantly the drinking water in few places was observed with enrichment of nutrients particularly nitrates due to dumping of animal manures by the aqua culturists who made the ground water highly contaminated.
- Based on the overall quality reports, there is an emergency to treat and to control pathogenic Bactria before reached to public. It's all can be achieved by proper continuous assessment of water samples i.e. periodically , checks of distribution networks systems, storage tanks, finding out corrosion of pipes may appears, etc.
- If the importance of people places or quality expectation changes of their life supporting habitats are not acknowledge, there is a life risk with a little period of prosperous growth of aquaculture industry based on intensive ecosystem exploitation, and it may turn into severe environmental, social economical and ecologically problems of conflicts. The management of sectoral aquaculture for short term profits does not recognize the interrelation between resource use, environmental impact and working of ecosystems. There is huge potential for recycling of resources and reduction of waste and pollutants in aquaculture which is suggested for better life and better future

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