Assesment of Ground Water Quality Near Muncipal Waste Dumpyard in Kanuru, Vijayawada, Andhra Pradesh, India

Y. Raja Venkata Sabith Chandra, A. Aravindan

Abstract: ***The municipal solid waste is defined as the waste that is generated from the residential, commercial as well as industries. The waste may be in the form of organic or inorganic wastage. In the present study is given on determining the ground water quality as well as the level of toxicity. By using the statistical and phenomenological relationships; we can easily monitor the sustainable municipal landfill with results samples of groundwater, leachate, solid waste were analyzed to determine the impact of leachate on groundwater. Results show that high traces of chlorides and COD in all the above samples. The study suggests serving as reference for implementation of suitable technique for reducing leachate pollution. The landfill site of Vijayawada kanuruis non- engineered and open dumping practices are followed here. The landfill is aged more than 70 years. As the age of landfill has a significant effect onleachate composition. Improper dumping should be immediately stopped or good sustainable measures were adopted to prevent the condition. By following the certain process to reduce the solid waste we can obtain a result of decreases in air pollution and ground pollution this may leads to reduce in global warming.***

Index Terms: Municipal landfill, Kanuru Dumping yard, Leachate.

I. INTRODUCTION

Municipal dump is one the major threats to the ground water resources. Wastes that are placed in the open dumps are infiltration from precipitation. These gets into the anaerobic decomposition and a material called Leachate is formed. This contains innumerable organic and inorganic compounds. This Leachate accumulates at the bottom of the landfill and percolates into the soil. Areas which are near to the dump yard has a greater risk off ground water pollution. Source of pollution originating from the nearby site. Many approaches have been used to assess the contamination of ground water and in this paper it is assessed by weighted arithmetic method. In the present study. The impact of Leachate percolation on ground water quality is estimated from the unlined, open dump site to Tenali, Guntur district Andhra Pradesh. Various physic- chemical parameters are analyzed in the collected ground water sample to know the level of pollution. The effect and distance of landfill from groundwater sources are studied and remedial measures are discussed. Impact of Leachate on the quality of surface and ground water and proposed measures for pollution remediation. Method of rehabilitation and prevention of further pollution by applying of Membrane Bio Reactor (MBR) plants for treatment of municipal, industrial and Leachate from informal landfills, which include the process of stabilization of residual sludge [1]. An idea about Indiscriminate dumping of municipal solid waste without proper solid waste management practices should be stopped or some remedial measures were required to be adopted to prevent contamination [2]. Assessed the ground water quality near municipal landfill and it can moderately impact the ground water and landfill site [3]. Investigation of Ground water Quality near a Municipal Landfall Site upgrading of solous landfill is highly recommended to prevent future contamination of groundwater within the vicinity [4]. Biodegradable fraction (paper, textiles and wood). Fig. 1 shows the Organic fraction in refuse.

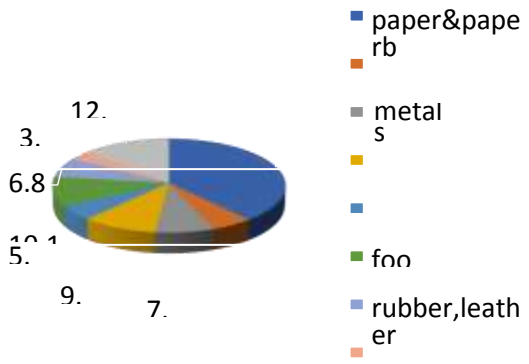

Fig. 1: Organic fraction in refuse
(Source: composition of municipal solid waste)

II. STUDY AREA

Vijayawada is a city in the Andhra Pradesh Capital Region, on the banks of River Krishna in Krishna district of the Indian state of Andhra Pradesh. The city is the third most densely populated in the urban population of built-up areas in the world and is the second largest city in Andhra Pradesh by population Vijayawada is classified as a *Y-grade* city as per the Sixth Central Pay Commission. Vijayawada is the commercial head quarters of Andhra Pradesh. It was recognized as a "Global City of the Future" by *McKinsey Quarterly*, which expected an increase to GDP

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Y. Raja Venkata Sabith Chandra, PG Student, Department of Civil Engineering, Koneru Lakshmaiah Education Foundation, Guntur, A.P, India.

Dr. A. Aravindan, Professor, Department of Civil Engineering, Koneru Lakshmaiah Education Foundation, Guntur, A.P, India.

of $17 billion by2025.Vijayawada was ISO 37120 Platinum Level certified in October 2018 and has been added to the "Global Cities Registry". The city is known for its landmarks such as Prakasam Barrage across the Krishna river; Krishna veni Mandapam (River Museum) depicting the history of Krishna river and a nearby idol of the river known as Krishnaveni statue; Gandhi Hill, the first Mahatma Gandhi Memorial in the country, an elevation of 500 f ton the on a hill; Bhavani Island, one of the largest river island amidst Krishna River. The Kanaka Durga Temple is a Hindu temple of Goddess Durga on the Indrakeeladri hill, on the banks of Krishna River. Table I represents the collected samples.

Table I: Samples Collected

S. No	Sample No	Longitude	Latitude
1	W1	16. 4948 N	80.9892 E
2	W2	16.4943 N	80.9894 E
3	W3	16.4946 N	80.9898 E
4	W4	16.4947 N	80.9893 E
5	W5	16.4949 N	80.9895E
6	W6	16.4942 N	80.9896E
7	W7	16.4945	80.9897

Fig. 2: Land showing the study conducting

Here the Fig. 2 and Fig. 3 represents Land showing the study conducting, Places of Samples Collected.

III. RESEARCH SIGNIFICANCE

This paper refers to detect the amount of ground water pollution in the municipal dump site in Kanuru Dump site. Analysis the level of most pollution in the nearby residential areas. The major risks in the Ground water in risk in human as well as domestic health

Table II: Physico-Chemical Parameters of Ground Water

Parameters	Samples							WHO 1997	ISO 10500-2012
	W1	W2	W3	W4	W5	W6	W7		
pH	7.8	7.2	7.3	7.4	7.7	7.3	7.2	6.5-8.5	6.5-8.5
Electricity conductivity	0.3	0.4	0.3	0.5	0.3	0.2	0.4	300	-
Turbidity	8.91	30.9	8.56	9.18	14.2	22.1	12.6	5.0	10
Alkalinity	16	28	12	16	19	23	14	-	200 ppm
Acidity	14	6	3	17	8	19	7	-	
Total Hardness	23	14	7	34	56	83	41	-	200
Total Chlorides	456	269	362	731	666	874	698	250	250
Fluorides	0.05	0.01	0.02	0.03	0.01	0.04	0.15	-	1.5
Dissolved Oxygen	0.1	0.4	0.2	0.3	0.2	0.5	0.8	6.0	5.0
TDS	267	331	342	125	218	116	126	-	-
TSS	271	227	281	234	198	259	297	-	-
Total Solids	7.78	1.48	5.67	5.46	5.89	6.28	5.57	-	-
C.O.D	23	18	26	18	16	21	29	10	-

IV. MATERIALS AND METHODOLOGY FIELD SAMPLING AND LABORATORY ANALYSIS

To investigate the amount of ground water pollution. Seven samples were collected designated w1 to w7were selected making site as centre and selected four cardinal points and collecting samples with equal distance from the site are presented. Water samples are collected in 1 lit bottle. As a part of quality control water bottles are washed properly presented. Water samples are collected in 1 lit bottle. As a part of quality control water bottles are washed properly. Table II represents the Physico- chemical properties of ground water.

V. RESULTS AND DISCUSSIONS

The soil stratigraphy of the specific site is of black cotton soil. Where there is high probability of Leachate entering into the ground water and contaminating them. The specific site is suitable for landfill construction and design such there we can decrease the amount of pollution.

The results were compared with World Health Organization (WHO). It is found that the results obtained from the study area are within the limits. But in future they may vary due to rapid increase in population.

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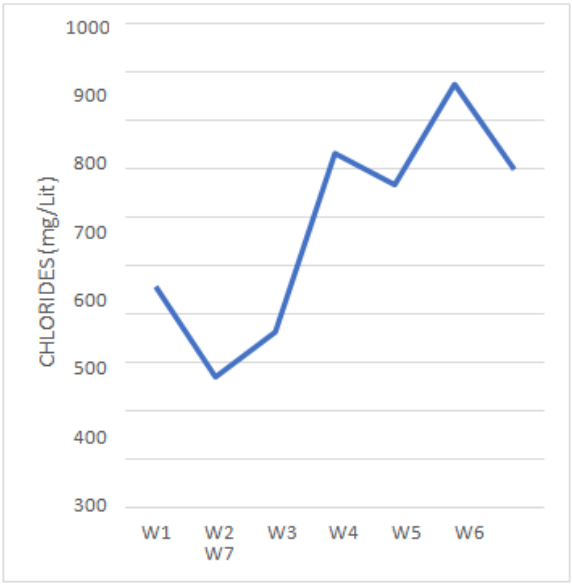

Fig. 3: Chloride concentration in various samples

A. Ground Water Quality

In the selected area groundwater is major source for domestic and other purposes. Samples were collected from the selected site and various groundwater quality parameters are tested and compared with the standard limits and is listed in the following table. When tested for pH maximum and minimum values are 7.8 and 7.2 respectively, which indicates that water is slightly alkaline. The water is also found to be hard which indicates the water contains calcium and magnesium and does not forms much lather when used for bathing or washing purpose but produces precipitate. While talking about chlorides the range is in between 2800 ppm to 3100 ppm which is very high when compared with standard limits.This high chloride content is the result of domestic pollution, or effluents from septics tanks and agricultural waste. This high level is injurious to people who are suffering from renal problems. Electrical conductivity, total dissolved solids are also found to be high when compared with the standard limits, which indicates the presence of pollution. High values of TDS indicates that the water is contaminated with leachate from the local dumping site. the parameters clearly indicates the poor condition of the water.

B. Harmful Effects of Chlorine in Drinking Water general Description

Chlorides are widely distributed in nature as the salts of sodium (Nacl), potassium (KCL) and calcium (CaCl2) Chlorides are leached from various rocks into soil and water by weathering. The chloride ion is highly mobile and is transported to closed basins or oceans Chlorides are one of the most common harmful contaminants in the ground water. Chlorides occur naturally ion ground water but it is harmful when there are excess amounts of traces. In the specific scenario chlorides are found in higher concentrations because of the existence of municipal dumpsite and higher Leachate accumulation. As here the people living by the nearby residential areas are especially at risk for the high levels of chloride. Although the chlorides at less level are harmless but when it is at greater level there is a risk for human health as well as flora and fauna. It also gives unpleasant taste to the water. Over time high chloride gives corrosively and will also damage the plumbing appliances and water heaters.

Although there is no federally enforceable standard for chlorides in drinking water, though EPA recommends levels no higher than 250 mg/L to avoid tastes and human health risk. At greater levels the chlorides can complicate existing heart problems and contribute to high blood pressure when ingested in excess.

Chlorides can be easily removed in drinking water by reverse-osmosis system.

VI. CONCLUSION

The present solid waste management being implemented in kanuru area is not engineered and is just collecting the waste from the local areas and dumping which is posing a serious threat to local environment both water and air also. If waste management is taken proper care the problem can be reduced to a maximum extent. In the present study the main aim is to find water quality parameters which are expected to be not in range due to contamination with the leachate being produced from the local dumpsite.The ground water quality of specific area is estimated by using different physico-chemical parameters such as Ph, EC, hardness, alkalinity, acidity, chlorides, turbidity chlorides, dissolved oxygen. Samples are collected during the month of september. This study concludes the local aquifer was completely polluted due to the leachate entering into the groundwater table. Of the collected samples chloride is in excess quantity in almost 80% of the samples. Moderate values of electrical conductivity and total dissolved solids in the groundwater indicates the poor condition of the water and indicates that water is not fit water drinking and other domestic purposes. There are certain parameters whose values lies within the permissible limits. Even then there is an emergency for the public health department to start working on the remedial measures which otherwise would result in huge loss.

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AUTHORS PROFILE

Y.RAJA VENKATA SABITH CHANDRA received B. Tech Degree in civil engineering from Koneru Lakshmaiah Education Foundation (Deemed to be University) in Civil Engineering, Guntur District, Andhra Pradesh, India in 2017. He is pursuing M. Tech in Environmental engineering from Koneru Lakshmaiah Education Foundation (Deemed to be University), Guntur district, Andhra Pradesh. He is actively participating in workshops and seminars in and around the university.

Dr. A. Aravindan working as Professor in Department of Civil Engineering at Koneru Lakshmiah Education Foundation, Vaddeswaram, Guntur district, Andhra Pradesh, India. He has completed Master of Technology in Environmental Engineering in 2007 and Ph.D. in Environmental Engineering from Anna University in 2017. His research interests include Solid waste management and Hazardous waste management of Environmental Engineering. He has published 7 research papers in international journals and conferences and guiding 7 number of Ph.D. scholars, guided 6 number of masters and 2 number of Bachelor's dissertation work. He is a lifetime permanent member of IE (Institute of Engineers), ISRD (International Society for Research and Development) and ISTE (Indian Society of Technical Education).