Impact of Ground Water Due to The Solid and Liquid Dump and Evaluating Various Parameters in The Leachate

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Abstract: ***Dumping of solid waste, garbage is very new science to local places and surrounding areas which It effects the ground water and nearby places . In this paper, important of leachate effects and the it rate pollutions interns of chemical tests. Here it is discussed about the Jawaharnagar local area which is situated in medchal village , Hyderbad city Telangana state India In this venture, the nature of groundwater around the Jawahar nagar GHMC dumping yard, fully effected which is situated in Medchal-Malkajgiri locale , close Kapra, India., the rate of plootion is has been explored via completing Physical and chemical investigation on groundwater and leachate tests gathered from the site, done to BIS standard. The technique incorporates computing the dissolved solids, pH, electrical conductivity, total disintegrated solids, Alkalinity, all out hardness, chlorides and nitrates in (ppm) parts per Million (aside from pH), along these lines it is trailed by depicting ventures for structuring the reasonable landfill according to standard rules alongside different methods to neutralize supporting issue. finally it conclude the pollution intensity which has effected surrounding area with different chemical effects and measures to carried for the same. Finally evaluated values are expressed in the form of tabular column The ground water pollution in the jawahar nagar observed physical and chemical values are that polluated and need design of land fill***

Index Terms: Groundwater, Leachate, Physical And Chemical Parameters, Jawahar nagar

I. INTRODUCTION

Fast industrialization, growing populace and changing lifestyle are the foundation causes for Increasing charge of solid waste generation which results in health hazards and an environmental burden. no longer only the waste has increased in amount, but the traits of waste have also modified tremendously over a period, with the creation of such a lot of new gadgets and equipment. The quantum of municipal solid waste generated in India is approximately 62 million tons yearly out of which less than 60% is accumulated and round best 15% is processed. Therefore management of stable waste and related environmental affects presents a massive assignment to both growing and evolved nations.

A. Waste Generation in India

According to the Press Information Bureau, 62 million tones of waste is generated annually in the country , out of which 5.6 Million Tones is plastic waste, 0.17 Million Tones (MT) is biomedical waste, hazardous waste generation is 7.90 Million Tones per annum and 15 lakh tone is e-waste. In india an average of waste generated 200 M grams to 600 M grams per day.

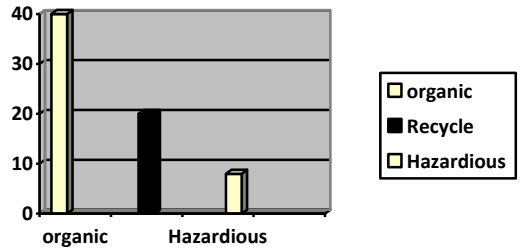
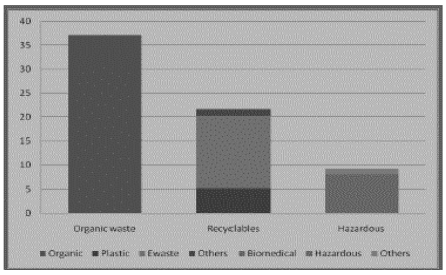


Figure 1.0



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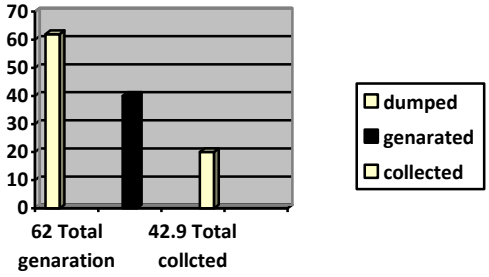

Figure 3.0

Figure 1, Figure2 and Figure 3: Collection vs Dumped Statistics (numbers in Million Tones(MT) per annum) (Source: PIB, Government of India) PIB 2016

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Fig 3 : Jawahar nagar Leachate lake near dump yard, Hyderabad

If a confining barrier beneath or surrounding the waste disposal site is absent, this leachate can migrate and contaminate subsurface and surface waters surrounding soils, vegetation, livestock and ultimately groundwater, which is a major source of water supply for drinking and domestic purpose in India.

- Several agro chemicals like DDT, fluorine, arsenic, lead compounds and organ phosphorus compounds found in polluted groundwater are super toxic and cause symptoms like nausea, vomiting, diarrhea, sweating, salivation and muscular tremors.
- Location of Jawahar Nagar dump yard, Jawahar Nagar village, Hyderabad, R.R.Dist.,Telangana, India.

B. Methodology

Very initial step was to select the location and visit the site, which in our project is Jawahar nagar dump yard located in Jawahar nagar village, Ranga Reddy district of Telangana, India.Leachate sample was collected in 1 litre pre-cleaned high density polyethylene bottle (HDPE) during pre onsoon. Similarly, ground water samples were collected from 4 stations during pre-monsoon within 5kmradius from the dumpsite employing random sampling method.The groundwater characterization has been carried out for the parameters like pH, alkalinity, total dissolved solids (TDS), total hardness (TH), chloride (Cl-), and nitrate (NO3 -) by following the standard methods prescribed as per Bureau of Indian Standard 10500 (BIS 2012).The physical and chemical characteristics like TDS, TH, CH, Cl- and NO3 - of collected leachate around the dumpsite during pre-monsoon were analyzed.WQI (Water Quality Index) for the water samples collected was calculated by considering abovementioned parameters. (Weighted Arithmetic Index method has been used).

C. Objectives of Present Study

- To analyze various physicochemical parameters including heavy metals in the leachate.
- Effect of the impact of leachate percolation on groundwater quality.
- scope of design and operate the suitable landfill for the selected site.

D. *Location* of Study Area

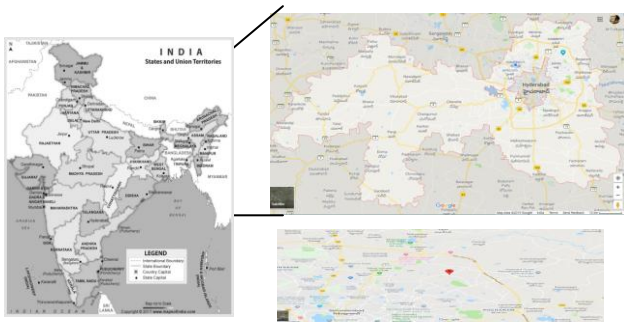

Fig 5 : Location Of Jawahar Nagar Dump Yard, Jawahar Nagar Village, Hyderabad, Telangana

II. LITERATURE REVIEW

A number of researches have been conducted on MSW management and Designing of Landfills during the recent years. The work of various researches have been studied and presented below:

1. Reducing the over-all cost of planning, design, operations and maintenance of landfill facilities while ensuring the protection of public health and the environment.-Rakesh Kumar Dutta 1,V. Gayathri2 et.al discussed about the environmental effect

2.. Building appropriate I nstitutional framework along with policy-level directions will help facilitate the necessary change. - Mathangi Swaminathan et al

3. The high concentration of Total Dissolved Solids, Electrical Conductivity and Chemicals , in ground water near landfill decreasing day by day . The threat to groundwater comes from un controlled landfills .-P. Vasanthi 1 & S. Kaliappan 2 & R.Srinivasaraghavan $_3$ et.al

Table 1: Geographical Details of the Study Area

S. No	Sample	Station	Latitude	Longitude	D
	GW1	Malkaram	17 31 38	78 34 52	1km
	GW2	Y.S.R.Nagar	17 31 02	78 34 57	1km
	GW3	GabbiLalpet	17 31 01	78 34 45	2km
	GW4	Dammaiguda	17 30 12	78 35 27	2km

GW1, GW2,GW3 and GW4 are the notation which represents the ground water collection from the samples. D is distance Collected from the sample site in km. Each of the leachate and groundwater samples were analyzed for 6 parameters viz., pH, TDS, TH, TA, Cl- and NO3 -using standard procedures. The pH was recorded on site at the time of sampling with digital pH meter. The physicochemical parameters like Total Dissolved Solids (TDS), Total alkalinity (TA) , Total Hardness (TH) and Chlorides (Cl-) of leachate, and ground water samples were analyzed titrimetrically. Chlorine is added to identify the ground water quality. Nitrates determination was carried out using spectrometer. The main

physical properties of water are color, taste, odor, turbidity, pH. These values should be within the permissible limits otherwise it is harmful. So tests have been conducted to find the quality of water present in and around Jawahar Nagar.

III. PHYSICAL AND CHEMICAL PARAMETERS

A. *PH*

In science, pH (capability of hydrogen) is a numeric scale used to indicate the causticity or basically of a fluid arrangement. It is around the negative of the base 10 logarithm of the molar fixation, estimated in units of moles per liter, of hydrogen particles. All the more unequivocally it is the negative of the base 10 logarithm of the action of the hydrogen particle. Arrangements with a pH under 7 are acidic and arrangements with a pH more prominent than 7 are fundamental. Unadulterated water is nonpartisan, at pH 7 (25 °C), being neither a corrosive nor a base. In opposition to prevalent thinking, the pH worth can be under 0 or more prominent than 14 for solid acids and bases separately. It is estimated utilizing pH meter.

B. Total Hardness (TH)

Hard water will be water that has high mineral substance (interestingly with " delicate water "). Hard water is framed when water permeates through stores of limestone and chalk which are to a great extent comprised of calcium and magnesium carbonates. Hardness in the drinking water is having less advantage. Where water hardness is checked to evade expensive breakdowns in boilers , pots and water warmers and so on. Any place water hardness is a worry, water mellowing is regularly used to diminish hard water unfriendly impacts

C. Total Dissolved Solids (Tds)

Absolute broke down solids (TDS) is a proportion of the broken up consolidated substance of all inorganic and natural substances present in a fluid in sub-atomic, ionized or miniaturized scale granular (colloidal sol)suspended structure. The main use of TDS is in the investigation of water quality for streams,rivers and lakes, in spite of the fact that TDS isn't commonly viewed as an essential toxin (for example it is not deemed to be related with well being impacts. This strategy is utilized as it is the best yet time-expending.

D. Total Alkalinity (TA)

Alkalinity is the capacity to cradle acids. The proportion of alkalinity is vital in distinguishing the level of buffering water has experienced against unexpected pH changes. In spite of the fact that consumption is for the most part a consequence of low pH in water, expanded alkalinity decreases calcium carbonate solvency, bringing about scaling

E. Chloride Ions (Cl-)

Regular chlorides incorporate sodium chloride (NaCl) and magnesium chloride (MgCl2). Chlorine alone as Cl2 is very poisonous and it is frequently utilized as a disinfectant.
In mix with a metal, for example, sodium it winds up basic forever. Limited quantities of chlorides are required for ordinary cell works in plant and creature life. hlorides can erode metals and influence the flavor of sustenance items. In this manner, water that is utilized in industry or handled for any utilization has a suggested greatest chloride level. Chlorides can debase new water streams and lakes. Fish and sea-going networks can't get by in elevated amounts of chlorides.

F Nitrate ions (NO_3 -)

Nitrate-nitrogen (NO_3- N) in groundwater may result from point sources, for example, sewage transfer frameworks and animals offices, non-point sources, for example, prepared cropland, parks, greens, yards, and plant enclosures.. The nitrite oxidizes the iron in the hemoglobin of the red platelets to shape methanol globing, which comes up short on the oxygen-conveying capacity of hemoglobin. This makes the condition known as methemo globinemia (now and again alluded to as "blue infant disorder"), in which blood does not have the capacity to convey adequate oxygen to the individual body cells making the veins and skin seem blue. The measure of nitrate particles present

IV. LEACHATE

The physical and chemical characteristics of collected leachate around the dumpsite during pre monsoon were analyzed and presented in the (Table number 2). From the results, it can be observed that pH is more in alkaline. Alkaline pH is normally available at landfills. one value of leachate 9.6 shown more alkaline. 10 years after disposal. Other analyzed parameters like TDS, TH, Cl- and NO_3 - were found to have higher concentrations in the leachate collected during pre-monsoon season when compared to post monsoon leach ate sample.

Table 2 Obtained Sample Values With World Health Organization

Ground points Sample collected	pH value	TDS mg/l	TH Value	TA Value	Cl- Value	NO3-
GW1	7.8	383	205	298	78	28
GW2	7.3	640	1000	427	126	174
GW3	7.2	512	275	222	138	165
GW4	7.1	960	465	394	355	196
LEACHATE	9.6	35200	2900		45319	1012
WHO Standards	7 to 8.5	500	200	200	250	50

V. EXPERIMENTAL RESULTS AND CONCLUSION

Result of the studies are carried out in the mode of ground water pollution by the impact of leachate expressed various Quanities

VI. GROUNDWATER AND VARIOUS QUANTITIES

Ground water after effects of physico-substance examinations of groundwater tests gathered during pre storm of 2019 were contrasted and the World Health Organization (WHO:2006) as appeared (Table:2). The pH estimations of all the ground water tests gathered around dumpsite fall inside the WHO (2006) limits demonstrating the basic nature. The TDS estimation of the ground water tests extended from 383-960mg/l during pre-rainstorm season and from 528-1260 mg/l which surpassed the admissible furthest reaches of WHO(2006). Total hardness values of water samples ranged from 205-465 mg/l during pre-monsoon were also above the permissible levels of WHO (2006) except one sample collection.

The chloride values ranged from 78-355mg/l during pre-monsoon were above the permissible levels of WHO (2006). Highest chloride concentration was observed in GW4 station. The high chloride present in groundwater basically from sewages, fertilizers, septic tanks, and leachates. Nitrate values ranged from 28-196 mg/l during pre-monsoon. Most of the water samples exceeded the WHO (2006) limits. It is further require to calculate the water quality index for the same area. Further its need of design and operate the suitable landfill for the selected site.

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