# THE EFFECT OF DOMESTIC BIOMEDICAL WASTE ON SOIL PH AND TDS

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## Abstract.

The amount of garbage produced by houses is significantly greater than that produced by hospitals and medical establishments. According to a recent study, the amount of garbage generated in the house hold sector is over four times that generated by the city's hospitals. Anyone residing in the residence, as well as guests and home healthcare personnel, is at risk from medical waste. If the material is dumped in the usual trash, the trash collectors may also be at risk. Sanitation employees are frequently stabbed by needles while on the job. Before dumping out unwanted medications, some waste management studies are commend combining them with coffee grinds or cat litter. Humans and animal pests will find them educations less appealing as a result (mixing eliminates the odour of the drugs). Then, before throwing it away, seal the mixture in a sealed container. Using 2 separate soils, laboratory studies were designed to simulate the field surrounding an unlined MSW landfill. The highest change in chemical concentration and engineering property was found on soil samples at a radial distance of 0.2 m and a depth of 0.3 m.

**Keywords**. Domestic Bio Medical Waste, Waste Management, Soil Contamination, Pollutant Transported

## 1. INTRODUCTION

India is currently faced with a municipal solid waste problem that involves all segments of society. The issue of consumer knowledge and community sensitization is low. At the household level, there [1] is no mechanism for sorting organic, inorganic, and recyclable waste. Unwrapped sanitary napkins, dirty diapers, syringes, blood-soaked cotton, and stained medical instruments are regularly disposed of in the dry waste bin in most Uttarakhand families. Household [2] biomedical waste is one of the most significant sources of biomedical waste in the state. Malaria, diarrheal, cholera, and other water-borne

infections are among the most dangerous. There is a sufficient legal structure in place in the country to deal with MSWM. Its implementation, however, is inadequate. Despite the fact that there is a strict law in place [3], open dumping is the most common method of garbage disposal. Public knowledge, political will, and engagement are all necessary for the successful application of legal rules and the development of an integrated strategy to the country's municipal solid waste management. Medical waste management is critical because of the potential for environmental and public health problems. Environmental regulatory agencies and garbage generators [4] have made numerous efforts in recent years to better manage trash from health care institutions.

## 1.1 SOURCE OF DOMESTIC BIO MEDICAL WASTE

The most common reasons given by respondents for having unused drugs at home were:

- Failure to follow the prescribed treatment.
- Preservation for future use and near the expiration date.
- Changing the treatment plan when the patient still has stock of the previous medicine or the pharmacy has not activated the discontinue order.
- In many hospitals, the same patient is followed up on.
- The death of the patient. Existence of medicines that have not been used.

## 1.2 DOMESTIC BIOMEDICAL WASTES AS A HAZARDOUS WASTE

Changing the therapy plan prescription from a few sources patient demise other Presence of un used meds: information as per the medicine [5] gathered in Riyadh twentieth December 2017 to twentieth March 2018 (218 families) it contains genotoxic materials, irresistible specialists, poisonous drugs and synthetics, sharp gear, and radioactive components, clinical waste (MW) is assigned as risky. It basically influences medical services representatives (specialists, attendants, and others), patients and guests to medical services offices, and people who work with rubbish (clinic labourer, incinerator, landfill, and so forth). Emergency clinics in Jordan produce around [6] 4000 tons of clinical waste each year. Because of the flood of Syrian outcasts into Jordan, clinical waste age has expanded. The river contains a variety of metals and non-metals. Some of them are hazardous metals, which are metals that are detrimental to living [7] organisms as well as the environment. If their concentration exceeds the allowed limit, then it causes.

## 1.3 QUANTITIES AND TYPES OF DRUGS AT HOME

The enumerators made it clear to the respondents that wellbeing enhancements like calcium tablets and prescriptions as of late endorsed by clinical specialists [8] in the former 7 days were prohibited from the overview, just like the amounts and sorts of unused (counting terminated and excess) drugs at their homes. The enumerators made it clear to the respondents that wellbeing enhancements like calcium tablets and medications as of late recommended by clinical specialists in Moreover, we discarded more hard to-gauge measurements structures, like asthma inhalers, from the calculation [9] of drug quantities held at home. According to survey data from another study, only a small percentage of abandoned drugs (e.g.,1%)wherein such unusual forms (Gracia-Vásquezet al.,2015).

## 2.DESCRIPTION OF SITE

Under the Ministry of Urban Development, the Government of India (GOI) launched the Jawaharlal Nehru National Urban Renewal Mission (JnNURM) (MoUD). As part of this scheme, an Integrated Solid Waste Management (ISWM) Plant is being established in Sheeshambada, Dehradun. The factory is 14000 square feet in size and has a daily [10] capacity of 350 metric tonnes of rubbish. Waste segregation, keeping at the source, primary pickup, street sweeping, secondary storage, transportation, processing, recycling, and scientific disposal of waste were all goals of this plant when it was approved on May 16,2008.Every day, the capital of Uttarakhand creates an average of 300 tonnes of rubbish. 250 tonnes of this is sent to the city's contentious Shishambada Waste Management Plant [11], which has been criticised by locals. Ramky Environ Engineers Limited has a processing plant 30 kilometres from the city. Currently, introduces two waste products: RDF, which is stacking up at the plant due to Ramky's inability to sell it, and low-quality compost [12]. The remaining 50 tonnes of garbage is not collected and ends up on high ways, in streams, and in communal dumpsters. Indeed, the city is having difficulties collecting garbage from residents' homes. Waste pickers in Bindal make a job by picking up trash that has been dumped on the streets and in bins.. To the mix has been added waste from the chicken [13] market, seafood restaurant, slaughter house, and dairy farm.

### 3.1 COLLECTION OF SOIL SAMPLES

For the investigation, soil from the landfill's base was gathered at random from three distinct places at 300 m lateral spacing from the landfill's edge. After removing the surface debris, polluted soil [14] samples were taken from three separate locations. IS: 3025 (Part 1) was followed for sample collection (1987).The subsurface soil was dug to a depth of about 1 m with a hand auger, and the samples were taken directly from the auger. In air tight containers and bags [15], three groups of soil samples were collected.

### 3.2 SOIL SAMPLE PREPARATION FOR CHEMICAL ANALYSIS

Sample preservation procedures are designed to limit biological action, hydrolysis of chemical compounds and complexes, and minimize constituent volatility, according to the American Public Health Association. pH control, chemical addition, cooling, and freezing are the only techniques of preservation (APHA, 1995).The standard preservation procedures for components are listed in Table 1. Because almost all preservatives interact with some of the tests, sample [16] preservation with preservatives is difficult. The most straight forward method of preserving most samples is to preserve them at a low temperature (40°C) (APHA, 1995). Following soil sampling, physico-chemical properties such as pH, total dissolved solids (TDS). The soil specimen was broken with a wooden hammer after air drying and sieved at 2.36 mm. A 0.1kilogramme sample of dirt was obtained and soaked in one litre of distilled water for 48 hours. There is due was then filtered to determine the chemical [17] makeup of the soil. A 425 micron IS sieve is used to assess the pH of the soil (APHA 1995). In Dehradun, each soil sample was submitted to a chemical analysis.

***Table1. Standard Preservation Methods by Constituents.***

| S.No. | Parameters | Preservation method | Maximum storage limit.( According to EPA regulations) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | PH | Analyses immediately | 2 hours |
| 2 | TDS | Refrigerate at 4°C until ready to analyses, and do so as quickly as feasible. | - |

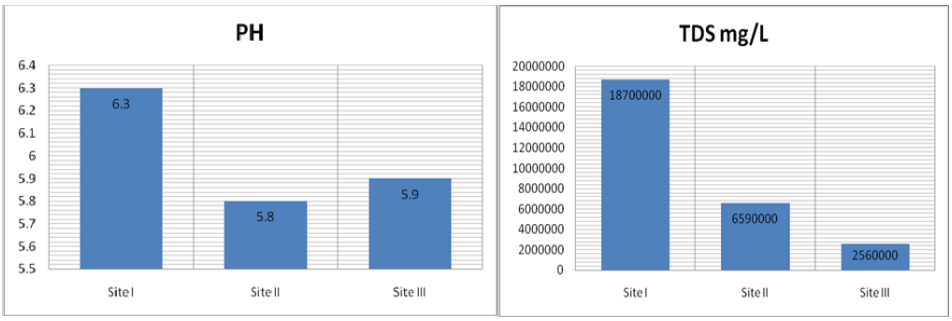
Almost all preservatives interact with [18] some of the tests; sample preservation with preservative is difficult. The easiest strategy to maintain most samples is to keep them at a low temperature (4°C) (APHA, 1995). PH and total dissolved solids (TDS) are the chemical characteristics investigated in soil samples.

## 4. RESULTS AND DISCUSSIONS

In the laboratory, the obtained samples from the MSW disposal site were analysed. The properties of soil samples were compared [19] to treated soil inland disposal standards. Some of the chemical characteristics of the leachate were found to be higher above the allowed limits.

| S.No. | Parameters | Site-I | Site-II | Site-III |
|---|---|---|---|---|
| 1. | PH | 6.3 | 5.8 | 5.9 |
| 2. | TDS mg/L | $1.87x10^7$ | $6.59x10^6$ | $2.56x10^6$ |

As shown in Table, the observed pH values in soil samples from all three bore holes are slightly acidic and within the normal range of pH [20] for treated soil. TDS, on the other hand, has high values. Rather than being a primary pollutant, TDS is frequently used as an aggregate indicator of the presence of a wide range [21] of chemical pollutants [22].




## 5. CONCLUSION

The inappropriate and unscientific management of domestic biological waste has been connected to dangers for individuals who are directly or indirectly involved in the sector, according to this study. Water, air, and soil quality have all been harmed as a result of biomedical waste. Various researchers have discovered risks connected with improper biological waste management and weaknesses in the current system. The majority of the research advocated for the creation of waste management policies, plans, and processes. Furthermore, training programmes for all health care personnel on proper waste

management have been established. It is necessary to do research on the conversion of biomedical waste into energy and other useful goods. This will aid in the prevention of environmental contamination and health risks. The site's soil and water samples were gathered and analyzed to see what pollutants were present and how they affected soil attributes.

**Future Scope**

• It aids in the preservation of water quality parameters and the provision of a healthier environment for aquatic animals and plants.
• It aided in the development of a sustainable waste management system for health-care waste.
• Rather than discarding, it can be utilized to avoid trash formation or to recover as much garbage as feasible.
• It provides environmentally friendly medical devices and ensures that they are properly disposed of.
• It can assist in reducing the leachate effect.

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