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Microbiological Study of Waste Disposal and It's Efficient Management

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Abstract :

Waste management or waste disposal are all the activities and actions required to manage waste from its inception to its final disposal. Generally waste is of 2 major types i.e biodegradable and non-biodegradable. A biodegradable material can be defined as a material which can be decomposed by bacteria or other natural organisms. A Non-Biodegradable material can be defined as a kind of substance which cannot be broken down by natural organisms. Some of the techniques like landfill, incineration are adopted for waste management but these techniques have certain drawbacks like it can pollute environment. It can cause harmful diseases to the peoples living in that area. The aim of this study is to protect health, well-being and the environment by providing solutions. For the pilot study survey was taken of 100 peoples and data was obtained that peoples are facing problem regarding waste management. Some eco-friendly methods can be used for proper management of waste like biogas plant should be installed. Biogas is produced by bacteria through the bio-degradation of organic material under anaerobic conditions. More awareness regarding classification of garbage should be given to citizens. A nodal government agency should be established that can properly check whether garbage is properly separated or not.

Introduction

Waste management or waste disposal are all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and management. Waste management normally deals with all types of waste whether it was created in forms that are industrial, biological, household, and special cases where it may pose a threat to human health.

Types Of Waste

Our planet continues to relentlessly grow in population. A corresponding growth in waste products also occurs. The two major categories of waste are, Biodegradable and Non-biodegradable.

Biodegradable materials can be decomposed by microorganisms

- **Human and animal waste**
- **Plant products, wood, paper, food waste, leaves, grass clippings**
- **Remains from the death of living creatures**

Materials having properties that do not breakdown or decay are called Non-biodegradable.

Examples include

•Glass

•Metals

•Plastics
•Electronic devices
• Medical waste

Current Methods Adopted For Waste Management:

Landfill

In this process, the waste that cannot be reused or recycled separated out and spread as a thin layer in some low-lying areas across the city. A layer of soil added after each layer of garbage. Once this process is complete, this area declared unfit for building construction for the next 20 years

Incineration

Incineration is the process of controlled combustion of garbage to reduce it to incombustible matter; ash, waste gas, and heat. The waste gasses thus generated are then treated and released into the environment. This process reduced the volume of waste by 90 percent. It is also known as landfill in the sky. It release dioxin gas which is very harmful that can cause cancer, skin disease and in children it can affect the developing nervous system, the endocrine system and reproductive functions.

Drawbacks of current methods

- Landfill can pollute air, water and also the soil.
- Many insects and rodents are attracted to landfills and can result in dangerous diseases.
- It can cause communicable diseases and illness in the communities living around the landfill.
- Incineration Pollutes the environment.
- Ash waste from incineration plant can potentially harm people and the environment.

Clean India Mission

Swachh Bharat Abhiyan (SBA) or Swachh Bharat Mission (SBM) is a nation-wide campaign in India for the period 2014 to 2019 that aims to clean up the streets, roads and infrastructure of India's cities, smaller towns, and rural areas
Swachh Bharat Abhiyan campaign, launched on 2 October 2014 on Gandhi Jayanti,
Swachh Bharat Mission (SBM) Mobile app is being used by people and Government organisations for achieving the goals of Swachh Bharat Mission. For this the government of India is bringing awareness to the people through advertisements.

❑ **Aim of study**

The aim of this study is to protect health, well-being and the environment by providing solutions.

❑ **Objective**

To find out which type of problems related to waste management are faced by the peoples.

❑ **Method**

For data collection we constructed a series of questions related to topic which includes 10 questions.

❑ **Population**

Random 100 peoples were taken as population for this research work.

❑ **Data Analysis**

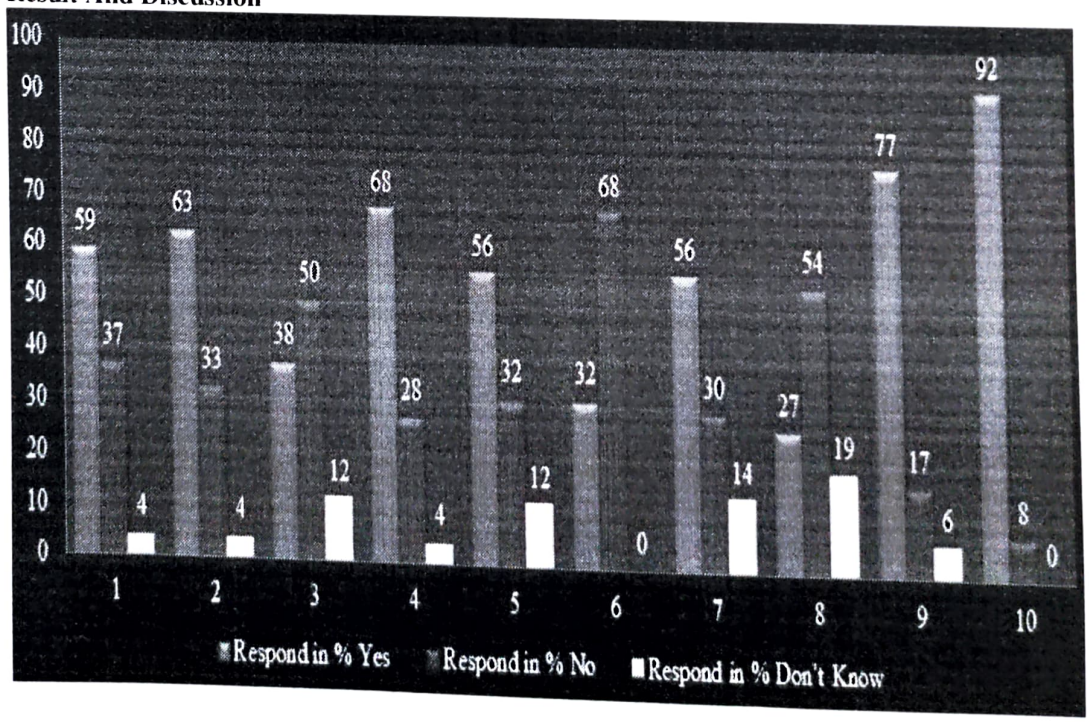
The Following data was obtained from the analysis of above method.

Materials & Methods

Sr No.	Questions	Respond in %

		Yes	No	Don't Know
1	Do you separate dry and wet waste at your home?			
2	Are you aware about classification of garbage?			
3	Do you think that, burning the garbage is only solution?			
4	Does garbage is collected regularly in your area?			
5	Are you satisfied with your current waste collection service?			
6	Do you know, how your service provider disposes your collected waste?			
7	Do you mix Biohazard or pharmaceutical waste with routine garbage?			
8	Has any one in your house suffered from disease due to mismanagement of waste?			
9	Do you think, waste management is an environmental problem?			
10	Do you want clean environment and a clean India?			

Result And Discussion



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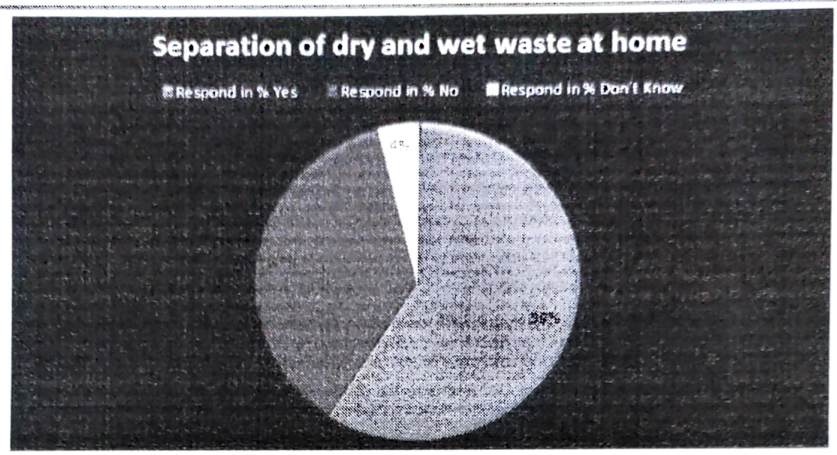

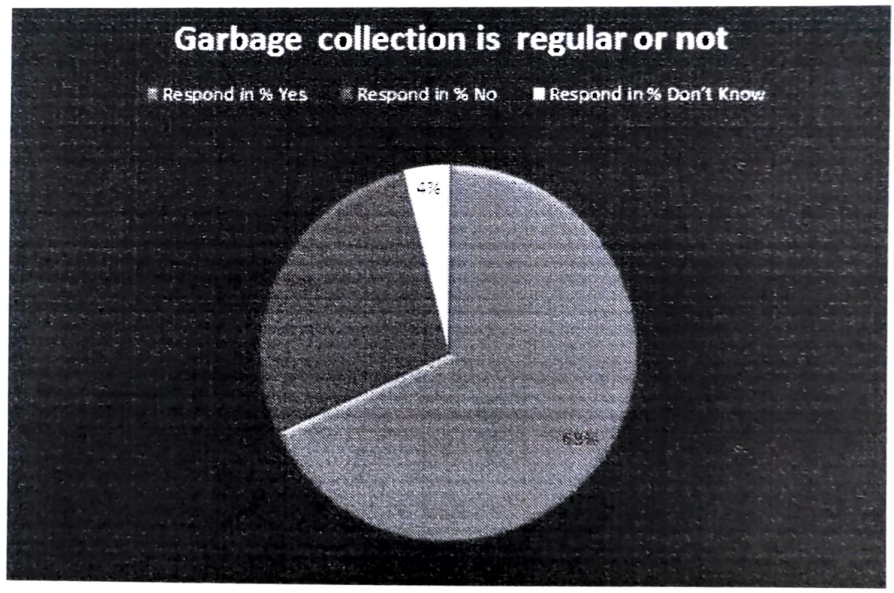

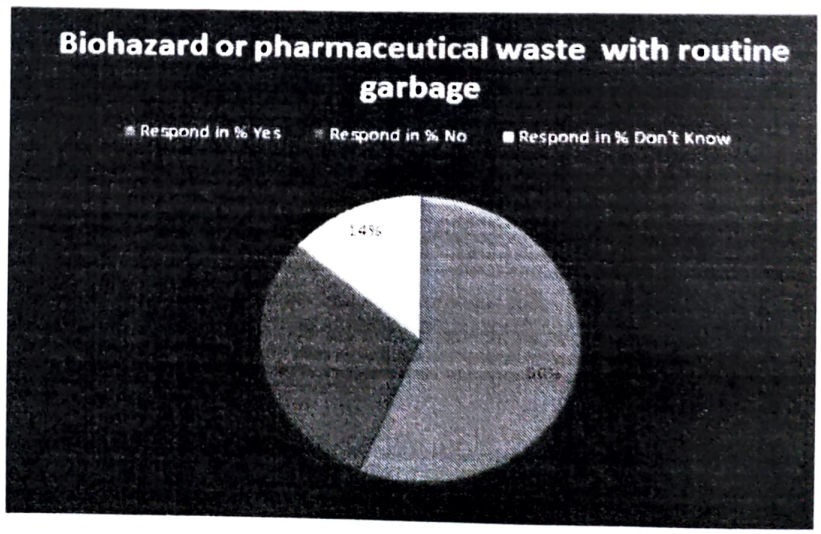

Out of 100 people, 56% people separate dry and wet waste at their home. 63% people are aware about classification of garbage. But waste is thrown without any separation or processing at the dumping yard. 38% people think that yes burning the garbage is only the solution. 63% people responded yes that there is regular collection of garbage in their area. 56% people are satisfied that there is regular collection of waste in their area. 32% people said no they are not satisfied as they want more advancement in their waste collection system. 68% people are not even aware that how their waste is disposed after collection. 56% people mix Biohazard and pharmaceutical waste with routine garbage .This is thrown together in dumping yard. 27% people said yes that in their house their family members suffered from disease due to mismanagement of waste. 19% people don't have any idea about it. 77% people think waste management is an environmental problem. Some initiatives should be taken to solve such kind of environmental problem. 92% people want clean environment and clean India.

Eco-Friendly Alternative Methods

Biogas plant

Biogas refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. In a biogas process, large organic molecules (proteins, sugars and fats) are successively broken down into methane and carbon dioxide, a gas mixture called biogas. The presence of several different microbial communities is required for the biogas process to work. In order to form biogas as an end product, these active microorganisms also have to work together (Zinder 1986).

Bio-gas plant and its components: A physical structure designed to carry out anaerobic digestion of
organic materials is called "Biogas plant".

Following are the components of biogas plants:

Mixing tank: Cow dung is collected from the shed and mixed with the water to make a homogenous mixture (slurry) in the mixing tank.

Feed inlet pipe/tank: The homogenous slurry is let into the digester through this inlet pipe.

Bio-Digester: The fed slurry is subjected to anaerobic fermentation with the help of microorganisms inside the digester.

Slurry outlet tank/pipe: The digested slurry is let out from the digester through slurry outlet pipe.

Gas outlet pipe: Stored gas is released and conveyed through the gas outlet pipe present at the top of gas holder.

Conclusion

1. The data regarding the solid waste collection,storage,transportation and disposal reveals that, in the study area the system employed for the solid waste management is inadequate.
2. It was found that the solid waste was not disposed scientifically and till the citizens are facing the solid waste problems.
3. Open dumping of garbage facilitates the breeding for disease vectors such as flies,mosquitoes,cockroaches,rats, and other pests.
4. The lacks of knowledge, awareness and cooperation have been identified

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