

DESIGN OF ECONOMIC MENSTRUAL WASTE TREATMENT PLANT

Krupa Narendra Savalia¹, Rakshanda Subhash Chavan², Muthulaxmi Devendra Kudumber³,

Prof. Poonam Satish Patil⁴

¹Civil Department, SPPU, Student,

²Civil Department, SPPU, Student,

³Civil Department, SPPU, Student,

⁴Civil Department, SPPU, Assistant Professor,

Abstract— Nowadays, the disposal of sanitary waste in India is a complex issue. Indian women are in discomfort in discussing menstrual hygiene openly; it dedicated how women dispose of their sanitary napkin. Due to this, it affects the entire environment. As there is no proper method of sustainable sanitary waste disposal, people dispose of it in the soil, air, and water which causes contamination. Lack of education awareness for people, unwilling to accept otherwise, still leads to restrictions on women's lives during their menstruation. To overcome this problem we have decided to prepare a model on menstrual waste disposal for our college. For this, we have conducted a questionnaire survey and collected responses. From those responses, we understand what brand they use, how it is disposed of at home and in public places. Then the planning and design of the model was conducted. After the model was prepared, testing was carried out on different parameters.

Keywords— Menstrual hygiene, Menstruation, Disposal, Environment

I. INTRODUCTION

Menstruation is the thing which usually happens in the daily life of ladies such as monthly period and after pregnancy. We are making a model on the disposal of sanitary napkins which deals with the daily life of women. Now India's 2018 population is estimated at 1.35 billion people out of which 659 million population is of females and 704 million males. Out of this 659 million females, 29.7% are kids below 15 years, 64.9% are between 15-64 years and 5.5% are above 65 years of age. Out of all this, 12% of women only use sanitary pads. 88% of women do not use sanitary pads, out of which 18% have access but do not use them and 43% of women do not have access to sanitary pads. Sanitary waste disposal has become an increasing problem in India as the plastic used in disposable sanitary napkins are not bio-degradable and lead to health and environmental hazards. However, the Bio Medical Waste Management Rules, 2016 indicate that items contaminated with blood and body fluids, including cotton, dressings, soiled plaster casts, lines, and bedding, are a bio-medical waste and should be incinerated, autoclaved or microwaved to destroy pathogens. As per the study, 36 million ladies in India utilize sterile napkins; Which makes it 12% of 300 million ladies in the age gathering of 15-54 years¹. A lady utilizes around 10,000 cushions, on a normal, in her whole life for around 30-40 years; this totals up to 58,500 million pieces for every year. With this quite a bit of harmful menstrual waste which is being created by just 12% of the ladies in India.

II. LIMITATIONS OF THE STUDY

- At a time only one pad can be disposed of.
- Regular maintenance i.e., daily cleaning required.
- Electric supply is necessary.
- Safety precaution is needed while operating the model.

III. EFFECTS ON HEALTH AND ENVIRONMENT

- Chemicals used in sanitary napkins and drainage clogging.
- Plastic and other contents in sanitary napkins.
- Water contamination.
- Issues of manual scavenging.
- Use of incinerators may release harmful gases.

IV. RESEARCH METHODOLOGY

Selection of hygiene products

A large selection of stores – groceries, supermarkets, perfumeries, discount chains, and pharmacies has been visited. A random selection of different brands of hygiene products was purchased to investigate further.

Selection of hygiene products for the project

The hygiene products were chosen to represent:

- Products made from different raw material
- Cheap and inexpensive products
- Product made by different manufacturers
- Products with special effect or appearance

Collection of sample

Individual sample is collected for primary testing. Different sanitary napkins are used during menstruation and then it is used for the further study.

Model setup:

Existing systems:

Physically Operated Fire Based Incinerators

Portrayal:

- Has a lower terminating chamber (for terminating and cinder accumulation)
- A center incinerator chamber for stacking utilized napkins
- A top unit for discharge control (for smoke and gas)
- Used napkins and different squanders are terminated on week after week premise
- Attached to the external mass of latrine; can be developed independently
- Height ought to be around 4 feet for simple and legitimate drop
- Chimney cowl ought to have shape that will maintain a strategic distance.
- Capacity: Approximately 200 Napkins for every day
- Cost: INR 2,000 to 3,000 Electrically Operated Incinerators.
- Instant transfer in a logical and sterile way
- Inside unmanageable coating giving amazing warmth maintenance
- Mineral wool is used for thermal insulation.
- The cinder is gathered in an Ash Collection Tray at the base
- Complete consuming of napkins
- Only fewer than 5% powder for each napkin created
- Size: Can be changed according to necessity

Other transfer instruments

Pit burning

Consuming of waste and particularly of plastic based clean napkins isn't prescribed, as it emanates dangerous mixes. Anyway plain cotton garments of degradable clean material can be scorched given that there are no better alternatives accessible. There are concerns with respect to security, fire risk and inadequate consuming.

Outline, task and administration:

- During the consuming, there ought to be wellbeing measures, for example, a devoted individual and stay away from contact by unapproved understudies
- Minimum specification: 0.5 m x 0.5 m x 1.0 m; 1.0 m x 1.0 m x 1.0 m (l x b x d)

Proposed System:

The proposed arrangement of clean napkin transfer goes for decreasing both air and soil contamination. Sun based power is used for working of this framework. At the point when the napkin is set in the plate the warming loop consumes the sterile napkin to cinders. The gathered cinder can is flushed out.

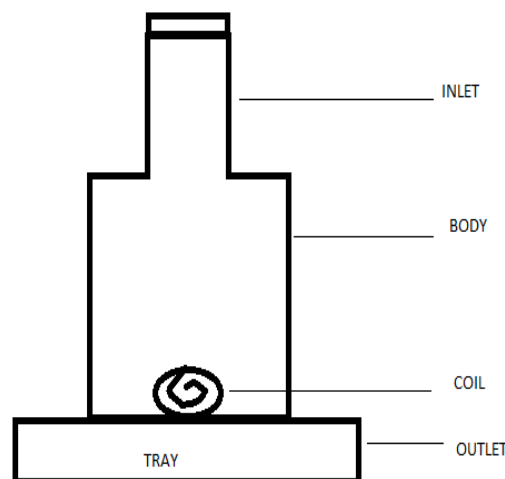


Fig. 1 Basic layout of model.



Fig.2 mineral wool used for thermal insulation



Fig. 3 Complete Model



Fig. 4 Ash formed after pad burning

V. RESULTS

TABLE I

Sr. No.	Description	Time
1	Time required to heat the coil.	3 mins
2	Time required to burn pad.	4 mins
3	Temperature of the model while burning.	40 degrees
4	Time required to cool the coil.	3 mins

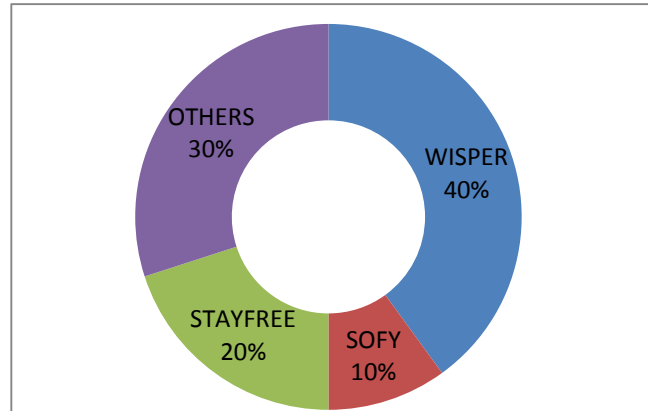


Fig. 5 Result of questionnaire survey about the brand of pads used

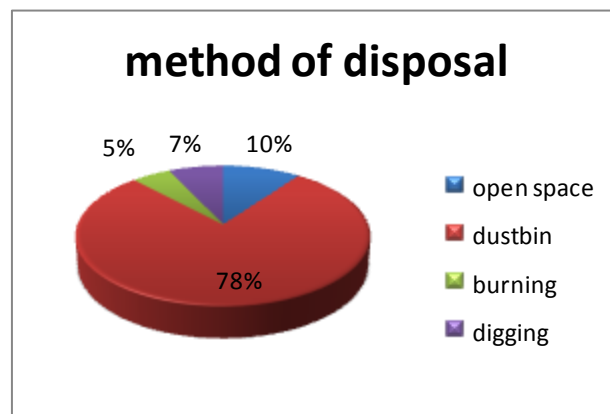


Fig. 6 Results of questionnaire survey based on method of disposal

VI. CONCLUSIONS

- It is environment-friendly as it is completely disposed within a few seconds. It is disposed of immediately so that before the formation of bacteria's and pathogens it can be killed.
- It is automatic.
- It is easy to store.
- It is easy to use.
- It is easy to handle.
- It is very cheap.
- It is easy to maintain.
- It has low cost of construction.

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