

## **SOLID WASTE MANAGEMENT PRACTICES IN PALANI**

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### **Abstract**

Palani is identified by Hill Muruga Temple. It is an important religious tourist place and earns more revenue. Maintaining green environment is an essential component. In this place mass floating population is the significant feature, it generates huge wastes; managing solid waste is a first prioritized task. Clean and hygiene environment is the responsible for concern Municipal Corporation. So temple and health care units are taken into consideration.

In this study we can have a detail of, how the wastages from temples and healthcare services are managed, and what are all improvements needed in its process, and then how should be environmental safety procedures implemented. **Specific objectives** of this study are examining solid waste management of health care units and study solid waste management of temple. This study is based on primary data, interview schedule were used to collect the data from Hospitals and municipality and panchamritham making madabams. Only 7 madabams are taken into consideration which is under Palani devasthanam. Primary data was collected by administering as pre-tested interview schedule. Findings are highlighted as temple wastes are recycled and make it as fertilizers, this may be purchased by farmers, Continuous working with wastes for long hours results in several health problems for sanitary workers. All the workers should have medical insurance schemes for treatment and compulsory medical checkup is been done every month in the district medical hospital. **Keywords:** green environment, Solid waste Management, Medical waste disposal, temple waste into products, medical waste hazards, medical waste segregation.

### **INTRODUCTION**

Palani is one of the famous Pilgrim Centre. Since Palani is a tourist place by religion floating population is high during normal season as well as festival season. Solid waste is the major issues it is required to be concentrated. In this regard two important area should be taken into consideration, one is "Temples" and another one is "Healthcare Service". Every year the number of persons who visit Palani have been increasing continuously. In order to maintain the city clean and hygiene obviously wastages should be maintained properly. Hence this study focusses the Solid waste management practices followed in Temple and health care units.

#### **WASTE FROM HEALTH CARE UNITS:**

Waste caused by health care units which includes Clinic, Hospitals, laboratories, Bio – medical research Centre's etc. Health care units which produces mass wastes in terms of quantity as well as variety.

Improper way of disposal of health care wastes would create serious hazards of secondary disease transmission due to exposures to infectious among waste pickers, sanitary workers, health workers, patients, and the community in general where waste is improperly disposed.

Burning wastages in an open place as well incineration without adequate pollution control exposes field workers who involved in that process and the surrounding to toxic contaminants in air emissions and ash.

#### **RISKS**

Healthcare waste can be categorized into - sharps waste, pathological waste, other infectious wastes, radioactive waste, pharmaceutical waste including cytotoxic waste, hazardous chemical waste and general (non-risk) waste.

In common, between 75% and 90% of the wastages produced by healthcare units is a non-risk (non-hazardous & non-infectious). Infectious waste is suspected to contain pathogens (disease-causing bacteria, viruses (Corona), parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts.

## **TEMPLE WASTE:**

Temples, churches and mosques possess a characteristic of attracting positive and divine vibrations from the surroundings; they sanctify the area and are believed to charge the atmosphere with heavenly vibes among the people too. People are accustomed to offer lot of flowers, garlands, coconut and milk to the deities in the temples as they are considered a symbol of devotion and reverence. But think every year how much tons of temple waste are dumped into the rivers and how much natural resources are become garbage. Most of temple wastages are killing fishes and other living beings, creating chaos in the fragile atmosphere and thus causing water pollution. With these, pesticides and fertilizers also stream in the river, threatening to the civic lives to a large magnitude.

Food, coconut scrub, flowers, cloths and leaf these kind of temple wastes can be used for many productive ways. Due to improper ways of disposing and handling method of wastages it become threaten to the living beings and environment too.

With this background this study has the objective of studying the solid waste management practices in Palani.

### **Specific objectives are**

- Examine solid waste management of health care units.
- Study solid waste management of temple

## **NEED OF THE STUDY**

Green environment is the need of the hour. To maintain green environment so many aspects to be considered like pollution control, plantation, avoid plastics, of which solid waste management is one of the focusing areas to maintain green environment. In this, four aspects are there, wastes from temple and health care units are notable area to study.

## **SCOPE OF THE STUDY**

Palani comes under religious tourist place; because of this the rate of floating population is increasing throughout the year. It generates revenue to the government. Bring sustainable development in socio economic aspects; the solid waste management is an essential component. Hence solid waste management practices of health care unit and temple is to be studied.

## **METHODOLOGY**

This study is based on primary data interview schedule were used to collect the data from municipality and panchamritham making madabams. Only 7 madabams are taken into consideration which is under Palani devasthanam. Banana wastes are handled by Municipal Corporation.

## **LIMITATIONS OF THE STUDY**

1. Study focuses only on hospitals in health care services.
2. Hill temple only considered, other temples are excluded.
3. Study is based on primary data it has its own limitations.

## **REVIEW OF LITERATURE**

Sineenart Puangmanee and Moltipa Jearanai E (2019) in their study “**Healthcare Waste Management: A Case Study of Health-Promoting Hospitals**” they examined the Healthcare waste management from health-promoting hospitals in some local areas of Thailand is weakly regulated. Environmental Pollution, that is originates from the poor management, ineffective control, and unsuitable disposal. We have reviewed the management of healthcare waste at health-promoting hospitals, aimed to study the type, quantity of healthcare waste, storage, collection, transportation and disposal. To the research, six hospitals were selected and prioritized from a district in a province in the upper part of southern Thailand. All waste was classified into two types as like waste from treated patients (general waste, hazardous and infectious waste) and waste from untreated patients (domestic and hazardous waste). The highest percentage of wastages from treated patients were 68.20% and waste from untreated patients were 86.60%. The waste from treated patients at all hospitals was put into red plastic bags/containers and placed inside stainless steel or plastic garbage cans. The waste materials were transferred daily by hospital employees. Wastages from the treated

patients were transported by a hospital employee who were unsuitable and non-protective equipment wearied persons. The waste materials were collected from all hospitals once in a week by pickup truck/lorry and moved to a single hospital point in the district where it waited for transportation to an incineration plant in central Thailand. The waste from untreated patients were transported by employees of the sub-district administrative organization. They also wore unsuitable protective equipment while working. The waste from untreated patients were transported by compact garbage truck and moved for disposal in two open dump sites in and around the local area. Although, the waste materials were basically managing by the guidelines, some of the handling processes were incorrect and ineffective. Therefore, everyone involved in healthcare waste managements and services from the top to down need to strictly practice the guidelines according to the laws for a better environment.

Mohammed Shafith. S(2018) stated the **“Hospital Waste Management and Environmental Problems in India”**,analyzed that in the main purpose of this paper is to convey a browsing of the hospital waste management and environmental drawback in India. This study’s target is to analysis the health care waste management system, as well as practices and compliances. Most countries of the planet, especially the developing countries, are facing the grim situation arising out of environmental pollution, because of pathological waste arising from increasing populations.And also the result ascent within the range of hospital units. In India, there are regarding 6,00,000 hospital beds, over 23,000 primary health centers, more than 15,000 small and personal hospitals. The biomedical Waste (Management and Handling) Rules 1998 build it obligatory for hospitals, clinics, and different medical and veterinary institutes to eliminate bio medical wastes consistent with the principlesstrictly. The few studies on bio medical waste management have established that hospitals did not manage health care waste properly.

Unsuitable disposal methods of health care waste causing dangerous infections and possessan attainable threat to the encircling surroundings, persons handling it and to the overall public. Within the past, medical wastageswere usually mixed with unit waste and disposed of in municipal solid waste landfills. In recent years, inflated public and environmental considerations over the improper disposal of health care waste have led to a movement to control the waste additional consistently and strictly by the Indian government. Waste reduction and utilization are still not well promoted and educated, which ends in vital amounts.

Isha Yadav et.al (2015) reported **“Temple Waste Utilization and Management: A Review”** evaluated that In India, worshipping is the way of living and people offer various offerings to the deities which are consisting of flowers, fruits, leaves, coconuts, clothes and others out of which floral offerings are found in huge quantity. Thus, temple waste has a unique share of flower waste in the total waste. After completing their purpose, flowers along with other wastages, find their way into the garbage or are discarded either into some of water bodies or left up on the open places or throwing everywhere as a waste causing various environmental problems. The majorly offering flowers in the temples are rose, marigold, jasmine, chrysanthemum, hyacinth, hibiscus and others,These floral wastes can be utilized in different ways of recycling like produce valuable products,this can help to save environment from pollution caused due to improper disposal of flower waste. Techniques like vermicomposting, composting, dyes extraction, making of holicolors, extraction of essential oils and bio-gas generation can be used. This flower wastes/garbage can also be used for making incense sticks besides using them for some art and craft techniques. Petals of different kind of flowers can also be utilized for handmade papers/papermaking by extracting the pulp or by mottling them into the readymade pulp. In this paper, we have reviewed the temple waste can be utilized and managed to get valuable products which will lead to a healthier and waste free environment pollution.

Mohankuma .S and Dr.K.Kottaiveeran (2011) reported the **“Hospital Waste Management and Environmental Problems in India”** they studied that the major purpose is to give a view of the **“hospital waste management”** and **“environmental problem”** in India. The objective of this analysisis to research about the health care waste management system, including practices and compliances. Most countries of the world, specially the developing countries, are facing the grim situations arising out of environmental pollution due to pathological waste arising from increasing populations and the

consequent rapid growth in the number of hospital servicing units. There are nearly 6 lakhs hospital beds, over 23,000 primary health centers, more than 15,000 small and private hospitals in India. The Biomedical Waste (Management and Handling) Rules 1998 makes it mandatory rule for all hospitals, clinics, and other medical and veterinary institutes to dispose of bio medical wastes strictly. The few studies on bio medical waste management from India have been established that, those hospitals did not manage health care waste properly according to the India health administration rules. The hospital waste management sector market revenue (2008) is 8% of the total waste management revenue in India expected growth in next 5-6 years is around 20%. There are many institutions polluting the environment but recently the ignored field which produces the pollution by way of hospital wastes. Attracts the attention of the environmentalists are the hospitals, dispensaries, medical shops, medical clinics of doctors and other paramedical staff. Safe handling, segregation, storage, separate storage containers, subsequent destruction and disposal of hospital waste ensure mitigation and minimization of the concerned health risks involved through contact with the potentially hazardous material, and also in the prevention of environmental contamination. Mismanagement of health care waste disposal methods are causing the dangerous infection, virus spread and possess a potential threat to the surrounding environment, persons handling it and to the public. In the past, medical waste was often mixing with household waste and disposed of in municipal solid waste landfills and other normal methods. In recent years, increased public concerns over the improper disposal method of health care waste have led to a movement to regulating the waste more systematically and stringently by the Indian government.

## **ANALYSIS AND INTERPRETATION**

### **1. Solid waste Generated from hospitals**

Waste from healthcare is categorized as potential infectious waste and non-infectious waste. Infectious wastes include infectious sharps and infectious non-sharp materials. Infectious Sharps consist of syringe or other blades, needles, infusion sets, broken glass or other items that can cause direct injury.

Infectious non-sharps include things that have been in contact with human blood, or its derivatives, swabs, bandages or items soaked with blood, isolation wastes from highly infectious patients (including food residues), used and obsolete vaccine vials, bedding and other contaminated materials infected with human pathogens. Human excreta from patients are also included in this category.

Non-infectious wastes may include materials that have not been in contact with patients such as paper and plastic packaging, metal, glass or other wastes which are similar to household wastes

In and around of Palani taluk, healthcare service units like hospitals, nursing homes, clinics, laboratories, animal/ Veterinary clinics and blood banks including 14 multi specialty hospitals are under private contractors to manage their wastages. Even though government hospital wastages have been collected and disposed by private contractors. Medical wastages and all not mingle with normal household and commercial units garbage's due to environment safety and disposing procedures. Because medical wastages may produce toxic while burning or dumping in open ground along with other decomposing wastages. That's the main reason to handling all the healthcare service units wastages are having conscious procedure, those procedures are handling properly by private contractors who are all authorized to do that.

Palani Municipal Corporation completely free from handling solid waste management of healthcare units and private contractors are handling the wastages. So, Municipal Corporation has no liable to handle these wastes.

### **2. Solid waste Generated from Temple**

Regarding solid waste management system of temple, has been divided into two team. One is solid waste managed by Municipal Corporation and another one is devasthanam. Under devasthanam Palani Muruga temple (hill), Thiruavinankudi temple, Perumalkovil, Periyannayagamman temple and Mariamman temple wastages are collected by devasthanam team. All other remaining temple wastages are collected normally by sanitary workers on daily basis.

“Palani Muruga Temple” wastages are handling by the temple management workers, like all the collected wastes from temple like food, coconut scrub, flowers, cloths and leaf are dumped and disposed separately back side of temple itself. Remaining temples under devasthanam management are taken care by separate vehicles and collected together, and then finally disposing same place where municipal corporation sanitary workers disposing town garbages.

Only the banana wastages from 7 panjamirudham production madabams are collected by municipal corporation sanitary workers during normal days on an average 300kgs to 400kgs of banana waste, during festival time wastages level depends upon the crowd. Commonly 6 to 7 tons of wastages have been collected from these mandabams.

**Table – 1 Banana Wastes during the Festival time by quantity**

Quantity	Thaipusam	Panguni Uthiram	Karthigai	Summer Holidays
Below 500 Kgs	2 (28.6)	2 (28.6)	7 (100.0)	5 (71.4)
500 Kgs to 1 Ton	1 (24.3)	2 (28.6)	0 (0.0)	2 (28.6)
Above 1 Ton	4 (57.1)	3 (42.8)	0 (0.0)	0 (0.0)
Total	7 (100)	7 (100)	7 (100)	7 (100)

Source: Primary data

Table reveals that 7 madabams are taken into consideration which is made panchamritham under Devasthanam, Palani. Sales take throughout the year, especially festival time it reaches peak. Four festivals are treated as most important due to flow of devotees such as Thaipusam, Panguni Uthiram, Karthigai and Summer Holidays (Agni natchathiram) also treated as peak season. During that time the banana wastes are comparatively huge collected by Palani Municipal Corporation.

Normal days it would be 300 kg to 400 kg of wastes were handled by the municipality. In peak season, out of four, Thaipusam and Panguni Uthiram are significantly more sales in panchamritham so that wastes were high. Of these at the time of Thaipusam, municipality would handled more than 1 ton of banana from 4 madabams it contributes 57.1 per cent followed by Panguni Uthiram 42.8 per cent. Thaipusam festival is famous for lord Muruga; so many devotees are come by pathayathirai.

#### **Analysis of Banana Wastes during the Festival time**

Festivals	Mean Score	Average Score	Ranks
Thaipusam	397	99.25	I
PanguniUthiram	358	89.50	II
Karthigai	326	81.50	III
Summer Holidays	312	78.00	IV

This table reveals that ranking of banana wastes are collected during the peak season which are identified as Thaipusam, Panguni Uthiram, Karthigai and Summer Holidays (Agni natchathiram). Garrett Ranking is used and described as Thaipusam leads first followed by Thaipusam, Panguni Uthiram, Karthigai and Summer Holidays (Agni natchathiram).

#### **Mandabam wise Banana Wastes handled by Municipal Corporation**

Mandabams	Thaipusam	Panguni Uthiram	Karthigai	Summer Holidays
1	Below 300 kgs	Below 300 kgs	Below 300 kgs	Below 300 kgs
2	Above 1 ton	Below 300 kgs	Below 300 kgs	Below 300 kgs
3	500 kgs – 1 ton	Below 300 kgs	Below 300 kgs	Below 300 kgs
4	Below 300 kgs	500 kgs – 1 ton	500 kgs – 1 ton	Below 300 kgs
5	Above 1 ton	500 kgs – 1 ton	Below 300 kgs	Below 300 kgs
6	Below 300 kgs	Below 300 kgs	Below 300 kgs	Below 300 kgs
7	Below 300 kgs	Below 300 kgs	Below 300 kgs	Below 300 kgs

Source: Primary data

This table explains banana wastes collected from the 7 madabams under the control of Palani Hill Temple Devasthanam by Palani Municipality. These wastes are recycled and prepared as manure. During the mentioned festival time, he wastes are collected at the range between 300 – above 1 ton. Of these 7 madabams Mandabam 5 contributes more banana wastes for preparing manure followed by Mandabam 2 and Mandabam 4. Manures are usually sold to farmers.

#### **Findings**

1. Healthcare waste may pose health risks indirectly through the release of pathogens and toxic pollutants into the environment.
2. Out of four important festival, Thaipusam and Panguni Uthiram are significantly more sales in panchamritham so that wastes were high.
3. At the time of Thaipusam municipality would handled more than 1 ton of banana from 4 madabams it contributes 57.1 per cent.
4. Out of 7 madabams, Mandabam 5 contributes more banana wastes for preparing manure followed by Mandabam 2 was contributed more for manure preparation.

### **Suggestions**

#### **1. To Healthcare:**

1. Know the healthcare waste laws. Healthcare waste is regulated by the DOT, EPA, OSHA, and the DEA.
2. Classify medical waste by type.
3. Use the right medical waste containers.
4. Include the right documentation.
5. Use the medical waste disposal color code.
6. Hire the right waste disposal company.

#### **2. To Temples:**

1. Flowers into herbal incense sticks.
2. Coconut shell as can be used in concrete construction cement.
3. Handmade paper production.
4. Veterinary feeds.
5. Herbal oils and syrup.

### **Conclusion**

The exhaustive review of various methods of utilizing temple waste for one or the other useful product like vermicompost, biogas, dyes, incense sticks, concrete aggregate replacement etc. suggest that the temple waste can not only be disposed safely in an environmental friendly manner but can also be utilized for making diversified products. This study will propose an alternative approach to waste management since the waste will neither be land filled nor burnt but would be used as a resource that will be recycled.

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