CHAPTER I

INTRODUCTION

"Refuse what you do not need; reduce what you do need; reuse what you consume; recycle what you cannot refuse; and compost the rest"

- Bea Johnson

"செயற்கைஅறிந்தகடைத்தும்உலகத்து
இயற்கைஅறிந்துசெயல்"

- திருவள்ளுவர்

Waste isan unusable materials.Waste is any substance that is dumped after its primary purpose or is useless is considered waste. Waste is a commodity or material which is no longer fit for use. Whereas waste of natural ecosystems is used as fuel or reactant, human waste products are also extremely durable and take long period for decomposition.

Waste may be categorized in to solid or liquid household waste, hazardous waste, medical waste, electronic waste, recycle waste.

Solid or liquid wastes are collected from the household, hotels, schools, offices and termed as domestic waste. Solid waste can be dangerous, be seriously impaired by the climate and health if it is left uncollected. While a substantial proportion of solid waste could be recycled or reused, the collection and recycling based on different forms of wastes remains one of the main obstacles for waste management.

Hazardous waste are waste which can be categorized in four aspects, ignitability or flammable, corrosively or rust reactivity or explosive and toxicity or poisonous. Hazardous waste is waste defined as potentially hazardous to the environment and human health, which includes special care and treatment. The precise storage and recycling process is determined by chemical and physical characteristics. The key aspects of hazardous waste are flammability, degradation, volatility, Eco toxicity and explosively. Special care is required by default for liquid, gas and powder waste in order to prevent waste dispersion.

The medical waste is produced by medications, chemicals and pharmaceuticals, bandages and used medical instruments, and typically by bodily fluids, as well as parts of

the body. Medical waste may be contagious, poisonous or radioactive or may include bacteria and dangerous (includes drug-resistant) microorganisms and nuclear waste includes products that are radioactive. Radioactive waste management is somewhat different from other waste management as it requires specialized techniques.

Clinical waste, commonly known as medical waste, is waste that cannot be classified as general waste and is generated in healthcare facilities such as clinics, laboratories, hospitals, nursing homes, and doctors' offices. Medical wastes include any wastes generated within healthcare institutions such as hospitals, primary health-care centres, burn patient units, veterinary hospitals/clinics, blood banks, and medical examination and testing sections. This category also covers waste generated by patients who take medications at home, such as dialysis and self-administered insulin. The majority of hospital trash are non-hazardous, and are similar to common household or workplace wastes such as papers, medicine packaging, cartons, and culinary wastes. Even though the numbers are tiny in comparison to non-hazardous wastes, infectious and chemical/radioactive wastes, which are commonly referred to as hazardous health-care wastes, account for 15% of total hospital disposals**(Brown, 2012).**

Wet waste (biodegradable) and dry waste (non-biodegradable) are two types of garbage (non-Biodegradable). Kitchen garbage includes all types of cooked and uncooked food waste, along with eggshells and bones. Plant waste comprises flower and fruit waste along with juice peels and vegetable garbage. Garden sweeping or yard waste, which includes green/dry leaves, sanitary wastes, and waste from food and tea stalls/shops are also included.

Plastics, paper, and cardboard are examples of non-biodegradable dry waste. Containers containing hazardous material, packaging material, glass, metals, rags, rubber items, Foils, ashes, wrappings, pouches, sachets, and tetra packs, discarded electronic items from offices, colonies viz. cassettes, computer diskettes, discarded clothing, printer cartridges and electronic parts, furniture and equipment.

Household waste, industrial waste, oil waste, e-water waste, construction waste, agricultural waste, food waste manufacturing, agricultural waste, nuclear waste, and slaughterhouse waste are examples of different types of garbage. Vegetable waste, kitchen garbage, and household waste are all sources of solid waste. E-waste is made up of

electronic items that have been discarded, such as computers, televisions, and music systems. Water utilised in many sectors, such as tanneries, distilleries, and thermal power plants, is referred to as liquid waste. Plastic bags, bottles, and buckets are examples of plastic garbage. Metal waste consists of unused metal sheet, scrap metal, and nuclear waste consists of wasted nuclear power plant materials.

In India, the generation of municipal solid garbage has increased significantly during the last several decades. This is due to global population expansion, and per capita municipal solid waste generation in India ranges from 100 g in small towns to 500 g in large cities. The amount of solid garbage generated in Indian cities has surged from 6 million tonnes in 1947 to 48 million tonnes in 1997, and by 2047, it is predicted to reach 300 million tonnes per year (CPCB, 2000). Food patterns, cultural traditions of residents, lifestyles, and environment all influence the features of MSW gathered from any location.

Household waste, street waste, and sanitation residue make up municipal solid waste. The majority of this trash comes from residential and commercial structures. As a result of urbanization, changing lifestyles, and eating habits, municipal waste is fast expanding.

Solid waste management is a discipline concerned with the control of solid waste storage, transportation, disposal, generation, and collection. It encompasses all of the critical tasks involved in transporting solid waste from the point of generation to disposal locations, as well as the actions carried out at the landfill to ensure environmental protection**(Sira, 2012).**

Solid waste management (SWM) is an important aspect of the urban environment and infrastructure development in order to ensure a healthy and safe human environment while also considering the growth of sustainable economic development. Fast financial development by the industrialization of the emerging nations has made significant issues of waste disposal because of unmonitored and uncontrolled urbanization (UNEP, 2007). The issue is further complicated by a lack of consideration for waste generators (the general population), as well as a lack of financial resources and people resources educated in SWM techniques in the transportation, final disposal, collecting, and processing circles. As a result, the agencies concerned or responsible for environmental

protection and public health are confronted with a crisis of inadequate solid waste management.

Any advancement growth in the public realm must have public participation. Meanwhile, communities continue to be viewed as passive beneficiaries of government services in many parts of the world, and they are frequently ignored even in local decision-making processes. As a result of this practise, the general public is unaware of the role they can play in the reform process. In this approach, cooperation could be a missing component/link in a possible recipe for better solid waste management, among a few wastes management and disposal techniques. Even in the areas of reusing behaviour, impressive research efforts have been coordinated to public participation**(Barr, 2004).**

India is the second most crowded country on the world; the uncontrolled development of urban zones has prompted insufficiency in infrastructural services, for example, municipal solid waste management (MSWM), water supply and sewage. The expanding populace has brought about a huge pressure on the therapeutic services, prompting tremendous measures of infectious/ hospital waste generation. The urban populace is assessed to be 285 million, or, in other words, a couple of huge urban areas and 32 metropolitan urban communities. Between 1981 and 1991, the number of Class 1 urban towns with populations exceeding 100,000 increased from 212 to 300. (CPHEEO, 2000). It's interesting to note that these Class I urban neighbourhoods house up to 65.2 percent of the urban population. Because of the rising Indian economy, the output of municipal solid waste (MSW) has increased at an exponential rate in recent years. The level of living in the country's urban areas has risen significantly, putting municipal officials in a difficult position. According to estimates, garbage volumes will increase from 46 million tonnes in 2001 to 65 million tonnes in 2010 **(Kumar and Gaikwad, 2004)**. Despite the fact that large portions of municipal consumption are set aside for it, most urban regions across the country are having solid waste management (SWM) challenges.

Solid waste management is one of the most pressing issues confronting cities throughout the world. The issue is exacerbated by urbanisation, industrialization, bad urban planning, and a scarcity of resources, all of which contribute to the massive amount of solid garbage generated. In developing countries like India, this problem has caused

major environmental, social, and economic problems. The city's rapid population increase and dynamic economic activities have resulted in a major waste management challenge. Industrial, Domestic and other wastes, whether low or medium level pollutants, pollute the environment and have become chronic challenges for humanity **(Ramasamy and Varghese, 2003).**

RCRA (Resource conservation and recovery Act 1976), defines that a wastewater treatment plant, a water supply treatment plant, or an air pollution control facility defines solid waste as any garbage or refuse that has been discarded as a result of a business operation or an industry, as well as garbage that has been discarded as a result of an agricultural or mining operation or as a community activity. Solid waste doesn't just refer to things that are 'solid' in the physical sense. Many solid wastes contain liquid, semi-solid, or gaseous constituents in addition to solid waste.

In India, where urbanisation, industrialization, and economic expansion have resulted in increased municipal solid waste (MSW) generation per person, solid waste management (SWM) is a major issue for many urban local bodies (ULBs)**(PPCB Punjab Pollution Control Board, 2010).**

Solid waste management encompasses the waste generation, storage, collection, transportation, segregation, processing, and disposal processes. Solid waste management is concerned with converting waste into useful resources.

Waste management also be referred to as solid waste management. Solid waste has been a drag in modern society for as long as people have lived in stable communities. Modern societies generate more waste than early humans ever did. Many kilos of solid garbage each client will be generated by drastic changes in business nations, not only directly from residences or families, but also indirectly from firms that create products purchased by customers. It is the system of handling, transferring all the garbage; Incinerators, landfills, recycling programs are the best waste collection system in municipalities for effective solid waste management **(Puja Mondal, 2012).**

Waste creation, storage, collection, transportation, processing and recovery, and waste disposal are the functional parts of solid waste management(**Mansour, 2018).**

Waste generation is the process of marking goods as no longer useful and then discarding or collecting them for disposal. Human, animal, and ecological activity all contribute to the creation of solid waste. The quality and amount of solid waste are two characteristics of waste generation. Quantity indicates the rate of generation, volume, and overall quantity of trash generated, whereas quality refers to the types, sources, and composition of solid waste.

The handling, storage, and disposal of solid waste at or near the point of generation are referred to as storage activities. It is the first stage of solid waste management at the household level. Any individual or family is accountable for a specific location for solid waste storage. Effective trash storage is the first step in proper garbage disposal for individual industries, residences, and commercial areas.

The operation of collecting solid trash and transporting it to the spot where the collection vehicle is unloaded is referred to as collection. The collecting process comprises not only picking or gathering solid garbage, but also transporting and unloading it at a transfer station or disposal site.

Transportation refers to the process of moving waste from a smaller collecting vehicle to a larger transport facility and then transporting it to a disposal site, usually over a considerable distance.

Processing and recovery are a partly solid waste disposal and reclamation process in which technology is used to increase the functional components of solid waste, recover valuable materials, and convert gods or energy from waste.

Disposal refers to the collection and transportation of solid trash to a landfill site, as well as semi-solid waste from waste water treatment plants, incinerator wastes, compost, and other contaminants from various solid waste treatments.

Lack of sufficient waste disposal and collection systems creates health problems, resulting in diseases, which exacerbate poverty and have negative consequences such as lost income due to illness, higher health-care spending, and the poor's inability to live in a safe environment(**McAllister, 2015)**

The fulfilment of human needs is dependent on environmental variables such as the availability of pure water, clean air, and appropriate living space, as well as people's

ability to preserve a spirit in cultural and aesthetic relationships with their surroundings in many cases**(Panneerselvam and Ramakrishnan, 1996).**

In India, the environment, health, and poverty are all intertwined since many of the most common and deadly diseases, particularly those that disproportionately afflict the poor, are caused by environmental factors **(Palczynski and Scotia, 2002).** Urban air pollution, which is generated by biomass burning in waste incinerators, open garbage burning on streets and in homes, and a lack of street sweeping, is a critical part of environmental health. Toxins and suspended particles such as ash can be discharged into the air when something is burned. In most Indian compounds, open burning is common. In India, collected household waste is dumped in open dumps, causing environmental issues.

The main issue with open dumping is that decomposing rubbish releases dangerous chemical substances into the surrounding soil, contaminating groundwater, rivers, and streams. Flies, rats, and other pests create health risks to locations where garbage dumps are adjacent to residential areas**(Palczynski and Scotia, 2002).**

Statement of the problem

Waste management constitutes the major issues towards the countries.

- Most of the towns and cities do not collect the generated waste and have proper disposal.
- Improper waste collection and disposal are major sources of pollution in water, rivers, streams, land, and air, posing significant threats to human health and the environment.
- Rapid industrialization, urbanization, and economic expansion in the countries are all expected to worsen the situation in the next decades.
- Waste management is becoming a major issue to the health and environment in semi urban, urban and even rural areas of many developing countries.
- Local government includes towns, villages, panchayat, municipalities are unable to provide the proper waste management. Illegal dumping, open dumping, incineration in road side, improper collection of waste from houses, hotels, schools is a common practice.

- Solid waste management is given a low priorities and budget for the provisions is low and attitudes among the people are major reasons to manage the waste.
- Local panchayats and small towns and villages face increasing in difficulty to play a role in manage the waste but inadequate in budget, provisions results in poor solid waste management.
- This fact has acknowledged and this research titled "**Disseminating knowledge on solid waste management".**

Need of the study

Rameswaram is one of the holy island with more floating population and waste generation is higher compared to other places and the population is about 50,594(according to municipality record) from the survey report of municipality record the volume of waste generation is about 11 tonnes per day and hauled to dumpsite daily. The improper disposal of waste in all over the places is witnessed.

One of the primary difficulties in countries is a lack of education and understanding about proper waste management procedures. Even if citizens were aware of recycling and other sustainable waste-management strategies, involvement in pro-environmental activities such as recycling programmes did not always transfer. People who are uninterested in environmental issues are ill-informed, which has an impact on their actions.

According to **McAllister (2015)**, a lack of environmental concern leads to a culture of community non-participation in decision-making processes, which intensifies a lack of accountability for waste and pollution issues. Citizens that receive waste education or awareness become more informed and understand the need of waste management, making them more responsible. Keeping them informed or educated entails enhancing their waste management expertise, which necessitates their participation in decision-making.

One of the primary difficulties in developing countries is a lack of education and understanding about proper waste management procedures. According to McAllister (2015), residents' awareness of recycling and other sustainable waste management strategies does not always translate into engagement in pro-environmental activities such as recycling campaigns. People who are disinterested in environmental issues are ill-

informed, which affects their activities and makes them feel excluded from waste management decision-making.

Littering is a major problem in most developing countries when it comes to solid waste management. Littering has a variety of causes. These factors include a lack of societal pressure to prevent littering, a lack of consistent enforcement or actual sanctions, and a lack of understanding of littering's environmental consequences **(Al-Khatib et al., 2009)**.

Most towns have a non-concerned attitude toward waste management, which lessens their environmental responsibilities. This is due to the fact that the majority of community members are not involved in decision-making and, as a result, develop a lack of care, rendering them unresponsible for waste management (McAllister, 2015). This attitude varies according to social status. Individuals' attitudes and behaviours, on the other hand, can be positively changed by developing effective waste management systems to effective waste generation. When the most basic needs for food and shelter consume the majority of a community's attention, many environmental ideals are overlooked. This suggests that those who have met or are meeting their basic needs are concerned about waste management.

Significance of Study

The important role of solid waste management is to reduce and prevent adverse effects due to improper solid waste management. Reducing the building sanitary landfill, and landfilling will reduce the ground and surface water contamination and provide clan water. Sustainable solid waste management can provide compost which can yield good agricultural product without chemicals, recyclable materials can create livelihood to the poor people.

Following a series of environmental conferences, beginning with the India Earth Summit in 1992, which marked the start of global environmental movements, most governments implemented policies to address environmental issues. The implementation of environmental awareness programmes among their populace was one of the initiatives. As the reality of environmental problems such as municipal solid waste becomes more widely understood, measuring and forecasting environmental awareness through environmental education becomes increasingly important.

Objectives of the study

This section discusses the study aims for which the full survey was created. The following are the objectives to,

- Assess the socio-economic characteristics of the women.
- Evaluate the women's current solid waste management procedures.
- Assess the knowledge, attitude and practices of women on regarding solid waste management.
- Assess the impact of educational intervention among women on solid waste management.

General Research Questions

What is the public's perspective of solid waste management and the potential role of environmental education in improving the trash issue in the chosen area?

Specific Research questions

The following are the exact research questions that were employed in the study and correspond to the objectives:

- What are the perspectives of women on solid waste management?
- What are women's perspectives on their involvement in solid waste management?
- What role could environmental education play in improving Rameswaram's solid waste management?

Hypothesis of the study

- There will be no association between the socio economic variables and the problems faced by the people due to accumulation of solid waste.
- There will be significant impact among women knowledge on solid waste management after the educational intervention.
- There will be significant impact among women attitude on solid waste management after the educational intervention.
- There will be significant impact among women practices on solid waste management after the educational intervention.

- Educational intervention programme does not improve the knowledge level of women.

Organization of the thesis

There are five chapters in this thesis. The first chapter offers background information, a summary of the problem, and a list of objectives. It also includes information on the study's goal or purpose, research questions, and importance. Chapter two analyses the relevant literature, and chapter three details the methods utilised in the study, including the research design, study region, population, sample, sampling mechanism, and data collection tools. The research findings are presented in Chapter 4 along with a discussion of the findings. Conclusions and recommendations are given in last fifth chapter.