"A STUDY ON WASTE MANAGEMENT IN THRIKKAKARA MUNICIPALITY"

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MAHATMA GANDHI UNIVERSITY, KOTTAYAM

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BACHELOR OF COMMERCE

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BONAFIDE CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY ON WASTE MANAGEMENT IN THRIKKAKARA MUNICIPALITY"**, has been prepared by **Akshai R.D, Anjana Santhosh, and Ajas Ahammad V.H** under my supervision and guidance in partial fulfilment of the requirement for the Degree of Bachelor of Commerce of Mahatma Gandhi University. This is also to certify that this report has not been submitted to any other institute or university for the award of any degree.

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DECLARATION

We, **Akshai R.D, Anjana Santhosh, Ajas Ahammad V.H**, B.Com Final year students, Department of commerce (Computer Application), Bharata Mata College Thrikkakara, hereby declare that the Dissertation submitted for the award of Bachelor's Degree is our original work. We further declare that the said work has not previously been submitted to any other University or Academic Body.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Among all the species living on the earth, man is the most intelligent one. But he has used this rarest gift of highly itellect to disturb and to destroy nature because of human activities in, on and above the earth, the planet itself has become on endangerd entity. This human attitude is responisible for all the problems of environment resources and the other species to our advantage, there by creating an imbalance in nature.

Waste management is collection, transport, processing, recycling of disposal of waste materials produced by human activity and is generally undertaken to reduce effect on health and the environment. Practice on the process of waste management to may differ in developing nation to under developing nations, urban to rural area and residential to industrial area. Waste can be solid, liquid or gases and each one of these has different methods of disposal and management. It may include industrial, biological, municipal, organic, biomedical, radio active waste.

Like most places in Ernakulam, Thrikkakara (Kakkanadu) has been facing serious waste management problem due to rapid urbanisation and changing life style of the people. As popolation increases, the burden of disposing of society's waste increases wih it. Increasing cost of waste management and securing final disposal landfills are the most issues in Thrikkakara today. In the instant paper the authors have made on in-depth study in to the menace of waste management and its impact on the public health. The authors observe that population explosion, tourism development, economic growth for sustainable development coupled with inadequate waste legislation enforcement, poor infrastructure and above all, public altitude are highly attributable to the soaring of waste production, inadequate waste management capacity there by causing inefficient or improper waste disposal practices in Thrikkakara (kakkanadu).

There are various methods and techniques for disposing of waste including compositing, landfills, recycling etc. These methods will be helpful in disposing of the waste without being harmful to the environment. Waste management is helpful in protecting the environment and

safety of the surrounding environment for human beings and animals.

Thrikkakara is a rapidly growing locality having info park, special economic zone, various central government offices and the ernakulam district collectorate. These commercial spaces are bound to generate large amount of waste and so far the municipality has not known what to do with the situation. But now they have launched a project named 'haritha mithram' which will enable Thrikkakara (kakkanadu) to get a clean municipality status. This project includes around 750 students from bharata mata college will support the municipality and haritha karma sena members in the compaign. They will visit each households for collecting details of the house owner and other details including waste management. Haritha mithram project involves monitoring waste management in the locality, checking the progress of infrastructure works, operating a complaint cell for the public and other features from ground level to the state level. Once the survey is completed, QR code will be pasted on the walls of 30000 houses and 20000 institutions in the municipality to monitor waste collection and management.

The study on this project will investigate the factors contributing to inadequate waste management in Thrikkakara. Data collection will be collected from both households and business premises. It will involve assesment of the level of knowledge or awareness on waste management, waste disposal, the method used in disposal and the cost incurred in waste disposal in area of Thrikkakara.

1.2 STATEMENT OF THE PROBLEMS

In this project, we proposed to examine a study on the waste management in Thrikkakara. The study focus on how to manage proper waste, create awareness about waste management in the minds of public, promote many waste management innovations.

Because there is no garbage or proper waste management collector in their community the alternative way they do to lessen their garbage is by means of burning it. Burning garbage is one of the reason why the air is being polluted because it produce harmful gases that affects the ozon layer together we the air we breath.

1.3 SIGNIFICANCE OF THE STUDY

The study on the waste management is important as it protect the environment from the toxic, inorganic and biodegradable element present in waste. Improper management of waste can cause damage to the environment like water contamination, soil erosion, air contamination and pollution. It will also affect the health of the humans and animals.The study on this project enable us to findout many solutions to overcome these problems. It enables us to study detail view about the waste management systems and measures to overcome the problem in Thrikkakara. It also aims to strengthen the existing waste management system.

1.4 OBJECTIVE OF THE STUDY

1. To understand and effective method of proper waste mangement system in Thrikkakara municipality

2. Create awareness about proper waste management in the minds of public

3. To study the importance of waste management to the environment

4. It protects the healthiness and well-being of people by providing an affordable waste collection service.

5.understanding of various systems available for collection transportation, recycling and disposals.

1.5 SCOPE OF THE STUDY

This study will helps to findout different methods of proper waste management. The study can helps to findout whether the ideas of waste management target the public. The study can findout whether the ideas or report educate the public in a right way or not. It helps us to know more about the proper method of waste disposal, it needs and importance. This study helps to resolve the problem of waste management in the locality. This study also enables to explore the level of

public participation in waste management in Thrikkakara town.

1.6 METHODOLOGY OF THE STUDY :

TOOLS FOR DATA COLLECTION:

PRIMARY DATA:

Primary data means the data which is collected by the investigator himself for the first and there are original in character. In this study, the primary data is collected through the questionnaire has been properly prepared inorder to cover all the information required for the study. Primary data is tabulated and analyzed by using tools like percentages and pie diagrams.

SECONDARY DATA:

Secondary data is the data collected by some person for his own purpose and they are published in nature. Here in this study secondary data collected from manual, books, internal source and journals.

1.7 LIMITATION OF THE STUDY

1. Bias of the respondents may affect the study

2. Lack of time. The respondent's opinion may changes from time to time

3. The study was limited to a specific area of Thrikkakara municipality.

1.8 CAPITATERISATION

CHAPTER 1 - INTRODUCTION

First chapter deals with the introduction to the topic a study on waste management in Thrikkakara, its significance, objective, methodology and limitations.

CHAPTER 2

Second chapter deals with review of literature done by other researchers on waste management, it provide the view about a study on proper waste management in Thrikkakara.

CHAPTER 3

Third chapter deals with the theoretical framework, it deals with some general theories, benefits, limitations etc about waste managment.

CHAPTER 4

Fourth chapter deals with the analysis and interpretation of data collected from individuals.

CHAPTER 5

Fifth chapter deals with the findings and suggestions we made after analysis and interpretation of the data.

CHAPTER 2

REVIEW OF LITERATURE

1.SONIL NANDA, FRANCO BERRUTI (2021):

According to sonil nanda, the composition of waste varies within income. That is low to middle income population generates mainly paper, metals and glass waste. The waste can be managed by several process. It includes recycling, incineration, waste to energy conversion, composting or landfilling. Sonil Nanda support the process of landfilling. She review the impact of landfill conditions such as constrction, geometry, weather, temperature, moisture, PH, biodegradable maller and hydrogeological parameters on the generation of landfill gases and leachate. She discuss volume reduction, resource recovery, valorization of dumped waste, environment protection and site reclamation towards urban development. She present the classifications and engineered iterations of landfills, operations, mechanisms and mining.

2.JOSHUA RENO(2015):

Joshua Reno demonstrated that waste is more than just a symptom of an all too-human demand for meaning or a merely technical problem for sonitary engineers and public heath officials. Waste management reveal the untrality of transient and discard things for questions of materiality and ontology and marginal and polluting labour and environmental justice movements as well as for uliques of the exploitation and deffored promises of modernity and imperial formations. He concludes that generation of waste are not only our problem, but become entangled with the lives of non-human creation and the future of the planet we share.

3.ABDULTADIR KAN (2009):

He argues that the waste has been increasing due to the increase in human population and urbanization waste are generated from manufacturing processes, industries and muncipal solid wastes. The environmental awarness has tremendously contribute to the disposal of the generated waste. His study presents a detailed review about research published on the effect of waste materials on environment.

4. MUFEED SHARLAY, KAFUL AHMAD, GAUHAR MAHMOOD, RC TRIVEDI (2008):

They reviewed about municipal solid waste management in Indian cities. Improve management of municipal solid waste causes hazards to inhabition various studies reveals that about 90% of MSW is disposed of inscientifically in open dumps which create a heavy problems to public health and the environment. In their studies they provide the characteristies collection, generation, transportation and treatement technologies of MSW produced in Indian cities has been carried out to evaluate the current status and identify the major problems. Colorful espoused treated technologies for MSW are critically reviewed, along with their advantages and limitations. The study is concluded with few suggestions and further improvement of present system.

5. ELLIOTT STEEN WINDFIELD, MARIANNE SU-LING BROOKS (2015):

His study examines about medical waste management, including the common sources, governing legislation and handling and disposal method. Lack of clarity has made sorting medical. Waste inefficient, there by increasing the voume of waste treated for pathogens which is commonly done by incineration. This review highlights the unnecessary classification of waste as infectious results in higher disposal costs and increase in undesirable environmental impacts. The review concludes that better education of healthcare workers and standardized sorting of medical waste streams are key avenues for efficient waste management at healthcare facilities, etc.

6. DANIEL HOORNWEG, PERINAZ BHADA-TATA (2012):

Solid waste Operation is the one thing in which every megacity government provides for its residers. While service situations, environmental impacts and costs vary dramatically. As the world hurtles towards civic future, the quantum of municipal solid waste(MSW) is one of the most important by- products of an civic life, is growing indeed briskly than the rate of urbanization. The reports estimates moment these quantities have increased to about 3 billion

residents generating 1.2 kg per person per day. By 2025 this will probably increase to4.3 billion civic residents generating about 1.42 kg/ capita/ day of municipal solid waste.

7. LORENZO GIUSTI (2009):

The most recent information on waste arisings and waste disposal options in the world, in European Union(EU), in organisation for profitable co-operation and development(OEDC) countries and some developing countries(specially China). The most recent information on waste arisings and waste disposal options in the world, in European Union(EU), in organisation for profitable co-operation and development(OEDC) countries and some developing countries(specially China). The implicit direct and circular impact of waste operation conditioning on health. The main focus is primarily on external solid waste(MSW). The reported goods of radioactive waste are also compactly reviewed. Hundreds of epidemiological studies reported on the prevalence of wide range of possible ails on workers of waste installations and on the resident population. The main conclusion of overall assessment of the literature is that the substantiation of adverse health issues for general population living near tip

spots, composting installations etc. In order to ameliorate the quality and utility of epidemiological studies applied to populations abiding in areas where waste operation installations are located or planned, preference should be given to prospective studies of sufficient statistical power, with access to direct mortal exposure measures, and supported by data on health effect biomarkers and vulnerability biomarkers.

8. ASTRID ALLESCH, PAUL H BRUNNER (2014):

Assessment styles are common tools to support opinions regarding waste operation. The ideal of this review composition is to give guidance for the selection of applicable evaluation styles. For this purpose, constantly used assessment styles are reviewed, categorised, and summarised. A thing participated by all studies is the support of stakeholders. utmost studies are grounded on life cycle assessments,multi-criteria-decision-making, cost- benefit analysis, threat assessments, and benchmarking. roughly 40 of the reviewed papers are life cycle assessment- grounded; and

further than 50 apply script analysis to identify the stylish waste operation options. utmost studies concentrate on external solid waste and consider specific environmental ladings. The choice of system rudiments and boundaries varies significantly among the studies, therefore assessment results are occasionally antithetical. Grounded on the results of this review, we recommend the following considerations when assessing waste operation systems:

i) A mass balance approach grounded on a rigid input – affair analysis of the entire system.

ii) A thing- acquainted evaluation of the results of the mass balance, which takes into account the intended waste operation objects.

iii) A transparent and reproducible donation of the methodology, data, and results.

9. ATHANASIOS C KARMPERIS, KONSTANTINOS ARAVOSSIS (2013):

This paper checks decision support models that are generally used in the solid waste operation area utmost models are substantially developed within three decision support fabrics, which are life- cycle assessment, the cost – benefit analysis and multi-criteria decision- timber. These fabrics are reviewed and their strengths and sins as well as their critical issues are anatomized, while their possible combinations and extensions are also bandied. Specifically, since a waste operation model is sustainable when considering not only environmental and profitable but also social aspects, the waste operation logrolling game is introduced as a specific decision support frame in which future models can be developed.

10. RAMZY KAHHAT, JUNBEUM KIM (2008):

Amounts of end- of- life electronics ore-waste around the world keep growing. E-waste is projected to grow in the coming many times. This paper explores issues relating to planning un borne-waste regulation and operation systems in the U.S. It begins by reviewing the being U.S. recycling systems in the U.S. to establish the significance of developing public responses. Other countries and regions around the world have formerly enacted and enforced electronic takeback and recycling systems. To establish the environment of being experience, e-waste operation systems in the European Union, Japan, South Korea and Taiwan are explored. Given this environment, a result is proposed that's designed to insure a proper end- of- life option while at the same time establishing a competitive request for exercise and recovering services. The result,

nominated e -Market for Returned Deposit, begins with a deposit paid by consumers to merchandisers at the time of purchase, electronically registered and tracked via a radio-frequence identification device(RFID) placed on the product. At end- of- life, consumers consult an Internet- enabled request in which enterprises contend to admit the deposit by offering consumers variable degrees of return on the deposit. After collection of the computer by the named establishment, the cyberinfrastructure utilizes the RFID to transfer the deposit to the winning establishment when recycled. However, the transfer is remitted until true end- of- life processing, If the establishment chooses to refurbish or resell the computer in lieu of recycling. Eventually the paper discusses the domestic and transnational consequences of the perpetration of the proposed design.

11. AC. ACHUDUME, JT OLAWALE (2007):

Microbial pathogens of public health significance set up in waste and common spots were collected from four different jilting spots and assessed for pathogenic agents. The modified styles employed were predicated on the classical styles and introductory principles of the responses followed by biochemical enzymatic morals described for gram negative non stirring bacteria. These pathogens can infect injuries and beget sepsis and mortality and can indeed do with analogous organisms to beget secondary infection. These groups of organisms are nearly impossible to control since they are ubiquitous. Public health may be assured from pathogenic agents at waste spots by prompt dumping of waste and proper operation(mechanical sorting and digging) styles.

12. DIETER STRAUCH (1996):

The operation of biowaste is an important factor for relief of the terrain. But it should not be ignored that a variety of pathogens can be set up in the raw material of biowaste. It's therefore necessary that by the composting technology the guarantee is given that these pathogens are inactivated during the composting process. The pathogens of significance in this respect belong to microbial groups of bacteria, fungi, contagions and freeloaders. The main part play salmonellas which reach the biowaste with kitchen waste of homes, caffs , canteensetc. ultimate of this material is of beast origin. The workers in composting shops are exposed to various dangerous influences dangerous substances, redolences, dust, microorganisms and their venoms,

noise. Especially the problem of aerosolized microorganisms like Aspergillus fumigatus, other bacteria and contagions and their possible influence on the health of workers and of dwellers in the surroundings of composting shops are mooted. Recommendations are mentioned for a better outfit of workplaces to meliorate the protection of workers from microbial emigrations. For the protection of the terrain the use of biofilters for sanctification of waste air is recommended.

13. L.NERSTING, P.MALMOROS, T.SIGSGAARD, C.PETERSEN(1991):

Figures of airborne microorganisms, fungi, Gram-negative bacteria, thermophilic microorganisms, endotoxins and dust have been covered in resource recovery shops and composting shops. The work is still in progress, so this paper decribes only primary results. Only low situations(< 15 ng m −3) of endotoxins were set up at all locales. situations of microorganisms, fungi, Gram-negative bacteria and dust changed with quality of waste, exertion in the factory etc. situations of airborne microorganisms, endotoxins and dust could be vastly dropped in resource recovery shops if only waste of good quality,e.g. presorted accoutrements , is handled. For composting shops the loftiest situations of airborne microorganisms were set up during aeration, especially by inner composting where situations of8.3 × 105 CFU of mesophilic microorganisms were set up.

14. SAMINA WASI, SHAMS TABREZ, MASOOD AHMAD (2013):

Environmental pollution implies any alteration in the surroundings but it is restricted in use especially to mean any deterioration in the physical, chemical, and biological quality of the environment. All types of pollution, directly or indirectly, affect human health. Present scenario of pollution calls for immediate attention towards the remediation and detoxification of these hazardous agents in order to have a healthy living environment. The present communication will deal with the use of naturally occurring microbes capable of bioremediating the major environmental pollutants.

15. OKSFRIANI JUFRI SUMAMPOUW, YENNY RISJANI (2014):

The terrain quality of water, soil and air is degraded decreasingly. thus we need to raise the forestallment of pollution by covering environmental quality. There were several monitoring styles on the environmental quality, especially natural system. Biological styles assess the

presence of several species, similar as shops, insects, fish, bacteria and contagions as environmental index. Some species of bacteria have been used as pointers in covering environmental quality, eg Coliform, Escherichia coli, Streptococcussp., Pseudomonassp., Vibriosp., Clostridiasp., Bifidobacterium pseudolongum, Arcobactersp., Thiobacillussp., and etc. The bacteria act as an index of ménage waste(mortal and beast feces, ménage waste and other), heavy essence pollution, crude canvases and other pollution.

CHAPTER 3

THEORETICAL FRAMEWORK

ABSTRACT

Waste management has elevated in importance across the globe. Rapid growing generation rates, increasing environmental and health problems caused by inappropriate handling of waste, decreasing waste disposal capacities and varying legislative and political conditions are having significant effect on waste management practices . Due to urbanisation and rising human population, trash production has been continually rising. Waste materials are mainly generated from the manufacturing process, industries and municipal solid waste. The increasing awareness about the environment contribute to the concern related with disposal of the generated waste. This project shows detailed review about waste and waste management options in Thrikkakara municipality.

INTRODUCTION

Thrikkakara is a place in the city of Ernakulam . The municipality consist of 43 wards. The Kerala state pollution control Board has stated that Thrikkakara municipality have fail to initiate any positive step for complying with the solid waste management rules in 2016. Problem with waste management are a concrete manifestation of the impact of consumption patterns and it has been suggested that seeking a solution for the waste problem for both for the industrialised countries and the emerging ones. In Thrikkakara rapid growth of urbanization , lack of funding facilities , poor maintenance of garbage collection, poor sanitation facilities leads to the cause of production of waste. Another predominant factor of waste disposal in most part of Thrikkakara municipality is open and unregulated dumps .The generation of organic waste may not cause too much problem to the environment because it is biodegradable , but the generation of inorganic

waste create major effect on the environment because it is non- biodegradable . These non-biodegradable inorganic waste remains in the environment and pollutes the environment.

The major municipal waste comprises of food waste, plant matters, dead animals, waste papers, plastics, dust and sand from road sweeping etc. To increase collection, consider door-to-door pickup, strategically placed community bins, and source-separated waste. However, improper collection time and frequency, a lack of transportation options, and other issues with resident knowledge lead to ineffective collection.

The management of waste through the process of incineration is not good for the environment as it emits harmful gases like carbon dioxide which cause global warming. Although technological solutions such as sanitary landfilling, recycling, incineration treatment have been implemented to handle the type and quantity of waste generated in Thrikkakara municipality, their contribution to the effective management of waste have been inefficient and low.

Digital Thrikkakara

The Haritha karma sena collects non- biodegradable waste from the houses and establishments to shredding units for recycling .The waste is segregated into different sections based on its features.

As part of implementing Haritha Mithram – smart Garbage Monitoring Apps for streamlining waste collection and management, a customer enrolment campaign has been launched in Thrikkakara Municipality. Renu Raj, district collector, launched the initiative. Around 750 students from Bharata Mata College Thrikkakara supports the municipality and haritha karma sena members in the campaign. They visited each households and collects the details of house owner and other necessary details including waste management. This project includes monitoring waste management, checking the progress of infrastructure works for the purpose, operating complaint cell for the public and other features from the ground level to the state level. Once the survey is completed, QR code will be pasted on the walls of houses and the institutions in the Thrikkakara municipality to monitor waste collection and management. The app was

developed by KELTRON. To help the public with their questions, a help desk staffed by five KELTRON employees has been put up in the municipality.

Disposal of non-biodegradable waste

Civil body told to ensure proper storage of non-biodegradable waste. The Thrikkakara Municipality has been ordered by the state Pollution Control Board (PCB) to make sure that non-biodegradable waste is stored properly at its material collecting facility next to the collectorate in Kakkanadu. After discovering waste being stored in the facility in the open, the civil body made a recommendation. Leachate flows as a result of it during the wet season.

The municipality provide various ways of disposal of waste in a scientific manner with provision for recycling and landfill. Separate vehicles are provided for the transport of waste. Waste spills must be prevented by covering the vehicles. Organizations that generate a large amount of waste are directed to treat it on-site. This includes hotels, industries, etc. It requires that garbage be divided into dry, wet, and hazardous waste at the source itself.

HOW DID WASTE MANAGEMENT EMERGE

Since our inception thousands of years ago, humanity have been using some of the most basic and primitive waste management systems and procedures. Along with burying their waste, the ancestors of humans made holes in the sand by hand to bury their faeces. This was done to deter rodents, rats, and other creatures that thrived on trash and spread several diseases among humans.

Days passed quickly, and with them came a modernization and improvement of the procedures we used. Many wastes stopped degrading biologically as a result of the rapid development of bio-degradation, necessitating the use of an alternative approach. Every nation's needs and ideals led to modifications to these methods, which resulted in the creation of distinctive frameworks for each.

Consider the aspect of composting, for instance. A compost pile is created from the food scraps, such as eggshells and bread crumbs, that are left over from our regular meals. These wastes are then gathered collectively.

Vermicompost, which makes for superior manure, is created by mixing these organic wastes with other green materials like grass and vegetable scraps in the proper ratios. One of the best examples of waste management recycling that we can cite is this.

IMPORTANCE OF WASTE MANAGEMENT

1. Minimize the transmission of illnesses and lower the risk of unintentional harm to community members, patients, and staff.
2. Reduces odors
3. Improve the facility internal safety and hygiene.
4. Boost the facility's internal cleanliness and safety.
5. Waste minimization, increased recycling, and reuse are being encouraged more and more by waste regulation and policy.
6. Encourages positive relations with the host country.

METHODS OF WASTE MANAGEMENT

1. RECYCLING

Recycling is the process of converting used product into new useful products. It is a fundamental idea in contemporary waste management. It is one of easiest and useful method of waste management that anyone can take to reduce the impact of humans on the environment. The process of recycling also saves the habitats such as rainforest. By reducing the demand for new materials from the environment. As a result more land and

habitats can be preserved or conserved. The method of recycling is very environmental friendly. It is less expensive than the combined cost of processing new materials. The importance of recycling has increased as men have learned more about the repercussions of pollution and global warming. Coal, oil, and gas reserves can be preserved by recycling. Recycling of metals like aluminum and steel saves energy. Recycling of plastics helps to protect water bodies as it reduces waste being released into the water bodies. Recycling of paper reduces air pollution as it will protect millions of trees. Recycling of rainwater helps in maintain underground water. Recycling helps in creating job opportunity and build a sustainable planet for the future generations.

2. INCINERATION

Incineration is a waste management technique that involves burning the organic compounds included in trash. It actually burns and convert the waste materials into ashes, flu gas and heat. It is one of the effective method of reducing the volume and weight of municipal solid waste. This process consist of burning of waste at high temperature (1200-1500 degree c).Energy recovered from burning of waste is used to generate steam for electricity generation. Combined heat and power plants increases the efficiency of energy recovery by producing electricity as well as utilizing residual heat. This method helps to reduce depends on fossil fuels. One of the main feature of incineration process is that it can be used to reduce the original volume of combustible solid waste by 80 to 90 %. Modern process of incineration helps to filter out many of the potential harmful emission. So that they do not escape in to the outside environment. These include various dioxins and some environmental dangerous acid gases like hydrogen chloride.

3. LANDFILL

A landfill is another method of waste management. It is the method of land disposal of solid and hazardous waste. It is a system of garbage and trash disposal by the way in which wastes is buried between the layers of earth. Burying of waste materials under

earth can produce energy by the conversion of landfill gas (Methane and CO2). The byproducts of landfill can be used as direct or indirect fuel for combustion. Landfilling is most convenient option. Waste inside a landfill must not come in contact with the soil and groundwater surrounding the landfill. To keep landfills clean, garbage is daily covered with a layer of soil, plastic, or both. It also provide many job opportunity for public. Waste transport costs can be reduce by landfill as the waste will only have to travel a short distance to landfill area. This will also reduce the amount of pollution caused by transporting the waste materials. But beside these dangerous gases are given off landfill sites that cause local air pollution. Once the site has been filled it might not be able to be used for redevelopment as it might me too polluted. It is very expensive method.

4. WASTE COMPACTION

Waste compaction is the process of compacting waste that is reducing it in size. Garbage compaction's fundamental goal is to minimise the amount of space that the accumulated waste occupies. This process of waste management of waste compaction is often utilized in conjunction with other methods to help manage the use of landfills to get a better effect. It helps in safe disposal of waste materials. It is very cheap method of waste disposal. It will also decreases the usage of garbage collection trucks in urban areas.

5. COMPOSTING

Composting is a another method of waste management. It is a natural natural biological process carried out under controlled aerobic conditions. Mainly each and every microorganisms, including bacteria and fungi, present in the waste materials breakdown organic matter into simpler substances. The method of composting waste helps to strengthens soils ability to retain water. This causes plants to not be watered frequently. Erosion occurs when top soil is blown or washed away causing infertile top soil. Compost can restore topsoil and build stable structure. The method of composting also helps divert materials from going to landfills, it will minimize the emission of greenhouse

gases to the atmosphere. It also helps to reduce the climatic change, . it helps to activate zero waste community.

6. VERMICOMPOSTING

It is the final result of worms decomposing organic matter to produce a usable fertile source of worm casting, that supply vital nutrients and beneficial microbes to soil and plants. It is sustainable fertilizer giving more than 10 to 15% more crop yield besides crop improvement. The production of vermin compost reduces emission of greenhouse gasses like methane and nitric oxide. Unlike chemical fertilizer, worm asting are not easily flushed from the soil because of the worm mucus that it contain. Plants have no longer to obtain the nutrients and get the maximum benefits. As these works on the plants and as a result it become healthier and the need of pesticides can be reduce. Beside these it is a very time consuming process and takes as long as six months to convert the organic matter into usable form.

7. PLASMA GASIFICATION

By mixing electricity and high temperatures, the waste-treatment method known as plasma arc gasification (PAG) transforms municipal waste (garbage or trash) into usable byproducts without combustion (burning). The main element of the plasma gasification process is the gasifier. Organic waste is transformed into synthetic gas by the plasma arc, and inorganic material is transformed into vitrified slag.

ADVANTAGES OF WASTE MANAGEMENT

1. Clean and fresh environment

Clean air, better water, and a decrease in the emission of dangerous greenhouse gases like methane and carbon dioxide are all benefits of properly removing garbage from the

environment. It also lessens the amount of scarce resources that are extracted, as well as pollution and energy use.

2. Reduce pollution

Reducing the hazardous impact of garbage on the environment and human health is the primary goal of waste management. Excess gases enter the earth's atmosphere as a result of improper waste management and disposal. This leads to the problem of pollution. Methane and carbon dioxide are released when waste breaks down, causing climate change on a worldwide scale. Reduce pollution and maintain a healthy environment by properly recycling garbage, burning it for energy recovery, or safely releasing chemical waste into the environment.

3. Helps to earn money

Waste management facilitates financial gain. Recycling fees, which also include the value of compost and recovered plastic trash, are paid by local businesses to acquire materials that will later be exported or turned into useful products. Gate fees for rubbish disposal are another way for people to make money.

4. Employment opportunity

To collect the trash from residences or from certain dumping sites, labour is needed. Installing numerous small-capacity waste handling facilities close together is necessary. Local residents will have more work options as a result of this. In order to explore new products from the trash processed at the plant, industrial research and development centres must be created. Opportunities will be provided for scientists, researchers, and chemical engineers as a result.

5. Conserve natural resources

The environment will be protected through trash reduction and effective waste management, which will also save money or lower disposal costs. Recycling or reusing waste materials reduces the need to extract resources and the likelihood of contamination, both of which are beneficial to the environment. In addition to saving 17 trees, 2 barrels of oil, and 4100 kilowatts of energy every tonne of recycled paper. As a result, recycling steel saves 2500 pounds of iron, 1400 pounds of coal, and 120 pounds of limestone for every tonne of steel that is recycled.

6. Cheap products

There are wide varieties of waste materials that can be recycle with minimum cost to produce many new materials cheap products which can be easily affordable to poor people.

7. Enhance brand reputation

Waste management can help your company project a better image to customers and potential clients if you can prioritise it. They are more likely to perceive you as socially and environmentally responsible.

DISADVANTAGES OF WASTE MANAGEMENT

1. Costly

The cost of trash management may be higher than the cost of building an industrial facility that uses waste as its primary raw material. The economy will become stable as a result. According to a study on trash management, it costs a lot of money to manage waste properly.

2. Practices are not done uniformly

Waste management aims to lessen the harmful effects of such junk on the environment and people's health. A substantial percentage of waste management is

devoted to managing municipal solid waste, which is generated by business, residential, and industrial activity. There are differences in waste management procedures between developed and developing countries, urban and rural regions, residential and commercial sectors, and even within the same country. In many places it is not done uniformly.

3. The sites are more dangerous

The waste management facilities, which encompass everything from landfills to recycling facilities, are particularly prone to bacterial and fungal growth, which can result in a number of diseases.

Such bacterial development would even hasten the formation of debris, rendering the workplace completely dangerous for the employees. It also releases dangerous chemicals and contributes to widespread contamination. The health of people is greatly endangered when these substances are combined with drinking water or any other consumable item.

4. Waste management can cause more problems

Even though waste management generates employment, it can only do so with low-quality employment. These employment range from sorting trash collectors to the demanding and arduous tasks required in manufacturing and retail establishments.

The daily collection of trash would leave extra waste on the streets to rot, making them look unsightly and filthy. Even when the final stage is successfully completed, there will still be a lot of chemical compounds that need to be safely and entirely disposed of in order to avoid them endangering the environment and defeating the aim of waste management altogether.

5. Affects the health of workers

Many bacterial and fungal illnesses and diseases can affect persons working in the waste management industry as a result of managing garbage and all the processes involved.

6. Results in solid contamination

Some wastes that are disposed of in landfills release dangerous substances into the ground. Consider the container of bottles. When they eventually degrade, DEHA, a carcinogen that harms our reproductive systems, damages the liver, and promotes weight loss, is released. Not only does contaminated soil hinder plant growth, but it is also harmful to people and animals who consume the plants.

Therefore, it is crucial that every household prioritise recycling. You can recycle plastics, metals, paper, electronics debris, and more at your neighbourhood recycling facilities. The majority of waste might be diverted from landfills if everyone took the time to sort and separate their recyclable wastes before bringing them to recycling facilities.

7. Impact on the life of animals and aquatic life

It must be emphasised again and again. It is not just us who are impacted by our carelessness with trash and waste. Animals are also harmed by pollutants brought on by poorly disposed of trash and waste. When consumed by marine species, Styrofoam and cigarette butts have been reported to result in mortality. Due to the chemicals that penetrate into the soil, animals who consume grasses close to polluted areas or landfills are also at danger of becoming unwell.

CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

4.1 GENDER WISE CATEGORIZATION

TABLE 4.1

GENDER	NO OF RESPONDENTS	PERCENTAGE
MALE	37	56.90%
FEMALE	28	43.10%
TOTAL	65	100%

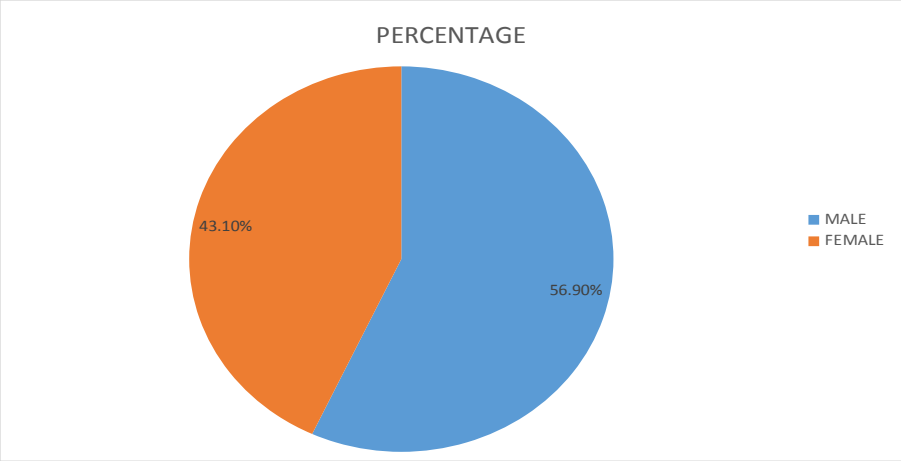


Fig no: 4.1

INTERPRETATION:

This chart represents the gender of the respondents. According to the above table 56.90% of the respondents are male, and the rest 43.10% of the respondents are female.

4.2 EDUCATIONAL QUALIFICATION

TABLE 4.2

EDUCATIONAL QUALIFICATION	NO OF RESPONDENTS	PERCENTAGE
STUDENT	29	44.60%
UNDERGRADUATE	19	29.30%
POSTGRADUATE	11	16.90%
OTHER	6	9.20%
TOTAL	65	100%

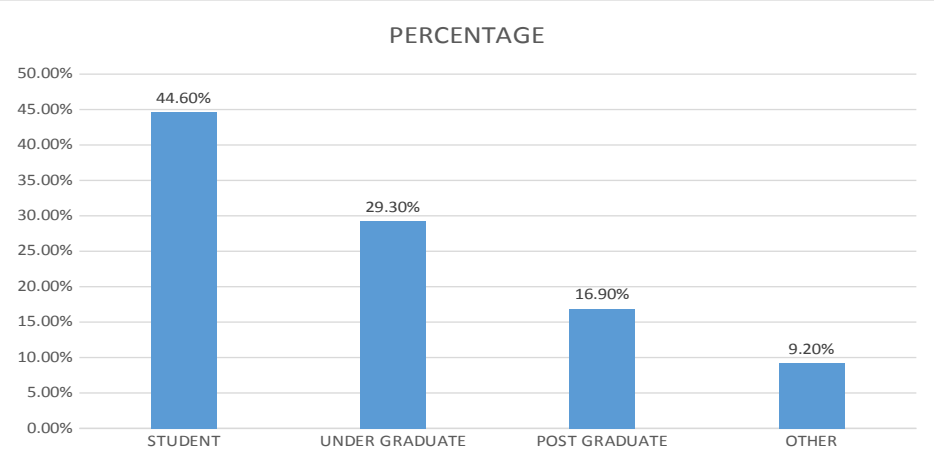


Fig no: 4.2

INTERPRETATION:

This chart represents the educational qualification of the respondents. A majority of 44.60% respondents are students, 29.30% of the respondents are undergraduate, 16.90% of the respondents are postgraduate, and rest 9.20% are graduate, B-tech, diploma etc.

4.3 AGE WISE CATEGORIZATION

TABLE 4.3

AGE	NO OF RESPONDENTS	PERCENTAGE
15-20	16	24.70%
20-30	23	35.40%
30-40	1	1.50%
ABOVE 40	25	38.40%
TOTAL	65	100%

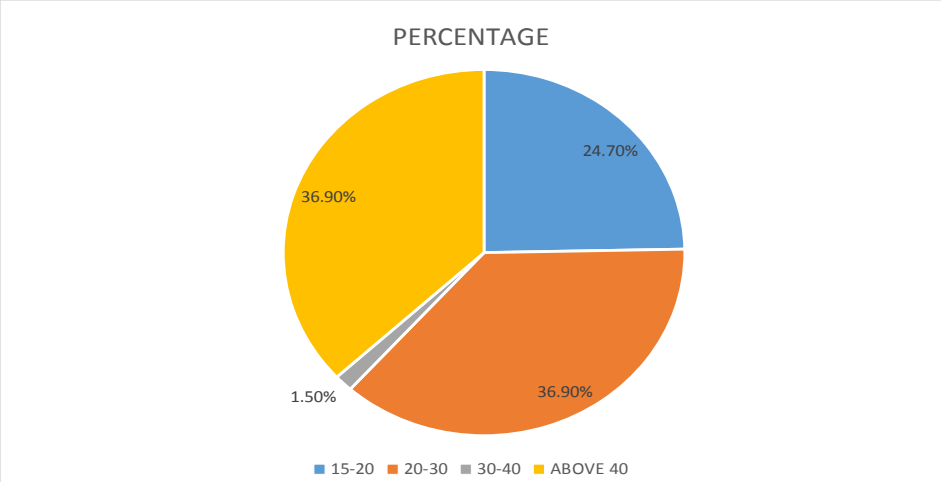


Fig no:4.3

INTERPRETATION:

This chart represents the age range of the respondents. A majority of 38.40% respondents belong to the age group above 40, 35.40% of the respondents belong to the age group 20-30, 24.70% respondents belong to the age group of 15-20 and 1.50% respondents belong to the age group 30-40.

4.4 DRINKING WATER SOURCE

TABLE 4.4

OPTION	NO OF RESPONDENTS	PERCENTAGE
PUBLIC WELL	6	9.20%
KERALA WATER AUTHORITY	25	38.40%
BORE WELL	2	3.10%
O		%
TC		%

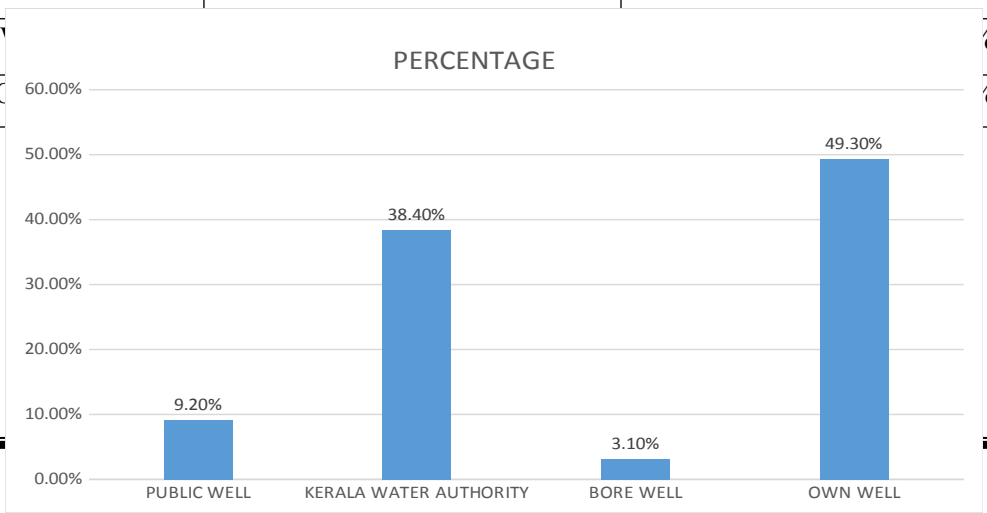


Fig no:4.4

INTERPRETATION:

This chart shows the drinking water source of the respondents. According to the above table, 49.30% of the respondents are using own well, 38.40% of the respondents are using Kerala water authority, 9.20% of the respondents are using public well and remaining 3.10% of the respondents are using bore well.

4.5 CURRENTLY USING BIO WASTE TREATMENT SYSTEM

TABLE 4.5

OPTION	NO OF RESPONDENTS	PERCENTAGE
BIO COMPOSTER	7	10.70%
PIT COMPOSTING	12	18.50%
BIOGAS PLANT	15	23.10%
AGRICULTURAL NEEDS	31	47.70%
TOTAL	65	100%

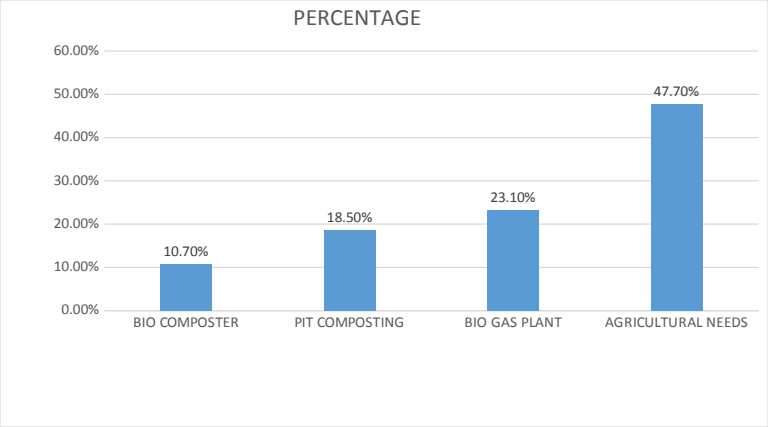


Fig no: 4.5

INTERPRETATION:

The above data shows a majority of 47.70% of the respondents are currently using bio waste treatment system as agricultural needs, 23.10% of the respondents are using biogas plant, 18.50% of the respondents using pit composting and rest 10.70% of the respondents using bio composter.

4.6 WHO DISPOSES HOUSEHOLD WASTE

TABLE 4.6

OPTION	NO OF RESPONDENTS	PERCENTAGE
FAMILY MEMBERS	51	78.50%
SERVANT	5	7.70%
ANY OTHER PERSON	3	4.60%
NONE OF THESE	6	9.20%
TOTAL	65	100%

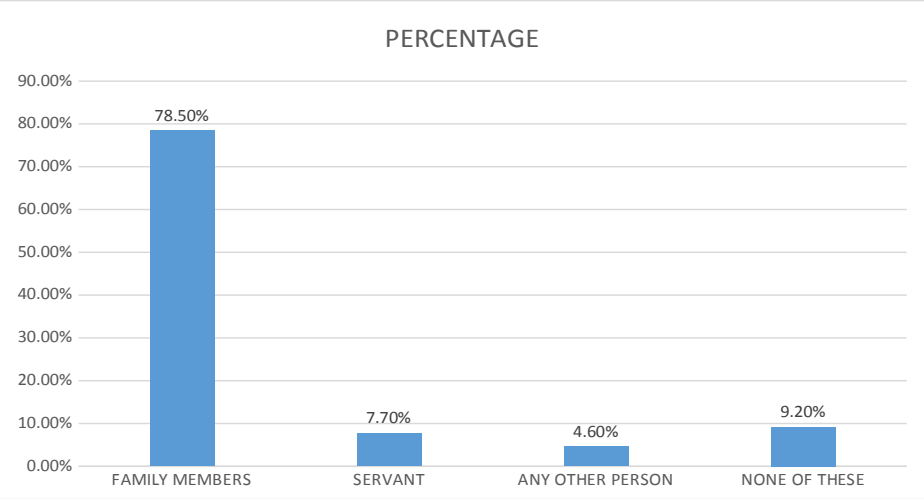


Fig no: 4.6

INTERPRETATION:

From the above data, we can get to know that 78.50% of the respondents are family members who disposes the household waste, 7.70% of the respondents dispose the household waste by servant, 4.60% of the respondents dispose the household waste by any other person, remaining 9.20% of the respondents voted as none of these as they don't throw household waste.

4.7 AMOUNT SPEND FOR WASTE COLLECTON

TABLE 4.7

OPTION	NO OF RESPONDENTS	PERCENTAGE
BELOW 100 Rs	37	56.90%
BELOW 300 Rs	18	27.70%
BELOW 500 Rs	7	10.80%
ABOVE 500 Rs	3	4.60%
TOTAL	65	100%

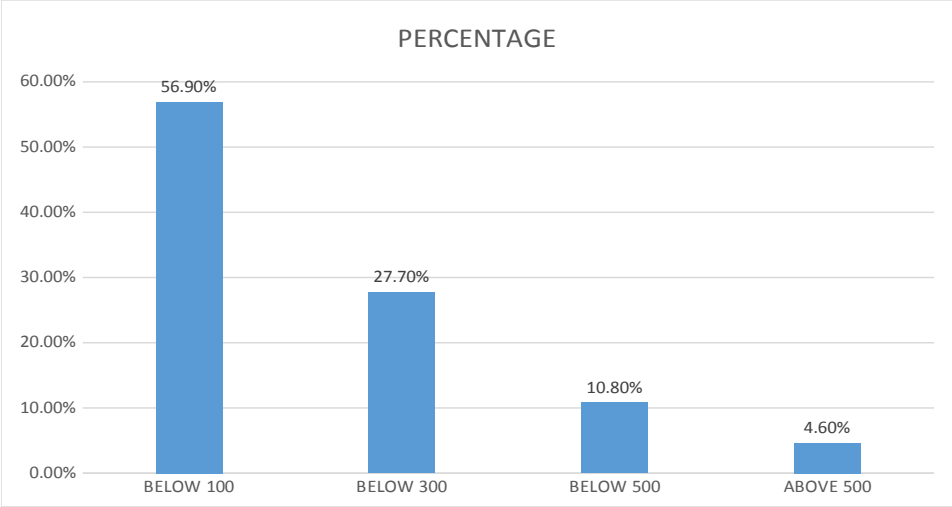


Fig no: 4.7

INTERPRETATION:

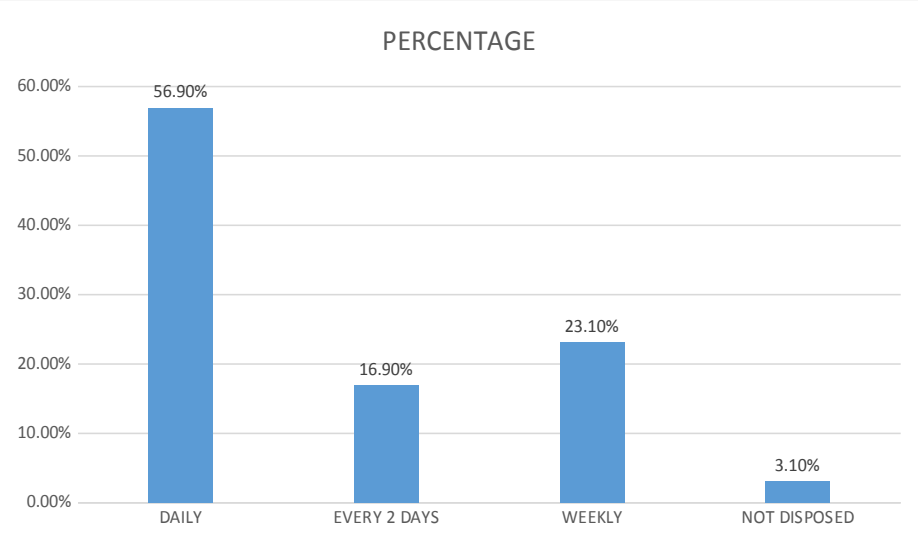
From the data above, shows that amount spend by the household per month, according to that 56.90% of the respondents are spending below 100, 27.70% of the respondents are spending below 300, 10.80% of the respondents are spending above 500 and remaining 4.60% of the respondents spend above 500.

4.8 HOW OFTEN YOU DISPOSE YOUR WASTE

TABLE 4.8

OPTION	NO OF RESPONDENTS	PERCENTAGE
DAILY	37	56.90%
EVERY 2 DAYS	11	16.90%
WEEKLY	15	23.10%
NOT DISPOSED	2	3.10%
TOTAL	65	100%

Fig no: 4.8



INTERPRETATION:

From the data above, we can identify that how often household waste is disposed, according to that 56.90% of the respondents dispose the waste daily basis, 23.10%% of the respondents dispose waste on weekly basis, 16.90% of the respondents dispose waste every 2 days basis, remaining 3.10% of the respondents are not disposed.

4.9 HOW YOU DISPOSE YOUR WASTE

TABLE 4.9

OPTION	NO OF RESPONDENTS	PERCENTAGE
PLASTIC BAG	12	18.50%
SMALL BUCKET	36	55.40%
ANY OTHER CONTAINER	7	10.80%
NONE OF THESE	10	15.30%
TOTAL	65	100%

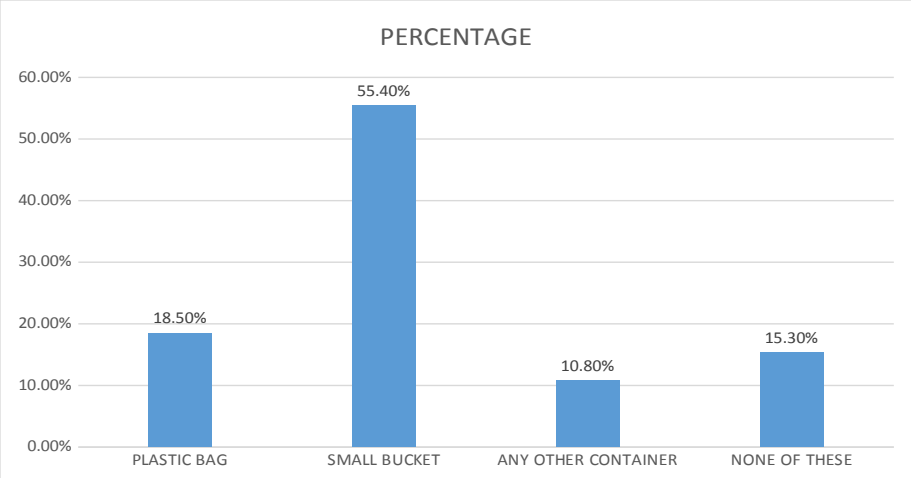


Fig no: 4.9

INTERPRETATION:

From the given data, we can clearly get to know that how households dispose the waste as we can know that 55.40% of the respondents dispose the waste in small bucket, 18.50% of the respondents dispose the waste in plastic bag, 10.80% of the respondents dispose the waste in any other container and remaining 15.30% of the respondents voted as none of these.

4.10 HANDLING E-WASTE METHOD

TABLE 4.10

OPTION	NO OF RESPONDENTS	PERCENTAGE
AGENCY DEALER	23	35.40%
MUNICIPALITY	30	46.20%
NOT DISPOSED	9	13.80%
BURNING	3	4.60%
TOTAL	65	100%

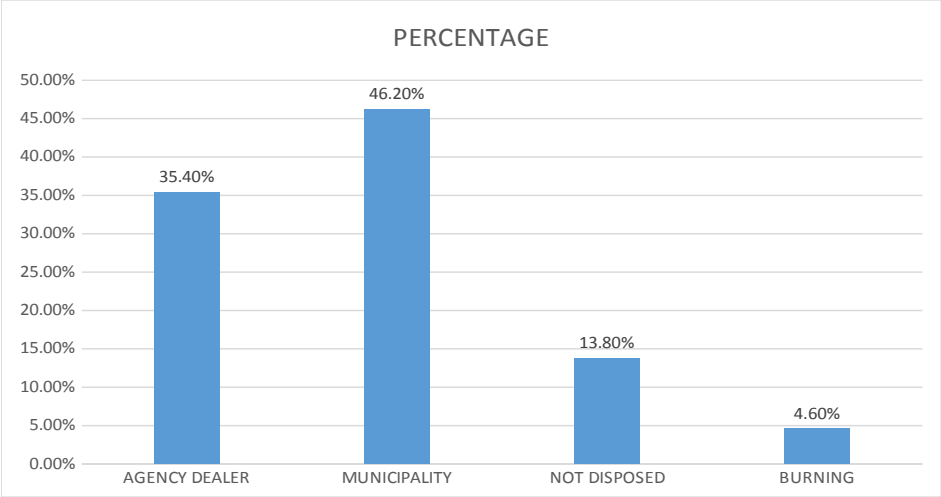


Fig no:4.10

INTERPRETATION:

According to the above data, we can identify the handling e-waste method of the households as 46.20% of the respondent's selected municipality, 35.40% of the respondents selected agency dealer, 13.80% of the respondents is not disposed and remaining of the respondents are burning the waste.

4.11 TIME OF DISPOSING THE WASTE

TABLE 4.11

OPTION	NO OF RESPONDENTS	PERCENTAGE
MORNING	26	40%
BETWEEN 1PM TO 5PM	20	30.70%
AFTER 6PM	13	20%
NONE OF THESE	6	9.30%
TOTAL	65	100%

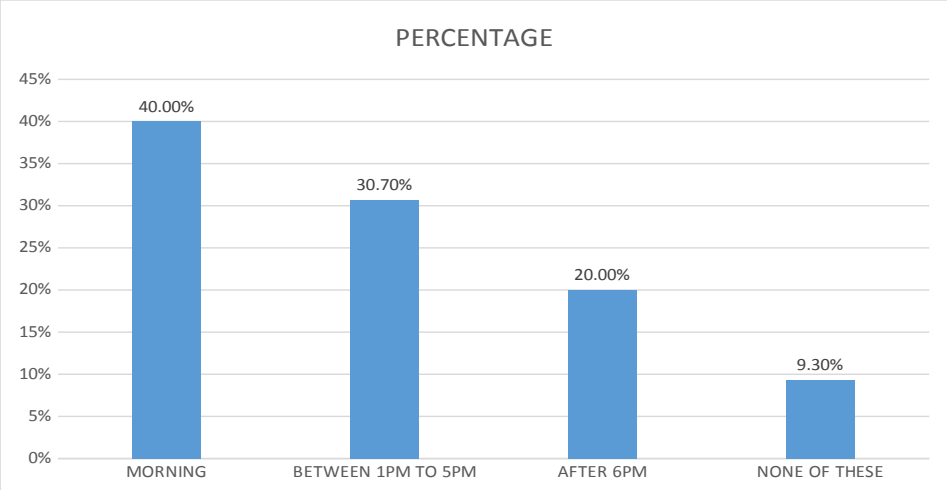


Fig no: 4.11

INTERPRETATION:

From the above data, we can get to know the timing of the disposing waste by the households as a majority of 40% of the respondents dispose the waste at morning, 30.70% of the respondents dispose the waste between 1pm to 5pm, 20% of the respondents dispose the waste after 6pm and remaining 9.30% of the respondents voted as none of these.

4.12 TYPES OF WASTE YOU STORE

TABLE 4.12

OPTION	NO OF RESPONDENTS	PERCENTAGE
PLASTIC MATERIALS LIKE MILK COVERS, OTHER FOOD PACKING	34	52.30%
WET WASTE	4	6.20%
HOUSEHOLD WASTE	11	16.90%
ELECTRONIC WASTE	16	24.60%
TOTAL	65	100%

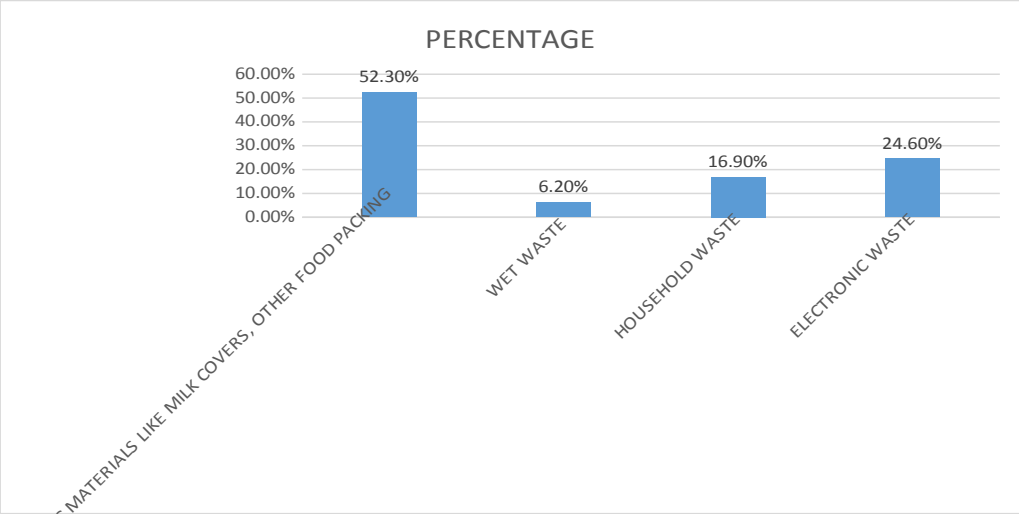


Fig no: 4.12

INTERPRETATION:

From the above data, we can identify what type of waste are supposed to store for a few days by the households as a majority of 52.30% of the respondents are storing plastic material like milk covers, other food packing, 24.60% of the respondents are storing electronic waste, 16.90% of the respondent's store household waste and remaining 6.20% of the respondents store wet waste.

4.13 REASON FOR THE SEPARATION OF WASTE

TABLE 4.13

OPTION	NO OF RESPONDENTS	PERCENTAGE
IT'S YOUR RESPONSIBILITY	29	44.60%
IT CAN GENERATE SOME INCOME	7	10.80%
IT'S MANDATORY	24	36.90%
NONE OF THESE	5	7.70%
TOTAL	65	100%

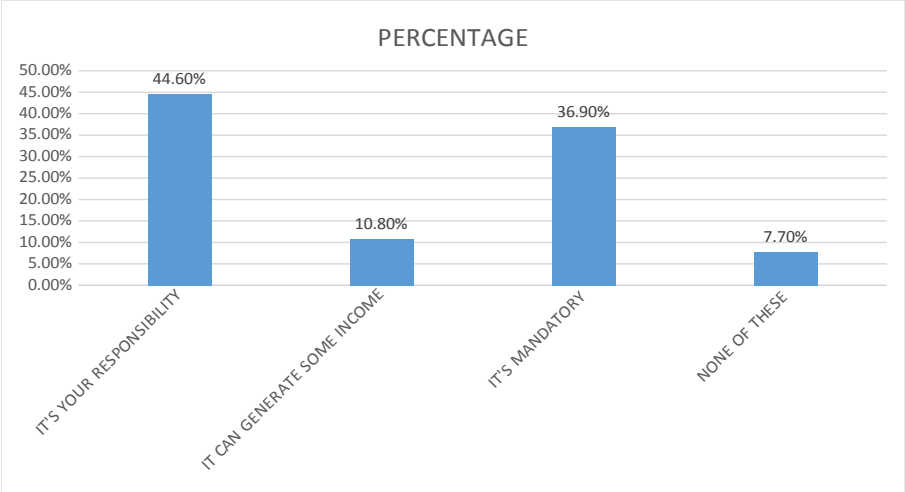


Fig no: 4.13

INTERPRETATION:

From the data above, we can identify the reason for separation of household waste and plastic waste as a majority of 44.60% of the respondents voted as it's your responsibility, 36.90% of the respondents voted as it's mandatory, 10.80% of the respondents voted as it can generate income and rest 7.70% of the respondents voted none of these.

4.14 HOW OFTEN WASTE MANAGEMENT AGENCY VISIT

TABLE 4.14

OPTION	NO OF RESPONDENTS	PERCENTAGE
ONCE A WEEK	20	30.80%
TWICE A WEEK	14	21.50%
ONCE A MONTH	26	40%
NEVER	5	7.70%
TOTAL	65	100%

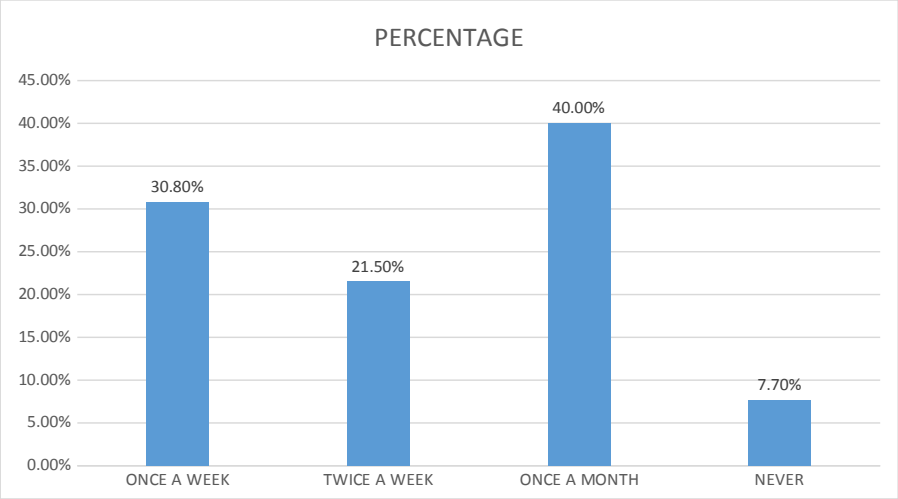


Fig no:4.14

INTERPRETATION:

From the data above, we can analyse how often the waste management agency visit your locality for waste collection as a majority of 40% of the respondents voted once a month, 30.80% of the respondents voted once a week, 21.50% of the respondents voted twice a week, remaining 7.70% of the respondents voted as they never visit.

4.15 TYPE OF WASTE THROWN

TABLE 4.15

OPTION	NO OF RESPONDENTS	PERCENTAGE
FOOD WASTE	49	75.40%
PLASTIC WASTE	9	13.80%
PAPER WASTE	5	7.70%

COTTON WASTE	2	3.10%
TOTAL	65	100%

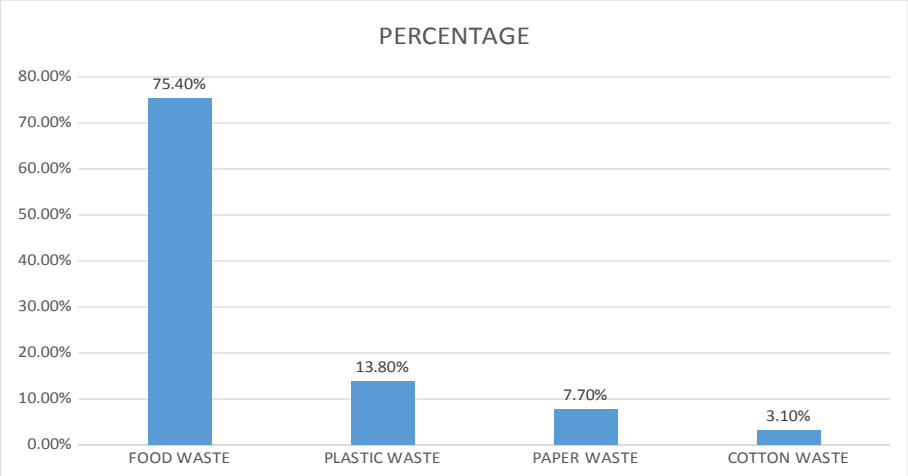


Fig no: 4.15

INTERPRETATION:

From the above data, we analyse what type of waste is thrown in your daily household waste according to the data a majority of 75.40% of the respondents selected food waste, 13.80% of the respondents selected plastic waste, 7.70% of the respondents selected paper waste, rest 3.10% of the respondents selected cotton waste.

4.16 HOW MANY WASTE AGENCIES OR COLLECTORS

TABLE 4.16

OPTION	NO OF RESPONDENTS	PERCENTAGE
1 TO 2	44	67.70%
3 TO 4	12	18.50%
5 TO 6	5	7.70%
NONE	4	6.10%
TOTAL	65	100%

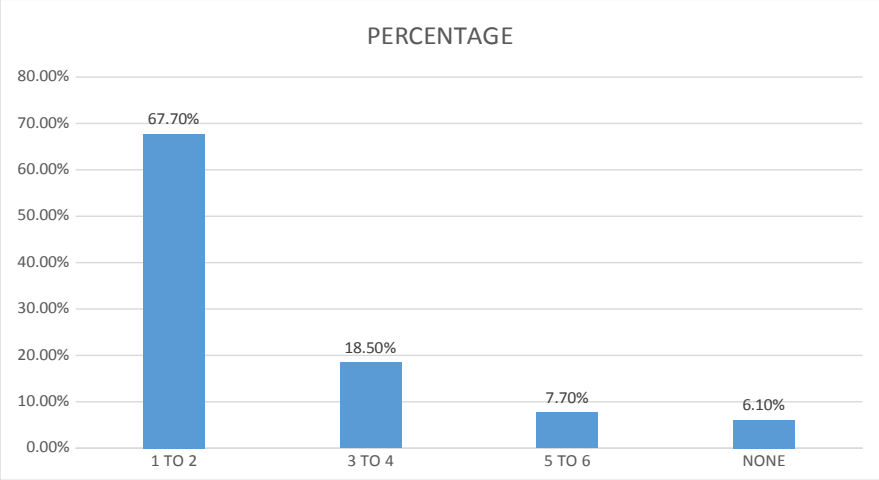


Fig no: 4.16

INTERPRETATION:

According to the above data we can get to know the how many waste agencies or collectors are there in your locality as a 67.70% of the respondents have 1 to 2 agencies, 18.50% of the respondents have 3 to 4 agencies, 7.70% of the respondents have 5 to 6 agencies and remaining 6.10% of the respondents have no agencies.

4.17 HOW MANY TIMES ENVIRONMENT SANITATION TOOK PLACE

TABLE 4.17

OPTION	NO OF RESPONDENTS	PERCENTAGE
ONCE PER WEEK	5	7.70%
TWICE A WEEK	15	23.10%

ONCE PER MONTH	21	32.30%
NEVER	24	36.90%
TOTAL	65	100%

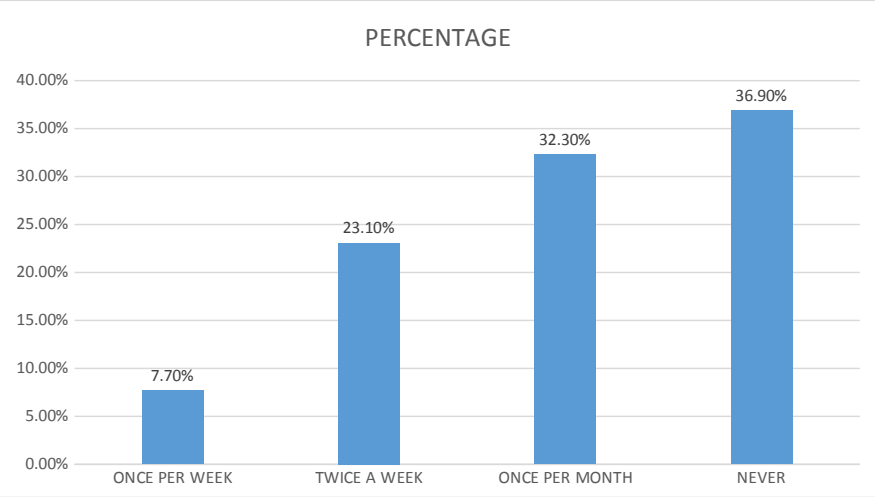


Fig no: 4.17

INTERPRETATION:

According to the given data as a majority of 36.90% of the respondents voted that environmental sanitation never happened in their locality, 32.30% of the respondents voted as environmental sanitation has done once per month, rest 23.10% of the respondents voted as environmental sanitation has done twice a week and 7.70% % of the respondents voted as environmental sanitation has done once per week.

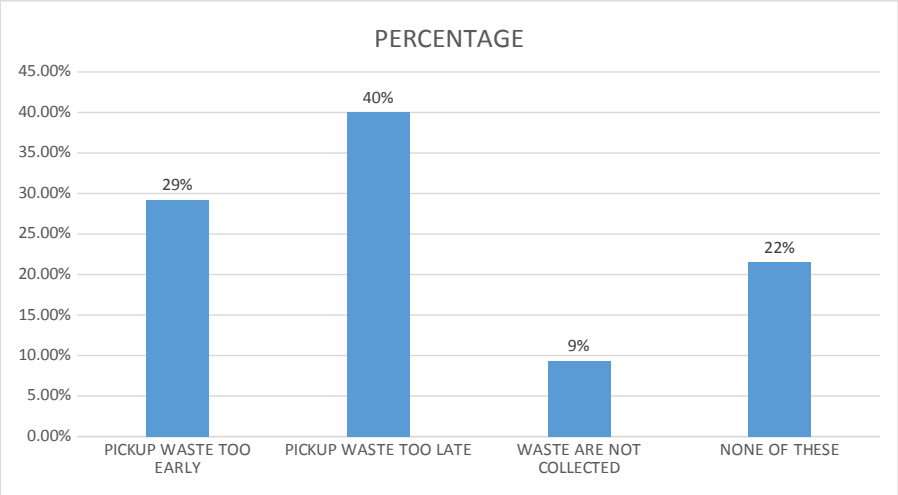
4.18 OPINION ABOUT TRASH COLLECTION

TABLE 4.18

OPTION	NO OF RESPONDENTS	PERCENTAGE
PICKUP WASTE TOO EARLY	19	29.20%

PICKUP WASTE TOO LATE	26	40%
WASTE ARE NOT COLLECTED	6	9.30%
NONE OF THESE	14	21.50%
TOTAL	65	100%

Fig no:4.17



INTERPRETATION:

From the above data, we can analyse the opinion about the waste collection in their locality as a majority of 40% of the respondents voted pickup waste too late, 29.20% of the respondents voted pickup waste too early, 9.30% of the respondents voted waste are not collected and remaining 21.50 of the respondents voted as none of these.

4.19 WASTE DUMPING AREA

TABLE 4.19

OPTION	NO OF RESPONDENTS	PERCENTAGE
IN THE PUBLIC BIN	29	44.60%
IN THE ROADSIDE	12	18.50%
ON AN OPEN SPACE	19	29.20%
OTHER	5	7.70%

TOTAL	65	100%

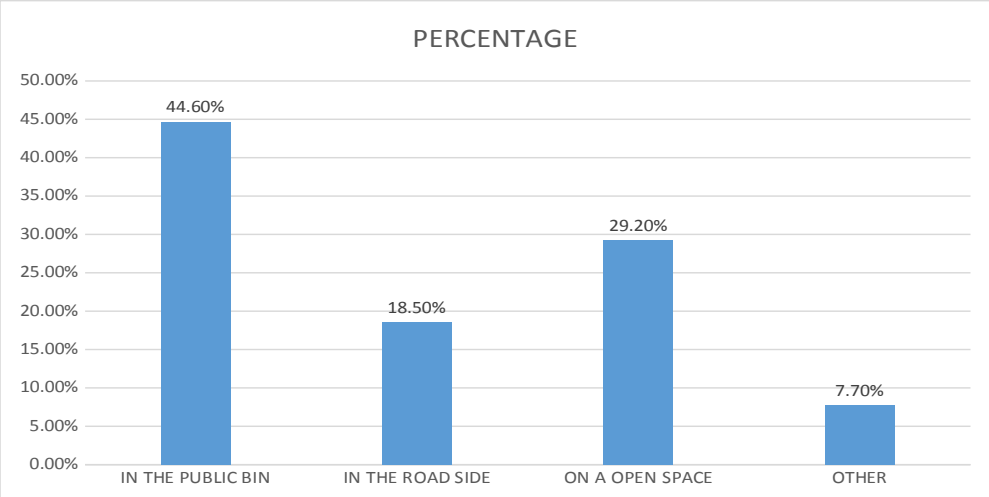


Fig no: 4.18

INTERPRETATION:

From the above data, we can analyse that where the household usually throw the waste as a majority of 44.60% of the respondents throw in the public bin, 29.20% of the respondents throw on an open space, 18.50% of the respondents throw in the roadside and remaining 7.70% of the respondents does not throw the waste.

4.20 HOW OFTEN A PUBLIC BIN IS EMPTIED

TABLE 4.20

OPTION	NO OF RESPONDENTS	PERCENTAGE
DAILY	15	23.10%
EVERY 2 DAYS	16	24.60%

ONCE A WEEK	23	35.40%
TWICE A WEEK	11	16.90%
TOTAL	65	100%

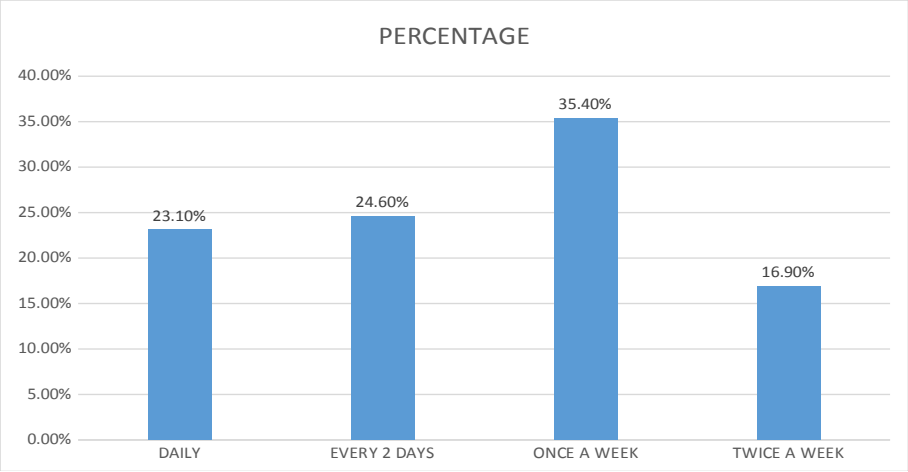


Fig no: 4.20

INTERPRETATION:

From the data give above, we can get to know the how often a public bin is emptied in their locality as a majority of 35.40% of the respondents voted once a week, 24.60% of the respondents voted every 2 days, 23.10% of the respondents voted daily and rest 16.90% of the respondents voted twice a week.

4.21 RATE YOUR NEAREST PUBLIC BIN

TABLE 4.21

OPTION	NO OF RESPONDENTS	PERCENTAGE
GOOD CONDITION	12	18.50%
NOT GOOD CONDITION	21	32.30%

ADEQUATE SIZE	13	20%
DON'T KNOW	19	29.20%
TOTAL	65	100%

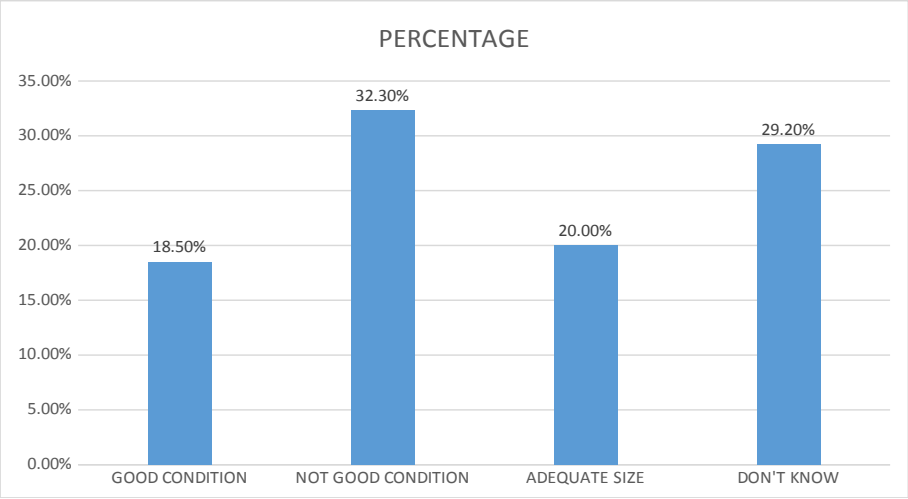


Fig no:4.21

INTERPRETATION:

As the data given above, a majority of 32.30% of the respondents rated not good condition, 29.20% of the respondents rated don't know, 20% of the respondents rated adequate size and rest 18.50% of the respondents rated good condition.

4.22 WASTE MANAGEMENT IS A GOOD BUSINESS TO START

TABLE 4.22

OPTION	NO OF RESPONDENTS	PERCENTAGE
YES	50	76.90%
NO	15	23.10%
TOTAL	65	100%

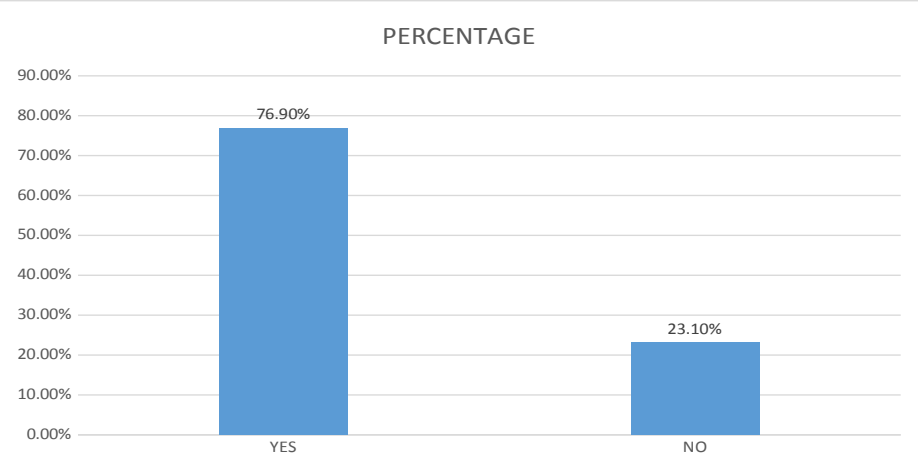


Fig no: 4.22

INTERPRETATION:

From the above data, a majority of 76.90% of the respondents voted that waste management is a good business to start and rest 23.1% of the respondents voted waste management is not a good business to start.

4.23 RATE THE WASTE COLLECTION AGENCY IN YOUR LOCALITY

TABLE 4.23

OPTION	NO OF RESPONDENTS	PERCENTAGE
EXCELLENT	13	20%

GOOD	34	52.30%
NEUTRAL	11	16.90%
BAD	5	7.70%
WORST	2	3.10%
TOTAL	65	100%

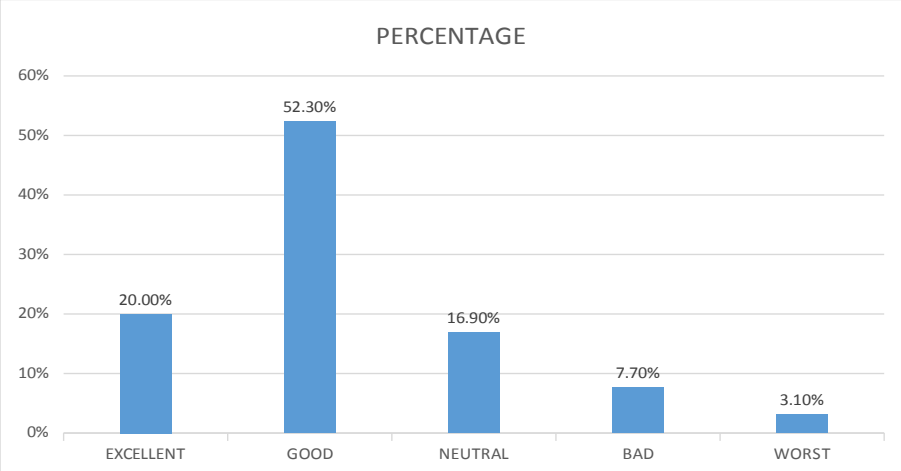


Fig no: 4.23

INTERPRETATION:

From the data given above we can analyse that a majority of 52.30% of the respondents have rated waste collection agency is good in their locality, 20% of the respondents rated excellent, 16.90% of the respondents rated neutral, 7.70% of the respondents rated bad, 3.10% of the respondents rated worst.

4.24 FAMILISED WITH APPLICATION

TABLE 4.24

OPTION	NO OF RESPONDENTS	PERCENTAGE
YES	24	36.90%

NO	41	63.10%
TOTAL	65	100%

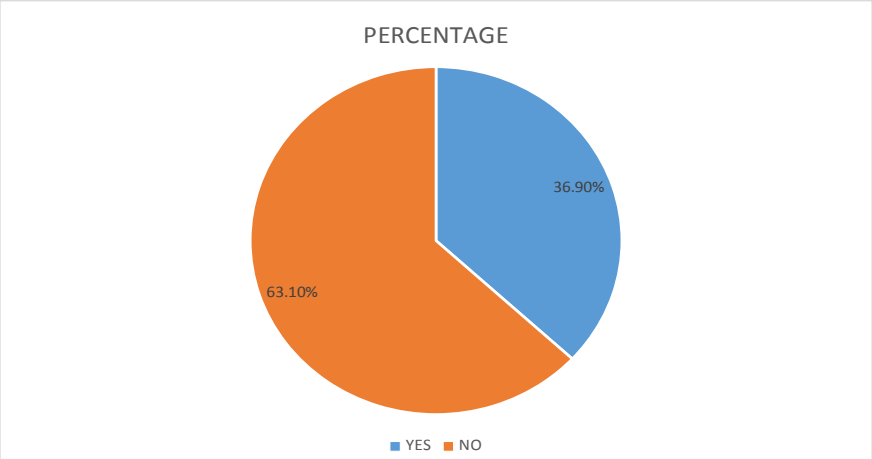


Fig no:4.24

INTERPRETATION:

From the above data we can get to know that a majority of 63.10% of the respondents have voted that there is no mobile application in their locality for waste collection and rest 36.90% of the respondents voted there is mobile application in their locality.

4.25 AVAILABILITY OF STAFF FOR WASTE COLLECTION

TABLE 4.25

OPTION	NO OF RESPONDENTS	PERCENTAGE
YES	44	67.70%
NO	21	32.30%
TOTAL	65	100%

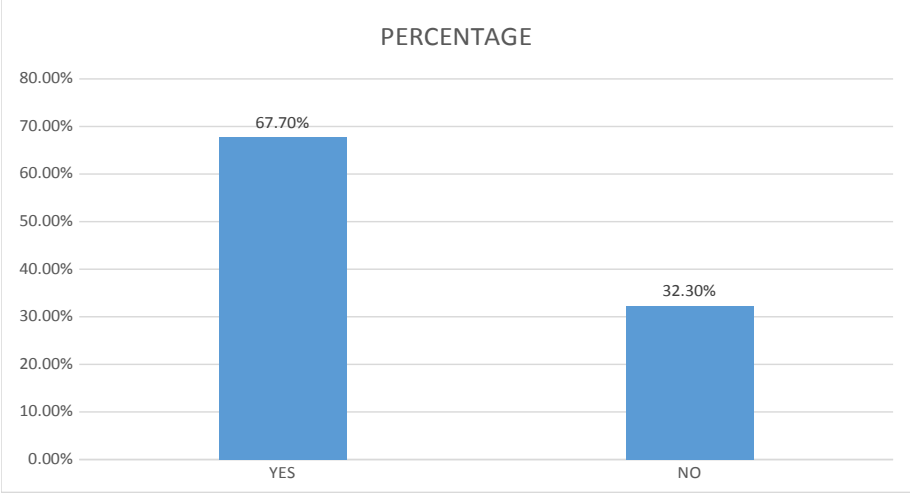


Fig no: 4.25

INTERPRETATION:

From the data given above clearly says that a majority of 67.70% of the respondents says in their housing society there is a dedicated staff for waste collection or disposal and rest 32.30 of the respondents says there is no dedicated staff for waste collection or disposal.

4.26 NECESSARY REQUIREMENTS EXPECT FROM THE MUNICIPALITY

TABLE 4.26

OPTION	NO OF RESPONDENTS	PERCENTAGE
NONE	19	29.20%

COMPOSTING UNIT	8	12.30%
BIOGAS PLANT	14	21.50%
BIO METHYLATION PLANT	5	7.70%
ORGANIC WASTE CONVERTER	8	12.30%
INCINERATORS	5	7.70%
SANITARY LANDFILLS	4	6.20%
OTHER	2	3.10%
TOTAL	65	100%

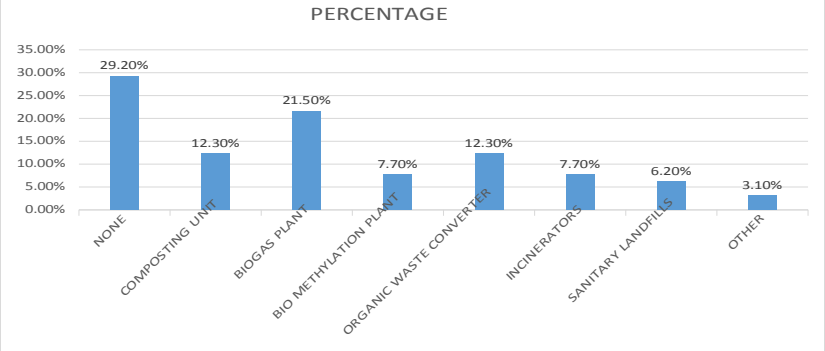


Fig no:4.26

INTERPRETATION:

According to the data shown above, we can analyse that the necessary requirements that the household except from the municipality for waste disposal as a majority of 29.20% of the respondents asked for not required, 21.50% of the respondents asked biogas plant, 12.50% of the respondents asked for composting unit and organic waste, 7.70% of the respondents asked for bio methylation plant and incinerators, 6.20% of the respondents asked sanitary landfills and rest 3.10% opted for other.

4.27 AGENCY USED TO DISPOSE WASTE IN THE ABSENCE OF IN-HOUSE WASTE DISPOSAL FACILITIES

TABLE 4.27

OPTION	NO OF RESPONDENTS	PERCENTAGE
MUNICIPAL CORPORATION	42	64.60%
PRIVATE CONTRACTOR	18	27.70%
OTHER	5	7.70%
TOTAL	65	100%

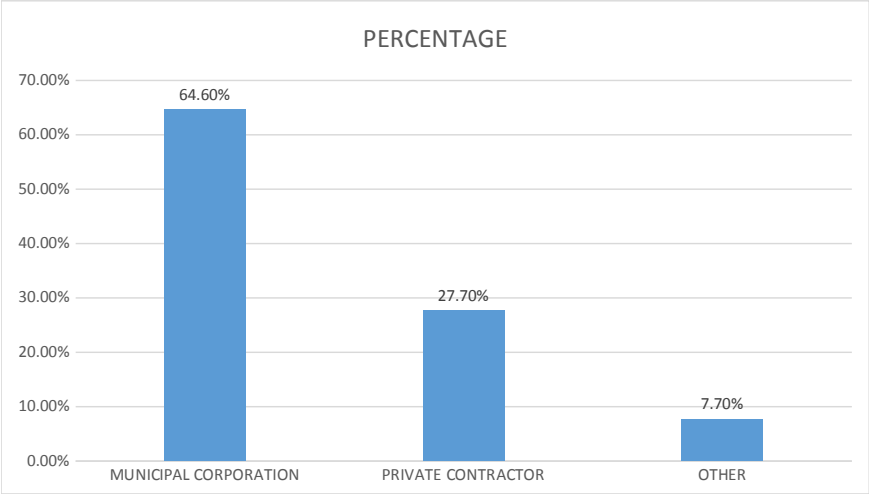


Fig no: 4.27

INTERPRETATION:

According to the given data above, we can analyse that in case an in-house waste disposal facility is not available then which agencies will the household select as a majority of 64.50% of the respondents had selected municipal corporation, 27.70% of the respondents selected private contractor and rest 7.70% of the respondents' opted others.

4.28 RESPONDENTS KNOWLEDGE ABOUT MSW

TABLE 4.28

OPTION	NO OF RESPONDENTS	PERCENTAGE
YES	36	55.40%
NO IDEA	29	44.60%
TOTAL	65	100%

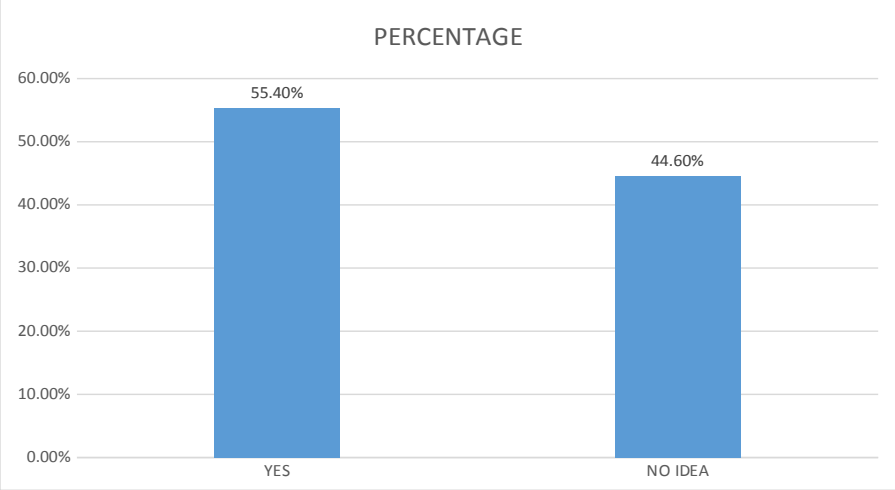


Fig no: 4.28

INTERPRETATION:

From the above data, we can know that a majority of 55.40% of the respondents has some knowledge on the effects of municipal solid waste (MSW) on public health and environment and rest 44.60% of the respondents has no idea about municipal solid waste.

4.29 RESPONDENTS HAVE EVER HEARD ABOUT SOLID WASTE MANAGEMENT

TABLE 4.29

OPTION	NO OF RESPONDENTS	PERCENTAGE
YES	45	69.20%
NO	20	30.80%
TOTAL	65	100%

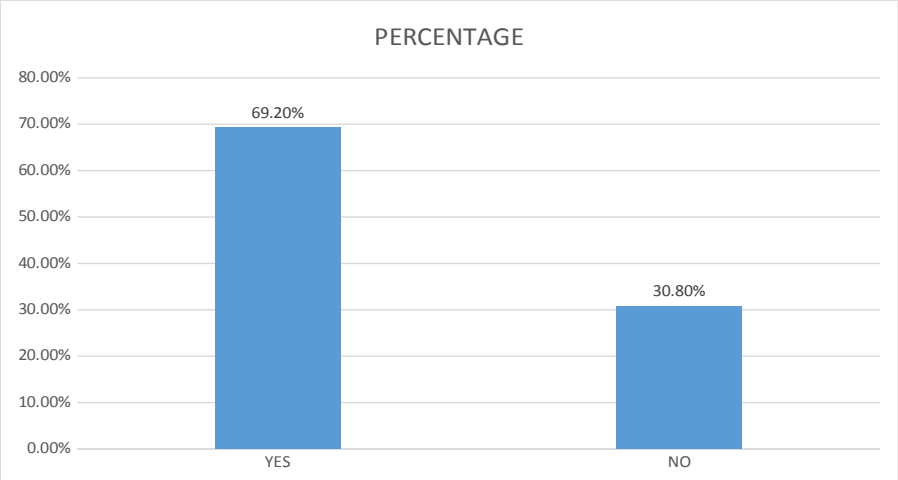


Fig no: 4.29

INTERPRETATION:

From the data above, we can analyse that most of the respondents have heard about solid waste management and remaining 30.80% of the respondents have not heard about solid waste management.

4.30 WHAT SIGNIFICANT EFFECT FACED BY THE RESPONDENTS ON MSW

TABLE 4.30

OPTION	NO OF RESPONDENTS	PERCENTAGE
FLOOD	10	15.40%
AIR POLLUTION	12	18.50%
DISEASE	24	36.90%
NONE	19	29.20%
TOTAL	65	100%

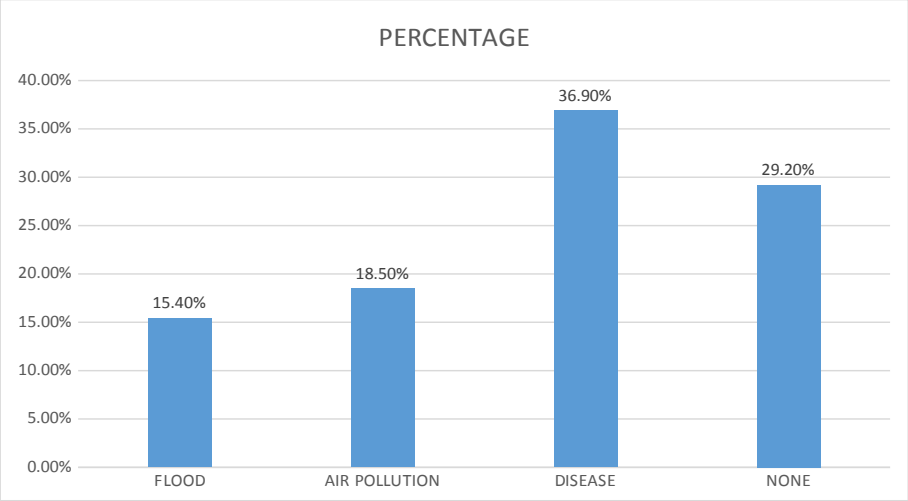


Fig no: 4.30

INTERPRETATION:

According to the data above, we can clearly identify that a majority of 36.90% of the respondents have faced disease by the municipal solid waste, 29.20% of the respondents have not faced any effects, 18.50% of the respondents faced air pollution and rest 15.40% of the respondents faced flood.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSION

FINDINGS

Based on the demographic analysis

1. Majority of the respondents are male group that is 56.90%.
2. Around 44.60% of the respondents are students
3. Majority of the respondents are at the age of 20 to 30.
4. It is found that respondents use own well as their drinking water source.
5. About 47.70% of the respondents uses bio-waste treatment system for agriculture needs.
6. Majority of the respondents household wastes are disposed by the family members.
7. It is found that below Rs.100/- per month is spend by majority of the respondent for waste disposal.
8. About 56.90% of the respondent disposes waste daily.
9. Most of the respondents uses small bucket to dispose their household waste.
10. A greater number of respondent chooses municipality for handling E-waste in their locality.
11. Majority of the respondent disposes waste during morning time.
12. Major part of the respondent store wastes like plastic materials such as milks covers and other food packings.
13. It is found that it's our own responsibility to separate household waste and plastic waste.
14. Found out that once in a month the waste management agency visits majority of the respondents locality for collecting waste.
15. About 75.40% of food wastes are thrown in daily household waste.
16. Only 2 waste agencies are there to collect waste from majority of the respondent's locality.
17. It is found that environmental sanitation never takes place in majority of the respondents.
18. The major part of the respondents urges that waste pickup by the trash collection is too late.
19. Greater part of the respondents deposit their waste in the public bins.
20. Around 35.40% of public bins are emptied once in a week.
21. It is found out that majority of the respondents public bins in their locality are not in a good condition.
22. A greater number of respondents suggests that waste management is a good business to start.

23. Around 52.30%, more than half of the respondents rate “good suggessions” for the waste collection agency in their locality.
24. About 63.10%of the respondents do not have their any mobile application for collection of waste.
25. About 67.70% respondents housing society has a dedicated staff for waste disposal.
26. Majority of the respondents prefer biogas plant method from the municipality for waste disposal.
27. The major part respondent chooses municipal corporation to dispose the waste in their society in the absence of in-house waste disposal facility.
28. Around 55.40% of the respondents have knowledge about municipal solid waste on public health and environment.
29. About 69.20% of the respondents have awareness about solid waste management.
30. It is found that disease is caused by over presence of municipal solid waste.

SUGGESTIONS

1. Educate the people about the importance of proper waste management.
2. Improve existing system of waste management to spread awareness about proper disposal of waste.
3. Provide proper dust bins in every locality by category.
4. Avoid or minimize the use of plastics.
5. Every municipality should ensure proper segregation of waste.
6. Municipality and government should pay importance to disposal of waste economically.

CONCLUSION

This project is based on the waste management of Thrikkakara municipality. The whole world is running to achieve economic development. At this state of mind of people are least bothered about the waste management and sustainable development. But near future we will start to think about it because situation will make us to think in such a way. This study also point out the same scenario here. Now a day's waste management become difficult task at the same time people try to implement unscientific method to dispose the waste it will create again a dangerous situation. Non disposable waste especially plastic creates a lot of problems to nature. In order to manage these issues we have to follow scientific especially like recycling and proper collection from resources otherwise the nature will lose its balance and it will affects our life also. In this situation authorities have to take proper decision and they have implement a proper plan.

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NEWSPAPERS

1. THE HINDU
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TEXT BOOK

ENVIRONMENT MANAGEMENT AND HUMAN RIGHTS

(BY, DR. BALAGOPAL M.K, DR. UDAYAKUMAR A,
DR. AMAL B. GOPAL)

ANNEXURE

A STUDY ON WASTE MANAGEMENT IN THRIKKAKARA MUNICIPALITY

1. Name

2. Gender

- Male
- Female

3. Educational qualification

- Student
- Under graduate
- Post graduate
- Other

4. Age group

- 15 to 20
- 20 to 30
- 30 to 40
- Above 40

5. Name of municipality

6. What is the drinking water source?

- Public well
- Kerala water authority
- Bore well
- Own well

7. What is the currently using bio waste treatment system?

- Bio composter
- Pit composting
- Bio gas plant
- Agricultural needs

8. Who disposes the household waste?

- Family members
- Servant
- Any other person
- None of these

9. How much do you spend for your waste disposal per month?

- Below 100
- Below 300
- Below 500
- d. None of these

10. How often do you dispose of your household waste?

- Daily
- Every 2 days
- Weekly
- Not disposed

11. How do you dispose of your household waste?

- Plastic bag
- Small Bucket
- Any other container
- None of these

12. Which is the handling method of E-waste?

- Agency dealer
- Municipality
- Not disposed
- Burning

13. Generally when will you dispose of your waste?

- Morning
- Between 1pm to 5 pm
- After 6pm
- None of these

14. What types of waste are you supposed to store for a few days?

- Plastic materials like milk covers, other food packing
- Wet waste
- Household waste
- Electronic waste
-

15. Will you separate your household waste and plastic waste because

- It is your responsibility
- It can generate some income
- It is mandatory
- None of these

16. How often does your waste management agency visit your locality for waste collection?

- Once a week
- Twice a week
- Once a month
- Never

17. What type of waste is thrown in your daily household waste?

- Food waste
- Plastic waste
- Paper waste

- d. Cotton waste

18. How many waste agencies or waste collectors do you have in your locality?

- 1 to 2
- 3 to 4
- 5 to 6
- None

19. How many times does environmental sanitation take place in your locality or area?

- Once per week
- Twice a week
- Once a month
- Never

20. What is your opinion about your trash collection?

- Pickup waste too early
- Pickup waste too late
- Waste are not collected
- None of these

21. Where do you usually throw the waste?

- In the public bin
- In the road side

- On an open space
- Other

22.If there is a public bin, how often is it emptied?

- Daily
- Every 2 days
- Once a week
- Twice a week

23.How can you describe your nearest public bin in your locality?

- Good condition
- Not good condition
- Adequate size
- Don’t know

24. Is waste management is a good business to start?

- Yes
- No

25. How will you rate the waste collection agency in your area or locality?

- Excellent
- Good

- Neutral
- Bad
- worst

26. Is there any mobile application available for waste collection in your locality?

- Yes
- No

27. Does the housing society have a dedicated staff for waste collection or disposal?

- Yes
- No

28. If No, what all necessary requirements do you expect from the agency or municipality for the waste disposal?

- None
- Composting unit
- Biogas plant
- Bio methylation plant
- e. Organic waste converter
- f. Incinerators
- g. Sanitary landfills
- h .Other:

29. In case an in-house waste disposal facility is not available, then select the external agencies used by the housing society to dispose off the waste

- Municipal corporation
- Private contractor
- Other:

30. Do you have any Knowledge on the effects of municipal solid waste (MSW) on public health and environment?

- Yes
- No idea

31. Have you ever heard about solid waste management ?

- Yes
- No

32. What significant effect has the presence of municipal solid waste (MSW) caused in your Locality?

- Flood
- Air pollution
- Disease