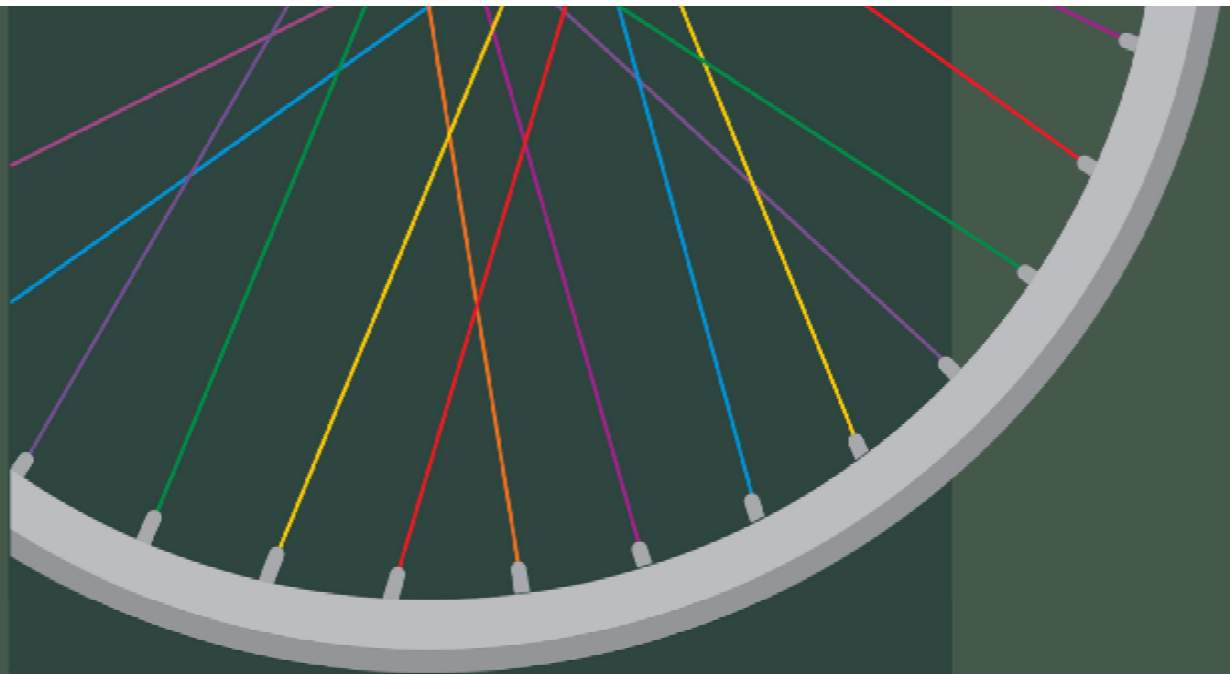


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6. PEOPLE AWARENESS AND PERCEPTIONS ON SUSTAINABLE HOUSEHOLD WASTE MANAGEMENT: A STUDY IN PULIKKAL PANCHAYAT, MALAPPURAM DISTRICT, KERALA

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ABSTRACT

The present study was conducted to understand the awareness and perceptions of people on sustainable household waste management in Pulikkal panchayat in Malappuram district. The detailed survey was conducted during the month of July 2021 among the randomly selected households in the 14th ward (Pandiyatupuram) of Pulikkal panchayat with a self prepared questionnaire. The results showed that the socio-economic status of the households was generally not much better. 90% of people do not know about the amount of waste generated. The survey observed 85% of people unaware about sustainable waste treatment methods. About 80% of households generate close to 500 grams of non biodegradable waste per week. It was found that plastic waste is the most problematic one among the non-biodegradable wastes. The survey found that 82% of households dispose their solid wastes including plastic wastes by burning. The study observed that service of Harithakarmasena not available in the ward. About 78% of people unaware about the proper disposal of gloves, masks, sanitizer bottles and medicine covers used in Covid pandemic period. Therefore the present study suggests implementing awareness programme on waste management at ward and Panchayat level and also to strengthen the Harithakarmasena activities in the study area.

Keywords: Household waste, Solid waste, Awareness, Perception, Waste management

INTRODUCTION

Most developing countries in Asia are facing a crisis in the management and control of household waste. This global problem is adversely affecting human health and the environment in which they live (Pandey et al, 2018). Sustainable management of household waste has also become a major issue in the current scenario. Legislation and policy plans need to be implemented in relation to household waste management (Choe & Fraser, 1999);

The nature of solid waste in developing countries like India is quite different from that in developed countries. This is due to food habits, culture, heritage and economic and social environment. (Madhu, 2001). All waste treatment technologies are being propagated as mere tools. The science behind this has not convinced the general public of the need. As a result, maintenance is not done properly and technology fails. Waste management can only be successful if maintenance actually becomes a habit (Raghunandan, 2018).

As the world moves into its urban future, the amount of municipal solid waste (MSW), one of the most important by-products of urban life, is growing faster than the rate of urbanization. At a population of 26 billion, the per capita waste was 0.64 Kg (0.8 billion tons per year). However, out of a population of 3 billion, an individual produces 1.2 Kg of waste per day (1.3 billion tons per year). It points to the potential for an urban area of 4.3 billion people by 2025 to generate 1.42 Kg of waste per day and 2.2 billion tons per year (Hoornweg, 2012).

Toxic gases emitted from pollutants, as well as improper waste treatment, contribute to air pollution. Transport problems, hydrocarbons and combustion are said to cause the amount of particulate matter in the air to exceed the limit. Sulfur dioxide, nitrogen oxides, carbon monoxide and ozone also affect the air. Odor is also emitted into the atmosphere through stagnant waste and improper combustion. The World Health Organization (WHO) has reported that such improper waste disposal and treatment in urban areas, where more than 80% of the population lives, is detrimental to air quality (Sinha & Nag, 2011). Through hazardous wastes and the toxins or other radiation they produce, they can even lead to deadly diseases such as cancer. Metals such as mercury, cadmium, zinc and anic, mainly from industrial sources, and their impurities can cause health problems (Ahmade & Alam, 2013).

In India, the domestic and commercial sectors generate 13,000 tonnes (47.5 million tonnes per annum) of urban waste per day. The country's urban waste generation has increased 204 times in more than a decade since 2001. Urban waste contains 47% moisture. Its average caloric value is 1.151 calories per kilogram (Joshi & Ahammed, 2016). About 50% solid wastes are generated from households in Kerala.

In Kerala, biodegradable waste generates at an average of 400 grams of bio-waste per day per person and the non biodegradable waste is about 150g. Thus an average person generates 550 grams of waste per day. Thus, it can be estimated that two and a half kilograms of waste is generated in a house (Raghunandan, 2018). Most of the activities through human interventions are harmful to the environment such as groundwater pollution, soil pollution, air quality degradation and health impacts (Achuthan, 2013).

In order to overcome the major problems caused by waste, it is necessary to understand the amount of waste generated and their characteristics. Accordingly, waste

should be managed properly and awareness should be created among the people. Studies in India and abroad (Acharya *et al*,2021; Pandey *et al*,2018; Andersson&Stage,2018; Xiao *et al*,2017; Chakrabarti *et al*,2009; Kaundal&Sharma,2007; Sdewart *et al*,2005) have shown that household waste treatment can be facilitated by understanding the quantities and characteristics of waste. Various studies on awareness and people perceptions on household waste management have done in Kerala (Kaidhery and Karunakaran, 2019; Savitha krushnen,2018; Ravi&Vishnudas,2017; Dhanalakshmi,2014; Licy *et al*,2013). Literature showed that no studies have been conducted on household waste management in and around Pulikkal Panchayat in Malappuram district. Therefore, the present study was undertaken to understand the type and characteristics of household waste, waste disposal and reuse methods. Besides, the study also focused to assess the people awareness, challenges and perceptions of household waste management especially in Covid Pandemic situation.

MATERIALS AND METHODS

Study Area

Pulikkal Panchayat in Malappuram district has an area of 28.7 sq.km, is situated in Kondotty Taluk with 21 wards. The boundary of Panchayat by Cheekodu, Muthuvallur Panchayat in the East; Cherukavu and Vazhayoor Panchayat in the west; Vazhakkadu Panchayat in the North; and Kondotty and Pallikkal Panchayat in the South. According to 2011 census, the total population in Pulikkal Panchayat is 43628 with 21244 males and 22384 females. The area selected for the present study is the 14th ward (Pandyatupuram) of the Pulikkal Panchayat with 607 households. The study area lies between longitude 75.9127° in the East and latitude 11.1889° in the North. The location map of the study area is given in Figure 1.

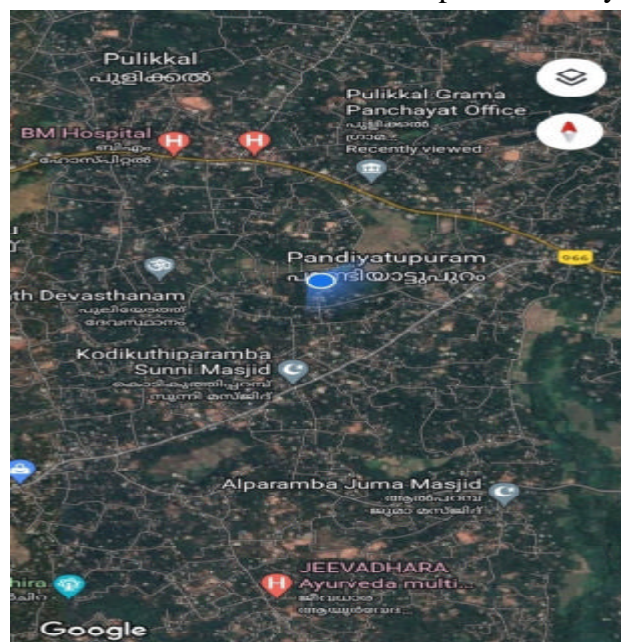


Figure 1. Location Map of Study area (source : <https://www.google.com/maps>)

METHODOLOGY

Both primary and secondary data were collected for the present study. For the collection of primary data, a detailed household survey was conducted in the study area in order to find out the socio-economic status, types, characteristics and quantities of household wastes, waste disposal methods, activities of Harithakarmasena, and awareness on sustainable waste management. The survey was conducted during the month of July 2021 among the randomly selected households (N=50) in the 14th ward (Pandyatapuram) of Pulikkal Panchayat with self prepared questionnaire. The secondary data were collected from the Panchayat Vikasanarekha, journals and reports.

RESULTS AND DISCUSSIONS

The data collected after the survey among the households in the 14th ward of Pulikkal panchayath were analysed using MS Excel 2010. The results obtained are described in detail in the following sections.

Socio-Economic status

The detailed results of socio-economic information includes education, employment, income and the total area of house of surveyed households are given in the Table 1.

The results of education status of surveyed population showed that 66% completed SSLC, 14% with below SSLC qualification, 10% with Plus Two qualification, 6% with degree qualification and 4% with higher professional qualification. It was observed that 42% of the members are involved in the daily wage jobs/coolies, 24% are NRIs, 16% are government employees, 10% are pensioners and 8% are merchants. From the survey it was found that 54% of households are with annual income less than Rs.10000; 24% with annual income between Rs. 10,000 and 50,000; and 12% with annual income greater than Rs.50,000. The survey observed that 24% of households possessed land area above 20 cents, 20% possessed between 15 cents and 20 cents, 16% possessed between 10 cents and 15 cents, 28% possessed between 5 cents and 10 cents and 12% possessed less than 5 cents.

Based on the socio-economic data, the standard of education is generally lagging behind, majority of them are SSLC qualification. The data shows 42% of the people in the study area are daily wage workers. Therefore the study showed that majority of the people in the study area is socially and economically backward.

Table 1. Socio-economic details of households

No	Socio – Economic Information	Percentage (%)	
1		S.S.L.C	66
		Below S.S.L.C	14
		Plus Two	10
	Education	Degree	6
		Professional	4
		Total	100
2		Mercenaries	42
		NRI	24
		Govt. Employees	16
		Pensioners	10
	Employment	Merchants	8
		Total	100
3		Below 10,000	64
		Between 10,000 and 50,000	24
	Income	Above 50,000	12
		Total	100
4		Upto 5 cent	12
		5 to 10 cent	28
		10 to 15 cent	16
		15 to 20 cent	20
	House and backyards	Above 20 cent	24
		Total	100

Types and Characteristics of wastes

From the survey, majority of the people opined that biodegradable, non biodegradable and hazardous wastes are commonly generated in the households. Of which, 90% of households generated in large quantities of food wastes and plastic wastes. Wastes such as glass, paper, hospital waste, and metal waste were found to be produced in very small quantities. However, the survey found that e-waste is scarce, electronic waste is not taken care of, and it is not treated as well as other wastes.

Quantity of waste

From the survey, it was found that no one has any idea about the daily production of waste. From the households surveyed, the response was that the daily figures were not taken into account. The survey revealed that no one knows the amount of biodegradable

waste. About 80 percent of households generate close to 500 grams of non biodegradable waste per week. About 14% of households generate less than 1 kilogram, 4% of households produce less than 500 grams and 2% of households produce less than 1.5 kilograms of waste. The survey found that biodegradable waste is the largest source of household waste. 64% of households have high levels of biodegradable waste and 28% of households have high levels of non- biodegradable waste. It is estimated that 8% of the other pollutants are both equivalent (Figure 2).

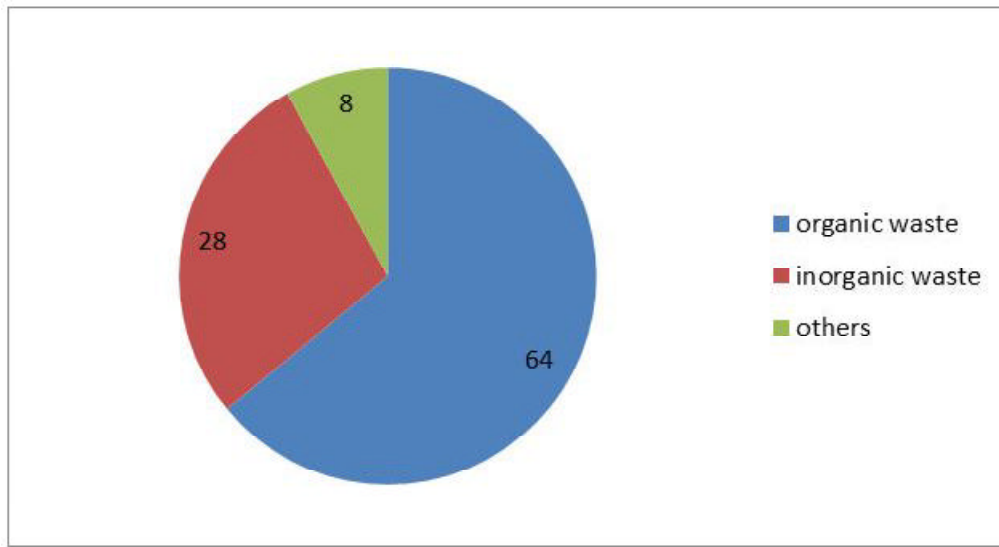


Figure 2. Quantity of waste generation (in percent)

It was found that plastic waste is the most problematic one among the non-biodegradable wastes. Out of the 50 households surveyed, 49 households were found to have high levels of plastic cover and only 1 household was found to be better recycling plastic covers. The study found that more plastic bags are being produced out of control than plastic bottles, and 98 % of households do not even try to recycle them. Barr et al. (2001) conducted a study in England, and suggests that recycling waste is the best way to reduce its volume. The study also found that household recyclers were more likely to reuse waste than other households, thereby significantly reducing amount of waste.

The survey observed that among the hospital wastes generated in the households, 56% are masks, 30% medicine covers, 8% medicine bottles, 4% syringes and 2% are other hospital wastes (Figure 3). Majority of the surveyed population opined that due to the Covid situation, more masks were produced than medicine bottles and medicine covers. It was also found that people have lack of knowledge on how to disinfect and handle masks in the right way.

The study found that higher incomes and better employment conditions led to an increase in waste levels in the households compared to others. Similar findings reported by Pandey et al. (2017) conducted a study on domestic waste management in Bhopal City

and clearly pointed out that households with higher lifestyles and economic status generate more waste than other households with low income.

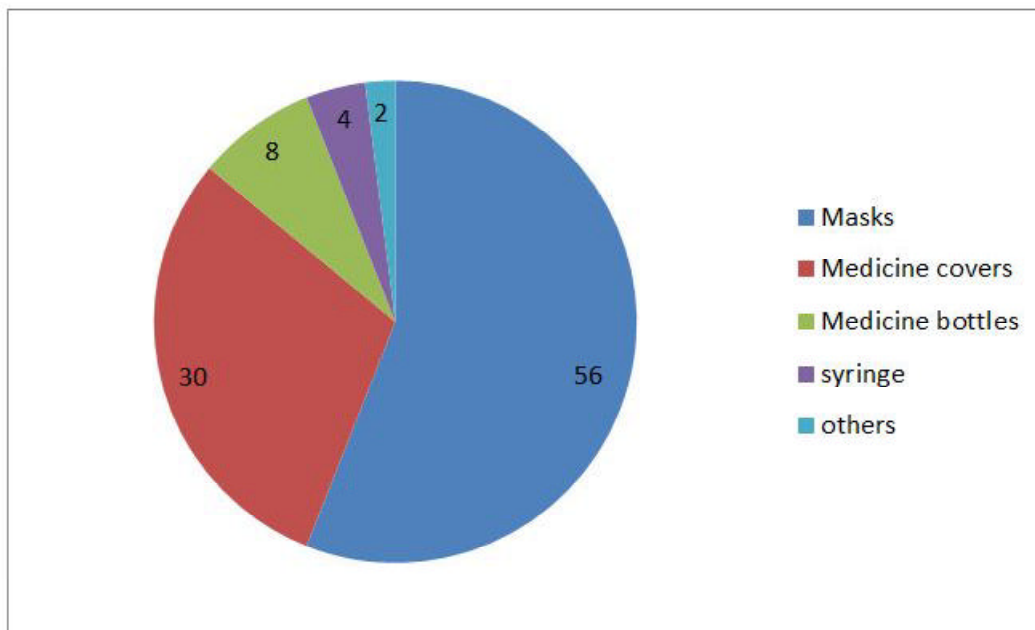


Figure 3. Types of hospital wastes (in percent)

Waste Disposal and Reuse

From the survey it was found that 82 per cent of households dispose their solid wastes including plastic wastes by burning, 16% of households dump their waste in pits and bins (Figure 4) in the premises of the households and the remaining 2% by throwing in the premises (Figure 5). Dumping of solid wastes in the premises of households leads to groundwater pollution, mosquito menace and causing water and vector borne diseases (Bhargava and Chatterjee, 2007).

Out of the 50 households surveyed only 16 % households (8 houses) are implementing waste disposal method at source level. Of which, 3 houses have biogas facility, 3 houses have pipe compost and 2 houses have composting facility. None of the households in the study area used vermicompost method for waste disposal.

The survey revealed 86% of households reuse plastic bottles for kitchen and other purposes. 8% of households reuse waste in effective manner such as cloth wastes and plastic cover were reused as floor mat. The remaining 6 % of households do not reuse waste properly.

The study also showed that 12 % households have difficulty in disposing the waste generated due to the lack of adequate backyard space.



Figure 4. Wastes disposed in cement bins

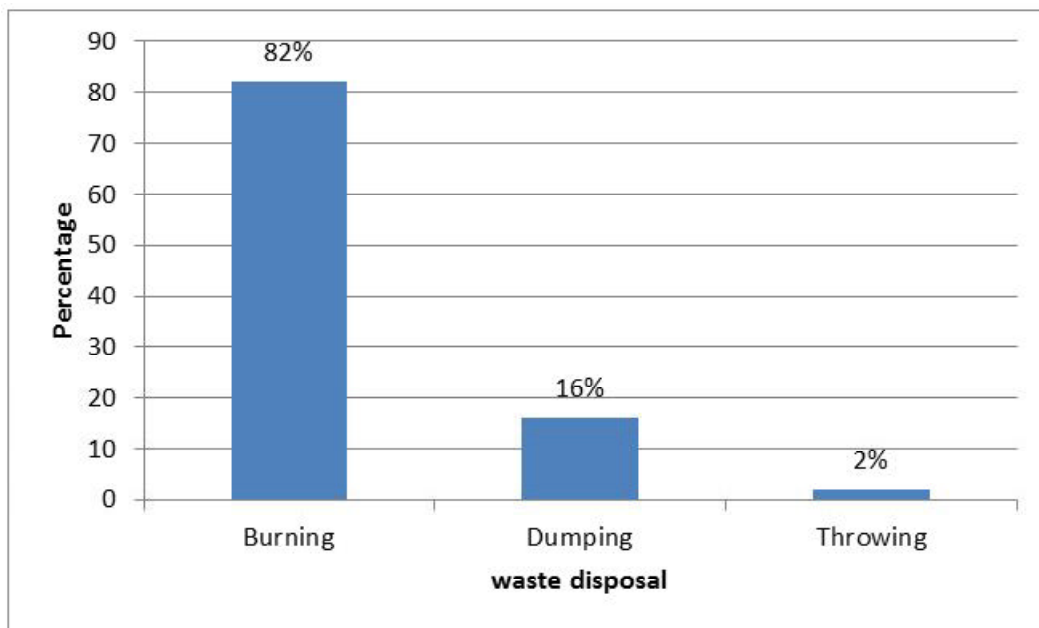


Figure 4. Waste Disposal methods (in percent)

Activities of Haritha Karmasena

Although there is a Haritha Karmasena in Pulikkal panchayath, 100 % surveyed population opined that the activities of the Haritha Karmasena are not available in the study area. The survey revealed that the service of Haritha Karmasena is essential in the ward for the effective management of waste disposal. Besides, the people in the study area ensure providing full participation for Haritha Karmasena activities.

Awareness on Waste management

The survey found that 85% of the people in the ward were aware about waste management but were not properly disposed of due to lack of interest and technical assistance. From the survey, 50% respondents opined that more facilities and possibilities should be created by the Panchayath authorities for the effective management of biomedical wastes generated in the households in the study area.

Possibilities and Challenges of Household Waste Disposal in the Covid Pandemic situation

The survey revealed that the Covid period has adversely affected the household waste disposal system. But at the same time, it was found that there were people in the ward who took advantage of this situation. Data from 86% of households indicate a significant reduction in the amount of waste generated in the Covid situation. 10% said the amount of waste was high and 4% said there was no change in waste generation. The survey also found that the number of plastic bags that had been mass-produced had dropped dramatically. It was found that 78% of people do not know how to dispose of gloves, masks, sanitizer bottles and medicine covers used in Covid pandemic period, whereas 20 percent of households are aware of the potential for 'waste recycling' during the Covid period. Through social media and so on, it was found that people tried to understand the concept of recycling waste and put it into practice. Disposable plastic bottles and lids were found to be better used. However, 88 per cent of the respondents said that they are facing much difficulty to dispose the waste properly due to the Covid situation. The survey also found that improper treatment of waste can lead to foul odours and accumulation of such waste on the roadsides and nearby drinking water sources causing health problems.

CONCLUSION

The present study concludes that household waste disposal and management in the study area is linked to the socio-economic factors of the people, lack of adequate space, lack of awareness for proper waste disposal and lack of Harithakarmasena activities. Hence the Panchayat authorities should take appropriate measures for adopting sustainable waste management practises in study area.

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