

UNDERSTANDING SOLID WASTE GENERATION IN A SOCIOLOGICAL PERSPECTIVE

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ABSTRACT: *Over the past few decades, there has been a global trend of sociologists paying special attention to environmental issues. The main objective of this study is to analyze the social aspects of solid waste generation, covering the existing research gaps in the field of research beyond the Anuradhapura District and the North Central Province. The sub objectives were identifying the social definitions on solid waste, understanding the relationship between gender and solid waste generation and identifying the correlation between sociocultural value factors with solid waste generation using survey data collected from three Wards of Anuradhapura Municipal council in the Anuradhapura District. Under the Survey method, observations and in-depth interviews were used as key data collection tools in this study. According to the study it was identified that the solid waste generation influenced in order to gender and socio-cultural aspects. Socialization plays a major role in definite the Solid Waste and regarding the knowledge on solid waste among the society. Reuse and reducing the solid waste have become a role of the women in the Sri Lankan context. Women play a major role in waste generation as they have the power to control the waste generation and the waste management. It can be concluded that apart from the science and scientific theories, the knowledge regarding both solid wastes generation and defining the solid waste come through the social education and social knowledge. The cognition of ordinary people and their local knowledge are as important as theoretical approaches and scientific teachings.*

Keywords: culture, gender, power, socialization, solid waste

1. INTRODUCTION

Over the past few decades, there has been a global trend of sociologists paying special attention to environmental issues. With this came a gradual recognition in the environmental field of the importance of the role of the social scientist in identifying environmental problems and finding appropriate solutions to them (Mol, 2006). In those approaches, environment sociology is relevant because it presents information on how social factors influence the highlighting or reversal of an environmental problem. Environment sociology focuses on identifying environmental issues, how they are presented, how each community's social and cultural background contributes to environmental issues, how different environmental issues are discussed in different societies, and how they become international (Lutzenhiser, 2002). Due to these factors, the relevance and importance of environment sociology in the field of environment is recognized. Focusing on the many environmental issues that have been created globally, it appears that environmental issues are being

created in almost every aspect related to human activities. Various factors are at work to address those environmental issues. These environmental problems can be considered as common social problems. When we look at environmental issues and take action on them, it seems that they do not arise naturally. Environmental issues can be defined as issues rose by different individuals or organizations based on an environmental disaster or problem. What environment sociology does here is to examine sociologically how environmental issues are shaped as social issues and to explain how and why they arise on different bases in different social systems at different times (Lutzenhiser, 2002). Sociologists seek to use sociological theory and methodology to justify and present these environmental problems as social problems. As a result, sociological studies have the potential to point out various factors that influence the social understanding of environmental problems and the solutions to them.

Once an environmental problem is identified as a social problem, it is possible to better understand how it affects the individual and society in general (Lutzenhiser, 2002). Many environmental problems are created within a certain physical background and initially affect individuals personally, and those environmental problems gradually translate into general social problems (Mol, 2006). The nature of environmental problems changes with human evolution over time. New environmental crises are being created due to changes in the lifestyle of modern man over the society of the past (Mol, 2006). Among the new environmental crises that have arisen globally, global warming, rising sea levels, climate and climate change, forest fires, greenhouse effect, deforestation, biodiversity loss and pollution are among the most socially talked about environmental crises today. Among these environmental changes, the growing growth rate of solid waste generation is causing serious problems as a global crisis (Lutzenhiser, 2002). Factors such as the rapidly growing world population and rapid urbanization in developing countries have led to an increase in the rate of urban solid waste generation. Numerous research reports on solid waste management indicate that solid waste generation in many parts of the world is surpassing population growth rates (Hoonwey and Bhada-Tata, 2012). The most discussed issues are solid waste management in developing countries. Global solid waste report data (2012) assume that waste generation will double in the near future as consumer consumption in developing countries surpasses that of developed countries. There are several major areas where problems arise in solid waste management (Hoonwey and Bhada-Tata, 2012). That is, there is a growing problem in the areas of solid waste collection, transportation and disposal. Disposal of solid waste into open ground has become a globally common practice due to the lack of suitable landfills for solid waste disposal. However, the dumping of solid waste into open areas can lead to massive environmental pollution and adversely affect public health in various ways. Most important of all is the destruction of terrestrial and terrestrial aquifers by open solid waste dumped illegally. Solid waste management methods are becoming more and more important as they are unique to each country in order to streamline solid waste management. Lack of effective regulations for this purpose has led to serious environmental problems that cannot be solved by solid waste management problems (Hoonwey and Bhada-Tata, 2012). It is pointed out that in the absence of a formal legal framework for solid waste management; governments tend to dump waste into

riverbanks and lowlands. This feature is clearly identifiable in relation to solid waste management in Sri Lanka (Bandara, 2008).

According to Bandara (2008), the solid waste is becoming a major problem in the developing countries though the countries still generate much less than developed countries when per capita figures are compared. As mentioned in the feasibility study report for Municipal solid waste disposal (2017), the per capita solid waste generations (kg/day) of selected world cities are New York (1.8), Singapore (0.87), Colombo (0.85), Rome (0.69), Jakarta (0.60), Manila (0.50) and Calcutta (0.50) (NSWMS, 2008). According to the Bandara (2008), the different level of per capita generation of solid waste (kg/day) in Sri Lankan local authorities, Municipal Councils (0.60), Urban Councils (0.60) and Pradeshiya Sabas / Village Council (0.40). Sri Lankans generate approximately 0.62 kg of solid waste per day on average. The total solid waste generation of Sri Lanka is from 8000 to 15000 metric tons per day and average waste production is around 4.5 million metric tons per year. However, it is only around 40% solid wastes collected by local authorities from the average production of 12400 metric tons per day (NSWMS, 2008).

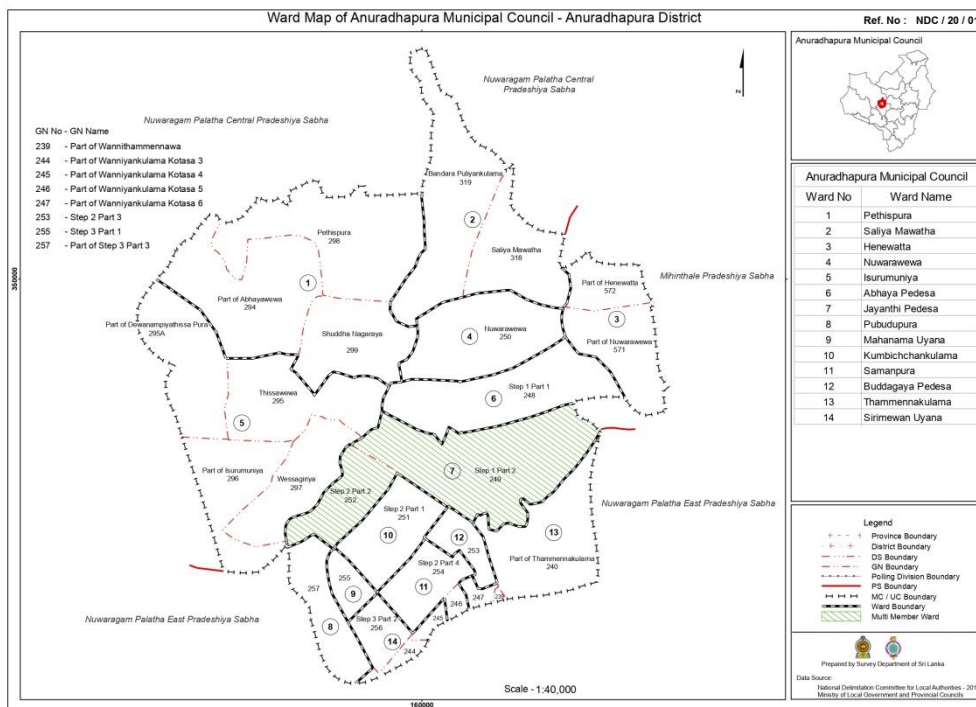
Due to the lack of a specific solid waste management system and a legal national policy framework in Sri Lanka, Colombo, the most populous city and capital city in Sri Lanka, has created the largest landfill in the island as a result of open waste solid waste disposal. That is the Meethotamulla waste dump. Meethotamulla Waste Dump is located at a distance of 4 km from the city of Colombo. The land consisted of segregated waste disposed of by the Colombo Municipal Council over a period of several years. The landslide-prone landfill on April 14, 2017 could be described as one of the most recent man-made environmental disasters. According to scientific research, landslides are caused by rainfall, pressure on the top of the mound, and destabilization of the mound (UDA, 2018). With this incident, the attention of state and local bodies on solid waste management became more and more focused. As a result of this incident, the Sri Lankan social attitude towards environmental disasters changed and solid waste management became a popular topic of discussion and discussion in various fields as same as Sociology and environment sociology.

The main objective of this study is to analyze the social aspects of solid waste generation, covering the existing research gaps in the field of research beyond the Anuradhapura District and the North Central Province. The sub objectives were identifying the social definitions on solid waste, understanding the relationship between gender and solid waste generation and identifying the correlation between sociocultural value factors with solid waste generation using survey data collected from three Wards of Anuradhapura Municipal council in the Anuradhapura District.

2. METHODOLOGY

Research area was selected in order to Anuradhapura District, which is having a major area of the Sri Lanka to for disposal, 15 Acres (Keerikkulama) (UDA, 2018). Typically, municipal council collects about 31 metric tons of solid waste in a day (UDA, 2018). According to Jayathilaka et al. (2020), it has been reported that 54% of the collected waste is short-term biodegradable waste. In principal, municipal solid waste collection service is provided by the municipal council at city center (covering commercial entities) daily and in residential areas with varying frequency, but at least

twice a week. During festival seasons, thousands of people visit or reside in the city creating an enormous pressure on public services and municipal council to increase the waste collection turns of those areas as and when necessary. Consequently, municipal solid waste collection during peak season increases by 50%. Some peri-urban areas however are not provided with the waste collection service. Nevertheless, most of the residents in these areas have own sizable land plots enabling them to manage the waste within their own premises. Municipal council has imposed a tax system on commercial and industrial units in the municipal council area for solid waste collection. About 70 institutions in the city have been registered under this system. Consequently, it is expected that the revenue from waste collection to be increased from 1.4 million LKR (in the year of 2013) to 5 million LKR per year (UDA, 2018). Anuradhapura municipal council maintains a compost plant through which about 26% of the waste (8 MT/day) is treated. The waste collected is in mixed nature, therefore only 2% (0.7 MT/day) is recovered as recyclables and the balance 72% (22 metric tons/day) is openly dumped. The dumping site is located adjacent to the compost plant located at Keerikkulama in Nuwaragam Palatha. Suitability of this disposal site is questionable as it is located within the catchment area of Nuwarawewa reservoir and also the site is not an engineered landfill. Previously, the dump site has been used for the disposal of septage as well (Jayathilaka et al, 2020). The research area was Jayanthi Pedesa, Pubudupura and Kumbichchamkulama; three Wards of Anuradhapura Municipal council in the Anuradhapura District.



Source: National Delimitation Committee for Local Authorities – 2013 Ministry of Local Government and Provincial Council.

Under the Survey method, observations and in-depth interviews were used as key data collection tools in this study. The main objective of the interviews was to gather

in-depth socio-economic and attitudinal information in related to solid waste generation and management based on random sampling method. The sample of the study is a random sample of forty five households (45) and it was taken as fifteen (15) households from each ward. Existing attitudes, perspectives, knowledge and information on solid waste generation and management were reviewed from sociological perspectives on this study. The data were analyzed quantitatively (demographic data) and qualitatively using Microsoft excel and Thematic analysis.

3. RESULTS AND DISCUSSION

The results and discussion have been themed according to four main themes as defining the solid waste, gender and solid waste generation, education and solid waste generation, and sociocultural value factors and solid waste generation.

Table 01: Solid waste generating in the household

Ward	Food Waste	Plastic/ Polythene	Paper	Wood	Metal	Glass
JP	100%	100%	100%	40%	13.3%	-
K	100%	100%	100%	13.3%	26.6%	13.3%
P	100%	100%	100%	13.3%	13.3%	-

According to the Survey data the solid waste generating among the sample households has been mentioned as a percentage of the households as below. It is clear that majorly all the households generate food waste, plastic and polythene and paper.

*JP (Jyanthi Pedesa), K (Kumbichchankulama), P (Pubudupura)

Source: Survey data (2022)

Table 02: Solid waste disposal and management methods

Ward	Owing a Compost Bin	Re use plastic/ Polythene	Burning	Dispose to separate bins	Sell metals and papers	Sell food waste
JP	4 HH	5 HH	8 HH	5 HH	11 HH	2 HH
K	6 HH	6 HH	9 HH	6 HH	11 HH	2 HH
P	3 HH	7 HH	7 HH	6 HH	13 HH	1 HH

As per the Survey data the solid waste disposal and management methods among the sample households has been mentioned as a percentage of the households as below. It is clear that majority of the households sell metals and papers and burns

their solid waste. Minority of the sample is sells food waste and owing a compost bin as a solution.

*JP (Jayanthi Pedesa), K (Kumbichchankulama), P (Pubudupura), HH (House Holds)

Source: Survey data (2022)

The data collected through the survey were analyzed using themes and under the major topic Understanding Solid Waste Generation in a Sociological Perspective, three main sub topics were generated as defining the solid waste and solid waste generation, gender and solid waste generation and sociocultural value factors and solid waste generation.

3.1 DEFINING THE SOLID WASTE AND SOLID WASTE GENERATION

Waste is simply what a person throws away, thinking that a product is no longer useful. As a result, it has no value in primary consumption. That is, substances that affect the environment and human health, which are useless for disposal, and everyday life, are called waste. As defined by McDougall et al (2001), waste can be classified by mass, physical condition, and original use in solid waste, by material. Also, solids can be defined by physical properties, origin, or level of protection. Also, the Environmental Protection Agency (2001) states that the legal definition of solid waste is not based on the physical nature of the material but on the fact that it is a solid waste.

Franklin Association (1999) has defined the types of Solid waste as food waste, office waste, processing waste, furniture waste, garden waste, construction waste, public waste and e waste. Source of solid waste has been identified by the Franklin Association (1999) as residential, commercial center, institutional, industry and city centered. From a sociological point of view, the definition of waste can be very subjective. According to Mahees (2018), what one person defines as waste can be valuable to another and important in livelihood and lifestyle. There must be a permanent legal definition of waste. Accordingly, there are different applications and built-in definitions to describe different types of waste, including controlled, domestic, industrial, commercial, special, active and inactive. In such cases, it can be seen that the definitive definition of waste represents in order to financial, legal, authorities and the government of a country (Mahees, 2018). Waste can be classified as gold and non-perishable waste. Natural waste discarded by humans is often biodegradable, while discarded synthetic plastics, such as polythene, are non-perishable wastes. According to Western Provincial Management Authority (2016) waste is a substance that people dispose of, intend to dispose of, or dispose of in accordance with local law.

The sample of the study defined the Solid Waste in various ways and it seemed that the definitions came out through their understanding, culture and the social experiences.

"I think solid waste is non-perishable material. Things like plastic." (Survey Data, 2022)

"Glass, plastic, iron, polythene, and foodstuffs can all be taken as solid waste, can't they? Our household bins are sorted in that order." (Survey Data, 2022)

"Any waste belongs to this category. I classify it as perishable and non-perishable." (Survey Data, 2022)

"We have a classification as solid waste, liquid waste, right?" (Survey Data, 2022)

"Household solid waste can be classified as industrial solid waste because it is completely different from solid waste." (Survey Data, 2022)

"Materials of no economic value that are discarded by humans or activities are waste" (Survey Data, 2022)

Waste is a dynamic concept. It can be interpreted in many different ways. According to Strasser (1992), a new definition of waste is being proposed. Strasser (1992) describes waste as object oriented modeling language. There, in defining waste, its purpose is structure. State and performance factors are important. There is no economic value that waste can be permanently discarded. The solid waste problem is the end result of problems of new environmental, social, cultural and political roots. The generation of solid waste causes environmental problems such as air pollution, water pollution, and soil pollution. Also solid waste is directly linked to the social life of the individual. The over-consumption pattern of modern man, the consumption of symbols, attitudes, and personal behaviors as well as the behavior of power politics are the reasons for the generation of waste. In solving the problem of solid waste from a sociological perspective, it is important to identify waste as a social fabric. Although the generation of waste is understood on a scientific basis, it is important to pay attention to all aspects of solid waste management, from the raw level, in identifying solid waste as a social construct and a structure of power politics. In explaining the sociological interpretations of solid waste, the concepts of solid waste as a social fabric are even more important. It is clear that the increase in token consumption in large societies and the growth of economic development dimensions have led to the generation of solid waste. Common social attitudes toward pollution are explained through cultural approaches. Mahees (2018) states that the negative attitude towards waste using three main dimensions. That is, the meaning of something dirties the attempt to hide the waste, and the social protests against the disposal of the waste change the social perception of the waste.

As per the findings of the survey data, it is defined solid waste in various explanations and it is clear the definitions on solid waste come through the education and culture. The fact is all the definitions are criticizing on the negative effect or harm of the solid waste. Thus, it is clear that social attitudes towards waste are negative. Society has not progressed enough to look into the aftermath of trying to dispose of waste due to its reluctance to realize that waste is generated within itself.

3.2 GENDER AND SOLID WASTE GENERATION

According to the survey data it is revealed that the majority of the study samples remained at home as housewives. Among them were a handful of small-scale self-employed people who could work from home. However, the husband was named as

the chief earner of the families by a large percentage of this family sample. Interviews with the study sample showed that women were more likely than men to control the role of women in the family and to control waste generation. It was revealed that the woman thinks it is her responsibility to determine the items consumed in the home, determine the nature of the items consumed, as well as determine the number of times an item is consumed. The study also found that women's domestic household power played an important role in family management in determining whether household waste was recyclable or not. Examples include disposable jam bottles, reusable spice packaging, disposable linens for home cleaning, and carpet use.

The traditional method of dividing responsibilities and tasks within the Sri Lankan family was similarly visible in this study sample. Fadhullah et al. (2022) describes women and power, noting that women's power varies from culture to culture. According to Fadhullah et al. (2022), a woman gains power in the home and men gain social power. Theoretical explanations of how women associate their power with the economy and society are confirmed by the domestic behavior of women in the study sample.

"We always tried to reduce the amount of waste in the house. We reduced our waste because we were aware of the damage caused by waste. We often try to use plastic bags instead" (Survey Data, 2022)

"The man's habit is to go to the store and bring the goods in a shopping bag. It's very difficult to control" (Survey Data, 2022)

"Children's school supplies can be procured from home. That way a lot of the things we throw away can be reused" (Survey Data, 2022)

"Most of the time, my husband's business brings in polythene bags. My daughter and I sew reusable bags. We make a lot of money from it. We sew about 100 bags a week" (Survey Data, 2022)

"We make compost and reuse polythene and it controls waste a lot. Also as a mother I am always caring about not to generate waste. If we can re-use something I am not spending any extra rupee for that" (Survey Data, 2022)

Women covered a number of important areas such as waste segregation, control of waste accumulation, and informing officials on waste disposal issues. It was also observed at the time of collecting the data that when the waste truck arrived, they had volunteered to inform the women in the neighborhood as well. Field observations made in connection with the study revealed that there are a number of problems related to the accumulation of waste in the housing complex. That is, tractors belonging to the Anuradhapura Municipal Council arrive on separate days to collect its waste. Lack of a specific sharp time for the tractors to arrive was a major problem with the waste disposal. Also, the majority of women were of the opinion that it would be difficult to keep waste in the house if the tractors that collect more than one day did not arrive. The observation also revealed that people from other areas were coming and dumping waste on both sides of the road. It had polluted the houses and housewives specially were informed and complained about it many times but authorities had not care about it.

Finally, it is clear that the theoretical explanation that a woman gains power in the home and men gain social power, and that a woman associates her power with the economy and society, is generally applicable to society. Women play a major role in waste generation as they have the power to control the waste generation and the waste management. Men as main earners are not that aware regarding the waste generation and according to the survey majority of the men generate waste and women control it by re using or reducing.

3.3 SOCIOCULTURAL VALUE FACTORS AND SOLID WASTE GENERATION

According to Tyler, culture or civilization is a complex set of knowledge, beliefs, arts, customs, and all the other habits and talents that a person acquires as a member (Tyler, cited O'Brien, 1999). Thus it is clear that culture can be interpreted as the heritage of a particular society. A subculture is a group of people who have been created using elements of the mainstream culture (O'Brien, 1999). Instead, there is a loose and informal social participation in a subculture (Scanlan, 2005). Environmental and geographical changes are a major factor in the formation of a subculture. In a few years, the creation of a landfill in an area where people live will force members to adapt to the new environmental pattern. Accordingly a new social environment is created. The study revealed that the subcultures that had been created in the field due to the waste heap had affected the lives of the people. It proved that various forms of power functioned in it.

Salequzzaman et al. (2001) found that education can be used to transform communities and change attitudes and develop skills for waste management and resource management. Salequzzaman et al. (2001) argues that education is vital to promoting sustainable development and improving human resilience to environmental and educational issues. The study's findings suggest that education is important based on the knowledge, attitudes, skills, and experience needed to address solid waste issues at the individual and social levels. Skinner (2004) states that community education is important for optimal waste management and that it can lead to risk reduction. Skinner (2004) also points out the need for cost-cutting programs that reduce the level of waste and recycle recycling through aggressive community education of consumers and manufacturers.

When considering the factor of education, there are some key points that have emerged from the study data. Although family members have little scientific knowledge of waste generation or waste management in the field, family education plays a vital role in social knowledge and social integration, especially for women.

"We've been making compost since time immemorial. I'm going through the same habit." (Survey data, 2022)

"Learn a lot and know the damage of waste. If you know you cannot live in a pile of rubbish, that's enough." (Survey data, 2022)

"I've been telling my kids since time immemorial what happens when waste is piled up. Polythene, that it's the biggest damage." (Survey data, 2022)

"Gentlemen, come in the morning and leave the waste bags. How can there be such people in the house?" (Survey data, 2022)

"I did not know it's not good to burn polythene. I got it on a Television show." (Survey data, 2022)

It is clear that the formation of knowledge and attitudes through informal education contributes significantly to the prevention of waste generation. The pattern of consumption in society is determined by established economic development. In the world sphere, industrial-capitalist economic development has existed since the mid-eighteenth and early nineteenth centuries. This development is based on the generation of goods and services on a large scale through mechanization powered by various energy sources. Consumption of goods is promoted through advertising. One of the main reasons for the accumulation of waste is its poor management, which is due to the unsatisfactory processing of waste from industrialization and production of goods and services into waste. Glass, for example, is a material that can be recycled many times over, and once used; it can be recycled as a raw material to produce new bottles instead of being thrown in the trash. The recycling of glass bottles is selected and the accumulation of waste is reduced as it becomes the raw material needed to produce new bottles. This will lead to less pollution due to the extraction of silica sand for glass production, reducing the industrial process time for glass bottle production, and reducing the amount of waste due to the addition of glass bottles or containers.

The relationship between culture and waste generation is also important. The term culture basically refers to the generally accepted pattern of behavior that includes all man - made material things. It applies to religion, ethnicity, language, symbols, beliefs, customs, values, norms, restrictions, skills and abilities. The formation of new cultural practices and attitudes in relation to social realities is another important aspect of culture. According to survey data:

"Buddhism teaches the importance of cleanliness in the home. We should not harm a single leaf of a tree. I think we learn these things from the family before school. Explain all this within a religion." (Survey data, 2022)

"There is a lot of talk in our religion about waste management, especially Buddhism. Gordon is focused on health." (Survey data, 2022)

"The church teaches us a lot. In the meantime, a waste-free house is a special lesson." (Survey data, 2022)

"Our house has the S 55 system. My kids definitely have to work under it. That's a big reason not to litter." (Survey data, 2022)

Peter Berger (1966) argues that the sociology of knowledge will have to deal not only with the empirical diversity of knowledge in human societies, but also with the processes by which any such knowledge becomes a reality socially validated. He goes on to say that the reality or knowledge of a society is socially constructed. That is, the importance of social knowledge when it comes to waste generation is evident.

They often believe that nature is a creation of God, and that polluting nature is tantamount to bringing disgust before God. For example, Mahees (2018) states that when it is difficult to control the dumping of waste on roads or public places in urban Sri Lanka, people temporarily place statues of gods or Buddha's near those waste dumps to prevent illegal dumping. Socially developed cognition of the individual or society's disposal of solid waste and its impact on various issues is important here. The cognition of ordinary people and their local knowledge are as important as theoretical approaches and scientific teachings. These indigenous knowledge or culturally constructed realities cannot be proven on a statistical or quantitative basis. They must be understood subjectively. As culturally constructed social realities became more powerful, the formation of those attitudes through social integration became clearer in the field than the scientific and theoretical understanding of the adverse effects of solid waste generation.

4. CONCLUSION

According to the study it is clear that the solid waste generation can be identified as a social activity. Apart from the science and scientific theories, the knowledge regarding both solid wastes generation and defining the solid waste come through the social education and social knowledge. Socialization plays a major role regarding the knowledge on solid waste among the society. Women play a crucial part in solid waste generation and mainly the female party of a family controls the solid waste generation and manage the solid waste. Reuse and reducing the solid waste has become a role of the women in the Sri Lankan context. Women play a major role in waste generation as they have the power to control the waste generation and the waste management. The cognition of ordinary people and their local knowledge are as important as theoretical approaches and scientific teachings. These indigenous knowledge or culturally constructed realities cannot be proven on a statistical or quantitative basis and this knowledge must be understood subjectively.

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