



THE IMPACTS OF SOLID WASTE DUMPING IN HATTON MUNICIPAL COUNCIL

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Abstract

Waste disposal is a systematic action to manage waste from origin to final disposal. It includes incineration/burning, burial at landfill sites, or discharge at sea/ lake/ river/ and recycling. Dispose of waste as a unit for the removal and destruction or storage of used, damaged, or unwanted industrial products. The disposal of solid waste is a priority environmental issue in Sri Lanka and at present, it has become a national concern. Based on this, Hatton Municipality is located in the Nuwara- Eliya District of the Central Province with an area of 4.2 Km², and it includes five Grama Niladhari Divisions. Identifying the impacts of solid waste dumping in Hatton Municipal Council is the Main Object of the study, and proposing a solution for the impacts of garbage dumping is the Sub Objective. Moreover, primary and secondary data collection methods were used to obtain data for the study. In that sense, Field visits, Discussions, interviews, and Questionnaires were used for the primary data collection, and the Hatton Municipal Council report, article, books, and internet were used as the secondary data collection. The data thus obtained were subjected to quantitative and qualitative analysis and new technologies were utilized to analyze the survey. Kuda Oya landfill closure, staff shortage, lack of transport facility to collect garbage, moving to other places to remove garbage improper disposal of waste, and lack of availability of a landfill site for the MC are the major reasons for the garbage dumping of the study area. Health-related issues, abhorrent impact, loss of land opportunity, and land degradation are the identified findings of the study. Eventually, specified suggestions including proper management of facilities and financial resources allocated for Solid Waste Management in the city by proper allocation of responsibility to labor working on Waste Management monitoring their activities, exploring low-cost technologies utilizing local resources which can be used for waste management in Hatton put forward on the steps to be taken for controlling the challenges faced by the people due to improper waste management and for the effective functioning of Hatton Municipality.

Keywords: *Waste disposal, Improper Waste Management, garbage, Municipal Council, Hatton*



Introduction

Garbage dumping is the biggest problem/challenge to human society and the environment worldwide. Illegal dumping (also called fly dumping or fly tipping) refers to waste dumping on sites with no license instead of using an authorized rubbish dump and being disposed of properly at a landfill (Liu, 2016). Illegal waste dumping has become a threat to human health and the global environment (Chu, 2021). Many barriers remain to improve the formality of collection, treatment, and final disposal (Ferronato and Torretta, 2019). Thus, the impacts dominate in developing countries rather than developed countries. Sometimes, the bitter truth is that developed countries treat developing countries as their garbage dump. Asian countries with greater populations produce more organic waste, such as kitchen waste, and fewer recyclable items, such as paper, metals, and plastics (Idris et al., 2004). Khajuria (2008), reported that the quantity of solid waste generated has increased significantly and its characteristics have changed as a result of the change in peoples' lifestyles due to swift urbanization. In the year of 2012, world cities disposed of 1.3 billion tons of solid waste per year, where world population will raise to 7.06 billion by 2025, and the rate of waste generation is roughly calculated to rise to 2.2 billion tons with a 9.8 billion population (Sahnaz *et al.*, 2019).

Knutsson et al., (2021), indicated that indiscriminate open waste dumping is the most common practice of managing solid waste in Sri Lanka. In the past few years, solid waste-related issues mostly take place, for example, the *Meethotumulla* dumping site. In Sri Lanka, the continuous dumping of waste in open areas eventually resulted in several Garbage Mountains in several municipalities in the country (Maheshi et al., 2015). As this dumping has improper management, leaving 32 dead and 60 houses destroyed. As well, the *Kollannawa* garbage dumping problem and the *Aruwakkalu* garbage dumping problem are for instance. In Sri Lanka, there are many Local Authorities (LA) that control the management of solid waste such as the Municipal Council (MC), Provincial Council (PC) Urban Council (UC), and Pradeshiya Shaba (PS).

According to AIT (2004), the per capita per day waste generation on average was 0.85Kg in other Municipal Councils (MC), 0.60 in urban councils (UC), and 0.4kg in Pradeshiya Shaba's (PS) (Nilanthi. J.G.J. Bandara, 2011). The collection of MSW by local authorities in Sri Lanka is around 2900 tons/day, with around 60% (1663 tons) gathered in the Western province, around 25% (700 tons) collected within Colombo municipal limits, the most urbanized area (Premachandra H.S, 2006). Municipal solid waste management solutions must be financial, sustainable, technically feasible, socially, legally acceptable, and environmentally friendly (Shafi and Mansour, 2018).

Therefore, the area which is coming under the **Hatton Municipal Council** doesn't have proper management for solid waste collection and dumping activities, by this also their multiple socio-environmental impacts increase day by day. Even in the beginning, in the **Kuda Oya** area, there was a garbage dumping place that was removed there due to the increasing socio-environmental impact issues according to the public resistance. Thus, Hatton Municipal Council does not have a specific dumping place. Consequently, the Hatton Municipal Council is encountering such an adverse issue there now. Thus, this study hopes to find the main reasons along with other factors and to identify environmental impacts, what are the solutions and suggestions to solve this problem as well.

Material and Method

Study Area

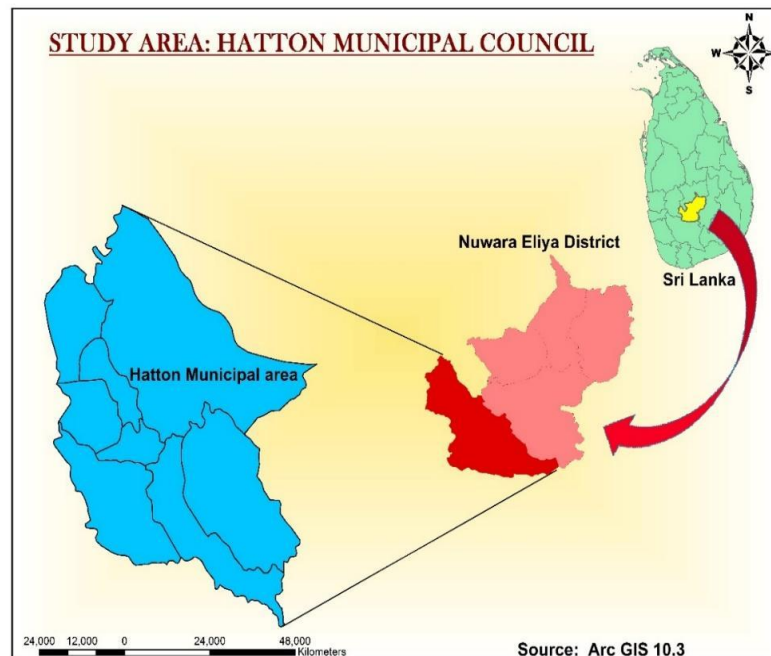


Figure 8: Study Area, Hatton Municipal Council
Source: Computed using ArcGIS 10.3

Figure 1 the study area, Hotton MC, which is located in Ambagamuwa DSD. There are five GN Divisions including Hatton Municipal Council, which are Hatton North, West, South, East, and Dickoya. The Ambagamuwa DSD is located in the Nuwara-Eliya District of the Central province. Even though the study area is located in Hatton Plateau. The coordinate of the study area is between $6^{\circ}52' 31.88''N$, $80^{\circ}36'12.77''E$ - $6^{\circ}54' 02.82''N$ $80^{\circ}35'47.90''E$. The study area belongs to a tropical climate. It has a significant amount of rainfall during the year. The average annual temperature in the study area is $19.9^{\circ}C$ / $67.9^{\circ}F$. The annual rainfall is 2834mm/ 111.6 inches. In the identification of the background of the Hatton Municipal Council area. The population level is approximately 27,800 in the study area. As well, the Research has main objectives and sub-objectives. Identifying the impacts of solid waste dumping in Hatton Municipal Council is the main objective of the study and to investigate the challenges of garbage dumping and propose a solution for the issues of garbage dumping in the study area.

Literature Review

Alvarez et al., (2017), examined this "A case study about the improper waste disposal in Barangay Mojon Tampoy". In this study, the researcher aims to create a solution for the main problems by interviewing the residents. According to the researchers' conclusions, improper waste disposal is the major problem of the residents in Mojon Tampoy. These problems were defined as incinerating, throwing their Garbage on the well, and the lack of Garbage collection. Incinerating, depositing trash in wells, and a lack of garbage pickup was listed as these issues. These issues could be harmful to both the locals and the environment.



The general objective of this paper is for the Barangay to know how to properly dispose of their garbage, to find alternative ways in eliminating their garbage, and to cleanliness in Barangay Mojon Tampoy. This study mainly focuses on how the practices of the people in the community can deeply affect, not just our nature but also their health. On the other hand, this study focuses on the problems caused by the lack of garbage collection.

Basnayaked and Visvanathan, (2013), studied under the title of “Solid waste management in Sri Lanka”. Researchers examine that as the country’s population is increasing, waste generation is also increasing. Hence, the formation of a sustainable solid waste management system has become crucial. More than 60% of the solid water generated is organic in nature. The prevailing MSW treatment and disposal methods are open dumpings, landfilling, composting, anaerobic digestion, and incineration. In terms of 3R, there two notable programs are the national post-consumer plastic waste management program and the “Pilisaru” waste management program and the study focused on solid waste management by enhancing the prevention techniques.

Benedict Francis Antony Basnayake and Renuka Ariyawansha, (2009) examined the topic of “Sustainable Waste Management Challenges in Sri Lanka”. This study advocates municipal solid waste management, including the present status of technology applications with an emphasis on 3R to divert wastes from Landfills. It contains reports on e-wastes collection programs and some processing, polythene recycling, hazardous, waste management, including healthcare wastes, disaster and construction and demolition wastes, informal sector and recyclers, the economics of waste management, and case studies. The author mainly focuses on sustainable waste management techniques but does not advocate the contemporary issues prevailing all around Sri Lanka.

The author Claudia et al., (2020) indicated that “Urban Management Model: Municipal Solid Waste for City Sustainability” this study revealed that population growth arises from the increase of municipal solid waste produced in urban areas causing hundreds of tons of waste. Additionally, the elements that make up its composition are poisonous and harmful, necessitating infrastructure and significant local resources for treatment. The study opens several future alternative solutions such as biotechnology, technological development, marketing, and trading materials to be reused and recycled, special studies for the final disposition destinations, and studies of companies’ organizations.

Methodology

This study is based on qualitative and quantitative. Thus, data for this research are obtained in two ways. Such as primary data collection and secondary data collection methods.

Primary Data Collection

Quality data are obtained by questionnaire, interview, and observation. Data accuracy is a key attribute of high-quality data. Quantitative data is obtained through the municipal council, library, and website. Direct



observations, interviews, questionnaires, and Focus Group Discussions were used to gather the primary data for the study.

The Public Health Inspector (PHI) of Hatton Municipal Council, 02 officers of the Municipal Council, 05 Grama Nilathary officers, and 02 Supervisors of the Municipal Council were interviewed for the study. Data were collected through questionnaire samples to identify litter-related problems in Hatton Municipal council. These are set up as closed questionnaires and provide all the data needed for the research. The Researcher issued 278 Questions that only received 170 responses, and the balanced was not received expectedly in the random sampling method. The researcher examined 1% of the people among 27800 of the total population who are most affected by garbage dumping in the study area. Thus, 1 is to 100 by total population was the sampling size for the questionnaire survey. 15 out of 15 people living in the area around Kuda Oya Garbage Dump were discussed as men 8 women 7 and 10 out of 10 employees working under the Hatton Municipal Council were discussed as men 5 women 5 and data required for the survey were collected. Direction Observation is also used to directly inspect sites and observe the garbage disposal site and other activities in several stages.

The following Quantitative and Qualitative Analysis methods were used to analyze the primary and secondary data collected for the study. Accordingly, results can be summarized, compared, or generalized, it aims to be objective, and findings can be evaluated using statistical analysis. This type of data is collected through methods of observations, one-to-one interviews, conducting focus groups, and similar methods using software such as MS Excel 2013, ArcGIS 10.3, and Google Earth was used for this study.

Secondary Data Collection

These kinds of Data can be collected from various sources. Mostly they are collected from published sources. Researchers are using some main sources, such as the internet, books, Library, satellite images, published and unpublished articles, previous theses, and reports.

Results and Discussions

Figure 2 specified the Kuda Oya Garbage dump front view and it was formed on an abandoned piece of land near the study area. The landfill was located in the *Kotagala* Area. This means that the ridge is located on the main road from *Hatton* to *Thalawakela*. The landfill is located on the A7 main road, 3km from Hatton Town. It is noteworthy that waste is collected from areas owned by the Hatton Municipal Council and is also dumped in the area by people living near the



Figure 9: Front view of Kuda Oya Garbage Dump
Source: Field visit and Observation, 2020

Kuda Oya Garbage Dump. There are six divisions of the Hatton Municipal Council such as *Ponnakar*, *Dunbar*, *Vilpattu*, *Aariyagama*, *Pandaranayagapura*, and *Hatton Town*. Household and other wastes of the



people living in the area are dumped in this landfill. This landfill is for 100 years and it covers 1 Acre, 2 rods- 20 perches.

The continuous dumping of garbage has caused socio-economic problems for the people of the area in the future. As such, the stench began to increase and mosquito breeding began to increase. There was a constant influx of crows and the number of animals seeking litter increased and some people migrated from the area. The normal life of the people of the area was also affected. The landfill, which has had a such socio-economic impact, was among the most popular protests against waste disposal In February 2016. That is, the court issued an interim injunction banning the dumping of rubbish in the area, which led to an increase in illegal immigration. So far, the Hatton Municipal Council has made various requests to acquire a place of its own, but no solution has yet been found. The following locations in table 1 have been identified by the Hatton Municipal Council as waste collection areas, according to the Hatton Municipal Council report.

Table 3: Places where waste is collected

Places	Amount - kg
Religious place	22
School	07
Government offices	08
Private Offices/Organizations/Institutions	05
Market	04
Supermarket	04
Bus Stand	02
Factories	03
Hospital	06
Houses	4000
Business Centers	
• Reception halls	13
• Guest Houses/ Restaurants	08
• Hotels	22
• Pharmacy	12
• Retail Stores	300
• Shopping centers	100
• Other malls	1100

Source: Annual Report of Hatton Municipal Council, 2020

During the direct inspection with PHI, the inspector found that 4 tons of waste per day were being collected from the five Grama Niladhari Divisions of the Hatton Municipal Council in this landfill. The DKW Polythene Factory and garment factory produce threats to the environment. This is because the researcher found in an interview with PHI that most of the garbage problem in Hatton Municipality is caused by the



use of polythene. In addition, the effluent wastes that are released are easily digested. Polythene waste is considered to be the main problem of the Hatton Municipal Council based on the fact that it takes at least two hundred years for the polythene waste to reach the core. During a face-to-face meeting with PHI, the researcher made it clear that the Hatton Municipal Council was facing massive challenges in collecting waste in the area. Thus, it takes much time to collect waste.

There are two Divisions in the Hatton Municipal Council categorized Waste Management Personnel and Municipal Council Activist Personal. In that manner, the number of employees involved in waste management activities is only 49 (45%), while the number of employees involved in other activities is 60 (55%) which is indicated in figure 3. Therefore, the Hatton Municipal Council undergoes an enormous challenge in managing waste due to the relatively rapid increase in waste in a particular study area based on the fact that it currently has an insufficient number of staff on duty to carry out waste disposal operations over a large area and they can only send to a particular area once in a given week.

Table 4: Human source of Hatton Municipal Council

Classification of the Post	The Number currently found	Number of employees required
Public Health Inspector (PHI)	01	02
Environmental Officer	00	01
Developmental Officer	00	01
Technical Officer	02	01
Management Assistant	01	01

Source: Interview and Field Visit, 2020

Table 2 refers to the human source of Hotton MC. Accordingly, vehicles collected from the five Grama Niladhari of the Hatton Municipal area are considered to be the most important resource for properly mismanaging and managing waste in one place. Also, it is a challenge to pick up the rubbish piled up in a particular division (*landlord's division*) as there are only 12 vehicles in total in Hatton Municipal Council. According to an interview with PHI, 4 tractors, a trump truck, and 7 handcarts were found (figure 4). According to an interview with PHI, a tractor that is currently going to a Grama Niladhari Division of the inspection area and collecting garbage has been forced to go back to the same Grama Niladhari Division twice to collect waste. Going twice and collecting waste is said to have a huge impact on the Hatton Municipal Council's budget as the fuel cost for the vehicle is found to be high. As a result, the Hatton Municipal Council is facing a major challenge in collecting waste over time due to limited vehicular traffic and staff redundancies, leading to a shortage of staff.

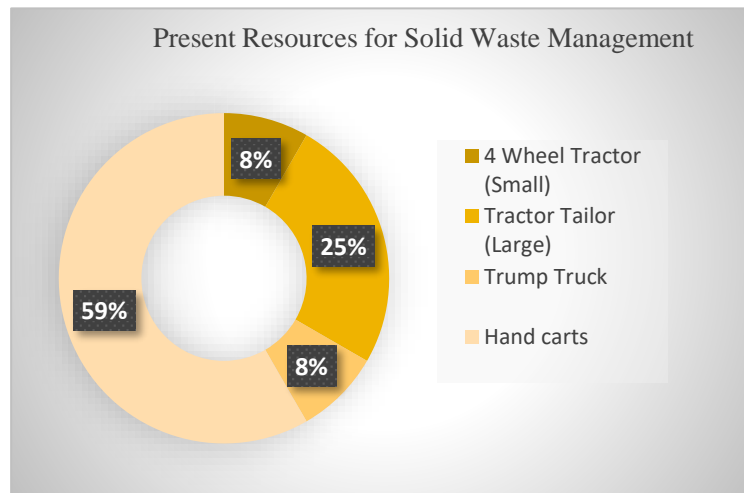


Figure 3: Present Resources for Solid Waste Management

Source: Interview and Field Visit, 2020

4 tons of waste is collected per day from all five Grama Niladhari Divisions and accumulates 120 tons of waste per month. Within the 4 tons of waste degradable waste is found to be 3 tons and non-degradable waste is 1 ton. Therefore, the bulk of the waste collected per month is sent to the outposts twice for waste management activities. As a first management activity, the waste collected within the Municipality is sent to the Solid Waste Central Station at “Maskeliya, Ricotton” and compost is made. An interview found that 240 Kg of compost was made using one ton of waste. The Hatton Municipal Council is spending a lot of money to send 120 tons of waste per month to Maskeliya, Ricotta. The below table indicates the amount of garbage in the MC per day, per week, and per month for various purposes.

Table 5: Amount of Garbage in the Municipal Council

Type of Garbage	Per Day	Per Week	Per Month
Biodegradable (short-term)	2271kg	15.89t	68.13t
Polythene and Plastic	188kg	1316kg	5640kg
Other	58kg	407kg	1740kg
Saw dust/paddy husk & Cloth/ Garment wastes	144kg	1008kg	4320kg
Slaughter House	72kg	510kg	2160kg
Building	165kg	1155kg	4950kg
Paper	169kg	1183kg	5070kg
Glass	106kg	742kg	3180kg
Wooden	368kg	2576kg	11040kg
Metal	127kg	889kg	3810kg



Biodegradable term)	(Long	330kg	2310kg	9900kg
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Source: Annual Report of Hatton Municipal Council, 2020

The Hatton Municipal Council spends 2 lakh rupees a month on composting and 80 thousand rupees on transport. In addition, the Hatton Municipal Council spends 3,366,000 rupees a year to send waste to *Maskeliya Ricotton* for management. Such activities are seen as having a major impact on the budget of the Hatton Municipal Council. In addition, due to the lack of facilities to collect fecal waste, it is sent to the *Thalawakela* waste disposal facility. This is seen as a challenge and a huge expense to Hatton Municipal Council. Thus, the lack of a waste collection site for the Hatton Municipal Council has made this a challenge. Water resources are affected due to the discharge of wastes into water bodies which is said to reduce the quality of the water and mixing the wastes with water also affects aquatic life. Putting the two wastes such as degradable waste, and non-degradable waste together is a big challenge for the employees who come to collect the waste. More than two thousand houses are found in the study area with the largest population. The Municipality faces the biggest challenge in separating the degradable waste, and non-degradable waste that can be collected in each house. The below figure shows the overall waste composition in the Hotton MC. 63% of waste is biodegradable (short term) in the major as well the paper and wooden materials are the least reported or identified waste in the study area with 2%.

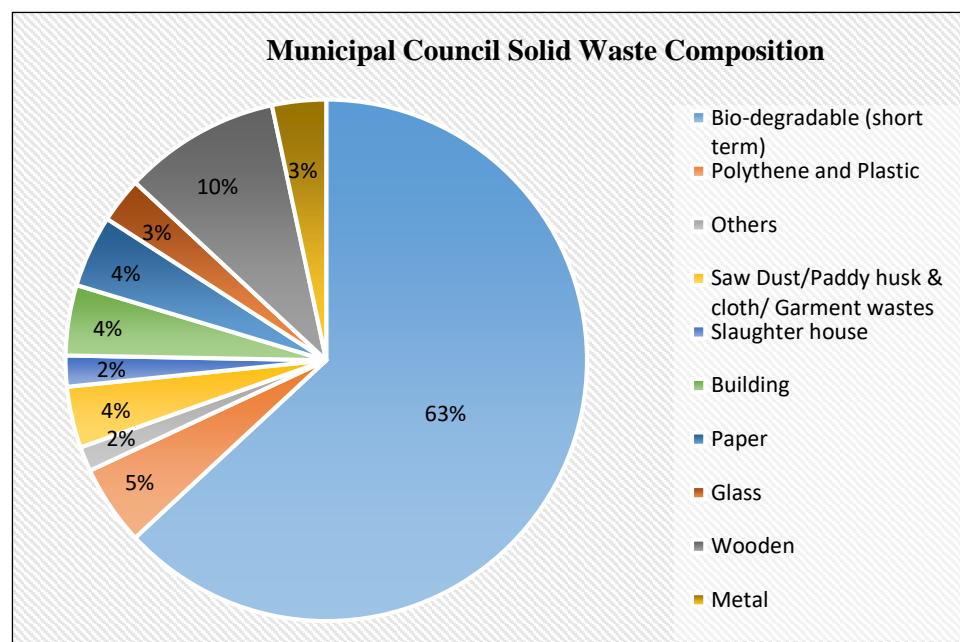


Figure 4: Percentage of Municipal council waste composition
Source: Annual Report of Hotton Municipal Council, 2020

Impact of improper Garbage/waste Management

Disposal of waste in this way causes various problems for humans and other organisms and the environment. The negative effect of improper waste management not only ends in a disgusting view but



also affects the overall economy of a country. Accordingly, the impacts can be classified as both social and environmental impacts.

Social Impacts:

Accumulation of waste in the study area is causing odor in some parts of the study area and affecting the normal life of the people. It is an accepted fact that more and more research is being done on this waste problem as it stands as the most important problem in the world today.

Health Impact:

Thus, man disrupts nature in various ways which is beneficial to humans. Improper disposal of waste in the study area and irresponsible dumping of rubbish along with improper disposal of non-hazardous waste can cause health problems in the study area. This was discovered by the researcher during a further interview with Public Health Inspector Bala Krishnan Sir. Improper disposal of such waste is to cause environmental pollution and health problems. That is, flies breed in areas where waste is dumped, and it is identified that people there are exposed to a variety of diseases because they move to neighboring settlements where they are dumped into food. The researchers found that people in the study area were suffering from diseases such as Dengue and Malaria. It is also known that people living near waste are prone to problems such as eye irritation, headache, nausea, skin problem, fever, and tension. It is very much clear through image 6 that various diseases from waste issues in the study area are calculated by percentage also.

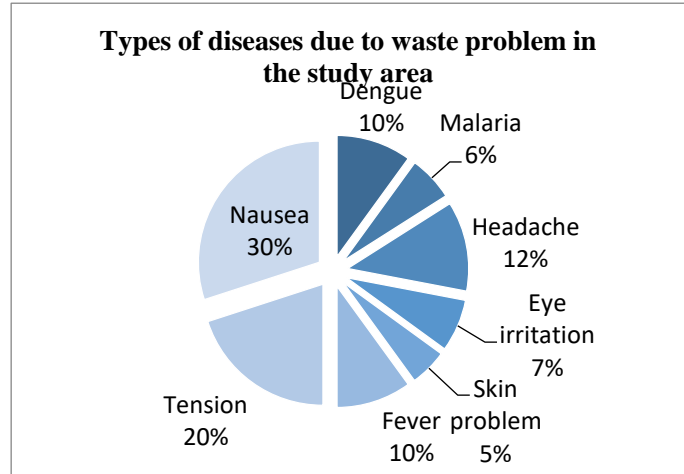


Figure 5: Multi disease due to waste problem in the study area
Source: Field visit and Questionnaire Survey, 2020

People and students undergo various issues due to improper dumping of waste in public places such as bus stands, and main roads. When the waste is burned, the chemical used in it also burns and pollutes the air when mixed with air. Therefore, it was clarified that some of the people of Ponnagar and Bandaranayakapura among the people of Hatton Municipal Council who breathe through such pollution are suffering from respiratory-related diseases. About 35% of people in the above areas go to the hospital every month due to fever. Improper dumping of waste in areas adjacent to water bodies in the study area is said to have greatly affected the water resources. Thus, in the City of Hatton, the areas



Figure 6 & 7: Issues related to animals
Source: Field Survey, 2020



including the *Princess Wedding Hall* and *Ajanta Wedding Hall*, a large amount of waste was dumped in adjacent areas and polluted the water supply.

Abhorrent Impact:

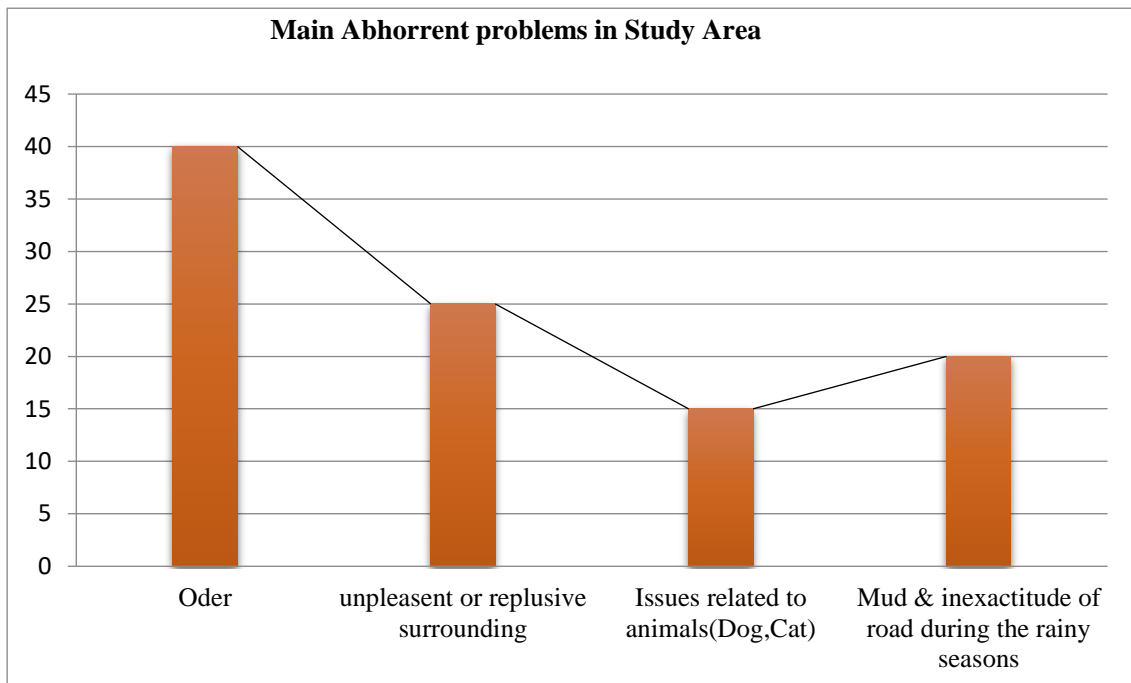


Figure 8: Main Abhorrent problems in Study Area
Source: Field Survey, 2020

The dumping of large amounts of rubbish on the main roadside in the study area is likely to create another social problem during the rainy season. This is because dumping waste on the side of the main road creates a muddy road that absorbs water during the rainy season and poses a challenge to vehicular traffic. As well as, the direct observation of the researcher that improper waste management is also responsible for affecting the walkway of the common people of Hatton Municipality. Images 7, 8, and 9 represent the abhorrent issues in the study area. Particularly, the odor is the most notable problem meanwhile animal related issues also have taken place at a minimum level.



Figure 9: Land degradation
Source: Field Survey, 2020

Environmental Impact:

Improper waste management in the study area is considered to have caused various environmental impacts such as chemical mixing, groundwater mixing, soil degradation, and air pollution.



Figure 10: Land degradation and water Pollution in Study Area
Source: Field Survey, 2020



Soil plays a very important role in determining the development of an area. Soil fertility is best seen when the soil components are high in alkalinity, acidity, moisture, and minerals. Such soil components are degraded due to human activities such as gem mining, chemical use, improper land use, improper waste management, etc. The survey found that the land in the study area was deteriorating due to improper waste management. As such, most of the waste dumped in residential areas under the Hatton Municipal Council poses a major challenge to land users. That is, the disposal of waste in improper ways makes the soil components vulnerable. Even if some of the waste is incinerated and disposed of, it degrades the soil. The researcher clarified this by analyzing the data obtained during his data collection.

Figures 10 and 11 describe land degradation along with water pollution. Thus, as per the observation of the researcher, the air is polluted by the use of chemicals, vehicle fumes, improper industry, deforestation, and waste incineration. The air in the study area is highly polluted by the incineration of waste. That is, people burn incinerators in Hatton Municipal Council because they could not dispose of the waste on time due to a shortage of employees. Furthermore, when chemical waste is incinerated, the chemical in it mixes with the air, making the path more vulnerable. People in the study area are said to be suffering from a respiratory ailment due to inhaling air.

Water is polluted by chemical compounding, improper irrigation, dumping of waste, and excessive water use. The direct observation is that the water in the study area is polluted due to the dumping of waste. That is due to improper waste management, the researcher has found that the water resources of the study area are polluted due to people dumping their household waste in waterlogged areas. It has also been identified that water pollution is more prevalent in the waters near *The Ajanta Wedding Hall* and *The Princess Wedding Hall* in Hatton Municipality.

Hospital waste is the most dangerous waste, as clarified in an interview with a Public Health Inspector, such hazardous hospital waste is mostly discharged at private hospitals particularly *Hatton CRN Clinic* and the *Nadaraj Clinic*. The people in the vicinity of the hospital are facing a great challenge due to the hazardous waste discharged from the hospitals. Bloody cotton swabs including hospital waste include ferns, pampers, and other bleeding waste. The Public Health Inspector mentioned that the waste discharged from medical roads is very dangerous. Accumulation of waste by landfill in the study area accelerates the chemical mixing peak. Thus, chemical mixing is known to cause harm to plants, animals, and other organisms. Researchers have found that people who use chemically treated soil for other purposes are also affected. Thus, the presence of earthworms and other organisms in the soil during chemical mixing may indicate the fertility and quality of the soil.

Conclusion

The waste problem is looming large around the world today. Disposal of waste in this way affects the ecological balance and creates many new diseases and threatens human life. The disposal of waste is not only harmful to humans but also plants and animals and poses a huge challenge to the environment. The socio-economic challenges posed by the *Meethottumulla*, *Aruvakalu*, and *Kolonnawa* landfills are significant in the history of Sri Lanka. It is noteworthy that the Hatton Municipal Council, the study area,



also faced various social and environmental challenges in improper waste management. Based on this, the study has been conducted to reduce the social and environmental impact of improper waste management and to create a waste-free environment for the people. Hatton Municipal Council does not have enough funds or income for putting forward some processes. As well as, there are no proper management practices for garbage dumping and no proper garbage vehicles, and no labor facilities. Albeit, the following recommendations are also very much helpful to mitigate the impacts that rose in the study area. When implementing these suggestions, would be muchly appreciable by the next generations.

Recommendation

To successfully address open landfills in Sri Lanka, this issue needs to be addressed on two timescales. After the collapse of the *Meethotamulla* landfill, the 800 tons of garbage brought to it each day is being redistributed to his two other landfill sites in Colombo city. Solutions must be not only environmentally sound but also socially desirable and financially viable to overcome the resistance faced by past proposed alternatives. Hmm. Resolved a local issue by suggesting an appropriate solution to the issue on behalf of the open issues analyst. The suggestions put forward by the researcher to create such a waste-free environment in Hatton municipal Council area are as follows.

- Attempts to procure Hatton Municipal Council vehicles because insufficient vehicles are the cause of improper waste management.
- The environmental impact of the collected waste can be controlled to some extent by using it for energy generation, recycling, reuse, etc.
- The Hatton Municipal Council holds regular meetings with the public to provide proper guidelines to mitigate waste dumping.
- Maintenance and updating of information and data on waste management and recording of this in digital format.
- Proper management of facilities and financial resources allocated for Solid Waste Management in the city by proper allocation of responsibility to labor working on Waste Management and monitoring their activities.
- Exploring low-cost technologies utilizing local resources which can be used for waste management in Hatton.
- Control and management of leachate from current landfills to meet common standards for discharge into inland surface water.
- Adequate land cover for waste dumped in landfills.
- Promoting waste management projects based on public-private partnerships.
- Raise sufficient public awareness on hygiene, 3Rs, environmental management, and the environmental and health impacts of landfilling sanitary and hazardous wastes together with municipal solid wastes without pretreatment.
- Develop a suitable training plan based on a training needs assessment and a suitable Trainer Training (TOT) program for trainers. Example: workers



- Proper collection of recyclable or reusable waste allows local councils to raise funds by donating to private companies.
- Environmental laws are well-established for the general public.

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