

Solid Waste Dumping Problems in Hinthada Town

Kyaw Min Htike¹, Myat Yazar Soe,² Ei Ei Phyoe³

Abstract

Hinthada Town is located an accessible area, existing economic activities and transport networks and attracting people from other areas. Economic growth and urbanization have greatly magnified the problem with Hinthada Town's Solid waste dumping system. The process of current solid waste dumping system is causing environmental challenges. This paper describes population growth and solid waste effects on the environment. Besides, it presents an analysis of solid waste management practices and future environmental challenges. In this research, primary and secondary data were demonstrated with descriptive method and also demonstrated using GIS in selecting suitable dump area for solid waste dumps. The paper also presents of the current municipal solid waste problems and discusses the solid waste dumping system of the government. The paper provides suggestions on potential places of the solid waste dumps SWOT analysis is used to know the advantages and disadvantages of solid waste dumps from the geographical point of views.

Keywords: urbanization, Solid waste, dumping system, environmental challenges, population growth

Introduction

Municipal solid waste management (MSWM) has emerged as a big challenge not only because of the health and environmental concerns but also due to huge quantities of waste generated. Many livelihoods in Myanmar, especially in rural areas, depend on natural resources and the environment (Shyamala Mani, 2015). However, the environment and the natural resource base are under stress from increased population, commercial exploitation, climate change, and natural disasters (ADB, 2017).

Hinthada Town is a district town in Ayeyarwady Region and its area is 17.52 square kilometers. There are (21) wards, (17634) houses and (81700) people in the town. It is located on the western bank of the Ayeyarwady River and it is also a densely populated town in Ayeyarwady Region. There are (13) small markets, an old solid waste dump and a new solid waste dump (4.98 acres). Selling agricultural products is the main business. There are a few social, health and political problems in the town. Myanmar is suffering from natural disasters that are getting worse in small scale industries, rice mills and oil mills. As a densely populated town, it is also an important task to properly dispose accompanying garbage. Nowadays, Myanmar is a undergoing the democratic transition and it needs to be strengthened in its economy. Each year it needs to promote environmental protection and improve living standards of the citizens; it is also an important part of the State to have healthy new generations. Although it has its natural beauty, Myanmar looks ugly due to the poor disposal system in many places of the country.

Every one knows about the city's decay and the health problems because of disorganized disposal. Then, health effect of this garbage, inhalation due to bad smells, flooding as drainage channels are blocked by the rubbishes are being produced in this town. When the water level rises yearly, environmental pollution is being created by nearly 130 garbage dumps in the town and some are located beside the bank of the Ayeyarwady River.

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Rapid urban population growth and economic development have not only changed the physical condition of the town but also effected significant additional pressure on the health of the people. The improper use of solid waste (especially plastic) pesticides and the incorrect disposal of kitchen wastes resulted in air pollution, pollution of groundwater, surface water, soil, and health problems in local communities.

Research Questions

- What are the present conditions of solid waste dumping system?
- What are the current practices of solid waste problem in Hinthada town?
- How can appropriate sites dumps selected in Hinthada town?

Aim and objectives

To analyse the present solid waste dumping practices and future challenges in Hinthada town

To understand the current solid waste dumping conditions of Hinthada town and

To develop the suitable solid waste dumping areas in Hinthada town

Data and methodology

To present this paper, the primary data such as daily solid waste tons were collected and interviews were done with local authorities, urban dwellers and authorities concerned. To know the problems in small dump sites, semi structure interview, informal talks and group discussion were held. To present this paper, descriptive method was used. GIS techniques were used for showing spatial distribution of population density and potential dumping sites that will be needed. Questionnaires were used to get the suggestions for better future solid waste management system by random sampling method according to the number of households along the way to garbage trucks and near the garbage sites, tanks and illegal dumps. Furthermore, the constraints faced by urban dwellers concerned with solid wastes are that the town does not have enough trucks to carrying dumps. The present paper is an endeavor to provide a comprehensive review of the solid waste dumping problem and highlight some major points of the government's policies and how to overcome the challenges of municipal solid waste management in Hinthada town.

Geographical Background

Hinthada Town is located in the Ayeyarwady delta, on the western bank of the Ayeyarwady River. It is situated on the deltaic plain of the Ayeyarwady Region and southern part of the Hinthada District. Hinthada Town extends from North Latitudes 17° 37' 50" to 17° 41' 10" and East Longitudes 95° 24' 50" to 95° 29' 30". This town is made up of 21 Wards namely Pyinmachaung, Nyaungpin, Tarnghse (North), Tarnghse (South), Letthama, Yonegyi, U Yin (North), U Yin (South), Shweku, Sagar, Kin, Pakhan, Tarkalay, Pabetan, Bayagyi, Kanaungsu, Padamyar, Thonepinkwin, Letigwin, Myawady and Ayemyathayar (Figs. 1 & 2). It has an area of about 7.18 square miles (17.52 square kilometers). The shape of the town is fairly elongated.



Figure(1) Location of Hinthada Township in Ayeyarwady Region
 Source: Based on Myanmar Survey Department, Yangon



Figure (2) Location of Hinthada Town in Hinthada Township
 Source: Based on Myanmar Survey Department, Yangon

Population Growth

According to the population records there werw about 75,289 persons in 2007 and 78,828 persons in 2013. The total population was increased to 3,539 persons within six years. So the average yearly population growth is 0.94%. So there are more high-storied buildings in Hinthada Town. In 2019, the population of Hinthada Town was increased to 81,700 persons. The population was increased to 2,872 persons during the period from 2013 to 2019. The growth rate (0.73%) was largely related to the higher degree of accessibility to place within the study area, prosperity of trade and business, establishment of new building for worker and their families.

According to table (1) the highest population density is usually found in U Yin (S) ward with a density of 18874 persons per square kilometer. The second highest population density are Mya Wa Di, Hpa Yar Gyi, Shweku, Zakar and Tar Ka Lay wards. The smallest population density wards are Pyin Ma Chaung with a population density is 1522 persons per square kilometer.

Table (1) Density of population in Hinthada town

No.	Ward	Area (sqkm)	2007		2013		2019	
			Population	Density (sq.km)	Population	Density (sq.km)	Population	Density (sq.km)
1	Pyin Ma Chaung	1.8	2,493	1,385	2,578	1,432	2,739	1,522
2	MyaWady	0.8	5,562	6,953	6,094	7,618	6,769	8,462
3	Pa Be Dam	1.5	4,736	3,157	4,805	3,203	4,957	3,305
4	Pa Da Myar	0.28	1,065	3,804	1,059	3,782	1,077	3,846
5	Sa Gar	0.25	2,543	10,172	2,552	10,208	2,606	10,422
6	Tar Ka lay	1.6	11,696	7,310	12,780	7,988	13,555	8,472
7	Ka Naung Su	1.7	7,490	4,406	7,667	4,510	8,100	4,765
8	Le Ti Gwin	2.42	3,867	1,598	4,196	1,734	4,475	1,849
9	Yone Gyi	0.28	1,520	5,429	1,675	5,982	1,764	6,301
10	Nyaung Pin	1.02	6,605	6,475	6,709	6,577	6,858	6,724
11	Shwe Ku	0.29	3,628	12,510	3,696	12,745	2,853	9,839
12	Kin	0.34	1,831	5,385	1,896	5,576	1,963	5,774
13	Pa Khan	1.4	2,413	1,724	2,484	1,774	1,893	1,352
14	Aye Mya Tha Yar	0.81	2,353	2,905	2,497	3,083	2,930	3,617
15	Tar Ngah Se (N)	0.25	1,946	7,784	2,073	8,292	1,765	7,061
16	Tar Ngah Se (S)	0.46	1,610	3,500	1,684	3,661	2,182	4,744
17	Thone Pin Kwin	1.4	6,156	4,397	6,199	4,428	6,470	4,621
18	U Yin (N)	0.31	1,815	5,855	1,982	6,394	2,070	6,678
19	U Yin (S)	0.14	2,328	16,629	2,460	17,571	2,642	18,874
20	Let Tha Ma	0.15	1,177	7,847	1,205	8,033	1,347	8,981
21	Hpa yar Gyi	0.32	2,455	7,672	2,537	7,928	2,683	8,385
	Total	17.52	75289	4,297	78828	4,499	81700	4,663

Source: General Administrative Department, Hinthada Township

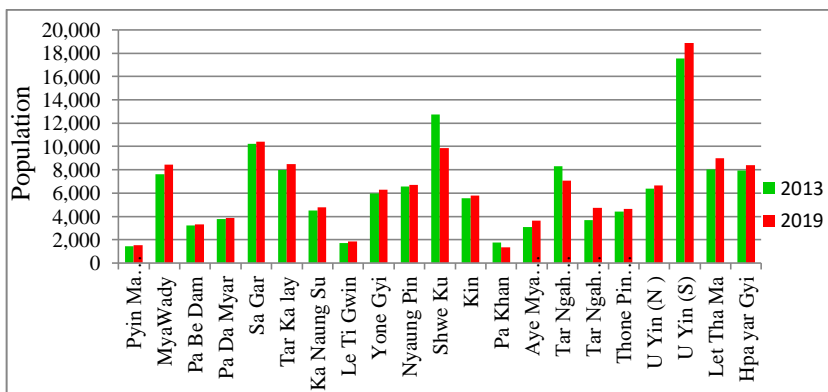


Figure (3.a) Population Distribution of Hinthada Town. Source: Table (1)

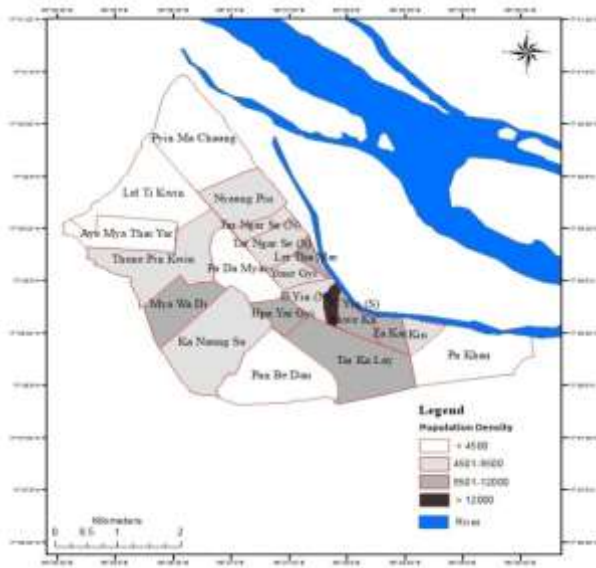


Figure (3.b) Population Density of Hinthada Town. Source: Table (1)

Landuse in Hinthada Town

There are five types of landuse in Hinthada town. Among them, the residential landuse occupied 56 percent of Hinthada Town area and the Municipal landuse is only 6 percent of the town area. According to the town population growth, the amount of solid waste is also increasing. Therefore, if the current rate of solid waste tons increase, HTDC must extend municipal land use for solid waste dumping areas in agricultural land.

Table (2) Types of Landuse in Hinthada Town (2009-2019)

Types of Landuse	Acres	Hectare	Percents
Residential Landuse	2460	996	56%
Agricultural Landuse	1445	585	33%
Commercial Landuse	5	2	0%
Municipal Landuse	274	111	6%
Institutionals and Religious Landuse	220	89	5%

Source: Hinthada Township Development Committee

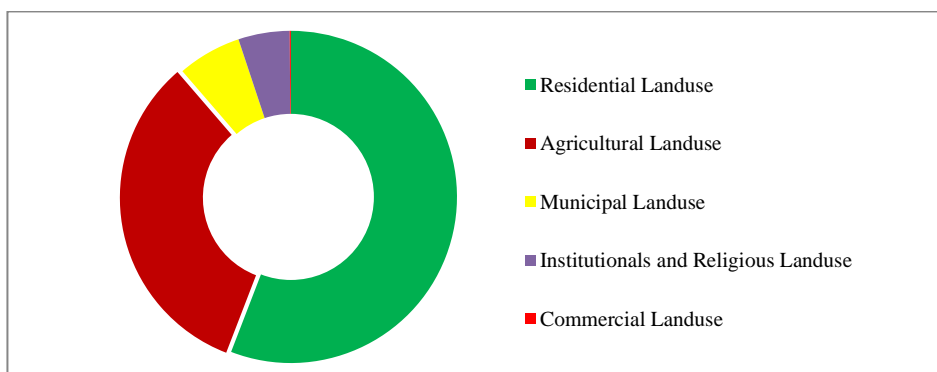


Figure (4) Landuse of Hinthada Town. Source Table (1.2)

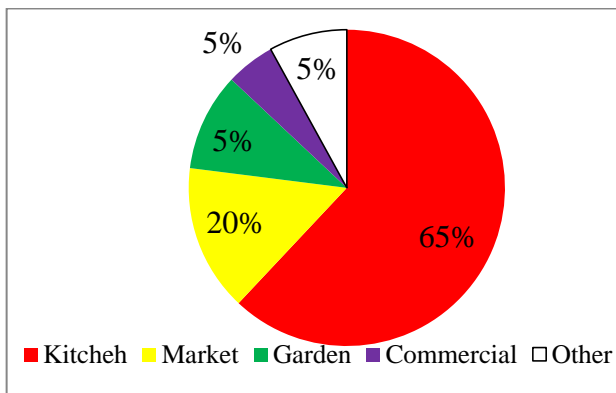
Present Solid Waste Management Practices in Hinthada Town

In Hinthada municipal area the daily generation rate of solid waste was approximately 8 tons in 2009. In 2019, the average waste generation of the public sector was about the daily rate of solid waste 28 tons per capita per day. Industrial sectors, agricultural sectors and commercial sectors are not severe. As urbanization and population growth of the study area have become wider and Pollution Control and Cleansing Department have (PCCD) to collect the solid waste in larger extent across the area of the town. Although population increases the generation rate is regular. The municipal solid waste in study area can be grouped broadly in to five categories : Residential, Commercial and Markets, Garden and Other waste. Hinthada Township Development Committee is using three garbage trucks to put away the kitchen waste from 21 wards, one garbage truck for the market, one garbage truck for three garbage dumps and one motor tricycle for the sidewalk stores such as betel shops.

Table (3) Contribution of solid waste tons (2019)

Solid waste groups	Percentage Contribution
Kitchen	65
Market	20
Commercial	5
Garden	5
Other	5
Total	100 %

Source : Hinthada Township Development Committee



Figure(5) Contribution of solid waste tons in Hinthada town. Source : base on Table (3)

The effect of urbanization process in the study area has obviously increased in the population. Therefore, various forms of waste amount arise from many places. HTDC is one of the responsible committee for solid waste management in Hinthada Town. It serves the collection of waste, storage, transportation from ward to dumping site and destroys disposal of waste by dumping and sometimes burning. The daily amount of solid waste tons is 50 percent that is not collected by PCCD but it is disposed by people usually burning and filling in low-lying areas. At present, collected solid wastes are transported to dumping sites which are not far from the collection points. In my study areas, residential wastes are collected every three days with three garbage trucks. Commercial wastes are collected on weekdays with bell ring collection and market wastes are collected every day.

According to HTDC in Hinthada town, collection practices can be categorized into three types:

- (1) Bell ring system
- (2) Collection at a street dump
- (3) Limited collection of market waste and other wastes

PCCD separately collects the waste from the hospital. Hospital wastes are deeply buried. The daily disposed solid municipal waste in Hinthada town is 28 tons. Generally, the main issues of waste collection in the study area are as follows:

- (1) Inadequate waste collection site
- (2) Insufficient of facilities
- (3) Lack of public Participation
- (4) Lack of law law enforcement
- (5) No interest in 3R stages

At present recycling of municipal waste has been not fully and systematically developed in Hinthada town yet. Composting way has been introduced in Myanmar in 1999 and operated under the control of Ministry of Agriculture, Livestock and Irrigation. HTDC is interested in and is implementing this practice to produce organic fertilizer and to reduce the current waste disposal and burden of waste.

Solid Waste Dumping Problem

There are 130 illegal garbage dumps in Hinthada town. Most of the dumps are located in and out of the embankment, besides the railway and other places in wards (Plates 1, 2, 3, 4, 5 and 6). Currently, there are 28 tons of solid waste disposal compared with more than 20 tons in 2009 figure 6(a) and figure 6(b). Therefore, in 2029 the estimate amount of solid waste disposal tons is 46 tons. Then, the landuse of Municipal Land is extended to agricultural area. Besides, half of the wards are experiencing air pollution of the illegal solid waste dumps near the railway and embankment wards. This means that, government should consider suitable waste tanks near the railway.

Table (4) Future Solid waste disposal of Hinthada Town

Year	Solid Waste Disposal
2007	4 tons
2013	10 tons
2019	28 tons
2025	46 tons (estimate)

Source : Hinthada Township Development Committee (2019)

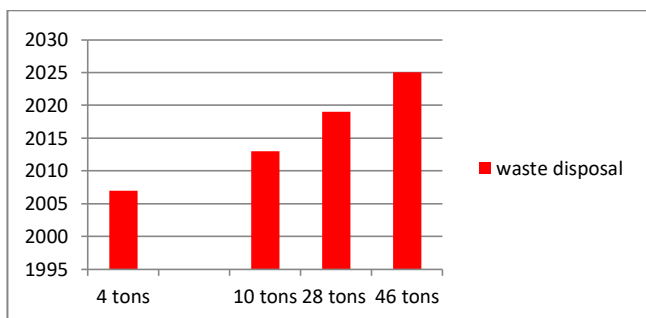


Figure (6.a) Future Solid waste disposal (tons). Source: Base on Table (1.4)

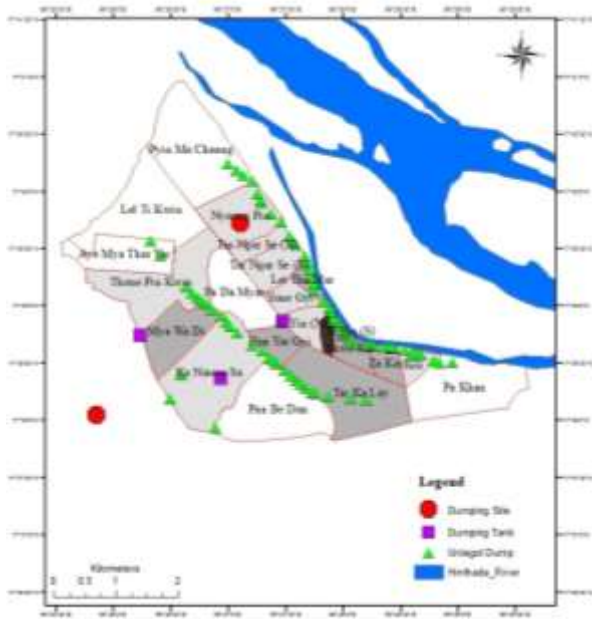


Figure (6.b) Present Solid Waste Dumps in Hinthada Town. Source: Field Survey, April 2020



Plate (1) Solid waste dump in drain



Plate (2) Solid waste dump in railway



Plate (3) Solid waste dump out of embankment



Plate (4) Solid waste dump beside the stream



Plate (5) Solid waste dump in Tar kalay ward



Plate (6) Solid waste dump near the Pagoda

Source: Base on Field Observation (3.6.2020)

Effect of Environment

Environmental issues are one of the primary causes of disease, health issues and long term livelihood impact. There are many environmental problems and it is challenging on our natural environment, such as causing water pollution, air pollution, soil or land pollution. Major environmental issues are agricultural degradation of land and environmental degradation of public health. According to figure (6.b), the illegal dumping sites are usually found along the embankment and near the railway-lines. Especially, the most land pollution

wards are Tar Ka Lay, Ka Naung Su, Tar Nga Se (N & S), Lat Tha Mar and Nyaung Pin wards.

The waste water generated in the wards normally percolates in the soil or evaporates. The uncollected wastes accumulate in the drainage areas that cause unhygienic conditions and release pollutants that leaches to surface and groundwater. Water pollution affects urban agriculture in Hinthada Town. The pollution of water in the study area is related to the dumps. Most households dispose the solid wastes within their house compound or into the nearby river. In the rainy season, these wastes depose and float here and there in the floodwater causing the water to be highly polluted. Energy is used to burn the dumps, but this method is costly. It may lead to air pollution. Garbage remains open for a long period of time. This can attract flies and insects that cause various diseases (Plate 7, 8, 9 and 10).



Plate(7) Air Pollution of Myawaddy Ward



Plate (8) Water Pollution of Myawaddy Ward



Plate (9) Le Land Pollution



Plate (10) Pollution of Nyaung Pin Ward

Source: Based on Field Observation (2.6.2020)

SWOT Analysis of Present Solid Waste Dumps

S- Strength	Small Area and Good Street
W-Weakness	Not Effective (not enough car, not disciplined, technology
O- Opportunity	Cottage Industry, Fertilizer and Job Opportunities
T-Threat	Air, soil or land and water Pollution

Source: Own Draft, 2020

Results Findings and Suggestions

Although the wastes from the houses on the way of garbage truck are kept, they did not hearing the bell of the truck, and some people miss the garbage truck because there was nobody at home when the truck came. There are also heartbreak, “if the wastes are kept, I can also contribute 30000 kyats or 50000 kyats a month. And then there are many places that the truck can be unreachable, there is not enough time to keep the wastes, they can not carry the wastes as the truck is full and so there are many disorganized disposals as there is not enough garbage dump near there. In 2019, there were only 3 garbage dumps although there were 8 garbage dumps in 2015 in Hinthda town. Garbage dumps were destroyed for the complains of bad smells and bad scenes due to the unauthorized commerical waste, home-grown waste, clinic and hospital waste and construction waste disposals.

According to the analyses of the garbage dump in Hinthada town, about 50 percent is along the embankment, 20 percent is on both sides of the railway and 30 percent is in other places. About 130 of the garbage dumps in town are located at drains, around the monastries and pagodas in yard, near the lakes and public places were recorded. Most of the illegal big garbage dumps such as along the embankment and railway dumps are difficult to clear by the people. It can be solved by the cooperation with the departments.

And then it needs a systematic system of solid waste dumping to solve the disorganized disposal using systematic method. Although there are (7) kinds of wastes in Myanmar according to Municipal Law, in general there are (3) kinds of solid waste; kitchen waste, commercial waste and the waste not from kitchen. At present, the kitchen wastes and commerical wastes in all wards are being carried together by (3) trucks. But there only a few trucks to carry wastes. The kitchen wastes cannot be kept because the commercial wastes are added to them. Thus, the wastes are easily thrown around them. Besides some businessmen are absent to pay tax for the commercial wastes. Therefore, there are many losses as the income tax is not received.

Suggestion

Most of the people are adviced that the trucks should carry the wastes more frequently than now, and garbage trucksshould go round more roads and streets than they do now. Urban dwellers suggested that more garbage dumps should be put near the place and garbages should be collected regularly. The people who are undisplinede should be fined and punished. It is suggested that the system of collecting dumps should be more perfect. The number of garbage dumps in town is about 130. Theses garbage dumps are just the list of big garbage dumps and it

doesn't include normal garbage dumps in wards, streets and drains. The small garbages in each ward should be cleaned by each organization concerned.

In my study, many disorganized garbages are due to the lack of discipline of urban dwellers.. It can not be enough to carry the kitchen wastes and resturent wastes from (21) wards only by using (3) trucks that can carry (5) tons. Thus, the number of garbage trucks should be increase and the suitable perfect disposal system is suggested; (1) commerical waste should be performed by drawing the garbage truck's way expressively and by using the require amount of trucks, (2) to bank up the kitchen wastes with the package in front of the houses without being over (3 viss) before a day from (4:00 p.m to 4:00 a.m) and to bank up the wastes from the street that trucks cannot enter at the temporary places near the truck way. It should be convened by the ward administrators and members (3) the trucks and the sweepers must collect from 5:00 a.m to 12 p.m, (4) to pay the suitable commerical wastes tax for the houses that produce over kitchen wastes. These should be performed by the garbage truck's workers and Sanctuary Beauty Team (5) to get the fine and to do the cleaning tasks seen in the ward by Sanctuary Beauty Teams and ward administrators and to fine money openly and the money should be used at the sector of cleaning and developing (6) if there is a disorganized disposal in the ward without knowing, Sanctuary Beauty Team from that ward must take the garbage truck using their own budget and remove it, (7) to keep the wastes that the people bank up completely, HTDC should provide it. It is suggested that the ward administrators and members, Sanctuary Beauty Teams and the people in the wards should manage and perform together these difficulties being led by HTDC.

Conclusion

The economic growth and urbanization have pushed the issue of solid waste dumping problems and environmental challenges. The present solid waste dumping system in this town are uses dump method and creates a number of environmental problems like air, water and soil or land pollution. An effective waste management plan is necessary for it will enable the government to design a good system. Comprehensive and regular waste collection services have to be offered regardless of where people they live. The 3Rs method such as reduce, reuse and recycle method can also be used to solve the growing solid waste problems.

To become a good waste dumping system of the Hinthada Town, the responsibility of individual dwellers in the town and cooperation of the relevant administrators are required. A lot of improvements can be made if authorities and the populace sites together to find ways and means of the solving urban problems. People should be encouraged to establish local community organizations to enhance urban waste management. If systems for solid waste removal are to be efficient, citizens need to know their daily responsibilities, routines, the collection timetables and the standard procedures. Therefore, an elaborate system of public education should be called for, with a focus on critical issues, such as method for waste collection, storage and delivery to the refuse dumps and inherent dangers of giving inadequate collection of all the waste.

Waste can be classified into three types which are all commonly found around the house and streets our wards. These include liquid waste, solid rubbish, organic waste, recyclable rubbish and hazardous waste. To clean and develop our town is duty of every urban dweller in Hinthada Town and it needs to cooperate with each one. By collaborating with the administrators of the wards, the relevant department and Sanctuary Beauty Team, we can create own town to be a pleasant, disciplined and wonderful town to live in.

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ဖွံ့ဖြိုးတိုးတက်ရေးကွန်ယက်-၂၀၂၀- ဟင်္သာတမြို့

ဟင်္သာတမြို့နယ်စည်ပင်သာယာရေးမှတ်တမ်း-၂၀၁၉- ဟင်္သာတမြို့။

ဟင်္သာတမြို့နယ် ပြန်တမ်း -၂၀၁၉ မတ်လ(၁၀) ရက်

လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန-၂၀၁၉- ဧပြီလ(၁၅) ရက်