

SWACHH BHARAT MISSION (GRAMIN) AND PRACTICES OF SOLID WASTE MANAGEMENT IN RURAL SIKKIM

Khangembam Indira*

Abstract

Generation of waste and disposal in rural areas has not been the prime focus for deliberation, unlike the urban areas where it is regarded as a crucial issue that demands immediate attention and solution. Until recently, managing solid waste was not considered an issue in rural areas of Sikkim. However, with the proliferation of solid waste in recent years due to increasing population, the growth of tourism industry and changing consumption patterns have prompted the government of Sikkim to decentralise the responsibility of managing solid waste in compliance with the guidelines of Swachh Bharat Mission (Gramin). Based on primary data collected from the two Gram Panchayats, namely Mellidara Paiyong and Lungchok Kamarey in South Sikkim district, the paper attempts to comprehend the various types of waste generated, and critically evaluate the common conventional methods and practices adopted by the villagers for disposal of their household waste. Simultaneously, it also attempts to assess various policies and strategies taken up by the local self-government in managing the solid waste generated from households.

Keywords: Guidelines, Practices, Panchayats, Solid Waste Management, Rural Sikkim.

*Assistant Professor, Department of Sociology, Sikkim University, 5th Mile, P.O. Tadong - 737102, Gangtok, Sikkim; Email: kindiraraj@gmail.com, Mob: 8116000733

Introduction

Throughout human history, waste has persistently been regarded as the undesirable by-product of mundane human activities having no intrinsic value. The arrival of industrial age has furthered in ushering an era of heightened production and consumption propagating massive generation of waste. This shift in consumption patterns is also evident among rural households, resulting in increased waste generation outside urban centres. Yet, waste management discourse and research in India have primarily revolved around urban areas (Jena, 2008; Schindler et al., 2012). The obscurity in rural waste generation could be attributed to the 'idealised or idyllic' (Boyle & Halfacree, 1998) perception of these regions as exemplifying organic and nature-centric lifestyles, despite the undeniable environmental impact of resource extraction and pollution (Beckert & Zafirovski, 2006).

Up until the 1990s, people in most places in India were leading a rural life (style) with little to throw away (Doron & Jeffrey, 2018). However, a discernible characteristic shift in the production of goods and services had occurred post-liberalisation of the Indian economy. Consequently, excess production and availability of manufactured goods at affordable prices along with increased purchasing power of people has led to a boundless rise in waste generation. Reddy in his refined message in the guidelines developed by Ramesh and SivaRam on Solid Waste Management (SWM) in Rural areas has stated, "When economies go after indiscriminate market-based growth and the people go after a consumerist culture, the apparent side effect is unimaginable waste generation" (2016, p. 2). Johnson (2005) further emphasised that life in Indian villages has undergone various changes, and consumerism has reached its highest point. Mathur (2014) states that the rise of consumerism in rural areas in the past two or three decades could be because of the perceptions of rural people that keeping away from consumerist lifestyles results in their marginalisation from the mainstream culture. Further, due to inadequate waste collection and

management services, substantial household waste is accumulating in rural areas. This pressing issue stems largely from the absence of proper waste collection services, a problem highlighted by Giddens as the "lack of refuse collection services" (2009, p. 168).

Contextually, Sikkim, a scenically beautiful mountainous region popular among both domestic and foreign tourists, has attracted around 16 lakhs tourists in 2022 (CEIC, n.d.), which is more than double of its population of 6,10,577 (Census, 2011). Evidently, it is deducible that the tourism sector indeed contributes to the state's economy helping in the generation of employment among the locals. However, as pointed out by Singh (2001), the sector also generates huge amounts of garbage and other wastes during tourist season at various destinations. In fact, the Lachung Dzumsa village authority has imposed a fine of Rs. 1,000 on tourists who leave behind plastic food packets and water bottles (Telegraph, 2011). Nonetheless, to tackle these various challenges, the state government started adopting a few pro-environment initiatives regarding SWM. One such policy has been banning non-biodegradable materials like plastics, polythene bags, and biomedical/chemical waste since 1997 (DESME, 2016). As an effort of the government vis-à-vis the effective implementation of the Total Sanitation Campaign launched by the Government of India in 1999, Sikkim achieved 100 per cent sanitation by 2008 and became the first state to be awarded with Rashtriya Nirmal Gram Puruskar. It also bagged the status of the first Open Defecation Free (ODF) state. With the renaming of the Nirmal Bharat Abhiyan (NBA) as Swachh Bharat Mission (SBM) in 2016, and further dividing it into urban and rural components under different Ministries, the state government initiated numerous programmes for waste management in both the urban and rural areas of Sikkim. As a result of the effort, Sikkim was announced as the cleanest state of India in 2016 under Swachh Survekshan Gramin by the Ministry of Drinking Water and Sanitation and successively declared as the 'Cleanest State' of the North-East India region in Swachh Survekshan,

2017. At present, the state is striving to make general refinement about cleanliness and sanitation with special emphasis on the 3 'R's (Reduce, Reuse, Recycle), zero waste practices and a ban on single-use disposable plastic items (Annual Report, 2018-19).

Against this backdrop, the study aims to investigate and comprehend the various dynamics which are involved in the praxis of SWM in rural areas of Sikkim, seeking to unravel a few research inquiries, which include the waste management mechanisms at individual household and community levels. Additionally, it aims to explore how local governing authorities employ various strategies for effective waste management. Moreover, the study also endeavours to critically examine the policy on SWM (Gramin) or SWM (G) and its effective implementation at the ground level.

In essence, this study attempts to explore the relationship between waste, disposal methods, and environmental sustainability under the principle of sustainable development, which addresses the present needs without compromising the needs of future generations. The question of sustainable development is complex in a country like India with its size and diversity. To address the issue, as argued by Sharma (2015), emphasis on decentralised decision-making and micro-planning suitable for local needs is pertinent.

Materials and Methods

Sikkim is divided into six districts, namely Gangtok, Gyalshing, Mangan, Namchi, Pakyong and Soreng. At the time of the fieldwork, which was between December 2019 and January 2020, the state had only four districts, namely North, East, South and West districts. The fieldwork was conducted in Sumbuk block under Namchi Sub-Division of South Sikkim district, which is the second most populated district in the state. The district has a total population of 1,46,850 and a population density of 196 per square kilometre (Census, 2011). Over 80 per cent of the district's population lives in rural areas. Out of the 48 Gram

Panchayats (GPs) in the district, five are in Sumbuk block. Among the five GPs, Mellidara Paiyong GP and Lungchok Kamarey GP were selected for the study as the former has a model Resource Recovery Centre (RRC) to reduce the locally collected wastes going to landfill whereas the latter is dependent on the former for the disposal of waste. Mellidara Paiyong is a model GP as it houses a market and a bank, has more schools and enjoys better road connectivity than Lungchok Kamarey GP.

Mallidara Paiyong GP is home to 1,670 residents residing in 338 households, while Lungchok Kamarey GP accommodates 1,731 individuals across 366 households (Census 2011). In this study, the household is the primary unit of analysis. Information was collected through individual-level responses within these household units. The study is based on a final sample of 120 households, 60 each from both GPs. Given the population size ($N=704$) of the GPs, the ideal sample size would have been 249. However, the wide geographical distribution of households in these GPs posed challenges in covering the entire intended households effectively. The convenience sampling technique was adopted to identify the 120 households.

Data collection involved gathering information on a range of socio-economic variables such as gender, age, education, income, and crucial aspects linked to waste and its management, including collection, sorting, and disposal. This comprehensive data was gathered using a semi-structured interview schedule. Furthermore, perspectives were sought from key stakeholders, including select Panchayat members, Rural Management & Development Department (RMDD) officials, and the Resource Recovery Centre (RRC) workers. The study employed both quantitative and qualitative methods of data collection and analysis. Observational techniques were also utilised to immerse in the local context, strengthening and validating the research findings. Narrative accounts shared by the community members underwent analysis to extrapolate broader insights into the methods and practices of SWM in rural settings. By

employing a tabular approach, we analyse the responses on the types of waste generated at the household level. Further, we rely on the same method to understand the strategy employed to dispose of the waste generated within the household. In this study, the terms 'garbage' and 'waste' have been used interchangeably.

Findings and Discussion

In our study of 120 samples, 58 per cent were males and 42 per cent were females. Majority of the household respondents (86.7 per cent) were in the age range of 21-60 years. About 60 per cent of the respondents were reported to be farmers; government employees constituted 22 per cent and the rest worked in the private sector or were engaged in small business. Regarding educational qualification, about two-fifths of the respondents have completed either secondary or higher secondary education and 30 per cent have completed primary schooling. It was also found that the household size in the sample had an average of five members. In terms of income distribution, about 40 per cent of the respondents earn more than Rs. 20,000 per month. In relation to the pattern of expenditure, predictably, a major chunk of their income is spent on food, education, clothing and other basic necessities.

Classification and Segregation of Household Waste

Ramesh and SivaRam (2016) argued, in the Indian context, that the domestic waste generated in rural households is becoming a growing issue of concern. However, domestic wastes can be resourcefully managed if biodegradable and non-biodegradable wastes are segregated properly. For the purpose of the study, waste generated from the households is mainly classified into two types, viz. (i) 'wet waste' - the major constituent being 'food waste', and (ii) 'dry waste', which is further classified into two components: a) biodegradable items like paper, cardboard, etc., b) non-biodegradables, such as plastic bottles, plastic covers, sachets, polythene, and e-wastes, which

are considered more hazardous as it takes longer to decompose and causes pollution to land, air, and water. As per the information provided by Sikkim Government Gazette 2019 (henceforth, SGG), the biodegradable or organic fraction (57 per cent) of the waste dominates the solid waste stream in the state.

The study observed that 94 per cent (see Table 1) of respondents reported generating plastic waste in the form of sachets, wrappers and other plastic wastes, which is followed by food waste with 93 per cent, paper/carton waste (42.5 per cent), bottle/broken glass (41.7 per cent), with scrap metals (16.7 per cent) to be the least. Interestingly, there is no substantial difference in the distribution of respondents by the types of waste generated across the GPs. The findings endorse the observation made in the SGG that a major chunk of the waste generated in the state is accounted for by paper and glass bottles, which constitute 84 per cent of the responses together. However, one has to exercise caution, as the observation is based on the type of waste generated rather than on the volume, which formed the basis of analysis of SGG. The SGG also states that plastic waste consists of a meagre share of total waste generated in the state. Again, the comparison is difficult but it can be seen that the majority of the respondents in our sample seem to generate plastic waste daily.

Food waste is the second most generated waste in the households. In the rural areas of Sikkim, however, this type of waste is used as feed for cows, goats, chickens and pigs. Those households with no livestock give away their kitchen waste to their neighbours who rear livestock. Doron and Jeffrey (2018), citing the work of Sushila Raja in the context of rural Rajasthan, also arrive at a similar finding. The study finds that paper waste generation is relatively lower vis-à-vis plastic and food waste. This is possibly due to the nature of paper discarded in rural areas, which largely consists of children's used copies and books, and is often repurposed as wrappers in local grocery stores. Among other types of waste, 40 per cent of the respondents reported generating waste

in the form of old clothes and accessories. E-waste also forms a part of the waste generated among 38 per cent of the responses. Based on the responses, the e-waste in the fieldwork areas includes electric and electronic items like fused bulbs and tube lights, sockets, chargers, electric kettles, rice cookers, batteries and mobile phones, among others. Around 28 per cent of the respondents mentioned generating sanitary wastes

such as diapers, sanitary pads, toothpaste tubes, shampoo bottles, and cleaning agents. Although, “sanitary waste” is generally classified as “wet waste” due to the presence of bodily fluids, however, for the study it is categorised as “dry waste” including toiletries. Scrap metals (with 16.7 per cent responses) comprising steel, aluminium and tin are the least generated waste in the region.

Table 1

Types of Waste Generated by Households

Gram Panchayats (GPs)	Wet Waste	Dry wastes						
	Biodegradables		Non-biodegradables					
	Food waste	Paper/ Carton	Plastic wrappers/ containers	Old Clothes	Broken Glass/ Bottles	Scrap Metals	Sanitary Waste	E-Wastes
Mellidara Paiyong	55 (92)	26 (43)	56 (93)	25 (41.6)	23 (38)	10 (16.6)	15 (25)	24 (40)
Lungchok Kamarey	57 (95)	25 (41.6)	57 (95)	23 (38)	27 (45)	10 (16.6)	18 (30)	22 (36.6)
Total	112 (93)	51 (42.5)	113 (94)	48 (40)	50 (41.7)	20 (16.7)	33 (27.5)	46 (38)

Note: Figures in parentheses correspond to the percentage of households in the sample who have reported to be generating that particular waste. As there are multiple responses, the total frequency is more than the sample size of 120.

Source: Estimates based on fieldwork data.

The data evidently shows the proliferation of plastic-packaged food/grocery items, electronic devices, and other sanitary pads and toiletries, driven by the increasing reliance on the products of modern consumerist lifestyles. This perhaps suggests that the increasing penetration of modernisation forces driven by market-oriented consumer culture and products is contributing to the solid waste generation at the household level. Hence, managing hazardous and non-biodegradable waste is emerging as a prominent issue in rural areas of Sikkim.

The field data also indicated that the majority of the respondents (about 70 per cent) were found to have been segregating waste into dry and wet, but

rarely separating it further into biodegradable and non-biodegradable, hazardous or non-hazardous. However, dry waste is typically sorted into items that hold resale value and those that do not. Items with resale value comprise liquor glass bottles, damaged aluminium/brass utensils, paper, cardboard, steel, and iron. Within these items, beer bottles are highly sought after by scrap dealers due to their potential for reuse in local liquor factories. In Sikkim, liquor is subject to lower taxes and its consumption is culturally accepted among various communities (Chakrabarti *et al.*, 2014), which leads to a cultural legitimization of alcohol consumption. Consequently, this practice results in significant volumes of waste liquor bottles, particularly during festival periods.

It was also found that the segregation of waste depends on the location of the households. The households located near the main road have to separate the garbage into wet and dry before handing them over to garbage collection truck. This is corroborated by one of the respondents staying in Mellibazar, whose house is situated on the main road. Others who stay in the same locality too expressed similar views. However, further segregation of waste into different types is rarely observed. In another instance, a 53-year-old woman from Mungram village informed that her household members do not segregate the waste. The futility of the practice is evident when she says *"Why segregate those unwanted waste; in the end, it all will mix and go to the same place."* The narration is pointing towards the absence of garbage collection service in her locality. Therefore, it has become a common practice among the villagers to dump and burn everything in the nearby vacant field.

It is important to note that the amount of waste generation depends on family size, income, education and cultural factors. Similarly, religious and ethnic backgrounds affect waste type (e.g., food habits). However, education does not always translate to proper disposal of waste due to limited facilities.

Common Waste Disposal Methods

Mihai (2017) contends that rural areas globally are prone to unregulated waste disposal practices due to lack of proper waste collection systems. Empirically, it was observed that the wastes in rural Sikkim are frequently managed at the household level through burning and dumping practices in the surrounding areas. Various conventional methods and practices adopted by people for waste disposal and management in everyday life are as follows:

a. Backyard Burning: The burning of waste in backyards is a common practice in numerous developing nations (Ferronato & Torretta, 2019). In the field, it was observed that burning is extensively practised as more than 71.8 per cent of the respondents claimed that they burn dry waste such

as leaves, twigs, papers, plastics, clothes, etc. Comparatively, Mellidara Paiyong GP (58 per cent) has reported less incidence of burning than Lungchok Kamaray GP (85 per cent). The relatively low occurrence of burning in Mellidara Paiyong GP is mainly due to the establishment of the RRC. The houses in the proximity of the RRC directly dump their waste at the centre. Moreover, the provision of garbage trucks for the transportation of waste comes more frequently while in the latter it usually comes once a month. Narrating the practices of the burning method, a 70-year-old respondent from Mellidara said, *"Almost everybody burns the waste here. We have been burning dry leaves, twigs, and paper since childhood. In fact, before plantation and after the harvesting season, husk, hay and straw are burned as it provides manure to the soil."* Despite the facilities of garbage transportation, in the locality, the steep topography of the terrain as a constraint makes people adopt the burning method, as narrated by a respondent, *"My family burn almost everything, including plastic containers, tetra packs and even batteries and outdated medicines, as we have to walk up the steep mountain for 20 minutes along with the garbage to reach the main road"*.

An interaction with the President of Lungchok Kamaray GP revealed that efforts were being made at the GP level for effective implementation of the policy as notified in SGG as well as in SBM (G) regarding non-disposal of solid waste by means of open or closed burning method as it produces carbon monoxide and other poisonous gases. However, the villagers continue to do so despite the warnings and penalties being issued. Findings from the field suggest that the burning method provides the easiest solution to do away with the waste. Disposing of waste through burning has evolved into a culturally ingrained practice, effectively hiding the problem from plain sight. Consequently, despite the new efforts and sensitisation about the long-term consequences on air, land, and water, changing the mindset of the people and shifting to new practices take time. Coupled with this, the minimum facilities provided and mountainous topography have contributed to the continual adoption of conventional methods.

b. Dumping of Waste: In addition to burning, dumping of waste is also simultaneously and substantially being carried out, where wastes are simply thrown out in the nearby vacant plots. A 61-year-old woman from Kerabari village revealed that after giving the food waste to the animals, the unusable wet waste coming out from the kitchen is just thrown in the compound as it decomposes naturally over time and becomes manure. Some households, constrained by crowded living spaces, opt to give their food waste to neighbours, who use it to feed their animals. However, in relation to sanitary pads and diapers, many women respondents expressed their concern about its disposal. A 35-year-old respondent, Meena Rai, mentioned, *"I do not face any problems in disposing of food waste since I rear cows, goats and some chickens. But I have major problems in disposing of my one-year-old son's soiled diapers and my sanitary pads."* Although SBM (G) guidelines mentioned about safe disposal of menstrual waste such as used sanitary clothes and pads, the field finding suggests that proper disposal of sanitary napkins is still an issue that many women respondents are struggling with. Despite their awareness that it needs to be disposed of

properly, in the absence of any alternative arrangement, they are forced to dump it in streams and caves, besides burning it and so on.

In the case of dry waste, which has the potential to cause physical injuries to humans, particularly broken glasses, it was found that more than 33 per cent of the respondents reported dumping it mostly in mountain caverns and caves, beneath old walls and forest areas (Table 2). A 45-year-old graduate from Paiyong revealed that his family dumped all the waste such as broken bottles, fused bulbs, tube lights, batteries, etc., in the nearby caves and forest for years without thinking much about its consequences to the other species. The empirical analysis suggests that the practice of dumping solid wastes in vacant plots and streams persists even today in rural Sikkim. It needs to be mentioned that the practice of dumping waste on any vacant ground was widely seen in India as well as across the world throughout the nineteenth century (Doron & Jeffrey, 2018). This illegal dumping of hazardous and non-biodegradable wastes can have long-term issues such as land and environmental dilapidation, pollution, degradation of soil quality and seeping of toxic chemicals into water resources.

Table 2

Waste Disposal Methods by the Respondents

Gram Panchayat	Burning	Dumping	Community bins	Transportation vehicle	RRC
Mellidara Paiyong	35 (58.3)	18 (30)	20 (33)	40 (66.6)	5 (8.3)
Lungchok Kamarey	51 (85)	22 (36)	16 (26.6)	30 (50)	0
Total	86 (71.6)	40 (33)	36 (30)	70 (58.3)	5 (4)

Note: Figures in parentheses correspond to the percentage of households in the sample who have reported to be using certain waste disposal methods. As there are multiple responses, the total responses are more than the sample size of 120.

Source: Estimates based on fieldwork data.

c. Community bins and transportation facilities:

In the study area, collection of waste using community bins and transportation via garbage trucks is another method adopted by the villagers. As many as 30 per cent claimed of availing the facility of community bins and more than 58 per cent of the respondents were using transportation vehicles. As indicated in Table 2, more people in Mellidara Paiyong GP use the community bins and transportation facility as the GP has better infrastructure. Sanitation workers clear the mixed waste gathered over time in community bins on a bi-weekly, bi-monthly, or monthly basis, using garbage trucks to transport the waste to the RRC. Although community waste bins are installed in both the GPs along the main roads, there is a lack of separate bins for waste segregation. However, the officials argued that there is no need for separate bins as the waste in the bins are predominantly dry.

During the Gram Sabha meeting, the Panchayat announced the regulations, specifying the schedule for garbage collection trucks - twice a week in Mellidara Kamarey GP and once a month in Lungchok Kamarey GP. At specified locations, villagers are signalled about the garbage truck's arrival through whistles or bell rings, prompting them to hand over their household garbage to the sanitation workers. Villagers commonly encounter a significant challenge due to the frequent alterations in the truck's arrival date and time, leading to confusion and often resulting in extended waiting periods.

Purna of Lungchok said, *"If I come to know that the garbage collector truck is coming, I take the garbage to the roadside. Sometimes it arrives promptly, more often than not, I end up waiting for hours. This delay poses a challenge in efficiently managing my other daily tasks."* So many times he disposes of garbage by himself either by dumping it in the jungle or by burning it. He further mentioned that despite the strict order from the Panchayat to put segregated garbage into trash collector vehicles, the irregular timing of vehicle and long waiting hours forced him to opt for the conventional

methods of dumping and burning. However, a few other respondents informed that they have been converting wet vegetable wastes to manure for a while which interestingly is emphasised in the SBM (G) principles as well.

The Three 'R's

Among other conventional practices, the '3Rs' i.e., *Reduce, Reuse, Recycle* have also been found commonly practised by the villagers. The concept of '3Rs' is a principle aimed at minimising waste and promoting more sustainable practices in managing resources. It works together to encourage responsible consumption, decrease the volume of waste, and promote a more sustainable approach to managing resources by focusing on prevention, extending the life of products, and utilising materials more efficiently. Further, as per the SWM (G) guidelines, people are encouraged to reduce waste by using reusable and eco-friendly items. In the course of the fieldwork, it was observed that a few respondents were found to have been making a conscious effort toward this direction. Instead of disposal, old bed sheets/bedcovers, worn-out sarees, etc., were turned into blankets, cushions, and curtains. At the same time, a few households were seen reusing plastic and glass jars/bottles for storing kitchen ingredients such as salt, sugar, spices, pickles, etc.

A 63-year-old lady from Lungchok opined that *"Till not so long ago, Horlicks was packaged in glass jars. After finishing the contents, we cleaned the bottles nicely and used them to store Dalle (a traditional Sikkimese round chilli), and the quality of the chillies remained good for a long time. However, these days almost all the items, including Horlicks, come in plastic containers, which at times is not desirable"*.

As far as reusing old items is concerned, some respondents said that they have recycled plastic jars and large-size cold drink bottles to make decorative items and flower pots. Some said that waste could even be used as a resource depending

on one's efficiency and knowledge. The recyclable items like paper, beer bottles, and metals which are generated from the households and RRC are sold either to the scrap dealers, who are mostly from outside the state, and visit these areas intermittently or to the shops dealing with recyclable merchandise which are located in nearby towns.

Plastic Ban and Zero Waste: Its Effectiveness

The Government of Sikkim was one of the first states in India to ban plastic bags and it has been quite effectively implemented in the state. A study by Toxics Link (2014, p.47) reveals that "66 per cent of the shops around Sikkim use eco-friendly paper bags and newspaper wrappings and around 34 per cent use plastic carry bags, including non-woven bags." Similarly, the fieldwork also found that generally, the shop owners pack the vegetables, fruits, meat, and other items using newspapers or paper bags (*thunga*). One of the shopkeepers in Melidara market stated that, *"I use newspaper and thunga for packing and give the virgin/recycled plastic bags only to my known customers because if I pack for someone whom I do not know, they may complain to the higher authority and I may be penalised."*

When asked about their awareness regarding the plastic ban, over 92 per cent of the respondents acknowledged that they were aware of it. However, they further pointed out that in today's time, the presence of plastic in some form or another seems to be unavoidable. Responding to the query on plastic ban, a 50-year-old cited the impossibility of carrying out daily household tasks without using any plastic products despite being aware of the prohibition. Concerning plastic products, over 90 per cent of the respondents reported using it at home as it is convenient, cost-effective, durable and easily available.

In the words of a 65-year-old man, *"To reduce the plastic, the factory should be monitored. He lamented that during his youth, ready-made edible items like peanuts and groundnuts were available*

in loose forms but now all the popular snacks sold in his area come in plastic packets." Since "plastic packages replaced other forms of packaging" (Yoda et al., 2014, p.7), the study revealed that although plastic is banned in the state, generation of plastic waste is unavoidable as it is not free from the impact of market forces. In fact, Mrs Januka, a respondent observed that *"goods sold in shops are to lure children, whatever the children eat and play either comes in plastic wrappers or made of plastic."*

Similarly, a study conducted by the Ecotourism & Conservation Society of Sikkim found that extruded foods, such as instant noodles, chips and various forms of potato-based snacks consumed in the state alone generate 3.47 crore pieces of plastic packaging waste (Toxics Link, 2014). Shops in the rural areas of Sikkim are now filled with food and grocery items packed in multilayer plastics or tetra packs, such as *Lays*, *Kurkure*, noodle packets of *Waiwai*, *Maggi*, biscuits, beverages, cold drink bottles and cans, though limited in variety are readily available because of tourism and the forces of globalisation. It can be argued here that the widespread use of plastic-packed items even in the remote villages of Sikkim mirrors Marshall McLuhan's concept of the "global village", illustrating how modernity's connectedness manifests in the ubiquity of plastic consumption (McLuhan & Powers, 1992). Relatively, Giddens (2009) also opined that when societies become richer, there is a gradual shift from organic waste to plastic and synthetic materials that take much longer to decompose. It was observed that only some local products like *chhurpi* (cottage cheese), *kinima* (fermented soya), *ghee* (butter) and bamboo shoots are wrapped using leaves. The study found that the use of plastic bags is relatively less in the state as there are surprise checks sometimes by the officials, and the shopkeepers are fined in case they are found using plastic bags. However, the irony is the flooding of packaged consumable and non-consumable items in the market which contributed to generating an unprecedented humongous amount of plastic waste.

Zero waste, which is a visionary goal in Sikkim, has been taken up by many NGOs in collaboration with the state government. To spread awareness among the people, various zero waste events are organised in many parts of Sikkim. Success stories on the non-use of disposable plastic from various places of Sikkim like Kanchendzonga National Park, Tsomgo Lake, Lachen, etc., have been reported. With the state's initiatives, the "clamours for a reduction or an elimination of waste are growing louder and louder" (Mauch, 2016, p.5) in Sikkim. The state has set guidelines for discouraging the use of plastic bottles, cups, and plates on the premises of government offices, educational institutes, meetings and seminars. Responding to the query on zero waste in the course of fieldwork, a state government official countered, *"Do you think zero waste is possible? Is it practical not to generate waste?"* As has been argued by Watanabe (2015), who stated that, it may not be possible not to generate waste but reducing the kind of waste we produce is conceivable. For realising the goal of zero waste, awareness and various sensitisation programmes have been already initiated at the GP level.

Panchayat's Initiatives and Interventions

Solid Waste Management Rules, 2016 recommended a decentralised approach to the management of solid and liquid waste, and subsequently, RMDD has encouraged the GPs and Blocks to uphold the management of waste (Annual Report, 2018-19). Although decentralised systems of waste management were started much earlier in the field areas, a more organised effort took place with the commencement of SBM (G) of the Government of India in order to make plastic-free GPs. Panchayat members along with ASHA (Accredited Social Health Activist) workers and SHG (Self-Help Group) members hold frequent awareness programmes on public health and sanitation. Dustbins are installed along the roadsides and sponsoring dustbins by the public are also encouraged. Among many initiatives, the following deserve special mention:

a. Resource Recovery Centre: MelliDara Paiyong GP is a model Panchayat and one of the first GPs to introduce RRC back in 2010 to collect and manage waste from five GPs, namely Lungchok Kamarey, Mellidara Paiyong, Sadam Suntoley, Sumbuk Kartikey, and Turuk Ramabung. Each GP pays Rs. 3,000 per trip for the transportation of wastes to RRC on a rotational basis. As per the information provided by the Panchayat Presidents, no separate fund is provided for SWM at GPs. The RCC staff's salary and transportation charges are met from the revenues collected through issuing certificates, trade licences, household tax, water use, parking, etc. Further, the funds received under the 14th Finance Commission, which was in place at the time of the fieldwork, are also being utilised for the purpose.

RRC has six workers who segregate the mixed waste received at the centre. Unlike other parts of India where cleanliness and sanitation work are mostly confined to people from lower castes (Teltumbde, 2014; Jodhka, 2012), the sanitation workers at MelliDara Paiyong RCC are found to be hailing from lower economic strata rather than caste or ethnic line. They get a consolidated remuneration of Rs. 6000 per month. RRC workers face multiple challenges due to inadequate protective gear like gloves and boots, forcing them to handle waste directly and exposing them to sharp objects like needles, blades, and glass fragments. Moreover, they encounter unhygienic and offensive materials such as human waste, animal carcasses, soiled diapers, and used sanitary pads, etc. Items like discarded shoes, mattresses, blankets, and non-recyclable textiles pose a dilemma as they cannot be recycled or degraded, leading to their disposal through burning, contradicting the established SWM norms. At times, residual non-disposable waste from the RRC is again transferred to a dump site named Sipsu in West Sikkim for disposal.

Villagers receive waste collection services without any charges, but shop owners are required to pay Rs. 50 monthly. Recyclable items segregated by the workers are sold to scrap

dealers. Organic waste is turned into manure, previously yielding an annual income of Rs 4-5 lakh by selling it to state horticulture and agriculture departments. However, recent concerns from Panchayat members highlight a decline in compost quality, impacting their revenue. This raises doubts about the RRC's ability to maintain high-quality compost production for making a steady and sustainable revenue.

b. Health and Hygiene for the Community: The Panchayat conducts a range of awareness programmes focused on health and hygiene, employing creative mediums such as painting sessions, cultural programmes, and quiz competitions in collaboration with local schools. Furthermore, in a bid to incentivise cleanliness and sanitation practices, the Panchayat has established awards for households exhibiting exemplary standards in health and sanitation. These awards serve as a motivational factor for villagers to maintain high standards of cleanliness and actively participate in health and sanitation programmes. Through these multifaceted efforts, the Panchayat aims to instil a culture of conscientious living and community engagement among its residents.

c. Transforming Waste: The Panchayat has implemented several small yet impactful initiatives aimed at fostering positive changes within the community. One such initiative involves advocating for alternatives like bouquets instead of traditional *khadas* (scarves), promoting the use of flower garlands and handmade badges, and discouraging the consumption of packaged water bottles during public events. Besides, the periodic cleanliness campaigns across the neighbouring areas are carried out by the dedicated Panchayat members and community. At present, a concerted effort is underway to reprocess multilayer plastics by involving students and SHGs in crafting plastic baskets, creating decorative pieces, and transforming these materials into resources that generate income. This initiative not only aims to address the issue of plastic waste but also endeavours to empower the youth and local groups by fostering creativity and entrepreneurship through innovative recycling practices.

Challenges and the Way Forward

Promoting people's involvement hinges on proficient communication and sharing information, transforming government policies and programmes into a *Jan Andolan*, or a people's movement rather than directives from top to bottom. In this line of thought, the local Panchayat initiated awareness programmes to boost community involvement in the implementation process. The study observed the following challenges that hinder the successful implementation of the idea of *Swachh Gramin*, *Swachh Bharat*.

1. Limited segregation of waste at source: As discussed, while most villagers segregate waste into wet and dry, they struggle to further sort it into distinct types, despite the Panchayat's awareness initiatives. Consequently, the RRC workers frequently encounter mixed waste, creating challenges and impeding efficient waste management. The lack of people's participation also partly lies in the absence of infrastructure linked to SWM.
2. Accessibility and terrain: The mountainous terrain, scattered settlements as well as inaccessible roads in Sikkim make door-to-door waste collection impractical. This geographical challenge limits efficient waste collection methods.
3. Increasing non-biodegradable plastic wastes: The accessibility to consumer goods and packaged products has resulted in the surge of non-biodegradable plastic and hazardous waste even in rural mountainous regions. This calls for sustainable packaging, better infrastructure and sophisticated treatment methods for effective waste management.
4. Relying on traditional/conventional ways of waste management: The current primary waste disposal methods adopted by the villagers, that is dumping and burning in vacant plots producing unpleasant odours in nearby areas, pose potential environmental and health hazards, which should be a major concern for the authorities.

5. **Limited waste disposal facilities:** Irregular service and lesser frequency of waste transport facilities, especially in Lungchok-Kamarey GP, act as a hindrance in managing the waste appropriately. Proper composting and scientific disposal of waste remains a challenge due to lack of funding, skilled labour, and advanced technologies.

Based on the analysis of the prevalent problem and challenges regarding SWM in the rural areas of Sikkim, particularly after observing the cases evident in the two GPs, the following steps can be taken to counter the issues.

1. **Promoting behavioural change:** A shift in mindset ("My waste is my responsibility") is vital. Strengthening awareness programmes to instil a sense of personal responsibility in the proper management of waste among residents is crucial. Encouraging them to avoid open burning and dumping hazardous and non-biodegradable waste will have long-term benefits.
2. **Innovative waste management solutions:** Encouraging the use of biogas, vermicomposting, and other sustainable methods for waste disposal in the rural areas of Sikkim can reduce the burden on land and the environment.
3. **Improved infrastructure and technology:** Increasing the frequency of waste transport trucks, and investing in infrastructure and advanced technologies for waste treatment and management are required. Proper funding allocation and skilled workforce training are essential.
4. **Community engagement and involvement of NGOs/SHGs:** Bridging the gap between the Panchayat and the public through the involvement of NGOs and SHGs can change societal perceptions and practices. This can foster a cleaner and more sustainable environment as mandated in SBM (G).

5. **Government support and funding:**

Advocating for increased grants to support Panchayats in waste management infrastructure and proper monitoring to enforce proper waste disposal regulations must be emphasised. In fact, the Sikkim government in its 'Memorandum to the Fourteenth Financial Commission' has requested the Central government to "increase the volume of local body grants substantially to support PRIs in the State" (FRED, n.d., p.83).

Conclusion

In conclusion, waste management in rural Sikkim continues to be handled at the household level through traditional methods like burning and dumping. Despite the local governing body's responsibility for waste management services, the limited basic amenities hinder the effective implementation of the Swachh Bharat Mission (Gramin) for a cleaner environment. Increased funding for PRIs and specific allocation for SBM (G) are crucial for the successful and effective implementation of this initiative. Sensitising the villagers on proper disposal of hazardous and non-degradable waste is essential. Alongside, encouragement of eco-friendly traditional waste disposal methods and adoption of modern technology for efficient waste treatment are also crucial for maintaining a sustainable environment. While some progress has been achieved with the proactive involvement of Gram Panchayats, further efforts should be made to address the identified challenges through improved sensitisation and effective monitoring.

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References:

- Beckert, J., & Zafirovski, M. (Ed.). (2006). *International Encyclopaedia of Economic Sociology*. Routledge.
- Boyle, P., & Halfacree, K. (Ed.). (1998). *Migration into Rural Areas: Theories and Issues*. Wiley.
- CEIC (n.d.). Visitor arrivals: Local. Sikkim [Infographic]. <https://www.ceicdata.com/en/india/resident-visits-by-states/visitor-arrivals-local-sikkim>
- Census. (2011). *Census of India: Sikkim*. <https://www.censusindia.co.in/states/sikkim>
- Department of Economic & Statistical Monitoring & Evaluation (DESME). (2016). *Sikkim: A Statistical Journal*. Government of Sikkim.
- Doron, A., & Jeffrey, R. (2018). *Waste of a nation: Garbage and growth in India*. Harvard University Press.
- Ferronato, N., & Torretta, V. (2019). Waste Mismanagement in Developing Countries: A Review of Global Issues. *International Journal of Environmental Research and Public Health*, 16(6), 1060. <https://doi.org/10.3390/ijerph16061060>
- FRED. (n.d.). Memorandum to the Fourteenth Finance Commission, vol. - I. (Finance, Revenue & Expenditure Department (FRED), Government of Sikkim.
- Giddens, A. (2009). *Sociology* (6th Ed.). Wiley India Pvt. Ltd.
- Jena, M. (2008). Pollution in the Mahanadi: Urban Sewage, Industrial Effluents and Biomedical Waste. *Economic and Political Weekly*, 43(20), 17-23.
- Jodhka, S. S. (2012). *Caste: Oxford India short introductions*. Oxford University Press India.
- Johnson, K. (2005). Globalisation at the Crossroads of Tradition and Modernity in Rural India. *Sociological Bulletin*, 54(1), 40-58. <https://doi.org/10.1177/0038022920050103>
- Mathur, N. (Ed.). (2014). *Consumer Culture, Modernity and Identity*. Sage Publications India Pvt Ltd.
- Mauch, C. (Ed.). (2016). *A Future Without Waste? Zero Waste in Theory and Practice*. RCC Perspective. Retrieved from <http://www.environmentandsociety.org/perspectives/2016/3/future-without-waste-zero>
- McLuhan, M., & Powers, B. R. (1992). *The Global Village: Transformations in World Life and Media in the 21st Century*. Oxford University Press.
- Mihai, F. C. (2017). *Solid Waste Management in Rural Areas*. InTech.
- Ministry of Drinking Water and Sanitation. (2017). *Guidelines for Swachh Bharat Mission (Gramin)*. <https://swachhbharatmission.gov.in/sbmcms/writereaddata/images/pdf/Guidelines/Complete-set-guidelines.pdf>
- Ramesh, R., & SivaRam, P. (2016). *Solid Waste Management in Rural Areas: A Step-by-Step Guide for Gram Panchayats*. National Institute of Rural Development & Panchayati Raj, Hyderabad.
- Rural Management and Development Department (RMDD). (2018-2019). *Annual Report*. Government of Sikkim.
- Schindler, S., Demaria, F., & Pandit, S. B. (2012). Delhi's Waste Conflict. *Economic and Political Weekly*, 47(42), 18-21.
- Sharma, P. D. (2015). *Ecology and Environment* (12th Ed.). Rastogi Publications.

- Singh, B. P. (2001). The Eastern Himalaya: Wetlands, Forests and Beliefs. *Economic and Political Weekly*, 36(31), 4-10.
- Telegraph. (2011, June 11). Fine for Plastic Dump on Sikkim Slopes. The Telegraph online. <https://www.telegraphindia.com/west-bengal/fine-for-plastic-dump-on-sikkim-slopes/cid/387641>
- Teltumbde, A. (2014). No Swachh Bharat Without Annihilation of Caste. *Economic and Political Weekly*, 49 (45), 11-12.
- Toxics Link. (2014). Plastics and the Environment: Assessing the Impact of the Complete Ban on Plastic Carry Bag. Toxics Link.
- Urban Development & Housing Department. (2019). State Policy on Solid Waste Management Strategy. Sikkim Government Gazette (SGG), Gangtok: Government of Sikkim.
- Watanabe, C. (2015). Waste Incorporated. *Gastronomica*, 15(4), 6-13. <https://doi.org/10.1525/gfc.2015.15.4.6>
- Yoda, R. M., Chirawurah, D., & Adongo, P. B. (2014). Domestic Waste Disposal Practice and Perceptions of Private Sector Waste Management in Urban Accra. *BMC Public Health*, 14(1), 1-10. <https://doi.org/10.1186/1471-2458-14-697>