Municipal Corporation of Saharanpur City

In association with

ITC Mission SunehraKal

Forum for Organised Resource Conservation and Enhancement

Umang SunehraKal Sewa Samiti

Detailed Project Report & Selection of Technologies for Processing & Final Disposal of Municipal Solid Waste

1. Introduction

Saharanpur is one of the flourishing city, situated between the Ganges and the Yamuna, the holy rivers of India. One of the major district of the state of Uttar Pradesh, in northern India, the history of Saharanpur dates back from 2000 B.C. It is a city in the Indian state of Uttar Pradesh with a rich heritage and culture. Founded by Shah Ranveer Singh the city got its name after the Sufi saint Shah HarunChisti. The city is between the Ganges and Yamuna River with the Shivalik Hills to the north giving this city a majestic look. It is internationally famous for its wood carving work cottage industry.

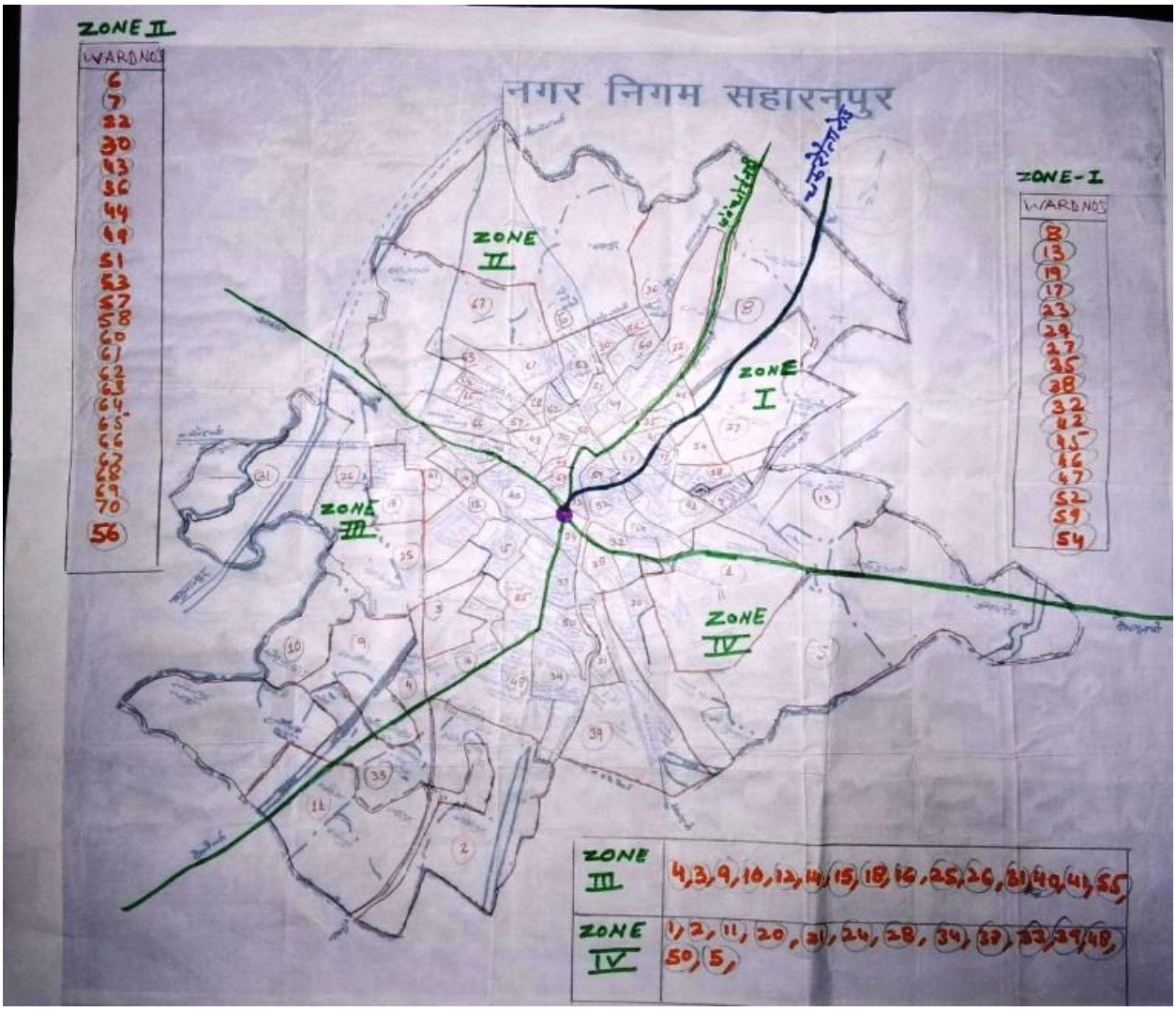
Saharanpur is a city and a Municipal Corporation in the state of Uttar Pradesh in northern India. It is the administrative headquarters of Saharanpur District and the Saharanpur Division.

Saharanpur city grew in a region named after a Sufi Saint Shah Haroon Chishti. It was founded by ***SahRanbirsingh, a Jainnobleman*** who was the Mughal treasurer; he laid the foundations of the present day city on the site of an army cantonment. Situated close to the borders of Haryana, Uttarakhand and Himachal Pradesh states, the city is surrounded by a fertile agricultural region that produces plentiful grains and fruits. Saharanpur is known for its wood carving cottage industry as well as a thriving market for local agricultural produce, including basmati rice and mangoes. A variety of industrial enterprises are located here

including textiles, sugar, paper and cigarette factories. It is about 550 km from the capital city Lucknow, It is 164 km from National Capital of India Delhi whereas It is 70 km away from the Capital of Uttarakhand, Dehradun.

Zone wise City Map

Saharanpur city has 70 wards and city divided into 4 different zones.



Saharanpur Municipal Corporation, with population of about 7.1 lakh is Saharanpur sub district's only municipal corporation located in Saharanpur sub district of Saharanpur district in the state Uttar Pradesh in India. Total geographical area of Saharanpur municipal corporation is 47 km^2. Population density of the city is 15094 persons per km^2. There are 86 wards in the city, among them Saharanpur Ward No 56 is the most populous ward with population of about 33 thousand and Saharanpur Ward No 82 is the least populous ward with population of 36.

Nearest railway station is Saharanpur which is 1 km far from here. Saharanpur is the sub district head quarter of the city. District head quarter of the city is Saharanpur. Lucknow is the state head quarter of the city and is 480 km far from here. Yearly average rainfall of the city is 781.7 mm. Maximum temperature here reaches up to 41.3°C and minimum temperature goes down to 7°C.

	Decadal Household		**Projected Household**
Census Year	**2001**	**2011**	**2018**
Population	0.83 lakh	1.29 lakh	1.60 lakh

2. Preamble

Solid waste management usually refers to the collection, transportations, recycling, resource recovery (composting, waste to energy, etc.,) and disposal of municipal solid waste, "Municipal solid waste is defined to include refuse from households, non-hazardous solid waste from industrial and commercial establishments, refuse from institutions, market waste, yard waste and street sweeping, etc. (World Bank, 1994).

Management of municipal solid waste involves (a) development of an insight into the impact of waste generation, collection, transportation and disposal methods adopted by a society on the environment and adoption of new methods to reduce this impact. (CPHEEO Manual, Jan2000).

Accordingly, waste management should be an integrated affair, which shall include: ¬

- Minimizing waste
- Maximizing environmentally sound waste re - use and recycling
- Promoting environmentally sound waste disposal and treatment and
- Extending the coverage of waste management services

The stages involved in SWM are primarily as follows:

- Primary collection of solid waste from household levels
- Primary transportation to municipal waste bins and collection points,
- Secondary transportation of Waste from municipal bins to disposal sites, and
- Actual disposal of the waste

It is estimated that about 80,000 metric tons of solid waste are generated every day in the urban centers of India at present. About 60% of generated are disposed of safely. The uncollected solid waste remains present in and around the locality or find its way into the open drains. Proper solid waste disposal is also hampered by the non – availability of suitable land fill

site. According to the survey, carried out by CPCB in 2001, it has been observed that the total quantity of solid waste generated by 23 metro cities of India is about 30,058 tons per day of solid waste. The per capita waste generation in small, medium and large cities/towns about 0.1kg, 0.3kg to 0.4 kg and 0.5 kg respectively. Because of this fact, management of solid waste is primarily an urban issue in country like India. In urban areas the responsibility of solid waste management lays exclusively with the urban local bodies, that is, municipal governments. However, the municipalities in most states in India are not statutorily responsible for collecting garbage from the households. They usually perform the third and fourth stages of the SWM function. But the households perform the first two and different arrangements are followed to accomplish the task. In many cases where residents are economically better off and environmentally conscious, community organizations are coming forward to handle at least the door to door collection of household waste and its transportation to municipal collection points. Even though such initiatives are still at nascent stage they are slowly gaining momentum and may assume a major role in future. There is a stage between the collection and disposal of solid waste, that is, resource recovery or segregation of degradable and recyclable materials in the garbage and actual recycling. In no Indian city is the separation of garbage between degradable and non – degradable items and recycling taken up at the municipal level. This is so not only because it is uneconomical since only 13 to 20 % of municipal waste is recyclable the remaining 80-85% is compost able, but is also extremely laboured intensive. In most cases however, secondary waste collection is not being done adequately. On an average, 20 to 30 per cent of the total waste generated remains uncollected, creating Environmental hazards in urban settlements. Now a days due to increase in the environmental concern, emphasis is laid on recycling and reuse of domestic garbage is gaining momentum. The municipalities and municipal corporations themselves are unable to take up such projects of collection, segregation, and recycling or composting in an integrated manner because of the high costs involved. But NGO‟s and many private agencies are now providing these services to the Municipalities or are independently running some projects for waste collection, segregation, recycling and composting or even bio-gas generation.

Policy Initiative for SWM:

In India, in the last few years, there has been lots of pressure due to international events concerning better environment and human settlements. As a result, several initiatives were taken at the National, State and Local Government level to go deep into the flaws in the existing situation and suggest remedies. The Central and State Governments initiated efforts to develop policies and programme in this regard. The Strategy Paper on Solid Waste Management in India by the National Environmental Engineering Research Institute (NEERI) in August 1995 is one of the most exhaustive evaluations of the problem at the national level. The J.L. Bajaj Committee constituted by the Planning Commission in 1994 immediately after the plague outbreak, also reviewed the prevalent conditions and made specific recommendations to deal with the situation. The Interim Report of the Committee on Solid Waste Management in Class I Cities in

India constituted by the Central Government by the Supreme Court in June 1998 is a valuable document which contains detailed recommendations for the removal of solid waste.

3. Salient Features of Solid Waste Management Rules, 2016

The Government has revamped the Municipal Solid Wastes (Management and Handling) Rules 2000 and notified the new Solid Waste Management Rules, 2016 on April 8, 2016. The salient features of the SWM Rules, 2016 are as under;

A. **Areas Covered**: These rules are applicable to;

- Every urban local body (Mega city to Panchayat level),
- Outgrowths in urban agglomerations,
- Census towns as declared by the Registrar General and Census Commissioner of India,
- Notified areas,
- Notified industrial townships,
- Areas under the control of Indian Railways,
- Airports/ airbases,
- Ports and harbors,
- Defense establishments,
- Special economic zones,
- State and Central government organizations,
- Places of pilgrims,
- Religious and historical importance as may be notified by respective State government from time to time and
- Every domestic, institutional, commercial and any other non-residential solid waste generator situated in the areas.

B. **The Waste Generators**

- Every house holds
- Event organizer
- Street vendors
- RWAs and market association
- Gated community having more than area 1000Sq m.
- Hotels and restaurant etc.

Duties of waste generators and authorities:

- Every waste generators shall segregate waste and store separately and hand over to municipal workers or authorized waste pickers
- Ministry of environment, Forest and climate change shall constitute central monitoring committee to monitor and review every year

- MOUD shall frame National Policy on SWM and coordinate with States/UTs, provide technical guidelines, financial support, training to local bodies, etc.
- Departments of Fertilizers & Chemicals shall assist in market development for city compost and make available to companies (3/4 bags compost: 6/7 bags Fertilizers).
- Ministry of Agriculture shall make flexible Fertilizer Control Order, promote utilization of compost, testing facility for compost and issue guidelines.
- Ministry of Power shall fix tariff of power generation from W-T-E project and ensure distribution through companies.
- MNRE shall facilitate infrastructure for waste-to-Energy plants and provide subsidy.
- SecyIncharge, UD (sate/UT) shall prepare State Policy/Strategy, adopt 3- Rs, coordinate for state planning, identification of common/regional landfills, notify guidelines of buffer zones.
- District Collector/Magistrate shall facilitate identification of landfill site, quarterly review the performance of local bodies.
- Secretary, Panchayats: same as Secy. UD at Panchayat level.
- CPCB shall coordinate with SPCBs/PCCs for monitoring and Annual Reports, formulation of standards, review new technologies, prepare guidelines for buffer zones restricting from residential, commercial and construction activities areas; and inter-state movement of waste.
- Local Authority/Panchayats shall prepare SWM plan with time line and its implementation, segregate, adopt 3-Rs, material recovery, processing/ disposal of Waste, user fee and levy spot fine.
- SPCBs/PCCs shall monitor, issue authorization and regulate.
- Manufacturers/Brand owners shall facilitate collect back wastes of their products and provide pouch for packaging sanitary wastes, etc.
- Industry (cement, power plant, etc.) shall use RDF within 100 km.
- Operator of facilities shall follow guidelines/standards

Criteria for Hilly Region: Avoid landfill, make waste transfer stations, strict action for littering and construct landfill at plain areas.

Waste to Energy plant for waste with 1500 Kcal/kg and above for co incineration in cement and power plants.

Time Frame for Implementation of SWM Rules:

- Landfill Identification : 1 year
- Procurement of waste processing facilities : 2 years
- Ensure segregation of waste : 2 years
- Cities up to 1 million population : 2 Years
- Million plus cities : 3 years
- Setting up sanitary landfills : 3 years
- Bioremediation/capping of old landfills : 5 years

Review of implementation of rules at various levels;

- MoEF& CC, Central Monitoring Committee: Every year

- District Collector review performance of Local authorities: Quarterly
- SPCBs/PCCs review implementation of Rules with DMA: half yearly
- Secretary In charge, UD- State level Advisory Committee: half yearly

4. Existing Process

Like most municipalities, Saharanpur Municipal Corporation started waste management with open community bins in different localities. These bins consisted of bottomless circular concrete rings and had mixed waste dumped into them by its citizens. Late it changed to iron covered bins.

When it was full, it was collected manually by municipal workers and transported in closed dome shaped Municipal Solid Waste trucks to a landfill where crude dumping was done. In order to dispose of household waste in a safe and cost-effective manner, ITC Ltd. launched the ***Solid Waste Management*** in October 2006, under its social development initiative ITC Mission SunehraKal. The project has developed a model that reduces the burden of land filling, and helps in recycling/ reusing of biodegradable and recyclable waste. The programme expanded to 50000 household of the city gradually in 11 years. The model is one of door-to-door collection of waste, six days a week. Each waste collector covers 200-250 households daily, between 7.30 am and 11.30 am. They move around in a *rickshaw* trolley, carrying two plastic bags – one for recyclable waste and the other for biodegradable and non-recyclable waste. Thus, primary segregation of the waste is done at the household level. Households are made aware of the importance and process of primary segregation through campaigns such as road shows, pamphlets etc., as well as day-to-day reminders by waste collectors.

To separate the non-recyclable and biodegradable waste, secondary segregation is done at the waste management site. The biodegradable waste is then processed to make organic compost, the recyclable waste is sold to private vendors, and non-recyclable waste is transported to landfills. Therefore, nearly 85% of the total waste is recycled or reused and only 15% (non-recyclable) goes to landfills.

In this process waste collectors get good income from household service charge. By these effect waste workers are also engaged in collection of waste from household level in newly developed colonies and well settled colonies. These waste collectors collect waste from household and dumps in municipal bins and nearby locations. Later the piled up waste shifted to landfills by municipality vehicles.

5. Existing Infrastructure of SWM

Vehicles Allocated for SWM

The vehicles available with SMC for transportation of MSW are listed below:

Sr. No.	Type of Vehicle	No of Vehicle	Work Responsibility
1	Tempo	20	Door to Door Waste Collection
2	JCB	2	Waste lifting
3	Tempo	13	Street Waste Picking

4	Tipper	12	Waste Transportation
5	Big Poke Len	2	Dum Sit Leveling
6	Tractor	5	Waste Shifting
7	Loader	5	Waste Shifting
8	Tipper	1	Waste Picking
9	Tipper	1	DP Bin Picker
10	Tractor	1	DP Bin Picker
11	Truck	2	DP Bin Picker

The vehicles available with Umang and Force for transportation of MSW are listed below:

Sr. No.	**Type of Vehicle**	**No of Vehicle**	**Work Responsibility**
1	Waste collection Rickshaw	233	Door to Door Waste Collection
2	Tractor	3	Waste Shifting
3	Tempo and Tata Ace	3	Waste Shifting

Staffing

The Municipal Corporation has only street sweepers on permanent and daily wage sanitation workers deployed in the city for street cleaning and waste shifting. The below table shows the worker details.

Sr. No	**Designation**	**Provision**	**Staff at Present**		
			Permanent	**Contractual**	**Third Party**
1	Sweeper/Waste Picker		464	175	932
2	Lorry Driver	11	10	0	0
3	Supervisors	41	57	0	0
4	Sanitary Inspector	12	11	0	0
5	Sanitary Chief	3	1	0	0
6	Zonal Sanitary Officer	2	0	0	0
7	District Health Officer	1	1	0	0

Staffing of Umang and Force

The Force and Umang placed a team of 52 staff to monitor and motivate the community to participate in the waste collection and segregation of waste as well as monitoring the daily waste collection.

Sr. No	Designation	Provision	Staff at Present		
			Permanent	Contractual	Third Party
1	Waste Picker / Processing Worker				261
2	Lorry Driver		0	0	6
3	Supervisors		0	22	0
4	Motivators		0	26	0
5	Asst. Coordinators		0	2	0
6	Coordinators		0	2	0

6. Field Study Carried Out

A team from both Umang and Force carried out and the study produced the following data:

The demarcation of the city into 4 zones for easier management and planning, of MSW with 2 supervisor in charge of each zone.

Zone No	Zone Name	Supervisor
1	Between Delhi Road to Dehradun Road	Nitin Kumar, Ajay Kumar
2	Between Dehradun Road to Ambala Road	Md. Arsh, Sunil Kumar
3	Between Ambala Road to Behat Road	Maidul Islam, Sandip Kumar
4	Between Behat Road to Delhi Road	AkashDhilotra, Sunil Vaish

Indicative List for Segregation of Household Wastes

BASIC SEGREGATION					
Wet waste (green bin)	**Dry waste (Blue bin)**				**Domestic Hazardous[7]**
	With further sub-segregation BASIC+				
Food wastes of all kinds, cooked and uncooked, including eggshells and bones, flower, fruit and waste including juice, vegetable peels and household garden/plant wastes. Soiled tissues, food wrappers, paper towels; fish and meat	Paper cardboard and cartons	Containers & packaging of all kinds excluding those containing hazardous materials Compound packaging (tetrapak, blisters etc.) Plastics	Rags Rubber Wood Discarded clothing Furniture	Metals Glass (all kinds) Inerts House sweepings and inerts (not garden, yard or street sweepings)	E-waste* Hazardous wastes** Household medical waste*** Batteries from flashlights and button cells. Lights bulbs, tube lights and Compact Fluorescent Lamps (CFL) Car batteries, oil filters and car care products and consumables

* E-waste: Printer & printer cartridges, electronic parts and equipment and others

** Hazardous wastes: Chemicals and solvents and their empty containers, paints, oil, lubricants, glues, thinners and their empty containers, insecticides, pesticides and herbicides and their empty containers, photographic chemicals, bleaches and household kitchen & drain cleaning agents

*** Household Medical Waste: Thermometers and other mercury containing products, discarded medicines, injection needles and syringes after destroying them both, sanitary wastes and diapers (should be collected daily)

Identifying Waste Generators:

Waste Generator Group	Number of Units
Households	54000
Offices	35
Shops & Schools	300
Restaurants	27
Hotels (Lodging Only)	2
Municipal Market	1
Hospitals, Nursing Homes, Dispensaries	
Street sweepings	
Construction Sites	

Quantities of Wet Fraction Generators:

Wet (Organic) Fraction Generator Group	Quantity	Percentage
Households	0.24 Kg	67%
Offices		
Shops & Schools		
Restaurants	6.8 Kg	100%

Hotels (Lodging Only)		
Municipal Market	2400 Kg	100%
Hospitals, Nursing Homes, Dispensaries		

Quantities of Dry Fraction Generators:

Dry (Inorganic) Fraction Generator Group	**Quantity**	**Percentage**
Households	0.12 Kg	33%
Offices	2.4 Kg	100%
Shops & Schools	1.24 Kg	100%
Restaurants		
Hotels (Lodging Only)	2.7 Kg	100%
Municipal Market		
Hospitals, Nursing Homes, Dispensaries		

Waste generation summery

Sl. No	Type of Waste	Waste generated	Waste generated
		(As per Municipality Data) (Tons/day)	(As per Waste Collection) (Tons/day)
1	Domestic Household waste	155	49
2	Commercial Establishments Waste	1	1
3	Hotels & Restaurants	5	5
4	Institutional waste	1	1
5	Parks and Gardens	1	1
6	Street sweeping waste	45	45
7	Waste from Drains	10	6
8	Hospitals	1	1
9	Markets	40	40
10	Temples	1	1
11	Construction and demolition waste	1	2
12	Chicken, Mutton, Beef, Fish	1	1
13	Cinema halls	1	1

14	Function halls	5	2
15	Total	272	155

7. Physical and Chemical Characterization of Waste

Physical Characterization of Waste

S No.	Components	Percentage by weight
1	Paper	1.3
2	Plastic	11.2
3	Metal	0.08
4	Glass	0.16
5	C&D	20.13
6	Rubber/ Rexin	0.08
7	Gunny bags	0.11
8	Cotton	0.36
9	Wood	0.34
10	Paddy Straw	1.4
11	Cow Dung	0.90
12	Baggage	0.26
13	Vegetable & Fruits	30.00
14	Horticulture Waste	12.87

Types of Waste Generate ward wise in Saharanpur city

Ward No	Ward Name	Types Waste Generate	Market / Residential/ Industrial
1	Moajjampura		
2	PinjoraBadhshahpur		
3	Auzpura		
4	Mohammadpur		
5	Sadakdoodhli		Residential
6	Vardhman colony		Residential
7	Jatavnagar	Commercial waste	Market
8	Darakothtalabairoon		Residential
9	Gwalira		Residential
10	Fatehpurjatt		
11	Mavikala		
12	Khalasi line		Residential/Market
13	Chakrethi		Semi Urban Residential

14	Shardanagar		Residential/Market
15	Railway quarter		Residential
16	Naveen nagar		Residential/Market
17	Gadhimalook		Residential
18	Labour colony		Residential/Market
19	Gopalnagar		Residential/Market
20	Janakpuri		Residential
21	Himmatnagar		Residential/Market
22	Municipal colony		Residential
23	Kishanpura	Biomedical waste	Market
24	Govindnagar		Residential
25	Khalasiline south		Residential
26	Manakmau		Residential
27	DaraMilkaana		
28	KhanaalampuraTakiya		Hospitals/Nurshing Home areas
29	Beribagh		Residential
30	Madanpuri		Semi Urban Residential
31	Manakmau south		
32	Khanaalampura		
33	Hasanpurkadeem		
34	Ilahipura		
35	Jawaharpark		Residential
36	Shiraz colony	Wooden waste	Market/ Residential
37	Gil colony		
38	New madhonagar		
39	Nazirpura	Vegetables waste	Market
40	Gurdwara road		
41	Shardanagar south		
42	Numaishkemp		Residential
43	Saraihisamuddin		
44	Kutubsher		
45	Chipyaan		Residential
46	Mohitvihar	Gobar waste / Milk dairies	
47	Khalapaar	Hoisery waste	Market/ Residential
48	Avasvikas		
49	Mubarakshah		Residential
50	Hakikatnagar		
51	Rani bazaar	Sweets waste	Market/ Residential
52	KilaNawabGanj		Residential
53	Pratapnagar	Clothes waste/	Residential

		vegetables waste	
54	Noor Basti	Hoisery waste	Industrial/ Residential
55	Chandernagar		
56	Khattakheri	Wooden waste	Market/ industrial
57	Saraimardaanali		Residential
58	Deenanath		Residential
59	Matiyamahel		Books market
60	Hayat colony	Wooden waste	Market/ industrial
61	Azad colony		Residential
62	Yahyashah		Market/ Residential
63	Sabribagh	Wooden waste	Market/ Residential
64	WoodSeasoning plant	Wooden waste	Market/ Residential
65	Kamela Colony	Slaughter house /meat waste	Market/ industrial
66	Nadeem Colony	Slaughter house /meat waste	Market/ industrial
67	Daraalibairoon		Residential
68	Aaliaahgraan		Residential
69	Lohanisarai		Iron market /Residential
70	Qazilakkhi gate		Residential

Sources: https://indikosh.com/city/118696/saharanpur

8. Chemical Composition of MSW:

The Chemical composition analysis of the MSW is presented in Table 4. It revealed that moisture forms major composition of 50.7 % followed by ash and volatile substances. The energy content has been estimated in the range of 1200 kcal/kg to 1800 kcal.kg.However, it is recommended that detailed waste characterization need to be done before the project actually commissioned.

S No.	Element	Percentage
1	Moisture	50.70%
2	Net VS	17.31%
3	Ash	30.70%
4	Coal	1.29%
5	Sulphate	3000 mg / kg
6	Phosphate	1457 mg / kg
7	Chloride	1499 mg / kg
8	T.K.N.	1105 mg / kg

9	Sodium	1302 mg / kg
10	Potassium	3315 mg / kg
11	Calcium	5600 mg / kg

9. Existing System of MSW Collection

The municipal corporation has, unfortunately, no land of its own for setting up any disposal facility. Municipal Corporation is dumping waste in an unscientific manner at a crude dumping site admeasuring about 36 bigha at kolhagarh Road. A new site has now been identified about 20 Km away from the city for setting up an integrated composting and disposal yard. It is estimated that about 150 metric tons of waste would be disposed of at the landfill on a day to day basis.

There are nearly 140,000 households in Saharanpur in the state of Uttar Pradesh and approximately 300 tons of waste are generated daily but there is no any type of disposal of garbage method is present in Municipal Corporation Saharanpur.




In order to dispose of household waste in a safe and cost-effective manner, ITC Ltd. launched the ***Mission SunehraKal*** in October 2006, under its social development initiative. The project has developed a model that reduces the burden of land filling, and helps in recycling/ reusing of biodegradable and recyclable waste.

It is implemented in collaboration with an NGO (non-governmental organization) called **UmangSunehraKalSewaSamiti& Force.**

The program covers nearly 1,07,560 households in Saharanpur.
The model is one of door-to-door collection of waste, six days a week. Each waste collector covers 225-250 households daily, between 7.30 am and 12.30 pm. They move around in a *rickshaw* trolley, carrying four plastic drums – two for recyclable waste and the other for biodegradable and non-recyclable waste[5]. Thus, primary segregation of the waste is done at the household level.

Households are made aware of the importance and process of primary segregation through campaigns such as road shows, pamphlets etc., as well as day-to-day reminders by waste

To separate the non-recyclable and biodegradable waste, secondary segregation is done at the waste management site. The biodegradable waste is then processed to make organic compost, the recyclable waste is sold by the waste collectors to private vendors, and non-recyclable waste is transported to landfills. Therefore, nearly 85% of the total waste is recycled or reused and only 15% (non-recyclable) goes to landfills.

Working on the principle of 'treatment closer to the generator' or decentralized waste management system, two pieces of land have been provided by the MCS for waste management. These sites have been developed close to the collection points to reduce the large expenditure on transportation.

The collection, segregation and transportation of waste not only reduced the cost for the MCS, but also its workload. The program is being scaled up to cover the entire city, with the MCS support. It now plays the role of a facilitator instead of the service provider.

The self-sustaining nature of the program makes it viable in the long term. The success of this initiative lies in the fact that the elected Municipal Councilors contribute by creating awareness among people and motivating them to pay the user charges.

Moreover, it has involved the community and local government bodies by following the PPPP (people-public-private partnership) model, ensuring the active participation of people and civil society representatives and accountability of the implementing agency in maintaining cleanliness.

In order to establish a long term solid waste landfill site for Saharanpur which would last for around 30 years, the Corporation of the City of Saharanpur has identified and proposes to acquire land for an integrated solid waste landfill site of kohlagarh of measuring an area of 36 bigha. The proposed land is ideal without any development in the surrounding areas and has an existing natural tree buffer zone.

As per the regulatory requirement, selection of landfill sites shall be based on **examination of environmental issues**. SMC may obtain the necessary approvals and clearances from State Pollution Control Board and other concerned regulatory authorities. It is recommended that SMC may take up necessary steps for getting the site notified for development of waste processing and disposal facility.

S No.	**Designation**	**Provision**	**Staff at Present**		
			Permanent	**Contractual**	**Third Party**
1	Sweeper/Waste Picker		442	168	1354
2	Lorry Driver	11	10	0	0
3	Supervisors	41	57	0	0
4	Sanitary Inspector	12	9	0	0
5	Sanitary Chief	3	1	0	0

6	Zonal Sanitary Officer	2	0	0	0
7	District Health Officer	1	1	0	0
8	Additional Municipal Commissioner	2	0		
9	Municipal Commissioner	1	1		

Collection system of existing solid waste in Saharanpur city by NGOs

There are nearly 136,000 households in Saharanpur in the state of Uttar Pradesh and approximately tonnes of waste are generated daily. In order to dispose off household waste in a safe and cost-effective manner, ITC Ltd. launched the ***Mission SuneharaKal*** in October 2006, under its social development initiative. The project has developed a model that reduces the burden of land filling, and helps in recycling/ reusing of biodegradable and recyclable waste. It is implemented in collaboration with an NGO (non-governmental organization) called FORCE &UMANG

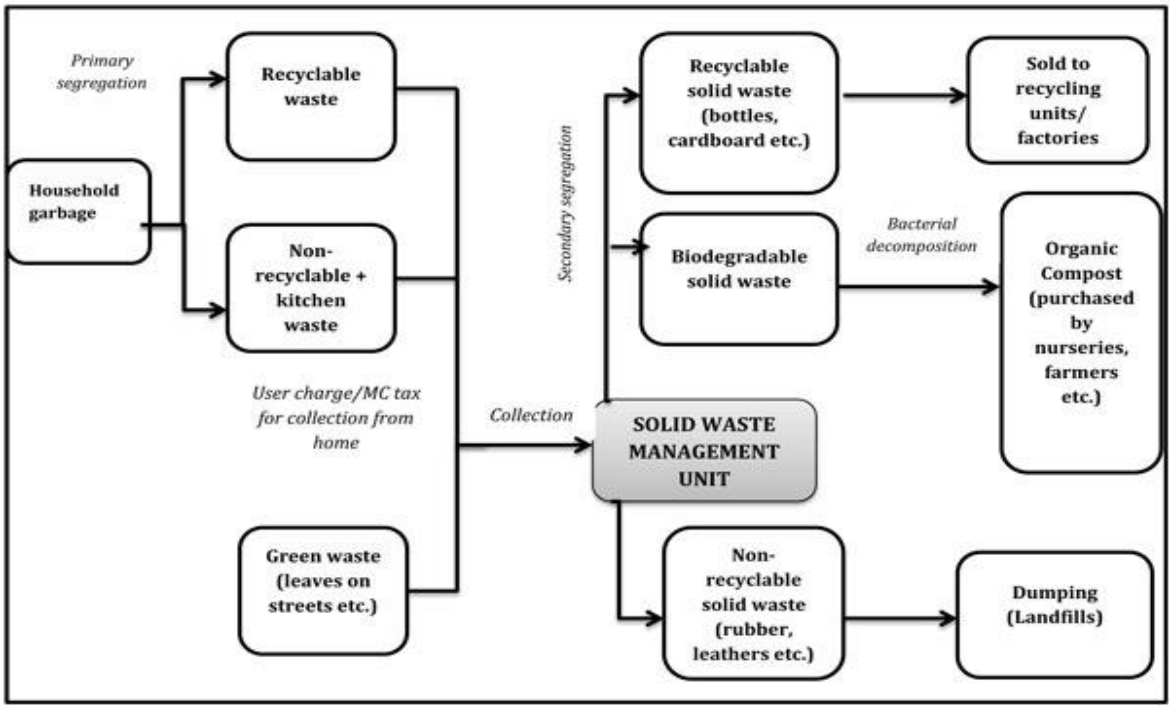
The program covers nearly 60,000 households in Saharanpur. The model is one of door-to-door collection of waste, six days a week. Each waste collector covers 225-250 households daily, between 7.30 am and 12.00 pm. They move around in a *rickshaw* trolley, carrying two plastic bags – one for recyclable waste and the other for biodegradable and non-recyclable waste[5]. Thus, primary segregation of the waste is done at the household level. Households are made aware of the importance and process of primary segregation through campaigns such as road shows, pamphlets etc., as well as day-to-day reminders by waste collectors.

To separate the non-recyclable and biodegradable waste, secondary segregation is done at the waste management site. The biodegradable waste is then processed to make organic compost, the recyclable waste is sold to private vendors, and non-recyclable waste is transported to landfills. Therefore, nearly 85% of the total waste is recycled or reused and only 15% (non-recyclable) goes to landfills.

Working on the principle of 'treatment closer to the generator' or decentralized waste management system, two pieces of land have been provided by the MC for waste management. These sites have been developed close to the collection points to reduce the large expenditure on transportation.

The collection, segregation and transportation of waste not only reduced the cost for the MC, but also reduce its workload. The program is being scaled up to cover the entire city, with the MC's support. It now plays the role of a facilitator instead of the service provider.

The self-sustaining nature of the program makes it viable in the long term. The success of this initiative lies in the fact that the elected Municipal Councilors contribute by creating awareness among people and motivating them to pay the user charges. Moreover, it has involved the community and local government bodies by following the PPPP (people-public-private partnership) model, ensuring the active participation of people and civil society representatives and accountability of the implementing agency in maintaining cleanliness.



YPR 2017-18

- Total Waste collected 3317 Metric Tons
- Compostable waste Collected 2688 Metric Tons
- Recyclable Waste Collected 199 Metric Tons
- Inert Waste Collected 430 Metric Tons
- Waste Composted 339 Metric Tons
- Sales of compost 332 Metric Tons
- Total collection Mohalla committee Rs 61.14 Lakhs
- Total HH Covered – 57,000
- Total No Mohalla Committee - 189
- Total No wards covered in SWM 55

Private Waste Collators

Apart from the above approx. 60000 household covered by private waste collectors. The no of waste collectors engaged in to work is 107 approximately. On daily basis they collect waste from 300 households in alternative days. The collect the mix waste and put it in municipal dump sites or nearby roads.

Municipal Corporation

Apart from the above municipality collects the waste from dump site, streets, etc. In this process 64 vehicles and approx. 190 persons engaged in the process.

10. Justification of Equipment Required

Setup of Waste Management Cell

At the moment, the Corporation has a waste management cell headed by Municipal Health Officer. The cell takes complaints, give information and attend to visitors, Display boards for awareness material, and a communication system for all supervisors to keep in touch with the cell and attend to complaints promptly could also be implemented. Apart from the cell as per MoU with ITC, Force and Umang a Project Management Committee formed where Municipal Commissioner is the President of the Committee. Other members are Municipal Health Officer, ITC Programme Officer is the Conveyer and Force Director, Umang Secretary and Municipal Chief Sanitary Inspector the members of the committee to monitor the progress and plan for further.

Generation of Information & Awareness

As per the study done it is observed that major household did not have knowledge of waste segregation or not willing to segregate the waste. Also it is observed that approx. 9% households are not interested to provide waste. So it is required to build knowledge of every citizen of the city. To create awareness generation it requires to undertake household campaign, meeting with women members, exhibitions, school programmes, drives, contests, etc to generate awareness among students and general public.

Provision of Litterbins

The open community bins are removed from all over the city, therefore there is need to install litterbins at a distance of 300 to 500 meters and the requirement of litterbins is necessary.

Door-to-Door Collection System

Presently the Force and Umang form 189 RWA covering 57000 households. The RWAs take responsibility of daily door to door waste collection out of this 28000 households ensuring segregation. The waste going to processing sits of Umang and Force. Apart from the above approx. 60000 household collected by private workers. So it need to form RWAs in these areas and convenience them to segregate waste. It is also require to meeting with these waste collectors to convenience them to collect on daily basis and hand over the waste to waste collection vehicles. In the project staff get all safety majors and to further improving of door-to-door Municipal Solid Waste collection is done as regards tointroduction of safety and health measures by way of supply of neat uniform to sanitation workers, and other requirements to private workers. Gloves that are in use are of standard rubber and cause skin irritation to the workers with prolonged use. A better, but little more expensive glove made of cloth or canvas is required. These gloves can be sourced locally. The waste is being collected in a wheeled trolley. For this purpose trolley should be made available to every society to transfer their household waste as the same can be lifted by waste collection vehicle without loss of time.

Hotel Waste

The waste from hotels, restaurants, is being collected separately as a special service. All the hotel in the city are listed under this scheme but need to cover restaurants. One truck collects the waste by making 2 trips to around 150 hotels and restaurants. It is proposed to introduce more trucks to perfect the system, as, if there is any delay in collection of this waste, hotels and restaurants close with waste left on the roadside.

Market Waste

The waste from the fish market and meat selling shops need to collect separately in the evening and others vegetable markets in the late evening. One truck makes two rounds to collect the waste. In the Mandi waste collection workers are placed by the committee, so it is required to setup composting unit in there to process the waste.

Medical Waste

Presently medical waste is being collected separately. However, the same is not disposed as laid down under the rules. The Corporation also does not have its own incinerator to dispose the waste. The collection of medical waste needs further improvement by introducing a van with a specially built compartment, special uniform to the waste collector and special container. As per the Bio-Medical Waste (Management & Handling) Rules, 1998, yellow bags are to be procured for separate collection of infected medical waste from clinics, labs and hospitals. Apart from the above for residential medical waste household and waste collectors should train for separate storage and collection respectively. In the rickshaw and collection vehicle a separate yellow container to be placed to collect the medical waste.

Setup of Composting Stations in the City

In order to reduce the amount of biodegradable wet waste to the landfill site, SMC need to ensure promote 1. Home Composting 2. Community Composting and 3. Processing and Composting sites. SMC need to promote different composting methods to process the biodegradable waste in their proximity itself. Also SMC required to set up four gasification station in the city to process the waste and reduce the methane effects in the city. The gasification and be used for cooking or electricity generation.

Management of Composting Stations

1. Home Composting – To reduce waste it is required to promote home composting in the city. In the process the wet or biodegradable waste composted in the house itself which reduces the hazards. To promote the same municipality requires to take some monitory benefits to the houses in terms for provide discount on service charge.
2. Community Composting – To process waste proximity to the generator it is required to set up processing sites in the parks of the community or spaces of the community where biodegradable waste processed.
3. Central Processing Sits- SMC has to plan 4 processing sits for gasification setup. The gasification will reduce the methane imitation which is harms to the environment. The Gasification process helps to generate power for SMC.

To manage the composting stations in the city, SMC guide the team of supervisors to monitoring and managing compostingstations. Besides uniform and gloves, a face-mask and rubber boots is also required to each of the processing Sanitation Workers.

Recyclable Waste Sorting Centers

In order to reduce the amount of recyclable dry waste going to the landfill site, SMC, requires to tighten the household and waste collectors to collect segregated waste form household and instruct waste collectors to collect segregated waste. Also take legal actions to household or waste collector to segregate waste and collect segregated waste. Apart from the above SMC has to set up another two place except Umang and Force center for segregation of recyclable waste. SMC has to ask all the rag pickers to segregate the waste in that sits and take to recyclable. The rest inert waste will goes to cement industry after compaction.

Reduction of Residual Waste

To reduce residual waste, steps have been taken to motivate the household to promote home composting. Also take steps to reduce or stop plastic waste or polythene use I the city which ranks first for look dirty. Apart from the above identify manufacturers to start the 'polluter pays' principle wherein the manufacturer takes back waste generated by its products. Also SMC require storage space and advertising material to promote such schemes.

11. Designs & Drawings of Proposed SWM

The Corporation is in process of acquisition of land for setting up of sanitary landfill site. The corporation allocated to land for compost processing to Umang and Force. SMC requires to identify two lands in the city for processing the waste in there. Once the land is taken into possession, detailed survey and geo-hydrological investigation will be carried out for development of sanitary landfill process the debris or construction wastes.

12. Operation & Maintenance of Equipment

Vehicles

SMC has a parking lot reserved for its present vehicle fleet. It also has anautomobile workshop with trained staff to undertake minor repairs,maintenance or preventive maintenance for all its vehicles including allMunicipal Solid Waste trucks available with itself. SMC has appointed a full-fledged engineer who is responsible for addressingall vehicle and vehicle staff issues. It is his responsibility to make sure that allthe vehicles are maintained in running condition.

Storage Bins & Implements

Every word comprises of 1500 to 3000 households and 100 to 200 shops & establishments. To cover the area, it requires to engage 7 to 14 waste collectors to collect the waste on daily basis. The waste collectors collect the waste an put the same in centralized place where municipality requires to place storage units in the area, from where vehicles pick up the waste and lift to processing sites.

13. Operation & Maintenance of Sanitary Landfill

The SMC have no sanitary landfill, so it is required to process al the waste in different process the processes are 1. Gasification or composting of biodegradable waste, 2. Sorting and handover the recyclable waste to waste collector or rag picker for processing and 3. Inert waste to be used for processing in cement industry.

14. Routing Plan for Storage & Collection of MSW

The Corporation of the City of Saharanpur has vehicles that have a daily plan to collect the waste from different areas. In the planned model a vehicle will placed at center point of the ward or an easy accessible place where all the waste collectors handed over the segregated waste to the vehicle or some time they can handover twice. To cover the delay and mitigate the gap municipality requires to put storage places where waste collector deposit their waste and vehicle take the waste from there. From there the vehicle shifts the waste to processing site. Waste is treated here, before it is left to compost for a period of 1.5 month or go for gasification. Compost generated will be sale to the nursery or farmer or is used for the gardens in the city. It is also passed on nominal cost to deserving farmers.

Apart from the above it requires to construct composting stations to promote community composting. The wet waste is transported to a community composting site and composted at there. For waste generated by Hotels & Restaurants & Market, it is taken to a larger composting facility where winrow composting is done with the help of an excavator and trained staff or Gasification will be installed for gasification as well as composting. Once Dry waste is picked up, it makes its way to once of the four sorting stations in the city where the recyclable fractions are extracted for recycling. The rest will be compacted and transported to cement industry.

15. Institutional & Financial Reform

Institutions – To monitor the progress the PMU will sit on quarterly basis to plan and monitor or if required for meeting call a meeting.

RWA – To sustainability of the SWM and create ownership it is required to form RWA or Mohalla Committee in every streets of the city (it is from 100 households 250 household per committee).

The responsibility of the committee is to appoint a waste collector to collect waste. The committee collect user charge from households and pay the wage to waste collector. In later stage the RWA will monitor the segregation, day to day collection and cleanliness of the area.

Financial reform – In the SWM process there is two major parts. The first part is collection of waste and second part is processing the waste. In the first part RWA collect the service charge from household and pay the same to waste collector. And in second part SMC collect the processing charge from household by including it in property tax.

16. Action Plan for Operation & Maintenance Through User Charges

Since 2017, Saharanpur Municipal Corporation has implemented user charges for all households, commercial establishments, restaurants, hotels and hospitals. The chargesare as follows:

Group	Purpose	Amount per Month
Households	Daily Collection of MSW	30 /- to 60 /-
Commercial Establishments	Daily Collection of MSW	30 /-
Restaurants / Hotels:	Daily Collection of MSW	300 /-
Shops	Daily Collection of MSW	30 /- to 70 /-
Restaurants	Daily Collection of MSW	300 /- to 700 /-
Hotels	Daily Collection of MSW	1000/- to 2000 /-
Lodge	Daily Collection of MSW	200 /- to 250 /-
Dhramsala	Daily Collection of MSW	100 /- to 200 /-
Banks and offices	Daily Collection of MSW	200 /-
Schools	Daily Collection of MSW	100 /- to 200 /-
Movie Hall	Daily Collection of MSW	500 /-
Mall	Daily Collection of MSW	5000 /-
Marriage Hall	Daily Collection of MSW	2500 /-
Hospital	Daily Collection of MSW	1000 /- to 2000 /-
Hostel	Daily Collection of MSW	200 /- to 300 /-
College and University	Daily Collection of MSW	2000 /-
Coaching Institute	Daily Collection of MSW	500 /- to 1000 /-
Workshop and Factories	Daily Collection of MSW	300 / - to 700 /-

As per the present situation and future sustainability it is required to for RWAs in every area of the city and they will manage the waste collection by engaging a waste collector and contribute user charges for wages of waste collector. They have also required to monitor the waste segregation at source. Apart from above to process the waste municipality will have to charge a certain amount to household and other establishments for processing the waste. The below table shows the cost calculation for processing the waste.

Sl. No.	Vehicle Required	Purpose	Expenditure
1	35 Tata Ace or Tractor	Waste pickup from Rickshaw	Rs 1000/day @ 25 days = 8.75 lakh
2	1 Compactor	Inert waste compaction	Rs 2000/day @ 25 days = 0.5 lakh
3	1 Truck	For waste shifting to cement plant	Rs 2000/day @ 25 days = 0.5 lakh
4	1 JCB	For Inert waste &	Rs 5000/day @ 25

		Debris Lifting	days = 1.25 lakh
5	4 processing site	Processing of waste biodegradable waste to gasification or compost	Rs 1 lakh per site = 4 lakh per month.
Total			Rs 14 lakh
Processing Cost to be recovered from household establishments			Rs 20 per household per month = 30.0 lakh

the SMC proposed to revise charges for processing of waste. It is also proposed to include these charges directly in the annual property tax.