

2022

**Pre-Feasibility Report of
Integrated Solid Waste
Management Project
Dineshpur Cluster
[Dineshpur and Gularbhoj ULBs]**

Ind Tech House Consult, New
Delhi

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CHAPTER - I EXECUTIVE SUMMARY

1.1 Introduction

Government of Uttarakhand has decided to implement Integrated Solid Waste Management (ISWM) in all Urban Local Bodies (ULBs) by forming Clusters of ULBs on the concept of Regional level facilities, including landfill site. In this model a cluster of ULBs is formed on the basis of logistical connectivity. The solid waste is to be collected from household in every ULB and it is to be brought to the regional landfill facility in covered vehicles. This regional landfill facility is to be situated in the town which produces maximum municipal solid waste. Then waste is to be weighed, segregated, material recovery and waste processing has to be done. The residual waste is to be scientifically disposed in the scientifically designed Sanitary landfill (SLF).

In this regard, Office of the Program Director, Uttarakhand Urban Sector Development Agency (UUSDA), Uttarakhand had appointed Tata Consulting Engineers (TCE) for “Carrying out Preparation of Detailed Project Report (DPR) for ISWM based on Regional Landfill Site Concept” for Dineshpur Cluster. The Dineshpur Cluster includes Two ULB’s viz. Dineshpur and Gularbhoj.

Salient Features of the Project

1	Name of the Applicant	Dineshpur Nagar Panchayat
2	Proposed Project	Integrated Solid Waste Management (ISWM) Project for Dineshpur Cluster (Dineshpur & Gularbhoj ULB's)
3	Proposed Sector	7(i), Common Municipal Solid Waste Management Facility
4	Address for Correspondence/ Telephone number	Dineshpur Nagar Panchayat Ward No. 02, Matkota Road, Dineshpur, Uttarakhand - 263 160 Tel # 059 4923 4605
5	Name	Mr. Sanjay Kumar
	Designation (Owner/Partner/CEO)	Executive Officer
	Proposed land area	0.385 Ha

Project Site Co-ordinates	Geographical Co-ordinates: Latitude: 29°02'07.60"N Longitude: 79°19'04.50"E
Design period and Capacity	10 TPD MSW Processing Facility for Dineshpur cluster with a design capacity of 25 years. The civil infrastructure for waste processing is proposed considering waste generation of next 25 years [21 TPD] at both the ULBs.
Components of the proposed facility	The facility will include – windrow composting of organic wastes, baling of dry wastes, temporary storage shed of inert waste for further weekly disposal at regional landfill facility at Rudrapur.
Manpower requirement	Manpower requirement for the proposed processing and disposal facility is 12.
Total Water Requirement/ Source	4 KLD Fresh water. Source: Onsite groundwater abstraction
Cost of proposed Project	INR 347.67 lakhs

CHAPTER – 02

INTRODUCTION OF THE PROJECT/BACKGROUND INFORMATION

2.1 Identification of the Project and Project Proponent

Urban solid waste management has become one of the important facets of public health. With rapid urbanization and changing lifestyles, there is an increased generation of MSW quantity which makes the problem of MSW management increasingly acute. Most of the urban areas are overwhelmed by discriminating problems related to solid waste management. The collection and disposal of solid waste is one of the pressing problems in the urban areas.

The scarcity of suitable landfill sites is one of the constraints increasingly being faced by ULBs in the discharge of their functions. As a result, even several years after the issuance of the SWM Rules 2016, the state of solid waste management systems in the country continues to raise serious public health concerns. Regional or inter-municipal solutions provide a viable option to redress this situation. Working together can be a practical and cost-effective way to discharge common tasks, share resources, and take advantage of the economies of scale that such arrangements would provide. This is applicable in the case of both large municipal bodies which experience scarcity of land resources, as well as smaller ones which may find technical and financial resources a challenge.

Dineshpur is a town and a nagar panchayat in Udham Singh Nagar district and Gularbhoj is a small village in the Gadarpur Block In Udham Singh Nagar District in Kumaon Division of Uttarakhand.

Two ULB's Dineshpur and Gularbhoj are considered for the Integrated Solid waste management plan for the Dineshpur cluster. The cluster is finalized ensuring optimization of the quantity of the solid waste and travel distance in the best possible way for the current scenario. The two ULB's are connected by road [approx. 6.5 km distance]. Dineshpur is the largest ULB in the cluster with Maximum population and waste generation respectively.

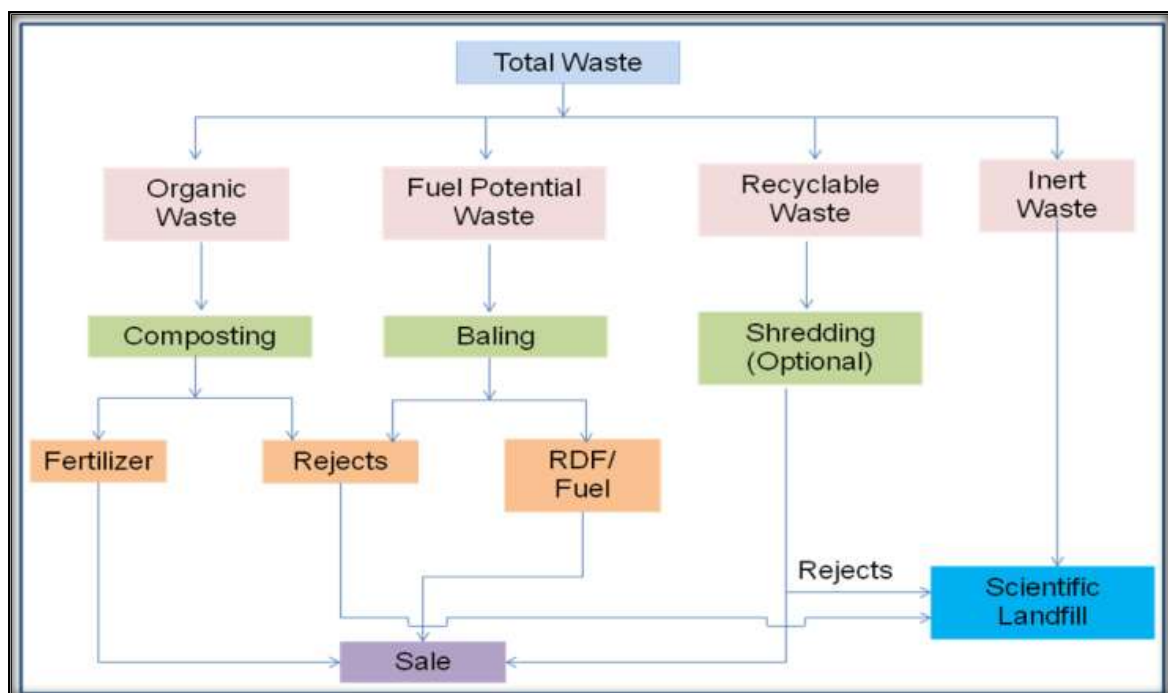
2.2 Brief Description of the Project

An integrated solid waste management (ISWM) facility on Cluster Approach at Dineshpur city will be established with redesigning & improving the existing solid waste management

system in an environmentally and economically sustainable manner. The project falls under Category 'B' of Schedule 7(i) Common Municipal Solid Waste Management Facility as per the EIA Notification, 2006 & its amendments thereof and will be appraised by SEAC Uttarakhand. The project consists of:

- Segregation and storage
- Primary Storage & Collection System
- Secondary Storage, Collection & Transportation System
- Integrated Solid Waste Management Facility on Cluster Approach at Dineshpur

The proposed infrastructure for primary waste collection will enforce segregation of waste at all the waste generation sources followed by separate collection and transportation system. The blueprint of the same is given in Figure below.



Proposed Waste Management System

2.3 Need of the Project

Government of Uttarakhand has decided to implement Integrated Solid Waste Management projects in all ULBs by forming Clusters on the concept of Regional Level Facilities, including Landfill Site. In this model, clusters of ULBs are proposed to be formed based on proximity, logistics and quantity of waste generated in the cluster. The solid wastes generated in ULBs

is proposed to be collected from household and brought to the regional landfill facility in covered vehicles. This regional landfill facility is proposed to be ideally situated in and around the ULB that generates maximum municipal solid waste in the cluster.

Office of the Program Director, Uttarakhand Urban Sector Development Agency (UUSDA), Uttarakhand has prepared a Detailed Project Report (DPR) for ISWM based on Regional Level Concept for Dineshpur Cluster through Tata Consulting Engineers.

ISWM is an organized process of storage, collection, transportation, processing of MSW and disposal of process rejects in an engineered sanitary landfill. It is an integrated process comprising several collection methods, varied transportation equipment, storage, recovery mechanisms for recyclable material, reduction of waste volume and quantity by methods such as composting and scientific disposal of process rejects in an eco-friendly manner.

The Implementation of ISWM is an important component of the Government of India's "Swachh Bharat Mission" (SBM) - component IV. Considering the above, UUSDA proposes to strengthen the ISWM system in each ULB covering segregation, collection, transportation, recycling, processing and disposal. The project shall comply with the Solid Waste Management Rules, 2016 (SWM Rules, 2016), CPHEEO manuals (including cost recovery mechanism), Operation & Maintenance (O&M) practices and service level benchmark advisories released by MoUD from time to time. SWM Rules, 2016 stipulate that each ULB should treat and dispose of the MSW generated by them in a manner so as not to cause damage to human health and environment.

CHAPTER – 03

PROJECT DESCRIPTION

3.1 Type of the Project

Dineshpur - Municipal Solid waste management facility for Dineshpur cluster will be developed in Dineshpur. Organic waste is proposed to be treated by composting technology along with wet waste from Gularbhoj. The dry waste will be baled and sold to recyclers. The inert waste storage shed is proposed at MSW processing facility at Dineshpur for temporary storage of the inert waste and then ultimately disposed to regional landfill site at Rudrapur, preferably once in week. Rudrapur is located at a distance of about 18 km from Dineshpur town.

Gularbhoj - Decentralized dry waste segregation center is proposed in this ULB. The dry waste will be baled and sold to recyclers.

The land available for setting up of processing site at Dineshpur is 0.4 Ha [4000 sqm]. The civil infrastructure for waste processing will be made considering waste generation of next 25 years [21 TPD] at both the ULBs.

3.2 Location

Dineshpur ULB in this cluster is a Nagar Panchayat in the district of Udham Singh Nagar and is located in the south-eastern part of the Indian state of Uttarakhand at 29°04'N and 79°32'E. It is around 244 km by road from state capital Dehradun. Matkota-Gadarpur Road and Dineshpur-Jafarpur are the major roads that cross the town and are the main center of commercial activities.

Gularbhoj is a small Village/hamlet in Gadarpur Block in Udam Singh Nagar District and comes under Gularbhoj Panchayat. It is located 17 KM towards North from District headquarters Rudrapur, 6 KM from Gadarpur and 215 KM from State capital Dehradun. It is located at 29°05'30.28" N 79°18'56.35" E. The distance between Dineshpur and Gularbhoj is approx. 6.5 km by road.

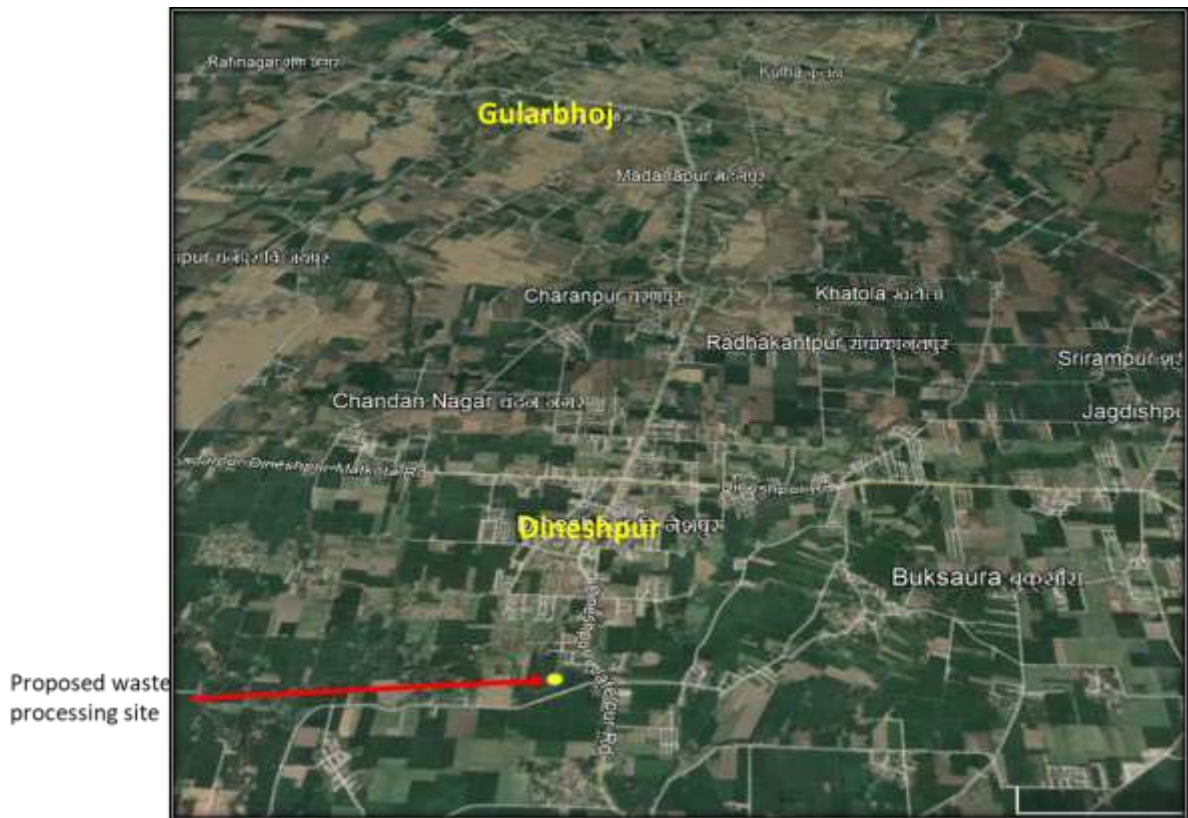


Figure 3.1 Location of Two ULBs and Waste Processing Site

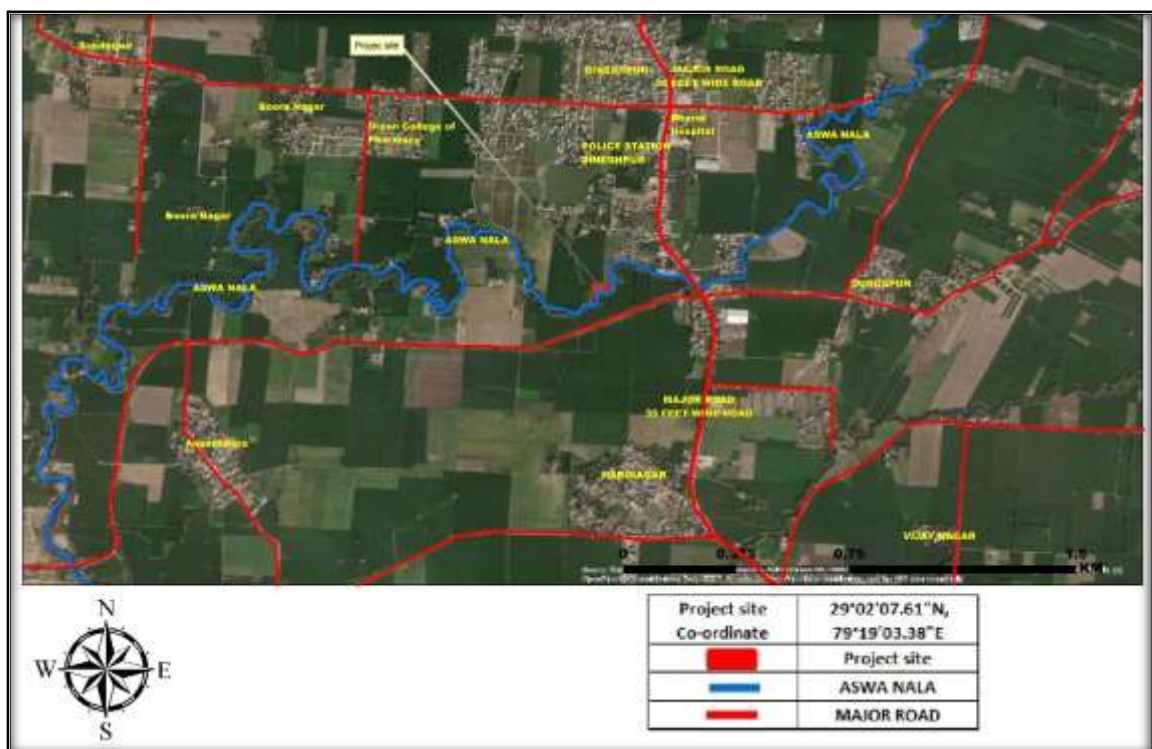


Figure 3.2 Proposed Waste Processing Site Location on Google Earth Imaginary

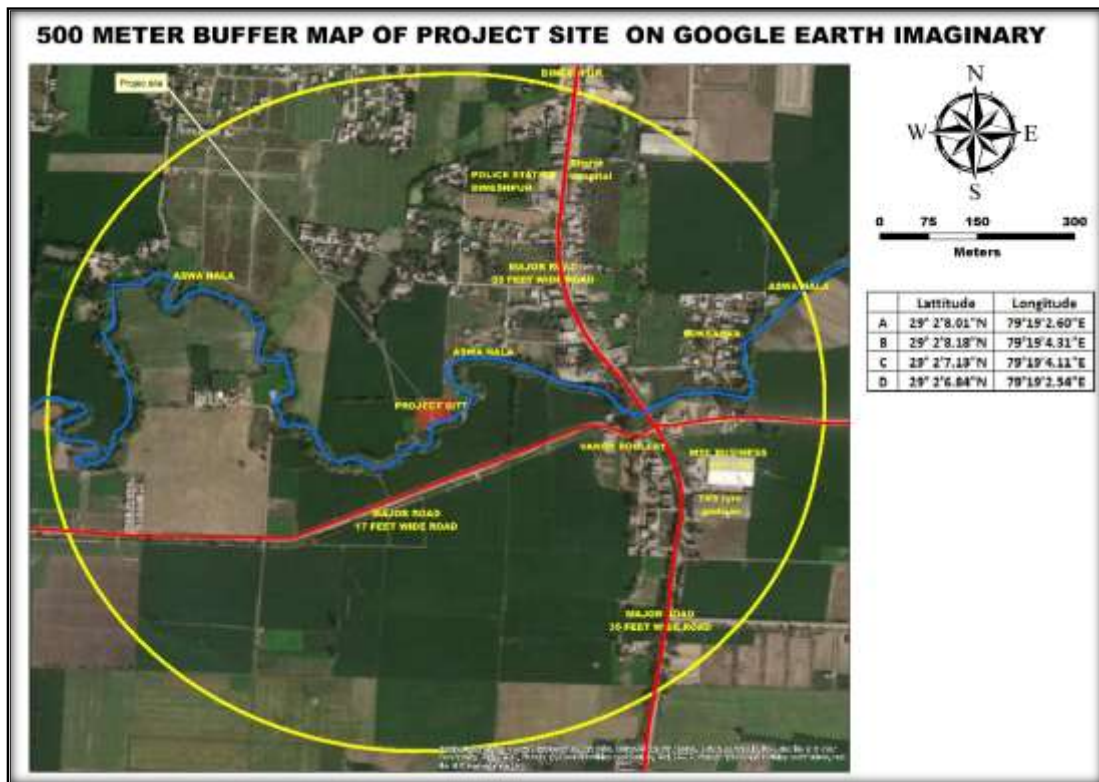


Figure 3.3: 500m Buffer Map of Proposed Site

3.3 Project Description

3.3.1 MSW Wastes Projection

The per capita waste generation is considered as 400 grams per day and for floating population 40 grams per capita per day is adopted.

Year	Projected Population	Floating Population	Per capita solid waste (in kgs/day)	Floating Population (per capita solid waste (in kgs/day))	Total population SW Generation (TPD)	Floating population SW Generation (TPD)	Total Solid Waste Generated (TPD)
2020	13587	543	0.41	0.041	5.54	0.022	5.57
2025	14787	591	0.450	0.045	6.660	0.027	6.69
2030	15953	638	0.497	0.112	7.93	0.032	7.97
2035	17085	683	0.055	0.549	8.545	0.038	9.42
2040	18183	727	0.061	0.606	9.529	0.044	11.07
2045	19248	770	0.067	0.669	12.88	0.052	12.94

Figure 3.4: Waste Projection for Dineshpur

Year	Projected Population	Floating Population	Per capita solid waste (in kg/day)	Floating Population (per capita solid waste (in kg/day))	Total population SW Generation (TPD)	Floating population SW Generation (TPD)	Total Solid Waste Generated (TPD)
2020	8157	816	0.408	0.041	3.33	0.033	3.36
2025	8824	882	0.450	0.045	3.97	0.040	4.01
2030	9491	949	0.497	0.050	4.72	0.047	4.77
2035	10158	1016	0.549	0.055	5.58	0.056	5.63
2040	10825	1082	0.606	0.061	6.56	0.066	6.63
2045	11491	1149	0.669	0.067	7.69	0.077	7.77

Figure 3.5: Waste Projection for Gularbhoj

3.3.2 Existing Solid Waste Management System [Dineshpur]

The flow diagram of existing solid waste management in Dineshpur is represented as below -

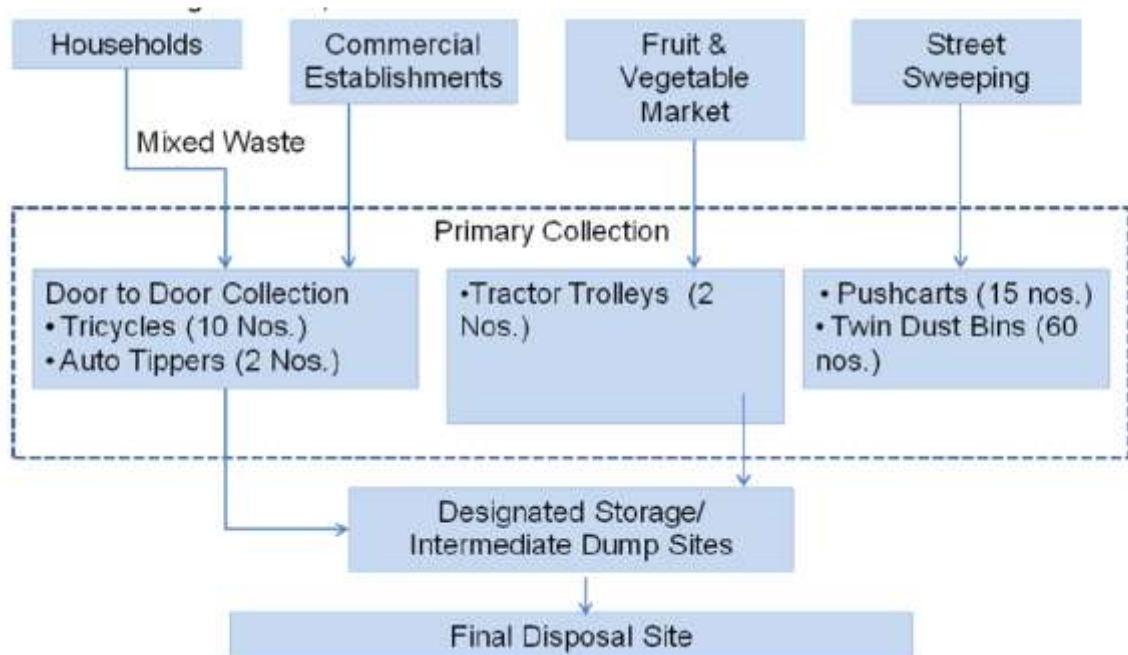


Figure 3.6: Existing Solid Waste Management System - Dineshpur

Present Disposal – All the solid waste generated at Dineshpur is dumped presently on sides of Gadarpur Road without any processing. The site is having a level difference of 1- 1.5 m from the road and the waste is being dumped in these low-lying areas.

3.3.3 Existing Solid Waste Management System [Gularbhoj]

Solid waste is collected and transported from residential, commercial and street sweeping by the Gularbhoj Nagar Panchayat (GNP). Source segregation is not achieved 100% across the entire town and missed waste is collected and transported to community bin. Transportation of waste is being done using auto tipper.

3.3.4 Proposed Solid Waste Management System [Dineshpur Cluster]

For the proposed project of SWM of Dineshpur Cluster (Dineshpur & Gularbhoj), following components are proposed:

- Household Bins for source segregation
- Roadside Bins
- Wheel Barrows for sweepers
- Auto Tippers for DTDC
- Processing facility infrastructure for 25 years
- All ancillary buildings and machineries
- Safety equipment's for all the workers

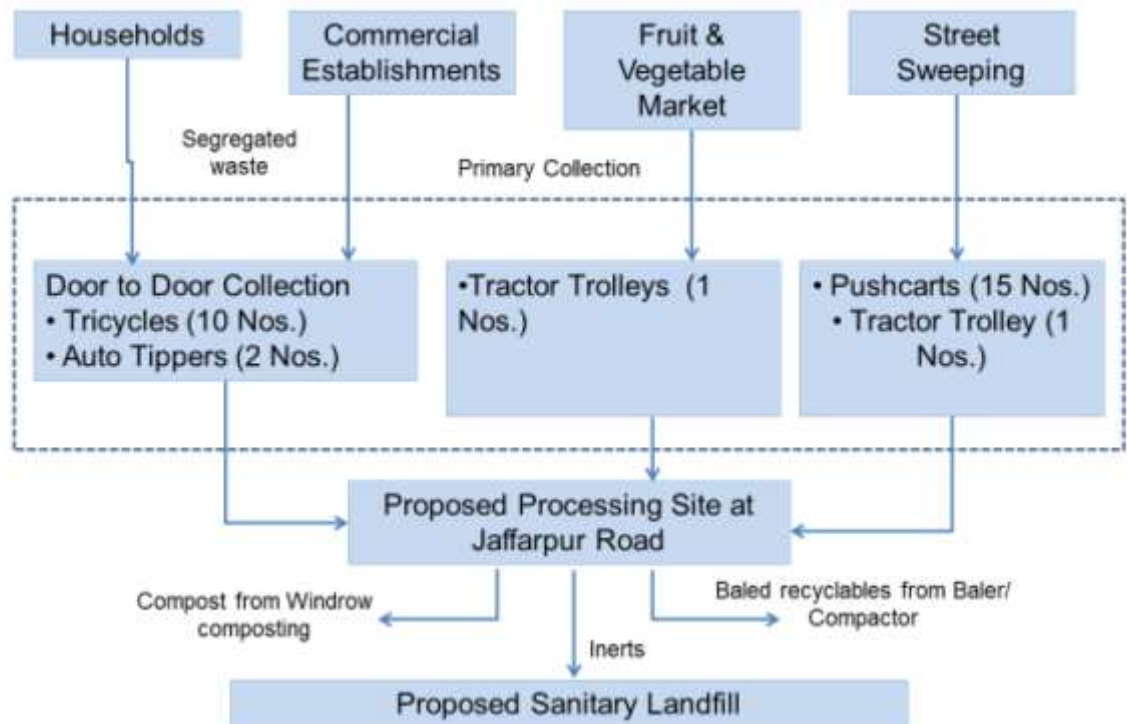


Figure 3.7: Proposed Solid Waste Management System - Dineshpur

The efficiency of the proposed Waste Management Plan will be driven by the separation of waste at the primary collection level. For this purpose, following approach needs to be adopted by the residents as well as the Municipality personnel –

- Create awareness for segregation and storage of waste in three bin system for wet, dry and household biomedical/ hazardous waste
- Organize awareness campaigns for waste segregation through local NGO’s, school representatives
- Regular meeting and interaction with representatives of local residents’ associations, community participants, NGO’s etc.
- To direct waste generators not to throw waste in the neighborhoods on streets and other open areas.

However, it is not easy to implement source segregation practices immediately. A prolonged campaign will be required with adequate budgetary provisions to impress the citizens that source segregation will provide them a healthy environment and a better lifestyle.

3.3.5 Proposed Wastes Processing Facility at Dineshpur

The facility will include –

- windrow composting of organic wastes collected from Dineshpur and Gularbhoj
- baling of dry wastes from Dineshpur
- temporary storage shed of inert waste for further weekly disposal at regional landfill facility at Rudrapur.

At present the proposed facility will manage 10 TPD municipal solid wastes processing for Dineshpur cluster with a design capacity of 25 years [21 TPD]. A Detailed Project Report has been prepared and as per DPR, the project has the capacity of 21 TPD as the wastes quantity will rise in next 25 years.

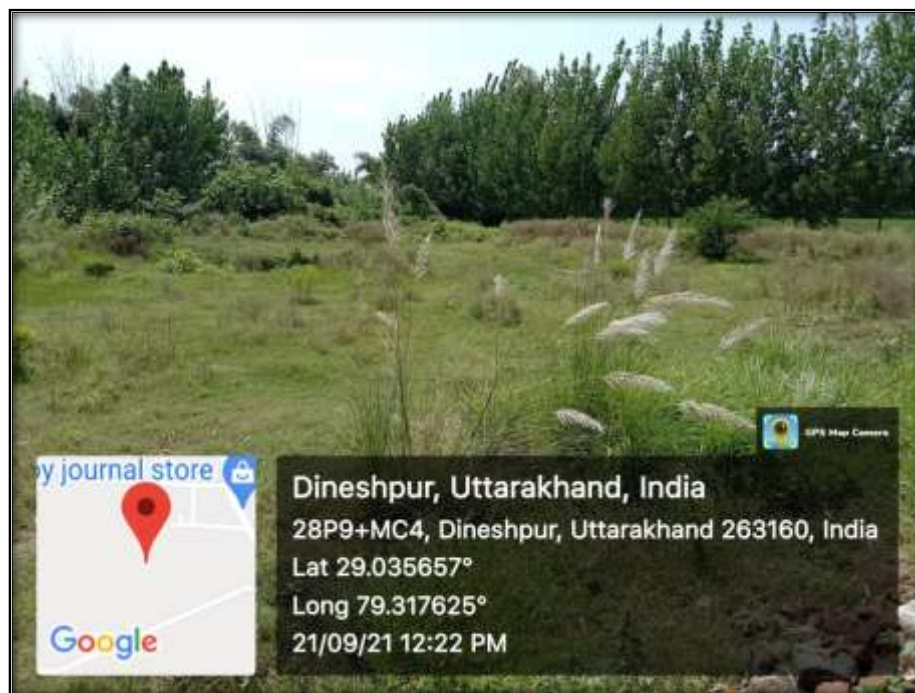


Figure 3.8: Proposed Site for Solid Waste Management Facility at Dineshpur

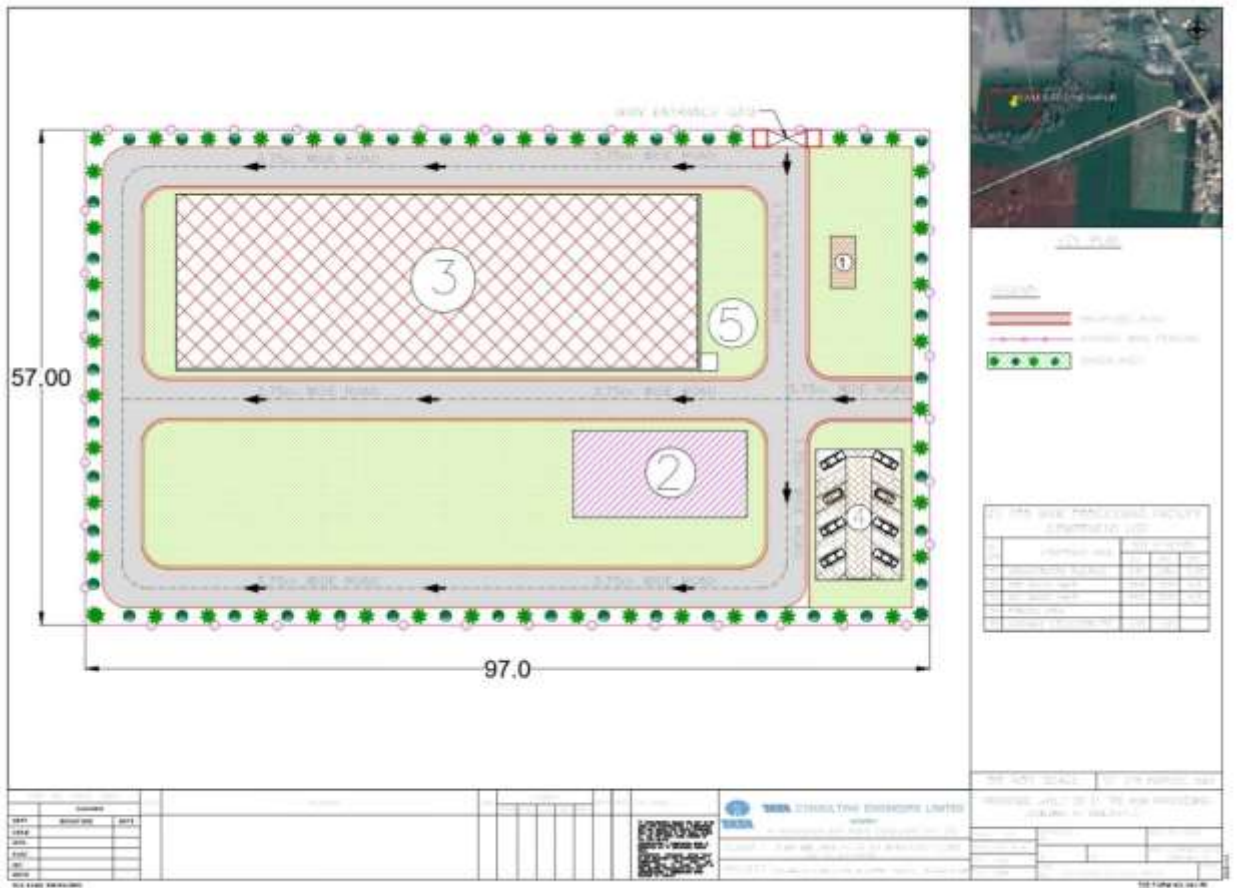


Figure 3.8: Proposed Project Layout Plan - Dineshpur

CHAPTER-04

SITE ANALYSIS

4.1 Site Selection

No alternative sites examined. Due to unavailability of alternate land, Govt. of Uttarakhand has approved the site for setting up of Dineshpur Cluster MSW processing unit.

Location Criteria	Village-Chandayan, Ward No. 09, Indra Nagar, Dineshpur, Tehsil-Gadarpur, Dist – Udham Singh Nagar, Uttarakhand – 263 160
Lake or Pond: No landfill should be constructed within 200 m of any lake or pond. Because of concerns regarding runoff of waste water contact, a surface water monitoring program should be established if a landfill is sited less than 200 m from a lake or pond.	No lake or pond within 200 m radius of the site
River: No landfill should be constructed within 100 m of a navigable river or stream. The distance may be reduced in some instances for non-meandering rivers but a minimum of 30 m should be maintained in all cases	No river within 100 m radius. Aswa Nalla [storm water channel-seasonal] is located adjacent to the project site on south outside the project boundary.
Flood Plain: No landfill should be constructed within a 100 year flood plain. A landfill may be built within the flood plains of secondary streams if an embankment is built along the stream side to avoid flooding of the area. However, landfills must not be built within the flood plains of major rivers unless properly designed protection embankments are constructed around the landfills	The project site is not located in any flood plain.
Highway: No landfill should be constructed within 200 m of the right of way of any state or national highway. This restriction is mainly for aesthetic reasons. A landfill may be built within the restricted distance, but no closure than 50 m, if trees and berms are used to screen the landfill site	No national or state highway within 200 m of the site. NH 309 passes - 3.5 km on SW

<p>Habitation: A landfill site should be at least 500 m from a notified habitated area. A zone of 500 m around a landfill boundary should be declared a No-Development Buffer Zone after the landfill location is finalized.</p>	<p>This proposed site is not for a landfill project. It will be a solid waste processing site and will include - windrow composting of organic wastes, baling of dry wastes, temporary storage shed of inert waste for further weekly disposal at regional landfill facility at Rudrapur.</p> <p>Nearby habitation is located at a distance of 80 m on NE of project site.</p>
<p>Public Parks: No landfill should be constructed within 300 m of a public park. A landfill may be constructed within the restricted distance if some kind of screening is used with a fence around the landfill and a secured gate.</p>	<p>No public park within 300m.</p>
<p>Critical Habitat Area: No landfill should be constructed within critical habitat areas. A critical habitat area is defined as the area in which one or more endangered species live. It is sometimes difficult to define a critical habitat area. If there is any doubt then the regulatory agency should be contacted</p>	<p>Not a critical habitat area.</p>
<p>Wetland: No landfill should be constructed within wetlands. It is often difficult to define a wetland area. Maps may be available for some wetlands, but in many cases such maps are absent or are incorrect. If there is any doubt, then the regulatory agency should be contacted</p>	<p>Not a wetland.</p>
<p>Ground Water Table: A landfill should not be constructed in areas where water table is less than 2 m below ground surface. Special design measures be adopted, if this cannot be adhered to.</p>	<p>Ground water table is approx.. 4 m bgl.</p>
<p>Airports: No landfill should be constructed within the limits prescribed by regulatory agencies (MoEF/CPCB/Aviation Authorities) from time to time</p>	<p>Pantnagar Airport – aerial distance 14 km on East</p>

<p>Water Supply Well: No landfill should be constructed within 500 m of any water supply well. It is strongly suggested that this locational restriction be abided by at least for down gradient wells. Permission from regulatory agency may be needed if a landfill is to be sited within the restricted area</p>	<p>This is not a landfill project. However, No centralized water supply well exists around the project site.</p>
<p>Coastal Regulation Zone: A landfill should not be sited in a coastal regulation zone.</p>	<p>Site not located in a coastal regulation zone</p>
<p>Unstable Zone: A landfill should not be located in potentially unstable zones such as landslide prone areas, fault zone etc.</p>	<p>The area is not a potentially unstable zone.</p>

4.2 Connectivity

Dineshpur - Pant Nagar Airport is the nearest Airport to Dineshpur situated at a distance of 17 km. Taxis are available from Pant Nagar Airport to Dineshpur.

Nearest Railway Station is Rudrapur City Railway Station which is well connected by railways with major cities of India.

Dineshpur is well connected with motorable roads with major destination of Uttarakhand state. Buses to Rudrapur a nearest city from Dehradun and Delhi are easily available

Gularbhoj – Gularbhoj railway station and Beria Daulat Railway Station are the nearby railway stations to Gularbhoj.

Gularbhoj is well connected to all major cities of the states and region. The nearest national Highway is NH 309. Gularbhoj is well connected to motorable roads with major destination of Uttarakhand state. Buses to Rudrapur a nearest city from Dehradun and Delhi are easily available.

4.3 Land Form, Land Use and Land Ownership.

Project site is an undeveloped vacant land [0.385 Ha] owned by Dineshpur Nagar Panchayat. The land has been approved by Govt. of Uttarakhand for the proposed project. Current landuse of the plot is industrial. So, there will be no change in land use due to development of Solid Waste Management Facility.

4.4 Topography (along with Map)

The site falls in the survey of India toposheet No. 530/8. The land within the existing remises is almost flat without any undulations. Average elevation of the site is 216m above sea level. Due to proposed project, there will be minor topographical changes due to the excavations, construction activities pertaining to the project.

4.5 Existing Land Use Pattern (Agriculture, On-Agriculture, Forest, Water Bodies (including area under CRZ), Shortest distances from the Periphery of the Project to the Periphery of the Forests, National Park, Wild Life Sanctuary, Eco Sensitive Areas, Water Bodies (distance from the HFL of the River), CRZ, in case of Notified Industrial Area, a copy of the Gazette Notification should be given.

The land area of 0.385Ha is already handed over to Dineshpur Nagar Panchayat where the proposed solid waste processing facility will be setup.

Land-use Pattern - Current land use is industrial.

List of the Reserve Forests present in Buffer Zone -

- DhMRI R.F - 6 km, NE
- Pipu R.F - 9 km, SW
- Haripura Reservoir – 8.8 km, N

List of the Protected Forests present in Buffer Zone - No such area is located within the 15 km radius of the proposed project area.

List of the Water bodies present in Buffer Zone -

- Aswa Nalla – adjacent on south
- Bhakra river – 2.1 km W
- Bhakra canal – 6.2 km NE
- Khala river – 1.5 km NW
- Thandapani River -5.6 km NW
- Khajya Canal – 6.2 km NW
- Saudiya river -7.5 km NW
- Kakrala River – 7.3 km NW
- Nihal river – 6.8 km NW

- Khairiya river – 5.1 km E
- Hatyari river – 8.5 km E
- Dhimri river – 6.3 km SE
- Kagarsen river – 7.7 km NE

“No national park/wild life sanctuary present within the 10 km radius of the project site”

4.6 Existing Infrastructure

The site is approached from Dineshpur- Jaferpur Road [approx. 30 feet wide] through existing kuchha village road [approx. 15 feet wide]. The final approach stretch of approx. 170m to be constructed by the Nagar Panchayat which joins the existing pucca road [110m stretch]. This road finally joins Dineshpur- Jaferpur Road.

The proposed site does not have any existing infrastructure. All facilities will be developed by the Nagar Panchayat.

4.7 Climatic Data from Secondary Sources

Dineshpur is situated at an altitude of around 222m above sea level. The climate of Dineshpur is generally temperate, although it varies from tropical, from hot in summers to severely cold. During the summer months, the temperature often reaches 42°C. The winter months are colder with the maximum and minimum temperatures touching 20°C and 4°C respectively.

Rainfall is scattered and ranges from 300 to 400 mm per year. Most of the average annual rainfall is received during the months from June to September.

Gularghoj experiences a maximum temperature up to 40°C in summer whereas as low as 28°C in winter. The average annual rainfall is 1500 mm.

4.8 Social Infrastructure Available

Udham Singh Nagar district falls in the Tarai region of Kumaon Division. Udham Singh Nagar District is the food bowl of Uttarakhand State. Prior to its formation, it was part of District Nainital. It was separated out on the basis of physiographical conditions i.e. Tarai.

The Dineshpur town is divided into 7 wards. The Dineshpur Nagar Panchayat has population of 11,343 of which 5,888 are males while 5,455 are females as per Census India 2011 data.

There are some hospitals, schools, places of worship and community facilities within 15 Km radius of the project site.

- Govt. Primary school, Dineshpur – 880 m on N
- Govt. Inter College, Dineshpur – 980 m on N
- Govt. Girls InterCollege, Dineshpur-1.5 km on N
- Primary Health Centre, Dineshpur – 1.2 km on N
- Bharat Hospital – 950 km on N
- Bishwas Red Rose Inter College, Anandkheda- 600 m SE
- Mother India Global School – 810 m on South

CHAPTER – 05 PLANNING BRIEF

5.1 Planning Concept (Type of Industries, Facilities, Transportation etc.) Town and Country Planning/Development Authority Classification.

Dineshpur is the ULB in this cluster, which is Nagar Panchayat and has population of around 11343 as per 2011 census. Gularbhoj is a small Village/hamlet in Gadarpur Block in Udham Singh Nagar District of Uttarakhand State, India and It comes under Gularbhoj Panchayat.

SN	Name of the ULB	Population as per 2011 Census	Grade
1	Dineshpur	11343	Nagar Panchayat
2	Gularbhoj	6957	Panchayat
	Total Population	18300	

Manpower requirement at the waste Processing Facility, Dineshour

Sr. No.	Designation/ Post	Numbers
Dineshpur		
1	Supervisor cum Weighbridge operator	1
2	Watchmen	2
3	Skilled (Driver/operator, etc)	1
4	Unskilled Labours	8
	Total	12

5.2 Population Projection

The population projection for Dineshpur ULB has been carried out based on following methods –

- Average state growth rate
- Incremental increase method
- Arithmetic increase
- Geometric increase
- Decadal growth rate
- Exponential method

It was found that average of Incremental Increase and Arithmetical Increase gives best fit average and the same was adapted for the design purpose of Dineshpur. In the case of Gularbhoj, due to non-availability of census population of four decades, and fluctuation in the population for three decades. The average state growth rate (19.17%) is adopted for the population projection and the design purpose. The average of the population growth of Dineshpur and Gularbhoj for 5 years interval is given in Tables below-

Population Projection for Dineshpur

Horizon Year	2020	2025	2030	2035	2040	2045
Incremental increase method	13472	14560	15581	16534	17420	18238
Arithmetic increase method	13703	15014	16325	17636	18947	20258
Average	13587	14787	15953	17085	18183	19248

Population Projection for Gularbhoj

Horizon Year	2020	2025	2030	2035	2040	2045
State average growth rate	8157	8824	9491	10158	10825	11491

5.3 Solid Waste Generation and Projection

The qualitative and quantitative assessment along with solid waste projections for solid waste was carried out for the cluster. In absence of any existing information on MSW, the average Indian profiling has been taken up to understand the solid waste quantity in the

ULB. Total waste generation of each ULB's has been calculated considering waste generation @400 gram /person per day.

Estimated Solid Waste Generation in Dineshpur

Year	Projected Population	Per capita generation (kg/day)	Floating Population	Floating population per capita generation (kg/day)	Total Population SW generation (TPD)	Floating population SW generation (TPD)	Total SW generation (TPD)
2020	13587	0.410	543	0.041	5.54	0.022	5.57
2025	14787	0.450	591	0.045	6.66	0.027	6.69
2030	15953	0.497	638	0.112	7.93	0.032	7.97
2035	17085	0.549	683	0.055	8.545	0.038	9.42
2040	18183	0.606	727	0.061	9.529	0.044	11.07
2045	19248	0.669	770	0.067	12.88	0.052	12.94

Estimated Solid Waste Generation in Gularbhoj

Year	Projected Population	Floating Population	Per capita solid waste (in kg/day)	Floating Population (per capita solid waste (in kg/day))	Total population SW Generation (TPD)	Floating population SW Generation (TPD)	Total Solid Waste Generated (TPD)
2020	8157	816	0.408	0.041	3.33	0.033	3.36
2025	8824	882	0.450	0.045	3.97	0.040	4.01
2030	9491	949	0.497	0.050	4.72	0.047	4.77
2035	10158	1016	0.549	0.055	5.58	0.056	5.63
2040	10825	1082	0.606	0.061	6.56	0.066	6.63
2045	11491	1149	0.669	0.067	7.69	0.077	7.77

Waste Composition for Dineshpur

Year	Total Solid Waste Generated (TPD)	Inert Waste - TPD	Waste to be treated - TPD	Composting - TPD	Dry Waste - TPD	Total inert (20% from composting + Inert waste)- TPD
		15.00%	85.00%	45.00%	40.00%	
2020	5.57	0.83	4.73	2.50	2.23	1.34
2025	6.69	0.87	4.91	2.60	2.31	1.61
2030	7.97	0.90	5.10	2.70	2.40	1.91
2035	9.42	0.93	5.29	2.80	2.49	2.26
2040	11.07	0.97	5.48	2.90	2.58	2.66
2045	12.94	1.00	5.68	3.01	2.68	3.10

Waste Composition for Gularbhoj

Year	Total Solid Waste Generated (TPD)	Inert Waste - TPD	Waste to be treated - TPD	Composting - TPD	Dry Waste - TPD	Total inert (20% from composting + Inert waste) - TPD
		17.98%	82.02%	44.76%	37.26%	
2020	3.36	2.76	1.50	1.25	0.91	0.60
2025	4.01	0.72	3.29	1.80	1.50	1.08
2030	4.77	0.86	3.91	2.13	1.78	1.28
2035	5.63	1.01	4.62	2.52	2.10	1.52
2040	6.63	1.19	5.44	2.97	2.47	1.79
2045	7.77	1.40	6.37	3.48	2.89	2.09

The total of ISWM system is based on the projections given in above section. The civil infrastructure for waste processing is proposed considering waste generation of next 25 years at both the ULBs.

5.4 Land Use Planning

Total land acquired for the proposed waste processing facility at Dineshpur is 0.385 acre. This land is sufficient for the setup of the proposed project. Adequate area will be provided for plantation and greenbelt as per standard norms. Within the proposed land in Dineshpur, processing facility such as composting, baling, temporary storage shed for inert wastes will be constructed.

5.5 Assessment of Infrastructure Demand (Physical & Social)

- Project site is an undeveloped vacant land under possession of Dineshpur Nagar Panchayat. The land has been approved by Govt. of Uttarakhand for the proposed project. Present landuse of the site is industrial and no agriculture is practiced at site
- The final approach stretch of approx. 170m kuchha road will be constructed by the Nagar Panchayat.
- Fresh water will be sourced through onsite abstraction of ground water using tube-well. Necessary permission if applicable, will be obtained from the concerned authority.
- Power will be sourced from Grid supply. DG set will be installed for emergency backup during power cut.

There is no other major infrastructural requirement for the project.

5.5 Amenities / Facilities

The necessary arrangement for proposed project for meeting water supply for drinking purposes, toilet facilities for workers, parking facilities will be provided. The leachate collection pit will be constructed. Sewage will be treated through septic tank and soak pit.

CHAPTER – 06

REHABILITATION AND RESETTLEMENT (R & R) PLAN

6.1 Policy to Be Adopted for R & R Plan With Respect To Project- Not Required

There is no displacement of any houses, habitation or livestock. Thus the project does not require any R & R plan.

CHAPTER: 7 PROJECT SCHEDULE AND COST ESTIMATE

7.1 Likely Date of Start of Construction and Likely Date of Completion

The Nagar Panchayat will take necessary approvals from the concerned authority and start the construction after obtaining Environmental Clearance. The Nagar Panchayat has proposed to execute the project through Public private partnership (PPP) based on DBOOT approach for concession period of 25 years. The overall project implementation plan for Integrated Solid Waste Management (ISWM) is given below -

Implementation Plan for ISWM

Sr. No.	Project Activity	Months											
		1	2	3	4	5	6	7	8	9	10	11	12
A	Procurement of Vehicles & Equipment												
1	Preparation of Specification and Bid document and Consent to establishment												
2	Invitation of Bid and Bid evaluation												
3	Procurement of vehicles & Equipment for primary collection and transportation for 5 years												
B	Dry waste processing Unit												
8	RFP for Development of Dry waste processing Unit												
9	Design Phase												
10	Construction												
11	Commissioning												
C	Composting (CC) Plant												
12	RFP for Development of CC												
13	Design Phase												
14	Construction												
15	Commissioning												

7.1 Project Cost

The overall estimated project cost for collection, transportation, processing and disposal of wastes in Dineshpur facility is INR 347.67 Lakhs.

CHAPTER – 09

ANALYSIS OF PROPOSAL

The solid waste management facility is planned for offering better living conditions and disease free environment to the society. The project will enhance cleanliness and aesthetics of the area. It involves door to door collection of waste, transportation, processing, baling of dry wastes and disposal of inert wastes into the regional sanitary landfill at Rudrapur.

- With the proposed infrastructures, Dineshpur ULB will have a full-fledged solid waste processing site which will improve the solid waste management of Dineshpur ULB.
- ULBs shall increase the awareness on waste segregation and its implications if the segregation is not carried out. This will improve awareness and civic sense in people resulting in improvement in quality of life.
- This project will not only provide better disposal of waste but also value addition products like bio-compost, segregated recyclable wastes will be obtained.
- In addition to above, a thick green belt has been proposed to be developed all along the project boundary. This will not only attenuate the pollution and odour emissions from plant but also will add to beauty of the area and will influence the microclimate of the area.
- The project will also have a positive impact in terms of health and socioeconomic development.

Financial Benefits

As estimated by the DPR consultant, about 83% of the O&M cost will be recovered from revenue generated from households and commercial establishments as SWM charges, sale of compost, recyclable materials etc. In view of the above, the proposed project seems to be technically and financially viable.