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Haryana State 15.3.15

HARYANA

IN THE HON'BLE NATIONAL GREEN TRIBUNAL

AT NEW DELHI

Original Application No. 199 of 2014

Almitra H. Patel & Anr.

.....PETITIONER

Versus


Union of India & Others

.....RESPONDENTS

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PLACE : Panchkula
DATE :15.03.2015


Pankaj Agarwal,
Director, Urban Local Bodies,
Haryana, Panchkula

Through Sh. Arun Bhardwaj,
Additional Advocate General, Haryana,
I-8, LGF, Jung Pura Extension, New Delhi

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Status report by of affidavit in compliance of the order dated 05.02.2015.

I, Pankaj Agarwal, Director, Urban Local Bodies, Haryana, Panchkula, do hereby solemnly affirm and declare as under:-

1. That this Hon'ble National Green Tribunal Principal Bench was pleased to pass the order on 05.02.2015, in the above captioned case. The contents of the order are as under:

"The status report with complete reply/suggestions based upon and with reference to the judgment of the Tribunal in the case of "Capt. Mall Singh & Ors. Vs. Punjab PCB & Ors. Appeal No. 70 of 2012" will be submitted positively within three weeks from today.

The Central Pollution Control Board shall submit its independent comments in relation to formulation of a national policy with regard to collection and disposal of the municipal solid waste as a Model policy to be adopted. Let the CPCB also submit such proposal within two weeks from today and put it on their websites so that other State Board and State Governments shall also have advantage of that Report and take the same into consideration while submitting their status reports/suggestions in accordance with this order.



15 MAR 2015

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We hereby direct that every status report will specifically indicate if there is even a single district or village in the entire State/UT where the MSW is collected in its entirety segregated and disposed of in accordance with MSW Rules, 2000. It will also be stated as to how the MSW is being converted to an environment friendly beneficial end product, i.e. whether it is totally converted into the useable material/component or is it composted or recycled.

All status reports filed so far are cancelled.

List the matter on 17th March, 2015. "

2 That in compliance of the order dated 05.02.2015, Haryana State Plan for Municipal Solid Waste with reference to the directions of the Tribunal in the case of "Capt. Mall Singh & Ors. Vs. Punjab PCB & Ors. Appeal No. 70 of 2012" and the model suggested by Central Pollution Control Board has been prepared by Transaction Advisor of the Department. The same was approved by the competent authority. True copy of the same is annexed herewith as **Annexure-1.**

3. That presently there is no city where MSW is segregated at door steps .However, waste is collected from households and disposed to the disposal sites. Three Solid Waste Management Treatments Plants are functioning at Karnal, Yamunanagar and Sirsa, where the compost and RDF are generated from the waste.

4. That the Urban Local Bodies Department is sincerely making all out efforts and will ensure the effective implementation of the provisions of Municipal Solid Waste (Management & Handling) Rules, 2000 in Urban Local Bodies, throughout the State of Haryana.

Place: Panchkula

Dated:15.3.2015


DEPONENT



15 MAR 2015

Verification :-

Verified that the contents of the above paras no. 1 to 4 of my affidavit are true and correct to my knowledge & belief & the same has been prepared on the basis of information as drawn from the official record. No part of it is false and nothing has been concealed therein.


Place: Panchkula

Dated: 15.03.2015



DEPONENT

15 MAR 2015

ATTESTED

MAHESH GOYAL
Notary
Distt. Panchkula (Hry.)

GOVERNMENT OF HARYANA
URBAN LOCAL BODIES DEPARTMENT



Haryana State Plan
For
Management of Municipal Solid Waste

[In compliance with Hon'ble National Green
Tribunal Order Dated 5th February 2015 in
the Matter of OA No.199 of 2014, Almitra H.
Patel & Anr. Vs Union of India & Ors.]

10 March 2015

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1 Background

There are 78 Urban Local Bodies (ULBs) in the state of Haryana with a population of about 88 lakhs as per Census 2011. These ULBs generate about 3,000 Tonne per Day (TPD¹) of Municipal Solid Waste (MSW) and this quantity is likely to be more than 7,000 TPD in next three decades, assuming the rate of increase of per capita waste generation is in proportion to increase in urban population.

Directions of Hon'ble NGT

Hon'ble NGT in OA No 199 of 2014 (Almitra H. Patel Vs Union of India) on 5th February, 2015 directed that "The Central Pollution Control Board shall submit its independent comment in relation to formulation of a national policy with regard to collection and disposal of a municipal solid waste as a National policy to be adopted. Let the CPCB also submit such proposal within two weeks from today and put it on their web sites so that other state board and state government shall also have advantage of that report and take the same into consideration while submitting status reports / suggestion in accordance with this order"

Accordingly, CPCB has published an indicative National Policy on their website². Hon'ble NGT in OA No 21 (THC) of 2013 (Davinder Kumar Vs Union of India & Ors) has also directed Haryana to develop set up cluster based Integrated Solid Waste Management (ISWM) facilities on the lines of Punjab ISWM model³.

The above mentioned two documents same were referred to in preparing Haryana State Action Plan.

¹ Source : Waste generation data collected from ULBs in 2014

² <http://cpcb.nic.in/NGT-orderdatedFeb-05-2015.pdf>

³ [http://164.100.107.74/orderinpdf/21-2013\(THC\)\(OA\)_11Mar2014.pdf](http://164.100.107.74/orderinpdf/21-2013(THC)(OA)_11Mar2014.pdf)

2 Haryana State Plan

The Haryana State Plan suggested in this document gives basic objectives and broad framework for solid waste management in the state. The State Plan further outlines indicate action plan and implementation plan for various components of solid waste management in the state.

2.1 Collection

Urban local bodies may arrange for the collection of domestic, trade and institutional food/ biodegradable waste from the doorstep or from the community bin on a daily basis. Local bodies should arrange for the primary collection of waste stored at various sources of waste generation by any of the following methods or combination of more than one method:

- Doorstep collection of waste from residential areas through containerized handcarts/tricycles or other similar means with active community participation. Collection through community bins from private societies multi-storied buildings, commercial complexes, Doorstep or lane-wise collection of waste from authorized/unauthorized slums or collection from the community bins to be provided in the slums by local bodies
- For collection of waste from commercial areas, doorstep collection service from shops and establishment may be provided or may be contracted out on 'full cost-recovery' basis. Large commercial complexes could use 3.0 cu.m to 7.0 cu.m containers, which are commonly used by the local bodies for community storage of waste for waste collection.
- Collection of bio-medical waste should be done in accordance with the rules/directions contained in the Ministry of Environment & Forests, Govt. of India Notification dated 20th July 1998 as the liability for safe disposal of biomedical waste is on such waste producer and the local body as such is not directly responsible to provide any service.
- Hotels and restaurants may make their own arrangements for collection of waste through their own association, or local bodies may extend help in primary collection of such waste by deploying their own manpower and machinery for door step collection of such waste on full-cost-recovery basis.
- Large containers kept in the fruit and vegetable markets should be removed during night time or non-peak hours and the waste

from meat and fish markets should be collected through closed pick-up vans service by engaging a contractor, or departmentally as deemed expedient by the local body.

- Garden waste may be collected on a weekly basis, through a contractor or departmentally as deemed appropriate by the urban local authorities.
- Special arrangement should be made for collection of waste from marriage halls, kalyan mandaps, community halls, etc. daily on a full-cost recovery basis.
- They must transfer the waste produced by them daily into the specified municipal storage containers nearby, which should be collected at regular intervals by local bodies.

Under the powers given to the state government by the Haryana Municipal Act 1973 and Haryana Municipal Corporation Act 1994, the government has notified certain user charges to be levied for solid waste management in urban areas. Following table depicts the user charges notified by the user charges notified of State as per the notification number 14/153/2011-4C dated 24.10.2011.

Table 1: Monthly user charges for Door to Door Solid Waste Collection

S.No.	Property Description	INR per month	Unit
Residential			
1	BPL houses, notified slums, malin bastis & EWS flats	5	
2	Residential houses incl. hostels up to 100sqm (plot area)	20	
3	Residential houses incl. hostels up to 100sqm but up to 200sqm (plot area)	40	
4	Residential houses incl. hostels more than 200sqm but up to 400sqm (plot area)	50	
5	Residential houses incl. hostels more than 400sqm (plot area)	100	
6	Apartments, flats having covered area up to 2000sqft except EWS flats	50	per flat
7	Apartments, flats having covered area more than 2000sqft	100	per flat
Commercial			
8	Individual shops and private offices up to 200sqft	25	

	covered area including service stations, restaurants, dhabas, fishery shops, shops in grain market and vegetable market etc.		
9	Individual shops and private offices more than 200sqft covered area including service stations, restaurants, dhabas, fishery shops, shops in grain market and vegetable market etc.	100	
10	Nursing homes, clinics/ hospitals/ aushadhalayas without indoor facilities, hospitals up to 50 beds	1500	
11	Hospitals more than 50 beds but up to 100 beds	3000	
12	Hospitals more than 100 beds	5000	
13	Shopping complexes including malls, cinema halls notified slaughter houses	0.5	sqft
14	Factories, mills	0.5	sqm
15	Banks, auditoriums, guest houses, hotels (upto 10 rooms)	500	
16	Marriage halls, banquet halls, hotels (above 10 rooms), commercial party lawns	4000	
17	Clubs with restaurants facilities having membership up to 500nos.	500	
18	Clubs with restaurants facilities having membership more than 500nos.	1000	
19	Petrol pumps, gas stations	1000	
Institutional			
20	Central and State Govt. and Public sector offices/ complexes, welfare organizations/ societies	150	
21	All educational institutes of any type having plot area up to 2 acres	500	
22	All educational institutes of any type having plot area than 2 acres but up to 5 acres	1000	
23	All educational institutes of any type having plot area more than 5 acres	2000	
24	All dharamshalas, religious places, sports clubs	Exempt	

2.2 Transportation

The solid waste thus collected from households and other sources will be transported to Primary Collection Centre (PCC), where, the waste would be primarily segregated i.e. recyclables shall be sorted out by the workers and stored separately.

For secondary transportation of solid waste from the Primary Collection Centre (PCC) to the designated processing plant site or sanitary landfill site, "Dumper Placers with twin bin containers" shall be provided. It is assumed that one dumper placer shall perform 4 trips a day.

For transportation of inert material collected from road sweeping, silt from drains, dry leaves etc.; it is proposed that one tractor trolley and one wheel barrow shall be provided for every 10,000 households and 2,000 households, respectively.

Primary Storage and Transportation:

It is proposed that 80% of total waste generation will be lifted by dumper placer and refuse collectors, 20% by tractors trailers.

2.3 Processing facilities

2.3.1 Study of Punjab and Gujarat cluster Models

This chapter intends to illustrate the leading practices in waste management in the country especially where the regional / cluster based technique has been followed. As mentioned in National Plan, Punjab and Gujarat models are studied. The different characteristics of cluster based approaches highlighted here are the number of ULBs, clustering technique, technology adopted, status of the project and lessons learnt.

Punjab Model

Transaction Advisor held discussions with the following people to gain an understanding of the underlying principles and techniques applied to arrive at the Punjab model of ISWM:

- Secretary, Department of Local Government, Punjab
- Officials of Punjab Municipal Infrastructure Development Company (PMIDC) which is the nodal Organization implementing the project.
- Transaction Advisor on ISWM to Government of Punjab

Clustering under Punjab Model:

There are 146 Urban Local Bodies in Punjab generating approximately 4250 tons of Municipal Solid Waste (MSW) every day. The Department of Local Government, Punjab has divided all the ULBs in the state into eight clusters each comprising eight to twenty six ULBs.

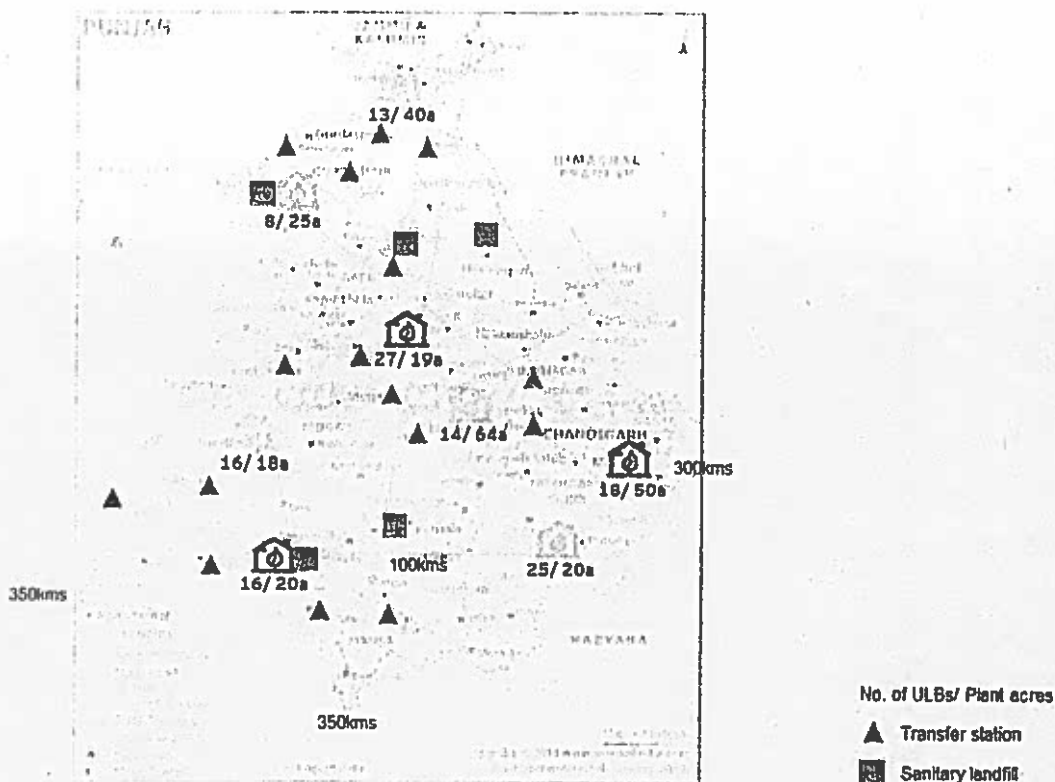


Table 2: Current status of Punjab ISWM Clusters

S.No.	Name of MSW cluster	MSW Generation Qty. MT/day	Private Operator selected
1	Jalandhar	750	M/s JITF Ltd.
2	Ludhiana	1100	M/s A2Z Ltd.
3	Ferozepur	300	M/s. JITF Urban Infrastructure Limited, New Delhi (JINDAL Group); and M/s Ladurner Impainti s.r.l., Italy
4	Bathinda	350	Consortium of M/s. JITF Urban Infrastructure Limited, New Delhi (JINDAL Group); and M/s Ladurner Impainti s.r.l., Italy
5	GMADA	330	Not Appointed
6	Pathankot	250	Not Appointed
7	Amritsar	700	Not Appointed
8	Patiala	500	Not Appointed
	Total	4230	

Observations from Punjab model of ISWM of are as follows:

- > The clustering model is based on regional planning approach and caters to the entire State. There is a balanced spatial distribution of sanitary landfills, treatment plants and transfer stations
- > As informed by officials developing the Punjab ISWM Model, following a cluster based solid waste management practice has been found to be more financially viable rather than each ULB having its own treatment and disposal facility

Following areas are to be examined in detail for taking learnings to be applied in the development of Haryana model

- > The proposed model does not consider the traditional waste management practices that were followed in the State like involvement

of rag pickers and *kabadi wallahs*. This has further led to resistance from these groups to implementation of ISWM projects⁴.

- There have been delays in development of treatment plants due to land availability, lack of environmental clearances etc. Till date none of the plants is operational even though the private operators for four of the clusters have been selected in 2011.

Gujarat Model

(Gujarat: Towards Zero-Waste Goal, Posted by: Clean India Journal - Editor May 16, 2014, <http://www.gudcltd.com/municipal-solid-waste-project.asp>)

Introduction

The Gujarat Urban Development Company Ltd. was appointed as a nodal agency in 2006, and mandated to develop a state-wide MSW management programme. The model adopted was that the waste would be initially treated in a decentralized manner at the individual ULB level through vermin composting. This was done in order to reduce the quantum of waste to be transported. The vermin composting plant was also to serve as a transfer station at the ULB level. The residual waste would be transferred to the sanitary landfill sites.

Clustering

Gujarat Urban Development Company Ltd. (GUDC) initiated the process of clusterization, land identification and acquisition for regional facilities. The clustering of 167 ULBs for disposal arrangements was finalized through an iterative process—the final clusterization, using a maximum travel distance of 50 km, led to the identification of over 20 clusters, each with a regional landfill site. For each of the clusters of ULBs, alternative sites for a shared landfill were identified using geo-informatics and CPCB recommended criteria. The effort focused on government owned wastelands closest to the largest generator of waste in each cluster. The sites identified were acquired and handed over to GUDC for development. The super-clusters thus demarcate the state into 12 zones for the purposes of solid waste management.

Current status:

- Adoption of cluster approach for non-organic type of waste
- Door-to-door collection; extent of coverage is 90%
- Over 70,000 vehicles/equipment supplied to all ULBs at a cost of INR 88 crore.
- Construction of Vermi-Compost Plants (VCP) in 93 ULBs completed
- 75 Vermi-Compost Plants under O &M
- Compost/ soil-enricher for agricultural purpose

⁴<http://www.ppcb.gov.in/MunicipalSolidWaste.aspx>,
<http://www.tribuneindia.com/2013/20130709/jaltrib.htm>

- **7 Scientifically Engineered Landfill Facility have been developed in the State.**

Some of the key learnings from the Gujarat Model are given below:

- Development of decentralized and community based waste processing facilities has been considered in smaller ULBs. The approach of a People Public Private Partnership ('PPPP') - model⁵ has been applied in the state.
- The distance of ULBs from the Treatment plants has been analyzed by means of GIS modelling techniques and it has been concluded that 50 km can be considered as an optimum distance between the ULBs and SWTPs and landfill sites.

2.3.2 Criteria for Cluster facility

In line with the National Action Plan, the following criteria are considered for adopting cluster-based approach for setting waste processing and disposal facilities;

- i) A detailed survey of State / UT with positioning of city / town / village and distance between them.
- ii) Based on local condition, fixing of criteria for each local body to transport the waste for common disposal point without causing public nuisance and traffic hurdles. An indicative distance of say upto 50 km for each local body may be feasible. However smaller local bodies may have difficulty to arrange transport on daily basis. For such villages / towns, alternative options will be worked-out.
- iii) An adequate size of land will be acquired which will be free from public objection. It will be ensured that there are no settlements in at least 3-5 km from its periphery.
- iv) Common facility will be identified depending upon number of towns/villages to be covered and corresponding to waste generation. Various end products like compost, RDF etc are identified to be generated in these facilities.
- v) Common facility will be consisting of sorting facility, compost, RDF/energy plant and followed by inert recycling / re-use. Only a fraction of inert waste will be disposed in landfills.
- vi) Bigger cities generating more than 1000 tons/day will adopt combination of waste processing technologies which may include; composting RDF, waste-to-energy (Anaerobic or thermal). Such facilities will meet existing environmental standards and even be designed with latest state-of-the-art technologies to meet stricter norms. However, State Govt. will provide proper Incentives so that such plants can be sustained and techno-economically viable.
- vii) In case of smaller town, say generating <1000 tones, can go for composting, RDF. In further smaller town, where waste generation is less than 100-500 tonnes per day, they can compost and produce RDF and send it to common facility for power generation. Even at District and sub divisional level, centralized RDF / Compost facility can be set up.

2.3.3 Proposed clusters in Haryana

Based on typical composition of MSW, technologies that are available for each cluster are identified. Tentative capital cost for setting up

⁵ <http://indiatoday.intoday.in/story/narendra-modi-govt-solid-waste-management-plants-for-power-generation-gujarat/1/316700.html>

treatment plants using these technologies is then estimated for each cluster. Details are presented in the following table.

Table 3: Details of proposed Clusters in Haryana

Cluster name	ULBs within clusters	MSW generation (TPD)			Location & TPD equivalent of land/treatment facility	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated Capital cost ⁶ (INR)
		Current	2021	2031				
Ambala	Ambala, Shahabad & Thanesar	167.94	198.74	294.50	17.03 acres in Ambala ULB for development of treatment plant. Land equivalent to 567.50 TPD	Presently 200 TPD and to be expanded to 300 TPD as per increased waste generation	Composting/ RDF	12 Cr
Bhiwani	Loharu, Bhiwani, Siwani & , Charkhi Dadri	132.80	156.66	232.56	4.00 acres in Bhiwani ULB for development of treatment plant. Land equivalent to 133.3 TPD. Additional modules may be installed as and when demand arises	Presently 150 TPD. For expansion, additional land pockets are to be identified.	Composting/ RDF	9 Cr
Dabwali + Sirsa	Dabwali, Kalanwali, Rania & Sirsa	181.00	209.84	324.26	Existing 50 TPD plant in Sirsa. Addition plant in Dabwali; 8 acres equivalent to 266.67 TPD	Presently 150 TPD and to be expanded to 250 TPD as per increased waste generation	Composting/ RDF	9 Cr and no additional investment in the existing treatment plant
Farukh Nagar	Farukh Nagar, HailyMandi, Pataudi, Sohna, Taoru, Nuh &	104.31	128.13	186.41	7.00 acres in Farukh Nagar ULB for development of treatment plant. Land equivalent to 233.3 TPD	Presently 100 TPD and to be expanded to 200 TPD as per increased waste	Composting/ RDF	6 Cr

⁶ Report of the Task Force on Waste to Energy (Volume I), (in the context of integrated MSW Management)

Cluster name	ULBs within clusters	MSW generation (TPD)			Location & TPD equivalent of land/treatment facility	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated Capital cost ⁷ (INR)
		Current	2021	2031				
	Palwal					generation		
Gurgaon + Faridabad	Gurgaon & Faridabad	486.32	651.98	925.32	Existing (but non-functioning) 600 TPD plant sufficient to treat future MSW generated. Additional modules may be installed as and when demand arises.	Existing treatment plant (600 TPD). For expansion, additional land pockets are to be identified.	RDF based power plant.	60 Cr ⁷
Hisar	Tohana, Fatehabad, Bhuna, Ratia, Ellenabad, Hisar, Uklana Mandi, Narnaund, Hansi, Barwala & Bawani Khera	296.18	353.49	527.82	15.56 acres in Hisar ULB for development of treatment plant. Land equivalent to 518.75 TPD	Presently 300 TPD and to be expanded to 500 TPD as per increased waste generation	RDF based power plant.	30 Cr
Kaithal	Pehowa, Cheeka, Kalayat, Kaithal, Rajaund, Pundri, Assandh, Jind, Uchana & Narwana	292.26	376.24	579.42	10.00 acres in Kaithal ULB for development of treatment plant. Land equivalent to 333.3 TPD	Presently 300 TPD. For expansion, additional land pockets are to be identified.	RDF based power plant.	30 Cr
Karnal	Karnal, Nissing, Indri & Nilokheri	113.32	148.45	226.93	Existing 150 TPD plant is sufficient to meet requirements of ULBs.	Existing treatment plant (150 TPD). For expansion, additional	Composting/ RDF	No additional investment in the existing plant

⁷ 1MW per 100TPD of MSW resulting in total power generation potential of 6MW for the cluster.

Cluster name	ULBs within clusters	MSW generation (TPD)			Location & TPD equivalent of land/treatment facility	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated Capital cost ⁶ (INR)
		Current	2021	2031				
					Additional modules may be installed as and when demand arises	land pockets are to be identified.		
Panchkula	Panchkula & Naraingarh	129.21	171.23	251.76	8.00 acres in Naraingarh ULB for development of treatment plant. Land equivalent to 266.67 TPD	Presently 150 TPD and to be expanded to 250 TPD as per increased waste generation	Composting/ RDF	9 Cr
Panipat + Sonapat	Gharaunda, Gannaur, Samalkha Panipat, Safidon, & Sonapat	346.95	431.02	647.98	8.00 acres in Panipat ULB and 14.4 acres in Sonapat ULB. Two treatment plants required to meet MSW generation for the cluster. Total land area is equivalent to 746.67 TPD	Presently 350 TPD and to be expanded to 650 TPD as per increased waste generation	RDF based power plant.	35 Cr
Punhana	F/Jhirkha, Punhana, Hathin & Hodel	24.75	31.27	45.33	3.00 acres in Punhana ULB for development of treatment plant. Land equivalent to 100.00 TPD	50	Composting	3 Cr
Rewari	Ateli Mandi, Kanina, Mahendragarh, Narnaul, Nangal Chaudhary, Bawal, Dharuhera	183.57	238.47	337.92	8.50 acres in Rewari ULB for development of treatment plant. Land equivalent to 283.33	Presently 200 TPD and to be expanded to 300 TPD as per increased waste generation	Composting/ RDF	12 Cr

Cluster name	ULBs within clusters	MSW generation (TPD)			Location & TPD equivalent of land/treatment facility	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated Capital cost (INR)
		Current	2021	2031				
	& Rewari							
Rohtak	Bahadurgarh, Beri, Gohana, Jhajjar, Kalanaur, Kharkhoda, Julana, Meham, Sampla, & Rohtak	399.11	513.78	786.35	33.89 acres in Rohtak ULB for development of treatment plant. Land equivalent to 1129.67 TPD	Presently 400 TPD and to be expanded to 800 TPD as per increased waste generation	RDF based power plant.	40 Cr
Yamunanagar	Yamunanagar -Jagadhari, Ladwa	112.09	133.94	197.86	Existing 150 TPD plant is sufficient to meet requirements of ULBs. Additional modules may be installed as and when demand arises	150	Composting/ RDF	No additional investment in the existing plant

Estimate capital cost does not include land cost and cost of collection and transportation. The facilities are preferred to be set up in lands owned by ULBs.

Number of vehicles and number of trips required for collection and transportation would depend on the quantity, type of waste, number of containers, type of vehicle etc. Approximate vehicle requirement⁸ for collection and transportation of MSW for the projected population in 2021 is given below:

Total projected Population in 78 ULBs in 2021				10482686
Vehicle Type	Quantity required for the projected population in 2021	Unit Cost (INR)	Total Cost (INR Cr)	
Containerized handcarts	15725	8000	13	
Containerized tricycles	1049	16000	2	

⁸ CPHEEO Manual on Municipal Solid Waste Management

Small vehicle for direct collection of waste	84	125000	1
Closed dumper placer containers of 4.5 cu.m. Volume	2097	25000	5
Closed dumper placer containers of 7.0 cu.m. Volume	1468	35000	5
Dumper placer machine for 4.5 + 7 cu.m. containers	263	750000	20
Total tentative cost for vehicle procurement (INR Cr)			46

In compliance with MSW Rules 2000, about 20% of total waste is proposed to be disposed in landfills. Cost of landfill varies from cluster to cluster. Tentative cost for development of landfill is given below:

Total waste generation from 78ULBS in 2021 (TPD)	3758.09
Quantity of waste reaching landfill based on waste generation in 2021 (TPD)	751.62
Cost of landfill development (INR/Ton)	500
Total tentative cost for 5 years (INR Cr)	69

Total tentative budget estimated for the facilities including collection, transportation and post processing disposal in landfills is as follows:

Total tentative cost for compost/RDF/RDF based power generation (INR Cr)	255
Total tentative cost for vehicle procurement (INR Cr)	46
Total tentative cost for landfill development (INR Cr)	69
Total tentative cost for cluster based ISWM facilities (INR Cr)	370

Provisioning of this budget is expected to be made through contribution of Central/State Governments and Private Operators through PPP route.

Government/Private Operators	% contribution	Amount (INR Cr)
Central Government through Swachh Bharat Mission	25%	100
State Government/ULB	35%	140
Private Operators	40%	160

2.3.4 Pilot project at Karnal

As directed by the Hon'ble National Green Tribunal in the hearing held on 25 February 2015, the Directorate of Urban Local Bodies, Government of Haryana has drafted a plan for using RDF based power plant technology for waste treatment at certain clusters. While the proposal is to decide the technology at the time of finalization of terms with the agency which shall setup, operate and manage the plant, the tentative plan on technologies is being prepared to indicate the possibilities, draft a detailed work plan and estimate costs involved. The technologies have been proposed based on the current and projected waste quantum and composition for the cluster.

For the purpose of preparing a model concept in using RDF based power plant technology, Karnal cluster has been selected primarily based on the criterion of confirmed availability of land. The model concept paper, enclosed herewith, comprises details on waste composition, land for the plant, estimated costs and work plan for setup of SWM facility for the cluster.

Table 4: Details of RDF generation at existing plants

Treatment facility location	Treatment Plant Capacity (TPD)	Treatment Technology adopted	RDF generation (20% of total Waste) TPD	Average Distance to Karnal (KM)
Yamuna Nagar	150	Composting + RDF	30	70
Karnal	150	Composting + RDF	30	-
Rohtak	175	Composting + RDF	35	110
Gurgaon	600	Composting + RDF	120	150
Total RDF generated (TPD)			215	

As and when the proposed cluster based solid waste processing facilities are set up in Haryana, RDF produced at these facilities will be used to expand the capacity of RDF based power plants. Estimated quantity of RDF production in the clusters is as follows:

Table 5: Details of RDF generation at proposed clusters

Cluster name	ULBs within clusters	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated RDF production @ 20% of total waste (TPD)
Ambala	Ambala, Shahabad & Thanesar	Presently 200 TPD and to be expanded to 300 TPD as per increased waste generation	Composting/ RDF	40

Cluster name	ULBs within clusters	Capacity of treatment plant proposed (TPD)	Proposed Technology	Estimated RDF production @ 20% of total waste (TPD)
Bhiwani	Loharu, Bhiwani, Siwani & , Charkhi Dadri	Presently 150 TPD. For expansion, additional land pockets are to be identified.	Composting/ RDF	30
Dabwali + Sirsa	Dabwali, Kalanwali, Rania & Sirsa	Presently 150 TPD and to be expanded to 250 TPD as per increased waste generation	Composting/ RDF	30
Farukh Nagar	Farukh Nagar, HailyMandi, Pataudi, Sohna, Taoru, Nuh & Palwal	Presently 100 TPD and to be expanded to 200 TPD as per increased waste generation	Composting/ RDF	20
Panchkula	Panchkula & Naraingarh	Presently 150 TPD and to be expanded to 250 TPD as per increased waste generation	Composting/ RDF	30
Rewari	Ateli Mandi, Kanina, Mahendragarh, Narnaul, Nangal Chaudhary, Bawal, Dharuhera & Rewari	Presently 200 TPD and to be expanded to 300 TPD as per increased waste generation	Composting/ RDF	40
Total RDF generation from the proposed clusters (TPD)				190

Power Generation and Cost Estimation:

One ton of RDF is likely to generate about 600-700 kWh of electricity⁹. Therefore, based on availability of about 215 TPD of RDF from the existing treatment plants, a total of 129000 kWh of electricity can be generated. Assuming that the power plant operated at 70% Plant Load Factor, it is proposed to set up a 7 MW RDF based power plant. As per CPHEEO norms and report of Planning Commission report on Waste to Energy, cost of setting up a RDF based power plant is about INR 10 Crores per MW. Therefore, estimated project cost for the proposed power plant is INR 70 Crores.

⁹ http://www.wtert.gr/Pdfs/CEMEPE_06.09_Psomopoulos_Themelis.pdf

2.4 Disposal

Rejects and residues collected from the above mentioned processes are disposed in engineered landfills. The cost of construction of engineered landfill sites is dependent on many factors including the size of the landfill, site conditions, availability of materials locally, manpower costs, etc.

3 Implementation Plan

In line with the guidelines of National Action Plan, following implementation plan is proposed for Haryana.

Table 6: Implementation Plan

Activities	Action points	Responsibility	Time frame
DPR	<p>A Detailed Project Report (DPR) will be prepared for each cluster in accordance with MSW Rules to cover;</p> <p>(i) waste segregation (ii) Collection (iii) Storage (iv) Transportation (v) Proceeding; and (vi) Disposal</p> <p>DPR will be prepared based on the indicative guidelines brought out by CPCB in National Action Plan</p>	Directorate of Urban Local Bodies (DULB), Haryana	Six months
Survey/ Assessment	Transaction Advisor of Haryana on Integrated Solid Waste Management has undertaken an assessment of quantity of MSW generation and its composition in all ULBs before identification of processing technology for MSW management	Directorate of Urban Local Bodies (DULB), Haryana, Private operators	<p>Six months (metro cities + State Capitals)</p> <p>8 months (Class I cities)</p> <p>12 months (Class II towns + below)</p>
Collection of waste	<p>Arrangements are being made for collection of waste to cover;</p> <ul style="list-style-type: none"> • House-to-house collection • Slums and squatters • Commercial areas • Industrial areas • Horticultural waste from parks, etc. • Construction and demolition waste • Office complexes • Slaughterhouses, vegetable markets 	By engaging NGOs/ Agencies	9 months

Segregation of waste	<p>Mass awareness programs are being planned for segregation of waste at;</p> <ul style="list-style-type: none"> • At school level • At residential level • At market/commercial areas <p><i>Through :</i></p> <ul style="list-style-type: none"> • Pamphlet • Interaction • Hoarding/newspaper/ local cable network, etc. <p>Door - to - door collection of segregated waste followed by recycling/ utilization by appropriate environment friendly manner.</p>	Through Institutions/ NGOs or Govt Departments.	6 months
Intra-city activities	<ul style="list-style-type: none"> • Regulation of stray cattle movement • Prohibiting burning of garbage, leaves, other waste. • Regular street sweepings. • Improving street sweeping on wider roads by mechanical means. • Covering dusty areas/ road sides to prevent flow of dust on roads and / or sweeping of dust causing high levels of dust in ambient air. • Setting up of public complaint cell and attending them on urgent basis. • Constitution of vigilance squads to; prevent littering of waste, monitoring lifting of garbage on daily basis, maintenance of dust bins, movement of stray cattle, burning of garbage, transportation of waste in covered conditions etc. 	<p>Issuing notification from DM or ULBs</p> <p>-by ULBs or engaging NGOs Agencies</p> <p>By SPCBs/ ULBs</p>	6 months
Storage of waste	<ul style="list-style-type: none"> • Setting up of bins of appropriate sizes in different localities (residential, commercial, slums/ squatters) • Setting up of three bins as per Rules. (to be started on experimental basis). • Provision of litter bins • Provisions of containers for horticulture and construction and demolition waste. 	Procuring tools/tackles, as per DPR.	9 months

	<ul style="list-style-type: none"> • Regular operation and maintenance of waste storage facilities. • Provision of bins for weekly markets, marriage halls and other functions. • Open sites to be eliminated. 		
Transportation of waste	<ul style="list-style-type: none"> • Devising transportation system for congested areas. • Devising transportation system for slums and squatters • Devising transportation system for horticultural and construction and demolition waste. • Setting up of workshop facilities for O & M of vehicles. • Estimating requirement of transportation fleet (optimum requirement) • Assessment of requirement of hand-carts, tricycles and other devices 	Procuring transport vehicles as per DPR	18 months

4 Organizational Structure

To oversee development and implementation of Haryana State Plan, following state level organizational structure is proposed. The committee shall be headed by the principal secretary, Urban Local Bodies, Haryana.

Table 7: Organizational structure

