



District Environment Plan

बोकारो इस्पात नगर में आपका हार्दिक स्वागत है।

Bokaro, Jharkhand



Drafted By:

Rajesh Kumar Singh, IAS, DC, Bokaro (Jharkhand)

Arun Kumar Singh, IFS, DFO, Bokaro (Jharkhand)

Reviewed By:

District Environment Committee, Bokaro, Jharkhand

For Feedback or any Complaint:

Please write to Member Secretary, District Environment Committee, Bokaro Jharkhand

Email:- bokarodfo@gmail.com

INDEX

Preface

1. Introduction	1
1.1. Basic features of the draft (Bokaro DEP):-	2
1.2. Environmental Status of India	3
1.3. Basic Environmental features of Bokaro District	5
2. Waste Management Plan	7
2.1. Solid Waste Management Plan	8
2.1.1. Solid Waste Management in Bokaro Steel City	8
2.1.2. Solid Waste Management Plan in Chas Municipal Corporation.....	10
2.1.3. Solid Waste Management Plan in Phusro Nagar Parishad	13
2.1.4. Proposed step wise Waste Management in Urban	16
2.1.5. Solid Waste Management at Block and Village Level.....	19
2.2. Plastic Waste Management Plan.....	22
2.3. Biomedical Waste Management Plan	25
2.4. Construction and Demolition (C&D) Waste Management Plan	34
2.5. Hazardous Waste Management Plan	37
2.6. E-Waste Waste Management Plan	39
3. Water Resources Management Plan.....	41
3.1. Domestic Sewage Management Plan	41
3.2. Industrial Waste water Management Plan	47
3.3. Polluted Rivers Extending in Bokaro	47
3.4. Ground Water Extraction, Contamination and Recharge Plan	49
3.5. Revitalization Of Water Bodies	50
4. Air Management Plan	52
4.1. 122Non-AttainmentCities	54
5. 100Industrial Clusters.....	54

6. Mining Activity Management Plan	54
6.1. Sustainable Sand Mining	55
6.2. Sustainable Stone Mining	56
6.3. Sustainable Coal Mining	57
7. Noise Pollution Management Plan	57
8. Financial Projections	58
References	58
9. Data Submitted to DEC	59 to 87

Abbreviations

BDO: Block Development Officer

CPCB: Central Pollution Control Board

SPCB: State Pollution Control Board

CO: Circle Officer

DC: Deputy Commissioner

ACF: Assistant Conservator of Forests

DFO: Divisional Forest Officer

SDM: Sub Divisional Magistrate

GM: General Manager

DEO: District Education Officer

DDC: Deputy Development Commissioner

AMC: Additional Municipal Commissioner

RO: Regional Officer, JSPCB

SP: Superintendent of Police

DEP: District Environment Plan

DSMS: Decentralized Sewage Management System DSP: Deputy Superintendent of Police

JSPCB: Jharkhand State Pollution Control Board

MoEF&CC: Ministry of Environment, Forest and Climate Change

MS: Member Secretary, DEC

NGT: National Green Tribunal

CTO: Consent to Operate

BSL: Bokaro Steel Plant

SAIL: Steel Authority of India Limited

TA: Town Administration

NP: Nagar Parishad

SHG: Self Help Group

STP: Sewage Treatment Plant

CMC: Chas Municipal Corporation

GP: Gram Panchyat

ASAP: As soon as possible

PWD: Public Works Department

DEC: District Environment Committee

Preface

Hon'ble National Green Tribunal (NGT) since its assent by the supreme legislative body of India (Indian Parliament) in June 2010 has been playing an augmented role in the conservation of national green environment. It pledges to maintain a healthy, sustainable and congenial atmosphere nationwide for all the creatures and specially the human society so that they can pursue a life full of health.

To make this mission successful it is important for the whole nation to participate in it at each unit of national administration. Thus, NGT took a constitutional reference to compliance with the provisions made in the constitution of India;

“under Articles 243 G, 243 W, 243 ZD read with Schedules 11 and 12 and Rule 15 of the Solid Waste Management Rules, 2016, it is necessary to have a District Environment Plan to be operated by a District Committee (as a part of District Planning Committee under Article 243 ZD) with representatives from Panchayats, Local Bodies, Regional Officers, State PCB and a suitable officer representing the administration, which may in turn be chaired and monitored by the District Magistrate. Such District Environment Plans and Constitution of District Committee may be placed on the website of Districts concerned.”

This order was re-stressed by Hon'ble NGT in O.A. No. 360/2018, order dated 26.09.2019, where Hon'ble Tribunal said,

“Compliance of this direction may also be seen by the Chief Secretaries of the States/UTs. This may not only comply with mandate of law but provide an institutional mechanism for effective monitoring of environment norms”

Accordingly, Forest, Environment and Climate Change Department, Government of Jharkhand, through notification no. 4869 dated 26.12.2019, reconstituted District Environment Committee and also gave it responsibility of drafting District Environment Plan (DEP).

Government of India has enacted acts such as The Water (Prevention and Control of Pollution) Act, 1974 (No.6 of 1974), The Air (Prevention and Control of Pollution) Act, 1981 (No.14 of 1981) and The Environment Protection Act, 1986 (No.29 of 1986) besides other acts which have implications on environment related governance.

Ministry of Environment, Forest and Climate Change (MoEF&CC) have notified various waste management rules under The Environment Protection Act, 1986 from time to time to manage the burgeoning issue of waste and thus prevent and control environmental damage.

To gain 360-degree view of situation of environment management related practices in Bokaro district, the newly constituted District Environment Committee organized several meetings. The committee also segregated data according to model data collection format prescribed by Central Pollution Control Board (CPCB) and tried to explore opportunities of better implementation of various acts and rules inside the district.

The appreciated efforts of the committee has resulted the **work** into this **dynamic draft**. This is to take proper assessment of the present scenario of environment related governance in the district at all administrative levels from urban to Panchayat. This also elicits present and future responsibilities of different functionaries and task forces related to implementation of acts and rules in the district. This draft paves future road map for governing district environment.

1. Introduction

This document has been drafted in compliance with the honorable NGT'S order in O.A. No. 710-713/2017, issued on 15-07-2019.

When it comes to the existence of the 'Environment' it is interactive consequences between the biotic components like animals, plants, and other living organisms, and abiotic the components – water, air, soil, sunlight etc. Many day to day activities as well as economic activities have a fall out of disturbing the environment around us. As, these activities are unavoidable, the need of the time is to manage the waste and pollutants in such a way that it affects our environment minimally.

The right justification is not to limit management of environment to only management of waste and pollutants. Rather, it also includes extracting our natural resources like drinking water in a sustainable manner and conserving our natural heritage like forest which provides innumerable number of eco-system services.

Hence, getting a holistic picture of scenario of environment is much more essential. The current status of implementation of applicable acts and rules made under them, future planning for their compliance and need of resources for the same. It is also essential that all the departments have a clear objective in their mind and are also clear about their role towards betterment of environment.

It is therefore mandatory to be practiced at district level, and thus District Environment Plan is condition sine qua non to sustainable development of district and it's citizen's health.

The scope of District Environment Plan is clearly laid out in Hon'ble NGT order in O.A. No. 360/2018, dated 12.09.2019, which said:

“while fixing a schedule for further appearance of the Chief Secretaries of all the States/UTs, direction has been issued to compile information with reference to the following specific thematic areas viz.:

- *In compliance with Solid Waste Rules including Legacy Waste.*
- *In compliance with Bio-medical Waste Rules.*
- *In compliance with Construction & Demolition Waste.*
- *In compliance with Hazardous Waste Rules.*
- *In compliance with E-waste Rules.*
- *351 Polluter Stretches in the country.*
- *122 Non-attainment cities.*
- *100 industrial clusters.*
- *Status of STPs and re-use of treated water.*
- *Status of CETPs/ETPs including performance.*
- *Ground water extraction/contamination and re-charge.*
- *Air pollution including noise pollution.*
- *Illegal sand and coal mining.*
- *Rejuvenation of water bodies”*

Forest, Environment and Climate Change Department, Government of Jharkhand, through notification No. 4869 dated 26.12.2019 also included implementation of

- Air Act
- Water Act

In the purview of the District Environment Plan.

Hon'ble NGT in O.A. No. 360/2018, order dated 26.09.2019, in Para 8, also said:

“Such information is to be furnished to the CPCB by the Chief Secretaries of all the States/UTs indicating:

- *Current status*
- *Desirable level of compliance in terms of statutes*
- *Gap between current status and desired levels.*
- *Proposal of attending the gap with timelines.*
- *Name and designation of designated officer for ensuring compliance to provisions under statute.”*

The above order provides the broad contours for developing a District Environment Plan. Thus, this District Environment Plan would follow above broad guidelines in context of Bokaro district.

1.1 Basic features of the draft (Bokaro District Environment Plan) :-

1. This draft is dynamic in nature with all the provisions of possible updates demanded by the changing scenario of the district environment. The present recommendation of update on the basis of revision is once every two years.
2. The document elicits the guidelines for both urban and rural areas' environment management plan.
3. The prescriptions will mostly need attention by responsible parties to ensure cleaner In order to get the environment of Bokaro better, all the responsible authorities will have to take part actively. In course of time both the State and the Centre government have to come forward for financial support. **The district administration has to work and look forward to all the possible platforms of revenue generation.**
4. The draft has the provisions of convergence during the implementation of all the applicable rules.
5. Target accomplishment is possible on the condition that:-
 - a). Responsible government functionaries are supposed to take initiatives.**
 - b). Heads of the local bodies are expected to participate actively.**
6. Report preparation, submission on demand at an interval and progress record to be updated with the **District Environment Committee mandatorily.**

1.2. Environmental Status of India:-

A huge and continuously rising population of the country and in order to impart different economic platforms for the survival and sustainable growth of the population, deliberately or by default we generate wastes in quite relevant proportion. Though sometimes the ignorance and unawareness of people causes a sheer increase in the quantity of the wastes. By product of industries and many similar activities which are unavoidable augment the waste production in India.

Urban India witnesses the waste generation of 65 million tones / year. Only 47 million tones (MT) of the waste is collected, 11.9 MT is treated and 31 MT is dumped in landfill sites. In terms of waste generation Urban India ranks 3rd position in the world and by 2050 waste production is expected to rise to 440 million tones. This is estimated figure for only municipal waste generated in urban area and does not include many other kind of waste such as Construction and Demolition waste, e-waste etc.

Year	Source	Generation (million Tons per annum)
2017	Based on 450 gm. per capita daily generation and urban population of 440million*	72
2017	Based on 450 gm. per capita daily generation and urban population of 440million*	62
2014-15	Central Pollution Control Board	52
2013-14	Task Force on Waste to Energy, Planning Commission	62

Though the per capita daily generation of waste is lower in non-urban setup, yet it can be as high as 30-35 million tons per annum. This figure doesn't really come in discussion because of they are not usually concentrated like in urban areas but are mostly dumped and burnt in backyard.

Various subordinate legislations for regulating the manner of disposal and dealing with generated waste are made under the umbrella law of Environment Protection Act, 1986 (EPA). Specific forms of waste are the subject matter of separate rules and require separate compliances, mostly in the nature of authorizations, maintenance of records and adequate disposal mechanisms.

Need of the hour is proper implementation of all the rules made under various act at district level. Due to multiplicity of the rules and technicalities involved, it is necessary that the implementation is steered by ensuring convergence between various stakeholders, be it regulator or the polluter.

District Environment Plan goes beyond only Pollution Management Plan. Management and regulation of polluting activities in India has been mainly devolved to local bodies and State Pollution Control Boards (SPCB). But, it is much more than that. There has to be co-ordination between district authorities and local bodies so that the district as a unit is able to comply with all the rules. Officials representing State Pollution Control Boards should not only check whether rules are being complied or not but go beyond that to facilitate one and all to manage polluting activities and reduce impact on environment.

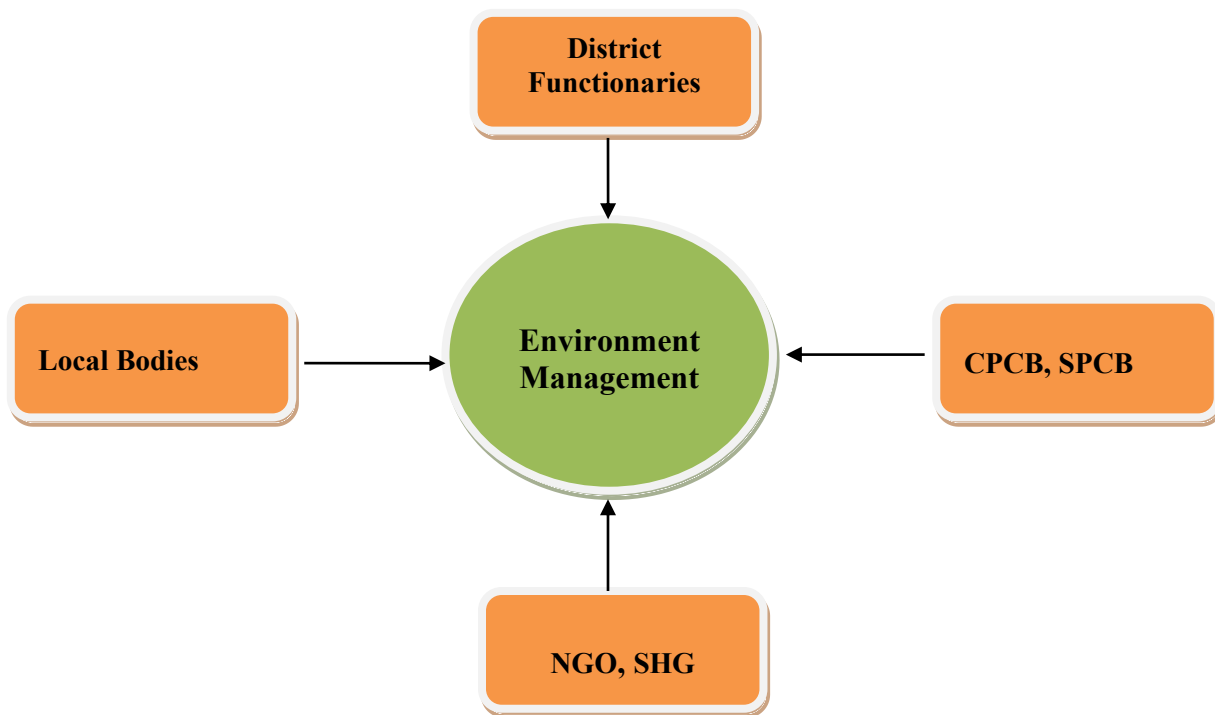


Figure 1. Environment Management Co-ordinates

At this juncture, it would also be wise to have a relook at the administrative setup at district level (More or less consistent across India). The Diagram represents it qualitatively given below:

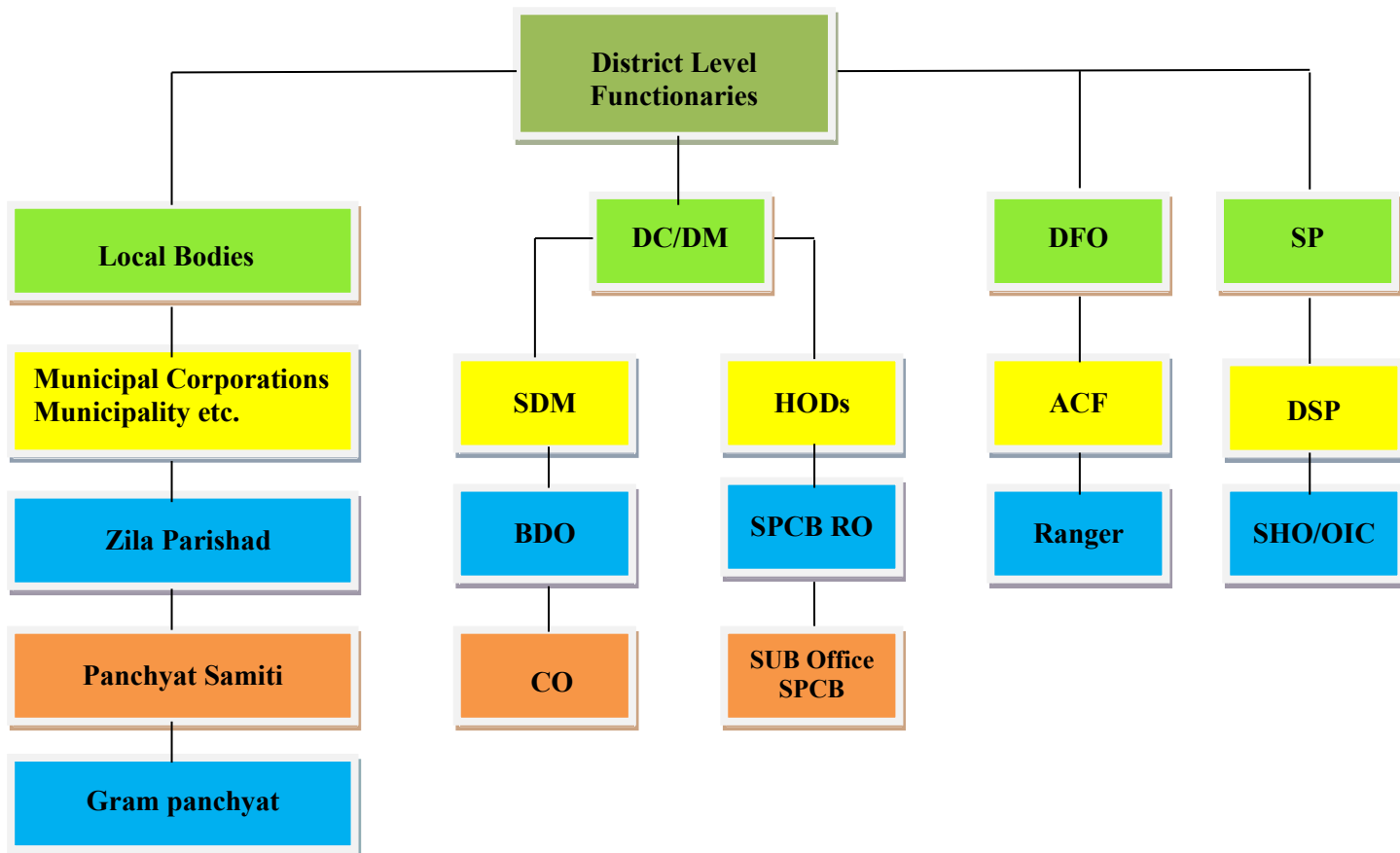


Figure 2. District Level Administrative Structure

1.3. Basic Environmental Features of Bokaro District:-

Bokaro district is one of the most industrialized zone of India. This is one of 24 districts of Jharkhand state. It was created on 1st April 1991. This is located east to Dhanbad district, west to Ramgarh district, south to Purulia district (WB) and north to Giridih, Hazaribagh and Dhanbad. This is industrial capital of Jharkhand state. Its latitudinal location – 23.26” to 23.57” N and 85.34 to 86.26” E. its elevation is 200 to 546 m from the sea level.



Figure 3. Geographical Location of Bokaro with respect to Jharkhand



Figure 4. Map showing different blocks of Bokaro along with Rivers.

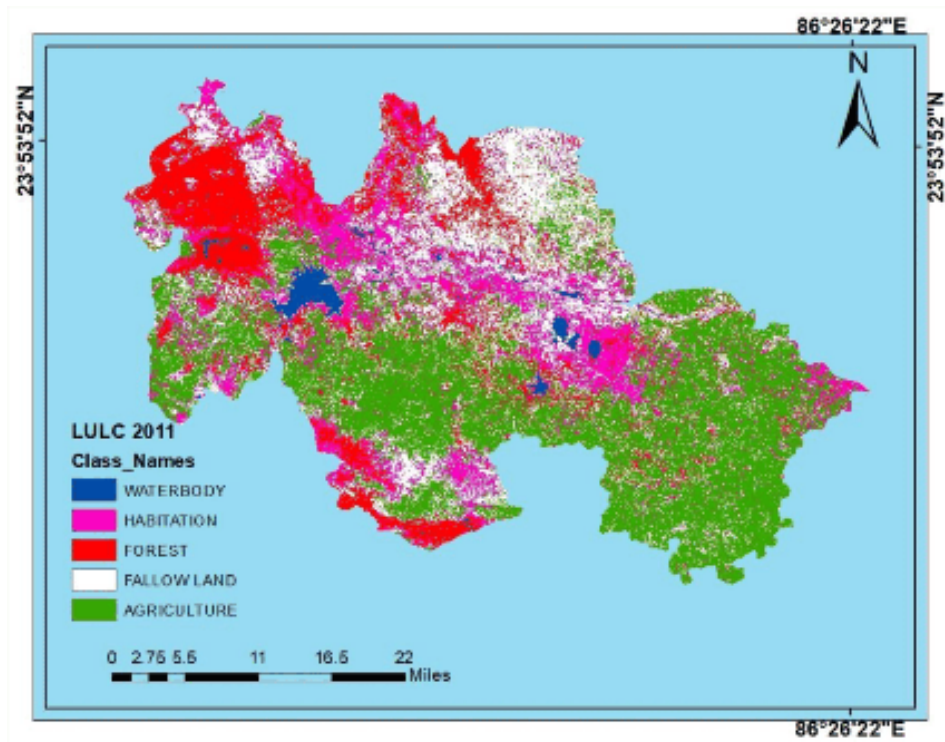


Figure 5. Land Uses in Bokaro district

Data related to Bokaro district in a glance:

Items	Statistics	
Population (2011 Census)	20.62	Lakhs
Urban Population(2011 Census)	10.78	Lakhs
Rural Population (2011 Census)	9.83	Lakhs
Area	2883	Km ²
Forest Area	784.89	Km ²
No. of Urban Local Body	3	
No of Blocks	9	
No. of Gram Panchayat	249	
No. of Revenue Villages	635	
Total solid waste generated in Urban area	157	MT/Day
Total solid waste generated in district app. (Assuming rural creation of waste as 1/5 th of Urban)	187	MT/Day
Total Liquid waste generated in urban areas	29	MLPD

2. Waste Management Plan:-

Unwanted production of any life style is referred as 'WASTEW'. Areas which are industry juncture of the country become the destination of common population for employment. This attracts the migrants for survival and eventually they start getting settled there. Facilities of basic and the most radical amenities gradually change the place in an urban area. Because of dense population waste is naturally produced. Hence, the need of waste management comes in picture. Though waste is naturally generated at all the administrative units like village, panchayat, block, municipality to a nation.

We could take look at quantity of wet waste (which can be composted) generated in the whole composition of municipal waste (in lower middle-income category) :-

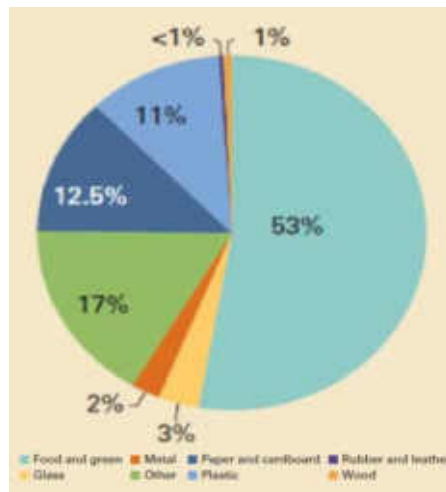


Figure-6 Typical waste Proportion in low income category country

The fact that around 55% of our waste is wet waste, should direct our policy of managing it. Source point segregation can reduce the burden on our dump yards.

It will be interesting to note that India lags far behind in segregation at source point. Costly and complex waste operations must compete for funding with other priorities such as clean water and other utilities, education, and health care. Waste management is often administered by local authorities with limited resources and limited capacity for planning, contract management, and operational monitoring. These factors make sustainable waste management a complicated proposition on the path of sustainable development.

Segregation at source can be biggest challenge for any local body. This is much more amplified because of lack of expert managers, lack of budget, poor financial health and low sources of income of local bodies.

City	State	Population (million)	Door-to-door Collection from Households (%)	Segregation at Source (%)
Vengula	Maharastra	10	100	95
Indor	Madhy Pradesh	0.5	100	90
Thiruvananthputam	Kerala	0.9	100	76
Gangtok	Sikkim	0.1	90	30
Warangal	Telangana	0.9	90	na
Tirunelveli	Tamil Nadu	0.5	100	100

Figure 7. Waste Segregation at source from few cities of India

2.1 Solid Waste Management Plan:-

A Solid Waste Management Rules, 2016, "solid waste" means and includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities and other entities.. There are separate rules for e- waste which would be discussed separately in this document.

Ministry of Environment, Forest and Climate Change (MoEF&CC) has notified the Solid Waste Management Rules 2016. As per the rules, the role of local body has been specified as section 15.

2.1.1 Solid Waste Management in Bokaro Steel City:-

Keeping the provisions of CPCB (section 8.1.1 of the document elicits the details) in mind the following format of collected data gives a comprehensive review:-

1. Total waste generation is around 85 MT/day inside jurisdiction are of Bokaro Steel City
2. Door to Door collection according to survey is 100 percent.
3. Waste segregation is partial.
4. There is no separate disposal of segregated waste.
5. Present dumpsite is located inside the town at every turning of the city for the quarters located in every sector. The main and major dumpsite of the city is located at the exterior of sector 11.

No of Ward	Population	Waste Generation per day	No of Dumping Vehicle
10 Sectors	2 Lakhs as per 2011 census	85 to 90 MT	Trolleys- 157 Compactor Loder-02 and Dumpler Placer- 01

Tabulation of activities with objective, status, responsible functionary and timeline is as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Responsive solid & wet waste segregation and Collection	To create the facility of solid and wet waste collection in separate container and dumping it to the nearby area with an arrangement of final dumping site where waste processing could be possible.	Running	General Manager Town Administration, Bokaro Steel Plant	On Going
	To make it mandatory for citizens to segregate solid and wet waste at source. Reasonable and possible monetary support to be asked to the citizens who are availing the door to door collection facility.	Running		On Going
Sustainable Segregation and Collection	To make it possible at large scale daily door to door collection (providing carts with two separate containers for wet and dry waste and one small for sanitary waste)	Running	General Manager Town Administration, Bokaro Steel Plant	On Going
	Providing large 3 dustbins with a capacity of 1000 liters at minimum possible distance and 2 covered bins of 300 liters for commercial & institutional premises.	90%		On Going
	Providing separate storage facility for recyclable and non-recyclable materials.	Partial		1 year
	Spreading awareness about plastic hazards and charging penalty on single plastic use.	Partial		
Domestic Hazardous Waste	To create possible number of disposal points for domestic hazardous waste inside the concerned jurisdiction.	Initiated	General Manager Town Administration, Bokaro Steel Plant	6 months
	Providing the facility of door to door collection of domestic hazardous waste once a fortnight.	Not Initiated		9 months
	Ensuring safe storage and transportation of the domestic hazardous waste to the hazardous waste disposal facility.	No provision		12 months
Planning	Prepare a solid waste management plan	Running	General Manager Town Administration, Bokaro Steel Plant	On Going
	Adopting the concept of composting at all the administrative level.			On Going
	Preparing estimate of budgetary needs			On Going
	Notifying the recyclers of the area.			On Going

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Participation of SHGs/NGOs/Waste Pickers	Inviting women SHGs and/or NGOs for collection and segregation of dry & wet waste.	Not Initiated	DC and General Manager Town Administration, Bokaro Steel Plant.	9 months
	Empowering the waste pickers with health security and authorization.			9 months
Integration of new sanitary landfill	Demarcation of sanitary landfill sites.	Old proposed site didn't get approval	General Manager Town Administration, Bokaro Steel Plant	1 year
	Site preparation on the permission of JSPCB			3 months
	Rehabilitation of old dumpsite	Initiated	General Manager Town Administration, Bokaro Steel Plant	1 year
Waste management awareness	Organizing Awareness Campaign on a regular interval on waste segregation, proper disposal and fines as applicable	Partial	General Manager Town Administration, Bokaro Steel Plant	3 months
Strengthening financial status.	Creating possible platforms of revenue collection(e.g. holding tax, waste collection fee...etc).	Running	General Manager Town Administration, Bokaro Steel Plant	On Going
	Levying Green Tax on all pollution causing units (e.g. vehicles, food units, factories...etc.).			

2.1.2 Solid waste management in Chas Municipal Corporation:-

Total waste generation is around 52 MT/day inside jurisdictions are of Chas Municipal Corporation.

1. Door to Door collection according to survey is only partial.
2. Waste segregation is partial.
3. There is no separate disposal of segregated waste.
4. A DPR for solid waste management is under process and expected to be accomplished shortly.
5. A processing unit of solid waste will be constructed under the proposed DPR with an aim to 100 percent door to door segregated waste collection.
6. Waste collection fee to be collected from the citizens availing the facility.
7. Currently waste collection fee is collected by Chas Enviro. Pvt. Ltd.

8. Rehabilitation of an old dumpsite on the bank of Garga River, near DC office has been done by composting in-situ and then converting it into an entertainment park. Some of the old sites have foretasted (e.g. ITI MORE landfill, by SHGs). Near NH-32 at Kamaldih Multipurpose Building and Municipal Corp. office are under construction.
9. Present dumpsite as well as processing unit is proposed at Kalapatthar in an area of 10 acres.

No of Ward	Population	Waste Generation per day	No of Dumping Vehicle	Employees (Safai Mitra)
35	141640 as per 2011 census	52 MT	Garbage Loader-1 JCB-1 Dumfar-1	Safai Mitra-70 Safai Mitra-228 (Sweeper)

Tabulation of activities with objective, status, responsible functionary and timeline is as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time After approval of DEP
Responsive solid & wet waste segregation and Collection	To create the facility of solid and wet waste collection in separate container and dumping it to the nearby area with an arrangement of final dumping site where waste processing could be possible.	Partial	Additional Municipal Commissioner/ Mayor Chas Nagar Nigam	3 months
	To make it mandatory for citizens to segregate solid and wet waste at source. Reasonable and possible monetary support to be asked to the citizens who are availing the door to door collection facility.	Initiated		1 year
Sustainable Segregation and Collection	To make it possible at large scale daily door to door collection (providing carts with two separate containers for wet and dry waste and one small for sanitary waste)	60%	Additional Municipal Commissioner / Mayor Chas Nagar Nigam	6 months
	Providing large 3 dustbins with a capacity of 1000 liters at minimum possible distance and 2 covered bins of 300 liters for commercial & institutional premises.	Partial		1 year
	Providing separate storage facility for recyclable and non-recyclable materials.	Partial		1 year
	Spreading awareness about plastic hazards and charging penalty on single plastic use.	Initiated		6 months

Domestic Hazardous Waste	To create possible number of disposal points for domestic hazardous waste inside the concerned jurisdiction.	Initiated	Additional Municipal Commissioner / Mayor Chas Nagar Nigam	6 months
	Providing the facility of door to door collection of domestic hazardous waste once a fortnight.	Not Initiated		9 months
	Ensuring safe storage and transportation of the domestic hazardous waste to the hazardous waste disposal facility.	No provision		12 months
Planning	Prepare a solid waste management plan (See Reference 3)	Not Initiated	DC, Additional Municipal Commissioner / Mayor Chas Nagar Nigam	9 months
	Adopting the concept of composting at all the administrative level.			9 months
	Preparing estimate of budgetary needs			9 months
	Notifying the recyclers of the area.			6 months

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Participation of SHGs/NGOs/Waste Pickers	Inviting women SHGs and/or NGOs for collection and segregation of dry & wet waste.	Initiated	DC, Additional Municipal Commissioner/ Mayor Chas Nagar Nigam	9 months
	Empowering the waste pickers with health security and authorization.			9 months
Integration of new sanitary landfill	Demarcation of sanitary landfill sites.	Proposed	DC, Additional Municipal Commissioner/ Mayor Chas Nagar Nigam, and RO,JSPCB	1 year
	Site preparation on the permission of JSPCB			3 months
	Rehabilitation of old dumpsite	Functioning	DC, Ex Officer (NP), DFO	On Going
Waste management awareness	Organizing Awareness Campaign on a regular interval on waste segregation, proper disposal and fines as applicable	Initiated	DC, Additional Municipal Commissioner/ Mayor Chas Nagar Nigam	3 months
Strengthening financial status.	Creating possible platforms of revenue collection (e.g. holding tax, waste collection fee...etc.).	Running	Additional Municipal Commissioner/ Mayor Chas Nagar Nigam	On Going
	Levy Green Tax on all pollution causing units (e.g. vehicles, food units, factories...etc.).			

2.1.3 Solid waste management in Phusro Nagar Parishad:-

1. Total waste generation is around 15 MT/day inside jurisdiction is of Phusro Nagar Parishad.
2. Door to Door collection according to survey is only partial.
3. Waste segregation is zero.
4. There is no separate disposal of segregated waste.
5. Under Swachhha Bharat Mission solid waste management work has been tendered to Ms.Cube Bio-Energy Pvt. Ltd. which is to be started shortly.

No of Ward	Population	Waste Generation per day	No of Dumping Vehicle
28 wards	89178 as per 2011 census	15 MT	Trolleys- 04 Mini Truck- 16 Truck- 01

Tabulation of activities with objective, status, responsible functionary and timeline is as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Responsive solid & wet waste segregation and Collection	To create the facility of solid and wet waste collection in separate container and dumping it to the nearby area with an arrangement of final dumping site where waste processing could be possible.	Partial	Executive Officer / Chairman, Nagar Parishad	3 months
	To make it mandatory for citizens to segregate solid and wet waste at source. Reasonable and possible monetary support to be asked to the citizens who are availing the door to door collection facility.	Initiated		1 year
Sustainable Segregation and Collection	To make it possible at large scale daily door to door collection (providing carts with two separate containers for wet and dry waste and one small for sanitary waste)	Partial	Executive Officer / Chairman, Nagar Parishad	9 months
	Providing large 3 dustbins with a capacity of 1000 liters at minimum possible distance and 2 covered bins of 300 liters for commercial & institutional premises.	Partial		1 year
	Providing separate storage facility for recyclable and non-recyclable materials.	Not Initiated		1 year
	Spreading awareness about plastic hazards and charging penalty on single plastic use.	Not Initiated		9 months

Domestic Hazardous Waste	To create possible number of disposal points for domestic hazardous waste inside the concerned jurisdiction.	Not Initiated	Executive Officer / Chairman, Nagar Parishad	6 months
	Providing the facility of door to door collection of domestic hazardous waste once a fortnight.	Not Initiated		9 months
	Ensuring safe storage and transportation of the domestic hazardous waste to the hazardous waste disposal facility.	Not Initiated		12 months
Planning	Prepare a solid waste management plan (See Reference 3)	Not Initiated	DC, DDC and Executive Officer, Nagar Parishad	9 months
	Adopting the concept of composting at all the administrative level.			9 months
	Preparing estimate of budgetary needs			9 months
	Notifying the recyclers of the area.			6 months

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Participation of SHGs/NGOs/ Waste Pickers	Inviting women SHGs and/or NGOs for collection and segregation of dry & wet waste.	Not Initiated	DC, Executive Officer / Chairman, Nagar Parishad	9 months
	Empowering the waste pickers with health security and authorization.			9 months
Integration of new sanitary landfill	Demarcation of sanitary landfill sites.	Proposed	DC, Executive Officer / Chairman, Nagar Parishad, and RO, JSPCB	1 year
	Site preparation on the permission of JSPCB			3 months
	Rehabilitation of old dumpsite.			Not Initiated
Waste management awareness	Organizing Awareness Campaign on a regular interval on waste segregation, proper disposal and fines as applicable	Partial	DC, Executive Officer / Chairman, Nagar Parishad	3 months
Strengthen in financial status.	Creating possible platforms of revenue collection (e.g. holding tax, waste collection fee...etc).	New	DC, Executive Officer/ Chairman, Nagar Parishad	Policy Decision
	Levying Green Tax on all pollution causing units (e.g. vehicles, food units, factories...etc).			

Further observations across the Bokaro urban center suggest the following:-

1. There is an awareness spreading (program run by World Green Line) among the citizens about segregation of waste.
2. The facility to encourage them to segregate waste is provided at a small possible scale by WGL. E.g. Disposal points having disposal containers for wet and dry waste.
3. Collection infrastructure mainly consists of tractor driven trolley and there is no infrastructure and system to collect and dispose the segregated waste.

2.1.4. Proposed step wise Waste Management in Urban Area:

- Step 1: Five Way Home Waste Segregation System :-



Step 2: Three way system of waste collection:-



1. Door to Door Waste Collection



2. Waste Collection from Dumpsites



3. Transportation from Dumpsite to segregation point or sanitary landfill

Step 3: Dry waste to Material Recovery Facility and Wet Waste to On-Site Composting:-



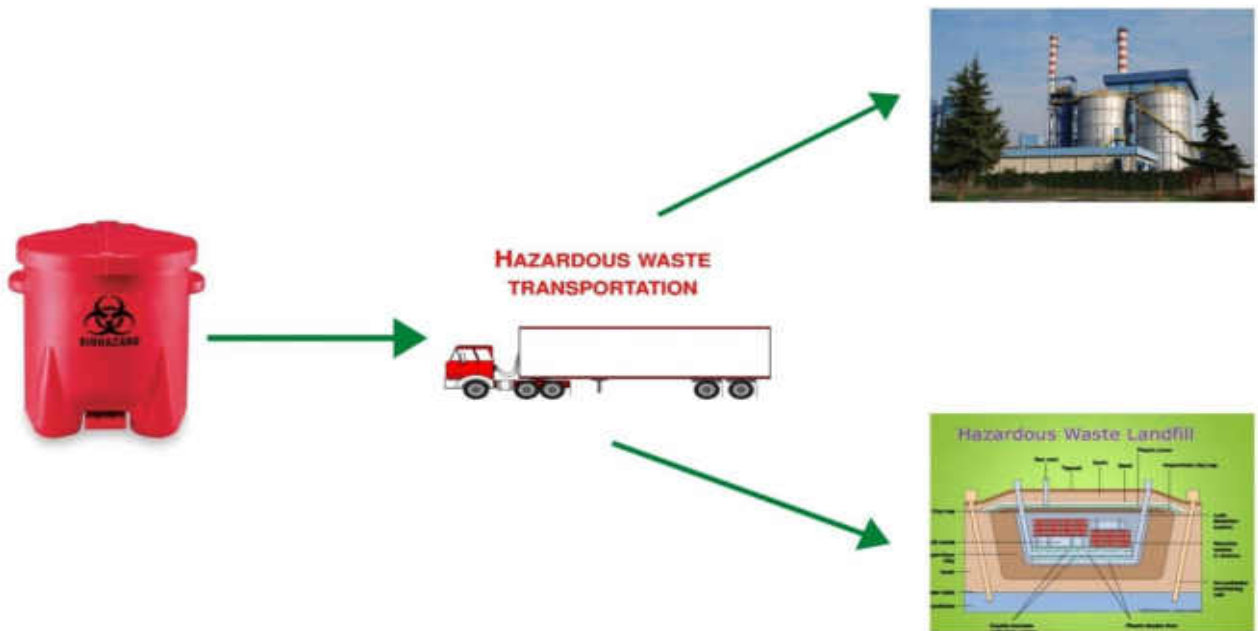
Step 4: Composting of Wet Waste at yard site:-



Step 5: Non-Recyclable Waste to Sanitary Landfill:-



Step 6: Hazardous Waste Collection and its transportation to nearest Hazardous Waste Treatment Facility:-



Waste Segregation and Management in Urban as depicted in the flow diagram:-

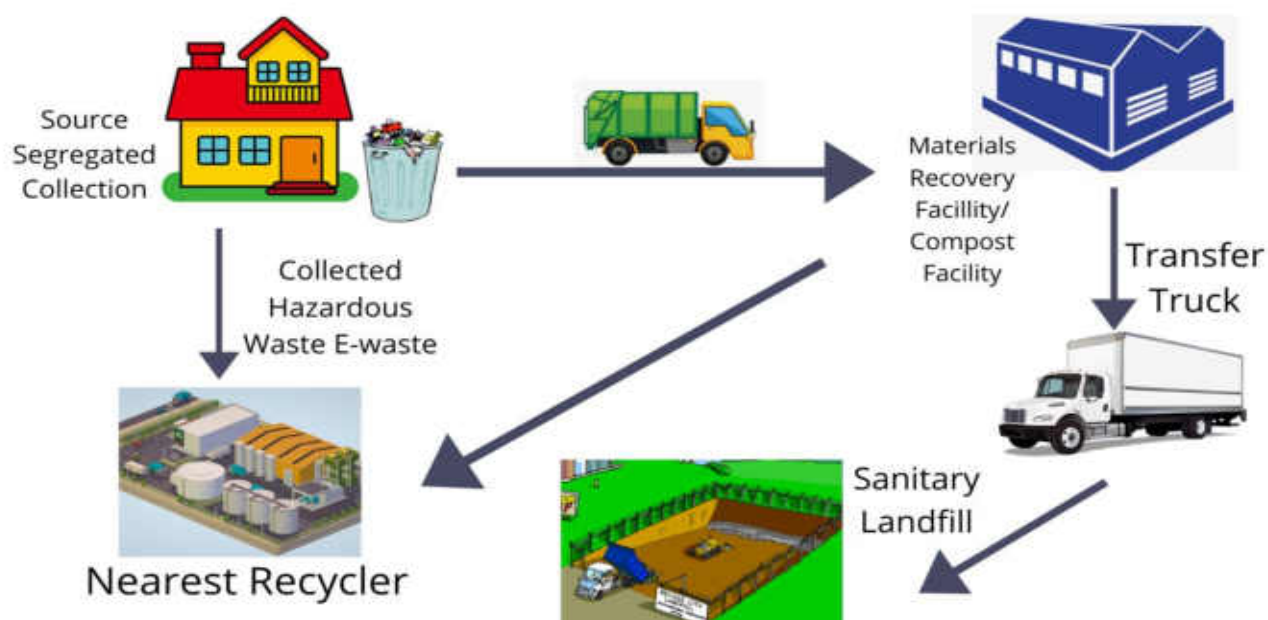


Figure 8. Suggested Flow of Solid Waste in Urban Area

2.1.5. Waste Management at Block and Village Level:-

India is the country of villages. Most population dwells in the villages. Though the population density is less than urban area yet waste generation is a by-product of lifestyle. Villages contribute almost 85% of the whole population. When it comes to Bokaro district, its population is 21 lakh (accord to 2011 census). Its villages contribute almost 10 lakh of its total population which evidently generate a huge waste and needs to have proper plan for waste management. Hence,

The Plan is formulated on the following standard:-

1. Each village should have a properly demarcated place for both dry & wet solid waste disposal.
2. Every Panchayat Samiti should appoint **waste management committee** a collection cart, which is support to look after the matter related management of the disposal sites.
3. A composting unit to make compost of possible waste and use it as fertilizer should be there in every village.
4. Prohibition of incineration of waste must be there.
5. Each block should have a properly demarcated place for both dry & wet solid waste disposal where each Gram Panchayat can deposit their dry waste.
6. Segregation of recyclable materials should be practiced by the Panchayat Samitis and as per the quantity of the waste each village (GP) should be paid.
7. Non-recyclable waste should be transported to micro sanitary land fill site by the Panchayat Samitis.

8. The collected recyclable waste from each village should finally be transported to Bokaro district recyclable waste collection point by the Panchayat Samitis and for this Panchayat Samitis should be paid the applicable rate.



Figure 9. Suggested Flow of Solid Waste at Village, Panchayat and Block Level

Approach towards Solid Waste Management in Bokaro District, considering the above are as follows:-

1. 100% segregation at source
2. 100% segregation while collection or at disposal points (No mixing of dry and wet waste)
3. Creating a culture of segregation of household waste at source.
4. Fee collection from each household for collection of segregated garbage from each household. Eg. Rs 50-110/household (to be deposited along with holding tax or separately)
5. 100% composting of wet waste. This will be done centralized in urban areas and distributed micro composting, at Village and Block level.
6. Involving SHGs/NGOs for segregation of recyclable waste and thus providing employment.
Switching to modified Padupanambur Dakshina Kannada district Zero Waste Model.
7. Rehabilitation of an old dumpsite on the bank of Garga River, near DC office has been done by composting in-situ and then converting it into an entertainment park. Some of the old sites have foretasted (e.g. ITI MORE landfill, by SHGs). And some are projected to be rehabilitated.

Ideas need to be adopted under the provisions by making by-laws are as follows:-

1. Continuous awareness program
2. Separate bin for plastic segregation.
3. Segregation at source ought to be mandatory.
4. Penalty on single plastic use.
5. Segregated collection of wet and dry waste from door to door on minimal fee.
6. Penalty levied on burning waste.

Tabulation of activities with objective, status, responsible functionary and timeline is as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Administration	Every GP should appoint a waste management committee a collection cart, which is support to look after the matter related management of the disposal sites.	Not Initiated	Panchayat Sachiv and Mukhiya	6 months
Segregation	Each village should have a properly demarcated place for both dry & wet solid waste disposal.	Not Initiated	CO, DDC and Ward Members	9 months
Collection	Collection and transportation (to block level collection point) of dry waste should be done by Each Gram Panchayat.	Not Initiated	BDO and Mukhiya	12 months
Conceptual isolation of dry waste.	An isolation center for dry waste at block level should be set up by Pachayat Samiti.	Not initiated	DDC, BDO, CO and Pramukh	3 months
Non-recyclable waste & Landfill	Non-recyclable waste should be transported to specifically demarcated micro sanitary land fill site by the Panchayat Samitis			12 months
Awareness	Gram Sabha should be organized with possible gears (i.e. posters, hoardings, handbills...etc.) specifically to promote the segregation of dry & wet waste.	Partial		6 months
Budgeting for Block level	Proper estimation and budget preparation for waste management activities year wise budget requirement.	Not initiated	BDO and Executive Officer, Panchayat Samiti	6 months

2.2. Plastic Waste Management Plan:-

It is mandatory to conceptualize the segregation, separation and minimization of recyclable and non-recyclable plastic at the source and sending the recyclable materials to the recyclers in compliance with Plastic Waste Management Rule 2016, notified by MoEF&CC.

Keeping the same in mind Government of Jharkhand has also imposed complete ban on manufacture, import, export, use & sale of plastic carry bags vide notification no. 3900, dated 15.09.2017.

Though the major producer of plastic waste in Bokaro district is Bokaro Steel City. Sub major producers are Chas Municipal Corp. and Phusro Nagar Parishad. The least producers include all the villages lying in the district. Yet the plastic wastes need to be collected from all the administrative areas.

Tabulation of activities with objective, status, responsible functionary and timeline of Bokaro Steel City as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Segregation and Disposal	Arrangement of disposal as secondary storage or material recovery facility with sufficient space for recyclable and non-recyclable plastic components.	Initiated	Town Administration, BSL	6 months
	In compliance with the guideline issued by the CPCB, it is important to fix the processing and disposal of non-recyclable fraction of plastic waste.			
Stepwise processing of collected waste	Handing over the recyclable plastic to nearest authorized plastic recycler	Initiated	Town Administration, BSL	18 months
	The concerned department should encourage the construction agencies for using non-recyclable plastic waste in their construction (e.g. roads).			
Administrative Inspections	Penalty with notice should be levied on single plastic use.	Not Initiated	Town Administration, BSL	9 months
	Sudden and unscheduled but at an interval, an inspection must be done to keep the by- laws and Gov. of Jharkhand ban in check.	Low Frequency	SDM, DSP, CO Town Administration, BSL	Continuous Process

Teachings And Awareness by District Administration	At a regular interval jute bags use and giving up of single plastic use awareness program must be organized.	Partial	Town Administration, BSL	Continuous Process
	Educating the population about harmful effect of plastic and encourage them to give up the use of plastic material.	Partial	DC, SP, DFO and Town Administration, BSL	3 months

Tabulation of activities with objective, status, responsible functionary and timeline of Chas Municipal Corporation as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Segregation and Disposal	Arrangement of disposal as secondary storage or material recovery facility with sufficient space for recyclable and non-recyclable plastic components.	Partial	DC and Additional Municipal Commissioner/ mayor CMC	12 months
	In compliance with the guideline issued by the CPCB, it is important to fix the processing and disposal of non-recyclable fraction of plastic waste.			
Stepwise processing of collected waste	Handing over the recyclable plastic to nearest authorized plastic recycler		Superintendent Engineer, PWD	18 months
	The concerned department should encourage the construction agencies for using non-recyclable plastic waste in their construction (e.g. roads).			
Administrative Inspections	Penalty with notice should be levied on single plastic use.	Partial	AMC, Chas Municipal Corporation	9 months
	Sudden and unscheduled but at an interval, an inspection must be done to keep the by- laws and Gov. of Jharkhand ban in check.	Low Frequency	SDM, DSP, CO AMC, Chas Municipal Corporation	Continuous Process
Teachings And Awareness by District Administration	At a regular interval jute bags use and giving up of single plastic use awareness program must be organized.	Partial	DEO, IPRD and Additional Municipal Commissioner, CMC	Continuous Process
	Educating the population about harmful effect of plastic and encourage them to give up the use of plastic material.	Partial	DC, SP, DFO and Additional Chas, Municipal Commissioner	3 months

Tabulation of activities with objective, status, responsible functionary and timeline of Phusro Nagar Parishad as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Segregation and Disposal	Arrangement of disposal as secondary storage or material recovery facility with sufficient space for recyclable and non-recyclable plastic components.	Not Initiated	DC and Executive Officer, Phusro Nagar Parishad	12 months
	In compliance with the guideline issued by the CPCB, it is important to fix the processing and disposal of non-recyclable fraction of plastic waste.			
Stepwise processing of collected waste	Handing over the recyclable plastic to nearest authorized plastic recycler		Superintendent Engineer, PWD	18 months
	The concerned department should encourage the construction agencies for using non-recyclable plastic waste in their construction (e.g. roads).			
Administrative Inspections	Penalty with notice should be levied on single plastic use.	Partial	Executive Officer, Phusro Nagar Parishad	9 months
	Sudden and unscheduled but at an interval, an inspection must be done to keep the by-laws and Gov. of Jharkhand ban in check.	Low Frequency	SDM, DSP, CO and Executive Officer, Phusro Nagar Parishad	Continuous Process
Teachings And Awareness by District Administration	At a regular interval jute bags use and giving up of single plastic use awareness program must be organized.	Partial	DEO, IPRD and Executive Officer, Phusro Nagar Parishad	Continuous Process
	Educating the population about harmful effect of plastic and encourage them to give up the use of plastic material.	Partial	DC, SP, DFO and all other Departmental Heads	3 months

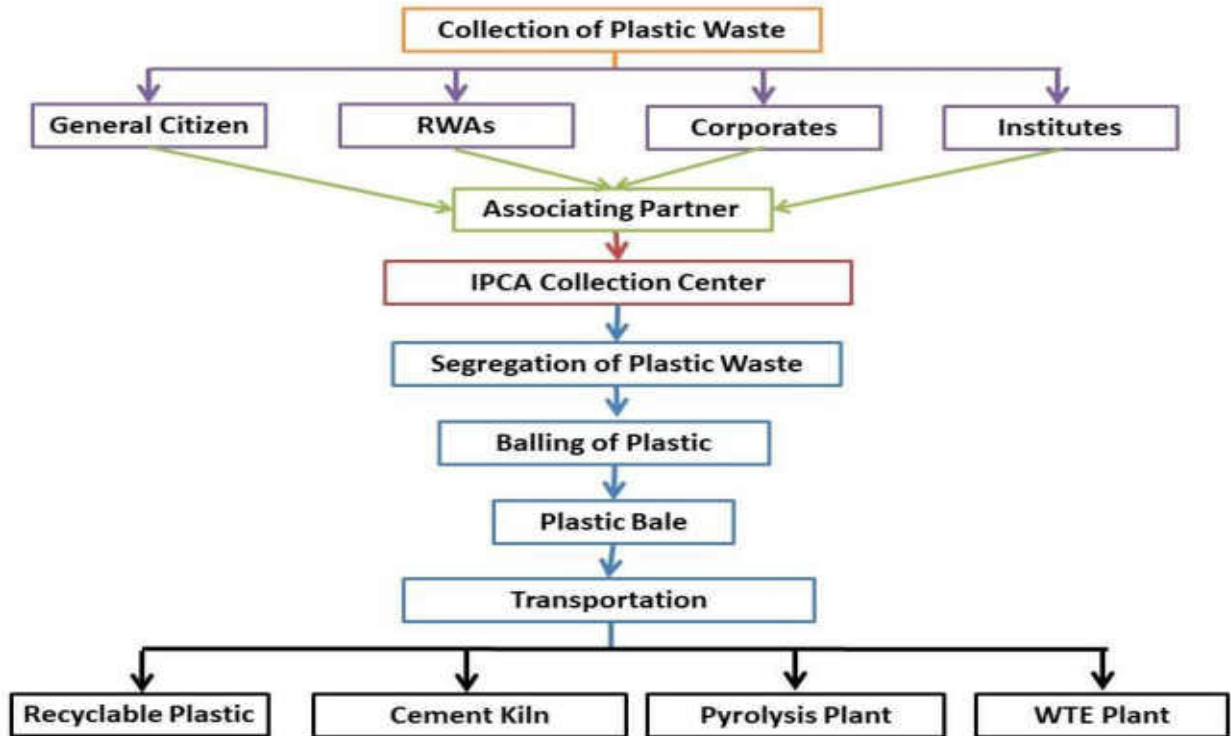


Fig. 10 Suggested Flow Chart of Plastic Waste at Urban Area

2.3 Biomedical Waste Management Plan:-

Biomedical waste: -

Biomedical waste is a broader term applied to waste generated in the diagnosis, treatment or immunization of humans, in research or in the production and testing of biological products. It also includes the waste coming out of medical treatment given at health camps

Infectious waste: -

Infectious waste includes all healthcare/ clinical waste which has the potential to transmit viral, bacterial, fungal or parasitic disease. It includes human waste, waste generated in laboratories practice. Hazardous waste is any waste with a potential to pose a threat to human health and life. Infectious waste is a part of hazardous waste.

Any waste contaminated with blood, body fluids, excretions and secretions is potentially infectious. One of the most hazardous waste is contaminated sharp waste which is a part of infectious waste and can also cause injury. The most common documented transmission of infection from waste to HCWs is through contaminated needles. Laboratory waste is a major potential reservoir of pathogenic microorganisms and requires appropriate handling.

National Rules for biomedical waste management:-

The Ministry of Environment, Forest and Climate Change published the Biomedical Waste Management Rules on 28 March 2016. These rules superseded the Biomedical Waste (Management and Handling) Rules, 1998. The 2016 Rules have been amended in 2018 and 2019. These Rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle biomedical waste in any form including hospitals, nursing homes, clinics, dispensaries, pathological laboratories, blood banks, Ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first-aid rooms of schools, forensic laboratories and research laboratories. Safe and proper identification, handling, storage, and disposal of biomedical waste from laboratories and related facilities is the responsibility of every occupier. "Occupier" means a person having administrative control over the institution and the premises generating biomedical waste, which includes a hospital, nursing home, clinic, dispensary, pathological laboratory, blood bank, HCF and clinical establishment, irrespective of their system of medicine and by whatever name they are called. Duties of the occupier/HCF.

Waste segregation at point of generation:-

HCF/ laboratory waste requires management at every step from generation, segregation, collection, transportation, storage, and treatment to final disposal. Of the waste generated in healthcare settings, approximately 10% to 25% is hazardous but if not segregated properly, the entire waste becomes infectious thereby escalating the overall cost of waste management. The most practical approach to the management of biomedical waste is to identify and segregate infectious waste, which would in turn drastically reduce the cost of waste disposal in healthcare settings. Biomedical waste should be segregated into containers or bags at the point of generation in accordance with. This includes placing different types of waste in different color -coded-bags and containers at the site of generation. Proper segregation should identify waste according to type of waste and type of disposal/ disinfection. Color-coded bags as per national norms need to be placed in appropriate containers with the appropriate label/ logo. For example, using a biohazard symbol for infectious waste Puncture-proof containers made of plastic or metal with a biohazard symbol, in blood collection areas, injection trolleys, nursing stations and OTs should be made available for collecting metallic wastes. Syringes should be either mutilated or needles should be cut and/ or stored in tamper-proof, leak-proof and puncture-proof containers for sharps storage. Ensuring segregation of liquid chemical waste at source and ensure pretreatment or neutralization before mixing with other effluent generated from HCFs.

BIOHAZARD SYMBOL



CYTOTOXIC HAZARD SYMBOL



Collection bags:-

Solid waste is collected in leak-resistant heavy-duty bags. Colored bags made of non-chlorinated plastic with biohazard sign and labels mentioning date and details of waste are to be used. The bags are tied tightly after they are three-fourths full.

Pre-treatment, packing, storage and transport:- Laboratory waste, microbiological waste, blood samples and blood bags must be pre-treated through disinfection or sterilization on site in the manner as prescribed by the WHO guidelines on safe management of wastes from healthcare activities and then sent to a common biomedical waste treatment facility for final disposal. Standards for autoclaving are as given in Schedule II of the Biomedical Waste Management Rules 2016. The bags or containers used for waste segregation shall be labeled as per the Rule. Provision must be made within the premises of an HCF for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bags or containers, inaccessible to scavengers and protected against insects, birds, animals and rain, to ensure that there is no secondary handling, pilferage of recyclables, or inadvertent scattering or spillage by animals. The biomedical waste from such places or premises should be directly transported to the authorized common biomedical waste treatment facility for the appropriate treatment and disposal. Transport of biomedical waste to common biomedical waste treatment facility will be done only in vehicles having appropriate label as provided in Schedule.

Treatment and disposal:-

The HCF hand over segregated waste as per Schedule to the common biomedical waste treatment facility for treatment, processing and final disposal provided that the laboratory and highly infectious biomedical waste generated shall be pre-treated by equipment such as autoclave or microwave. The HCF shall treat and dispose the biomedical waste in accordance with Schedule), and in compliance with the standards provided in Schedule II of the Biomedical Waste Management Rules 2016. On-site biomedical waste treatment and disposal facility M/s. Biogenetic Laboratory Pvt. Ltd., Chotapichri, Kalyanpur, Dhanbad, Jharkhand are established common biomedical waste treatment facility is available within a distance of 35 km from Bokaro H.Q.

The duties of the common biomedical waste treatment facilities are given in Annex I.

Duties of the M/s. Biogenetic Laboratory Pvt. Ltd., Chotapichri, Kalyanpur, Dhanbad, Jharkhand:-

Annex I.

1. Take all necessary steps to ensure that the biomedical waste collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with these rules and guidelines issued by the Central Government or, as the case may be, the Central Pollution Control Board from time to time.
2. Ensure timely collection of biomedical waste from the occupier as prescribed under these rules.
3. Establish bar coding and global positioning system for handling of biomedical waste in accordance with the guidelines issued by the Central Pollution Control Board by 27 March 2019.
4. Inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated biomedical waste in accordance with these rules.
5. Provide training for all its workers involved in handling of biomedical waste at the time of induction and at least once a year thereafter

6. Assist the occupier in training conducted by them for biomedical waste management. Undertake appropriate medical examination at the time of induction and at least once in a year and immunize all its workers involved in handling of biomedical waste for protection against diseases, including hepatitis B and tetanus, that are likely to be transmitted while handling biomedical waste and maintain the records for the same.
7. Ensure occupational safety of all its workers involved in handling of biomedical waste by providing appropriate and adequate personal protective equipment (PPE).
8. Report major accidents including accidents caused by fire hazards, blasts during handling of biomedical waste and the remedial action taken and the records relevant thereto, (including nil report) in Form I (refer to rules) to the prescribed authority and also along with the annual report. Maintain a log book for each of its treatment equipment according to weight of batch, categories of waste treated; time, date and duration of treatment cycle and total hours of operation.
9. Allow occupier, who are giving waste for treatment to the operator, to see whether the treatment is carried out as per the rules.
10. Shall display details of authorization, treatment, annual report, etc. on its website; after ensuring treatment by autoclaving or microwaving followed by mutilation or shredding, whichever is applicable, the recyclables from the treated biomedical wastes such as plastics and glass, shall be given to recyclers having valid consent or authorization or registration from the respective Jharkhand state Pollution Control Board.
11. Supply non-chlorinated plastic coloured bags to the occupier on chargeable basis, if required.
12. Common biomedical waste treatment facility shall ensure collection of biomedical waste on holidays also.
13. Maintain all record for operation of incineration, hydro or autoclaving for a period of five years.
14. Upgrade existing incinerators to achieve the standards for retention time in secondary chamber and dioxin and furans within two years from the date of this notification.

Biomedical waste handlers Immunize all HCWs and others, involved in handling of biomedical waste for protection against diseases including hepatitis B and tetanus which are likely to be transmitted by handling of biomedical waste, in a manner as prescribed in the National Immunization Policy or the guidelines of the Ministry of Health and Family Welfare issued from time to time. Ensure occupational safety of all HCWs and others involved in handling of biomedical waste by providing appropriate and adequate PPE. Conduct health check-up at the time of induction and at least once in a year for all Health Care HRs and others involved in handling of biomedical waste and maintain their cords for the same.

Annual report Every HCF has to submit an annual report to the prescribed authority in Form- IV every year on or before the 30 June at Civil Surgeon cum Chief Medical officer, office, Bokaro. Training All workers involved in handling of biomedical waste must be provided training at the time of induction and at least once a year thereafter. Records of the training programmes conducted, number of personnel trained and number of personnel who have not undergone any training must be maintained.

According to the rule following comes under purview of Biomedical Waste Management Rules:

- **Hospitals including Ayush Hospitals**
- **Nursing Homes, Clinics**
- **Dispensaries**
- **Veterinary Institutions, Animal Houses**
- **Pathological Laboratories**
- **Blood Banks / Blood Donation Camps**
- **Clinical Establishments**
- **Research or Educational Institutions, Research Labs**
- **Health Camps**
- **Medical or Surgical Camps**
- **Vaccination Camps**
- **First Aid Rooms of Schools**
- **Forensic Laboratories**

BMW Waste Management Rule 2016 Follows in the Government Health Facility Bokaro District-(Annex.- II)

Sl No .	Name of Health Facility	Consent to operate (CTO) Done by JSPCB as BMW Rule 2016	Name of CTF Agency for BMW safe disposal as BMW Rule 2016 Biogenetic laboratory Pvt. LTD. Chotapichri ,Kalyanpur, Dhanbad, JH. MoU Yes OR No	BMW				Method of BMW waste disposal	
				Yellow	Blue	Red	White	Sharp Pit	Placenta Pit
1.	Sadar Hospital Bokaro	YES	YES	YES	YES	YES	YES		
2.	Community Health Centre Chas	YES	NO	NO	NO	NO	NO	YES	YES
3.	Sub divisional Hospital Chas	YES	NO	YES	YES	YES	YES	NO	NO
4.	Sub divisional Hospital Bermo	YES	NO	YES	YES	YES	YES	NO	NO
5.	Community Health Centre Bermo	YES	NO	YES	YES	YES	YES	NO	NO
6.	Community Health Centre, Chandankiyari	YES	NO	YES	YES	YES	YES	NO	NO
7.	Community Health Centre Gomia	YES	NO	YES	YES	YES	YES	NO	NO
8.	Referal Hospital Jainamore (Jaridih)	YES	NO	YES	YES	YES	YES	NO	NO
9.	Community Health Centre Kasmar	YES	NO	YES	YES	YES	YES	NO	NO
10.	Community Health Centre Nawadih	YES	NO	YES	YES	YES	YES	NO	NO
11.	Community Health Centre Peterwar	YES	NO	YES	YES	YES	YES	NO	NO
12.	Sub divisional Hospital Tenughat	YES	NO	YES	YES	YES	YES	NO	NO

**BMW Waste Management Rule 2016 Follows in the Private Health Facility, Private Labs. Bokaro District
(Annex. - II) –**

Sl. No.	Name of Health Facility	Consent to operate (CTO) Done by JSPCB as BMWM Rule 2016	Name of CTF Agency for BMWM safe disposal as BMWM Rule 2016 Biogenetic laboratory Pvt. LTD. Chotapichri ,Kalyanpur, Dhanbad, JH. MoU Yes OR No	BMW				Method of BMWM waste disposal	
				Yellow	Blue	Red	White	Sharp Pit	Placenta Pit
1.	Surya Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
2.	Kumar Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
3.	RambhaOrthopedic Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
4.	Produce Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
5.	Jyoti Reproductive Health Care Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
6.	Muskan Hospital Rech. Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
7.	Khushi Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
8.	Medinova Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
9.	Brinda Maternity Home &Sergical Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
10.	Diagnostic Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
11.	New City X-Ray & Path. Lab	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
12.	SevaSadan	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
13.	SanjivaniFracutre Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
14.	Surgy Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
15.	Chest Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
16.	Neelam Hospital & Research Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
17.	Shyama Diagnostic Lab	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
18.	Care Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
19.	City Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
20.	Krishna Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
21.	Prudence Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
22.	Shiv Shakti Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
23.	St. PoulHealthways	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
24.	Aastha Care	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
25.	Dentistree	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
26.	Dr.Shivam Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
27.	Subham Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
28.	Siddhi Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
29.	Brindavan Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
30.	Digital Patho. Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
31.	Hope Hospital & Ultrasound Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
32.	Su Khushi Hospital & Rech. Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
33.	Navjeevan Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
34.	Dr. (Mrs) PratapPathologicl Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
35.	Neuro Scan	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
36.	Indian Health Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
37.	Global Hospital &Rech. Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
38.	B.T.P.S. Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
39.	C.T.P.S. Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
40.	Dr.ShobhaSinha Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
41.	Mother Care	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
42.	Shree Sai Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
43.	Implant & Cosmetic Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
44.	Danta Multi Speciality Dental Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
45.	New Max Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR

46.	DhanwantriOrthopedic & Trauma Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
47.	Bharat Hospital &Rech. Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
48.	Swastik Hospital & Urology Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
49.	Bokaro Pathological Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
50.	BokaroPathjological Laboratory	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
51.	Hi -Tech Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
52.	Bokaro Pathological Lab.	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
53.	K. M. Memorial Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
54.	SanvikaMultispeciality Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
55.	Asha Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
56.	Life Line Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
57.	Rahat Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
58.	Bokaro Surgical & Maternity Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
59.	Electrosteel Limited	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
60.	Om Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
61.	Satyam Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
62.	Raj Hospital	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
63.	Mathur Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
64.	Multi Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
65.	IshaJanchGhar	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
66.	Baba Diagnostic Centre	NA	Yes	Yes	Yes	Yes	Yes	NR	NR
67.	Thyro Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
68.	Surgy Centre IVF	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
69.	Dalmia Social Welfare Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
70.	Shiv Shakti Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
71.	Maa Hospital &Rech Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
72.	RNB Hospital & Pal Eye Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
73.	City Care Hospital & Heart Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
74.	Relief Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
75.	Priyadarshi Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
76.	S.D. Dental & Research Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
77.	Goutam Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
78.	Life Care Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
79.	Maa Tara X Ray &Patholabs	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
80.	Kumar's Diagnostic Health Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
81.	BSM Clinilab Diagnostic & Imaging Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
82.	Life Line Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
83.	Blood Bank Red Cross Society	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
84.	Narayani Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
85.	Adhya Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
86.	Raj Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
87.	X Ray &Patholab& Sunrise Medico	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
88.	Sri Ram Hospital &Rech Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
89.	Smile Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
90.	Shree Ram Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
91.	AshaShashiHospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
92.	Dr.Shila Victor Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
93.	Jeevan Deep Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NO	NO

94.	VidyaPatho Lab	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
95.	Bokaro PAC DrLalPatho Lab	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
96.	MaaBhawani Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
97.	Sadar Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
98.	Shanti Health Care Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
99.	Prudence Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
100.	Khusi Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
101.	SaiDaignostic Laboratories	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
102.	St. Upel Nursing Home	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
103.	Maa Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
104.	Saraswati Maternity Home	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
105.	Asha Deep Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
106.	Raksha Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
107.	Mahabir Health Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
108.	Digital Diagnostic Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
109.	PoonamHospita	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
110.	Rai Dental & Implant Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
111.	Drihti Eye Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
112.	Advance Medi Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
113	Skin & Smile Leaser Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
114..	Rani Hospital & Baby Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
115.	Bhushan Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
116.	Kumar's Digital Health Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
117.	Park Digital XRay&JanchGhar	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
118.	G.K. Hospital &Rech. Centre	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
119.	Life Care Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
120.	Dy C.M.O. S.T.M.M. Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
121.	SRL Reach Limited	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
122.	SRL Diagnostic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
123.	Su KhusiDiagnostic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
124.	MM Hospital	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
125.	AbhaPatholab	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
126.	Ayub Dental Clinic	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
127.	MISSION HOSPITAL	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
128.	APEX HOSPITAL	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
129.	YOGIMAYA AAROgyAM	NA	Yes	Yes	Yes	Yes	Yes	NO	NO
130.	DCDC Kidney Care	NA	Yes	Yes	Yes	Yes	Yes	NO	NO

NA- Not Available # NR – Not Required

Tabulation of activities with objective, status, responsible functionary and timeline is as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Segregation and Record Keeping	Segregation of waste according to Annexure-8.1, of both government and private facilities	Partial	Civil Surgeon, District Veterinary Hospital In charges, Owners of Private Health Facility	3 months
	Make provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bags or containers in the manner as specified in Annexure 8.1, to ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals and the bio-medical waste from such place or premises shall be directly transported in the manner as prescribed.	Partial		3 months
	Not to give treated bio-medical waste with municipal solid waste	Complied		Immediate
	Provide training to all its health care workers and others, involved in handling of bio medical waste at the time of induction and thereafter at least once every year.	Partial		3 months
	Maintain and update on day to day basis the bio-medical waste management register and display the monthly record on its website according to the bio-medical waste generated in terms of category and color coding	Partial		Immediate
	Establish a process of collection of bio- medical waste from other CHCs every 48 hours, so that they can come to Bokaro for deep burial, if no Common Biomedical Waste Treatment Facility is finalized. To be sent to CBWTF when finalized.	Not Initiated		6 months

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Disposal	Each BMW producer to identify nearest Common Bio-Medical Treatment Facility and send their waste properly segregated and bar coded to them for final disposal.	Running	Civil Surgeon, District Veterinary Hospital In charge, Owners of Private Health Facility	On going
	Establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or place for any Purpose	Partial		6 months
	If CBWTF is not within radius of 75kms, on site disposal may be allowed after the facility has taken permission from JSPCB and is following guidelines	NA	Civil Surgeon and RO, JSPCB	NA
	Avoidance of deep burial and switching over to process like autoclave, pyrolysis etc. Government run facilities to present estimates to health department regarding the same.	Partial	Civil Surgeon, Owners of Private Health Facility	3 months
	Maintain all record for operation of incineration, hydro or autoclaving etc. , for a period of five years.	Partial		3 months

2.4. Construction and Demolition (C&D) Waste Management Plan as bellow:-

Duties and responsibilities laid out by the Waste Management Rule 2016 in detailed manner to all the stakeholders ranging from waste generators to ULBs to ministries.

However, implementation of these rules has not been to full extent. Best practice in India shows that 80- 90% of C&D waste can be reused after processing in a variety of applications such as landscaping, earth work, soil erosion prevention and other applications such as road tiles etc.

Construction and demolition waste generators of Township are informed about their duties:-

- (i) Regarding the responsibility for collection, segregation of concrete, soil, and others and storages of C&D waste separately.
- (ii) To ensure that other waste does not get mixed with this waste.
- (iii) To ensure that there is no littering or deposition C&D waste so as to prevent obstruction to the traffic or the public or drains.
- (iv) Duties of service provider and their contractors:
Service providers are asked to remove all C&D waste and clean the area, appropriate storage and collection in a planned manner.
- (v) Appropriate containers for collection of waste and its removal at regular intervals.
- (vi) Collected waste is transported to appropriate site.
- (vii) Keeping track of generation of C&D waste.

After all marking of a place for disposing C&D waste is very important.

Tabulation of activities with objective, status, responsible functionary and timeline of Bokaro Steel City as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Carriage & Disposal	Service providers are asked to remove all C&D waste and clean the area, appropriate storage and collection in a planned manner. Demarcation of deposit site for C&D waste. Collected waste is transported to appropriate site.	Partial	DC and GM, TA, BSL	3 months
	To ensure that other waste does not get mixed with the C&D waste.	Initiated		Immediate
Penalty & By-law	Keeping track of generation of C&D waste. Passing of by-law, imposing fine for irresponsible disposal of C&D waste	Not initiated	GM, TA, BSL	6 months

Tabulation of activities with objective, status, responsible functionary and timeline of Chas Municipal Corporation as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Carriage & Disposal	Service providers are asked to remove all C&D waste and clean the area, appropriate storage and collection in a planned manner. Demarcation of deposit site for C&D waste. Collected waste is transported to appropriate site.	Partial	DC, & AMC, Chas Municipal Corporation	3 months
	To ensure that other waste does not get mixed with this waste.	Initiated		Immediate
Penalty & By-law	Keeping track of generation of C&D waste. Passing of by-law, imposing fine for irresponsible disposal of C&D waste	Not-initiated	AMC, Chas Municipal Corporation	6 months

Tabulation of activities with objective, status, responsible functionary and timeline of Phusro Nagar Parishad as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Carriage & Disposal	Service providers are asked to remove all C&D waste and clean the area, appropriate storage and collection in a planned manner. Demarcation of deposit site for C&D waste. Collected waste is transported to appropriate site.	Partial	DC and Executive Officer, Phusro Nagar Parishad	3 months
	To ensure that other waste does not get mixed with this waste.	Not Initiated	Executive Officer, Phusro Nagar Parishad	Immediate
Penalty & By-law	Keeping track of generation of C&D waste. Passing of by-law, imposing fine for irresponsible disposal of C&D waste	Not-initiated	Executive Officer, Phusro Nagar Parishad	6 months

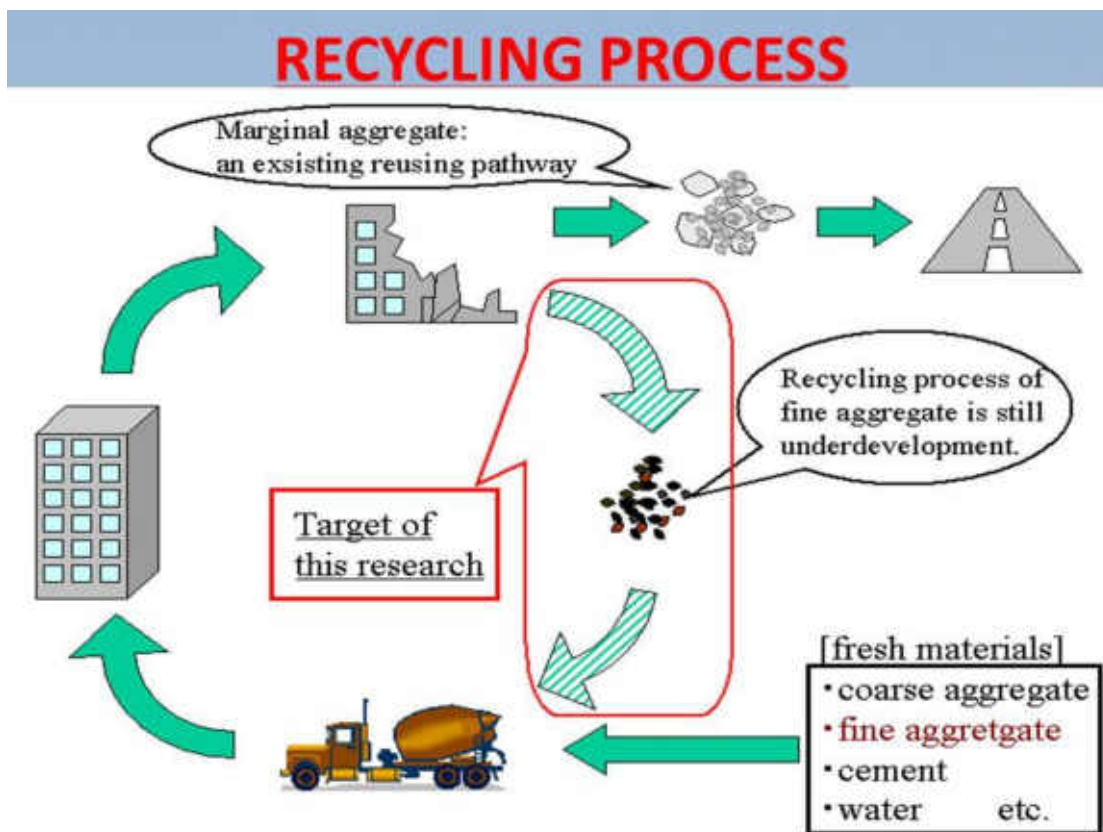


Figure 10. Proposed Construction and demolition waste management in urban area

2.5. Hazardous Waste Management Plan:-

The term **Hazardous waste** interprets as “any substance, excluding domestic and radioactive wastes, which causes significant hazards to human health or environment because of its quantity and/or corrosive, reactive, ignitable, toxic and infectious property when improperly treated, stored, transported and disposed.

As per the Hazardous Management Rule 2016, a list of activities (as well as metals in excess of certain concentration and many other compounds classified as hazardous) that create hazardous waste can be tabulated as follows:-

Tabulation of activities with objective, status, responsible functionary and time line as below:-

Activity	Objective	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Disposal & processing of Industrial HW	Storage of HW generated by the industrial units has to be done in an appropriate & safe manner by themselves. HW generating units have to get a registration under JSPCB.	Periodically updated	G.M, DIC and RO, JSPCB	3 months
	Maintaining a track record of all the activities/industrial processes which can create hazardous waste to ensure that they follow Hazardous Waste Rules 2016.			
	There should be authorized disposal or authorized user to buy the hazardous wastes generated whiles the establishment of an industrial unit.	Not-initiated		3 months

Tabulation of activities with objective, status, responsible functionary and timeline of Bokaro Steel City as below:-

Processing & Collection of Domestic HW	The administration is supposed to create possible and required number of safe disposal points in its jurisdiction for the disposal of domestic hazardous waste.	Not-initiated	GM, TA Bokaro Steel City	6 months
	To provide the facility of door to door domestic hazardous waste collection once a month.			9 months

Tabulation of activities with objective, status, responsible functionary and timeline of Chas Municipal Corporation as below:-

Processing & Collection Of domestic HW	The administration is supposed to create possible and required number of safe disposal points in its jurisdiction for the disposal of domestic hazardous waste.	Not-initiated	AMC, Chas Nagar Nigam.	6 months
	To provide the facility of door to door domestic hazardous waste collection once a month.			9 months

Tabulation of activities with objective, status, responsible functionary and timeline of Phusro Nagar Parishad as below:-

Processing & Collection Of Domestic HW	The administration is supposed to create possible and required number of safe disposal points in its jurisdiction for the disposal of domestic hazardous waste.	Not-initiated	Executive Officers , Phusro Nagar Parishad	6 months
	To provide the facility of door to door domestic hazardous waste collection once a month.			9 months

M/s. Trident Metal Energy Pvt. Ltd., At+PO- Karharia, Dist- Bokaro is nearest recycler.

Standard Operating Procedure at SAIL/Bokaro Steel Plant for ensuring Compliance to Hazardous & Other Wastes (Management & Trans boundary Movement) Rules' 2016.

SAIL/ Bokaro Steel plant has standard practice for management of Hazardous wastes generated at different shops in consonance with Hazardous & Other Wastes (Management & Transboundary Movement) Rules'2016 and amendments thereof. The standard operating procedure is as under:-

- M/s SAIL/ Bokaro Steel Plant is operating with valid Hazardous Waste authorization from Jharkhand state Pollution Control Board. HW Authorization (Ref. No. JSPCB/HO/RNC/HWM-6676084/2020/23, Dated: 29-07-2020) is valid up to 31st December2020. Online Application has been submitted to JSPCB for its renewal for next four years.
- The Various Hazardous Wastes generated out of steel making processes have been identified and characterized as per Hazardous & Other Wastes (Management & Trans boundary Movement) Rules'2016.
- The Quantity & type of Hazardous Waste generated & disposed are being maintained by various shops and are submitted to Environment Control Department in form-3. Total Hazardous Waste generated & disposed is compiled on annual basis by ECD.

- Annual return in Form-4 is submitted to board before 30th June for the previous fiscal. The Hazardous Waste return for 2019-20 was submitted to JSPCB on 12th 2020.
- BSL is following the philosophy off RRR, i.e. Reduce, Reuse, Recycle and Eco-friendly disposal in Secured Land Fill.
- Hazardous Waste manifest System is maintained by stores department for the HW sold to Authorized Recyclers. The copy of the same is submitted to board as & when received from stores.
- The non-usable & non-saleable Hazardous Wastes are dumped in our captive secured land fill.
- In compliance to Honorable Supreme Court order the details of Hazardous Wastes has been displayed at our Main gate.
- All the conditions of HW authorization are complied with. The compliance Report to the conditions of Hazardous Waste authorisation is submitted to the board on regular basis.

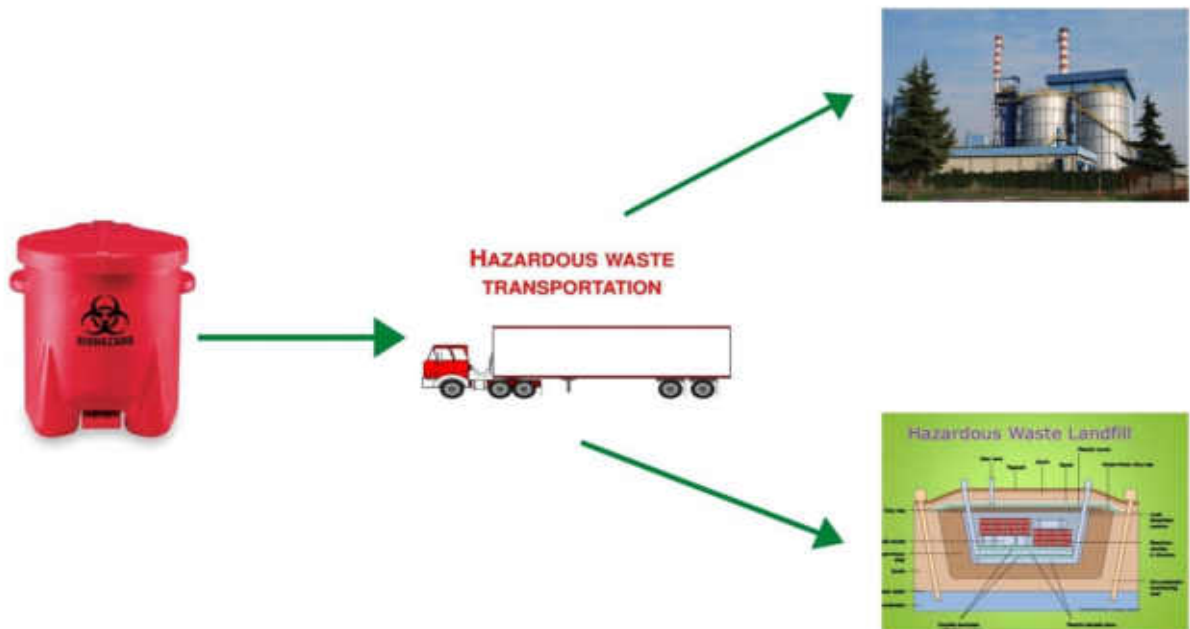


Figure 11: Proposed Construction and demolition waste management in urban area

2.6 E-Waste Management Plan:-

In this highly technological age Electrical and electronic equipment dominate. The matter of fact is that we can't imagine this century without electronics and electrical. Scientifically every electronics and electrical lose the favorable status of use after 3 years. After 3 years of use it becomes a scrap and termed as E-Waste. It includes the components, parts and spares, CPU, Laptops, electrical-typewriters, telex, telephone, cellular phones, printers including cartridges, T.V, LED, Refrigerator, Washing Machine, A.C, fluorescent and mercury containing lamps etc.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Disposal point & collection	Demarcated and identified disposal point within the concerned jurisdiction with proper safety measures (bin cover).	Partial	TA BSL, Chas AMC Chas Nagar Nigam, Executive Officers ,Phusro Nagar Parishad	6 months
	Preparing a record of E-waste collectors and making them publically well known.			6 months
	Inviting and facilitating the agencies to set up their collection Centre in the district.			1 year
Transportation & Recycling	Ensuring transportation of collected E-waste in an interval to the nearest authorized E-Waste recycler for recycling.	Partial	DC GM,TA BSL, AMC, Chas Nagar Nigam, Executive Officers ,Phusro Nagar Parishad	9 months
E-waste awareness program	A wide range awareness program to make common people aware about e-waste as it generated by every individual family.	Not Initiated	DC, GM,TA BSL, AMC Chas Nagar Nigam, Executive Officers , Phusro Nagar Parishad	Immediate
	To make sure that people must not treat e-waste as other general solid waste.			

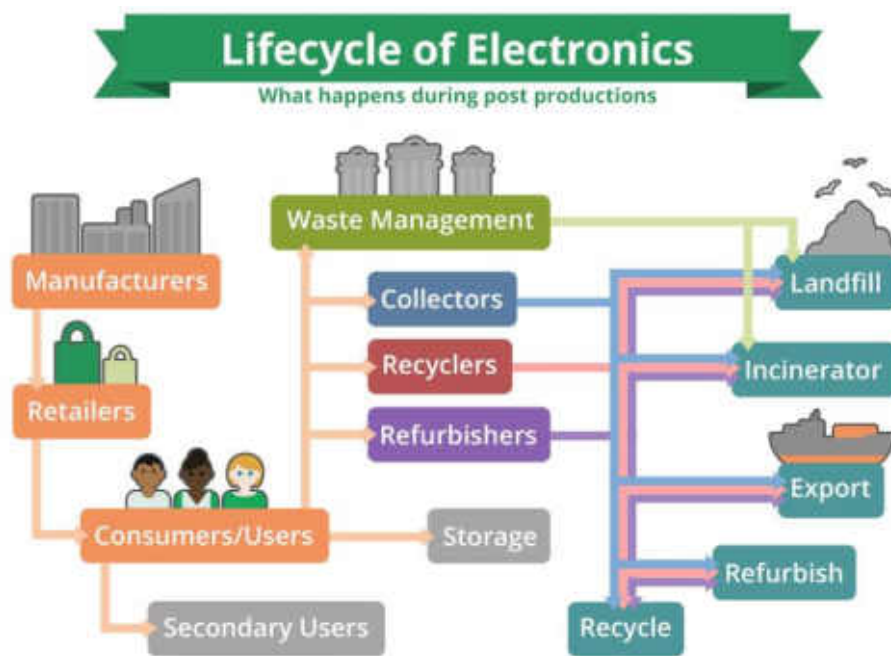


Figure 12. Proposed Cycle of E-waste management.

3. Water Resources Management Plan:-

An attitude of ignorance causes waste. Water one of the basic amenities essential for living is misused and thus changes into waste water. This is the major problem that is causing the whole living community suffer. The waste water even contaminates the ground water and breed pathogens, contributes to significant part of population dealing with water borne diseases.

India has rich resources of surface water nevertheless it depends on ground water. Ground water extraction has increased so much in the last two decades. Because of depletion of resources we are at the stage of water crisis in most part of the nation.

Bokaro is in industrial zone and thus the water requirement here is more. The town areas have the facility of supply drinking water facility. Villages do not have proper drinking water facility. For water they totally depend on ground water. Extraction of ground water at such a high level is exhausting the ground water level. Most places directly dump their drainage water into the existing drains which finally leads to the rivers through nalas and pollute the river water.

Waste water can be recycled or reused in many ways which can help fight water crisis to a greater extent along with water harvesting system of rain water.

As per According to a data publish by the Central Ground Water Board's 2017, **1,592 blocks**, identified as “water-stressed”, 313 critical blocks, 1,000-odd over- exploited blocks and 94 blocks with least water availability (for states without water-stressed blocks).

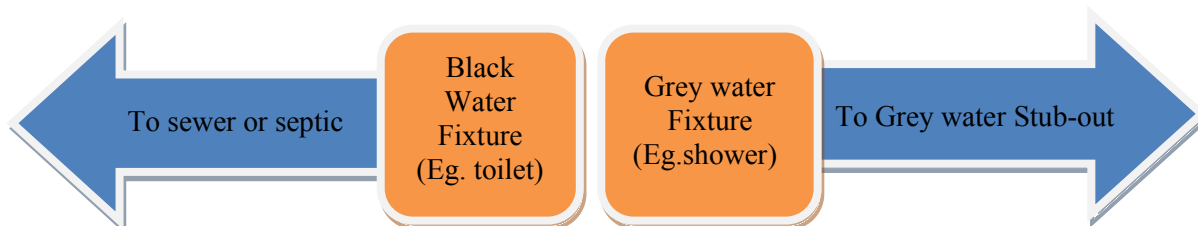
Bokaro district has 57258 no. of water bodies. The number includes **04** lakes, **1631** (GOV) ponds, **55614** Small Ponds (DHOBA), wells, 9 rivers.

3.1.Domestic Sewage Management Plan:-

Liquid waste flowing through the Sewage of the district consists of liquid waste generated in residences, industries waste discharge and inflow of rain/flood/storm water.

Hence basically sewage contains three components:

- Sanitary or domestic sewage
- Industrial wastes
- Infiltration, Inflow and storm-water.



Scenario in Bokaro:-

1. Only few parts of the district (Bokaro Steel City) has proper sewerage system (260 kms.). Rest of the district drastically lacks the sewerage system. Some of the places (Chas Municipal and Phusro Nagar Parishad) have open drainage system. The destination point of most of the sewage and drains is Garga River via depression and nalas.
2. A DPR has been formulated for proper sewerage system and sewerage treatment plant of 20 MLD at Chas Municipal Corp and project of 196.41crore has been sanctioned by Phusro Municipality.
Most of the household in the district have backyard sump as way of disposal of domestic waste water (grey water).
3. No part of liquid waste is treated

Considering above, the proposals for management of waste water are:

1. Bokaro district lacks centralized sewerage system and not advisable at this juncture as well.
2. Rather, **decentralized sewerage system for each ward**, should be attempted for managing the grey water.
3. Chas Municipal Corp. is under process to formulate STP of 20MLD capacity.
Decentralized sewerage system is the collection, treatment, disposal / reuse of sewage from individual homes, clusters of homes, isolated communities or institutional facilities, as well as from portions of existing communities at or near the point of waste generation.
4. Chas Municipal Corp. is under process to formulate project about 196.41 crore.
Decentralized sewerage system is the collection, treatment, disposal / reuse of sewage from individual homes, clusters of homes, isolated communities or institutional facilities, as well as from portions of existing communities at or near the point of waste generation.

The decentralization concepts and technologies in sewerage management of grey water need to be systematically investigated, with focus on its development and practical implementation in Bokaro. It may be borne in mind that the approach adopted for decentralized sewage management system (DSMS) is area specific and governed by number of issues and conditions prevailing, and also the methodology adopted and is influenced by:-

- (i) Technical aspects
- (ii) Financial aspects,
- (iii) Social aspects,
- (iv) Environmental aspects, and
- (v) Legal aspects.

Hence, the district administration needs to plan it properly. One can take up one habitation of 60-100 households respectively and plan implementation of DSMS of 1-2 MLD capacity.

One example of Decentralized Wastewater Treatment System with treatment sequence is given below:

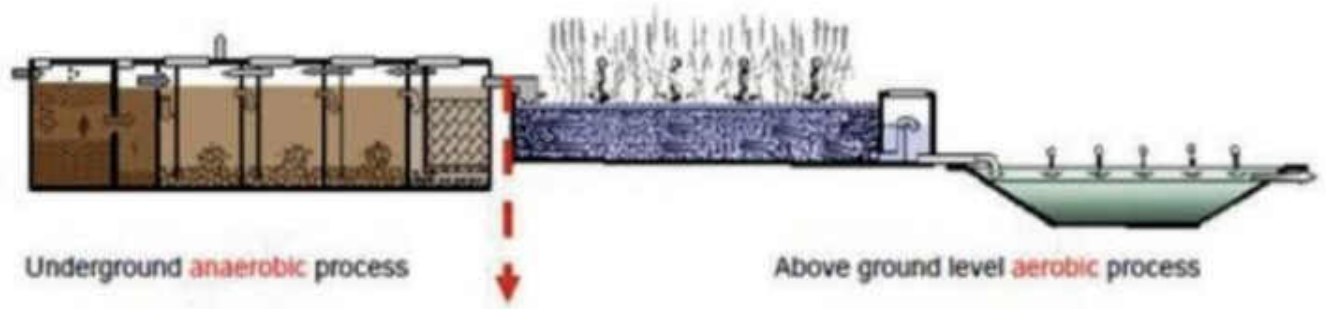


Figure 12. Schematic process flow diagram of DSMS

Tabulation of activities with objective, status, responsible functionary and timeline of Bokaro Steel City as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Formulation	Preparation and submission of the map of existing sewerage network and their outlet points in Bokaro Steel City to District Environment Committee.	Running	GM, TA, BSL,	1 Month
	(a) DPR preparation for development of sewerage and treatment system of domestic sewage and estimation of capacity of STP needed.	Old is Running & Modern Projected		On Going
	(b) Development of DPR for Decentralized Waste Water Collection and Treatment System (DWWCTS) - Sector WISE for in the Bokaro Steel City.	Running		On Going
Installation of sewerage network and STP	Placement and initiation of first unit of DWWCTS in one of the Sector of Bokaro Steel City.	Old is Running & modern Projected	GM,TA, Bokaro Steel City.	1.5 years
	Making of STP at Bokaro Steel City.		GM,TA, Bokaro Steel City.	1 years
	Installation of separate Effluent Treatment plant for sewage from DMCH		Civil Surgeon&	1 year
By-Laws	Making it mandatory in by law for complete ban on flow of grey water from households to water bodies like river, lakes and ponds.	Initiated	GM,TA, Bokaro Steel City.	1.5 years
	A compulsory backyard sump for household snot connected to sewerage system.			ASAP

Tabulation of activities with objective, status, responsible functionary and timeline of Bokaro Steel City as bellow:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Formulation	Preparation and submission of the map of existing sewerage network and their outlet points in Bokaro Steel City to District Environment Committee.	Running	GM, TA, BSL,	1 Month
	(a) DPR preparation for development of sewerage and treatment system of domestic sewage and estimation of capacity of STP needed.	Old is Running & Modern Projected		On Going
	(b) Development of DPR for Decentralized Waste Water Collection and Treatment System (DWWCTS) - Sector WISE for in the Bokaro Steel City.	Running		On Going
Installation of sewerage network and STP	Placement and initiation of first unit of DWWCTS in one of the Sector of Bokaro Steel City.	Old is Running & modern Projected	GM,TA, Bokaro Steel City.	1.5 years
	Making of STP at Bokaro Steel City.		GM,TA, Bokaro Steel City.	1 years
	Installation of separate Effluent Treatment plant for sewage from DMCH		Civil Surgeon&	1 year
By-Laws	Making it mandatory in by law for complete ban on flow of grey water from households to water bodies like river, lakes and ponds.	Initiated	GM,TA, Bokaro Steel City.	1.5 years
	A compulsory backyard sump for household snot connected to sewerage system.			ASAP

Tabulation of activities with objective, status, responsible functionary and timeline of Chas Municipal Corporation as bellow:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Formulation	Preparation and submission of the map of existing sewerage network and their outlet points in Chas Municipal Corporation to District Environment Committee.	Initiated	AMC, Chas Municipal corporation	1Month
	(A) DPR preparation for development of sewerage and treatment system of domestic sewage and estimation of capacity of STP needed.	Initiated		Running
	(b) Development of DPR for Decentralized Waste Water Collection and Treatment System (DWWCTS) - WARD WISE for in the Chas Mun. Corp.	Not initiated		1 year
Installation of sewerage network and STP	Placement and initiation of first unit of DWWCTS in one of the wards of Chas Mun. Corp.	Initiated	AMC, Chas Municipal corporation	1.5 years
	Making of STP at Chas Mun. Corp.		AMC, Chas Municipal corporation	1 years
	Installation of separate Effluent Treatment plant for sewage from DMCH		Civil Surgeon	1 year
By-Laws	Making it mandatory in by law for complete ban on flow of grey water from households to water bodies like river, lakes and ponds.	Initiated	AMC, Chas Municipal corporation	1.5 years
	A compulsory backyard sump for households not connected to sewerage system.			ASAP

Tabulation of activities with objective, status, responsible functionary and timeline of Phusro Nagar Parishad as bellow:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Formulation	Preparation and submission of the map of existing sewerage network and their outlet points in Phusro Nagar Parishad to District Environment Committee.	Initiated	Executive Officer, Phusro Nagar Parishad	1 Month
	(a) DPR preparation for development of sewerage and treatment system of domestic sewage and estimation of capacity of STP needed.	Initiated		Running
	(b) Development of DPR for Decentralized Waste Water Collection and Treatment System (DWWCTS) - WARD WISE for in the Phusro Nagar Parishad	Initiated		1 year
Installation of sewerage network and STP	Placement and initiation of first unit of DWWCTS in one of the wards of Phusro Nagar Parishad	Initiated	Executive Officer, Phusro Nagar Parishad	1.5 years
	Making of STP at Phusro Nagar Parishad.		Executive Officer, Phusro Nagar Parishad	1 years
	Installation of separate Effluent Treatment plant for sewage from DMCH		Civil Surgeon	1 year
By-Laws	Making it mandatory in by law for complete ban on flow of grey water from households to water bodies like river, lakes and ponds.	Initiated	Executive Officer, Phusro Nagar Parishad	1.5 years
	A compulsory backyard sump for households not connected to sewerage system.			ASAP

3.2. Industrial Wastewater Management Plan:-

Water is one of the most important factors of industrial settlement. Without water we cannot impart an industry. Same time industry's discharge mixes with water and pollutes it. Thus the water is termed as industrial waste water. If we take it at national level its quantity is tremendously huge as India is at the stage of industrialization.

Bokaro is an industrial zone of the country. Here Asia's largest steel plant (SAIL BOKARO) is located. Other than that some more industries (ELECTRO Steel, JIADA, JP Cement ...et.) are there. Hence generation of waste water is evident and needs **Industrial Waste Water Management Plan.**

3.3. Polluted Rivers Extending In Bokaro:-

According to the guidelines issued by the Hon'ble NGT in its order dated 20.09.2018 in O.A No. 673/2018, CPCB has classified the polluted river stretches in five priority categories i.e., I, II, III, IV, V depending upon the level of BOD.

- Criteria for Priority I - BOD greater than or equal to 30mg/L
- Criteria for Priority II - BOD between 20-30mg/L.
- Criteria for Priority III - BOD between 10-20mg/L.
- Criteria for Priority IV - BOD between 6-10mg/L.
- Criteria for Priority V - BOD between 3-6mg/L.

Seven river stretches have been identified in Priority IV & V as polluted stretches in Jharkhand.

Sl. No.	River	River Stretch	Approx. Length Of The Stretch (Km)	District
1	Garga	Along Telmuchu	22	Bokaro
2	Sankh	Kongserabasar To Bolba	10	Simdega
3	Subarnarekha	Hatia Dam To Jamshedpur	120	Ranchi, Khunti, SeraikelaKharsawan & East Singhbhum
4	Damodar	Phusro Road Bdg To Turio	12	Bokaro
5	Jumar	Kanke Dam To Kadal	10	Ranchi
6	Konar	Along Tilaya And Konar	-	Koderma & Hazaribagh
7	Nalkari	Along Patratu	-	Ramgarh

According to the above table the river “Garga” (flowing through only Bokaro district) is the most polluted and endangered river that mandatorily needs to be monitored and for this Chas Municipal Corp. has submitted a plan emphasizing the expedition to make ‘Garga’ pollution free. The plan also consists of making of DPR for constructing sewerage with treatment plant of 20MLD capacity.

The district enjoys the inflow of 09 rivers. Out of which most are under the risk of disappearance. Some major rivers we could take a glance of are:-

Damodar:- The river has been revitalized by restricting the disposal of ashes from **THERMAL PLANTS**. Tributaries of Damodar river are affected by idol immersion and plastic wastes. It is projected to keep a proper vigilance after the DEP gets approval.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Cleaning & Mandatory Monitoring of Rivers	A planned expedition to clean ‘Garga’ river and appointing a committee to monitor the health of the rivers half yearly.	Initiated (DPR Submitted to Gov. of Jharkhand For constructing sewerage & treatment plant)	DC,RO,JSPCB,DF O& TA BSL, Chas Nagar Nigam,	Running
	In no way mixing of pollutants and letting the sewerage and nals to join the ‘Garga’ / rivers. For this a proper vigilance should be mandatory.	Initiated		

3.4. Ground Water Extraction, Contamination and Recharge Plan:-

The original India dwells in villages. One of the major problems that our country faces is drinking water problem. And on that mostly this problem is dominant in the villages. Villages mostly depend on ground water. Extraction of ground water is done in different ways like, well, hand pumps, bore well...etc. continuous extraction of ground water to meet the demand of rising population has exhausted around 56 percent in many of the states.

Bokaro district has the same scenario as the whole nation. Mostly villages depend on ground water for their need. Different resources have different purpose of use e.g. pond and river- irrigation, well, hand pumps & bore wells- drinking and other domestic use.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Listing & networking the deprived villages and Convergence	Listing and networking of villages having water scarcity.	On-going	DC, Executive Engineer, Drinking Water and Sanitation Dept.	6 months
	Execution of all the schemes ensuring provision of drinking water for deprived villages.			1 year
Awareness camps for Rain Water Harvesting	Creating infrastructure for rain water harvesting structures on department buildings.	Partial	Departmental Heads	Before next monsoon
	Creating infrastructure for rain water harvesting compulsorily and passing of by-law for that.	Not-Initiated	DC & Departmental Heads	1 year
	Organizing awareness camps for making of rainwater harvesting structures like backyard sump.	Not-Initiated	DC, DFO, DDC, BDO and Head of Local Bodies	Continuing

3.5. Revitalization of Water Bodies:-

Considering India with respect to population it more prone about getting its water bodies like ponds and lakes dead, dry and disappear. These water bodies have been the dumping sites/points for urban as well as rural areas. In urban areas water bodies are the means of recreation which results into dumping of plastic materials, papers, water bottles by visitors. Other than that immersion of idols in both urban and rural areas are done into these water bodies. Thus, there a need of mandatory action to be taken so that these water bodies can be saved from siltation, sedimentation and weed growth. Water bodies under such condition must be re-charge so that they can get back to status of natural water retention.

Further they are polluted due to human activities such as bathing and washing of clothes.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Inventory of Water Bodies	Creating a datasheet of lakes, ponds, and rivers including the new ones constructed under schemes like MGNREGS	Partial	DC,DDC,CO	9 months
Cleaning and De-siltation of Water Bodies	Planned expedition for cleaning and de-siltation of lakes and other required water bodies.	Not-Initiated	DC,DDC, TA BSL, Chas Nagar Nigam, Phusro Nagar Parishad	12 months
Restriction	Putting a restriction on the use of soap and bathing in certain lakes and ponds by creating by-laws. Alternate supply of water to the hot spots used for bathing and washing.			15 months
Treatment provision	Creating provision for the treatment of effected water bodies.		DC,DDC, DFO,TA BSL, Chas Nagar Nigam, Phusro Nagar Parishad	18 months

The following table (status of Industries in Bokaro District) shows the Water status in the district:-

Status of industries in Bokaro District			
S.N.	Type of Industries	Pollution Control Arrangement	
		Air	Water
1	Coal Mines	Water spraying by tanker, Controlled Blasting,	Siltation Pond, Garland drain
2	Coal Washeries	Dust suppression by water spraying	Settling pond provided with
3	Hard Coke Plants	Down Draft / Double Tunnel with stack, Bag filter in coal crusher	Settling tank with recirculation system has been provided.
4	Soft Coke & Briquette Industries	Wet Scrubber with stack	Settling tank with recirculation
5	Refractories	Bag filter, water spraying	N/A
6	Stone Crushers	Crusher & Screen Covered, Tree plantation, Water spraying, Boundary Wall Provided.	N/A
7	Stone Mines	Tree Plantation, Manual Water spraying arrangement	
8	Thermal Power Plants	ESP, Water spraying	Ash settling pond,
9	Cement Plants	Bag House / Bag filters, Water spraying	N/A
10	Integrated Steel Plants	ESP, Bag filters, Cyclone, etc	Combined Effluent Treatment Plant
11	Sponge Iron Plant	ESP, Bag filters, Water spraying	Settling tank for recirculation.
12	Steel Products Mfg. Ind.	Fume extraction system, Water spraying etc	Cooling tower with recirculation system.
13	Red Bricks Ind.	Wet Scrubber / Induced draught	N/A
14	Quartz Grinding Ind.	Bag filter, Crusher & Screen covered, Fixed type water sprinkler installed for dust suppression	N/A
15	Flour Mills	Cyclone With Bag filter	N/A
16	Chemical Ind.	Water spraying	ETP
17	Misc. Ind.	As per list attached	As per list attached

Status of BMW Management & Disposal			
S.B.	No. of HCF	BMW Generation (Kg/day)	Pollution Control Arrangement
1	Bedded - 106	255.912	ETP/ BMW Disposed through CBWTF / Deep Burial
2	Non Bedded - 34	26.0422	BMW Disposed through CBWTF / Deep Burial

Water Quality Management
Data of NWMP for the year 2019 is enclosed

Air Quality Management
OCEMS has been installed in total 07 no. of industries falling under 17 categories for online monitoring
Installation of PM10 has been made mandatory at the industries for monitoring of Real Time Air Quality
Notification enclosed

Status of River Garga
Domestic Waste water discharge from BSL Township falls into river Garga
Municipal drains from Chas town are also falling into river Garga
Installation of STP(s) is/are required for treatment of domestic discharge to make river Garga Pollution free.

Note : Complete Details are as enclosed in Excel File containing corresponding sheets.

4. Air Management Plan:-

Air crisis is the most serious problem of not only India but also the world. Human activities and scientific development has taken this problem to the next level. Air pollution has become the matter of great concern for the whole globe.

In no way the scene of Bokaro district in this regard is different. Being the industrial zone of the country the district has put itself at the stage of air crisis.

Following are the factors causing Air Pollution in Bokaro:-

1. Bokaro Steel Plant (SAIL BOKARO)
2. Electro Steel Plant (Talgaria)
3. Burning of solid municipal waste & domestic fuel burning emission.
4. Coal mining, Stone Mining and Crushing (will be dealt with in Section6)
5. BTPS (Kathara), CTPS (Chandrapura)
6. Vehicular Emissions
7. Other industries like Cement factory (Dalmia), JIADA.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Vigilance on Air Quality	Setting up a Continuous Ambient Air Quality Monitoring Station (CAAQMS) and maintain a record of its readings for future reference.	Not Initiated	DFO and RO, JSPCB	1 year
Vehicular Emissions and Dust	Mandatory pollution check points for vehicles keeping loading norms of vehicular emission rules in mind as vehicle emits more smoke.	Initiated	DTO	Continuous
	Check posts must check sand and coal laden vehicles if they are covered.			
Complete restriction on burning waste	A by-law that must make sure that burning of municipal waste in entire district is totally and strictly prohibited.	Partial	Head of all Local Bodies	6 months
Vigilance on Emissions from Designated Industrial Area	Strict instruction must be given to the industries periodical to maintain air pollution levels.	Initiated	RO, JSPCB	Twice a year

Also, the abandoned mines pose a huge opportunity for land reclamation.

The following table (status of Industries in Bokaro District) shows the Air status in the district:-

Status of industries in Bokaro District			
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		Air	Water
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3	Hard Coke Plants	Down Draft / Double Tunnel with stack, Bag filter in coal crusher	Settling tank with recirculation system has been provided.
4	Soft Coke & Briquette Industries	Wet Scrubber with stack	Settling tank with recirculation
5	Refractories	Bag filter, water spraying	N/A
6	Stone Crushers	Crusher & Screen Covered, Tree plantation, Water spraying, Boundary Wall Provided.	N/A
7	Stone Mines	Tree Plantation, Manual Water spraying arrangement	
8	Thermal Power Plants	ESP, Water spraying	Ash settling pond,
9	Cement Plants	Bag House / Bag filters, Water spraying	N/A
10	Integrated Steel Plants	ESP, Bag filters, Cyclone, etc	Combined Effluent Treatment Plant
11	Sponge Iron Plant	ESP, Bag filters, Water spraying	Settling tank for recirculation,
12	Steel Products Mfg. Ind.	Fume extraction system, Water spraying etc	Cooling tower with recirculation system.
13	Red Bricks Ind.	onal Dust Settling Chamber / Induced dra	N/A
14	Quartz Grinding Ind.	Bag filter, Crusher & Screen covered, Fixed type water sprinkler installed for dust suppression	N/A
15	Flour Mills	Cyclone With Bag filter	N/A
16	Chemical Ind.	Water spraying	ETP
17	Misc. Ind.	As per list attached	As per list attached

Status of BMW Management & Disposal			
S.No.	No. of HCF	BMW Generation (Kg/day)	Pollution Control Arrangement
1	Bedded - 106	255.912	ETP/ BMW Disposed through CBWTF / Deep Burial
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OCEMS has been installed in total 07 no. of industries falling under 17 categories for online monitoring
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Domestic Waste water discharge from BSL Township falls into river Garga
Municipal drains from Chas town are also falling into river Garga
Installation of STP(s) is/are required for treatment of domestic discharge to make river Garga Pollution free.

Note : Complete Details are as enclosed in Excel File containing corresponding sheets.

4.1. 122 Non-Attainment Cities

Bokaro is not in the list of Non-attainment cities.

5. 100 Industrial Clusters

Bokaro is not a polluting industrial cluster.

6. Mining Activity Management Plan:-

Bokaro district has mainly coal mining, stone mining and sand mining and the related activities.

Activity	Licensed Units
Coal	09
Stone Mining	19
Sand Mining	02

Mining creates occupational illness. Coal mining and stone mining are kinds of mining which create high life risk. Sand mining creates a low risk. Related activities like loading, dumping, furnace use and stone crusher also create occupational illness. Stone crushers even cause respiratory risk to passers by.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Prevention of Dust around Crushers	Quarterly report submission in compliance with CTO by crusher units, Non-complying units to be taken under surveillance.	Partial	DMO, JSPCB	3 months
	Crushers to be set up with dust soakers and sprinklers compulsorily.	Partial initiated		
	Crushers to have fencing of dust-cum-visual barrier.			
Occupational Safety	Wearing of dust preventive masks by every employee to ensure occupational safety.	Initiated		

6.1. Sustainable Sand Mining:-

Guidelines issued by MoEF&CC as well as Jharkhand state regarding sustainable sand mining ensures the future of sand mining.

The salient features of Sand Mining Policy notified by Jharkhand State in 2017 are as follows:-

District Survey Report to be prepared mandatorily.

1. Streams/River to be categorized.
2. The District Survey Committee shall fix the sand order available in different order of streams such as 1st, 2nd, 3rd, 4th, ...etc. based on its size and capacity
3. Management of Sand Deposits of Category-1Streams/Rivers
4. Management of Sand Deposits of Category-2Streams/Rivers
5. The sand deposits of Category-1 stream/rivers will be kept fully free from domain of grant of mining lease.
6. The Sand deposits of Category-2 shall be managed by State Government.

Mining policy 2017 states that each district has to prepare District Survey Report (DSR), stating the available potential of minor mineral in a district and also to calculate sustainable mining rates for different sand mining river points.

DSR of Bokaro is under procedure that will reveal the depth as well as amount of annual sand that can be mined. Thus, immediate update is expected.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary(ies)	Expected Time after approval of DEP
Preparation & Submission of DSR	Review and updating of DSR to calculate the rate of annual sustainable sand mining (Ghat wise) and categorize the river stream.	Partial	Geologist, District Geology Office	6 months
Record of amount of extraction	Balu Ghats Lease holders to keep the record of the amount of sand extracted from their lease area and its random checking.		SP, DMO, Mining Task Force,	Continuous
Vigilance on Illegal Sand Mining	Monsoon sand mining to be totally prohibited. Proper vigilance on illegal extraction and sale of sand.			

6.2 Sustainable Stone Mining:-

DSR of Bokaro is under procedure that will reveal the depth as well as amount of annual Stone that can be mined. Thus, immediate update is expected.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Preparation & Submission of DSR	Review and updating of DSR to calculate the rate of annual sustainable Stone mining (Stone Mining wise) and categorize the hilly area.	Partial	Geologist, District Geology Office	6 months
Record of amount of extraction	Stone Mining Lease holders to keep the record of the amount of stone extracted from their lease area and its random checking.		SP, DMO, Mining Task Force,	Continuous
Vigilance on Illegal Stone Mining	Proper vigilance on illegal extraction and sale of stone.			

6.3 Sustainable Coal Mining:-

DSR of Bokaro is under procedure that will reveal the depth as well as amount of annual sand that can be mined. Thus, immediate update is expected.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Preparation & Submission of DSR	Review and updating of DSR to calculate the rate of annual sustainable coal mining (mine wise).	Partial	Geologist, District Geology Office	6 months
Record of amount of extraction	Coal mining Lease holders to keep the record of the amount of COAL.		SP, DMO, Mining Task Force,	Continuous
Vigilance on Illegal Coal Mining	Monsoon COAL mining to be totally prohibited. Proper vigilance on illegal extraction and sale of COAL.			

7. Noise Pollution Management Plan:-

Noise pollution causes a kind of physical disability. This is one of the major environmental problems in our country. Mainly it is caused by vehicles, industries, loud music....etc.

Since Bokaro is an industrial area hence noise pollution is evident here. Measures taken by the district administration for maintaining a peaceful ambience are as follows:-

1. Educational institutions and hospitals to be kept free from noise creating elements.
2. No noise causing element should lie in an area of 100 mtrs. From a school/hospital.
3. Penalty on violating the noise norms.
4. Awareness programs about the harms of creating noise and noise is a kind of pollution.
5. Loud horns, amplifiers, DJ, to be strictly restricted according to Noise Control Regulation Act-1951-2000.
6. Low sound explosive and siren to be used by the industries.

Tabulation of activities with objective, status, responsible functionary and timeline as below:-

Activity	Objectives	Status	Responsible Functionary (ies)	Expected Time after approval of DEP
Restriction on high noise creating elements	Loud horns, amplifiers, DJ, to be strictly restricted according to Noise Control Regulation Act-1951-2000.	Initiated	SP, SDM	Continuous
Educational institutions/hospitals	Educational institutions and hospitals to be kept free from noise creating elements. No noise causing element should lie in an area of 100 mtrs. From a school/hospital		SP, SDM	Continuous
Industries & vehicles	Penalty on violating the noise norms. Proper vigilance on loud noise explosive, siren & vehicle horns.			

8. Financial Projections:-

Will be done in due course of time.

References:-

1. www.downtoearth.org.in
2. **What a waste 2.0** published by World Bank
3. **Municipal Solid waste management manual, part –ii** Published by CPHEEO, MoUHD
4. **Success story of ambika Pur zero waste model**
5. **TGM_ Commam Hazardous Waste Treatment, MoEF&CC**

9. Data Submitted to DEC

1.0 Waste Management Plan

(i) Solid Waste Management Plan

No.	Action Areas	Details of Data Requirement	Please enter Measurable Outcome for District	ULB1	ULB2	ULB3
	Name of Urban Local Body (ULB)			Bokaro Steel City, Township (BSL), Town administration Department.	Chas Municipal Corporation	Phusro Municipality
	No of ULBs in the District					
	Population			2 Lakh	141640	89178
SW1	Report on inventory of total solid waste Generation					
SW1a		Total solid waste Generation		85-90 MT	52 MT	15.16 MT
SW1b		Qty. of Dry Waste segregated		36 MT	16.68 MT	3 MT
SW1c		Qty. of Wet Waste segregated		4.5	32	1
SW1d		Qty. of C&D Waste segregated			1 MT	1.18 MT

SW1e		Qty. of Street Sweeping			0.5 MT	N.E.
SW1f		Qty. of Drain Silt			1 MT	N.E.
SW1g		Qty. of Domestic Hazardous Waste(DHW) collected			0.02 MT	N.F.
SW1h		Qty. of Other Waste (Horticulture, sanitary waste, etc.)			0.8 MT	N.E.
SW1i		No of Old dump sites		None	0	1
SW1j		Qty stored in dumpsites		Not estimated	NA	N.E.
SW1k		No of Sanitary landfills		None	0	0
SW1l		No of wards		10 Sectors / nos	35	28
SW2	Compliance by Bulk Waste Generators			Nil		
SW2a		No of BW Generators		inventory not done	12	2
SW2b		No of on-site facilities for Wet Waste		No data	3	2
SW3	Compliance in segregated waste Collection SW Collection			Partial		
SW3a		Total generation			52	
SW3b		Wet Waste			NA	1 MT
SW3c		Dry Waste			NA	3 MT
SW3d		C&D Waste			NA	1.18
SW4	Waste Management Operations					

SW4a		Door to Door Collection		100%	60%	50%
SW4b		Mechanical Road Sweeping		Initiated but Stopped.	0	0%
SW4c		Manual Sweeping		100%	100%	100%
SW4d		Segregated Waste Transport		partial	10%	50%
SW4e		Digesters (Bio-methanation)		Not Initiated	Not initiated	0%
SW4f		Composting operation		Not Initiated	10%	20%
SW4g		MRF Operation		MRF used	MRF Used	N.I.
SW4h		Use of Sanitary Landfill		no SLF	No SLF	NO SLF
SW4i		Reclamation of old dumpsites		initiated	3	N.I.
SW4j		Linkage with Waste to Energy Boilers / Cement Plants			Not initiated	N.I.
SW4k		Linkage with Recyclers		not initiated	Not initiated	N.I.
SW4l		Authorization of waste pickers		initiated	Initiated	Initiated
SW4m		Linkage with TSDF / CBMWTF		not initiated	Initiated	N.I.
SW4n		Involvement of NGOs		not initiated	Initiated	Initiated
SW4o		Linkage with Producers / Brand Owners		not initiated	Not initiated	Initiated
SW4p		Authorisation of Waste Pickers		not initiated	Initiated	

SW4q		Issuance of ID Cards			Initiated	N.I.
SW5	Adequacy of of Infrastructure			Adequate for collection, storage and transporation		
SW5a		Waste Collection Trolleys		157 Nos. Required / 157 Nos. Available	75/40	4
SW5b		Mini Collection Trucks		Not required.	40/17	16
SW5c		Segregated Transport		yes 20 %	Yes/25%	11%
SW5d		Bulk Waste Trucks		02 Compactor Loader and 01 Dumpher Placer . Required] /01 Compactor Loader and 01 Dumpher Placer Available]	10/05	1
SW5e		Waste Transfer points		Not. Required	NA	0
SW5f		Bio-methanation units		Not. Required	NA	N.A.
SW5h		Composting units		01 Nos. Required / Not. Available]	4/2	N.A.
SW5i		Material Recovery Facilities		Not Available	1 in Use	N.A.
SW5k		Waste to Energy (if applicable)		Not. Required	NA	N.A.
SW5l		Waste to RDF		Required	NA	N.A.
SW5m		Sanitary Land fills		Not Available	NA	N.A.
SW5n		Capacity of sanitary landfills		Nost. Available	NA	N.A.
SW5o		Waste Deposit Centers (DHW)		612 Bins Available	1	N.A.
SW5p		Other facilities		JCB		
SW6	Notification and Implementation of By-Laws					

SW6a		Notification of By-laws			Done	Done
SW6b		Implementation of by-laws			In Progress	In Progress
SW7	Adequacy of Financial Status of ULB					
SW7a		CAPEX Required			20 Crore	
SW7b		OPEX			3 Crore	
SW7c		Adequacy of OPEX			No	

(ii) Plastic Waste Management (for each ULB)

No.	Action Areas	Details of Data Requirement	Please enter Measurable Outcome for District	ULB1	ULB2	ULB3
	Name of ULB			Bokaro Steel City, Township (BSL), Town administration Department.	Chas Municipal Corporation	Phusro Municipality
	Population			2 Lakh (Approx.)	141640	89178
PW1	Inventory of plastic waste generation					
PW1a		Estimated Quantity of plastic waste generated in District		4.5 MT/day	1 MT/Day	2.2 MT/day
PW2	Implementation of Collection					

PW2a		Door to Door collection		100%	10%	partial
PW2b		Segregated Waste collection		80%	Partial	partial
PW2c		Plastic waste collection at Material Recovery Facility		not installed	MRF in Use	N.I.
PW2d		Authorization of PW pickers		not initiated	33	N.I.
PW2e		PW collection Centers		not established	1	N.E.
PW3	Establishment of linkage with Stakeholders					
PW3a		Established linkage with PROs of Producers		not established	Not established	N.E.
PW3b		Established linkage with NGOs		not established	1	Established
PW4	Availability of facilities for Recycling or utilization of PW					
PW4a		No. of PW recyclers		Not Known	0	0
PW4b		No Manufacturers		Not Known	0	0
PW4c		No of pyrolysis oil plants		Not Known	0	0
PW4d		Plastic pyrolysis		Not Known	0	0
PW4e		Use in road making		Nil	Not per Month	0
PW4f		Co-processing in Cement Kiln		Nil	Not per Month	0
W5	Implementation of PW Management Rules, 2016					
W5a		Sealing of units producing < 50-micron plastic			Partial	Sealed
PW5b		Prohibiting sale of carry bags < 50 micron			Partial	Prohibited

PW5c		Ban on Carry bags and other single use plastics as notified by State Government			Partial	Banned
PW6	Implementation of Extended Producers Responsibility (EPR) through Producers/Brand-owners					
PW6a		No of Producers associated with ULBs			None	None
PW6b		Financial support by Producers / Brand owners to ULBs			None	None
PW6c		Amount of PRO Support			None	
PW6d		Infrastructure support by Producers / Brand owners to ULBs			None	None
PW6e		No of collection centers established by Producers / Brand owners to ULBs			None	None

(iii) C&D Waste Management

No.	Action Areas	Details of Data Requirement	Please enter Measurable Outcome for District	ULB1	ULB2	ULB3
	Name of ULB			Bokaro Steel City, Township (BSL), Town administration Department.	Chas Municipal Corporation	Phusro
	Population			2 Lakh (Approx.)	141640	89178
CD1	Inventory of C&D waste generation					
CD1a		Estimated Quantity		Not estimated	1000Kg/Day	1018
CD2	Implement scheme for permitting bulk waste generators					
CD2a		Issuance of Permissions by ULBs		Not initiated	NA	Initiated
CD3	Establishment of C&D Waste Deposition centers					
CD3a		Establishment of Deposition Points		No	Yes	No
CD3b		C&D Deposition point identified		No	Yes	No
CD4	Implementation of By-Laws for CD Waste Management					
CD4a		Implementation of By-laws		Not Notified	Notified	Notified
CD4b		Collection of Deposition / disposal Charges			Initiated	Not Initiated

CD5	Establishment of C&D Waste recycling plant or linkage with such facility					
CD5a		Establishment CD Waste Recycling Plant		No facility exists	Sent to Shared Facility	No facility
CD5b		Capacity of CD Waste Recycling Plant		Not available	NA	N.A.

(v) Hazardous Waste Management

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
HW1	Inventory of Hazardous Waste			
HW1a		No of HW Generating Industry	[Nos.]	42
HW1b		Quantity of HW	[MT/Annum]	61062.4279 MT/Annum
HW1c		Quantity of Incinierable HW	[MT/Annum]	1348.925 MT/Annum
HW1d		Quantity of land-fillable HW	[MT/Annum]	2830.2922 MT/Annum
HW1e		Quantity of Recyclable / utilizable HW	[MT/Annum]	11016.5607 MT/Annum
HW2	Contaminated Sites and illegal industrial hazardous waste dumpsites			
HW2a		No of HW dumpsites	[Nos] / [None]	[None]
HW2c		Probable Contaminated Sites	[Nos] (provide list)	1. Chandrapura Thermal Power Station, DVC, Bokaro, Jharkhand
HW3	Authorization by SPCBs/PCCs			
HW3a		No of industries authorized	[Nos]	42
HW3b		Display Board of HW Generation in front of Gate	[Nos]	37
HW3	Availability of Common Hazardous Waste TSDF			
HW3a		Common TSDF	[Exists] / [No] / [Sent to Other District within State]	[Sent to Other District within State]
HW3b		Industries linkage with TSDF	[Nos.]	[Not Available]
HW4	Linkage of ULBs in District with Common TSDF			

HW4a		ULBs linked to Common TSDFs for Domestic Hazardous Waste	[Yes] / [No]	[N/A]
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(vi) E-Waste Management

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
EW1	Status of facilitating authorized collection of E-Waste			
EW1a		Does the citizen are able to deposit or provide E-Waste through Toll-free Numbers in the District	[Yes] / [No]	No
EW1c		Collection centers established by ULB in District	[Nos] / [None]	None
EW1d		Collection centers established by Producers or their PROs in the District	[Nos] / [None]	None
EW1e		Does the district has linkage with authorized E-Waste recyclers / Dismantler	[Yes] / [No]	No
EW1f		No authorized E-Waste recyclers / Dismantler	[Nos] / [None]	None
EW2	Status of Collection of E-Waste			
EW2a		Authorizing E-Waste collectors	[Authorized] / [None]	None
EW2b		Involvement of NGOs	[Yes] / [No] / [Nos]	No
EW2c		Does Producers have approached NGOs/ Informal Sector for setting up Collection Centers.	[Yes] / [No] / [Nos]	No

EW2d		Does ULBs have linkage with authorized Recyclers / Dismantlers	[Yes] / [No]	No
EW4	Control E-Waste related pollution			
EW4a		Does informal trading, dismantling, and recycling of e-waste exists in District	[Yes] / [No]	No
EW4b		Does the administration closed illegal E-Waste recycling in the District	[Yes] / [No] / [Nos]	No
EW4c		No of actions taken to close illegal trading or processing of E-Waste	[Nos]	None
EW5	Creation of Awareness on E-Waste handling and disposal			
EW5a		Does PROs / Producers conducted any District level Awareness Campaigns	[Yes] / [No] / [Nos]	No
EW5c		Does District Administration conducted any District level Awareness Campaigns	[Yes] / [No] / [Nos]	No

2.0 Waste Water Management Plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
WQ1	Inventory of water resources in District			
WQ1a		Rivers	[Nos] and [Length in Km]	River- 9
WQ1b		Length of Coastline	[in Km]	NA
WQ1c		Nalas/Drains meeting Rivers	[Nos]	Not Estimated
WQ1d		Lakes / Ponds	[Nos] and [Area in Hectares]	1667
WQ1e		Total Quantity of sewage and industrial discharge in District	[Automatic] (SW1a+IW1b)	Automatic
	Control of Groundwater Water Quality			
WQ2a		Estimated number of bore-wells	[Nos]	30,566
WQ2b		No of permissions given for extraction of groundwater	[Nos]	869(CMC & Phusro Nagar Parishad)
WQ2c		Number of groundwater polluted areas	[Nos]	Null
WQ2d		Groundwater Availability	[adequate] / [not adequate]	Not Adequate
WQ3	Availability of Water Quality Data			
WQ3a		Creation of monitoring cell	[Yes] / [No]	Yes

WQ3b		Access to Surface water and groundwater quality data at DM office	[Available] or [Not available]	Available
WQ4	Control of River side Activities			
WQ4a	Control of River side Activities	River Side open defecation	[Fully Controlled] / [Partly controlled] / [no Measures taken]	Fully Controlled
WQ4b		Dumping of SW on river banks	[Fully Controlled] / [Partly controlled] / [no Measures taken]	Partly controlled
WQ4c		Control measures for idol immersion	[Measures taken] / [Measures taken post immersion] / [No Measures taken]	No measures taken
WQ5	Control of Water Pollution in Rivers			
WQ5a		Percentage of untreated sewage	[%] (automatic SM1g/SM1a)	Automatic SM1g/SM1a
WQ5b		Monitoring of Action Plans for Rejuvenation of Rivers	[Monitored] / [Not monitored] [not applicable]	Monitored
WQ5c		No of directions given to industries for Discharge of Untreated industrial wastewater in last 12 months	[Nos]	0
WQ6	Awareness Activities			
WQ6a		District level campaigns on protection of water quality	[Nos in previous year]	From 3rd- 8th Oct Under Jal Jeevan Mission
WQ6b	Oil Spill Disaster Contingency Plan			
WQ6a		Creation of District Oil Spill Crisis Management Group	[Created] / [Not Created]	Not Created

WQ6b		Preparation District Oil Spill Disaster Contingency Plan	[Prepared] / [Not Prepared]	Not Prepared
WQ7	Protection of Flood plains			
WQ7a		Encroachment of flood plains is regulated.	[Yes] / [No]	No
	Rainwater Harvesting			
WQ8a		Action plan for Rain water harvesting	[Implemented] / [Not implemented]	Implemented

3.0 Domestic Sewage Management Plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
SM1	Inventory of Sewage Management			
SM1a		Total Quantity of Sewage generated in District from Class II cities and above	[MLD]	29 MLD
SM1b		No of Class-II towns and above	[Nos]	2
SM1c		No of Class-I towns and above	[Nos]	1
SM1d		No of Towns needing STPs	[Nos]	4
SM1e		No of Towns STPs installed	[Nos]	Null
SM1f		Quantity of treated sewage flowing into Rivers (directly or indirectly)	[MLD]	29
SM1g		Quantity of untreated or partially treated sewage (directly or indirectly)	[Automatic]	NA
SM1h		Quantity of sewage flowing into lakes	[MLD]	4

SM1i		No of industrial townships	[Nos]	1
SW2	Adequacy of Available Infrastructure for Sewage Treatment			
SM2a		% sewage treated in STPs	[Automatic]	Nil
SM2b		Total available Treatment Capacity	[MLD]	NA
SM2c		Additional treatment capacity required	[MLD]	NA
SM3	Adequacy of Sewerage Network			
SM3a		No of ULBs having partial underground sewerage network	[Nos]	1
SM3b		No of towns not having sewerage network	[Nos]	1
SM3c		% population covered under sewerage network	[Automatic]	2 Lakh people Covered

4.0 Industrial Wastewater Management Plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
IWW1	Inventory of industrial wastewater Generation in District			
IWW1a		No of Industries discharging wastewater	[Nos]	01
IWW1b		Total Quantity of industrial wastewater generated	[MLD]	8100 KLD
IWW1c		Quantity of treated IWW discharged into Nalas / Rivers	[MLD]	8100 KLD
IWW1d		Quantity of un-treated or partially treated IWW discharged into lakes	[MLD]	N/A
IWW1e		Prominent Type of Industries	[Agro based] / [Chemical – Dye etc.] / [Metallurgical] / [Pharma] / [Pesticide] / [Power Plants] / [Mining] / [Automobile] : Multiple selection based on size of operation and number	Integrated Steel, TPP, Coal Mines & Washeries
IWW1f		Common Effluent Treatment Facilities	[Nos] / [No CETPs]	Nill

IWW2	Status of compliance by Industries in treating wastewater			
IWW2a		No of Industries meeting Standards	[Nos]	12 (GPI & 17 Cat Ind.)
IWW2b		No of Industries not meeting discharge Standards	[Automatic]	Nil
IWW2c		No of complaints received or number of recurring complaints against industrial pollution in last 3 months	[Nos]	Nil
AWW4	Status of Action taken for not meeting discharge standards			
IWW4a		No industries closed for exceeding standards in last 3 months	[Nos]	Nil
IWW4b		No of industries where Environmental Compensation was imposed By SPCBs	[Nos]	02

5.0 Air Quality Management Plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
AQ1	Availability of Air Quality Monitoring Network in District			
AQ1a		Manual Air Quality monitoring stations of SPCBs /CPCB	[Nos] / [None]	[0]
AQ1c		Automatic monitoring stations Operated by SPCBs / CPCB	[Nos] / [None]	[0]
AQ2	Inventory of Air Pollution Sources			
AQ2a		Identification of prominent air polluting sources	[Large Industry] / [Small Industry] / [Unpaved Roads] / [Burning of Waste Stubble] / [Brick Kiln] / [Industrial Estate] / [Others] (Multiple selection)	Large Industry (Integrated Steel/ Thermal Power Plants / Coal Mine & its Transportation)
AQ2b		No of Non-Attainment Cities	[Nos] / [None]	Vehicular exhaust
AQ2c		Action Plans for non-attainment cities	[Prepared] / [Not yet prepared]	[0]
AQ3	Availability of Air Quality Monitoring Data at DMs Office			
AQ3a		Access to air quality data from SPCBs & CPCB through Dashboard	[Available] / [Not yet Available]	[N/A]
AQ4	Control of Industrial Air Pollution			

AQ4a		No of Industries meeting Standards	[Nos]	[Non]
AQ4b		No of Industries not meeting discharge Standards	[Nos]	[Non]
AQ5	Control of Non-industrial Air Pollution sources			
AQ5a		Control open burning of Stubble -during winter	[Nos of fire incidents]	[N/A]
AQ5b		Control Open burning of Waste - Nos of actions Taken	[Nos]	[N/A]
AQ5c		Control of forest fires	[SOP available] / [No SoP]	[N/A]
AQ5d		Vehicle pollution check centers	[% ULBs covered]	[N/A]
AQ5e		Dust Suppression Vehicles	[% ULBs covered]	[N/A]
AQ6	Development of Air Pollution complaint redressal system			
AQ6a		Mobile App / Online based air pollution complaint redressing system of SPCBs.	[Available] / [Not available]	[No]

6.0 Mining Activity Management plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
MI1a	Inventory of Mining in District			
MI1a		Type of Mining Activity	[Sand Mining] / [Iron Ore] / [Bauxite] / [Coal] / Other [specify] Multiple selection in order of magnitude of operations	09 Coal Mining, 19 stone, 02 sand & 05 Quatrzit
MI1b		No of Mining licenses given in the District	[Nos]	35
MI1c		Area covered under mining	[Sq. Km]	Non Inventory
MI1d		Area of District	[Sq. Km]	2883
MI1e		Sand Mining	[Yes] / [No]	Yes 38 sand Ghats Auctioned in Financial Years 2015-16 for Three Year.
MI1f		Area of sand Mining	[River bed] / [Estuary] / [Non -river deposit]	River Bed
MI2	Compliance to Environmental Conditions			
MI2a		No of Mining areas meeting Environmental Clearance Conditions	[Nos]	35
MI2b		No of Mining areas meeting Consent Conditions of SPCBs / PCCs	[Nos]	35

MI3a	Mining related environmental Complaints			
MI3b		No of pollution related complaints against Mining Operations in last 1 year	[Nos]	Nil
MI4	Action against non-complying mining activity			
MI4a		No of Mining operations suspended for violations to environmental norms	[Nos]	Nil
MI4b		No od directions issued by SPCBs	[Nos]	Nil

7.0 Noise Pollution Management Plan

No.	Action Areas	Details of Data Requirement	Measurable Outcome	Please enter Measurable Outcome for District
NP1	Availability Monitoring equipment			
NP1a		No. of noise measuring devices with district administration	[Nos] / [None]	2
NP1b		No. of noise measuring devices with SPCBs	[Nos] / [None]	3
NP2	Capability to conduct noise level monitoring by State agency / District authorities			
NP2a		capability to conduct noise level monitoring by State agency / District authorities	[Available] / [Not available]	Available
NP2	Management of Noise related complaints			
NP2a		No of complaints received on noise pollution in last 1 year	[Nos]	18
NP2b		No of complaints redressed	[Nos]	18
NP3	Compliance to ambient noise standards			
NP3a		Implementation of Ambient noise standards in residential and silent zones	[Regular Activity] / [Occasional] / [Never]	As per Noise Regulation Rule, 2000 District Administration is the authority for compliance of ambient noise standard.

NP3b		Noise monitoring study in district	[carried out] / [not carried out]	DO
NP3c		Sign boards in towns and cities in silent zones	[Installed] / [Partial] / [Not Installed]	DO