

# 29 BIOMEDICAL WASTE MANAGEMENT SERVICE



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## 1. INTRODUCTION

A biomedical waste management service in Uttarakhand is a lucrative opportunity due to the significant amount of biomedical waste generated by healthcare facilities (HCFs) in the state. According to the annual report 2020 of the Uttarakhand Pollution Control Board (UKPCB), 4,442 HCFs in Uttarakhand reported generating a total of 7,383.94 kg/day of biomedical waste. Of this total, 3,829.35 kg/day was generated by bedded HCFs, 803.18 kg/day by non-bedded HCFs, and 2,751 kg/day was COVID-19 waste. These figures highlight the substantial need for proper management and disposal of biomedical waste in Uttarakhand.

## 2. SERVICE & ITS APPLICATION

The proposed project involves setting up a Common Bio-medical Waste Treatment Facility capable of treating 250 kg per hour of biomedical waste. This facility will include essential equipment such as an incinerator, autoclave, shredder, storage facilities, and an effluent treatment facility. These components will ensure the safe and efficient treatment of biomedical waste generated by healthcare facilities.

## 3. DESIRED QUALIFICATION FOR PROMOTER

The promoter of this project should ideally possess expertise in waste management, environmental regulations, and project management. Knowledge of biomedical waste treatment technologies and experience in setting up and operating similar facilities would be advantageous.

## 4. INDUSTRY OUTLOOK AND TRENDS

The annual report of the Uttarakhand Pollution Control Board (UKPCB) highlights a significant demand for biomedical waste management services in Uttarakhand. With 4,442 healthcare facilities (HCFs) generating a total of 7,383.94 kg/day of biomedical waste, including COVID-19 waste, the need for efficient waste management solutions is evident. This presents a promising business opportunity for biomedical waste management services in Uttarakhand, given the substantial volume of waste generated and the regulatory requirements for its safe disposal.

## 5. KEY BUSINESS ELEMENTS

- Compliance with regulatory requirements
- Efficient operation of treatment facilities
- Provision of reliable waste collection and disposal services
- Ensuring safety standards for workers and the environment
- Maintaining environmental sustainability through responsible waste management practices

## 6. SUPPLY OF RAW MATERIAL

With 4,442 healthcare facilities (HCFs) in Uttarakhand generating a total of 7,383.94 kg/day of biomedical waste, including COVID-19 waste, there is a consistent and significant supply of raw material for biomedical waste management services.

## 7. BUSINESS MODEL

The proposed facility aims to cater to more than 10,000 beds/day, with a capacity of 250 kg/hr and operations scheduled for four shifts. The facility will be situated on a 1-acre land, indicating a large-scale operation to meet the demand for waste management services in Uttarakhand.

## 8. BUSINESS PROCESS

The project will encompass incineration, autoclaving, and shredding facilities within the site to effectively handle the diverse types of biomedical waste generated by healthcare facilities across Uttarakhand.

- **Incineration Facility:** Utilized for the high-temperature burning of biomedical waste, reducing it to ash and gases. This process effectively destroys pathogens and reduces the volume of waste.
- **Autoclaving Facility:** Involves sterilizing biomedical waste using high-pressure steam, killing harmful microorganisms and reducing the volume of waste. Autoclaving is particularly useful for treating infectious waste that cannot be incinerated.
- **Shredding Facility:** Used to mechanically shred biomedical waste into smaller pieces, facilitating further processing or disposal. Shredding helps in reducing the size of waste items, improving handling efficiency, and ensuring uniform treatment.

## 9. MANPOWER REQUIREMENT

Sr. No	Particulars	No.	No of month in year	Wages/Salaries per month (Rs. In Lakhs)	Annual Expense (Rs. In Lakhs)
1	Self-employed	1	-	-	-
2	Skilled Person	4	12	0.2	9.6
3	Semi-skilled Person	4	12	0.15	7.2
4	Unskilled	3	12	0.12	4.32
	<b>Total</b>				<b>21.12</b>

## 10. IMPLEMENTATION SCHEDULE

Sr. No.	Activity	Time Required (in months)
1	Acquisition of premises	1
2	Construction (if applicable)	1.5
3	Procurement & installation of Plant & Machinery	2.5
4	Arrangement of Finance	1
5	Recruitment of required manpower	1
6	Total time required (some activities shall run concurrently)	3

## 11. COST OF PROJECT

Sr. No	Particulars	Annual Expenses (Rs. in lakhs)
1	Land	-
2	Building (Rented)	-
3	Plant & Machinery	17.35
4	Equipment and Furniture Exp.	1.50
5	Misc. Fixed Asset	0.02
6	Preoperative & Preliminary Exp.	0.25
7	Working Capital	9.58
	<b>Total Project Cost</b>	<b>28.70</b>

## 12. MEANS OF FINANCE

Bank-term loans are assumed @ 60 %

Sr. No.	Particulars	Annual Expenses (Rs. in lakhs)
1	Promoter's contribution	11.48
2	Bank Finance	17.22
	<b>Total</b>	<b>28.70</b>

## 13. MACHINERY

Sr. No	Particulars	Unit	Price per Unit (Rs. in lakhs)	Total Amount (Rs. in lakhs)
1	Disinfecting Unit	1	2.00	2.00
2	Destruction Unit	1	2.50	2.50
3	Waste Storage	1	0.80	0.80
4	Waste disposal	1	0.55	0.55
5	Incineration	1	1.00	1.00
6	Air Pollution Control Device (APCD)	1	2.00	2.00
7	Autoclave	1	3.00	3.00
8	Shredder	1	4.00	4.00
<b>Total Amount</b>				<b>15.85</b>
Tax, Transportation, Insurance etc.				1.00
Electrification Exp.				0.50
<b>Grand Total Amount</b>				<b>17.35</b>

## 14. FURNITURES AND FIXTURES

Sr. No	Particulars	Unit	Price per Unit (Rs. in lakhs)	Total Amount (Rs. in lakhs)
1	Tools & Equipment (Storage Tanks, Handling Equipment, etc.)	-	0.50	0.50
2	Furniture & Set-up (work area, cleaning tools and equipment, storage area, chairs, shelves and racks etc.)	-	1.00	1.00
	<b>Total</b>			<b>1.50</b>

## 15. PROFITABILITY CALCULATIONS

Sr. No	Particulars	Annual Expenses (Rs. in lakhs)
A.	Sales realisation	164.25
B.	Cost of production	
i)	Raw materials	98.55
ii)	Utilities	6.50

iii)	Manpower Cost (Salaries/wages)	21.12
iv)	Administrative expenses	0.70
v)	Packaging Cost	0.00
vi)	Material Lost Cost	0.00
vii)	Selling & distribution expenses	0.90
viii)	Repairs & maintenance	0.00
ix)	Rent	0.40
x)	Interest	1.99
xi)	Misc. expenses	0.00
	Total (B)	130.16
	Gross profit/loss (A – B)	34.09
	Less: Depreciation	1.81
C.	PBIT	32.28
D	Income-tax	-
E	Net profit/loss	32.28
F.	Repayment (Annual)	1.01
G	Retained surplus (E-F )	31.26

## 16. BREAKEVEN ANALYSIS

<b>Fixed cost</b>	
Land & Building Rent	0.40
Depreciation	1.81
Interest	1.99
Manpower	6.34
<b>Total Fixed cost</b>	<b>10.54</b>
<b>Variable cost</b>	
Raw materials	98.55
Utilities	6.50
Man Power	14.78
Administrative expenses	0.70
Selling & distribution expenses	0.90
<b>Total Variable cost</b>	<b>121.43</b>
<b>Contribution margin</b>	<b>20%</b>
Break-Even Point in Value	52.70

## 17. STATUTORY/GOVERNMENT APPROVALS

The establishment and operation of a biomedical waste treatment service require compliance with several statutory and government approvals. Here are the key approvals needed:

- Authorization under Biomedical Waste Management Rules, 2016: The Biomedical Waste Management Rules, 2016, regulate the management, handling, and disposal of biomedical waste in India. Any entity involved in biomedical waste treatment must obtain authorization from the State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) as per these rules.

- **Consent to Establish (CTE) and Consent to Operate (CTO):** These approvals are required from the respective State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs) before establishing and operating the biomedical waste treatment facility. The CTE is obtained before construction, while the CTO is obtained after construction and before commencing operations.
- **Fire Safety Certificate:** Approval from the local fire department certifying compliance with fire safety standards is essential, especially for installations such as incinerators.
- **Building Construction and Occupancy Permits:** Depending on local regulations, building permits and occupancy certificates may be necessary for constructing and occupying the treatment facility.
- **Electricity and Water Connection Approval:** Approval from relevant authorities for electricity and water connections to the facility is necessary for operational requirements.
- **Health Department Approval:** Approval from the local health department may be required to ensure compliance with health and sanitation standards.
- **Environmental Clearance (if applicable):** Large-scale biomedical waste treatment facilities may require environmental clearance from the Ministry of Environment, Forest, and Climate Change (MoEFCC) or State Environmental Impact Assessment Authority (SEIAA) depending on the scale and potential environmental impact of the project.
- **Waste Management Authorization:** Apart from biomedical waste, there may be other types of waste generated or handled by the facility. Approval for handling such waste may be necessary as per relevant waste management regulations.

## **18. TRAINING CENTERS AND COURSES**

Training centers that offer professional training and certification in entrepreneurship and business management are as follows:

1. **National Institute for Entrepreneurship and Small Business Development (NIESBUD)**  
Regional Centre, Dehradun  
NSTI Campus, Green Park, Dehradun-248001,  
Uttarakhand, India
2. **Indian Institute of Entrepreneurship (IIE)**  
NH-37 Bypass, Near Game Village,  
Lalmati Guwahati- 781029,  
Assam, India
3. **Institute of Entrepreneurship Development (IEDUP)**  
A- 1 & 2, Industrial Area, Sarojini Nagar,  
Kanpur Road, Lucknow-226008,  
Uttar Pradesh, India

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