

Programme Name :

**CERTIFICATE IN SOLID WASTES TREATMENT  
TECHNIQUES**

Programme Code	CSWATT
Course Title	Project
Course Code	BWAP001
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Date of Submission	

**R**educe

**R**euse

**R**ecycle

**SCHOOL OF ENGINEERING AND TECHNOLOGY  
INDIRA GANDHI NATIONAL OPEN UNIVERSITY  
MAIDAN GARHI, NEW DELHI - 110 068**

**PROFORMA FOR APPROVAL OF PROJECT PROPOSAL (BWAP001)**

Enrolment No.: 2107441957  
 Study Centre: \_\_\_\_\_  
 Regional Centre: 13  
BENGALURU

Name and Address of the Student:

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Title of the Project:

**Subject Area:** General classification and data; Industry specific wastes; Treatment technologies; Collection and transportation of wastes; Equipments; Safety and health; Advanced technologies; Emission study, air pollution and climate change; Landfill and design; Leachate generation and water pollution;

Name and Address of the Supervisor: S. RAGHUNATH - PROFESSOR  
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Is the Supervisor an Academic Counsellor of Engineering Programme of IGNOU

Yes/No

(NO)

If Yes, Name and Code of Study Centre:  
 Mention the courses he/ she is counseling for and since when

No. of student currently working:  
 Under the local supervisor for BWAP001  
 (Please refer to point No. 4 in the guidelines)

Signature of Student

Date: 27/08/2022

S. Raghunath  
 Signature of Local Supervisor  
 Date: 27-8-2022

Please do not forget to enclose the synopsis of the project and the Bio-data duly signed by the Guide.

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Synopsis	Supervisor
Approved	Approved
Not Approved	Not Approved

P.P. No.: \_\_\_\_\_

Signature of Internal supervisor  
 Name:  
 Date:

Signature of  
 Director/ Coordinator  
 Date:

Comments/ Suggestions for reformulating the Project

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*Home is the first school. Zero Solid Waste Management In my own house marks with basic Ragpicking of plastic coupled by composting of kitchen waste. One of the Constitutional Duties should have been Solid Waste Management at every house in the entire territory of India.*

***Wake up and clean up.*** *I have done my duty,*

*now perform your own duty of solid waste management. Sculpt a first step to Permaculture with your own love affair on waste free environment.*

## Synopsis

### 1. Tenets of Solid Waste Management

### 2. Objective : **Solid waste management from grassroots to enforce the Right to clean environment as conferred by the Indian Constitution**

### 3. Rationale :

- Stinking smell thrown open by the garbage carrying truck.
- garbage carrying truck leave leachate on the roads followed by unbearable rotten smell left for hours.
- Unanswered letter addressed to the Bengaluru Municipal Council about waste recycle.
- Unanswered letter addressed to the Member of Legislative Assembly about waste recycle.
- Letter to the Municipal council to enrol for Suchi Mitra - SWM.
- Prevention of plastic use . Unable to make my own family to understand the bad effects of single usage of plastic.
- solid waste at Religious places not recycled.

### 4. Methodology

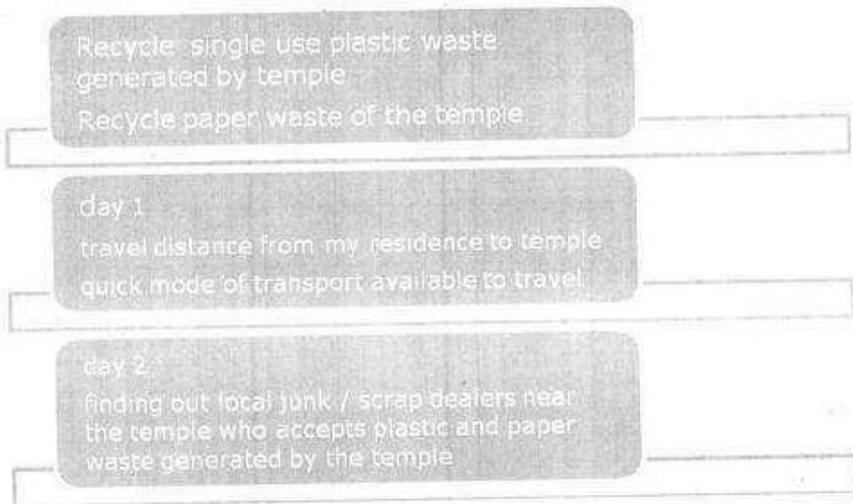
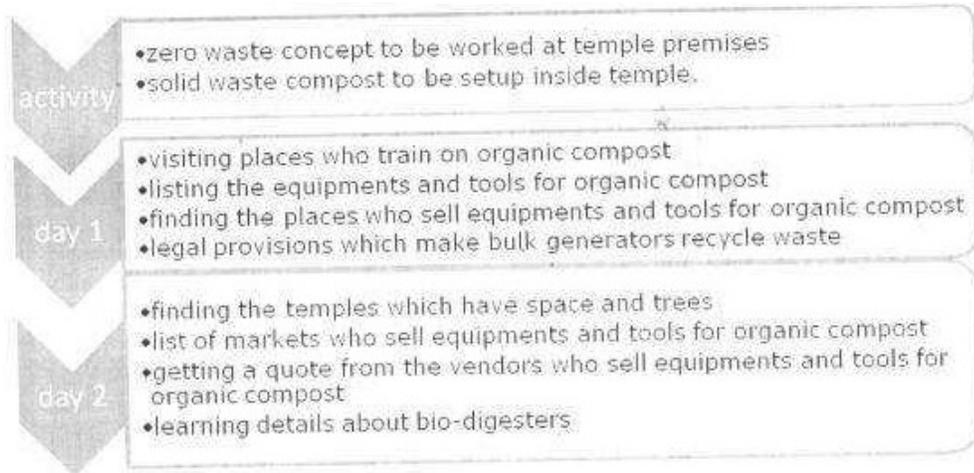
- ❖ Several visits Bengaluru Municipal Council.
- ❖ Email to Member of Legislative Assembly for recycle of solid waste.
- ❖ Started solid waste recycle at home .
- ❖ probably an alternate to the deadly plastic may exists.

## 5. Contribution

- Bio- degradable Organic waste such as kitchen waste is recycled at my home. Mixed waste not landing at the landfills.
- Basic idea of organic waste compost with the house. Did spread the idea of waste Compost with family members and friends.
- Karnataka Muncipal Act section 260 directs the Municipal corporation to prepare compost from rubbish and filth. Organic Compost made at home applied to my coconut trees. The healthy microbes let to thrive. Soil erosion is avoided.
- Home grown Coconut Harvest shared with my sister family rather than the chemical infused coconut available in the market.
- A citizen earns livelihood by removing coconut from the tree. Livelihood protected by two coconut trees in my house.
- Karnataka Muncipal Act section 295 (4) & Bengaluru Mahanagara Pallike Building Bye laws , 2003 - 4.1.2 propogate planting of tree inside the compound space maintaining ecological balance. Organic waste compost at home protects the purpose of Karnataka Muncipal Act section & Bengaluru Mahanagara Pallike Building Bye laws , 2003.
- Everyday I collect the milk plastic waste and grocery plastic waste and handed it over to the local junk or scrap dealer. Indian Constitution Article 43 makes it mandatory to the States of India for creating the jobs and securing the living, wages of the workmen. Livelihood of the local Kabadiwala is protected.

- Kabadiwala – junk or scrap dealer who collects the plastic in bulk sends it to the waste management companies. Plastic landing at landfills is stopped.

6. List of activities : plastic waste recycle , home compost of organic waste.



## 7. Places

- Shredding machine manufacturers
- Municipal waste recycling plants
- Temples with Indian culture/Breed of trees
- Spacious and historical temples.
- Market where weighing scales are sold

## Labs

- University of Agriculture science
- Gandhi Krishi vigyana kendra
- Research institute of organic farming
- Permaculture at The Art of Living Ravi Shankar Ashram

## Equipments

- Weighing scales
- Shredders
- Pulvizers
- Moisture content meters
- Dewatering machine
- Log machine
- Briquette machine
- Bio gas plants
- Bio diggesters / bio composters

## Tools

- Cotton hand gloves , Small size spade , Small size agriculture crow  
bar

## Planning of arrangements

- Costing, Travel time from residence to place of work
- Quick transport available to reach place of work
- Finding the authority in the temple who can pass order for setting of the waste management setup at the temple premises
- Meeting the decision making authority. Briefing the setup and advantages of the waste management at the temple premises

## 8. Problems envisaged in carrying out the project :-

- (i) Temple authority think keeping waste invite Shani – bad omen.
- (ii) Temple authority hesitant to talk about waste recycle inside the temple premises. The meaning of waste is meant to be thrown to Municipal council and not for recycle.
- (iii) Temple authority state that the disciples visiting would object for the waste to be kept inside the premises due to smell and that waste would affect the cleanliness of temple premises.
- (iv) Temple authority would not allow waste recycle at their place where Idols for worship is kept which is against the Dharma ideology.
- (v) Even after several visits unable to convince the legal requirement of waste recycle at the temple premises moreso Temples are classified as bulk waste generators.

<b>FINAL PROJECT REPORT</b>		
I	TITLE	
II	OBJECTIVE	
III	METHODOLGY	
IV	STATEMENT OF THE PROBLEMS	
V	<p>INPUTS</p> <p>DATA</p> <p>FIGURE D – 1.1 : High Court of karnataka direction for enforcement of Karnataka Municipal Corporations Act, 1976 – section 13 I (h)</p> <p>Figure D - 1.2 Guidelines OF karnataka state pollution board</p> <p>Figure D - 1.3 ARTICLE 12</p> <p>Figure D - 1.4 ARTICLE 21</p> <p>Figure D - 1.5 ARTICLE 25</p> <p>Figure D - 1.6 ARTICLE 32</p> <p>Figure D - 1.7 ARTICLE 38 &amp; ARTICLE 39</p> <p>Figure D - 1.8 ARTICLE 43 &amp; ARTICLE 44</p> <p>Figure D - 1.9 ARTICLE 47 &amp; ARTICLE 48</p> <p>Figure D - 1.10 ARTICLE 48 A &amp; ARTICLE 49</p> <p>Figure D - 1.11 ARTICLE 51 A</p> <p>Figure D - 1.12 ARTICLE 226</p>	

	STRUCTURE QUESTIONNAIRE	
VI	ANAYLSIS SOLUTIONS DESCIPTION	
VII	FINAL RESULTS ( Figure F - 1.1) Proposal Shredder machine ( Figure F - 1.2) Proposal Waste composter	
VIII	CONCLUSIONS	
IX	SCOPE OF FUTURE STUDY (Figure S - 1.1, 1.2) SAAHAS (Figure S - 1.3) DAILY DUMP (Figure S - 1.4, 1.5) LOOPWORM (Figure S - 1.6, S - 1.7) Primove (Figure S - 1.8) Bio green bags (Figure S - 1.9) ECOSTAN (Figure S - 1.10) ADAMYACHETANA (Figure S - 1.11) HASIRUDALA	
X	BIO DATA OF THE STUDENT	

## I. SOLID WASTE MANAGEMENT AT RELIGIOUS PLACE

*"What's bad for the hive is bad for the bee."*

### II. Objective :

- ☀ CONCEPT OF ZERO WASTE MANAGEMENT AT PLACES OF WORSHIP.
- ☀ RELIGIOUS PLACES ARE CLASSIFIED AS BULK GENERATORS.
- ☀ IT IS ESSENTIAL TO SET THE EXAMPLE OF WASTE RECYCLE IN THE COMMON MINDSET OF DISCIPLES WHO THROG PLACES OF WORSHIP.

### III. Methodology :

- Marking an area which is close to my residence with the temple of historical importance and spacious landscape made of Indian culture/breed of trees.
- Making a list of temples to visit for carrying out solid waste management.
- Visiting the temples in the list.
- Seeking permission from the temple authority to screen the waste generated.
- Screening the composition of waste at the temple
- Collecting data from the temple officials on the days when the quantity of waste is generated.
- Creating awareness about the zero waste management within the temple premises protecting the social values. Find simple resource to experience an innovation for basic waste recycle at the source.

#### IV. Statement of the problems :

- Convincing the temple authorities was next to impossible
- Several temples after visit never showed interest
- Majority of view was that holding waste inside the temple premises would invite bad luck.
- Major waste generated at temple is green leaf plates made from Peepal tree leaves, banana leaves & Banyan tree leaves.
- Main constituent of temple waste is lignin and lignin cellulose biomass.
- Inviting the recycle of waste inside the temple premises is the big issue.
- After visiting several temples only three temples showed interest.
- Meeting the temple authority concerned to decision making was also difficult.
- In the list, two temples turned out to be under the jurisdiction of Murzari department – State of Karnataka. BANASHANKARI TEMPLE BENGALURU is one of them.

*'cleanliness is next to godliness'*

#### V. INPUT

- ❖ The criteria of zero waste management happens inside the temple premises after Compulsion , perseverance, repeated pursuit to ensure.
- ❖ Meeting the Bengaluru Pollution Board officer to direct Temples fo recycle of waste.
- ❖ Meeting the Special Commissioner of Solid waste managment from the Bengaluru Municipal Council seeking direction for temple waste recycle.

- ❖ Perpetual meeting with the Chief Temple Authority for implementation of solid waste management inside the temple premises
- ❖ Better quote from vendors for machinery like the biodigester / biocomposter.
- ❖ Better quote from vendors of weighing machine, tools & equipments.
- ❖ Alternate current source like solar rooftop power plant to create balance of convenience.
- ❖ Briefing the Rain water harvesting to keep bio-gas option open.
- ❖ Regular followups for putting the project in motion.
- ❖ Visiting the Ignou Library , referring notes in UNIT of solid waste management course.

#### DATA

- Gathering laws concerning to solid waste management from the Special Commissioner of Solid waste management from the Bengaluru Municipal Council & jurisdiction Pollution Board officer. High Court of Karnataka direction in Writ Petition - 24739/2012 the applicable law for enforcement of Karnataka Municipal Corporations Act, 1976 – section 13 I (h) which directs the Municipal council for ward wise recycling of waste (**Figure D - 1.1**). Chief environmanetal officer of kamataka state pollution board issues Guidelines under Waste Management rules. **Figure D - 1.2**
- Applicable Articles of Constitution to facilitate Solid Waste management are –
  - Article 12 (**Figure D- 1.3**),
  - Article 21 (**Figure D - 1.4**),
  - Article 25 (**Figure D 1.5**),

Article 32 (**Figure D 1.6**),

Article 38 & Article 39 (**Figure D 1.7**),

Article 43 & Article 44 (**Figure D 1.8**),

Article 47 & Article 48 (**Figure D 1.9**),

Art 48 A (**Figure D 1.10**),

Art 51 A (**Figure D 1.11**),

Art 226 (**Figure D 1.12**).

- Heritage temple at Bengaluru produces 15 tons of waste every month .  
Mixed waste is the composition of solid waste at Heritage Temple in Bengaluru. **"RECYCLE OF WASTE IS BASIC DUTY"**.
- Research is extensively carried out at Entomological Society of India with details in website :- <https://www.entosocindia.org>. Entomological Society of India are in research about the humble insects which are actively involved in attending to their duty of recycling waste. Waxworms, Indian meal moth who feed on plastic and breakdown plastic is one such interesting aspect followed by the Black Solider fly who contribute to waste recycle.
- The research of meal worms digesting the plastic is creating economical food chain :-  
<https://www.youtube.com/watch?v=iOPeLSmisBk>  
<https://www.youtube.com/watch?v=q-X2KkKfW2U>  
<https://www.youtube.com/watch?v=Ub1LBeNQDxw>



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Home >> Education >> Community Outreach >> Press >> Historic direction by Karnataka High Court to BBMP to ensure Ward Committees prepare Ward Level Solid Waste Management Plan

### Historic direction by Karnataka High Court to BBMP to ensure Ward Committees prepare Ward Level Solid Waste Management Plan A fundamental step to securing decentralisation in urban governance

Press Release : Bangalore : 10 November 2017

[application/msword icon](#) ESG Press

Release on Karnataka HC 10th Nov 2017 decision on Ward Committees functioning

[application/pdf icon](#) State of Landfills, Waste Processing Sites and Garbage Dumping Grounds in Bangalore: ESG Report filed in Karnataka High Court

[application/pdf icon](#) Kannada v ESG Release SWM Ward Cmt Kar HC Ruling Nov 2017

[application/pdf icon](#) Unofficial Kannada Translation of 10 Nov HC Order on Ward Cmts



In a historic decision by the Division Bench of Hon'ble High Court of Karnataka consisting of Justice Mr. B.S. Patil and Justice Mrs. B. V. Nagarathna (see order below), Bruhat Bengaluru Mahanagara Palike (BBMP) has been directed to ensure that Ward Committees constituted on 31st October 2017 in all the 198 wards of the city should meet by end of November in accordance with Section 13-H of the Karnataka Municipal Corporations Act, 1976. The Court further directed that during this first meeting each and every Ward Committee shall prepare a ward level plan to "ensure proper solid waste management and sanitation work in the ward and finalise location of new public sanitation units" as per Sec 13 (I) (i) of the Act. These plans will be consolidated into an Action Taken Report (ATR) by BBMP and placed on its website, and a report of progress will be produced in Court prior to the next date of hearing i.e. 8th December 2017.

The direction assumes critical importance at a time when governance and management of large metropolitan centres such as Bangalore are in a perpetual state of crisis. This is a direct consequence of the lack of decentralization and devolution of power that guarantees direct public participation in civic matters as per the Constitutional 74th Amendment (Nagarpalika) Act, 1992. This critical reform initiated 25 years ago with the aim of improving transparency, accountability and efficiency in civic administration has been delayed for one or the other reason. Comprehending the entire situation and the prevailing crisis, the High Court issued these directions in response to a submission made by Mr. Leo F. Saldanha of Environment Support Group in WP 46523/2012 (Environment Support Group & Ors v. Bruhat Bengaluru Mahanagara Palike & Ors connected with WP 24739/2012 and other Public Interest Litigations that are being heard by the Court since July 2012 in tackling the solid waste management crises).

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In an unprecedented initiative, the Court also directed BBMP to prepare a booklet consisting of all High Court directives, as also specific provisions of Municipal Solid Waste Management Rules, 2016 and Karnataka Municipal Corporations Act, 1976 relating to Ward Committee functioning, and reach that to every Ward Committee within 10 days. The Committees would then be assisted by BBMP in developing a Ward Level Waste Management Plan based on micro-plans developed by BBMP, the prevailing reality and inputs from the public.

The High Court in earlier orders has made Ward Committees responsible to manage waste within their ward limits. In fact, in directions issued in November 2012, that Court had held there is no solution to the garbage crisis unless each and every ward would segregate waste at source and manage waste produced within the ward by establishing two wet waste and one dry waste processing centres. This was to ensure that waste would not travel tens of miles to be dumped in quarries or landfills causing havoc in the lives of thousands of villagers, who are unfortunate victims of the city's waste.

Mr. Sarfaraz Khan, Jt. Commissioner (SWM and Health) of BBMP submitted that maximum efforts were invested to ensure segregation and management of waste at source. However, only 40% of waste segregation has been achieved. While efforts are on to ensure maximum management of waste by segregation at source, interim measures demand waste need to be taken to quarries. This is also because eight waste processing sites that have been established at the cost of Rs. 450 crores have not been functioning optimally due to various reasons, including local resistance.

Earlier, Mr. Ajesh Kumar, Counsel for petitioners in WP 24739/2012, brought to the attention of the Court that several progressive directions issued for managing solid waste have not been complied with. These directions require segregation of waste at source and its management in local areas. As a result, accumulated mixed waste was being dumped in quarry pits in and around the city resulting in massive environmental and health impacts on local village communities.

Mrs. Kathyayini Chamaraj of CIVIC Bangalore, who is an impleading applicant in the PILs, argued that the Ward Committees currently set up have not been constituted as per the law. The Court felt that such legal objections could be raised independently. But the Ward Committees now set up must begin functioning immediately.

The Hon'ble Court also directed BBMP to file a compliance report of action taken regarding biomining of accumulated waste in Mavallipura landfills and of efforts invested in remedying the health and environmental problems faced by the local communities by the next hearing date. The BBMP in its compliance report has to respond in detail to a comprehensive report filed by ESG in Court: **"A Review of the Health and Environmental Implications of Bengaluru's Solid Waste Landfills, Waste Processing Sites and Dumping Grounds - With Focus on the continuing toxic impacts of landfills in Mavallipura"**.

Issued by Namrata Kabra, Mallesh K. R. and Harsh Vardhan Bhati  
Environment Support Group

Daily Orders of the Case Number: WP 46523/2012 c/w WP 24739/2012 for the date of order 10/11/2017

**High Court of Karnataka**  
**Hon'ble Justice B.S PATIL AND B.V. NAGARATHNA**  
10/11/2017  
Order in WP 24739/2012

As per directions issued earlier in these writ petitions, particularly vide order dated 04.09.2017, Ward

## NOTE

### Subject - Guidelines under Waste Management Rules

For effective implementation of Waste Management Rules several guidelines are notified by CPCB and other agencies. These guidelines are to be considered while implementation. Following are the list of guidelines

Compiled by **DR. A.RAMESH**, CHIEF ENVIRONMENTAL OFFICER, KSPCB

S I no	Rule	S I no	GUIDELINES
I	Plastic Waste Management Rules, 2016	1	Guidelines & Application form for Recognition of Producer Responsibility Organization (PRO)/AGENCY
		2	Guidelines for the Disposal of Non-recyclable Fraction (Multi-layered) Plastic Waste
		3	Consolidated Guidelines for Segregation, Collection and Disposal of Plastic Waste
		4	Guidelines for Co-processing of Plastic Waste in Cement Kilns
		5	Guidelines for Disposal of Thermoset Plastic Waste including Sheet moulding compound (SMC)/Fiber Reinforced Plastic (FRP)
II	Solid Waste Management Rules, 2016	6	Guidelines for Management of Sanitary Waste
		7	Guidelines on provision of buffer around waste processing and disposal facilities Under SWM Rules, 2016
		8	Guidelines for Disposal of Legacy Waste (Old Municipal Solid Waste)
		9	"Selection Criteria for Waste Processing Technologies"
III	Biomedical waste Management Rules, 2016	10	Guidelines for Verification of Two Seconds Residence Time in Secondary Combustion Chamber of the Biomedical Waste Incinerator
		11	Guidelines for Handling of Biomedical Waste For Utilization
		12	Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016
		13	Guidelines for Bar Code System for Effective Management of Bio-medical Waste
		14	Revised Guidelines for Common Bio-medical Waste Treatment and Disposal Facilities
		15	Guidelines for Disposal of Bio-medical Waste Generated during Universal Immunisation Programme

			(UIP)
		16	Environmentally Sound Management of Mercury Waste Generated from the Health Care Facilities
		17	CPCB Guidelines for Imposition of Environmental Compensation Charges against Healthcare Facilities and Common Biomedical Waste Treatment Facilities
IV	e-waste Management Rules, 2016	18	Guidelines for Public Responsibility Organizations (PRO)
		19	Guidelines for Environmentally Sound Management of E-Waste
		20	Guidelines for implementation of the e-waste Management Rules, 2016
V	Hazardous and other waste Management and transboundary Movement Rules, 2016	21	Guidelines for Pre-Processing and Co-Processing of Hazardous and Other Wastes in Cement Plant as per H&OW(M & TBM) Rules, 2016
		22	Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty
		23	Guidelines For Common Hazardous Waste Incineration
		24	Criteria for land fill site
		25	Protocol for Performance Evaluation and Monitoring of the Common Hazardous Waste Treatment Storage and Disposal Facilities including Common Hazardous Waste Incinerators
		26	Guidelines for Setting up of Operating Facility: Hazardous Waste Management
		27	Management of Hazardous Waste - Guidelines For Proper Functioning And Upkeep Of Disposal Sites
		28	"Guidelines for Storage of Incinerable Hazardous Wastes by the Operators of Common Hazardous Waste Treatment, Storage and Disposal Facilities and Captive HW Incinerators"
		29	Guidelines for conducting Environmental Impact Assessment : Site Selection for Common Hazardous Waste Management Facility
		30	Guidelines for Preparation of Inventories on Hazardous and Other Waste Generation and their Management

		31	Enforcement Framework for Effective Implementation of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
		32	Guidance document for assessment and remediation of contaminated sites in India
		33	Standard Operating Procedure and Checklist of Minimal Requisite Facilities for utilization of hazardous waste under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary movement) Rules, 2016
		34	Guidelines on framework on identification of materials generated from industrial process as wasters or by products
		35	Guidelines for management, Handling, Utilization and Disposal of Phosphogypsum generated from Phosphoric acid plants
		36	Manual for Sampling, Analysis & Characterization of Hazardous waste
		37	Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of-Life Vehicles (ELV)
VI	Construction and Demolition of Waste Management Rules, 2016	38	Guidelines for implementation of Construction and Demolition of Waste Management Rules, 2016
		39	Guidelines on dust mitigation measures in handling construction material and C&D waste
VII	Slaughter House	40	Revised Comprehensive Industrial Document on slaughter
VIII	Battery Rules	41	Standard Operating Procedure for Grant, Renewal or Cancellation of registration to the Importers of New Lead Acid Batteries under Rule 5 of the Batteries (Management and Handling) Rules, 2001 as amended in 201

DR. A.RAMESH,

CHIEF ENVIRONMENTAL OFFICER, KSPCB