

WASTE MANAGEMENT IN INDIA

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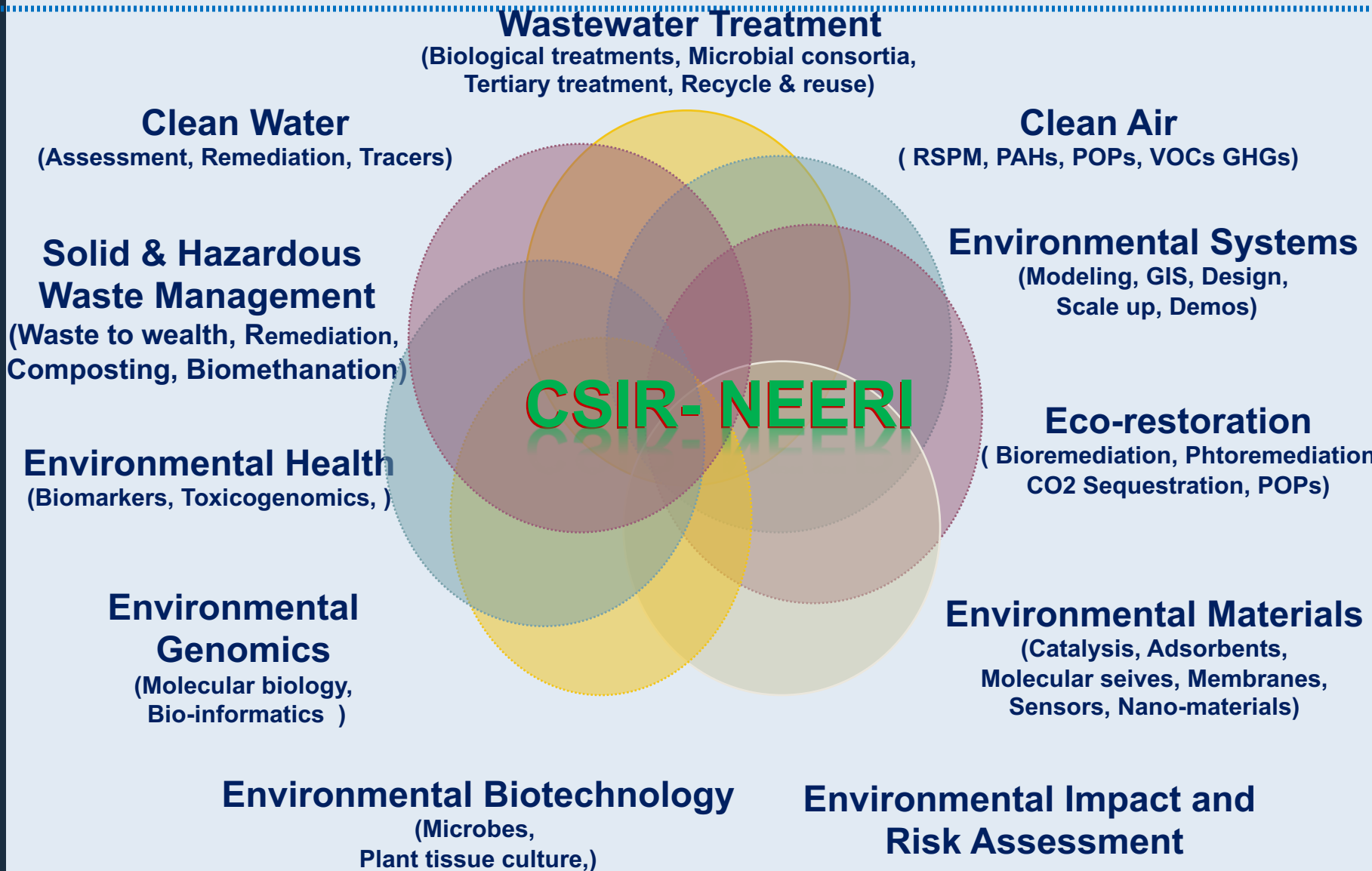
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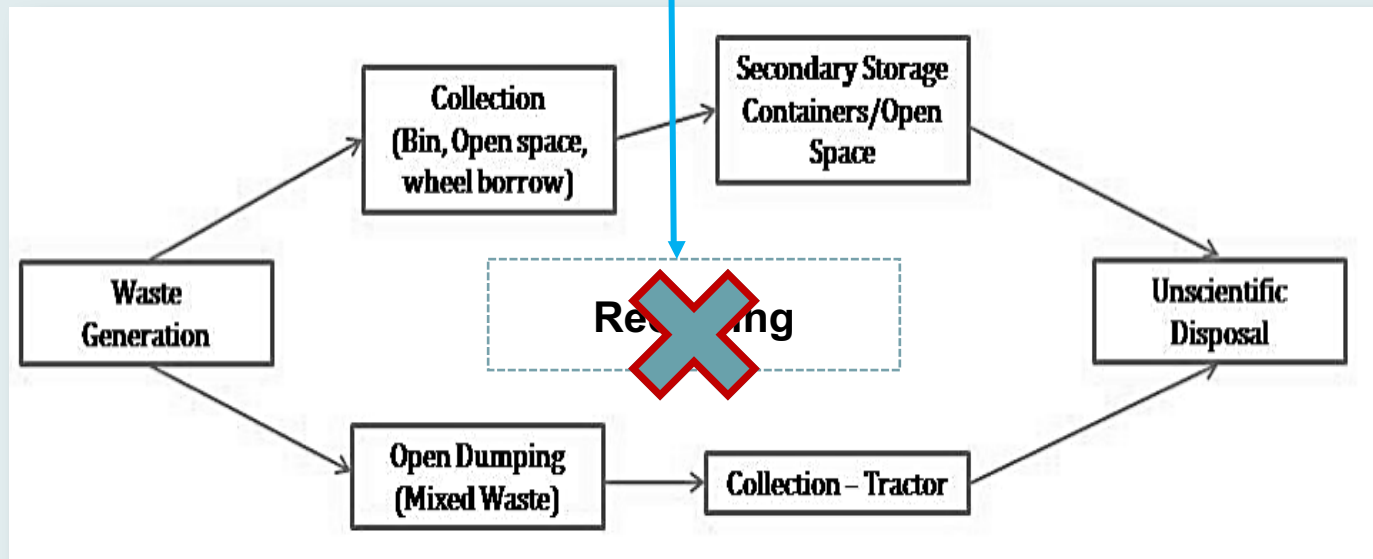
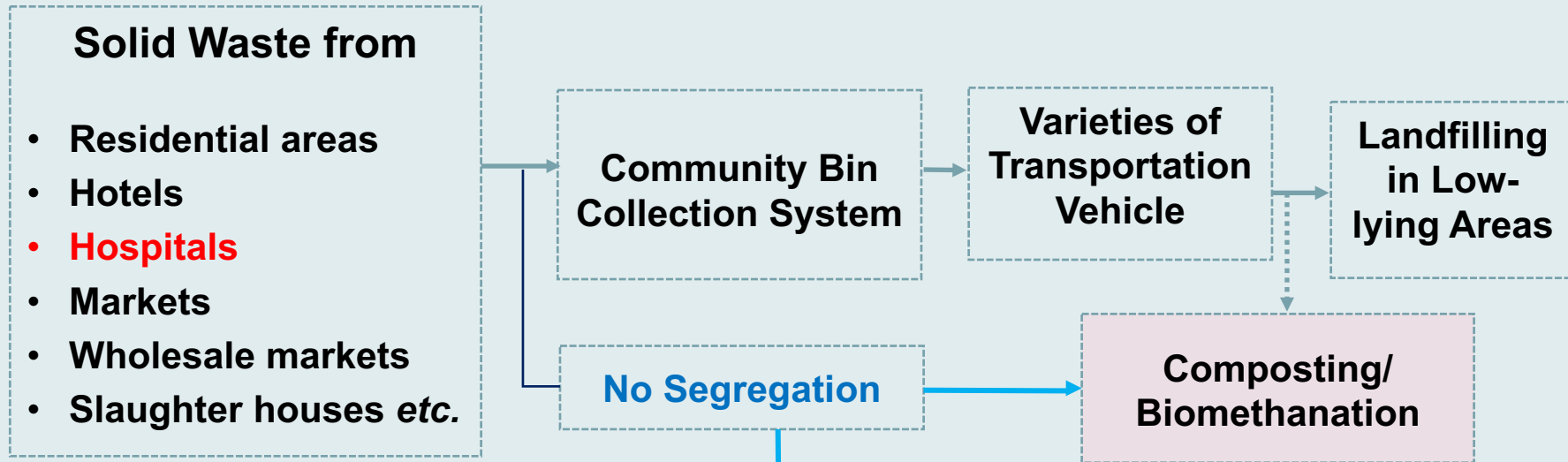
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R & D Focus of CSIR-NEERI



Current management of MSW in India



India- MSW Current Status

MSW Generation in India

- 46 Million Tonnes (2001)
- 125 Million Tonnes (2030)

Largest producers of MSW

Sr.No.	Cities/Towns	Waste Generation Rate (kg/day/capita)	Total Waste (Tonnes/day)	Quantity
1.	Delhi	0.57	5922	
2.	Greater Mumbai	0.45	5320	
3.	Chennai	0.62	3036	
4.	Kolkata	0.58	2653	
5.	Hyderabad	0.57	2187	

Source: NEERI Report 2006

India- MSW Current Status

Cities having population < 1 lacs (8 cities)

Per Capita Generation:- 0.17 to 0.54 kg/day

Cities having population 1 lacs – 5 lacs (11 cities)

Per Capita Generation:- 0.22 to 0.59 kg/day

Cities having population 10 lacs – 20 lacs (16 cities)

Per Capita Generation:- 0.19 to 0.53 kg/day

Cities having population > 20 lacs (13 cities)

Per Capita Generation:- 0.22 to 0.63 kg/day

Average Per Capita Generation: 0.300 - 0.600 kg/day

Current Practices: Gap Analysis

■ Littering (Absence of waste storage)

- *Bad habit and attitude*
- *Lack of awareness, motivation and education*
- *Lack of coordination between ULBs and waste generator*
- *Insufficient bins*
- *Lack of infrastructure planning*
- *Resistance about tradition*

■ Street Sweeping

- *Unpaved road*
- *Non-mechanical system*
- *Lack of human resource*
- *Traditional and social barrier*
- *Lack of concern about health of sanitary workers*
- *Financial constraints*

■ Source Segregation

- *Lack of awareness about benefit of segregation*
- *Traditional habit and attitude*
- *Lack of coordination between ULBs and waste generator*
- *Insufficient funds*
- *Poor capacity building and lack of understanding about type of waste*
- *Flexibility in legal policies*

■ Primary Collection

- *Bad habit, attitude, social and traditional constraint*
- *Poor response from citizen due to lack of awareness, motivation and education*
- *Lack of vehicle and equipment*
- *Insufficient bins*
- *Existing infrastructure and lack of understanding about type of waste*
- *Financial constraints*

Current Practices: Gap Analysis

■ Secondary Collection

- *Insufficient number of bins*
- *Old infrastructure (lack of space to install container and for movement of vehicle)*
- *Poor planning for maximum utilization of secondary bins*
- *Non-mechanized system is prevailing*
- *Non-identification of place for secondary storage*
- *Financial constraints*

■ Transportation

- *Old vehicle*
- *Not waste and container specific*
- *Insufficient funds*
- *Poor O&M*
- *Flexibility in legal policies*

■ Processing System

- *No segregated waste comes at processing plant*
- *Lack of technical know-how*
- *Non-adaptation of waste specific technology*
- *Financial constraints*
- *Revenue and end product is not attracting third party.*
- *Lack of skilled person to operate*
- *Availability of Land: Long yime taking*
- *Social dispute*
- *Poor response from citizen due to lack of awareness, motivation and education*

■ Disposal of Waste

- *Unavailability of appropriate land*
- *Financial constraints*
- *Non-satisfactory performance of processing system*
- *Insufficient implementation of entire value chain*
- *Lack of technical and skilled person*
- *Lack of institutional capacity*

Waste Projection

Year	Projected Urban Population (in thousands)	Waste Generation (gm./capita/day)	Total MSW generation (Million Tons)
2000	281255	327	33.7
2005	315276	391	45.0
2010	355205	471	61.0
2015	401898	571	83.8
2020	455823	696	115.8
2025	517178	848	160.1
2030	586052	1032	220.7

Source: *Improving Management of Municipal Solid Waste in India: Overview and Challenges*, World Bank, 2006

WTERT, India : Need

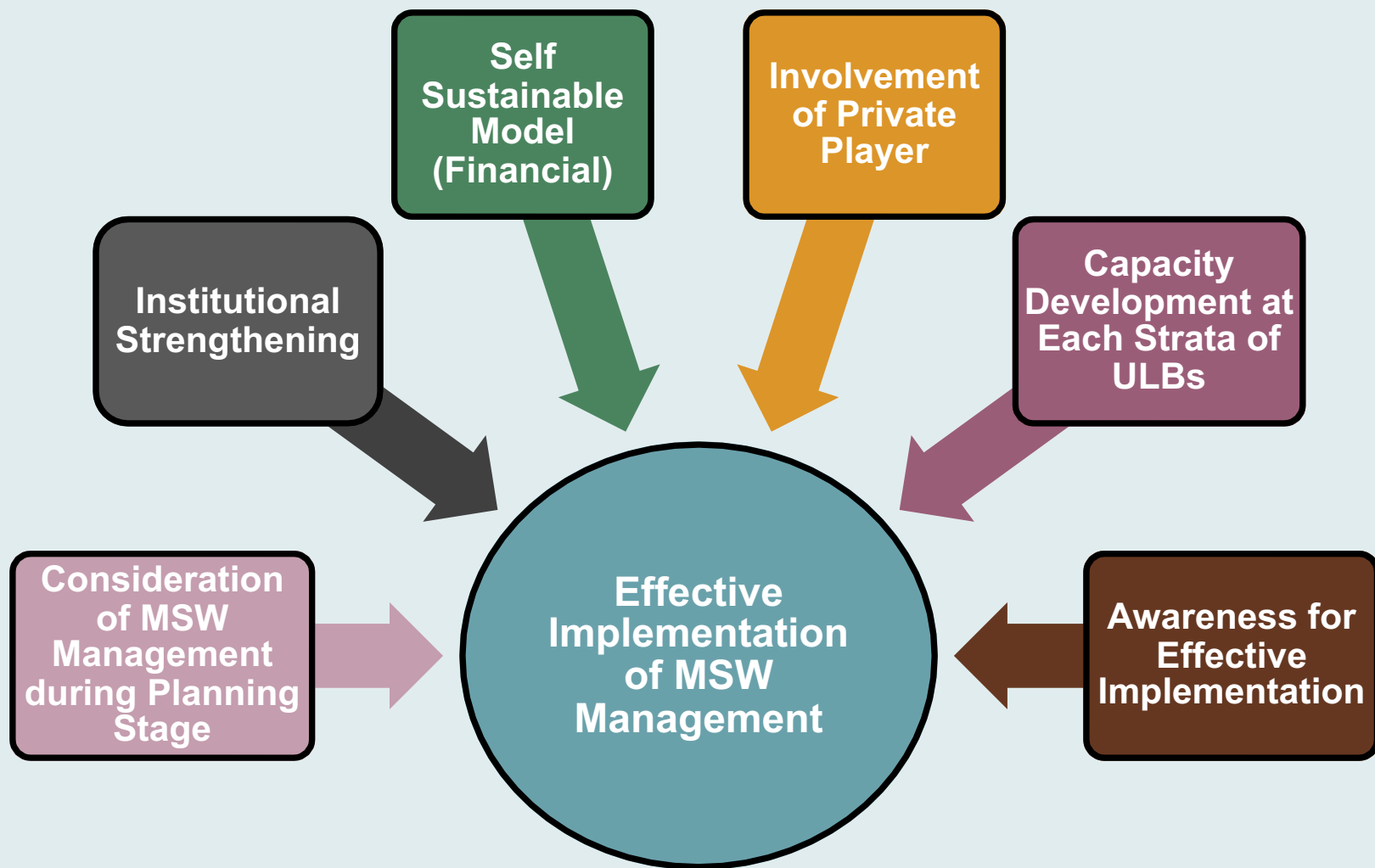
Why

- Per capita waste generation increasing by 1.3% per annum.
- Urban population increasing between 3 – 3.5% per annum.
- Increase in waste generation is **about 5% annually.**

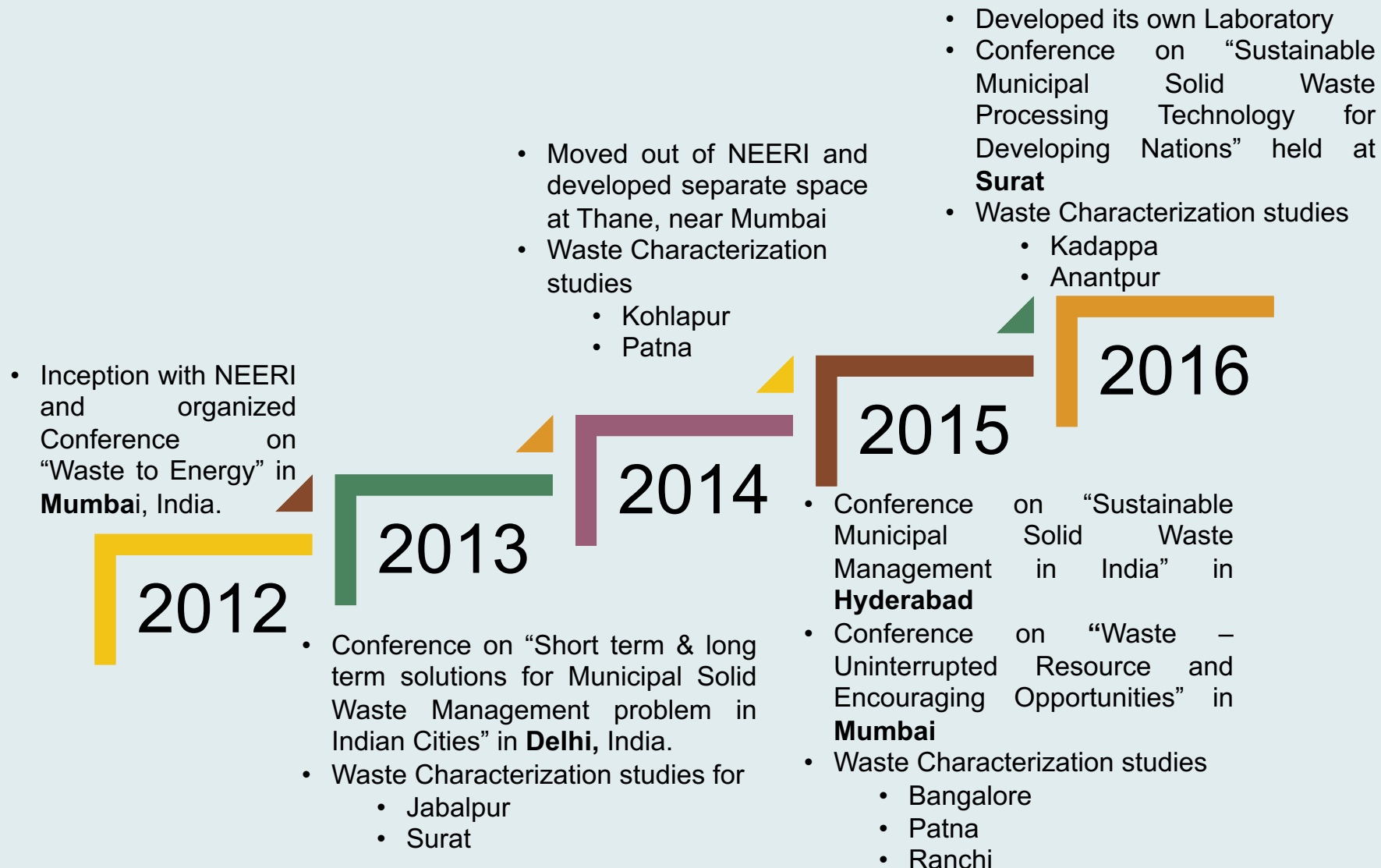
Objective

- To create a niche for the budding Solid Waste Management (SWM) sector against gigantic problem of waste disposal in India.
- To act as a swivelling catalyst to funnel important decisions related to SWM through organizing International Conferences and to take hand on problem of MSW through its characterization study.

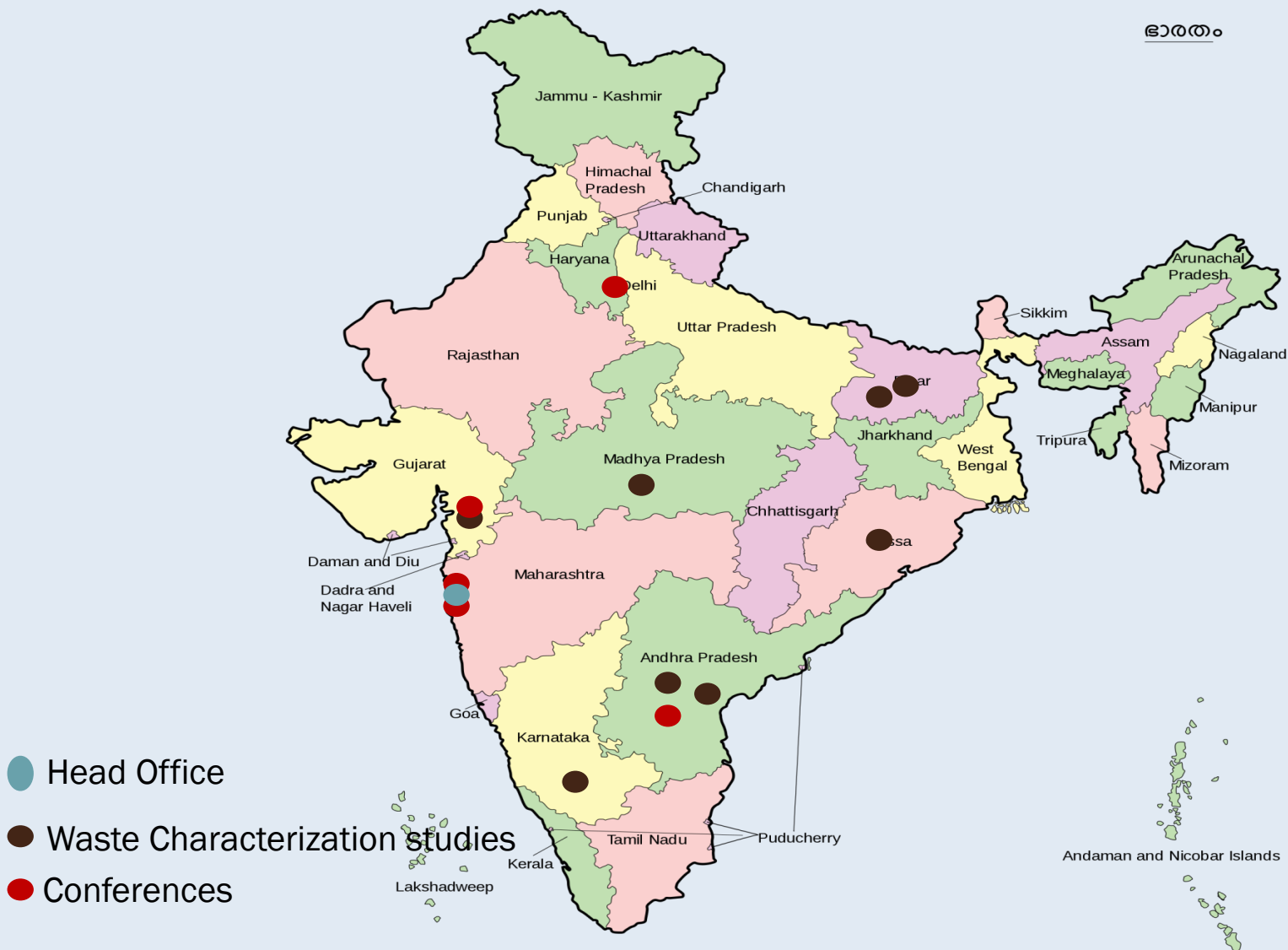
WTERT, India : Role



WTERT, India: Achievements



WTERT, India : Footprint



Waste to Energy : Ongoing

Jindal, New Delhi

- Technology : HBG& Co.
- Throughput: 1350 TPD (Mixed Solid Waste)
- Grate Type : 2 segment reverse and forward acting (Martin type)
- Assumed Calorific Value: 1400 kcal/kg.
- Power Generation (Gross): 20 MW
- Status: Operation Since May 2012

Ramky, New Delhi

- Technology :Chongqing Sanfeng Environmental Industry Co., China
- Throughout: 1200 TPD
- Grate Type : Martin reverse acting (CITI 2000)
- Assumed Calorific Value: 1600 kcal/kg.
- Power Generation (Gross): 23 MW
- Status: Commissioning on progress

Hitachi, Jabalpur

IL&FS, New Delhi

- Technology :Kepple Sheggers
- Throughout: 1200 TPD (RDF)
- Grate Type : Forward acting (Sheggers Air Cooled Gate)
- Assumed Calorific Value: 2000 kcal/kg.
- Power Generation (Gross): 10 MW
- Status: Commissioning done

Waste to Energy : Potential

- ◇ Increase in electricity generation from 66 GW in 1991 to over 200 GW in 2012 has been recorded.
- ◇ Electricity production and peak electricity consumption shortages recorded to be 10% & 12%, respectively.
- ◇ Potential of generating energy (theoretical) from waste by 2030 (MNRE):
 - 1500 MW from MSW
 - 225 MW from sewage/ sludge
 - 1300 MW from industrial waste
- ◇ Estimated that 1700 MW of energy can be harnessed from urban wastes, as suggested by MNRE.
- ◇ With assuming 30% of efficiency factor for production of electricity: **equal to 0.42 %** of current peak electricity consumption can be meet.

Waste to Energy : Government Initiatives

- **SWM Rules, 2016** has indicated that all industrial units using fuel and located within one hundred kilometers from a solid waste based RDF shall make arrangements to replace at least 5 per cent of their fuel requirement through RDF.
- **MNRE** has promoted the national programme for the recovery of energy from industrial and urban wastes. The major initiatives are :
 - Financial assistance through interest subsidy for commercial projects.
 - Financial assistance is provided on the capital cost for demonstration projects and for power generation in STPs.
 - Financial incentives are given to municipal corporations for supplying garbage free of cost at the project site and for providing land.
 - Incentives available for the state nodal agencies for promotion, co-ordination and monitoring of such projects.
 - Financial assistance is given for carrying out studies on waste to energy projects
 - Assistance is given in terms of training courses, workshops and seminars and awareness generation.

Setting up of Advanced Research Centre for Surat Municipal Corporation: An agreement executed with WTER-India in the month of Dec. 2015.

Organizing two days International Conference at Nagpur on “Role of Waste to Energy in Circular Economy: The Potential of India”

Two days Workshop on “Advancing State of the Art, Sustainable Waste to Energy in Asia”, tied up with the conference–February 2017

(Tentative)

WTER, India: Major Initiatives

Waste Characterization studies of 5 clusters of Andhra Pradesh i.e. Anaparthi, Kaddapa, Machilipatnam, Tadepalligudem, Vizianagaram with a population of each cluster of 3 lakhs to 5 lakhs and waste quantity ranging from 200 to 350 TPD – 2016-2017 year.

Certificate course on Municipal Solid Waste Management, to be launched in November/December 2016 for the students of Post Graduate in the field of Environment for better implementation of SWM practices and to enhance capacity building.



Thank
You!!

Pic: Dhapa Dumping Site, Kolkata