

**Then in
whose
backyard?**

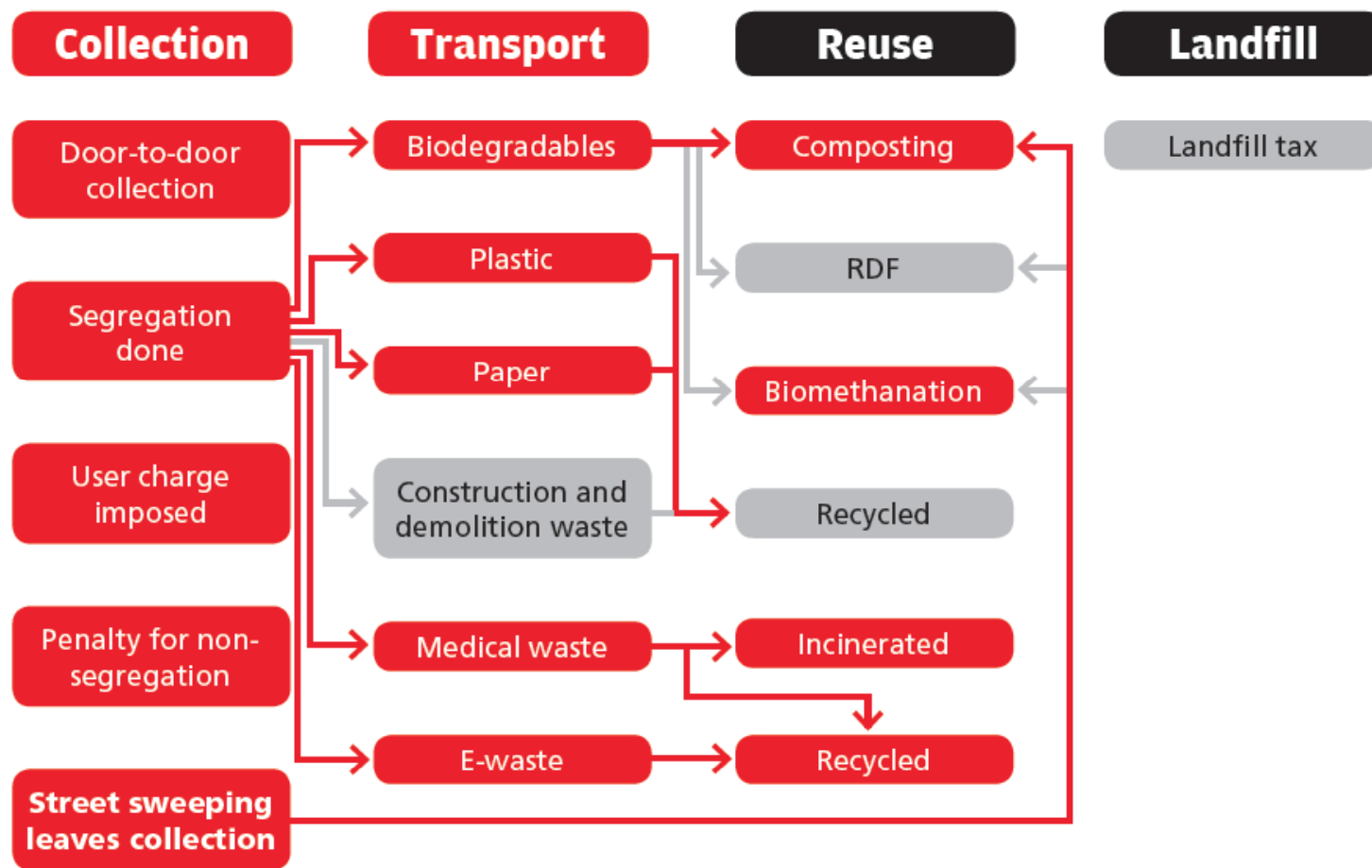
**Setting the agenda
for **garbage-free**
Bihar**

**Centre for Science
and Environment**



Our Assessment

WHAT THE CITY DOES...

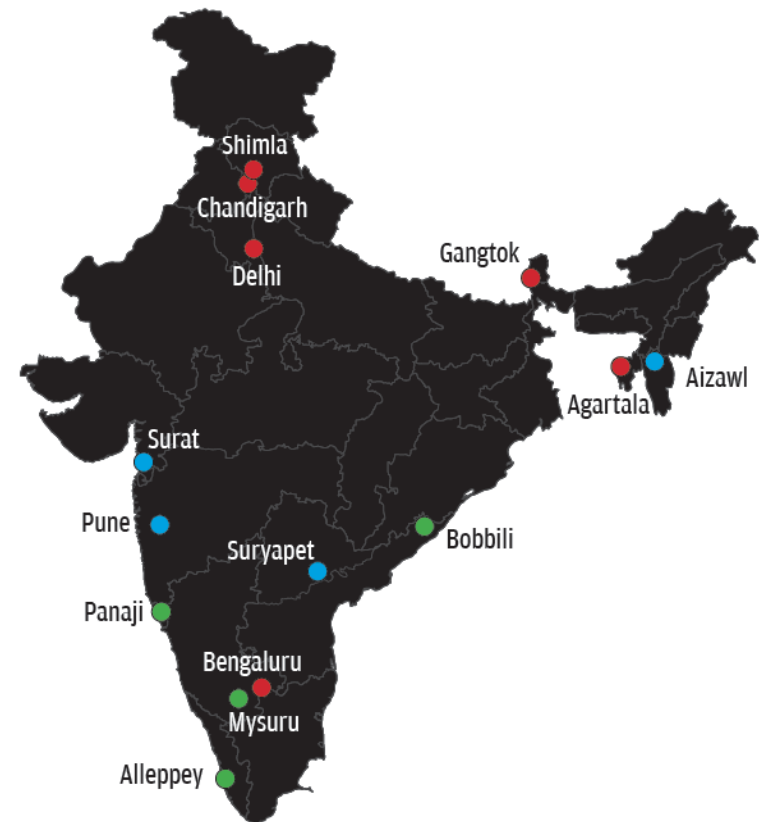


THE GOOD, BAD AND SMELLY

CSE rankings of cities based on their solid waste management system

Group	City
Group 1 Best: Segregation, processing and recycling of waste. Zero-landfill cities	Alleppey, Kerala
	Bobilli, Andhra Pradesh
	Panaji, Goa
	Mysuru, Karnataka
Group 2 Second-best: Clean cities; some segregation and some processing	Aizawl, Mizoram
	Pune, Maharashtra
	Surat, Gujarat
	Suryapet, Telangana
Group 3 Third-best: Have worked on cleaning the city but not on how to process and recycle the waste	Agartala
	Bengaluru
	Chandigarh
	Delhi
	Gangtok
	Shimla

Source: CSE survey, 2014-15



How much waste is generated?

- No clear idea on how much we generate
- Data on generation of solid waste is not based on measurement, but estimated
- Thumb-Rule is:
 - Small cities: 0.3 kg/capita/day
 - Big cities: 0.5-0.6 kg/capita/day
- But what is clear is that per capita waste generation is growing across country
- **Waste generation is linked to wealth** – *As we grow more wealthy, we generate more waste. The richest cities and states in India are generate most waste*

Solid waste generation in India

(Million tonnes/Year)

1991



2000



2011



2014

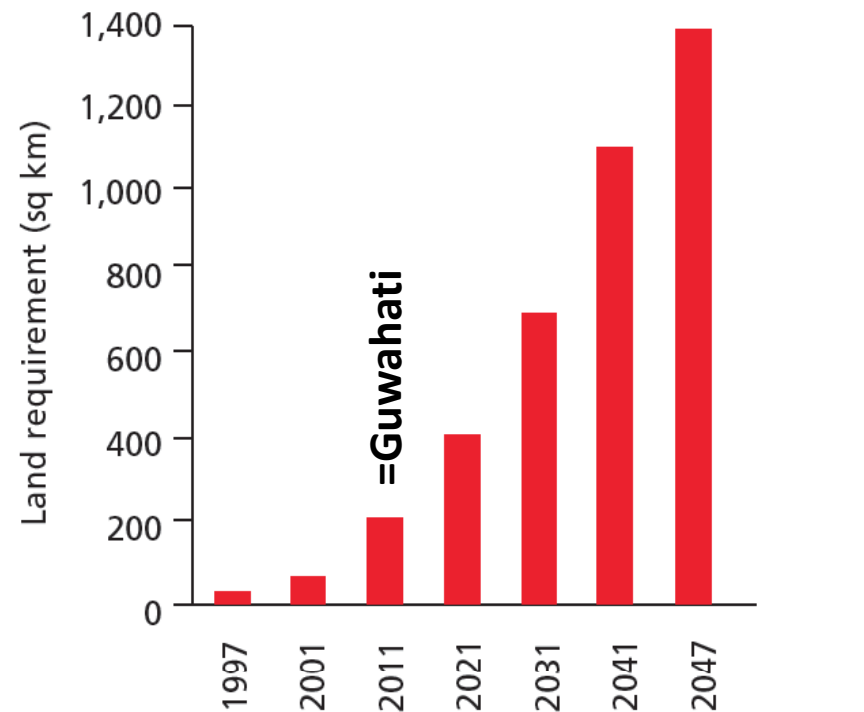
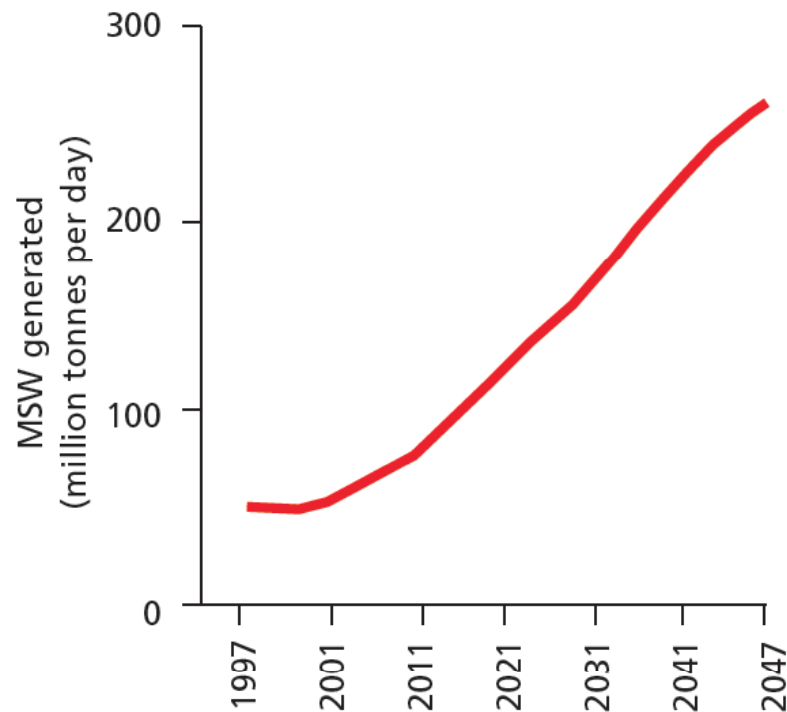


Source: Compiled from research papers and available documents
(DEA and CPCB)

***Waste generation growth is outpacing population
growth by 2-3 times***

SOLID WASTE GENERATION AND LANDFILL REQUIREMENTS

There has been an exponential increase in the volume of MSW and, therefore, the area of land needed to dispose it



Source: DEA 2009, *Position paper on solid waste management sector in India*, Department of Economic Affairs, Ministry of Finance, New Delhi

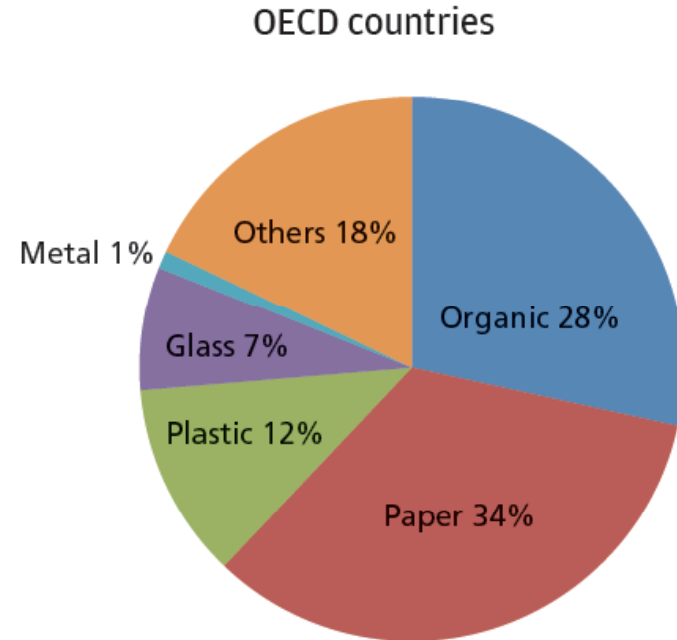
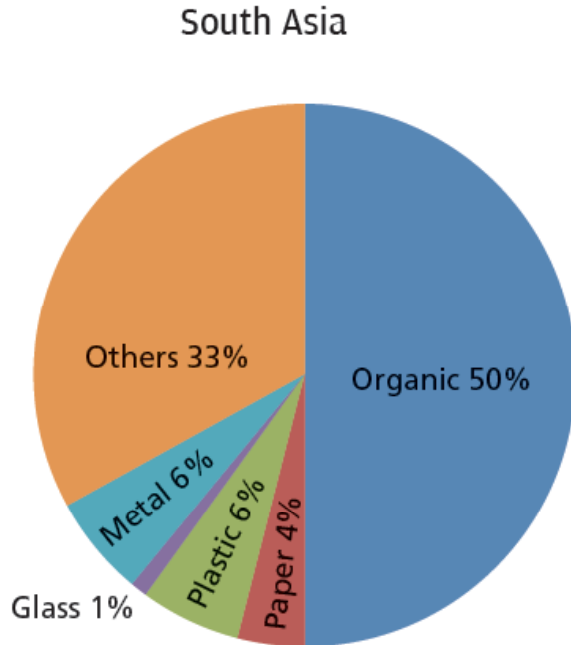
Composition of waste

- Critical question
- Determines what will be the 'method' of waste management
- **Again**
- We have broad idea that our waste is mainly organic and so biodegradable
- But will also change (**is changing**)

Composition changes with wealth

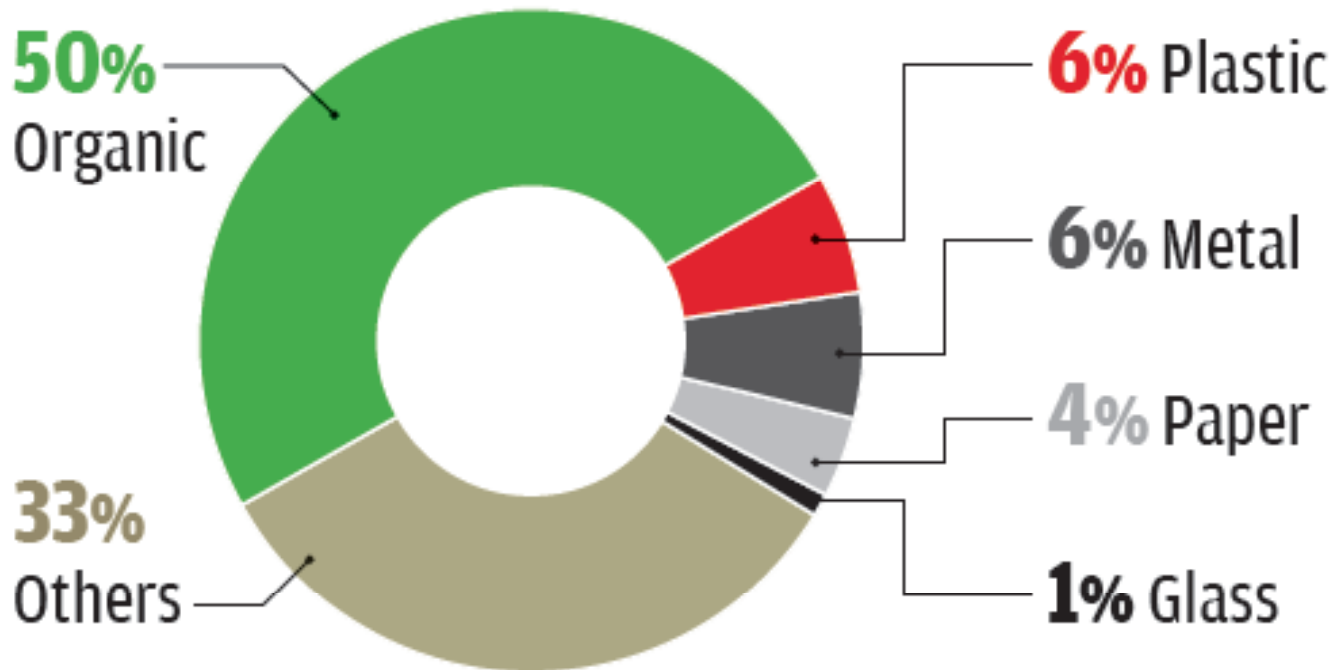
COMPOSITION OF WASTE

Half of the waste in South Asia is organic, while the organic fraction is less than one-third in OECD countries



Source: *What a Waste*, 2012, World Bank paper

Composition of waste in India



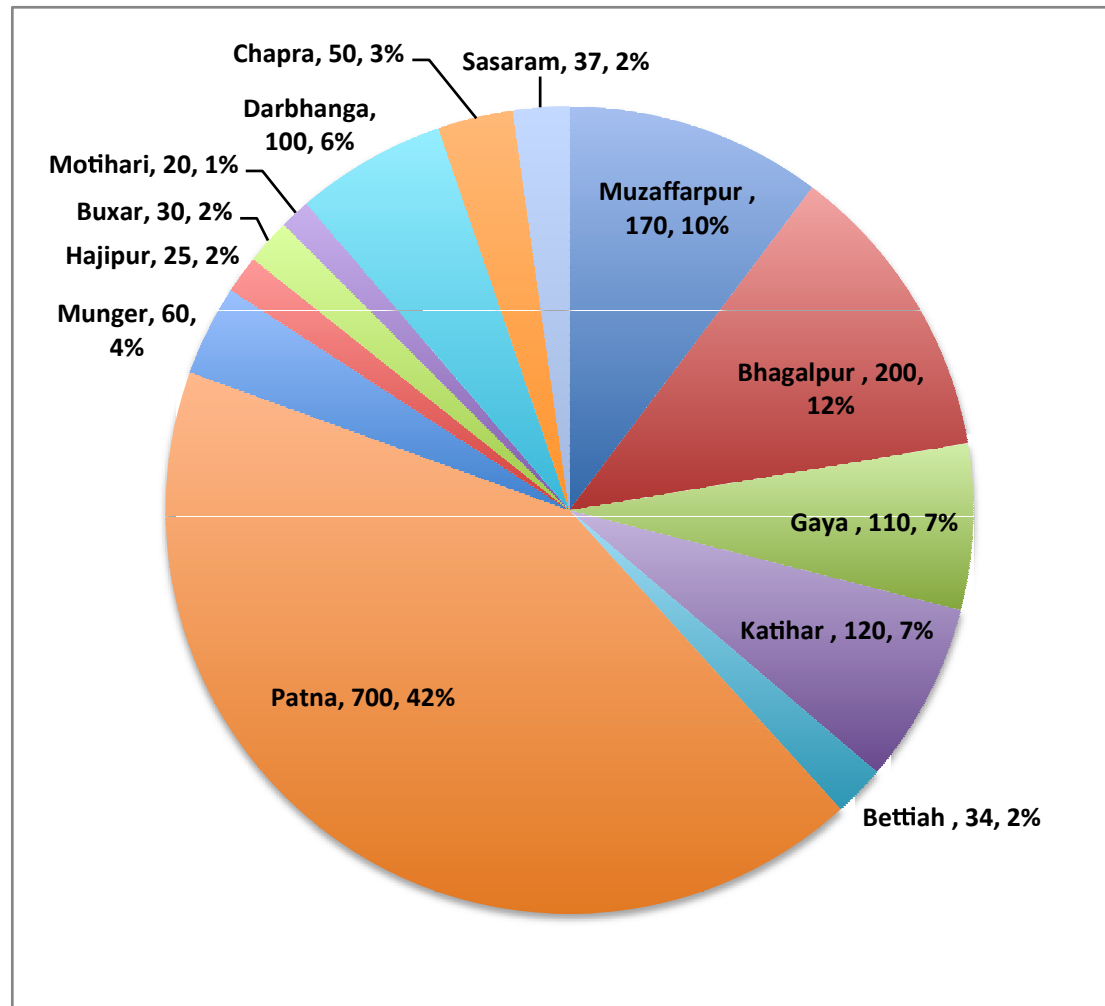
Source: What a Waste, 2012, World Bank

This is a misleading picture as composition is estimated at landfills. But we know much of the plastic, paper, glass, metals etc. is already collected by informal waste collectors and does not make it to landfills

Bihar – Waste management profile

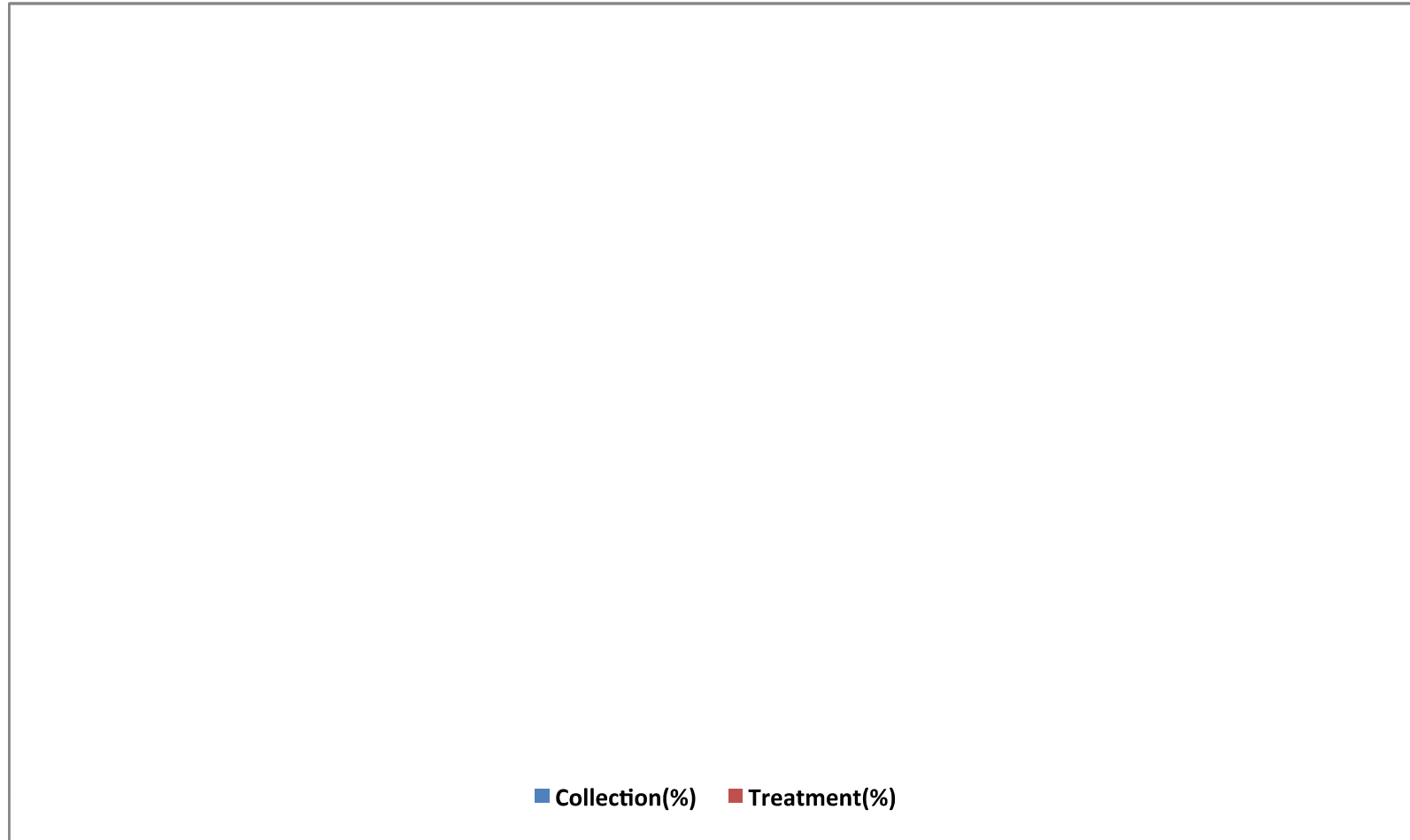
- Very few primary data; estimates based on thumb-rules
- Population: 11.6 crores (Estimated 2016)
- Total solid waste generation: Approx. 10-11 lakh tonnes/ year
- Per capita waste generation: Approx. 0.2 kg/ day
- Sanitary landfill sites: 0
- Compliance with MSW rules, 2000: All cities non-compliant
- Smart Cities: Only **Bhagalpur**

Solid Waste Generation in major cities of Bihar



Total: 2800-3000 TPD

Collection efficiency below 50 percent, no treatment of solid waste



PATNA

Population: 57 lakh (2011 census)

☐ Generation

- MSW generation: 700 TPD, to reach 1537 TPD by 2030
- Per capita waste generation: 0.5kg/per capita/day

☐ Collection

- Collection efficiency: 65%
- D2D collection: 60%

☐ Transportation

- Inadequate fleet of vehicles
- Lack of transfer stations

☐ Treatment

- No system of formal treatment or processing
- Open dumping; no sanitary landfill site

MUZAFFARPUR

Population: 48 lakh (2011 census)

☐ Generation

- MSW generation: 170 TPD
- Per capita waste generation: 0.3 kg/day

☐ Collection

- Collection efficiency: Above 50%
- D2D collection: 55%

☐ Transportation

- Adequate fleet of vehicles
- Lack of transfer stations

☐ Treatment

- No system of treatment or processing
- Waste dumped in Rautiniya, 12 km away from city

BHAGALPUR

Population: 30 lakh (2011 census)

☐ Generation

- MSW generation: 200 TPD
- Per capita waste generation: 0.5 kg/per capita/day

☐ Collection

- Collection efficiency: Above 70%
- D2D collection: 40%

☐ Transportation

- Limited vehicles

☐ Treatment

- No system of treatment or processing
- Open dumping

Overall Assessment

Situation is improving, but a long way to go

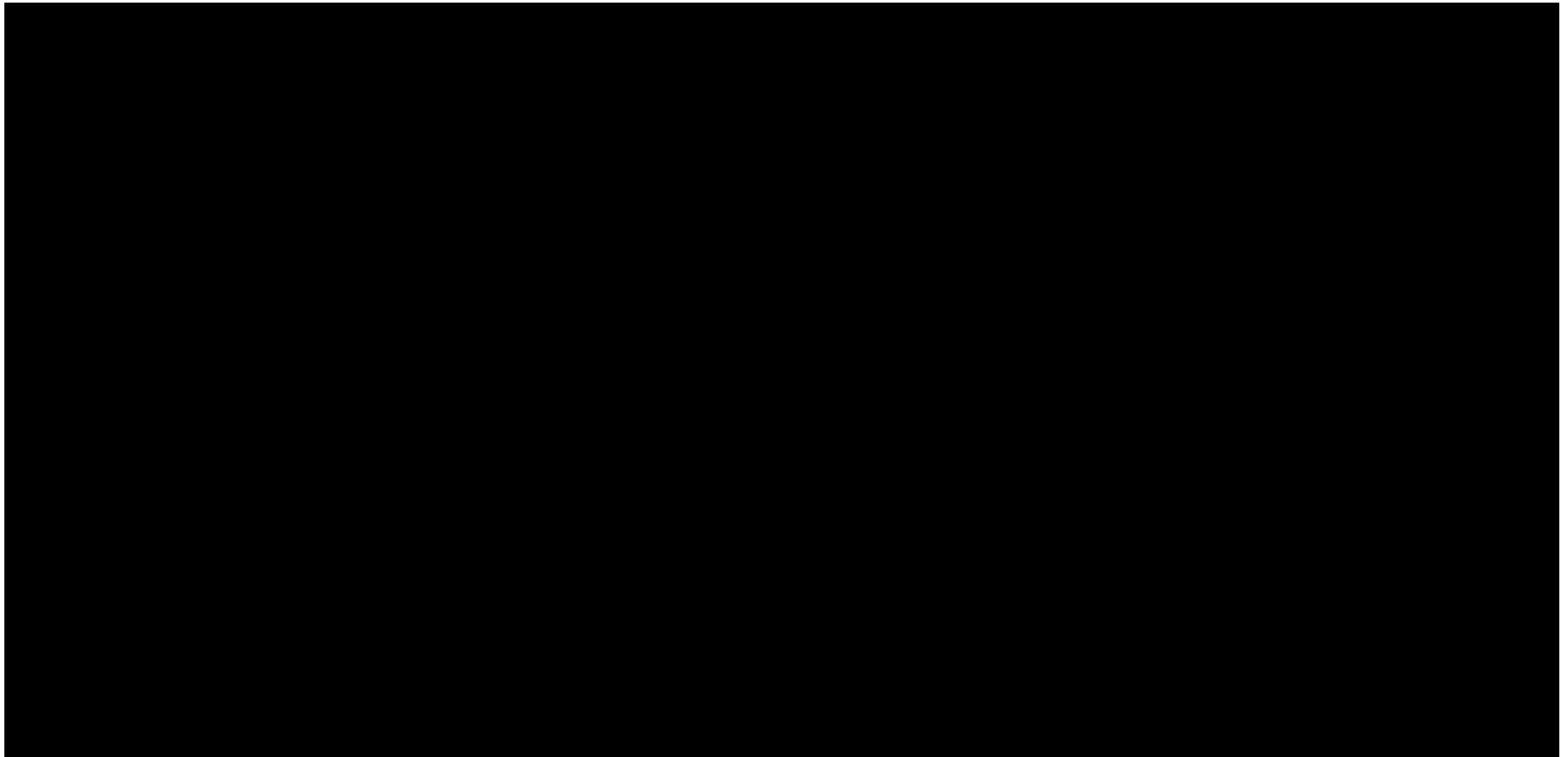
- In past five years, door to door collection has improved significantly and collection efficiency has increased from 20-30% to 60%
- Adequate infrastructure is being built in cities
 - ✓ Fleet of vehicles for C&T
 - ✓ Manpower
 - ✓ Resources and funds
- Land is not available for landfill in large number of ULBs.

Our unclean cities & mountains of waste

- **Two big issues:** How to improve cleanliness of our cities and how do we dispose what we collect
- But we are running out of land to dump waste
- **Not-in-my-backyard** means that conventional waste disposal scheme of landfill is being contested across India
- Silver-bullet of burning waste to make energy not working
- Municipal capacity weak; funds limited and dream of 'outsourcing' not so simple
- **Agenda for Swachh Bharat; Swachh Bihar**

Good News: We know how to clean our cities and eliminate landfills

- **Panjim:** *D2D collection of segregated waste, then reuses, recycles; bin free, zero landfill policy*



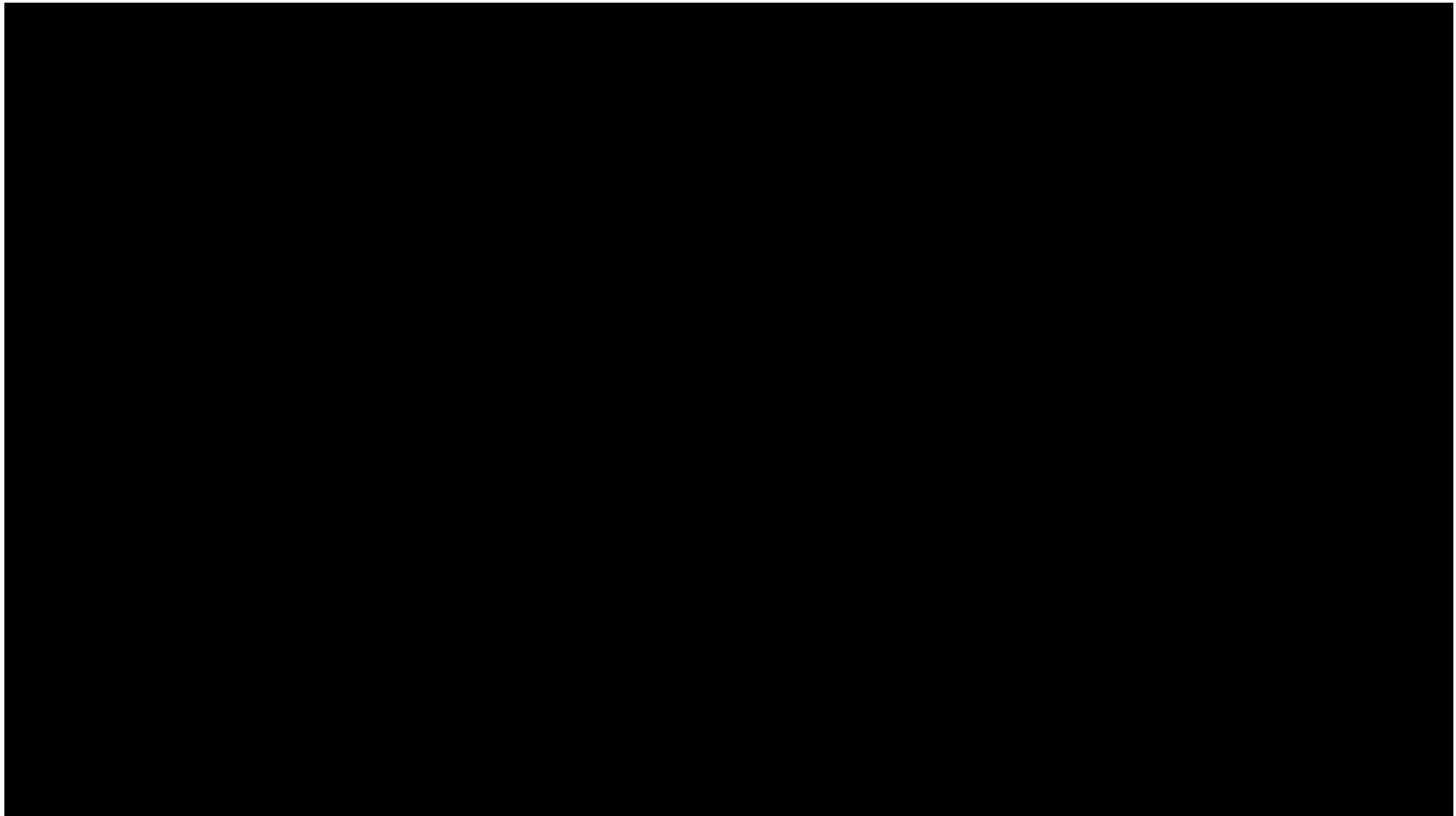
Good News: We know how to clean our cities and eliminate landfills

- **Alleppey:** *No D2D collection. Segregation, compost & biogas at households*



Good News: We know how to clean our cities and eliminate landfills

- **Mysore:** *D2D collection of segregated waste, no tipping fees, private sector makes money by selling compost*



Agenda 1: segregate.. segregate

- Do not focus on land and technology
- **Focus on segregation**
- Lost last 25 years in bad experiments; sold white elephants by technology companies:
Waste-To-Energy or Sanitary Landfills

'Sold' quick fix

- Waste-To-energy plants closing; asking for higher rates for tipping fee or energy generation; or people are protesting against pollution by plants
- Reason is quality of waste received by plants
- '**Sorting**' at plant does not work if waste is mixed – everything from plastic to construction waste
- More non-segregated waste, less calorific value, less energy – not-viable
- **Global experience: W-T-E works** if waste is segregated so that fuel generated is of high quality and plants can get paid for energy

Agenda 2: Operationalize segregation

- Two ways:
- **Alleppey-way**: municipality does not collect waste because of NIMBY and so households have to segregate and compost/biogas
- **Panjim-way**: municipality collects biodegradable waste everyday; non-biodegradable twice a week; promotes community compost
- **Any other way**: But segregate at source essential. Then transport and process segregated streams of waste (**do not first sort and then mix**)

Agenda 3: Re-design MSW contracts

- All contracts for municipal waste management provide perverse incentive to transport more waste, not less
- Agencies are paid 'tipping' fee based on how much MSW is brought to landfill site
- Pay instead based on how much waste is **segregated; recycled and processed** – not how much is collected or transported

Agenda 4: Landfill tax

- Zero landfill has to be objective of waste management
- **Wealth from waste has to be to the motto**
- Impose landfill tax – waste that is brought to landfill pays cost of land and its ‘misuse’
- High charge – has to be disincentive
- Countries use provision this to move towards waste-recycling and reuse

Agenda 5: Recognize informal sector

- The reason we have not completely drowned in our waste is because **the 40 lakh waste collectors (3 times the number of people employed by the largest employer in India – Indian Railways)** collect it and then process it
- We do not **recognize** this contribution
- We do not even **measure** this contribution
- We certainly do not **promote** it or **reward it** in municipal bylaw
- The issue is how to work with massive and well-organized informal waste collection and processing sector without destroying it

Agenda 6: Celebrate NIMBY

- When the poor say **not-in-my-backyard** nobody listens
- When the middle-class says **not-in-my-backyard** then somebody listens
- But poor are getting more politically aware (as they must). They will insist also **not-in-my-backyard**
- **Support this. Then only we will find better ways to manage our waste**
- **Waste is resource. Not use and throw, but use and recycle and reuse**



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