



Procedures and approaches to minimize emissions from construction

Avikal Somvanshi

Sustainable Cities Programme, Centre for Science and Environment





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Delhi's air quality has been oscillating between 'poor' and 'very poor' and severe category over the past one month.

CPCB for ban on construction activities in pollution 'hotspot' if Delhi air quality turns severe

1 min read . Updated: 22 Nov 2018, 08:01 PM IST

PTI

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Photo Credit: Thinkstock

On Friday the advisory recommended people to avoid strenuous physical activity such as running and jogging during the November 1-10 period.



New Delhi: After the air quality deteriorated to 'severe' category, the environment officials announced a blanket ban on construction and excavation work across the national capital region on Saturday. Accessing the gravity of situation the government has mentioned that the officials who will fail to stop such activities will face criminal prosecution.

hindustantimes

Ban on construction work in Delhi-NCR till Nov 10 to combat pollution, violators to face action

At least 34% of Delhi's PM2.5 pollution during winter is generated by local sources, a recent study by The Energy and Resources Institute (TERI) has found.





Environment officials announced a complete ban on construction and excavation work across the national capital region on Saturday. (AP File Photo)

Updated: Oct 28, 2018 12:07 IST

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Delhi Air Quality 'Severe', Environment Body Orders Ban On Construction

📍 Delhi 🗣️ Press Trust of India

The order includes halt of all construction activities involving excavation, civil construction to remain closed in Delhi and other NCR districts from November 1-10, closure of all stone crushers, hot mix plants generating dust pollution in Delhi and NCR districts from November 1-10.

🕒 Updated : October 30, 2018 20:38 IST



Batting	R	B	
Peter Hands...	99	88	
Glenn Maxwell*	4	3	
Bowling	W	R	O
Jasprit Bumrah	2/33	5.4	

Directions from the Hon'ble National Green Tribunal

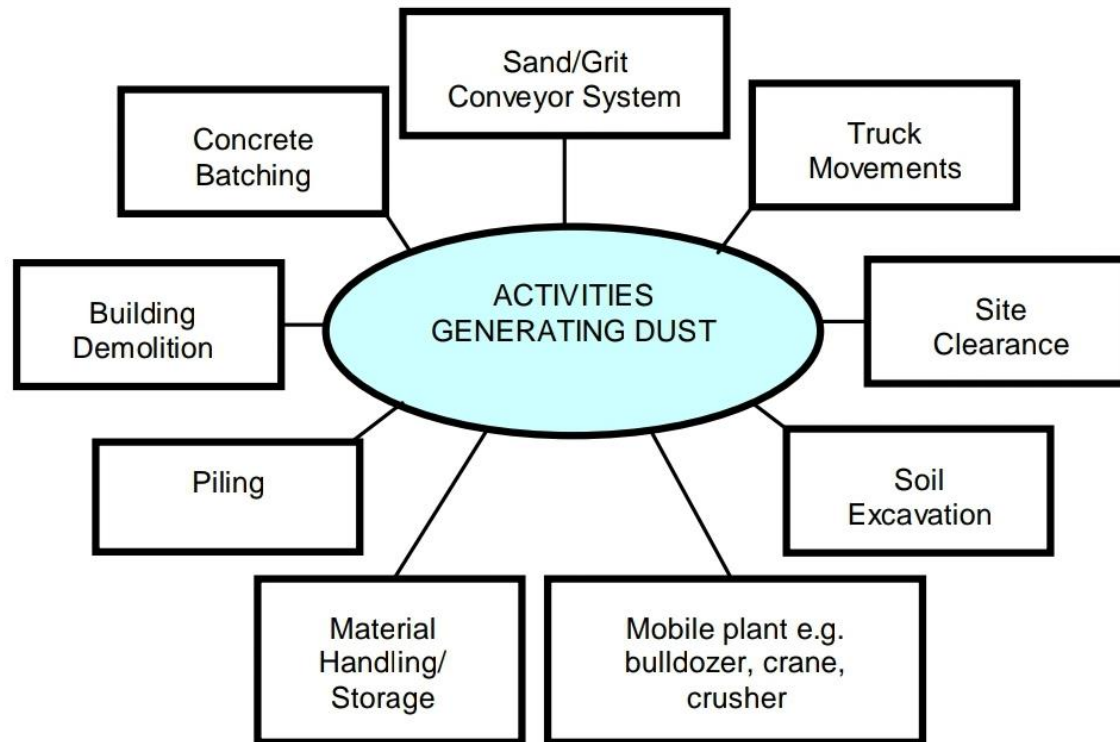
Order dated 10.04.2016

The Hon'ble NGT dated 10.04.2015 in *O.A No.95 of 2014 in the matter of Sanjay Kulshrestha Vs Union Of India & Ors inter alia* directing that if any person, owner and or builder is found to be violating any of the conditions stated in this order and or for their non- compliance such person, owner, builder shall be liable to pay compensation of Rs 50,000/- per default in relation to construction activity at its sites and Rs. 5000/- for each violation during carriage and transportation of construction material, debris through trucks or other vehicles which all stakeholder agencies in NCR are implementing.

Directions from the Hon'ble Supreme Court

Order dated 16.12.2016

“It was submitted that Union of India and State Governments concerned must be directed to take steps to enforce the CPCB rules and norms against those engaged in such construction activities to prevent further rise of pollution levels. We see no reason to decline a direction to that effect. CPCB norms regarding prevention of pollution by putting curtains and other devices at construction sites must be strictly enforced by the enforcement agencies concerned. We direct accordingly.”



S.No.	Task	Significance
1	Whether continuous dust/wind breaking walls of appropriate height* have been provided around the periphery of the construction site?	High
2	Whether tarpaulin or green-net on scaffolding around the area under-construction and the building is provided?	High
3	Whether all vehicles including carrying construction material and construction debris of any kind cleaned and wheels washed before leaving the construction site?	High
4	Whether all vehicles carrying construction material and construction debris are fully covered and protected so as to ensure dust from construction material or debris does not become air-borne in transportation?	High
5	Whether all construction debris and construction material of any kind is stored on the site (not dumped on roads or pavements) and is fully covered in all respect? Ideally in a warehouse.	High
6	Whether wet-jet being used in grinding and stone cutting?	High
7	Whether unpaved surfaces and areas with loose soil are adequately sprinkled with water to suppress dust? Ideally site to be fitted with fine water spraying nozzle system.	Medium
8	Whether construction and demolition waste is recycled on-site or transported to authorised recycling facility and due record of the same is maintained?	Medium
9	Whether every worker working on construction site and involved in loading, unloading and carriage of construction material and construction debris are provided with dust-mask to prevent inhalation of dust particles?	Medium
10	Whether arrangement provided for medical help, investigation and treatment to workers involved in the construction of building and carry of construction material and debris relating to dust emission?	Medium
11	Whether green belt or green air barriers created around the construction site? Note: This method is usually not possible in under-construction site and should not be insisted upon if all high and medium significance requirements are fulfilled.	Low
12	Any additional measures taken to control dust pollution.	Low



What to inspect for?

Agency	Number of projects
Delhi	
DPCC	53
Haryana	
HSPCB	138
Uttar Pradesh	
Yamuna Expressway Authority	11
NOIDA Authority	45
Greater Nodia	156
GDA	116

But numbers were abysmal



Number projects larger than 20,000 sqm in NCR (as noted by EPCA in 2016)



Majority of construction within the city limit are under 20,000 sqm and thus outside purview of EIA.



Status of Dust Control in projects smaller than 20,000 sqm (Delhi only)



Agency	Number of challans	Amount recovered
NDMC	-	-
North-DMC	240	Rs. 23,00,000
East-DMC	440	Rs. 35,00,000
South-DMC	714	Rs. 33,50,000
Department of revenue	437	Rs. 60,85,000
PWD-Delhi	11	Rs. 95,000
Total	1700	Rs. 2,37,45,000



Hawa Badlo



WHAT'S CHOKING OUR CITY?

% of Air pollution in Delhi-NCR



LEAF AND GARBAGE BURNING



Toxic smoke

34%

WINTER

19%

SUMMER



BUILDING AND CONSTRUCTION



Toxic smoke

8%

Citizen engagement

Graded Response Action Plan for Delhi & NCR

In pursuant to the Hon'ble Supreme Court's order dated December 02, 2016 in the matter of M. C. Mehta vs. Union of India regarding air quality in National Capital Region of Delhi, a Graded Response Action Plan has been prepared for implementation under different Air Quality Index (AQI) categories namely, Moderate & Poor, Very Poor, and Severe as per National Air Quality Index. A new category of "Severe+ or Emergency" has been added. Ministry of Environment, Forests & Climate Change has notified for implementation of Graded Response Action Plan through Environment Pollution (Prevention & Control) Authority vide S.O. 118 (E) dated January 12, 2017 (copy enclosed).

Severe + or Emergency (ambient PM _{2.5} or PM ₁₀ concentration values of 300 µg/m ³ or 500 µg/m ³ respectively persist for 48 hours or more)	Agency responsible/Implementing Agency
Stop entry of truck traffic into Delhi (except essential commodities)	Municipal Corporations and Traffic Police of Delhi and NCR Towns
Stop construction activities	Delhi Pollution Control Committee/Municipal Corporations of Delhi and NCR towns
Introduce odd and even scheme for private vehicles based on license plate numbers and minimize exemptions	Secretary cum Commissioner of Transport Department, NCT of Delhi, and Transport Commissioners of NCR towns
Task Force to take decision on any additional steps including shutting of schools	
Severe (ambient PM _{2.5} or PM ₁₀ concentration value is more than 250 µg/m ³ or 430 µg/m ³ respectively)	Agency responsible/Implementing Agency
Close brick kilns, Hot Mix plants, Stone Crushers	Chairpersons Delhi Pollution Control Committee, State Pollution Control Boards of Haryana

Construction and Demolition Waste

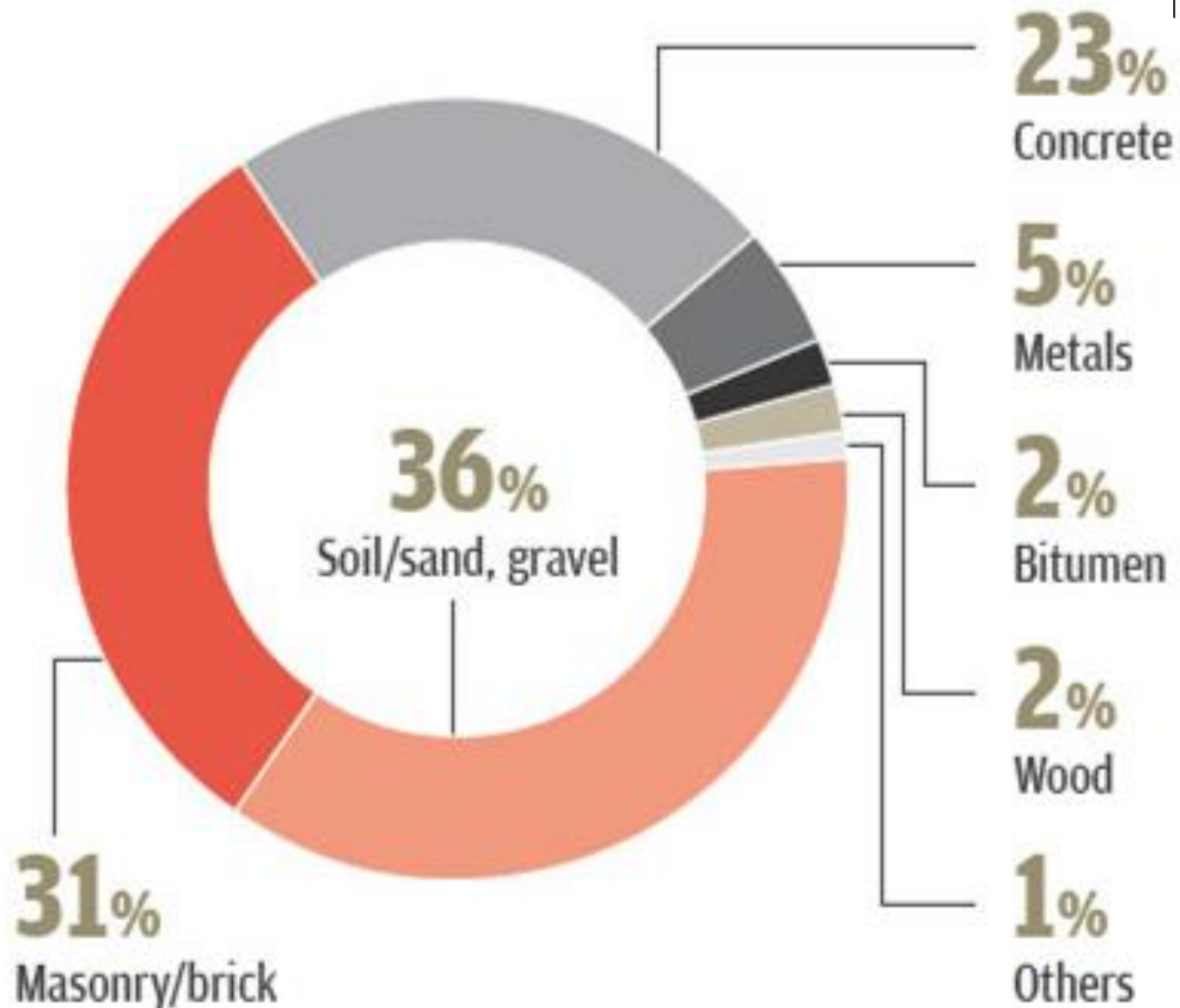




Construction & Demolition (C&D) waste means “the waste comprising of building material, debris and rubble resulting construction, re-modeling, repair and demolition of any civil structure”

Construction and Demolition Waste Management Rules, 2016

Composition of construction and demolition waste in India as per
Technology Information, Forecasting and Assessment Council





CONCERNS

C&D wastes stored outside construction sites and along road sides are a cause of both **traffic congestion and mishaps**

Waste from small generators quite often finds its way into the nearest municipal bin, waste storage depots, making the municipal waste heavy and degrading its quality for further treatment like composting or energy recovery

C&D waste is also often dumped in surface drains obstructing the flow of waste water leading to **urban flooding**

C&D waste is a source of dust pollution

1. Pattinapakkam Beach



Severing our water bodies



2. Yamuna, Delhi



6. Keelkattalai Lake, Chennai



3. Ram Nadi, Pune



4. Mangroves, Navi Mumbai



7. Coimbatore



5. NRI Complex, Mumbai





Sand Mining

It is killing our rivers twice



As waste lies waste... nature is devastated to support urban boom

Sand mining triggers debate

2012: Supreme Court order on stronger regulations for minor minerals

2013: National Green Tribunal declared sand mining with environmental clearance illegal.

Union Ministry of Housing and Urban poverty alleviation alerted Rajya Sabha in 2012 about the shortage of building material especially aggregates. Holding up housing and civic infrastructure projects...

**Need substitutes and strategies to reduce stress on
naturally sourced material**

No one really knows the scale of the problem



Year	Authority/Institute	Estimate (million tonnes)
2000	Ministry of Urban Development	10-12
2001	Technology Information, Forecasting and Assessment Council , Department of Science and Technology	12-15
2010	Ministry of Environment and Forest	10-12
2013	Centre for Science and Environment	530
2014	Ministry of Urban Development	No estimates exist
2015	Ministry of Urban Development	10-12
2015	Development Alternative and GIZ	750
2016	Ministry of Environment, Forest and Climate Change	530
2017	Building Material and Technology Promotion Council	150

Small steps to make resource from waste



C&D waste can be recycled and reused in construction and minimize environmental degradation and pressure on land. Matured technologies are available.

Small steps in Delhi and Mumbai:

MCD-ILFS-IEISL initiative in Delhi

C&D waste is being recycled into aggregates which are converted to Ready Mix Concrete, pavement blocks, kerb stones and concrete bricks.

YUVA and CIDCO initiative in Navi Mumbai

This has recycled 1500 tonnes of C&D waste between 2002-06. But operations shut down as no policy and market support

Materials recovered from C&D



Mixed Waste



Concrete Waste



Recycled Aggregate (RA)



**Sand Substitute
Aggregate -3mm**

Recycled Concrete Aggregate (RCA)



Aggregate 10-20 mm



Aggregate 3-10 mm



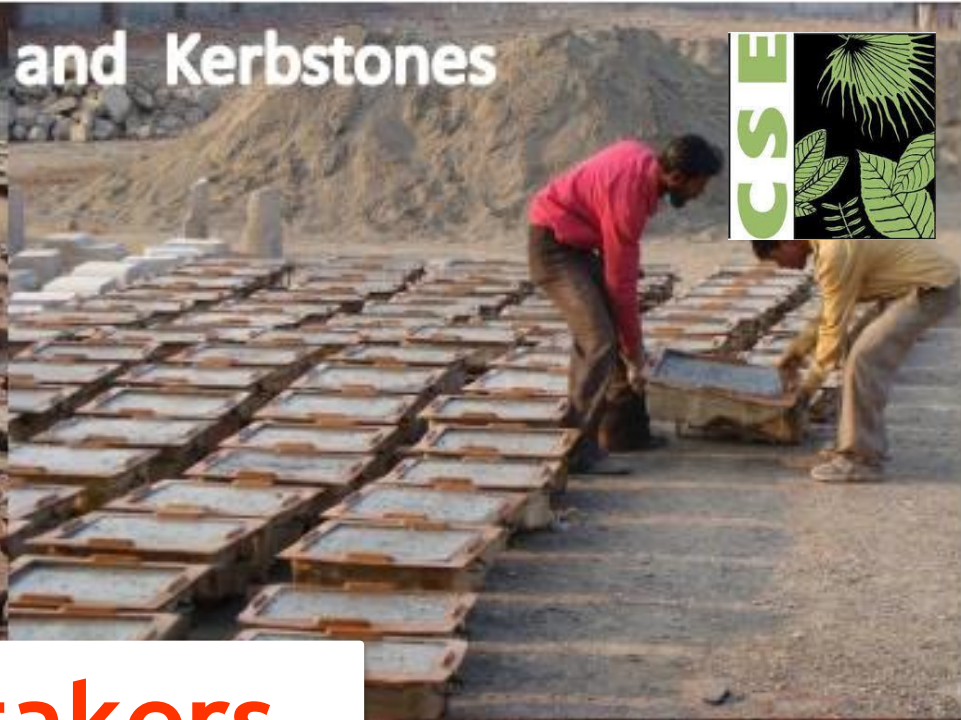
Aggregate 3-10 mm



Aggregate 10-20 mm



Pavement Blocks and Kerbstones



No takers



What was coming in the way?



Indian standards used to permit only
‘naturally sourced’ material

No legal framework

Municipal Solid Waste (Management and Handling) Rules 2000 only made a brief mention of C&D waste without laying down any guidelines for its management.

No standards for recycled products

The BIS allows use of non-natural materials to be used for construction but doesn't have any specific standard for recycled material, leading to major confusion among various agencies and developers. Most are abstaining from using recycled waste citing Indian standard specification related to aggregates for concrete state that these should be ***‘naturally sourced’***.

- Only virgin materials (sand, aggregate) mined directly from nature can be used. This does not allow recycled or reused components
- Any use of recycled aggregate become ‘illegal’

**State construction agencies could not include these material
in their Schedule of Rates**

2016 Amendment of IS:383

Coarse and Fine Aggregate for Concrete



(Clause 4.2.1)

		Maximum utilization in		
		Plain Concrete	Reinforced Concrete	Lean Concrete (less than M15 grade)
1) Coarse Aggregate				
i)	Iron slag aggregate	50%	25%	100%
ii)	Steel slag aggregate	25%	Nil	100%
iii)	Recycled concrete aggregate (RCA) (See Note 1)	25%	20% (only upto M20 grade)	100%
iv)	Recycled aggregate (RA)	nil	nil	100%
2) Fine Aggregate				
i)	Iron slag aggregate	50%	25%	100%
ii)	Steel slag aggregate	25%	nil	100%
iii)	Copper slag aggregate	40%	25%	50%
iv)	Recycled concrete aggregate (RCA) (See Note 1)	25%	20% (only upto M20 grade)	100%

National Building Code of India 2016



Part 11 of NBC 2016 on 'Approach to Sustainability', states that :

- a. Recycled Coarse Aggregate may be used in concrete for bulk fills, bank protection, base/fill of drainage structures, pavements, sidewalks, kerbs and gutters etc.
- a. Up to 30 percent of natural crushed coarse aggregate can be replaced by the recycled concrete aggregate
- a. This percentage can be increased up to 50 percent for pavements and other areas which are under pure compression

Further support

Exemption from the compliance of norms (Schedule I (14))

The following are exempted from the norms of pollution from dust and noise as mentioned above:

- a. For construction work, where at least 80 percent construction and demolition waste is recycled or
- a. reused in-situ and sufficient buffer area is available to protect the surrounding habitation from any adverse impact.

Construction and Demolition Waste Management Rules, 2016



This was urgently needed as cities are choking on construction and demolition waste with serious environmental and public health consequences

The next step is to create a clear mechanism for stringent and scaled-up implementation in cities for improved collection, segregation and handling of waste; decentralised collection and recycling centres; penalty for littering; lower taxes on recycled products and public awareness

Make developers responsible and accountable for good construction practices, onsite segregation of waste, reuse and disposal; and impose waste tax to minimize waste-generation.

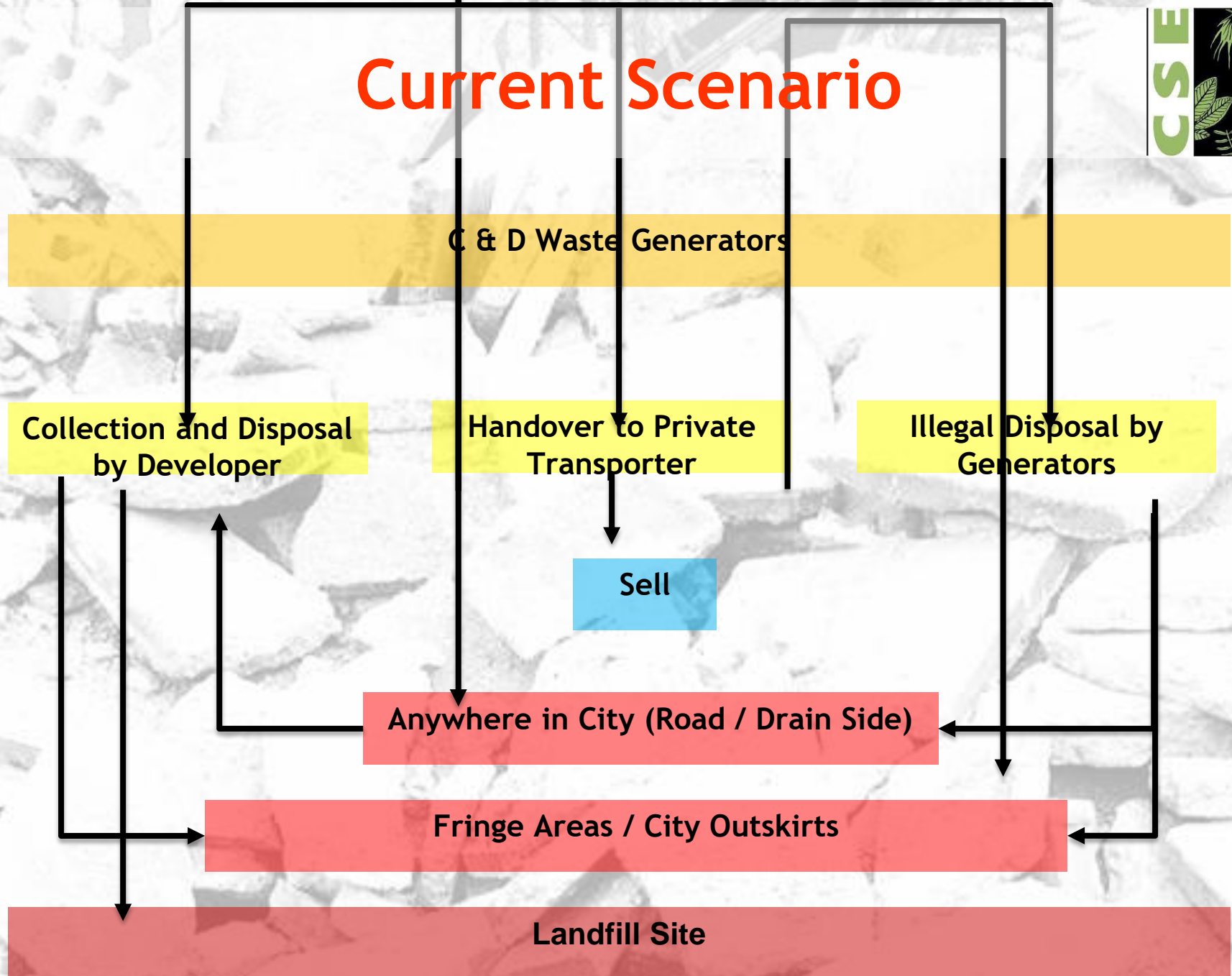
The key highlights of the new C&D Rules



The key highlights of the new notification on C&D waste:

- Mandates use of recycled of products in construction, Local bodies will have to utilise 10-20 per cent of material from C&D waste in municipal and government contracts for construction
- All large developers are accountable for collection and disposal of C&D waste
- The Bureau of Indian Standards needs to prepare a code of practice and standards for products of construction and demolition waste
- Indian Road Congress needs to prepare standards and practices pertaining to products of construction and demolition waste in road construction
- Local authorities to give appropriate incentives to waste generators for salvaging, processing, and recycling, preferably in-situ
- Recycling facilities will have to be created at a safe distance from habitation with adequate buffer zone
- Local authorities to established a database and update it once in a year

Current Scenario



Proposed Scenario

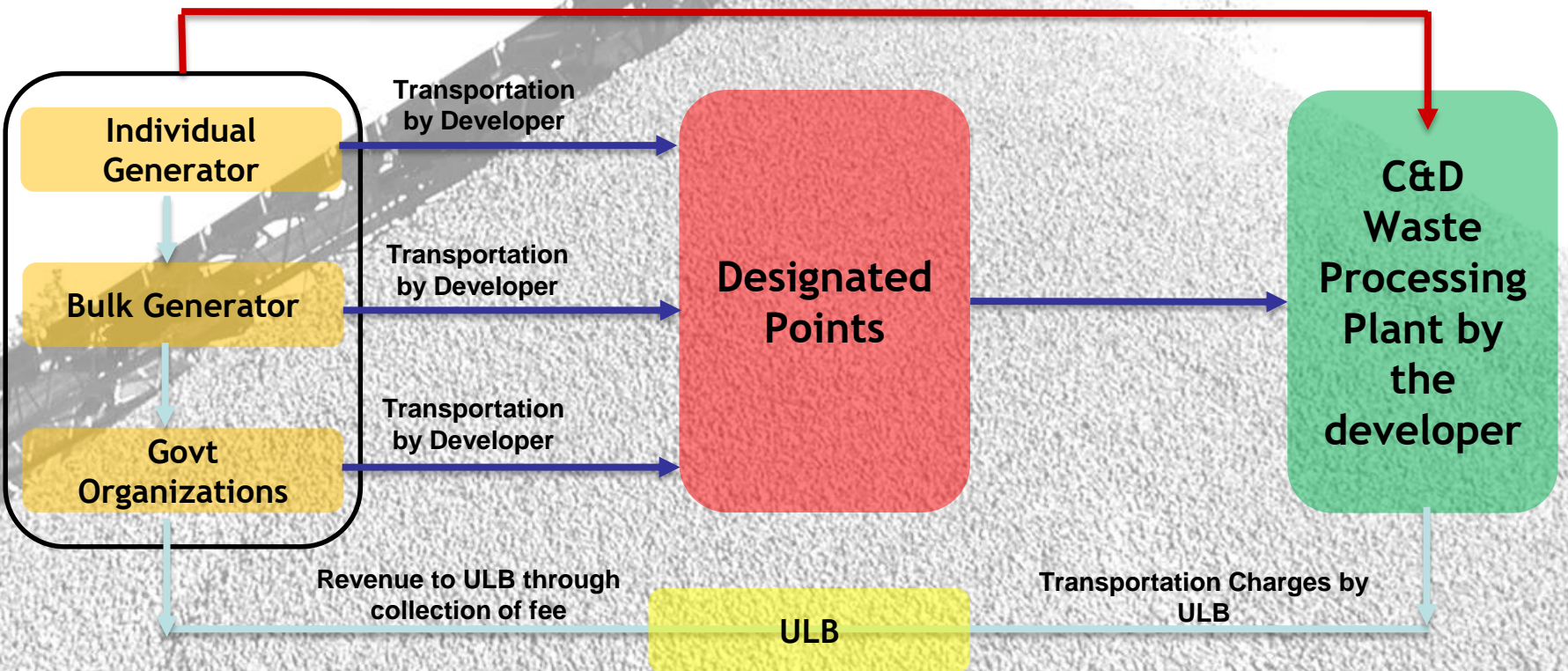


Monitoring Agency:
Urban Local Body

Transportation by developer

→ C&D waste Debris
→ Payment system

→ Direct Transportation of C&D waste Debris



Waste generator responsibilities



- Submit a **waste management plan** to the local authorities before starting construction
- Inform the authorities of every construction and demolition activity from planning to implementation stage. (Processing and disposal charges to be done)
- Generating more than 20 tons/day or 300 tons/project of C&D waste in a month - **segregation into streams**: concrete, soil, steel, wood and plastics, bricks and mortar
- Make sure C&D waste is **not mixed with solid waste** and keep it within premise
- **Pay relevant charges** for collection, transportation and disposal as notified by the concerned authorities. Rates to be fixed by concerned local authority
- Generators of more than 20 tons/ day or 300 tons/ project in a month shall pay separately for processing and disposal



ULBs responsibilities

Cities with population > one million

Bulk generators : The agencies that generate C&D waste in bulk quantity to deliver the C&D debris at the recycling plant

Fee on bulk generators: The terms and conditions with the concessionaire and the fee levied on bulk producer of C&D waste are made available at a price at least 20% lower than corresponding materials from natural resources.

Criteria for setting up C&D waste processing facilities: The Civic bodies wherein current waste generation > than 2000 tpd, to set up more than one plant for recycling of C&D waste

Cities of population < one million

Non-bulk generators : Collection points be provided so that small quantity generator of C&D waste is not required to transport the debris to a distance more than 2.5 to 3.0 km

Mandate use of recycled C&D waste products



- a) Mandate use of C&D waste products : As and when C&D waste recycling plant is commissioned at a city, it may be made mandatory for all construction activities to use a specified percentage of building construction materials manufactured from recycled debris.
- a) Incentivize utilization of recycled C&D waste products :
 - i. All Government constructions may be mandated to use at upto 20 per cent of recycled C&D waste products.
 - ii. All renovation projects involving demolition, even in private sector, may be mandated to use at least 20 per cent of recycled C&D waste products.
 - iii. The tipping fee for delivery of C&D waste to the recycling plant, terms & conditions of civic body with the concessionaire may be designed to keep the price of C&D waste recycled products about 20 per cent lower than the corresponding conventional products.

Duties of SPCBs

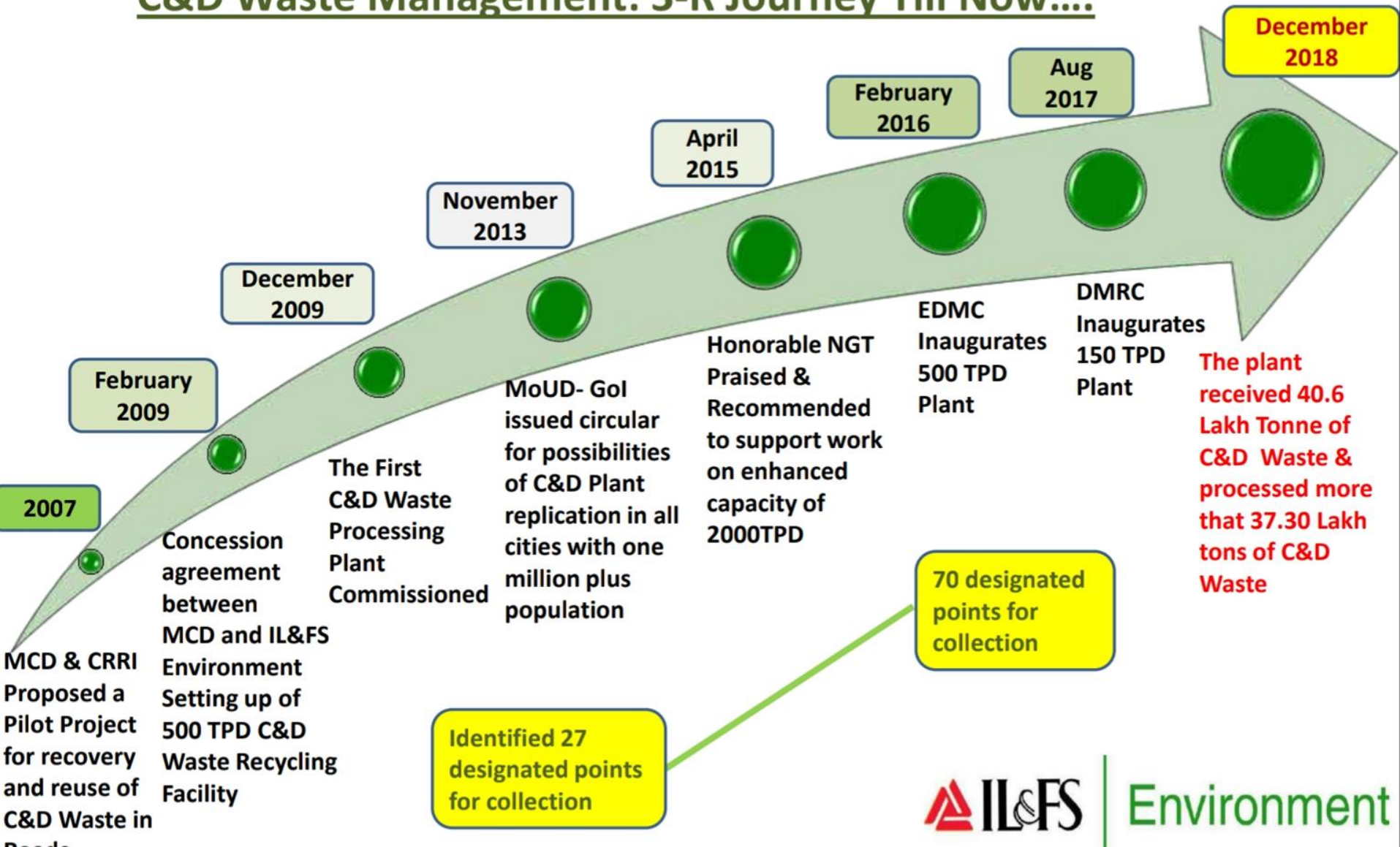


Monitoring

- Implementation of the rules by concerned local bodies
- **At processing and recycling facilities, local authority shall:**
 - Provide storm water drains to prevent stagnation of surface water
 - Provide paved or concreted surface in selected areas in the processing or recycling facility for minimizing dust and damage to the site.
 - Prevent noise pollution from processing and recycling plant
 - Provide treatment of effluent if any, to meet the discharge norms as per Environment (Protection) Rules, 1986.
- **SPCBs shall:**
 - Monitor Work Zone air quality at the Processing or Recycling site and ambient air quality at the vicinity
 - Measure ambient noise at the interface of the facility with the surrounding area, i.e., at plant boundary.
- **Exemption:** For construction work, where at least 80 percent construction and demolition waste is recycled or reused in-situ and sufficient buffer area is available to protect the surrounding habitation from any adverse impact.
- Annual reporting (before 31st July of each financial year) to Central Pollution Control Board for generation of state level comprehensive data
- Authorization of C&D waste processing facility

So far

C&D Waste Management: 3-R Journey Till Now....



So far



CPWD has started **using recycled C&D waste** - the Supreme Court extension has exclusively used recycled C&D waste blocks. Total 1.8 million blocks are used.

The National Buildings Construction Corporation Ltd. also **recycled all the C&D waste** it generated in Government of India's mega redevelopment of East Kidwai Nagar in New Delhi

All Delhi government agencies will be required to incorporate a clause in their tenders that mandate use of a minimum of two per cent recycled products from construction waste in all future contracts for building works and **10 per cent recycled products** for road works. It expects the urban local bodies to **mandate 5 per cent** use of such products for non-structural applications while examining and approving building plans

Deconstruct

Deconstruction





CSE Recommends

Construction Activities

Ensure dust pollution from construction. Check list for inspection of construction sites prepared under directions of NGT and EPCA.

Undertake control measures for fugitive emissions from material handling, conveying and screening operations. Needs enforcement.

Construction and Demolition Waste:

Provide a network of decentralized C&D waste segregation and collection sites across the city.

For material handling, construction and demolition, it should be obligatory on part of the developers to provide evidence of debris on-site recycling and/or disposal at designated site

Promote recycling of construction and demolition waste; change schedule of rates



Thank you!