



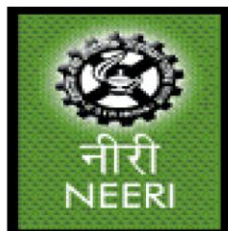
COLUMBIA UNIVERSITY
EARTH ENGINEERING CENTER

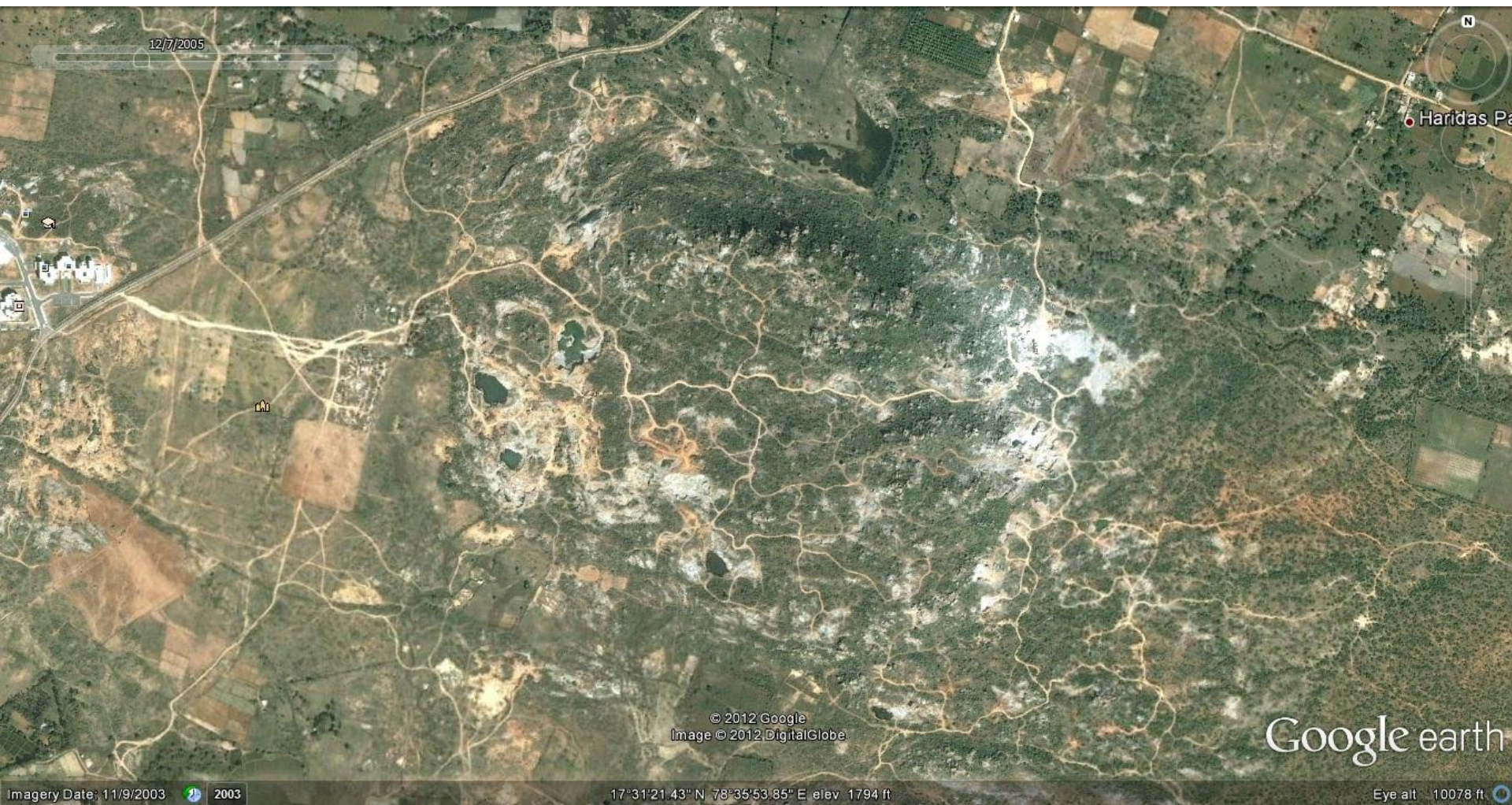
Advancing Sustainable Waste Management

Event

Partnership

National Environmental Engineering Research
Institute, (NEERI) India

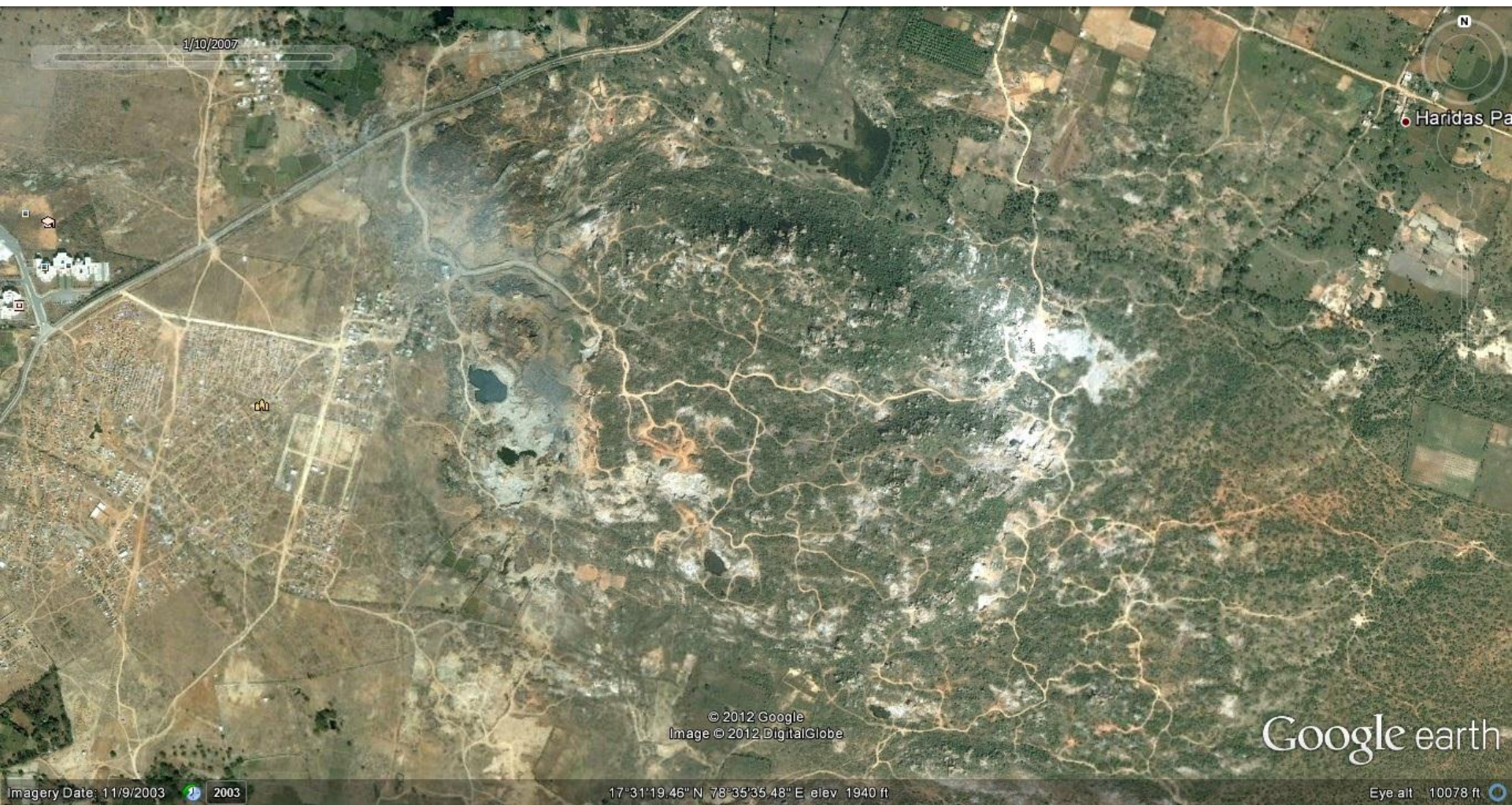




December, 2005

Hyderabad, India - Jawaharnagar

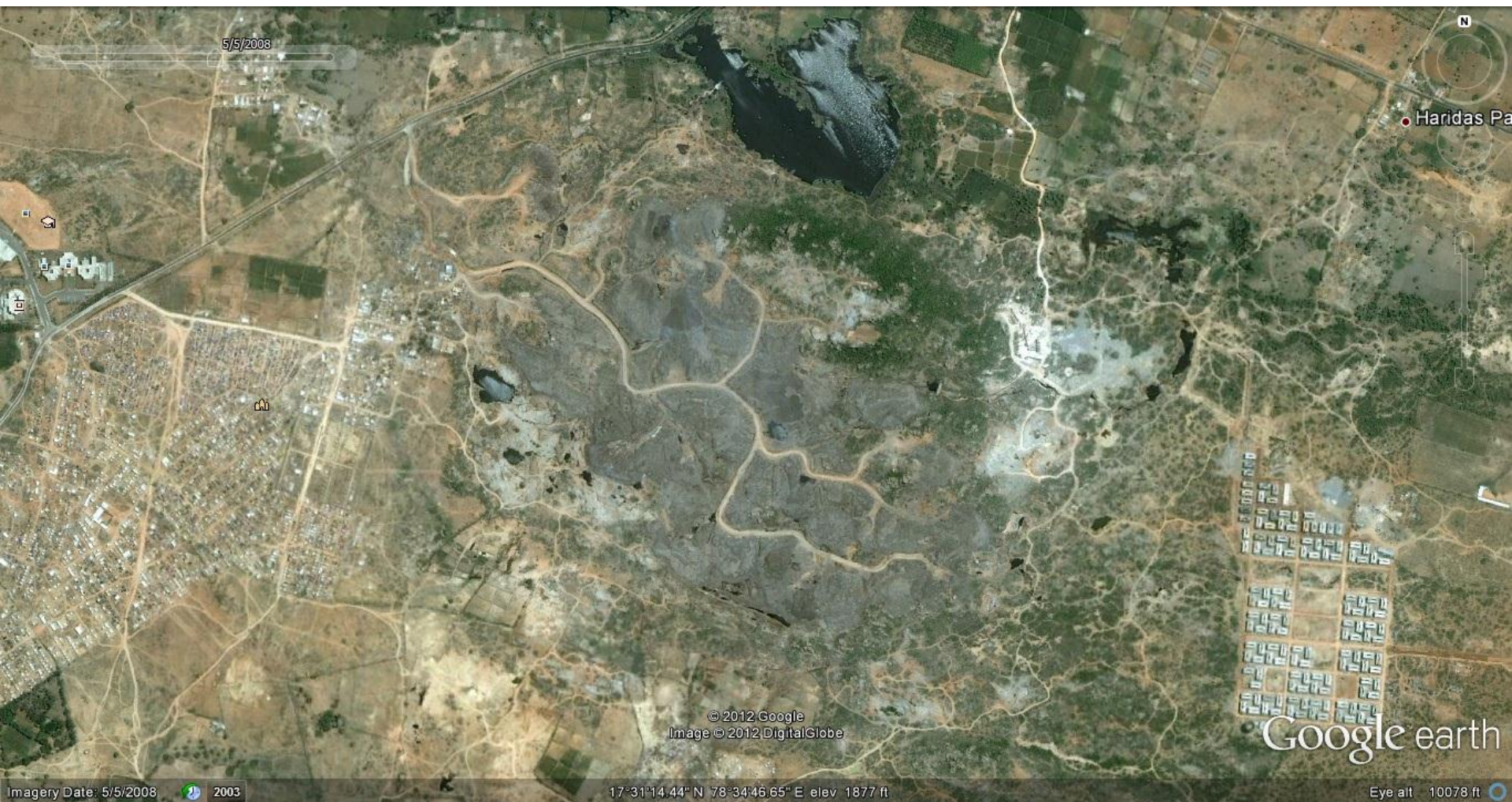
WTERT's Facebook Page



January, 2007

Hyderabad, India - Jawaharnagar

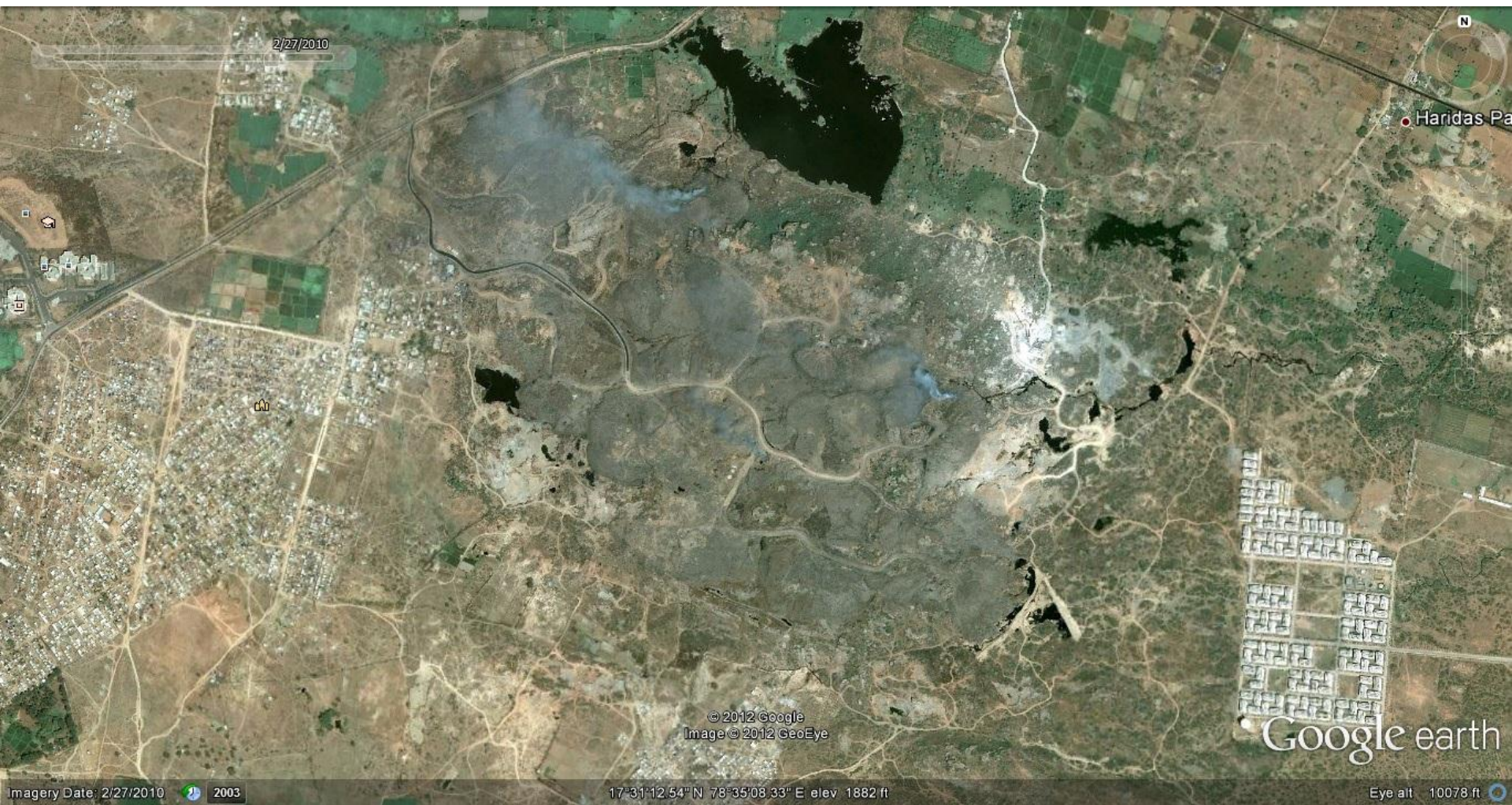
WTERT's Facebook Page



May, 2008

Hyderabad, India - Jawaharnagar

WTERT's Facebook Page



February, 2010

Hyderabad, India - Jawaharnagar

WTERT's Facebook Page



May, 2010

Hyderabad, India - Jawaharnagar

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April, 2011

Hyderabad, India - Jawaharnagar

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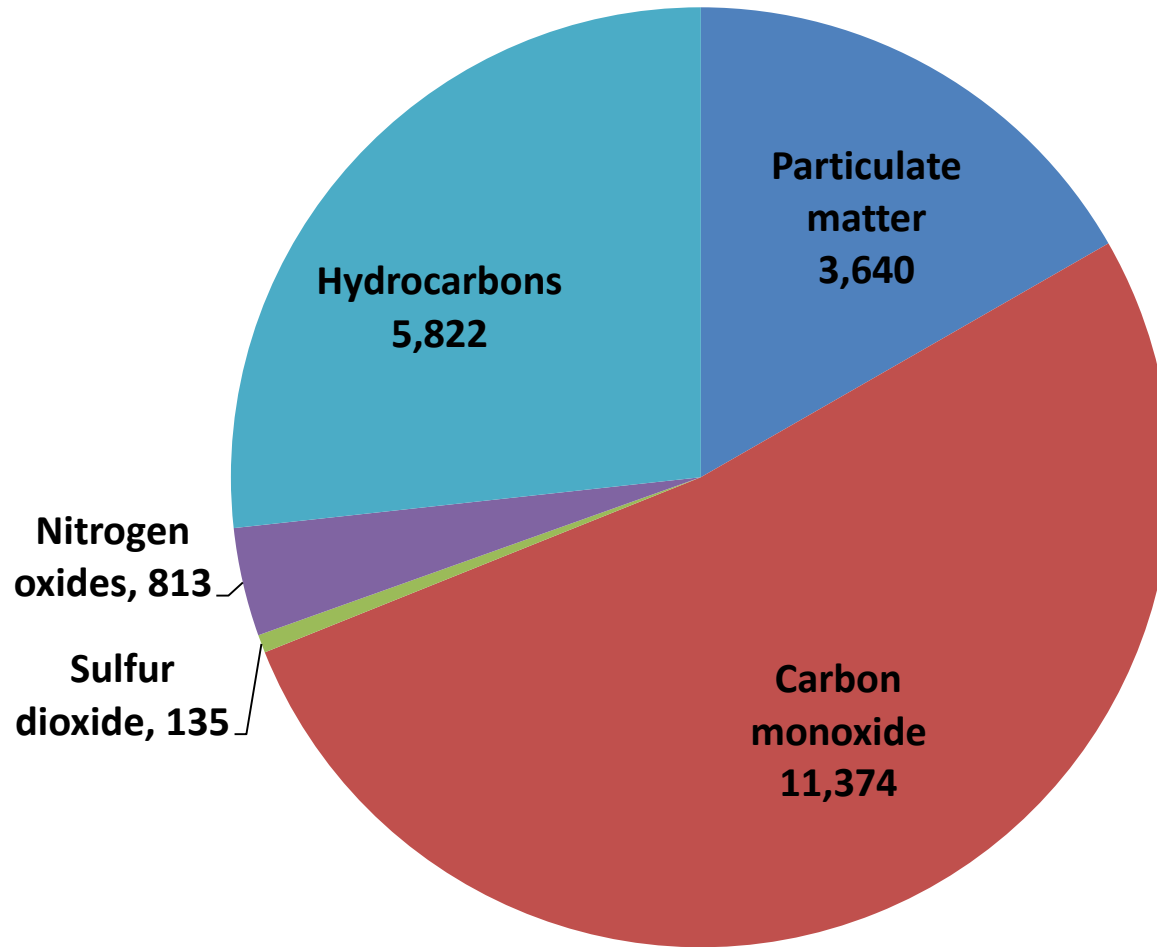


Hyderabad, India - Jawaharnagar

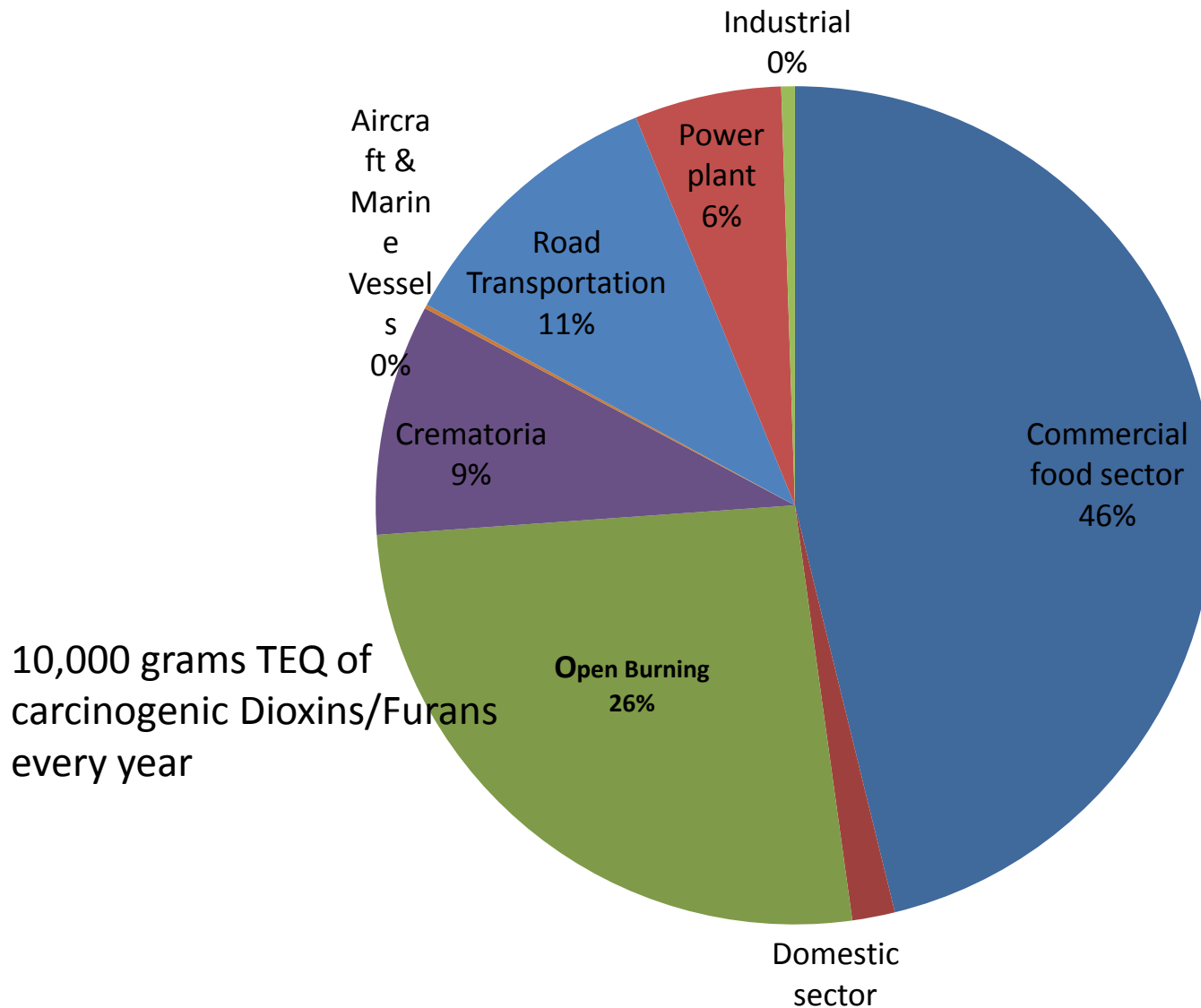
WTERT's Facebook Page

January, 2012

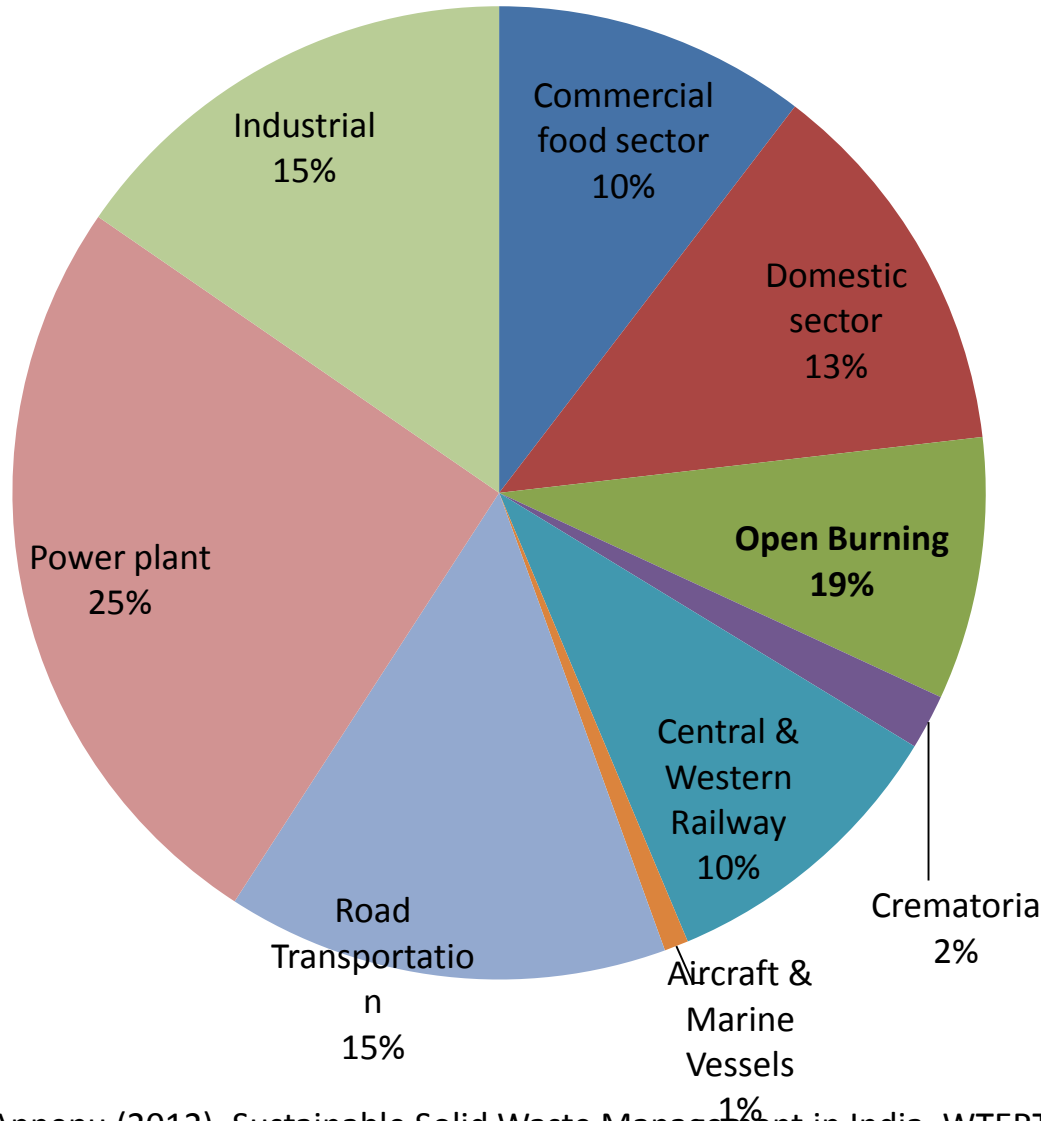
Emissions from Open Burning and Landfill Fires in Mumbai, Tons per year



Comparison of Hydrocarbons Emissions in Mumbai



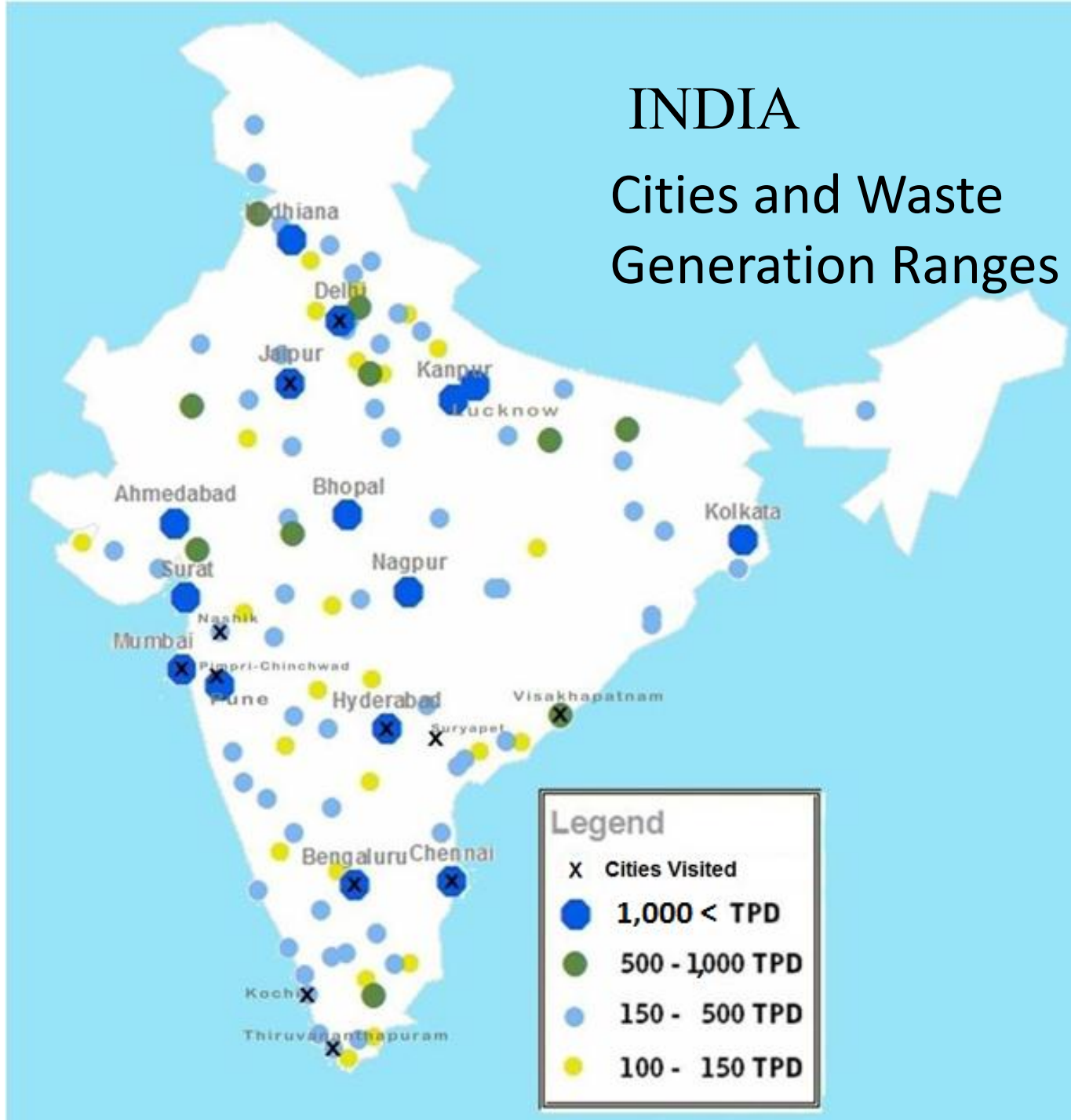
Comparison of **Carbon Monoxide, Hydrocarbons** and **Particulate Matter** Emissions in Mumbai (only)



- Emissions into the lower atmosphere
- 10,000 gTEQ/year of dioxins and furans
- The only non-contributor to the city's economic growth

INDIA

Cities and Waste Generation Ranges



Cities generating above 150 TPD

City	TPD						
Kolkata	11,520	Durg-Bhilainagar	698	Gorakhpur	426	Udaipur	252
Mumbai	11,124	Vijayawada	688	Ajmer	409	Siliguri	249
Delhi	11,040	Ghaziabad	686	Mangalore	405	Dehradun	247
Chennai	6,118	Amritsar	679	Jabalpur	380	Guwahati	246
Hyderabad	4,923	Aurangabad	671	Bikaner	361	Bellary	241
Bengaluru	3,344	Faridabad	667	Bhubaneswar	356	Raurkela	240
Pune	2,602	Kota	653	Nashik	329	Ujjain	239
Ahmadabad	2,518	Kalyan-Dombivali	642	Gulbarga	326	Thrissur	230
Kanpur	1,756	Dhanbad	625	Ranchi	325	Firozabad	229
Surat	1,734	Vadodara	606	Rajkot	317	Rajahmundry	227
Kochi	1,366	Hubli-Dharwad	602	Erode	316	Nanded	227
Jaipur	1,362	Mysore	552	Raipur	316	Amravati	226
Coimbatore	1,253	Madurai	543	Tirunelveli	313	Gaya	226
Visakhapatnam	1,194	Pimpri Chinchwad	541	Tiruvananthapuram	308	Malegaon	216
Ludhiana	1,115	Thiruchirapalli	537	Saharanpur	307	Alappuzha	214
Agra	1,021	Jammu	534	Nellore	301	Patiala	213
Patna	945	Jalandhar	529	Belgaum	301	Kurnool	212
Bhopal	877	Solapur	526	Guntur	299	Akola	211
Indore	867	Jamshedpur	515	Bilaspur	297	Kakinada	211
Allahabad	815	Salem	504	Vellore	292	Jalgaon	208
Meerut	804	Chandigarh	486	Kolhapur	292	Shimoga	206
Nagpur	801	Bareilly	474	Kollam	289	Bhatpara	203
Jodhpur	788	Bhiwandi	467	Jamnagar	289	Shahjahanpur	201
Lucknow	743	Warangal	457	Sangli	288	Panipat	200
Thane	740	Gwalior	456	Bokaro	263	Sagar	195
Srinagar	713	Aligarh	451	Cuttack	262	Bijapur	190
Asansol	706	Pondicherry	449	Durgapur	260	Tumkur	188
Varanasi	706	Tiruppur	441	Jhansi	259	Bhagalpur	185
		Moradabad	436	Bhavnagar	254	Muzaffarnagar	185
		Kozhikode	429	Ulhasnagar	254	Khammam	184
						Thoothukkudi	183
						Latur	182
						Dhule	180
						Maheshtala	179
						Yamunanagar	178
						Bhadravati	175
						Mathura	170
						Korba	165
						Nizamabad	164
						Karimnagar	164
						Ahmadnagar	162
						Brahmapur	162
						Panihati	161
						Muzaffarpur	161
						Noida	161
						Gurgaon	157
						Tirupati	157
						Nagercoil	156
						Farrukhabad	155
						Rohtak	154
						Rajpur Sonarpur	153
						Chandrapur	153
						Ichalkarnji	151
						Bardhaman	150
						Ramagundam	149
						Dindigul	149
						Junagadh	149
						Rampur	148
						Bhilwara	148
						Alwar	145

Land Required for Waste Disposal

Year	Area of Land Occupied/Required for MSW Disposal (sq.km)	City Equivalents
1947 - 2001	240	50% of Mumbai
1947 - 2011	380	90% of Chennai
1947 - 2021	590	Hyderabad
2009 - 2047	1,400	Hyderabad + Mumbai + Chennai

City Size

City	Population
Mumbai	20 million
Chennai	6.5 million
Hyderabad	5.8 million
TOTAL	32.2 million





KV6
XIS

GHMC

GHMC

AP15
08239

“But now, there are too many street dogs in India...”

- animalcruelty-india.blogspot.com

**11,000 deaths from rabies
due to stray dog bites
per year -**

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2244675/>

apagemedia.com

Quality of Life = Expectations vs Reality



The 3 Incidents

- Kolkata (**Calcutta**)
 - Dengue fever outbreak
- Bengaluru (**Bangalore**)
 - Public protests and subsequent closure of the landfill
 - Municipal commissioner was changed
- Thiruvananthapuram (**Trivandrum**)
 - Above 2,000 police had to accompany a waste management company's truck
 - Blocked the truck by sleeping on the road

Right to clean environment & fight for a greater
quality of life



**WTER
INDIA**

For sustainable waste management in India

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1st International Brainstorming Workshop on Waste to Energy in India: 24th-25th August 2012
This is the first major outcome of WTER India. ...more

WTER – Greece successfully completed "Sustainable Waste Management: A Workshop on Principles and Practice"
The 1st International Intensive Course entitledmore

Under Construction



Latest Publication

[What a Waste – A Global Review of Solid Waste Management](#)

This report estimates that today these amounts have increased to about 3 billion residents generating 1.2 kg per person per day (1.3 billion tonnes per year). By 2025 this will likely increase to 4.3 billion urban residents generating about 1.42 ... [Continue reading →](#)

[More Publications...](#)



Upcoming Events!

No events to show



Latest Discussion

Under Construction

Theme Areas for the 1st Brainstorming Workshop

- Material Recovery from Municipal Solid Waste
 - a. Avenues for increasing material recovery for recycling
 - b. Beneficial use of WTE bottom ash
 - c. Landfill mining and remediation
- Energy Recovery from Municipal Solid Waste
 - a. Waste as a source of renewable energy
 - b. Biogas technologies for households, markets and large institutions
 - c. Landfill mining, landfill gas recover and landfill remediation
- Waste-to-Energy Research and Development
 - a. Adapting WTE technologies for India
 - b. Merits & Demerits of various other Thermal processes and their current state of operation & development
 - c. State of the art Flue-gas cleaning and monitoring systems
 - d. Effect of MSW size distribution and grate design on the combustion capacity of WTE Units
 - e. Prevention of corrosion in WTE units
- Understanding the Market in India
 - a. Waste-to-Energy Market and Financing in India
 - b. WTE project failures around the world
 - c. Policy interventions required to make WTE viable
 - d. Legislation Framework in India for Waste Management and Improving Proposals
 - e. Policy on WTE technologies worldwide with special focus on India
 - f. Emissions regulatory system in India
- Role of GIS in waste management
- Challenges Faced by Waste Management Industry in India
 - a. Municipal expectations from the Waste Management Industry
- Innovation in Solid Waste Management for the Developing World
- Panel Discussion on Public Awareness of Waste-to-Energy

Academia

- Most research is on biological technologies
 - As a result, small scale biogas is successful in India
 - It provides relief
 - Does not provide a solution
- Not well funded
- Not directly applicable
- Aware of the current waste crisis and that it will only worsen...

Industry

- Inflow of players from various sectors
- Very enthusiastic about WTE
 - India has 1 WTE plant now
 - Expecting 10 plants in the next 3 years
- They found a medium for communication for the first time
- Cut throat competition for tenders
 - Results in bad projects
 - Take the industry backwards

Municipal Authorities

- Major complaint: NO land
- A magic solution is around the corner
 - They mean Pyrolysis
- Waste is “wealth” (!\$\$\$\$!)
- Cannot share risk,
 - but will take profits (Royalty)
- Lack of human resources to manage tenders and contracts

Points everyone agreed upon

- Current status of waste management is abysmal
- Public is being severely effected
- Integrated waste management should be the goal

WTER-India

- 2nd Brainstorming Workshop, within six months from the first
- Held in National Capital – Delhi
- Targeting policy makers and municipal authorities
- **“Short, Medium and Long Term Solutions to Solid Waste Management in Indian Cities”**
- Biggest impediment: Confusion on technologies, timelines, and priorities.

Objectives

- Policy change
- Through the education of officials
- Using workshops, media, and research

Current Status

- Community of Practitioners (COP)
- Corpus fund for the next 3 years
- Founding partners

Global WTER* Council

- Advancing Sustainable Waste Management around the world

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[Brazil](#) [Canada](#) [China](#) [Germany](#) [Greece](#) [India](#) [Italy](#) [Japan](#) [UK](#) [USA](#)

TUESDAY, OCTOBER 16, 2012

Advice to Thiruvananthapuram might not help alleviate the city's looming solid waste crisis

This post is a response to an article published by FirstPost.com with the title "[Thiruvananthapuram sinks in its own waste as rulers look for shortcuts](#)" on October 16, 2012.

This critique is not about the conceptual or factual validity of the article but it is to distinguish between the short-term and long-term priorities and solutions for the city. In the absence of such a distinction, various stakeholders with the same goal of solving the crisis and with correct models will end up debating ideals and fighting within each other, finally doing no good to the city.

While depicting the situation as:



Public protests - The Hindu

When the residents of Vilappilsaala said "no more garbage" to their neighbourhood, the corporation, which is used to an archaic collect-transport-dump routine, didn't know what to do. They just stopped garbage

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Waste-to-Energy Research and Technology Council (WTER)



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swmIndia.blogspot.com

SUSTAINABLE SOLID WASTE MANAGEMENT IN INDIA

Link to the entire report is provided below this picture

EARTH ENGINEERING CENTER (EEC)
WASTE-TO-ENERGY RESEARCH & TECHNOLOGY COUNCIL (WTERT)
COLUMBIA UNIVERSITY