



# GOVERNMENT OF PUDUCHERRY DEPARTMENT OF SCIENCE, TECHNOLOGY & ENVIRONMENT PUDUCHERRY CLIMATE CHANGE CELL

AWARENESS WEBINAR FOR STUDENTS AND GENERAL PUBLIC


## “GREEN DEEDS & HABITS FOR SUSTAINABLE ENVIRONMENT”

22.07.2020

PRESENTED BY  
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JUNIOR RESEARCH FELLOW, PCCC



# INTRODUCTION

- The campaign on Green Good Deeds was launched by the Union Minister for Environment, Forest and Climate Change, Dr. Harsh Vardhan on January, 2018.
  - The main objective is taking forward the Green Good Deeds to the school students by various environment awareness programmes.
  - It is a platform that every individual can perform in their day-to-day life towards preserving and protecting the environment.
- 



# THEMES

- EFFICIENT WASTE MANAGEMENT
  - ENERGY CONSERVATION AND PROMOTING RENEWABLE ENERGY
  - CONTROL POLLUTION (AIR, WATER, NOISE, SOIL, LAND)
  - BIODIVERSITY CONSERVATION
  - RESOURCE EFFICIENT PRACTISES
  - SUSTAINABLE WATER CONSUMPTION
  - PLANTATION & GREENING
  - HEALTHY HABITS
- 

# 1. EFFICIENT WASTE MANAGEMENT

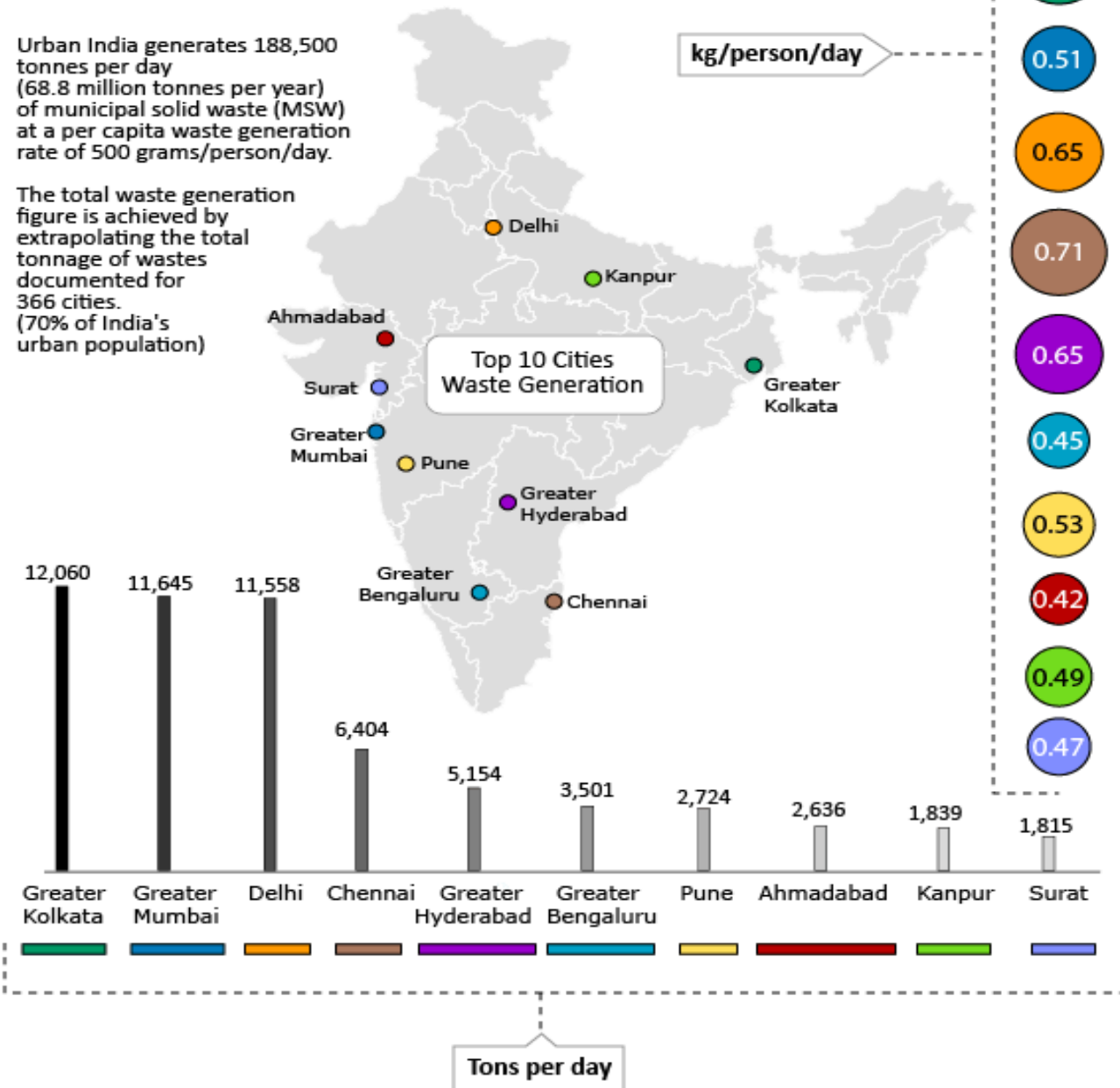




# Municipal Solid Waste Generation Quantity in Indian Cities

Urban India generates 188,500 tonnes per day (68.8 million tonnes per year) of municipal solid waste (MSW) at a per capita waste generation rate of 500 grams/person/day.

The total waste generation figure is achieved by extrapolating the total tonnage of wastes documented for 366 cities. (70% of India's urban population)

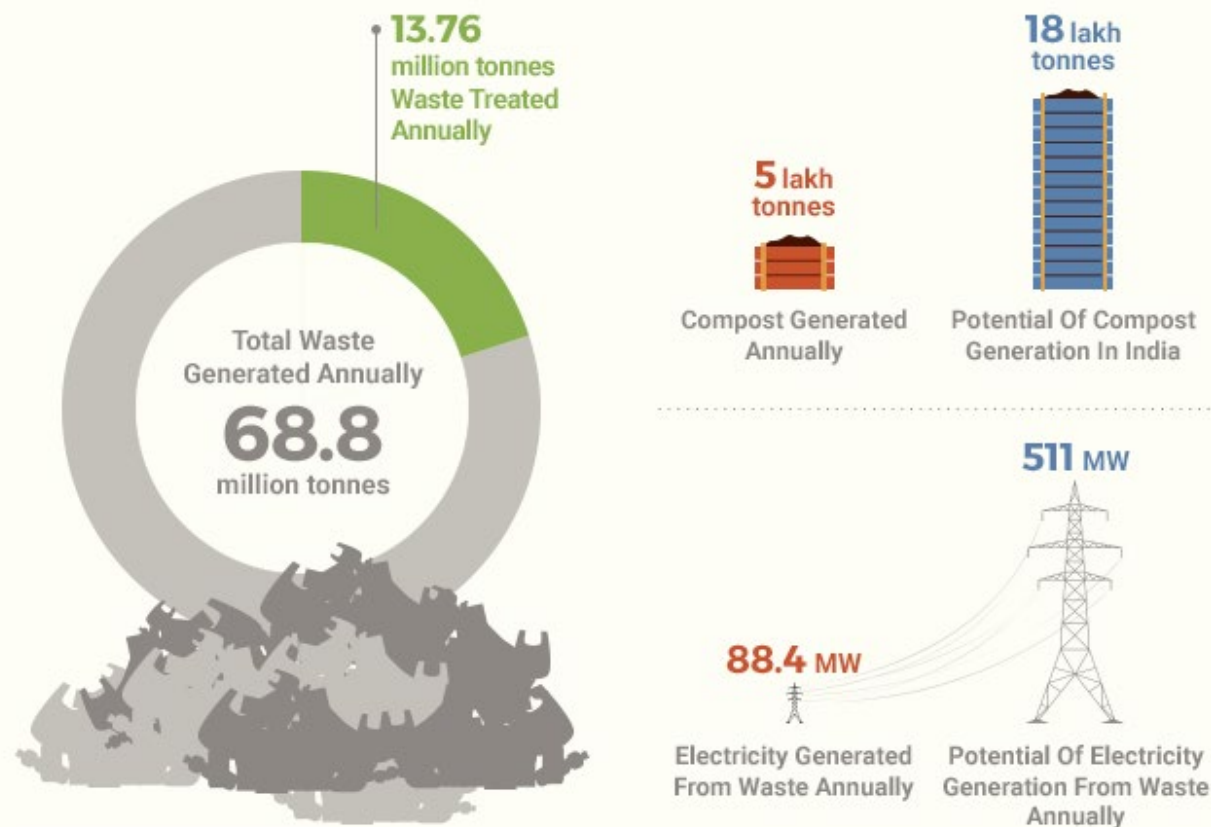


- India is the world's 3rd largest garbage generator
- Urban India generates 68 million tonnes of waste (MSW) annually, and it has been predicted that this will reach 165 million tonnes in 2030 and by 2050 waste is expected to rise to 436 million tons up
- 2/3<sup>rd</sup> is food waste
- Total solid waste generation in the Union Territory is about **599.25 TPD** (\* as per CPCB 2018-19 report)





# WASTE GENERATION IN URBAN INDIA



Source: Central Pollution Control Board



# HAZARDS CAUSED BY WASTE

## “LANDFILL LEACHATE”

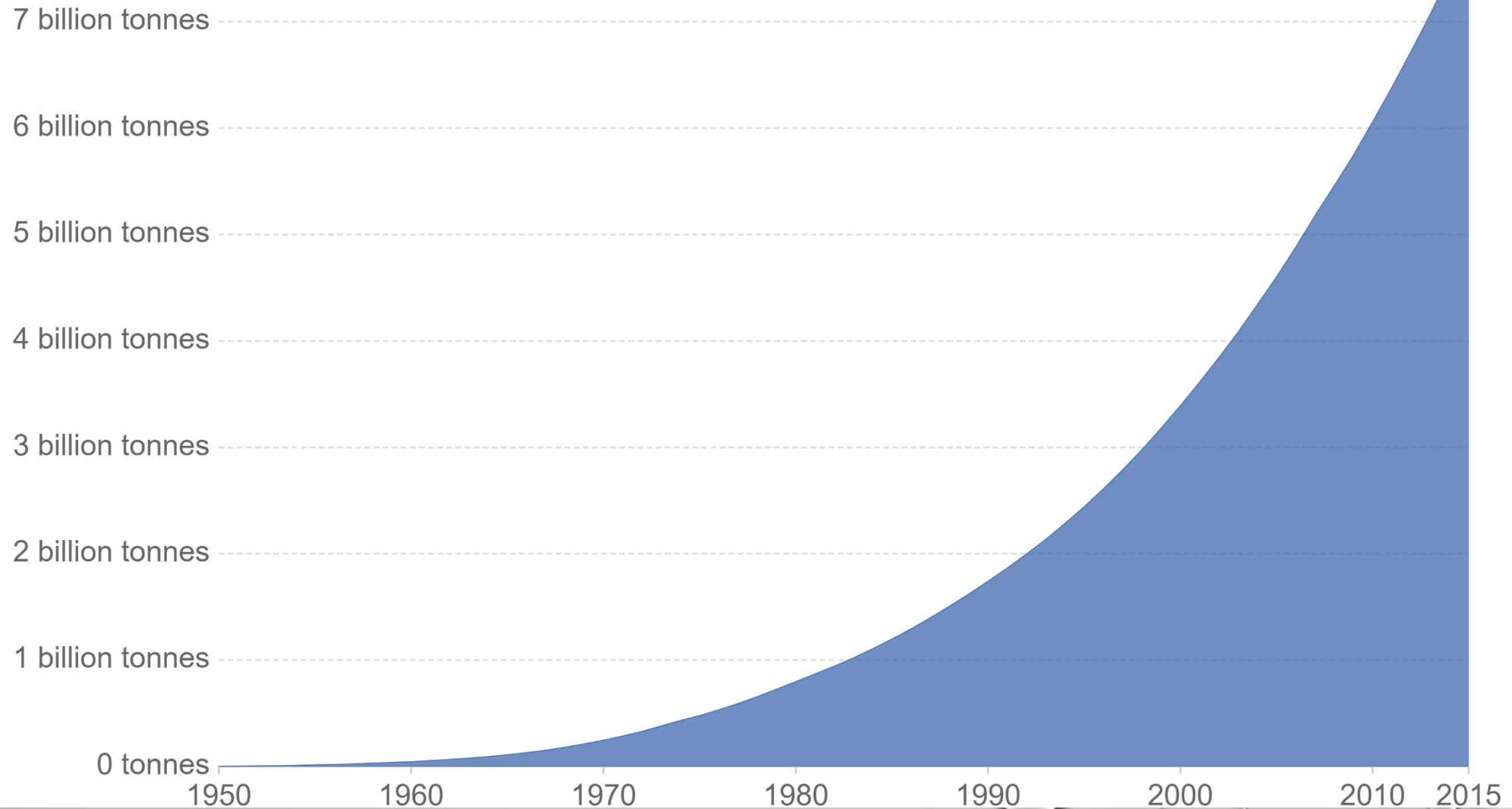
- Poisonous liquid can seep into groundwater and streams
- Causes health problems like diarrhoea, cancer and birth defect



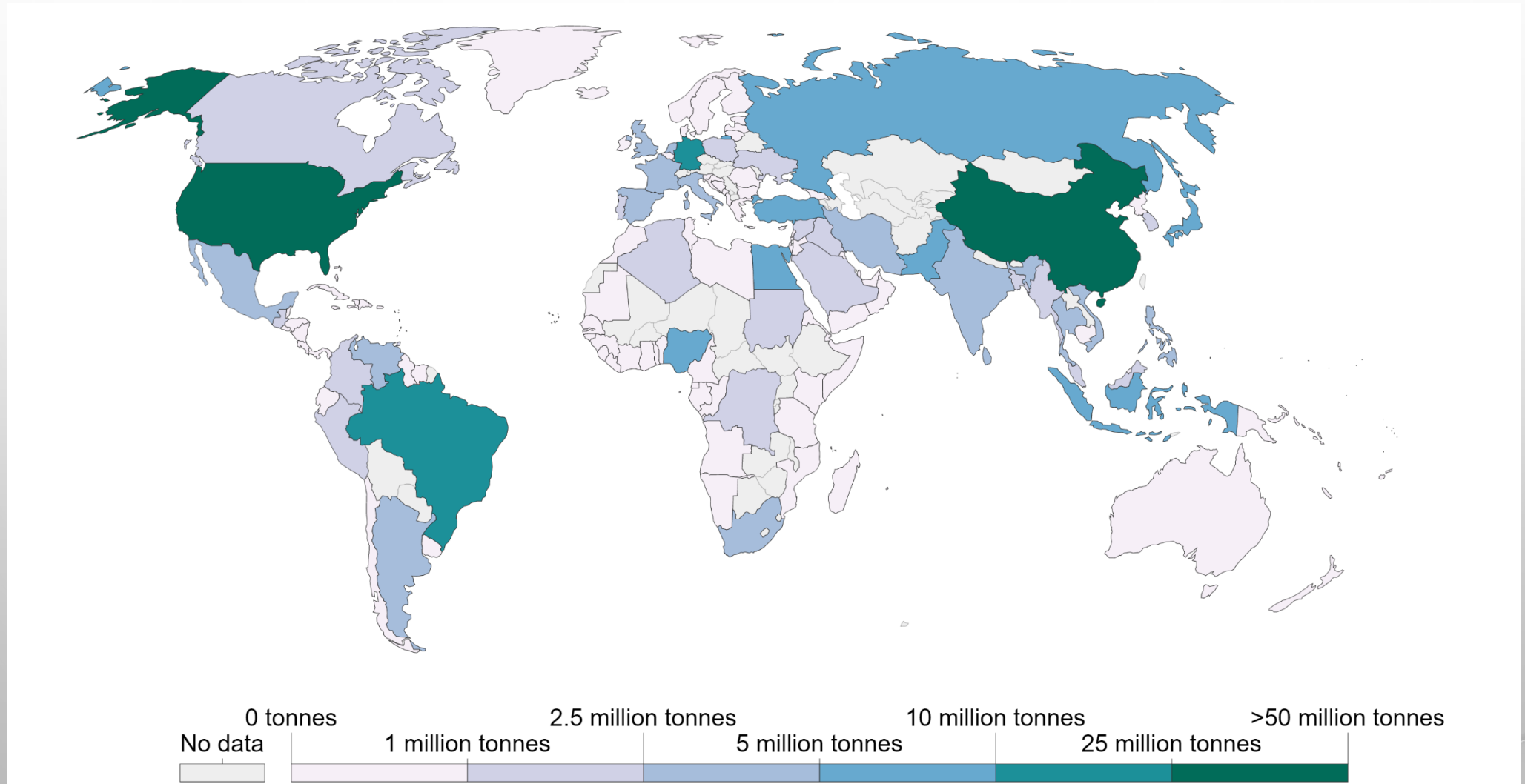
# PLASTIC POLLUTION



# GLOBAL PLASTIC PRODUCTION 1950-2015



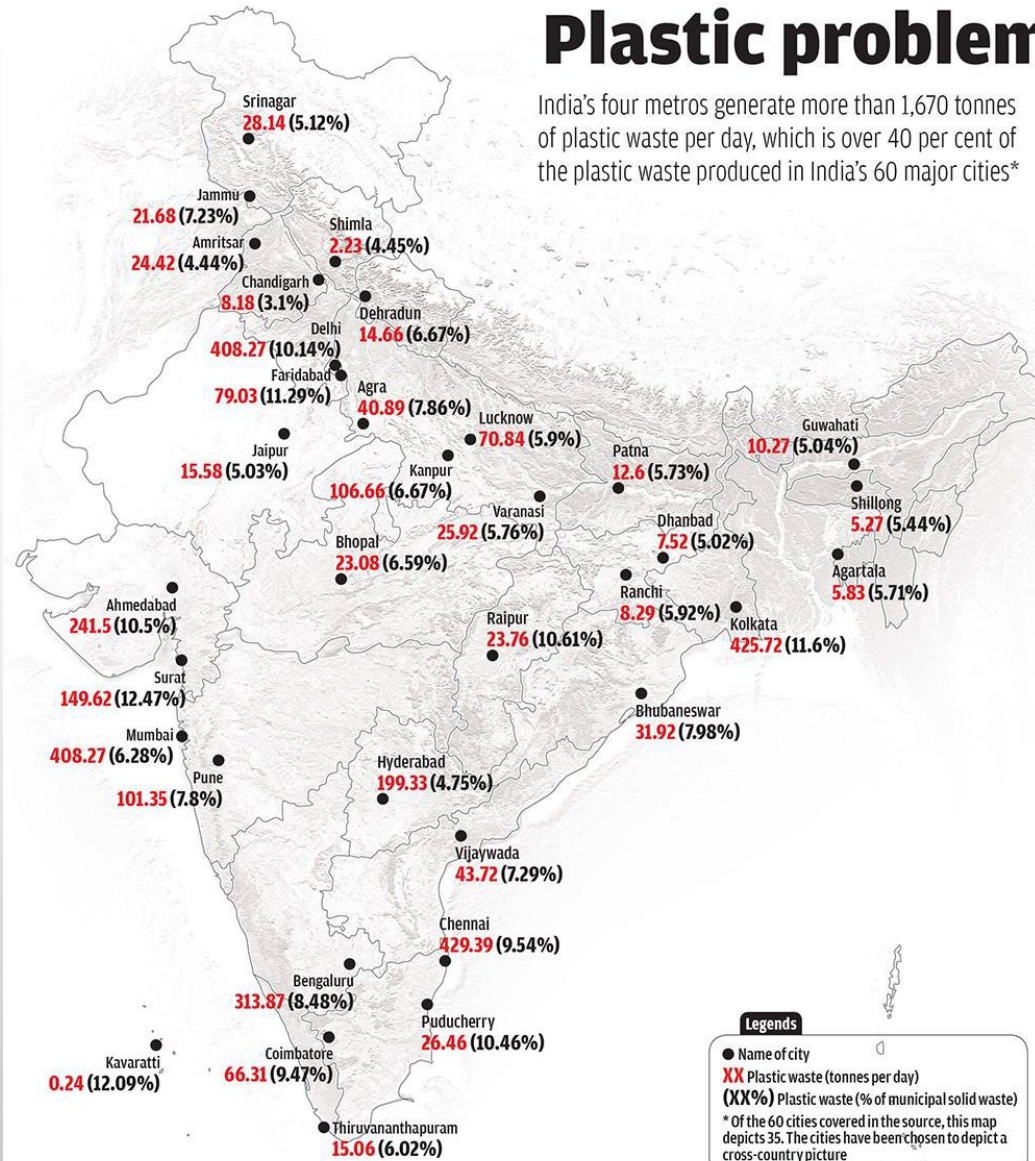
# PLASTIC WASTE GENERATION





# Plastic problem

India's four metros generate more than 1,670 tonnes of plastic waste per day, which is over 40 per cent of the plastic waste produced in India's 60 major cities\*



Average plastic waste generation in India (tonnes per day)

**4,059.18**

Average plastic waste share in municipal solid waste in India

**6.92%**

## Legends

- Name of city
  - XX Plastic waste (tonnes per day)
  - (XX%) Plastic waste (% of municipal solid waste)
- \* Of the 60 cities covered in the source, this map depicts 35. The cities have been chosen to depict a cross-country picture



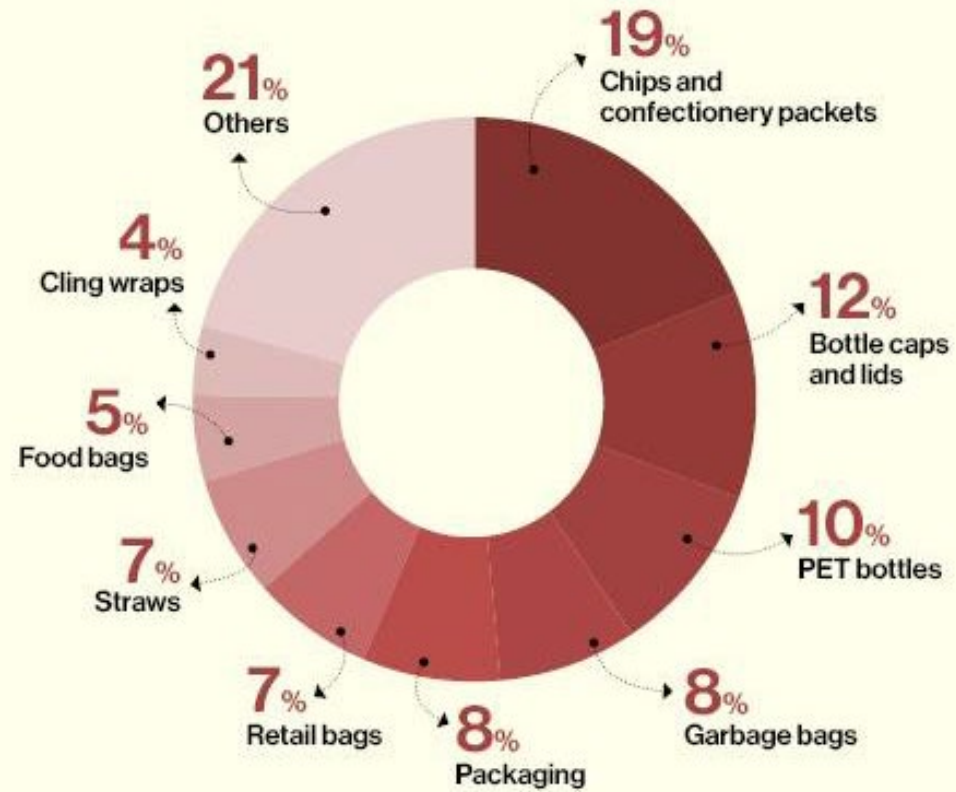
Prepared by DTE/CSE Data Centre  
Infographics: Raj Kumar Singh

Analysis: Snigdha Das

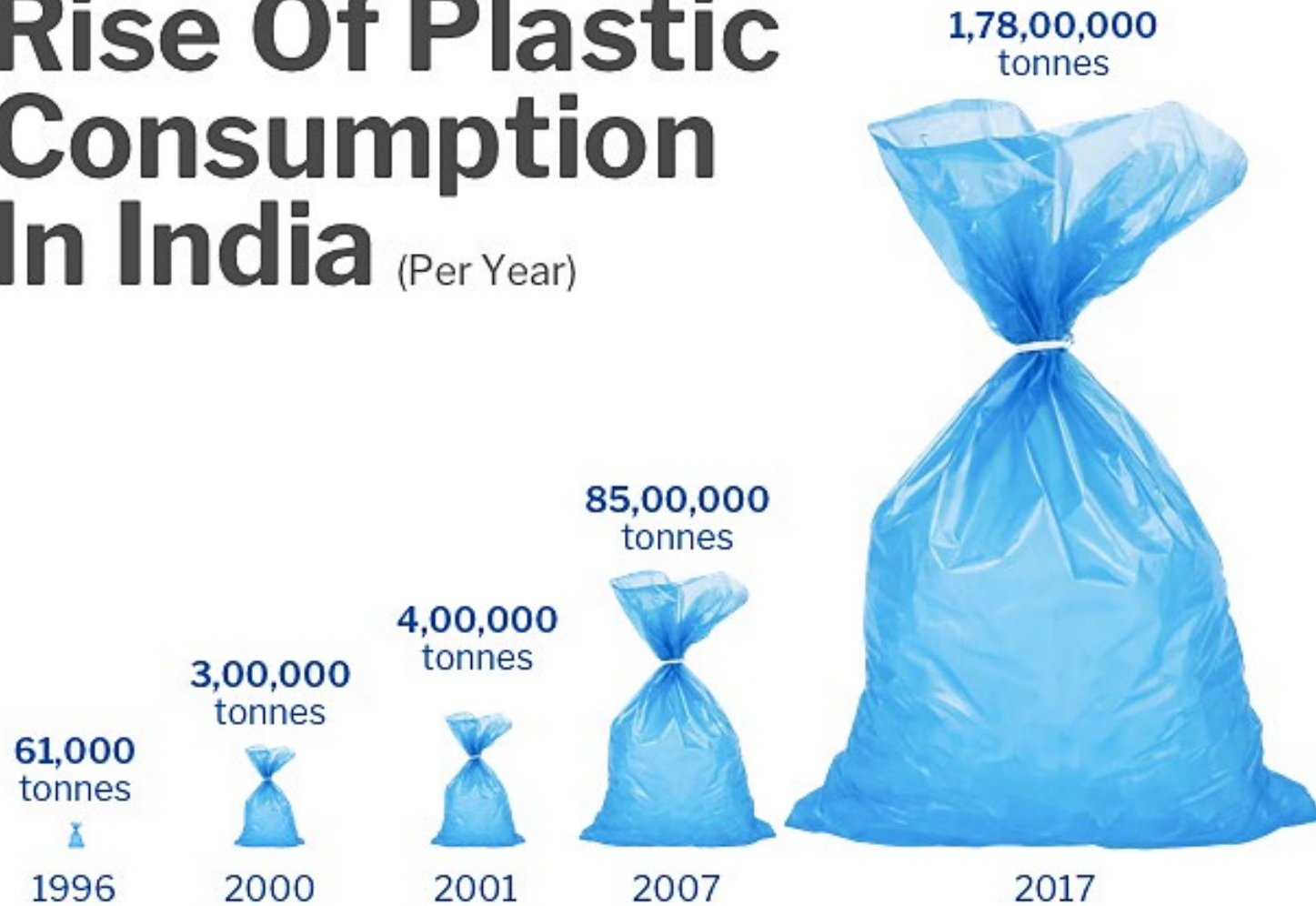
Source: Consolidated Guidelines for Segregation, Collection and Disposal of Plastic Waste, CPCB, September 2017

For more such infographics visit: [www.downtoearth.org.in/infographics](http://www.downtoearth.org.in/infographics)

## PLASTIC WASTE GENERATED IN INDIA



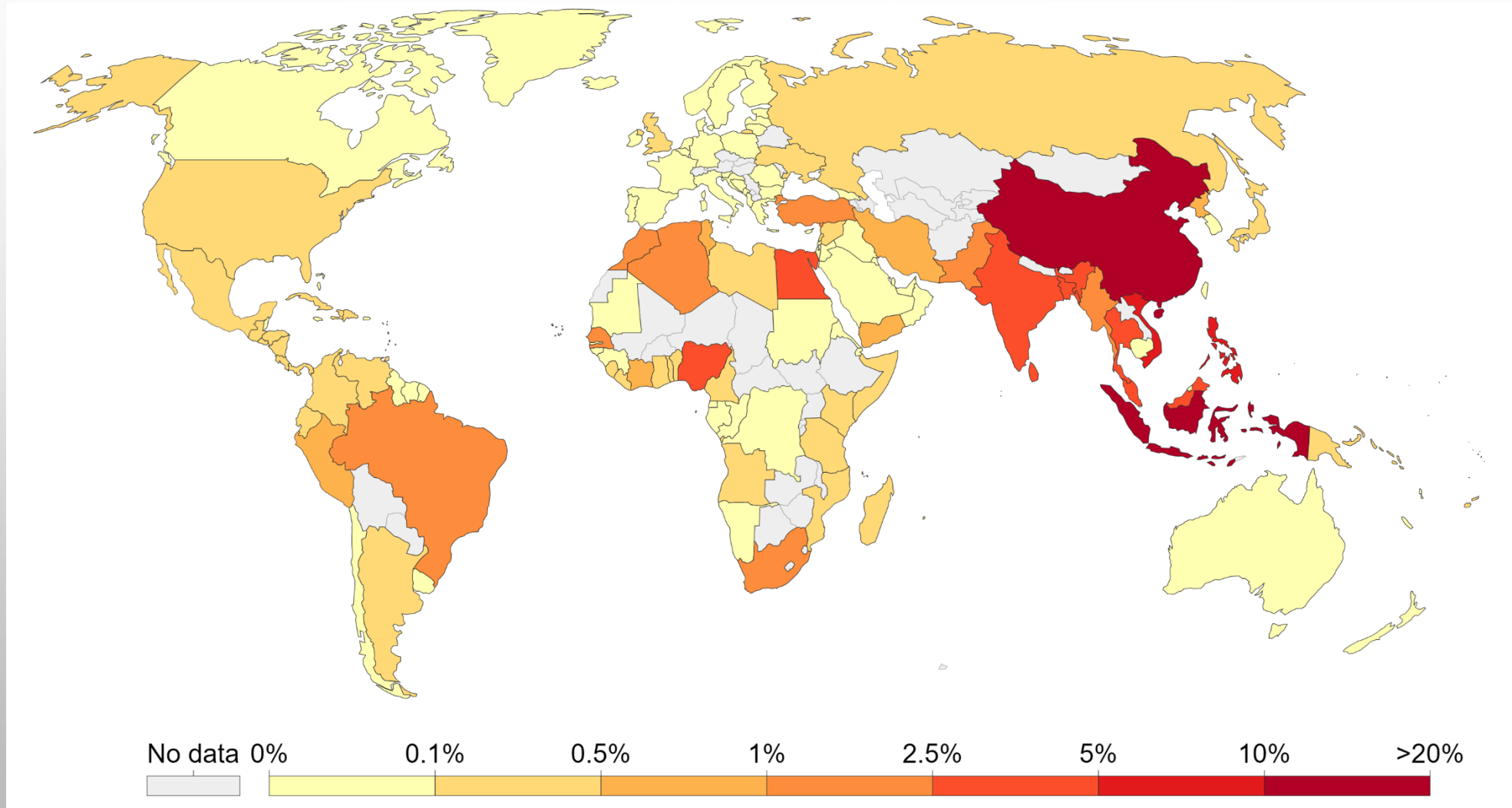
# Rise Of Plastic Consumption In India (Per Year)



Source: Central Pollution Control Board

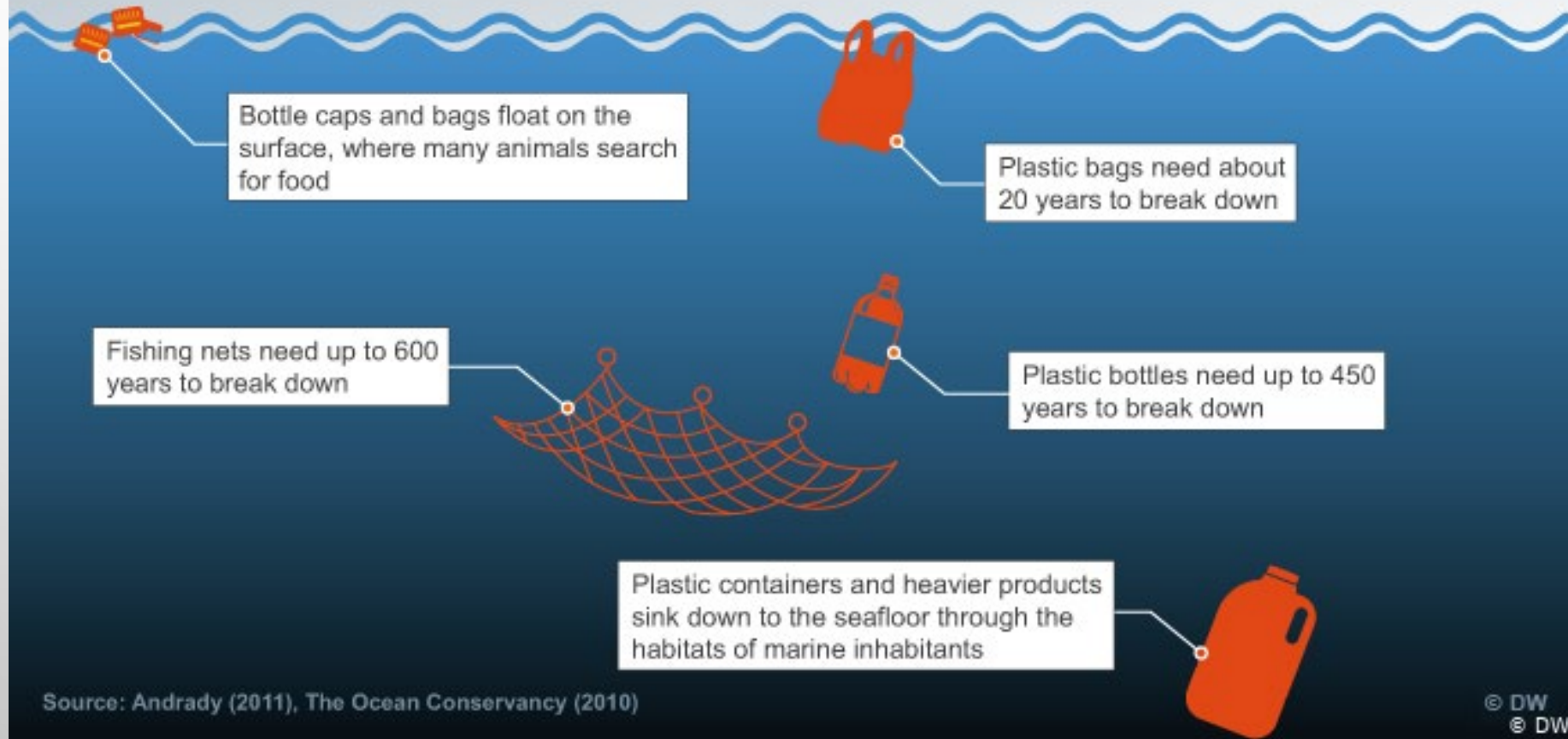
[www.cpcb.gov.in](http://www.cpcb.gov.in)

# PROJECTED 'MISMANAGED' PLASTIC IN 2025

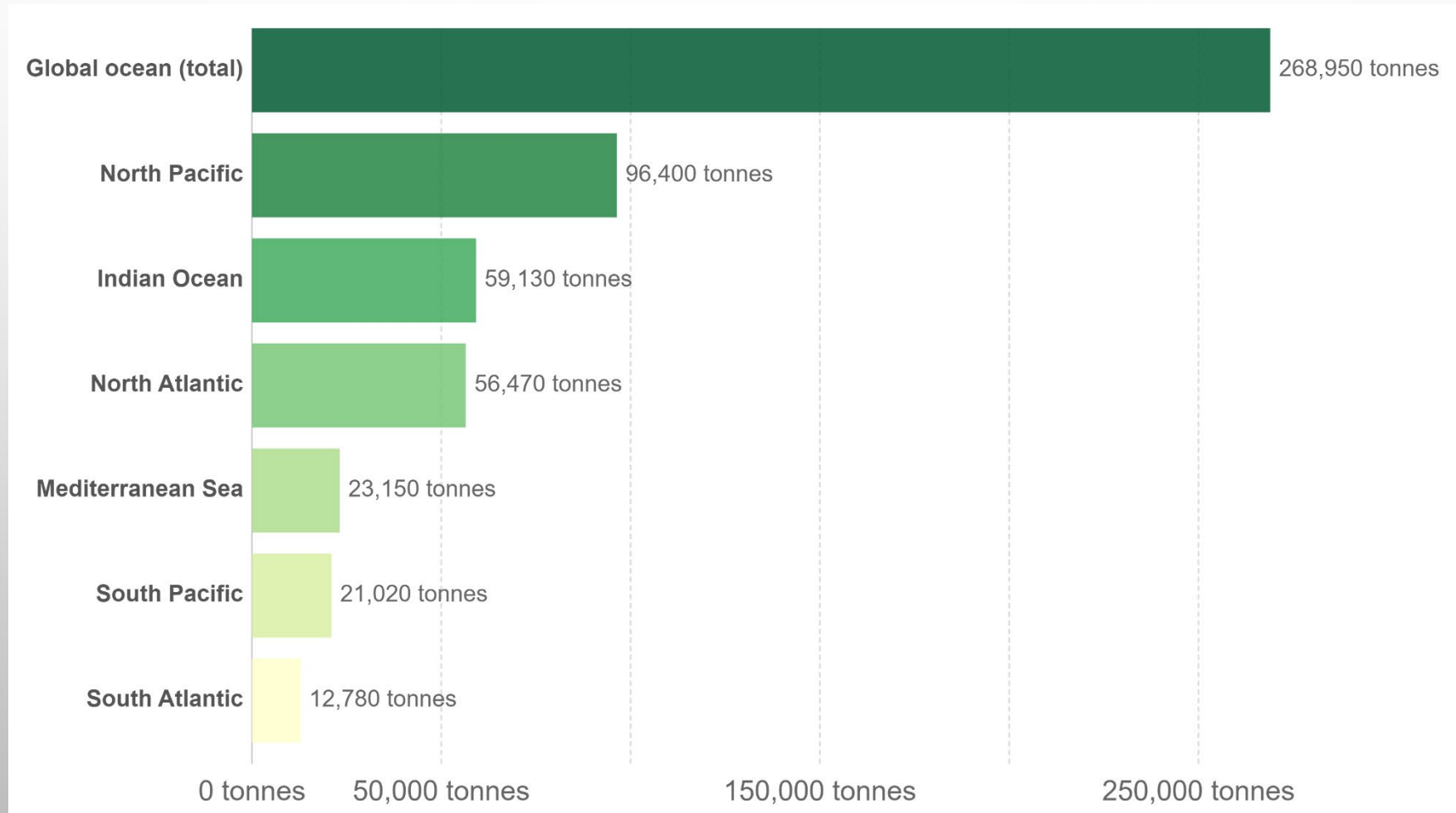




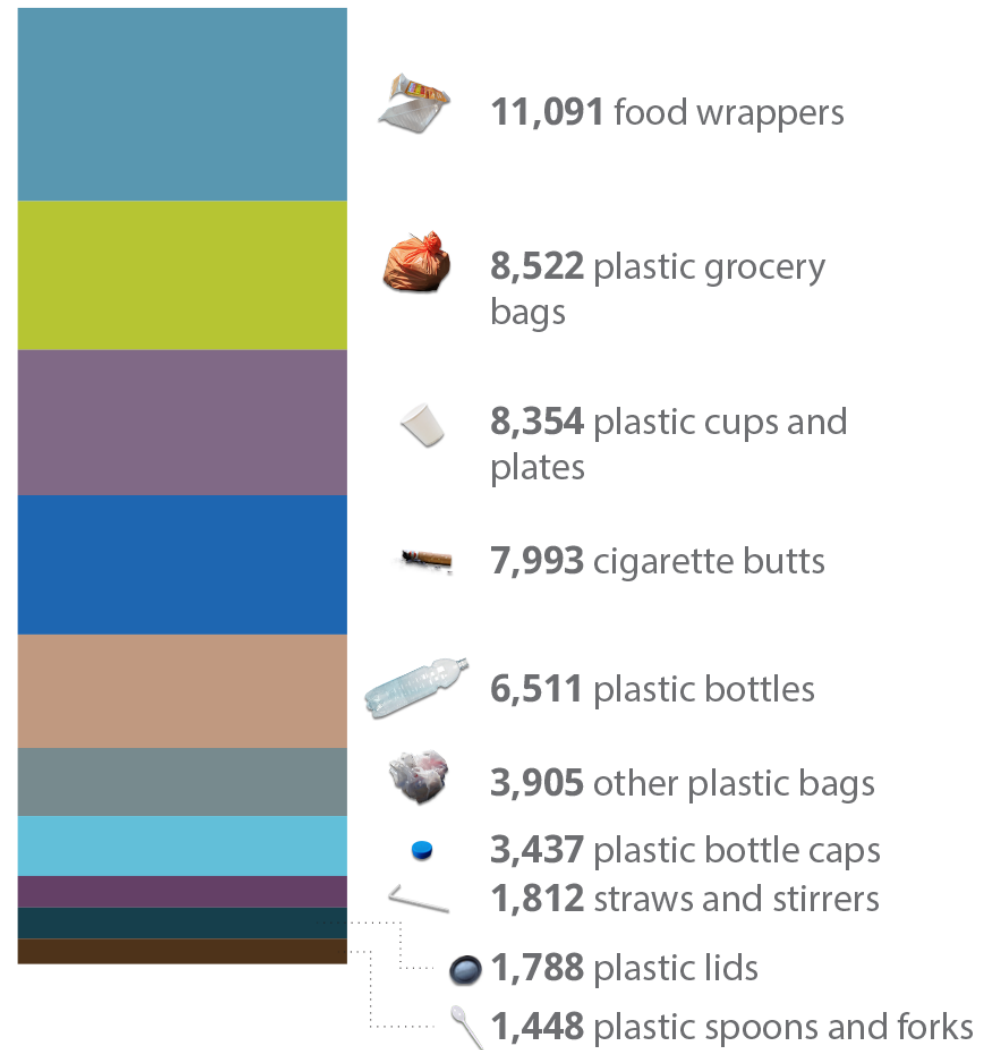
## How long does plastic remain in the ocean?



# PLASTIC IN TONS IN EACH OCEAN: Indian Ocean (2<sup>nd</sup> most)



## The top 10 items found along 387 km of Indian coastline, in 2018





# 9 TIPS FOR LIVING WITH LESS PLASTIC



1

Bring your own shopping bag



2

Carry a reusable water bottle



3

Bring your own cup



4

Pack your lunch in reusable containers



5

Say no to disposable straws & cutlery



6

Skip the plastic produce bags



7

Slow down and dine in



8

Store leftovers in glass jars



9

Share these tips with your friends

LESS  
PLASTIC.

[WWW.LESSPLASTIC.CO.UK](http://WWW.LESSPLASTIC.CO.UK)

# PLASTIC BAN IN PUDUCHERRY

- The Govt. Of Puducherry has banned the use of single use plastics including plastic bags from 2<sup>nd</sup> August, 2019.



Why use Jute Bags / products



**புதுவை அரசு**  
**அறிவியல், தொழில்நுட்பம் மற்றும் சுற்றுச்சூழல் துறை**  
**புதுச்சேரி மாசுகட்டுப்பாட்டு குழுமம்**



புதுவையில் ஆகஸ்டு, 2ஆம் தேதி முதல் தடை செய்யப்பட்ட பிளாஸ்டிக் பொருட்கள்		புதுவையில் அனுமதிக்கப்பட்ட பிளாஸ்டிக் பொருட்கள்	
பாலித்தின் / பிளாஸ்டிக் / பாலிபிரொப்பலீன் தூக்குப்பைகள்		நெய்யப்படாத பாலிபிரொப்பலீன் பைகள்	
பாலித்தின் / பிளாஸ்டிக் குவளைகள்		பிளாஸ்டிக் பூசப்பட்ட காகித குவளைகள்	தண்ணீர் பாட்டில்
பாலித்தின் / பிளாஸ்டிக் தட்டுகள்			
ஸ்டைரோஃபோம் (தொர்மக்கோல்) தட்டுகள்		தொழிற்சாலைகளில் உற்பத்தி செய்யும் பொருட்களை மூடுவதற்கு பயன்படும் பிளாஸ்டிக் தாள்கள்	
ஸ்டைரோஃபோம் (தொர்மக்கோல்) குவளைகள்			
உணவுப்பொருட்களை கட்ட உபயோகிக்கும் பிளாஸ்டிக் பைகள்		பருப்பு வகைகள், தானியங்கள், மருந்துகள் மற்றும் பால் ஆகியவைகளை விற்பனை செய்ய பயன்படும் பைகள்	
உணவு அருந்தும் மேஜையின் மேல் விரிக்கப்படும் பிளாஸ்டிக் தாள்		பல அடுக்கு பேக்கேஜிங் பொருட்கள்	
நீர் நிரப்ப பயன்படும் பைகள்		ஒட்டும் நெகிழி	
பிளாஸ்டிக் உறிஞ்சு குழல்கள்		திட மற்றும் உயிர் மருத்துவ கழிவு சேகரிக்க பயன்படும் (40x50) செமீ அளவு உள்ள பைகள்	
பிளாஸ்டிக் கொடி		தோட்டக்கலை நாற்றுகளுக்கு பயன்படும் பிளாஸ்டிக் பைகள்/தாள்கள்	
<p>தடை செய்யப்பட்ட பிளாஸ்டிக் பொருட்களை உற்பத்தி செய்வது, பயன்படுத்துவது, விற்பது சுற்றுச்சூழல் பாதுகாப்பு சட்டம் 1986-ன்படி குற்றமாகும். மீறினால் தண்டிக்கப்படுவீர்கள்.</p>			



Don't burn waste. Burning garbage releases smoke and particles that can affect health and cause climate change

Rivers are sacred.  
Flowers, clothes, fruits, decorations, plastics and leftovers shouldn't be dumped in the rivers



Avoid throwing garbage in drains as it leads to clogging



Stop using single use plastic bottles, bags, plates & cutlery etc.,  
Reduce the use of micro plastics



Use appropriate bins for disposal - a blue bin for recyclable waste and a green bin for wet waste





## 2. ENERGY CONSERVATION AND PROMOTING RENEWABLE ENERGY

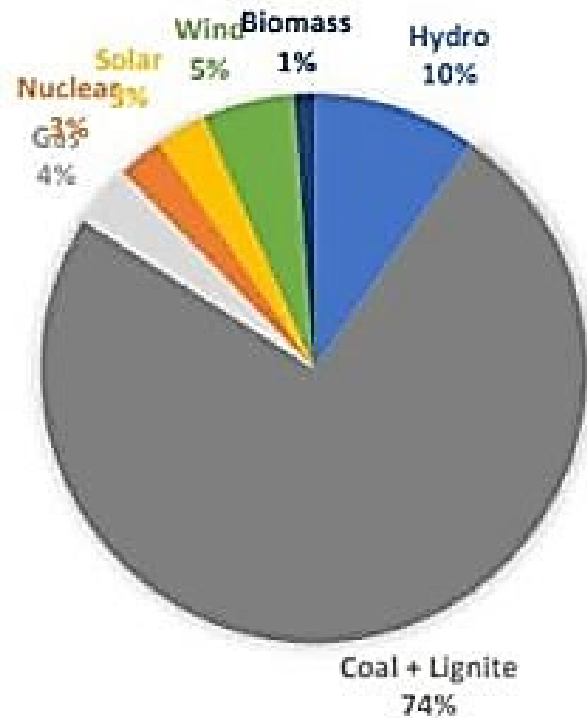


- As on 30.06.2020, the installed capacity of India is 3,71,054.12 MW.
- Of which, Puducherry uses 376.20 MW
- Some 75% of India's electricity is still generated from fossil fuels.
- The power sector is responsible for half of India's CO<sub>2</sub> emissions.

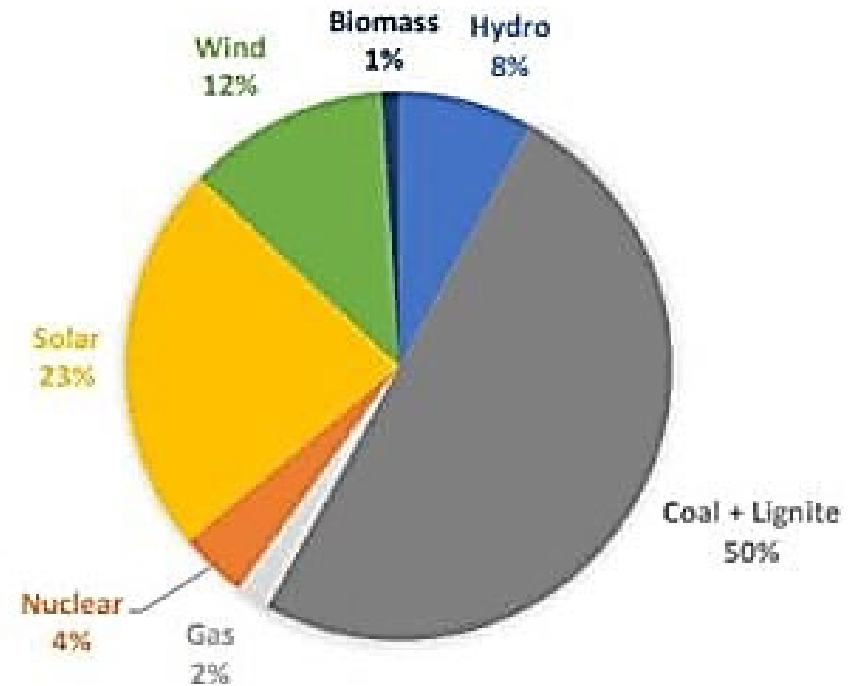


# PRESENT/FUTURE SHARE OF ENERGY

GENERATION 2018/19

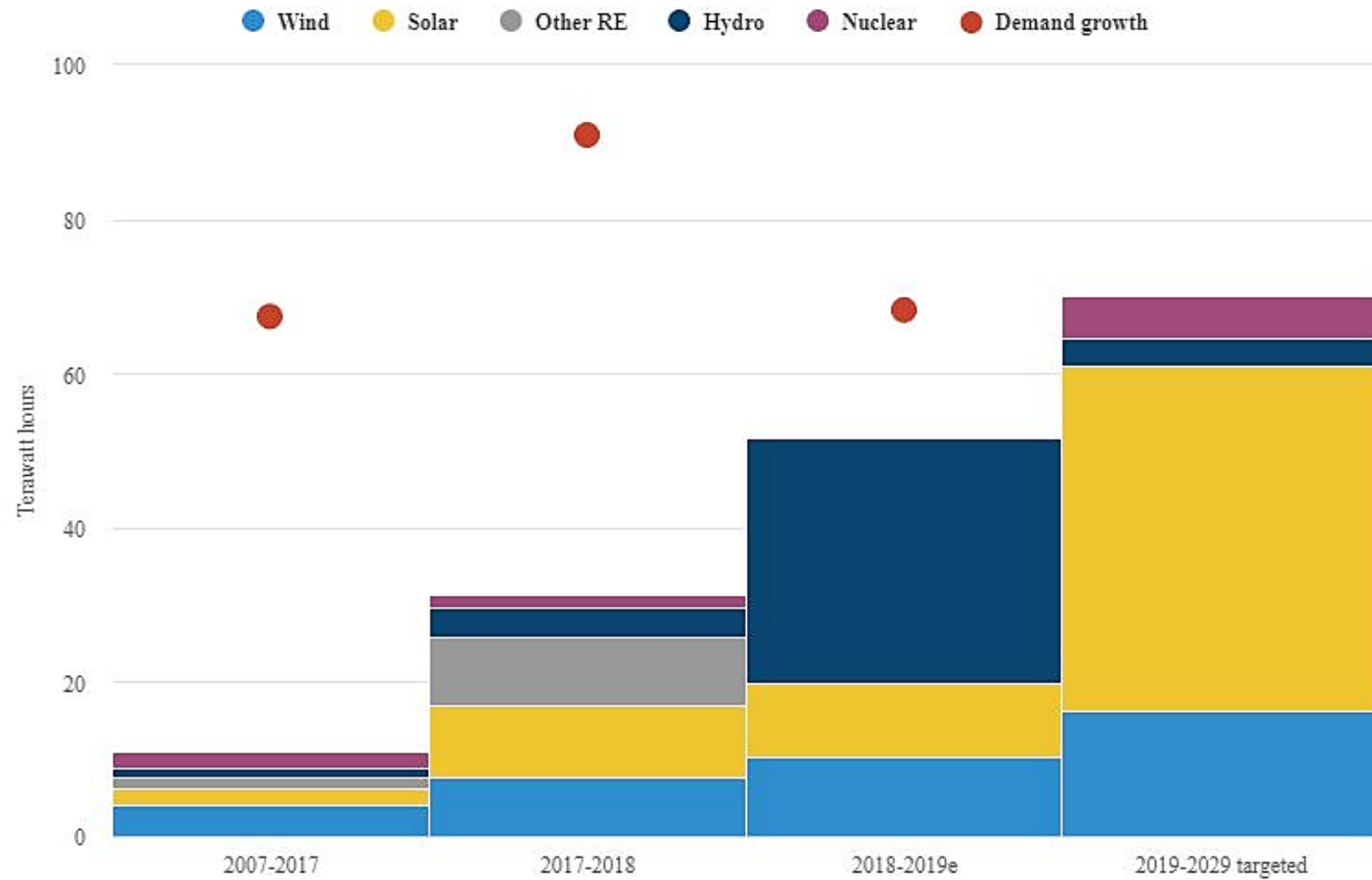


GENERATION 2029/30



## India's new targets could see **rising electricity demand** mostly met by non-fossil sources

In the previous decade, just 20% of incremental demand was met by wind, solar, hydro, nuclear and other renewables





- Asia's largest solar power plant inaugurated on 10.07.2020.
- 750 MW Rewa Solar in Madhya Pradesh
- It will reduce 1.5 million tons of CO<sub>2</sub> emissions per year.
- In 2014, solar power generation was merely 2.5 GW.
- In just 6 years, India's solar generation crossed 37 GW.





Light your places efficiently, use as much natural light as possible.



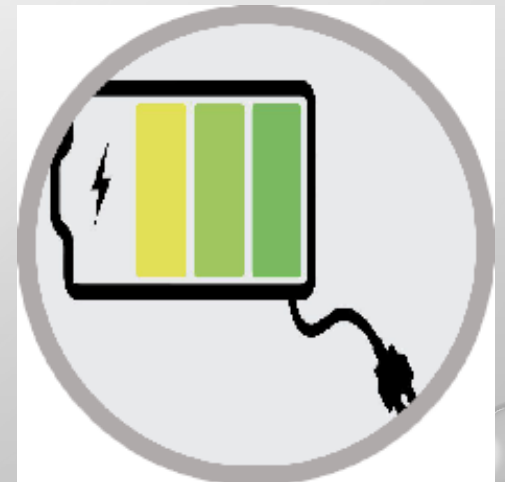
Don't overload your vehicles, overloading means higher fuel consumption



Use energy efficient Electrical appliances



Switch to rechargeable batteries



Switch to LED bulbs, reduce carbon emission

### 3. CONTROL POLLUTION

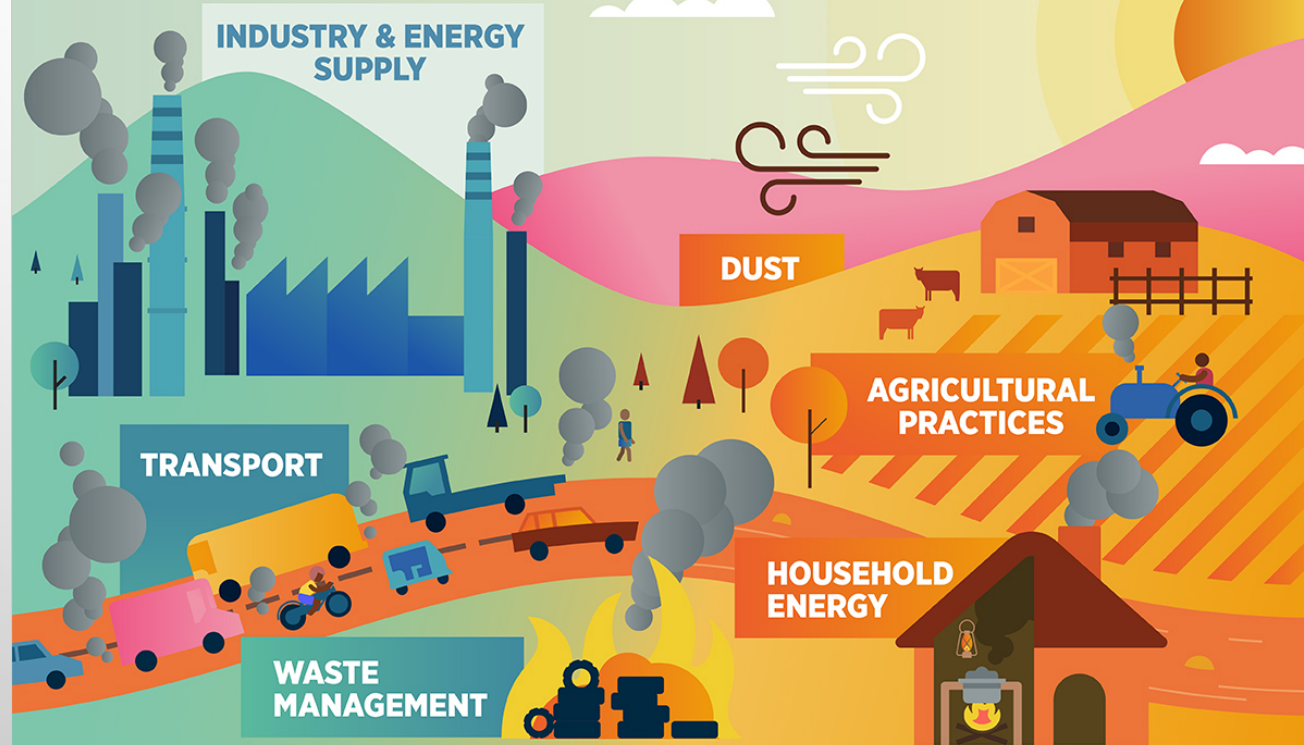
#### A. AIR POLLUTION





# WHAT ARE THE SOURCES OF AIR POLLUTION?

Outdoor air pollution affects urban and rural areas and is caused by multiple factors:



**Countries cannot tackle air pollution alone.**  
It is a global challenge we must all combat together.

**CLEAN AIR FOR HEALTH**

**#AirPollution**






## CAUSES

- Most air pollution comes from energy use and production
- Burning fossil fuels releases gases and chemicals into the air.
- Smog especially during the winter season caused by vehicular pollution and agricultural/stubble burning.

## IMPACTS

- According to the World Health Organization, air pollution causes an estimated 3.8 million premature deaths a year globally
  - Increased mortality from cardiovascular diseases, cancers and respiratory infections.
- 

# AIR POLLUTION – THE SILENT KILLER



Every year, around  
**7 MILLION DEATHS**  
are due to exposure  
from both outdoor  
and household air  
pollution.

**Air pollution is a major environmental risk to health.** By reducing air pollution levels, countries can reduce:



Stroke



Heart  
disease



Lung cancer, and  
both chronic and acute  
respiratory diseases,  
including asthma

## REGIONAL ESTIMATES ACCORDING TO WHO REGIONAL GROUPINGS:



**CLEAN AIR FOR HEALTH**

#AirPollution

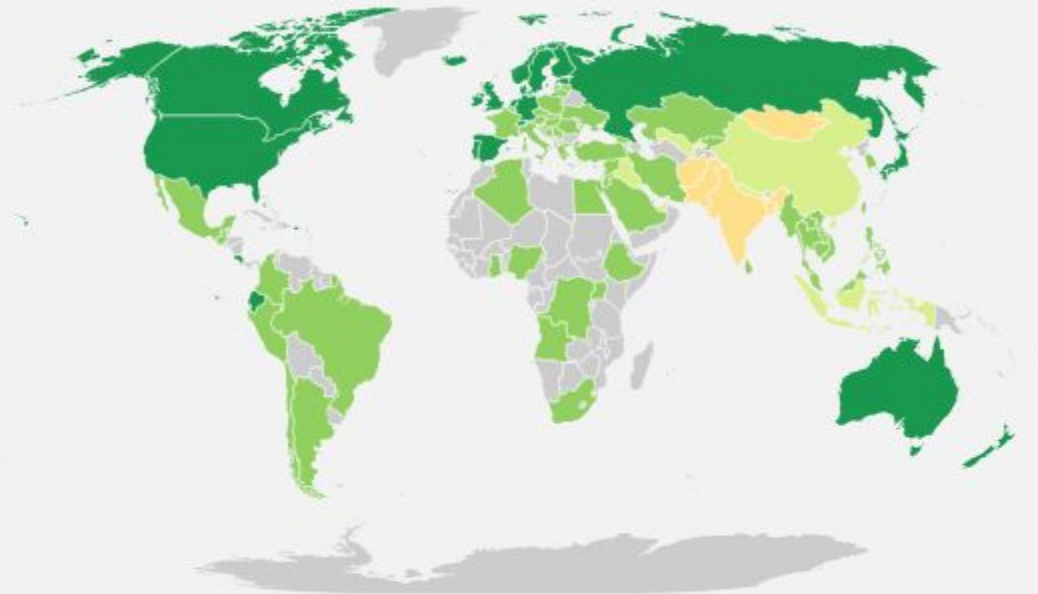


# Air pollution across the world in 2019

A new report found that Asian countries and territories dominated the list of most air polluted regions in 2019. The map below shows pollution by country and territory using the US Air Quality Index.

## Air quality

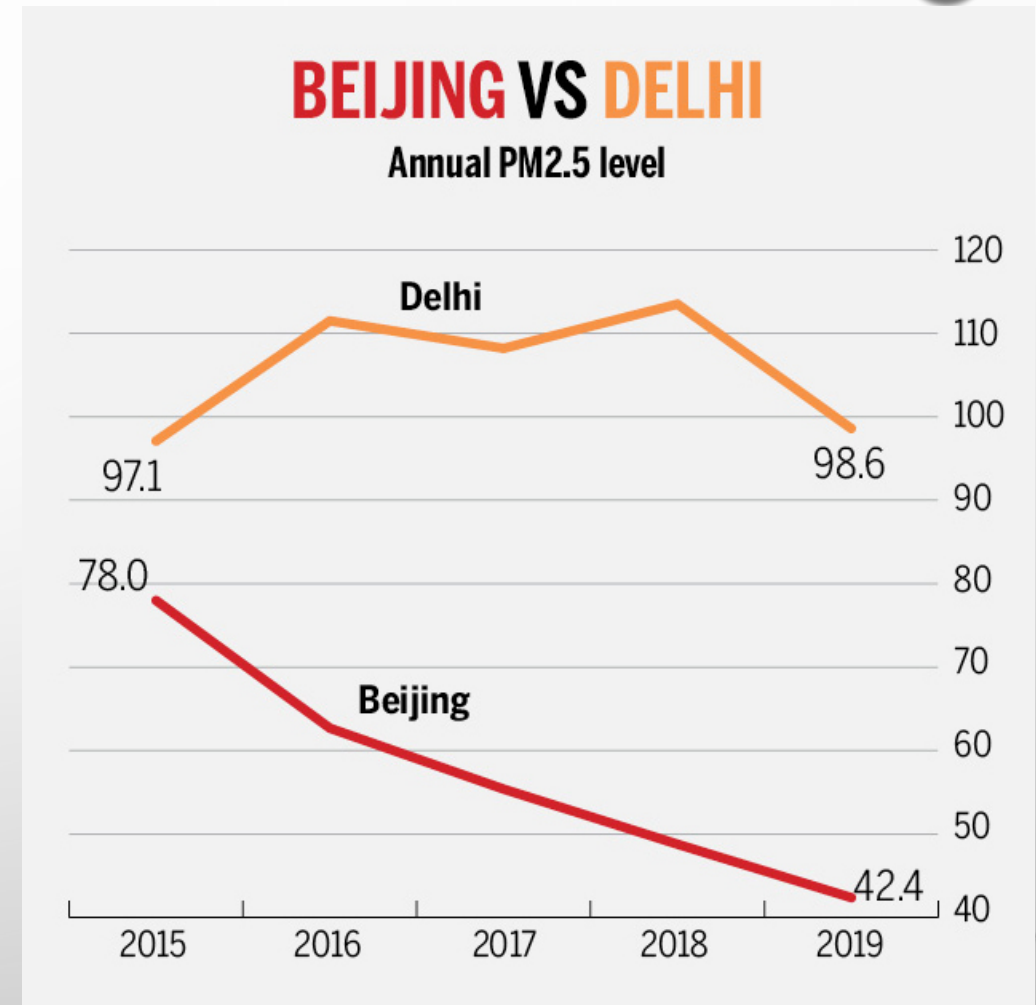
- Good
- Moderate
- Unhealthy for sensitive groups
- Unhealthy
- Very unhealthy
- Hazardous



Country	Air quality	PM2.5*
Bangladesh	Unhealthy	83.3
Pakistan	Unhealthy	65.8
Mongolia	Unhealthy	62
Afghanistan	Unhealthy	58.8
India	Unhealthy	58.1
Indonesia	Unhealthy for sensitive groups	51.7



- Twenty-one of the world's 30 cities with the worst air pollution are in India, with six in the top ten. (IQAir Airvisual's 2019 World Air Quality report).
- Ghaziabad in Uttar Pradesh, is ranked the world's most polluted city, with an average  $PM_{2.5}$  concentration of 110.2 ppm in 2019.





Don't keep vehicle engine running unnecessarily, turning off the engine will prevent the release of harmful air pollutants

Avoid burning crackers. Adopt Green Diwali



Switch off engines at traffic intersections, to save fuel



Drive CNG/electric vehicles

Use public transport



## 3 B. WATER POLLUTION






- 90% of rural India's drinking water comes from groundwater.
- As India grows and urbanizes, its water bodies are getting toxic.
- It's estimated that around 70% of surface water in India is unfit for consumption.
- Every day, almost 40 million litres of wastewater enters rivers and other water bodies with only a tiny fraction adequately treated.



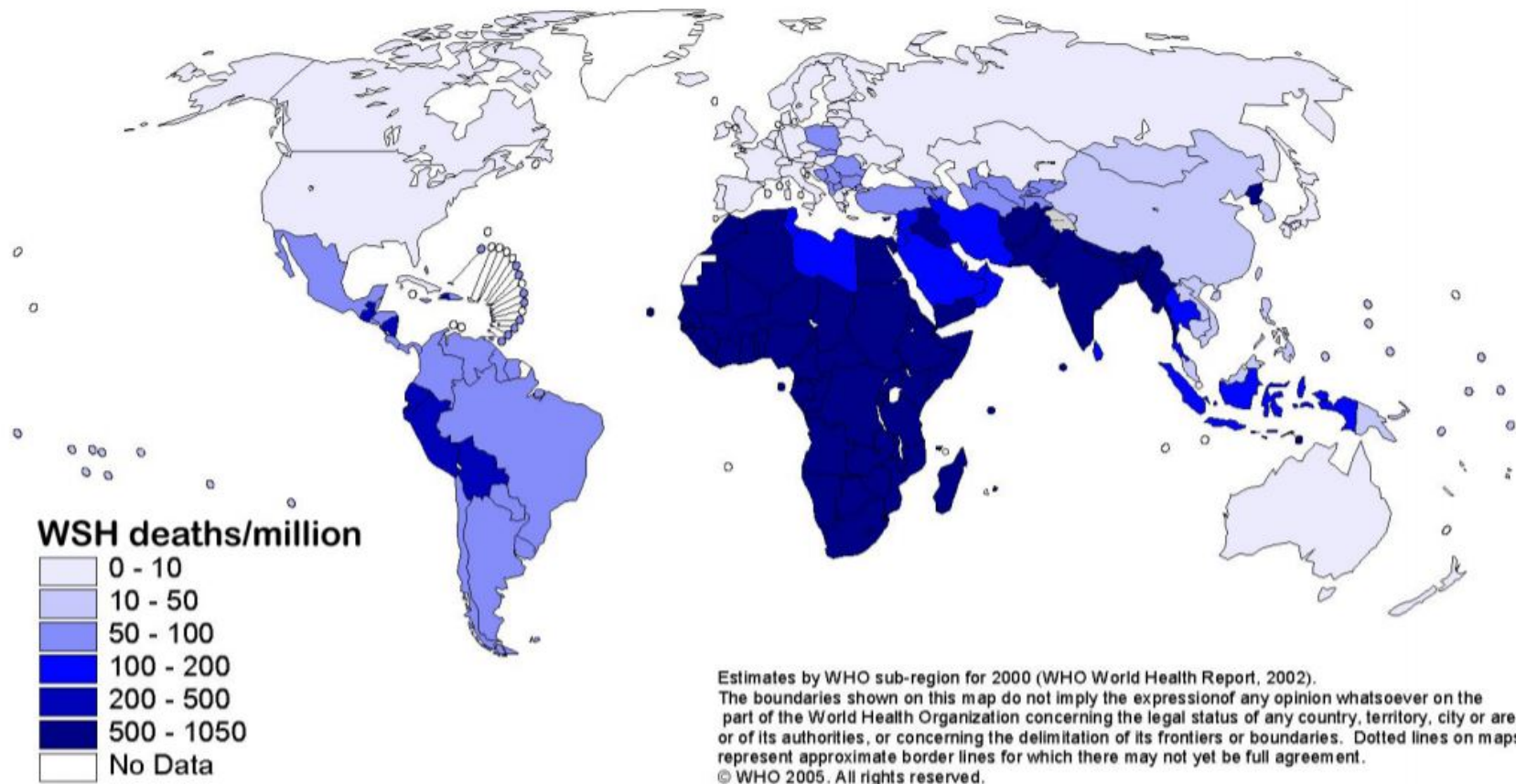




# IMPACTS OF WATER POLLUTION

- Polluted water can lead to diseases such as cholera, tuberculosis, dysentery, jaundice, diarrhoea, etc.
  - In fact, around 80% stomach ailments in India happen because of consuming polluted water.
- 

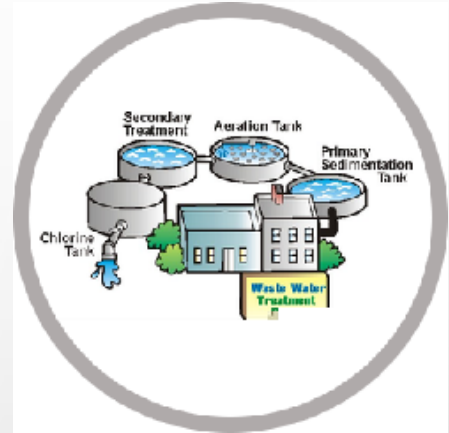
# Deaths from unsafe water, sanitation and hygiene





Celebrate your festivals with idols made of environmental friendly materials

Treat liquid waste before discharging into the rivers, water bodies, lakes, ponds & ocean



Don't throw the fishing net in the sea and river; they have become a major menace for the marine environment

Use organic fertilizers and pesticides



Try using phosphorous free detergent



### 3 C. NOISE POLLUTION





# How Loud Is Too Loud?

The louder the sound, the quicker it can damage your hearing. Sound is measured in decibels. Sounds at or above 85 dBA\* can cause hearing loss.

\*dBA = A-weighted decibels

2 minutes at 110 dBA can damage your hearing.

**140-160 dBA**  
Fireworks show



**110-129 dBA**  
Ambulance sirens



## Why Protect Your Hearing?

Noise-induced hearing loss:

- Can build over time.
- Is permanent.
- Is preventable.

14 minutes at 100 dBA can damage your hearing.

**94-110 dBA**  
Headphones, sporting events and concerts



## How to Protect Your Hearing:

- Lower the volume.
- Move away from the noise.
- Wear hearing protectors, such as earplugs or earmuffs.

8 hours at 85 dBA can damage your hearing.

**80-100 dBA**  
Lawnmower



**74-104 dBA**  
Movie theater



A program of the National Institutes of Health

<https://www.noisyplanet.nidcd.nih.gov>

Toll-free voice: (800) 241-1044

It's a Noisy Planet, Protect Their Hearing® and the Noisy Planet logo are registered trademarks of the U.S. Department of Health and Human Services.

**NIH** National Institute on Deafness and Other Communication Disorders

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health  
National Institute on Deafness and Other Communication Disorders

Follow Us  

At or below 70 dBA, sounds are generally considered safe.

**60-70 dBA**  
Normal conversation



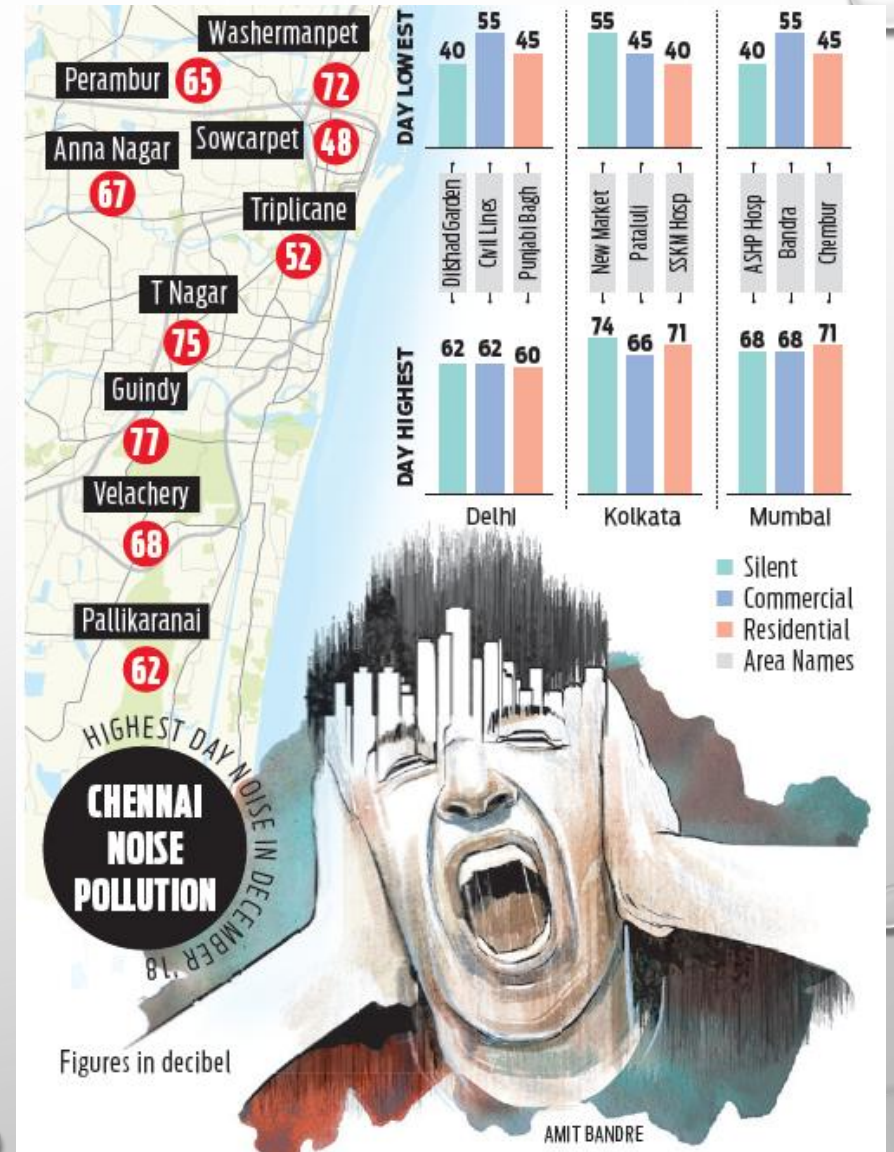
**30 dBA**  
Whisper



Source: CDC National Center for Environmental Health

- Generally sound over 85db is considered “loud noise”.
- Over 1 billion people are at risk for permanent hearing loss from loud sounds, warns WHO.
- People especially between 12 – 35 years are more vulnerable owing to their recreational exposure of the present times.

- Chennai is the noisiest metropolitan city in the country (CPCB)
- As per the data, the noisiest place is Guindy, where decibel levels constantly clocked 76-77 dB during the day and 73-75 dB at night
- The average noise levels during the day is 67.8 decibels (dB), much higher than Delhi that has recorded 61 decibels.





Irrational use of horns is a major noise pollutant, besides being an irritant

Control the bass of music systems and TVs which causes noise pollution



Do not honk near schools, hospitals or where the 'No Horn' sign is displayed

Use silencers for noisy machines wherever possible



Use sound pump (acoustic) DG sets to prevent noise pollution



### 3 D. LAND POLLUTION





## CAUSES

- CHEMICAL FERTILIZERS AND MUNICIPAL SOLID WASTE

## IMPACTS

- The average concentration of PolyChlorinated Biphenyls (PCBs) in Indian soil was almost twice the amount found globally -12 ng/g as against 6ng/g.
- PCBs are synthetic organic chemicals used in electrical equipment, adhesives, paints and several other products
  - cancers and birth defects
  - central nervous system, immune and reproductive systems, and also affect the food chain.



Use traditional and organic farming techniques

Make use of fly ash in construction projects,  
embankments and road pavements



Stop stubble burning

Develop green belts in cities



## 4. BIODIVERSITY CONSERVATION



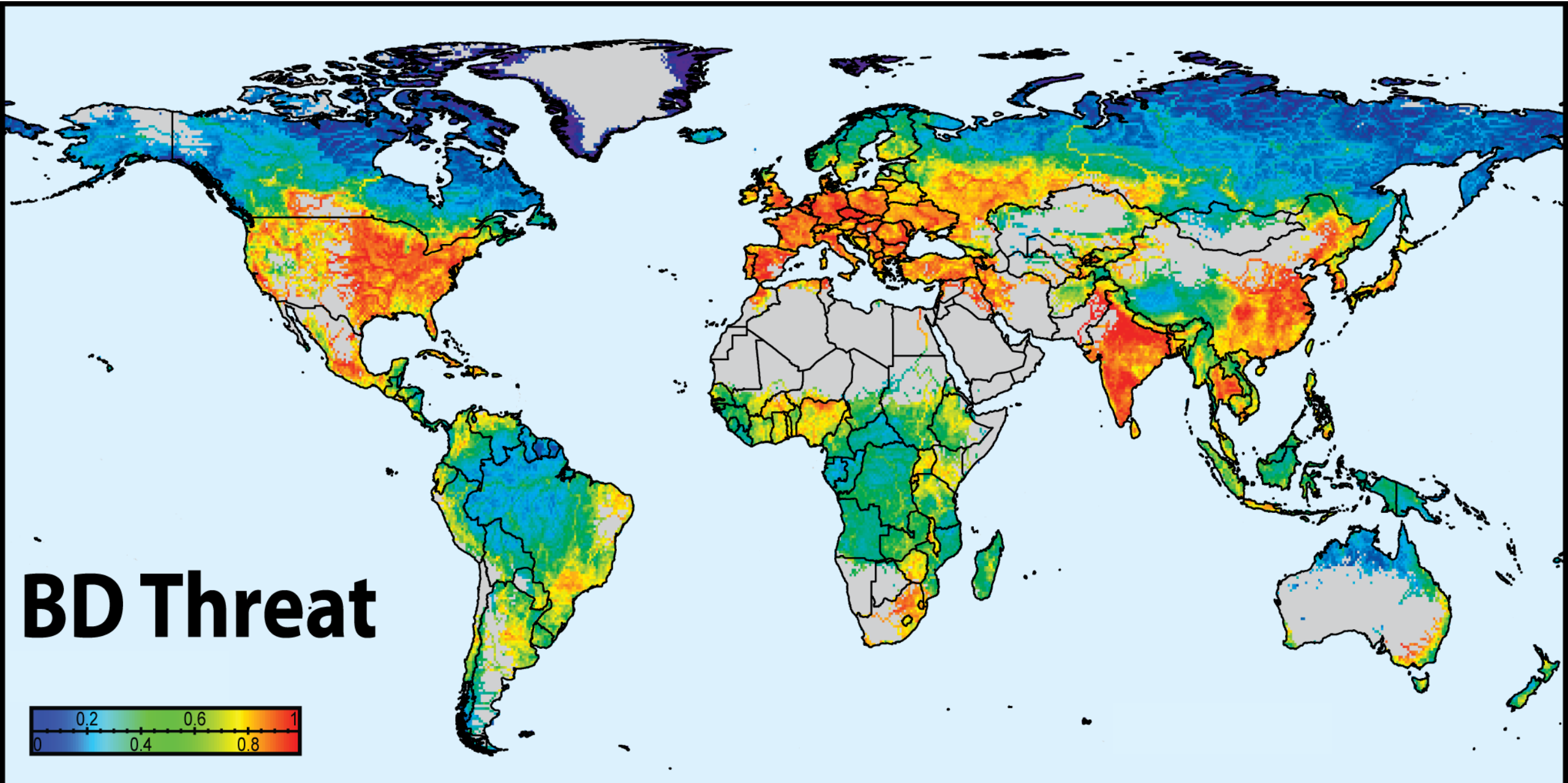


# INDIAN BIODIVERSITY

- India is one of the 17 mega biodiversity countries of the world.
- India consists around 8% of the all the recorded species on the planet.
- India is home to around 60,000 insect species, 2500 fish species and 460 reptile species, 1200 bird species, 400 mammal species.
- Around 20% of all species are categorized as endemic but 10% are threatened at present.
- Around 10 biogeographic zones, >200 types of forest, 5-6 grassland, 13 wetland, 3 desert, and a vast marine/coastal habitat.







# LOSS IN BIODIVERSITY

## **SPECIES LOSS**

- >6% of wild plants/animals threatened.
- 2/3<sup>rd</sup> species could become extinct in the next 50 years.

## **HABITAT LOSS:**

- >50% of forest disappeared in the last 200 years.
- >70% of waterbodies drained/polluted
- >40% of mangroves destroyed (India is 2<sup>nd</sup> largest)
- >40% of coral loss in the last 30 years.



# The Great Barrier Reef







Healthy - Dec 2014

Dying - Feb 2015

Dead - Aug 2015





Protect the avian population as many are already extinct or facing extinction

Boycott products and souvenirs made from skin and fur of wild animals, elephant tusks, rhino horns etc.



Don't tease animals when you visit zoos, national parks and sanctuaries - respect their privacy



Don't feed animals in zoo and sanctuaries



Don't litter and make loud noises as it can stress, traumatize and even irritate animals

## 5. RESOURCE EFFICIENT PRACTISES



## Food wastage crisis in india

- Around 67 million tonnes of food is wasted in India every year
- Annually, close to 21 million metric tonnes of wheat rots in India
- Mumbai generates close to 9,400 metric tonnes of solid waste per day, from which 73% is food, vegetable, and fruit waste, while only 3% is plastic.

## WHY INDIA CAN'T FEED HER PEOPLE

An infographic based on a Toronto Star article by Rick Westhead ([bit.ly/qDZ51A](http://bit.ly/qDZ51A))

by [www.indi.ca](http://www.indi.ca)

credits: [indi.ca/?p=5753](http://indi.ca/?p=5753)

Today there is less food per Indian than 30 years ago

In 2008, India produced 436 grams of food grains per person down from 445.3 in 2006.



20%  
₹

food prices have risen in recent months by 20%

40% of Indian children are malnourished



In Madhya Pradesh, two-thirds of children under five are malnourished

India loses 40% of its food

More fruit and veg than the U.K. consumes

More grain than Australia produces



Lack Of Cold Storage

Spotty Electricity

Bad Roads

India spends 0.6% of GDP on agriculture

down from 1.4% in the 1980s



China spends 5%

China grew 6.2 metric tons of rice per hectare in 2008



double India's output

Between 1997 and 2009, an estimated 200,000 Indian farmers committed suicide



The average farm is 50% smaller than in 1947

farmers will grow 5% less food in 2011 than 2010

# PAPER AND PAPER WASTE:

Paper manufacture demands two valuable resources – Trees and Water

- Of all the trees cut in the world, 40% are being used for paper manufacture alone.
- Printing of daily newspaper for a single day requires 75,000 trees!
- Every tree produces enough oxygen for 3 people to breathe.
- Paper manufacture is one of the most water intensive process.
- 324 liters of water is used to make 1 kg of paper.
- 10 liters of water is needed to make one sheet of A4 paper.

Despite the electronic revolution of the recent times, Demand for paper is expected to double before 2030.

- Paper accounts for 25% of landfill waste and 33% of municipal waste.
- 50% of the office waste is composed of paper.
- Recycling 1 ton of paper saves around 682.5 gallons of oil, 26,500 liters of water and 17 trees.





Ensure food is properly stored and refrigerated at ideal temperature

Turn to nature for packaging; Ecofriendly packaging reduces the waste of natural resources



Managing food leftovers; handover leftover food to NGOs

Cook on low flame. Keep the flame right



Plan a single trip for several tasks

## 6. SUSTAINABLE WATER CONSUMPTION

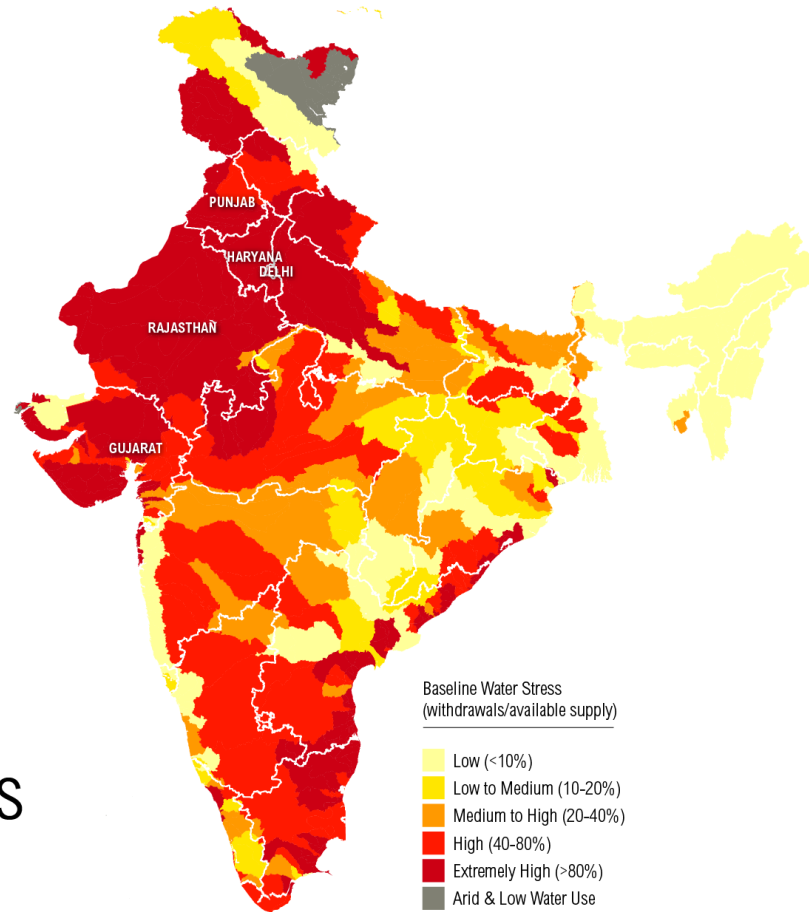




- India is facing one of its major and most serious water crisis.
- 21 major cities including Delhi, Bengaluru, Chennai, and Hyderabad, are racing to reach zero groundwater levels by 2020.
- By 2030, the country's water demand is projected to be twice the available supply, implying severe water scarcity for hundreds of millions of people



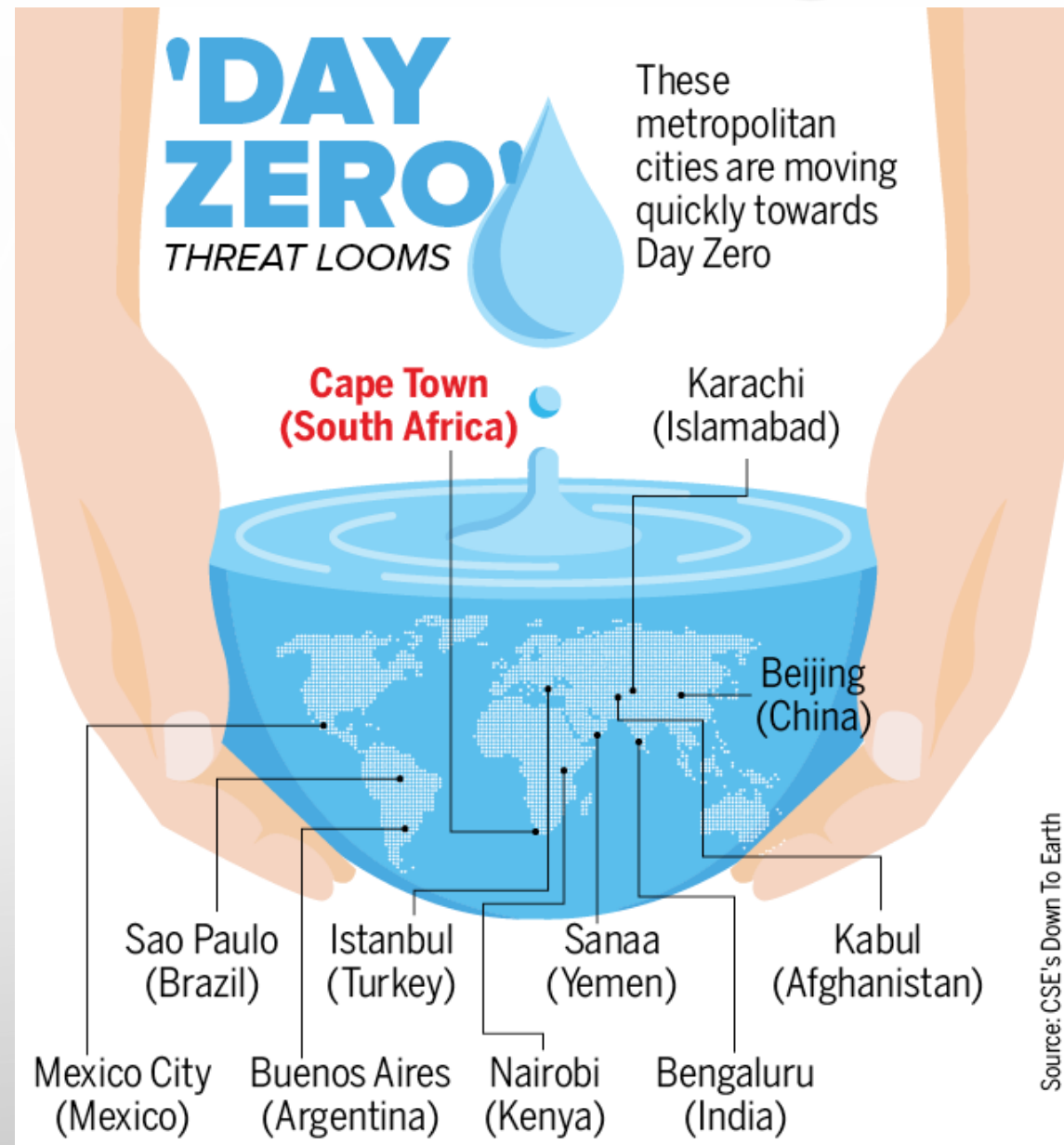
**54%**  
of India  
Faces  
**High to  
Extremely  
High**  
Water Stress





## DAY ZERO

- The day when a city's taps dry out and people have to stand in line to collect a daily quota of water.
- Chennai, one of India's major cities facing an acute, unprecedented water shortage.
- Over 12% of India's population - 163 million people of 1.3 billion - is already living the "Day Zero" scenario, with no access to clean water near their home





Use the washing machine efficiently to reduce water usage, Use cold water whenever possible and dry clothes in the Sun

Reduce household water usage by reusing kitchen wastewater in gardening



Efficient faucets should be used to help save water



Prefer earthen pots over plastic bottles



## 7. PLANTATION & GREENING





Keep indoor plants to purify air, they can curb cancer-causing volatile organic compounds

Use native plants in garden or as a part of the landscape, as they require less water, fertilizers and pesticides



Avoid concrete bases around the plants, as they are detrimental to their growth

Corporates should support “Green” initiatives

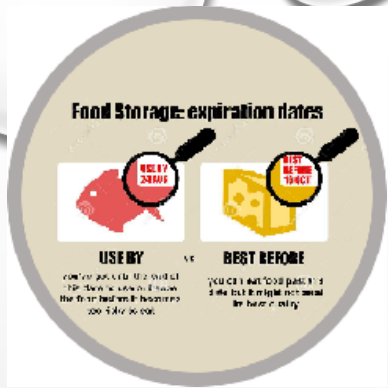


Green your place of work, school, college etc.



## 8. HEALTHY HABITS





Check expiry date before you consume packaged food/ beverages

Ventilate your homes properly to minimise health risks from indoor pollutants



Cycle your way to a healthier environment

Drink clean water [Ensure water tank is cleaned periodically]



Consume seasonal fresh fruits and vegetables

Thank  
you