



Council of Enviro Excellence

# NATIONAL WASTE MANAGEMENT

## SUMMIT AND AWARDS 2025

With a special emphasis on Fly Ash &  
Gypsum Utilization



**TOWARDS ZERO WASTE IN POWER  
AND CEMENT SECTORS**

**DR. S.K. GOYAL**

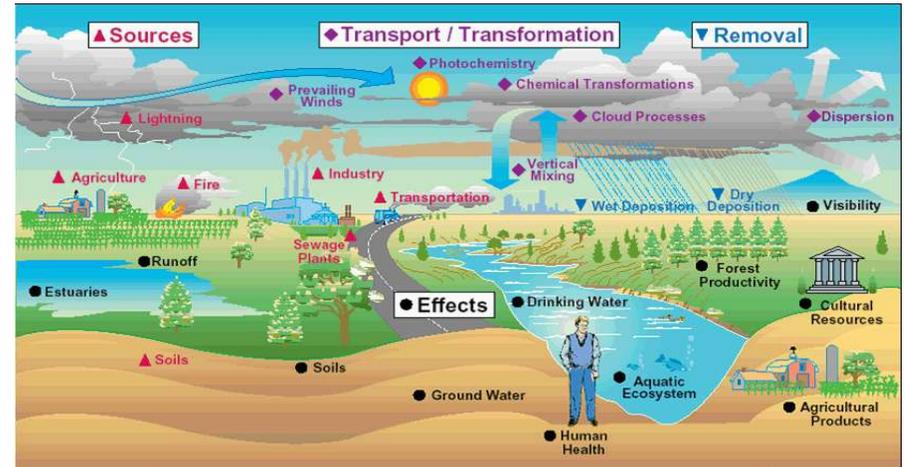
**“National Waste Management Summit & Awards 2025”**

**“Towards Zero Waste in Power and Cement Sectors”**

**Aiming Environmental Sustainability...**



**Need Efforts beyond Compliance**



**Organized by**

Council of Enviro Excellence (CEE),  
at Hyatt Centric, Janakpuri, New Delhi  
October 6, 2025



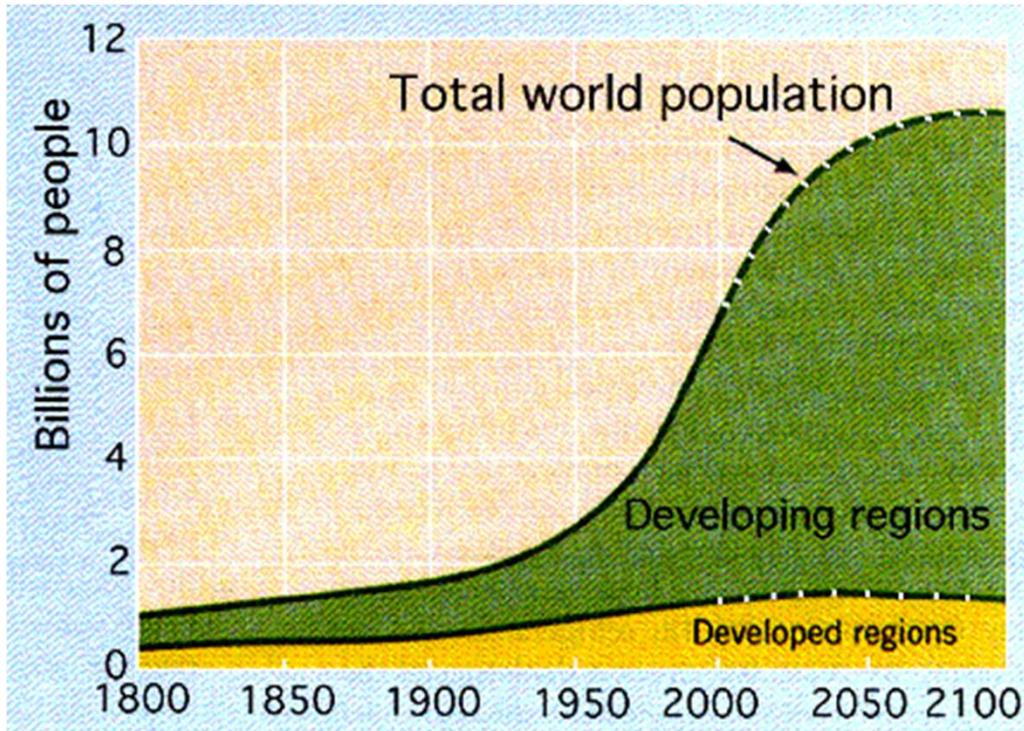
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# Atmanirbhar and Viksit Bharat by 2047

## Wherein People's Needs and Aspirations are met

We will be around 165 Cr. (1/6 th of World population)



**Impact on Resources and Environment**

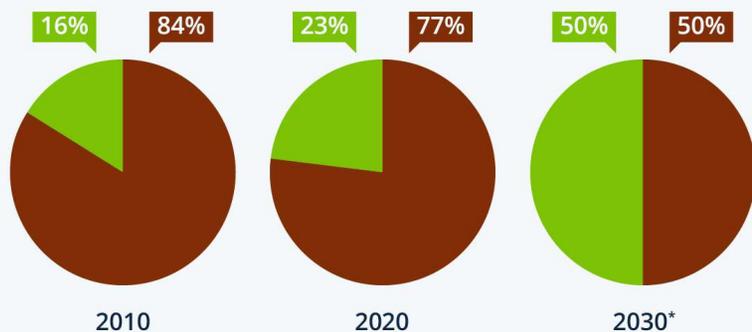
# Thermal Power Plants in India

India's power generation is rapidly expanding, driven by a significant shift **towards renewable energy sources**, with solar and wind power leading the growth.

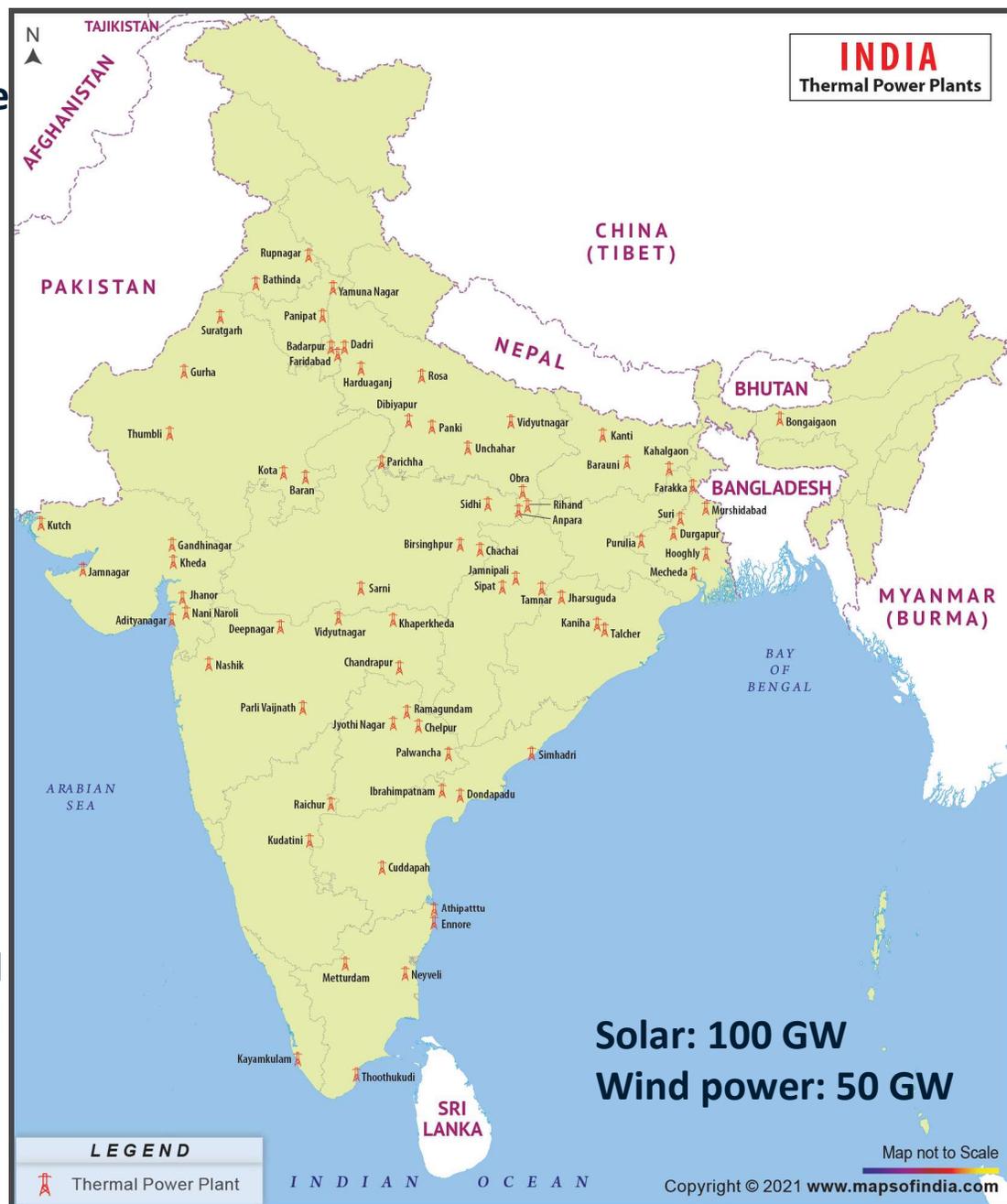
## India's Electricity Mix

Electricity generation by source in India in 2010, 2020 and 2030\*

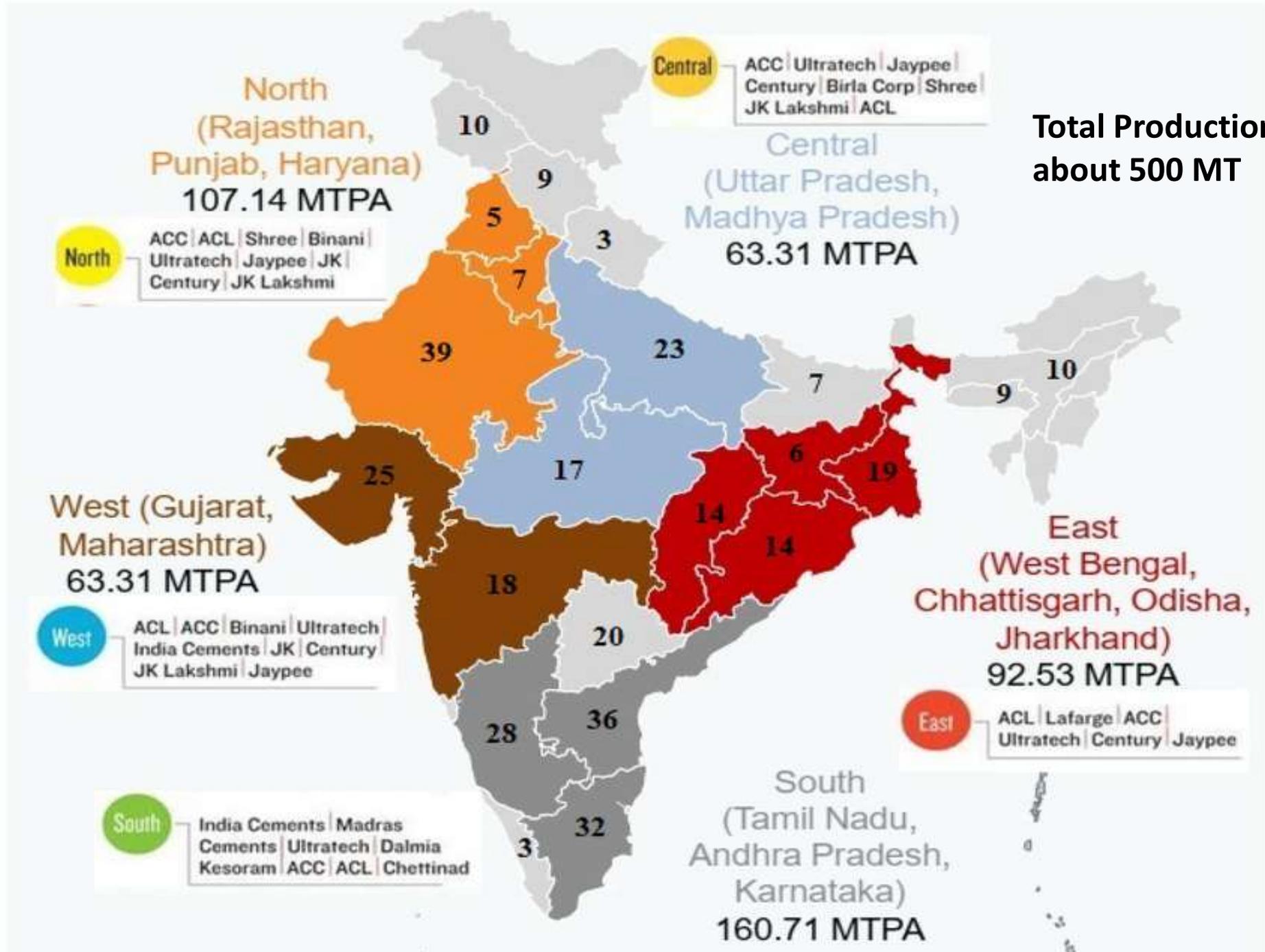
● Fossil fuels ● Renewables



As of June 2025, the country's total installed power capacity **reached 476 GW**, supported by both conventional (thermal, hydro, nuclear) and growing renewable energy sources.



# Cement Plants in India



# Step Towards Environmental Sustainability... by TPPs and Cement Industry ...

*Huge consumption of Natural Resources annually...  
leaving high environmental impact*

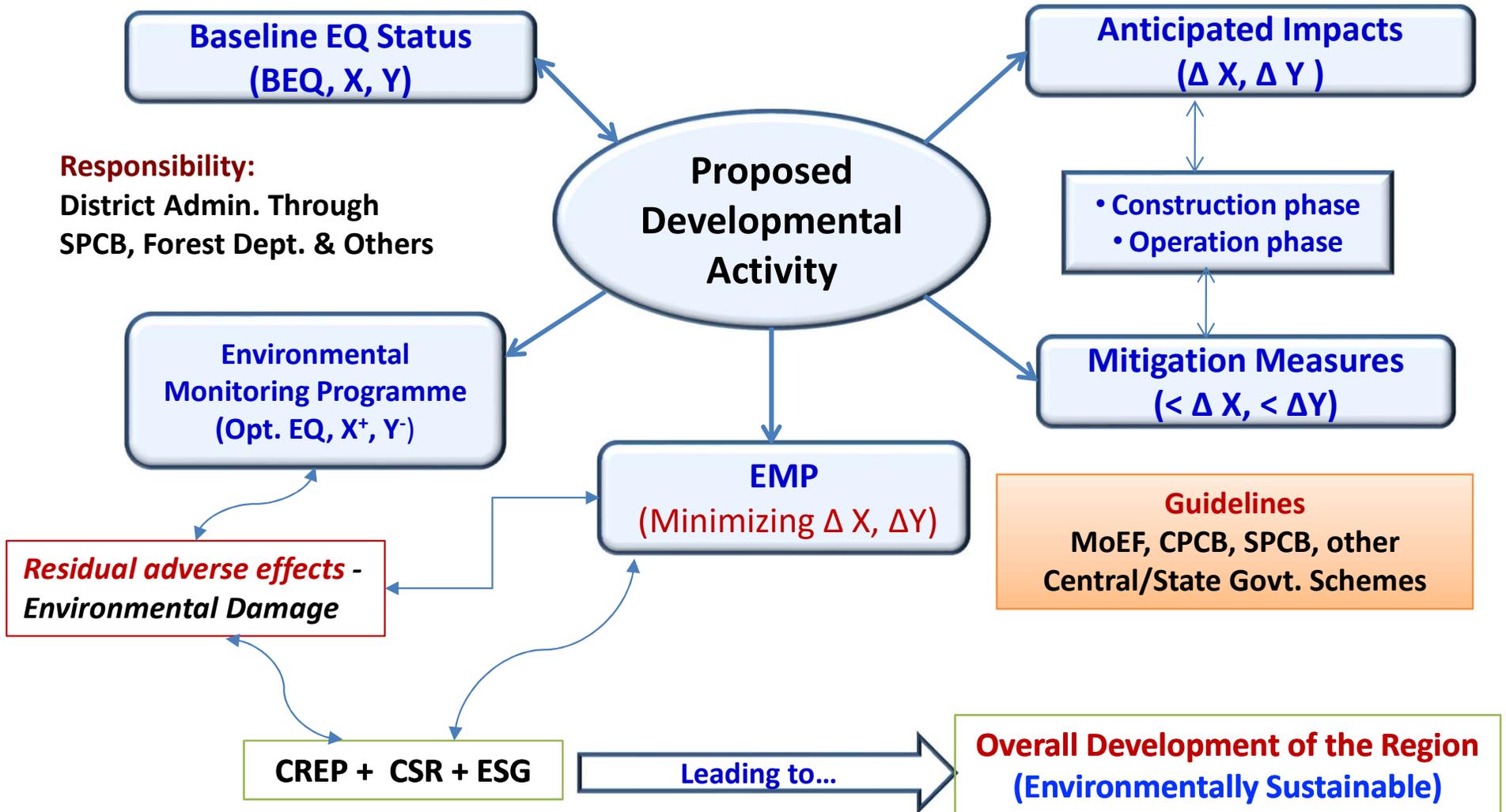


*Compliance and Monitoring of key EC Conditions*

# What is Environmental Sustainability...

*Air, Noise, Water, Soil, Biological (Flora, Fauna), Social*

X – Positive impact parameters  
 Y – Negative impact parameters



**Responsibility:**  
 District Admin. Through  
 SPCB, Forest Dept. & Others

*Residual adverse effects -  
 Environmental Damage*

**CREP + CSR + ESG**

**Leading to...**

**Overall Development of the Region  
 (Environmentally Sustainable)**



## 1. Statutory & Approval

- EC under EIA Notification, 2006
- Public Hearing & EMP
- CTE/CTO from SPCB
- Forest/Wildlife clearance, if applicable
- Follow MoEF&CC, CPCB & SPCB norms

## 2. Air Pollution Control

- ESP/Bag Filters for PM emissions
- SO<sub>2</sub>, NO<sub>x</sub>, Hg norms as per 2015 notification
- FGD installation for SO<sub>2</sub> where required
- Fugitive emission control, dust suppression
- Covered conveyors, enclosures
- Windbreaks for stockpiles
- Covered transport of materials
- Continuous Emission Monitoring (CEMS) and linked to SPCB/CPCB
- Annual monitoring for trace pollutants

## 3. Fuel & Ash Management

- Use coal with ash < 34% or washed coal
- Closed conveyors for coal & ash handling
- 100% fly ash utilisation
- Safe ash pond design with impermeable lining
- Utilize kiln dust, clinker dust
- Hazardous waste disposal as per rules

## Key EC Conditions/ Sustainability Requirements (2/3)

### 4. Water & Effluent

- Permission for water withdrawal (CWC/State WRD)
- Closed Cycle Cooling System (CCCS) with towers
- Zero Liquid Discharge (ZLD) or treated effluent reuse
- Effluent Treatment Plant (ETP) mandatory
- Separate storm water drains

### 5. Noise & Occupational Health

- Noise < 75 dB(A) day, < 70 dB(A) night
- Acoustic enclosures for noisy units
- Regular health check-ups for workers
- Provide PPE (masks, helmets, ear protection)

### 6. Green Belt & Land Use

- Develop 33% green belt with native species
- Avoid prime agricultural/forest land
- Buffer distance from sensitive areas

## Key EC Conditions/ Sustainability Requirements (3/3)

### Special Conditions

- NO<sub>x</sub> control via Low-NO<sub>x</sub> burners
- Biomass plants: control odour & fugitive emissions
- Fly ash and gypsum use in cement/other industries
- Automatic shutdown for pollution control failure
- Co-processing of Waste (Cement Plant)

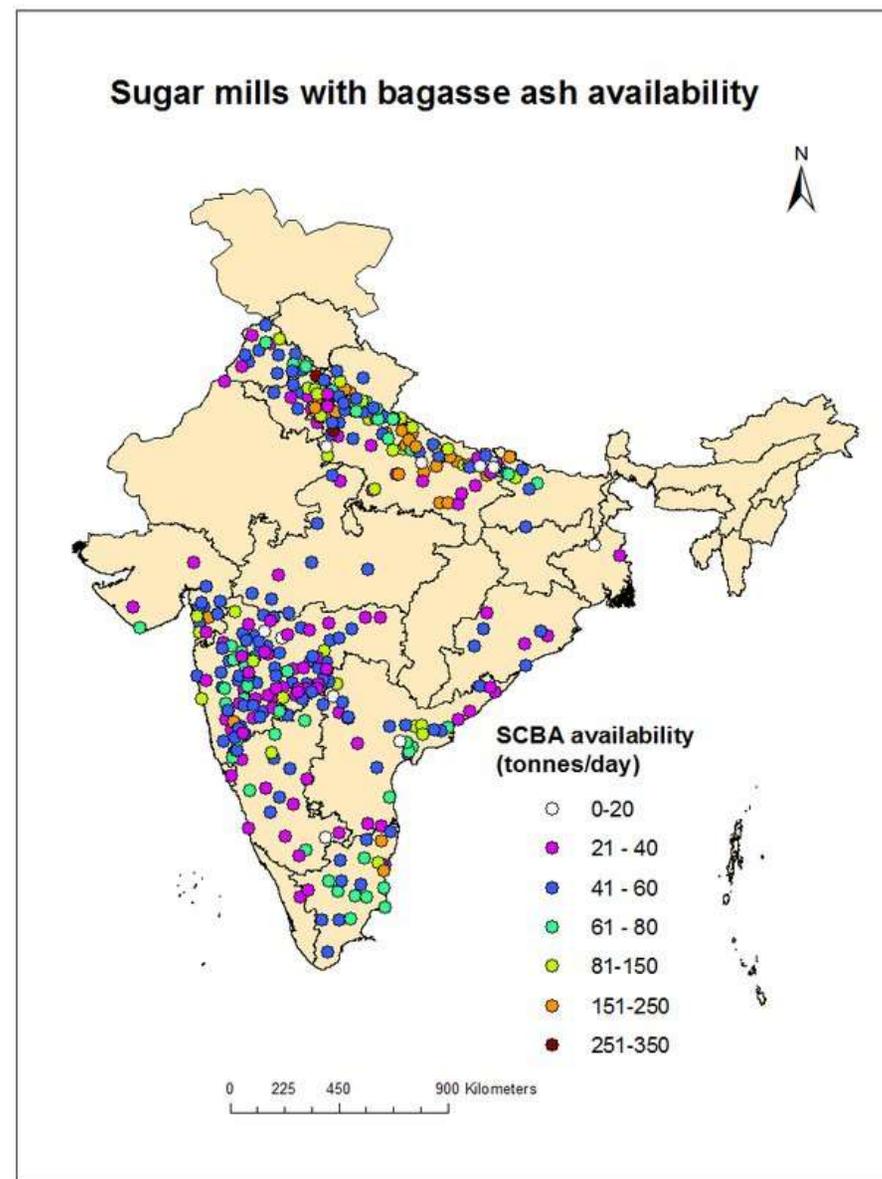
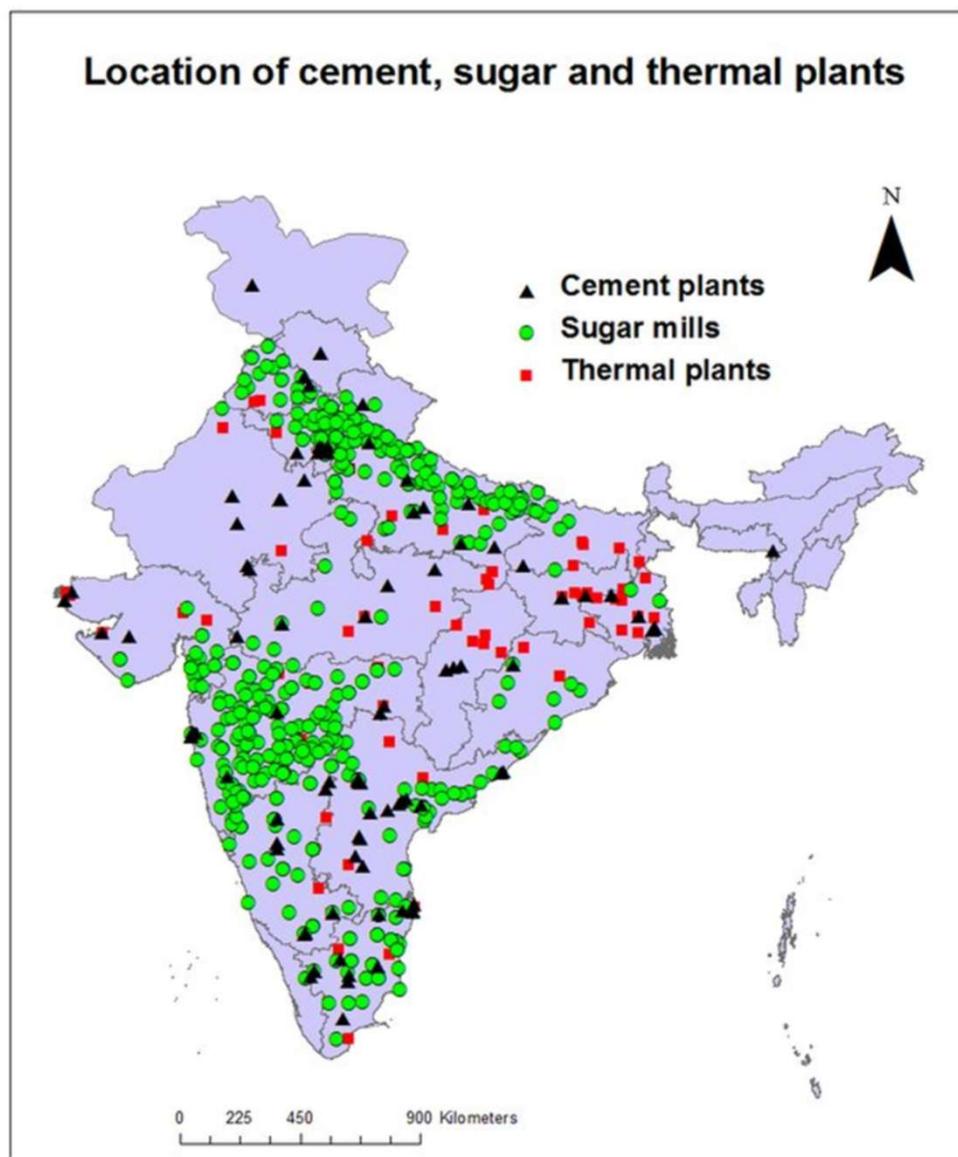
### Disaster & Safety

- On-site Emergency & Disaster Management Plan
- Regular mock drills
- Fire protection systems (NBC/CEA guidelines)
- Seismic safety compliance (Zone III/IV/V)

### Monitoring & Reporting

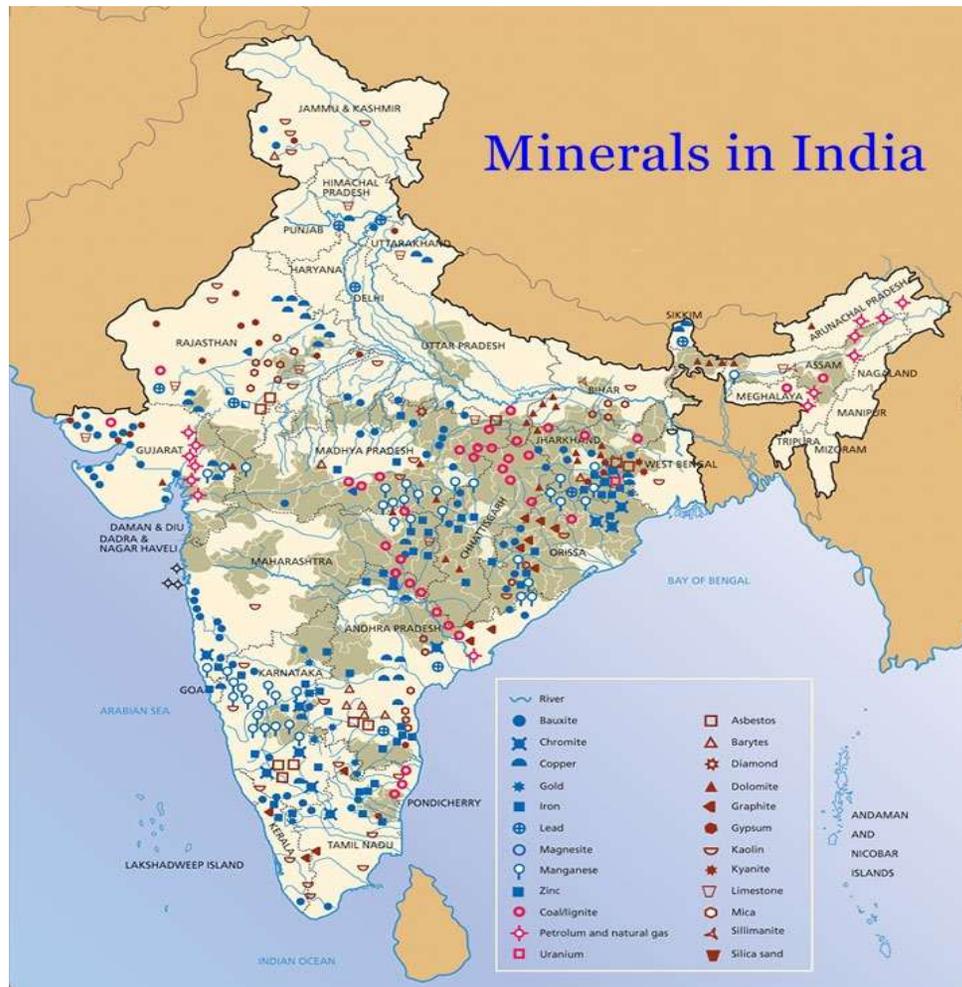
- CAAQM stations around site
- Online data to CPCB/SPCB
- **Six-monthly compliance reports**
- Maintain environmental lab or NABL tie-up

## Environmental Concerns beyond TPP & Cement Plants...



Ref: Bahurudeen A, Vaisakh KS, Manu Sathanam (July 2015). Availability of sugarcane bagasse ash and potential for use as a supplementary cementitious material in concrete, Indian Concrete Journal 89(6).

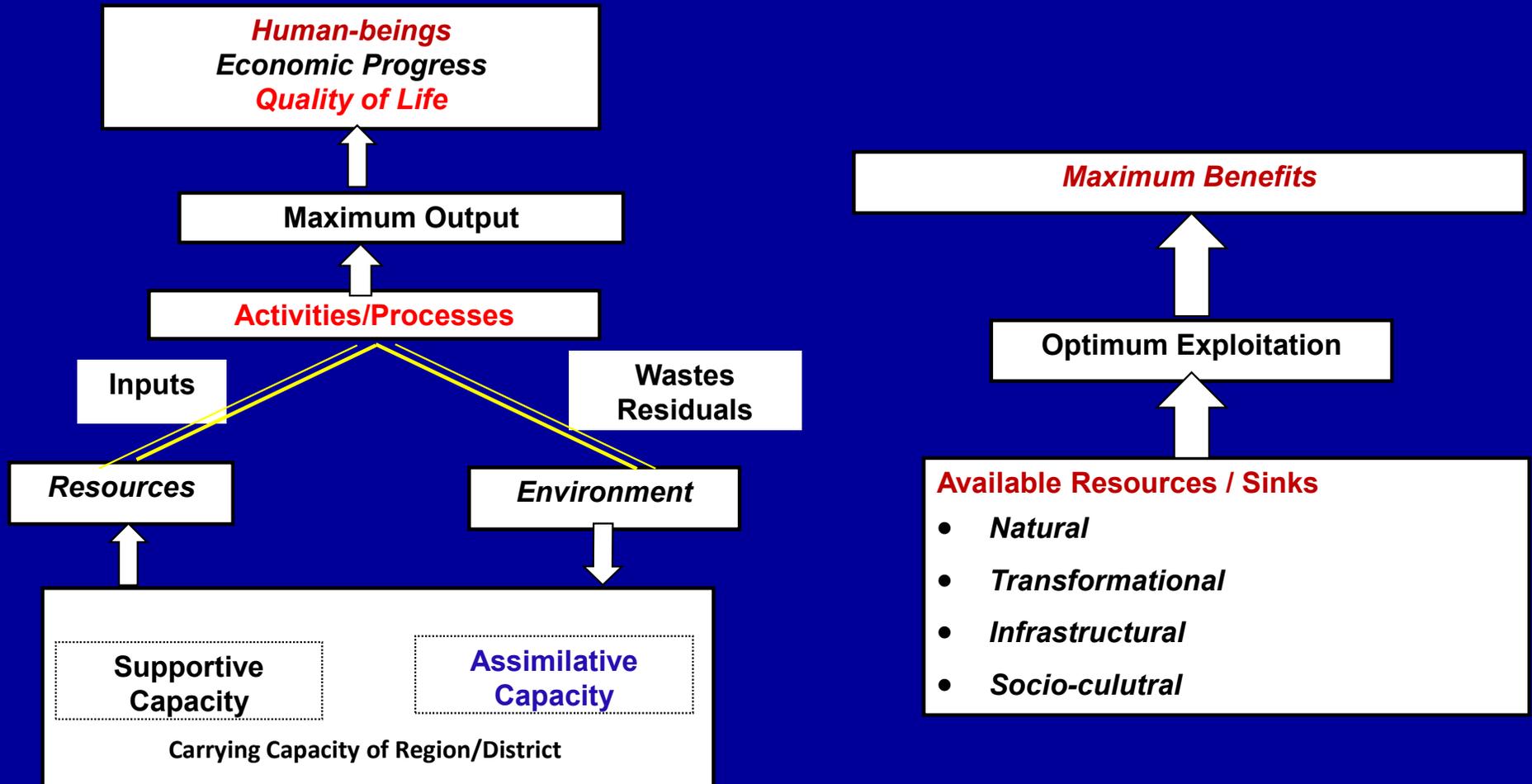
## Carrying Capacity based Regional Developmental Planning for Sustainable Industrial Development (Efficient Resource Use and Environmental/Waste Management)



मानव चाह सदा सुख की,  
और प्रभु सृष्टि है खेल।  
अंतर्द्वंद है विकास पथ गर,  
प्रकृति संग नहीं मेल॥

# Holistic Approach to Environmentally Sustainable Regional Development

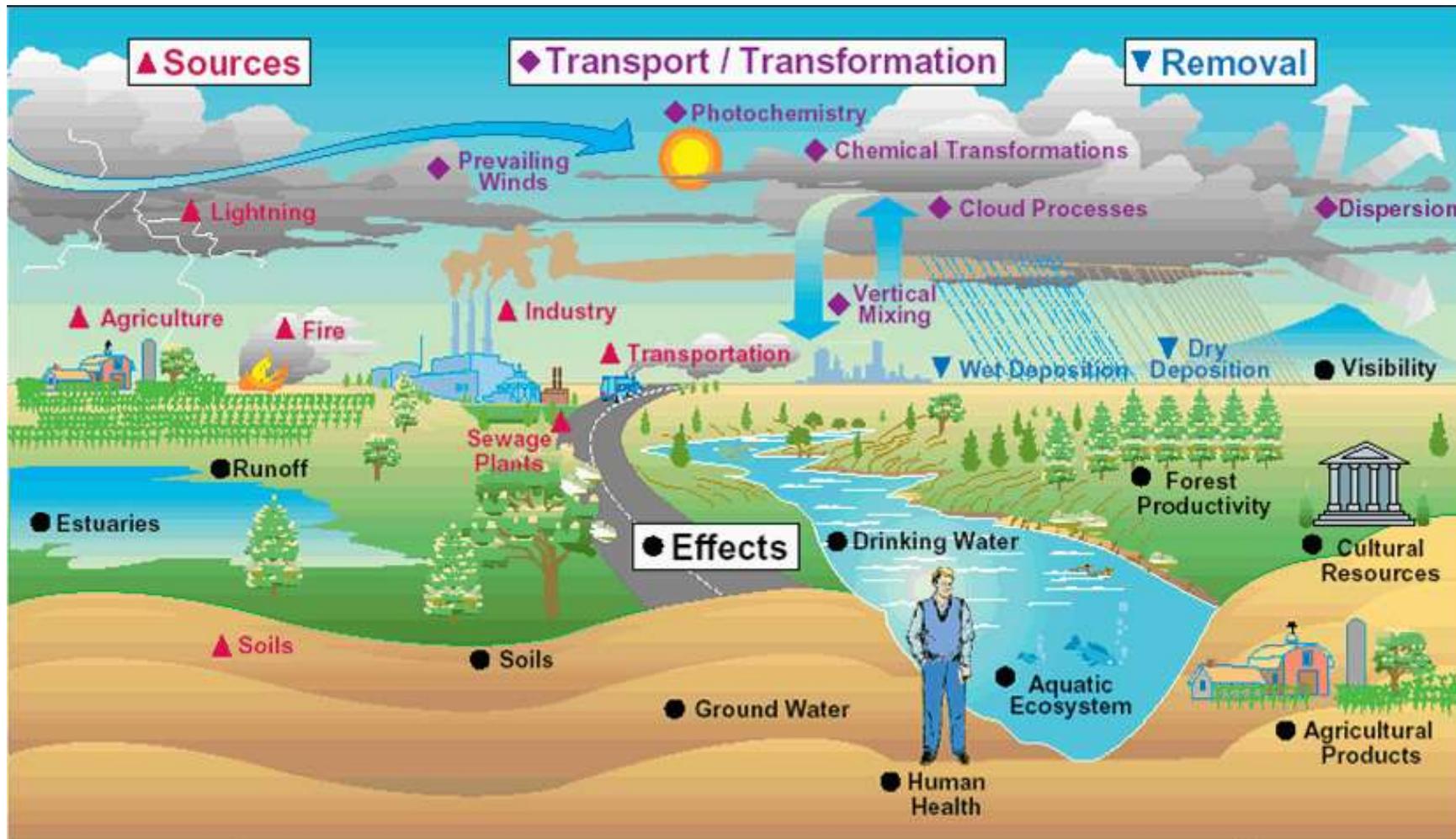
773 D



**Minimize Gap between Resource Consumption and Waste Generation through continuous Technological Advancements (like GC,GE)**

# Planning Development for Environmentally Sustainable Region (Individually as well as Cumulatively)

## Efficient Resources Use & Wastes Utilization in the Region



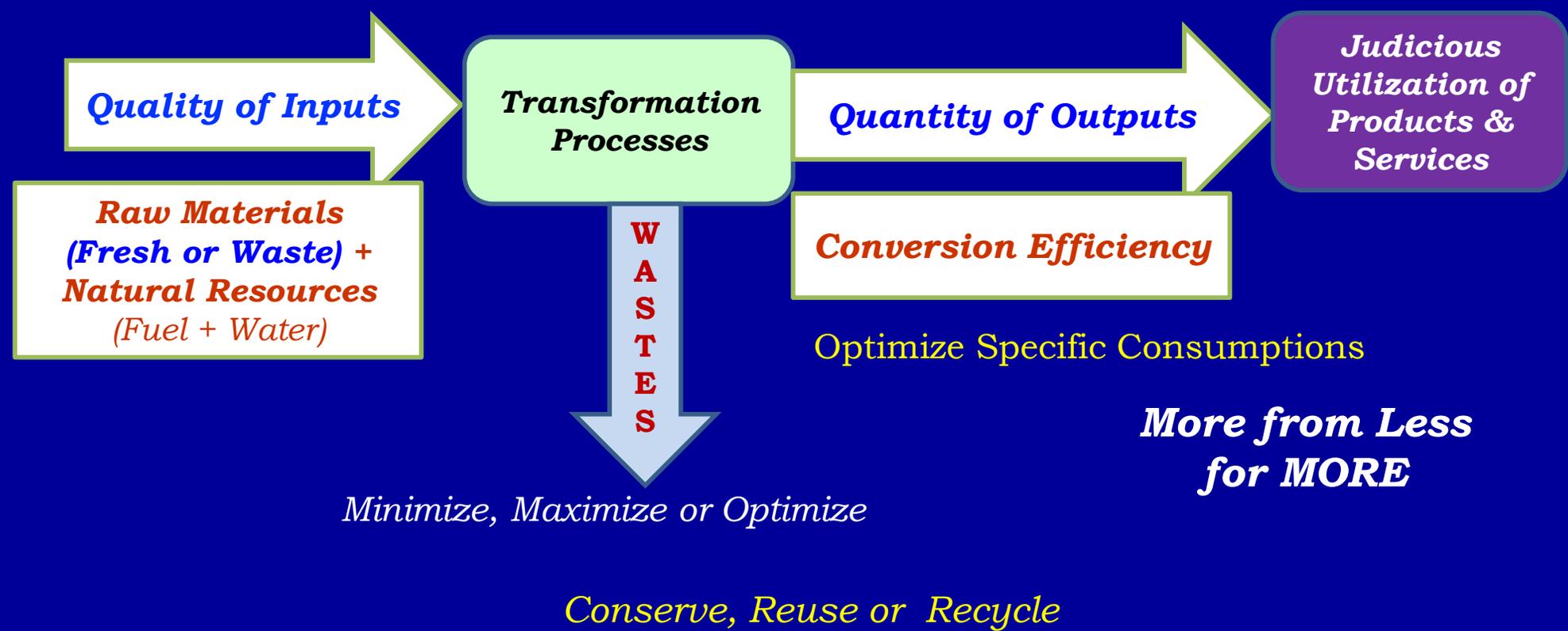
*for each District/ each Block/ each region aligning with various Central/State Govt. policies, rules, regulations, guidelines and local region's resources including social-cultural setup.*

# Conceptual Flow Diagram

## Efficient Resource Use as well as Waste Utilization

(Individually & Collectively)

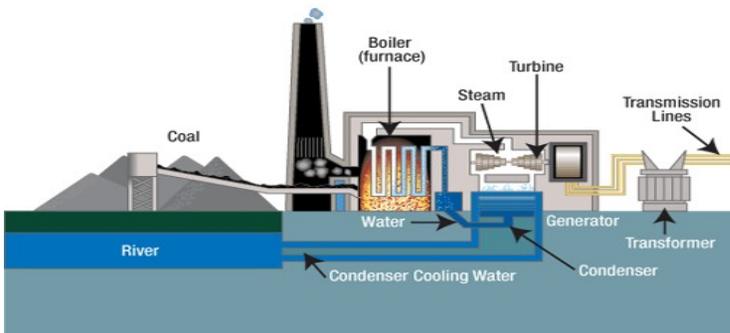
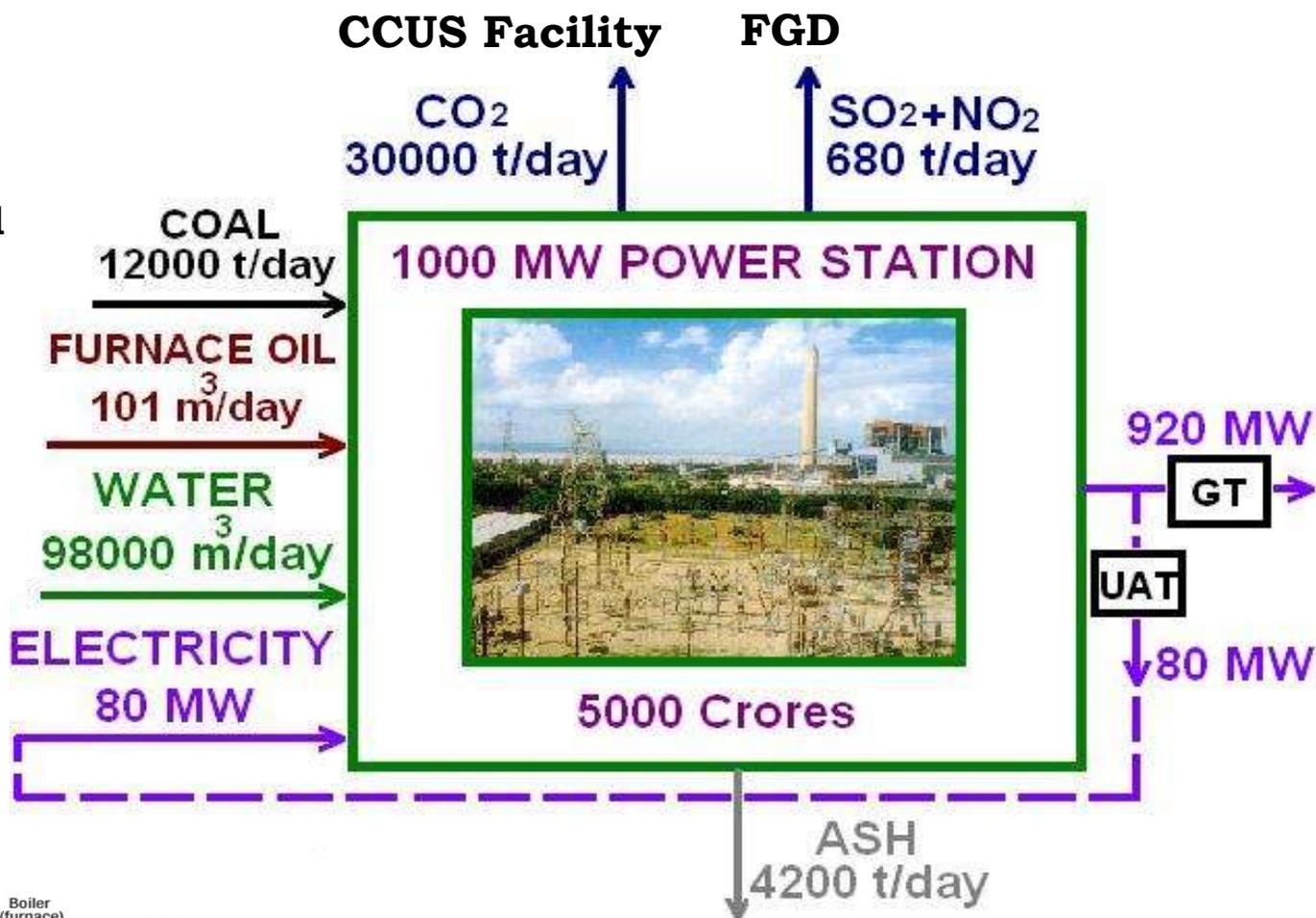
**Zero Defect : Zero Effect**



**Resource Optimization by Individual Industry/ Region**  
(IA, SEZ, IP, District, Block etc.)

# Environmental Sustainability Example...

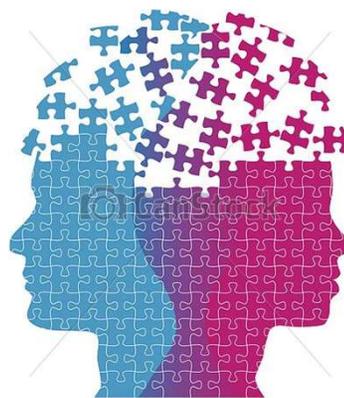
Quality of Coal  
(Ash, Sulphur)



**T&D losses**  
**India: 20+%**  
**Japan, Germany: 4%**

## ***To Conclude....***

- *Currently the country has enough **environment legislations & regulations and technical knowhow** wrt industries to ensure sustainable production and ensure environmental protection, and many others are in the process of formulation as per the requirement, .....*
- *but there is need for constant efforts to ensure that these are properly complied/ implemented, standards/norms are met at all the levels and all the time honestly, .....*  
*And the region/ district/ city has good environment, good water , good agriculture providing good quality of life to the people in the region.*



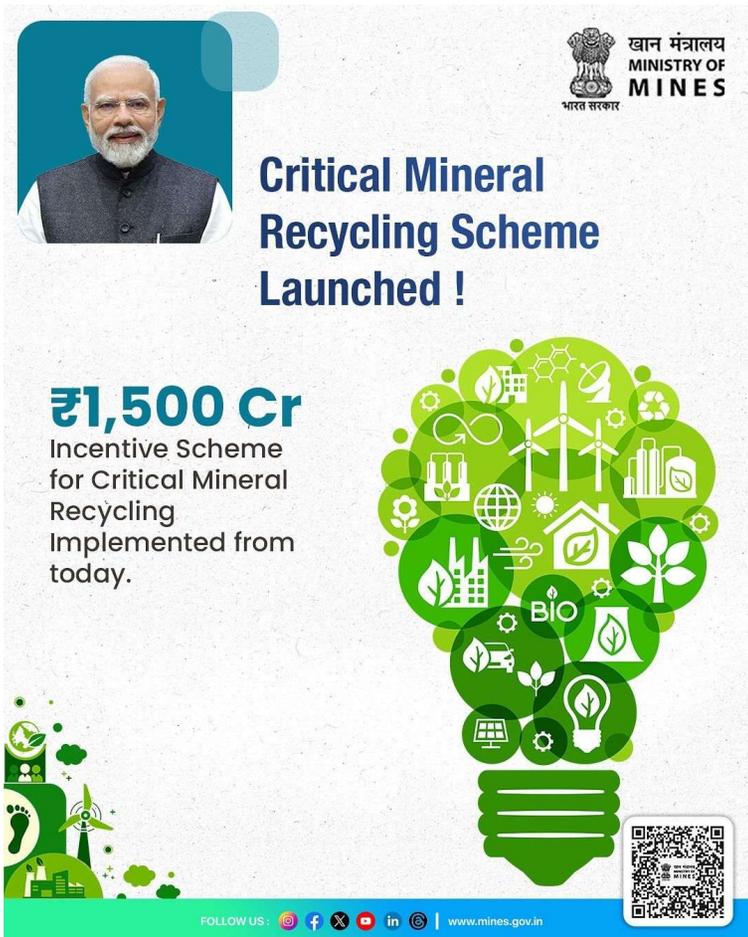
**Alignment & Integration**

## Few Suggestions...

- Industry and Region Specific planning to be done
- Critical review & use of 6 monthly compliance reports on annual basis to prepare environmental sustainability report for the industry
- Critical analysis of regional development requirements and invest in CSR activities accordingly
- Integration with other industries and activities to be done in the region
- New initiatives (process-wise) beyond compliance to be taken up....

**“Today’s Well Managed Waste ...  
Resource for Future”**





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MINISTRY OF  
MINES**  
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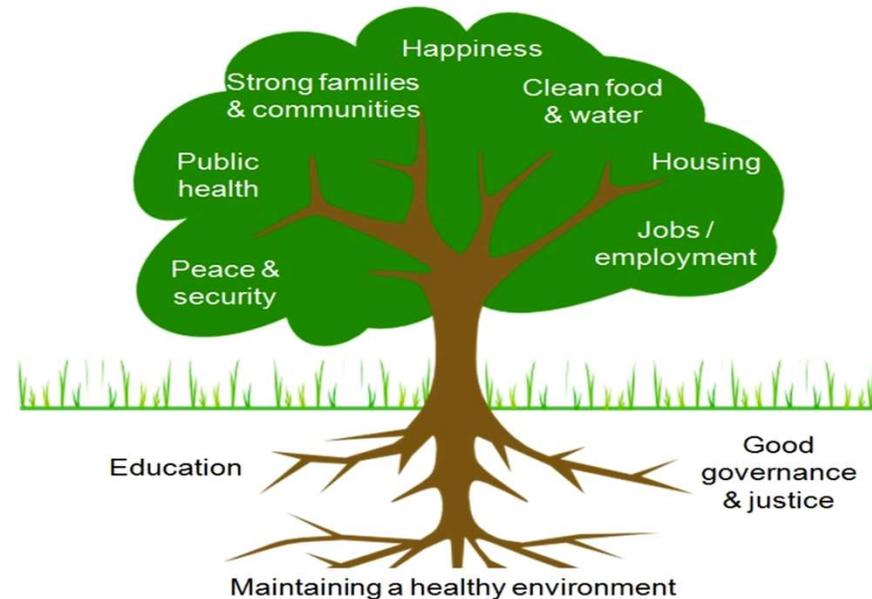
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## **Ultimate Goal**

### **Overall Development of the Region/ District/ State / Country through environmentally Sustainable Actions**

The foundations of our national and international goals



# **Thank you**