

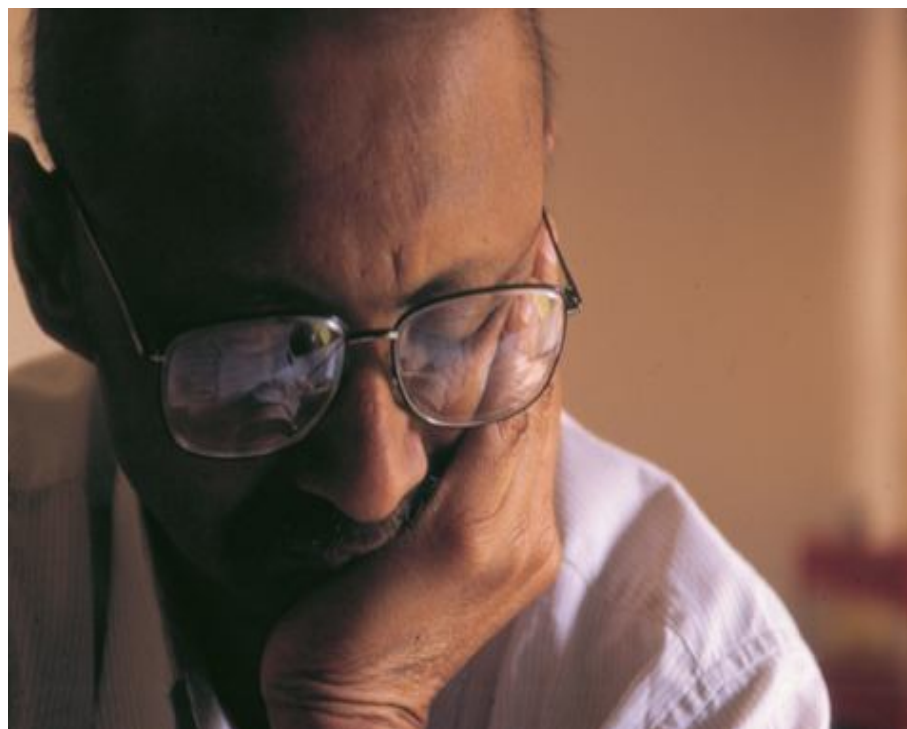
Introduction to CSE



Priyavrat Bhati

Programme Director (Energy)

-
- CSE: set up in 1980.
By Anil Agarwal.
Engineer-journalist.
 - Important period for
Env regulation –
MoEF established
 - CSE – research
based advocacy



CSE- Work Domains



Awareness Raising & Documentation	Research & Policy Advocacy	Training & Outreach
<p>Down to Earth</p> <p>Gobar Times</p> <p>State of India's Environment Reports</p> <p>Books, Documents, Journals, Databases</p> <p>Environment Portal</p> <p>Web-based info. services</p>	<p>Water Management (Rural, Urban & Rivers)</p> <p>Sustainable Industrialization</p> <p>Air Pollution & Mobility</p> <p>Green Buildings</p> <p>Policy Research & Community Support</p> <p>Pollution Monitoring Laboratory</p> <p>Food Safety & Toxins</p>	<p>Green Schools' Programme</p> <p>Media Outreach</p> <p>Regulators' programme</p> <p>Environment Training Institute (ETI)</p> <p>AAGC (students)</p>
	<p>Climate Change</p> <p>Renewable Energy</p>	



Sustainable industrialization



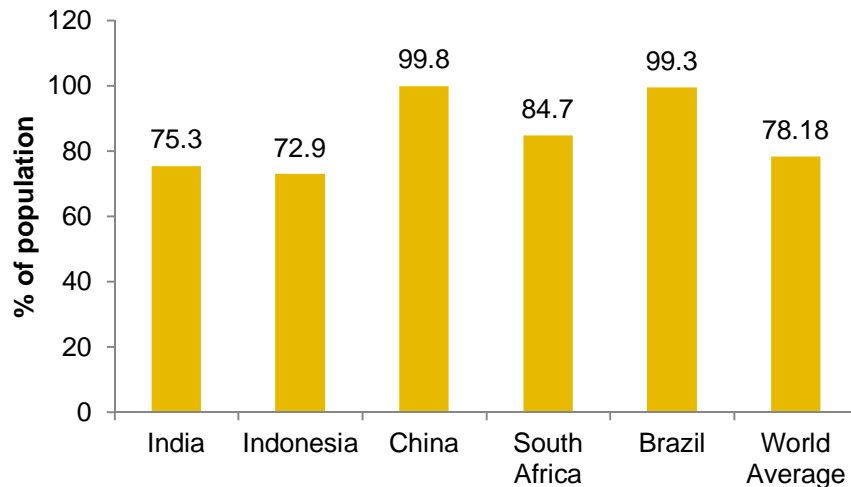
- Genesis: Green rating of industrial sectors
 - Steel, Cement, Auto, Chlor-Alkali, Paper
- In 2012, started researching power sector
- *Why rate Coal-based power sector?*
 - *Scale of env. impact*
 - Ratings and Policy Recommendations to the govt - 2015
 - Energy Group – Need for long term & wide engagement to improve the sector –
 - policy issues (discoms, renewables, rural energy access)
 - Linkage with climate change and development challenge – different from other industrial sectors
 - Implementation help at state level



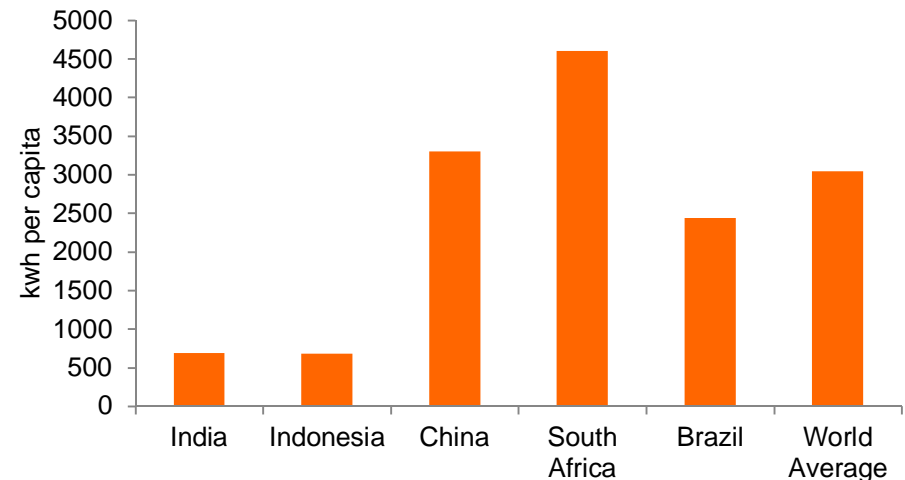
Electricity access & consumption

- Third largest power consumer in the world after USA and China.
- But, 25 % population without access to electricity ; huge population gets intermittent supply - **Lowest per capita electricity use amongst major economies** (914 kWh/p.a. in 2012 - third of the world average)
- **Govt. goal - 24x7 power to all by 2019**

Energy Access



Electricity Consumption per Capita





Electricity – demand growth

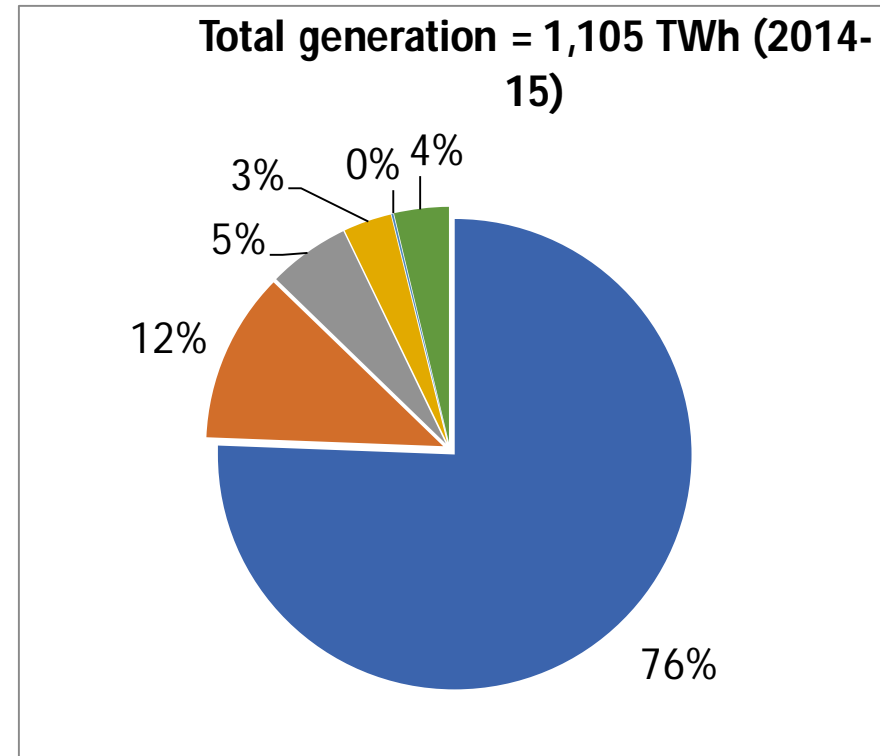
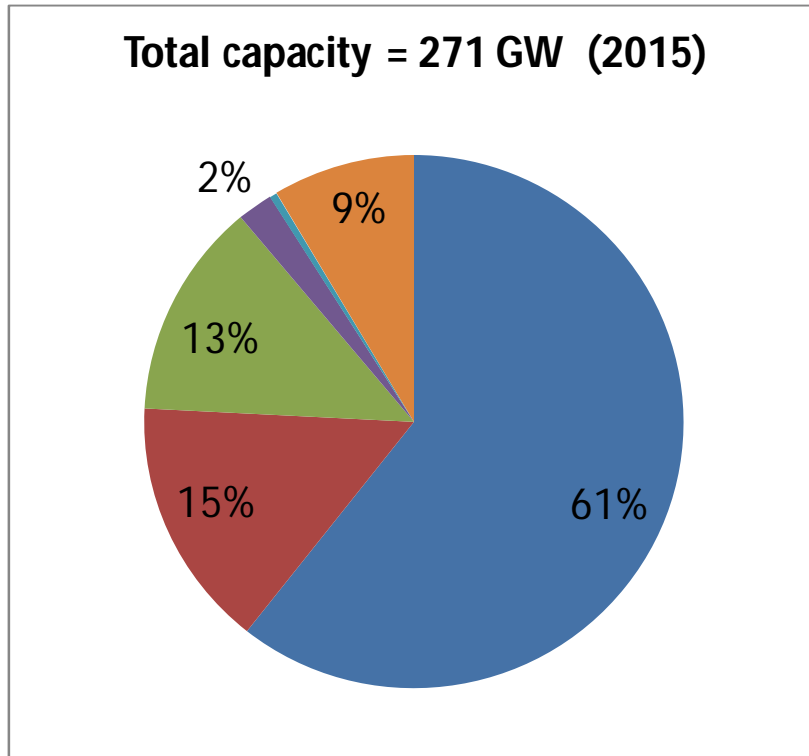
TWh	2012	2022	2030	2047
Industry	336	494	703	1,366
Residential	175	480	842	1,840
Commercial	86	142	238	771
Agriculture	136	245	336	501
Others	29	71	121	233
Total	762	1,433	2,239	4,712

Source: Niti Ayog, 2014

- Overall demand expected to grow at 5% p.a. over next 20 years
- Industrial consumption will dominate electricity demand; But, domestic consumption growth rate the fastest



Generation: Coal dominant



■ Coal ■ Hydro ■ Renewable ■ Nuclear ■ Diesel ■ Gas



COAL WILL REMAIN CENTRAL



- **COAL – 65% OF GENERATION IN 2022; 55% IN 2040**
(National Energy Policy – Draft released in July 2017)
- **But, reduced emphasis - NEP/CEA Projections**
 - RE 175 GW by 2022;
 - Coal capacity – ZERO addition needed in next 5 years;
- ...So what's the problem?

Env. Impact – Coal-based Power



A. LOCAL IMPACT

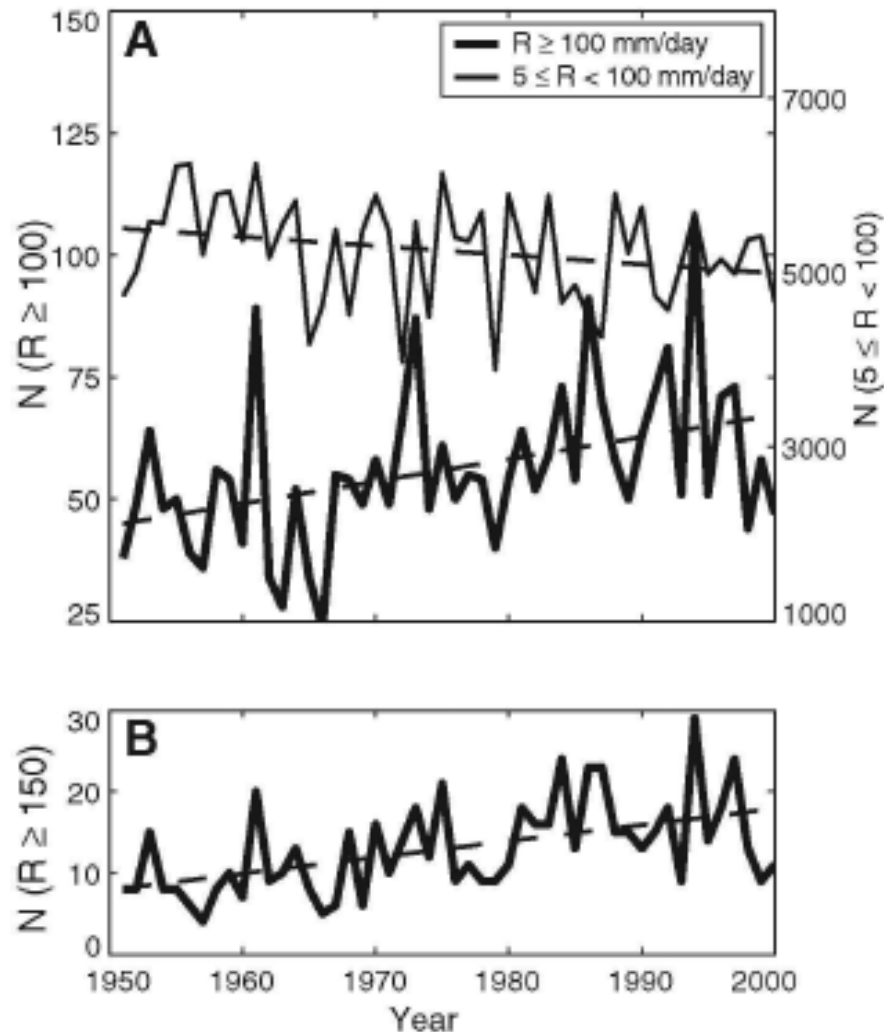
- **Air: PM, SO_x, NO_x, Mercury – 30-60% of Ind. emissions**
- **Water withdrawal**
- **Fly Ash**

B. GLOBAL IMPACT

- **Almost half of GHG from energy contributed by coal-based power. India's INDC Goals**
 - **Reduce GDP Intensity by 33-35% (2030 vs 2005)**
 - **Non-fossil fuel 40% of capacity by 2030**



Extreme rainfall events

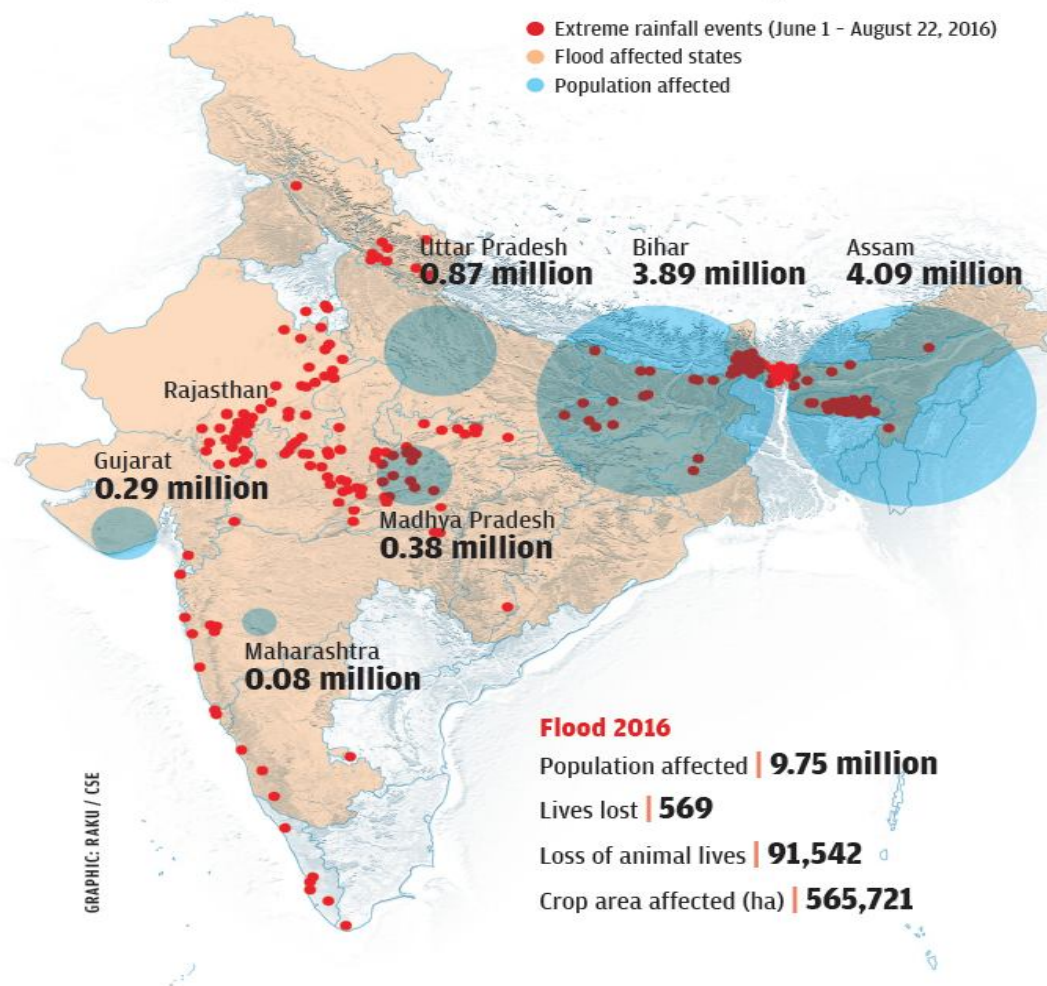


- 2005: 994 mm of rainfall in 24-hours in Mumbai. One of the highest ever recorded. 5000 dead
- 2010: “cloudburst” 150-250 mm of rainfall in 30 minutes in around Leh town (cold desert). 255 dead
- 2013: Uttarakhand, 340 mm in 24-hours; 850% more rain than normal in a week. 5700 dead
- 2014: Jammu & Kashmir, 200 mm in 24-hours. More than 300 dead

UNDER WATER



Most of the floods in 2016 were preceded by extreme rainfall events—a precipitation of 124.5 mm or more in a day

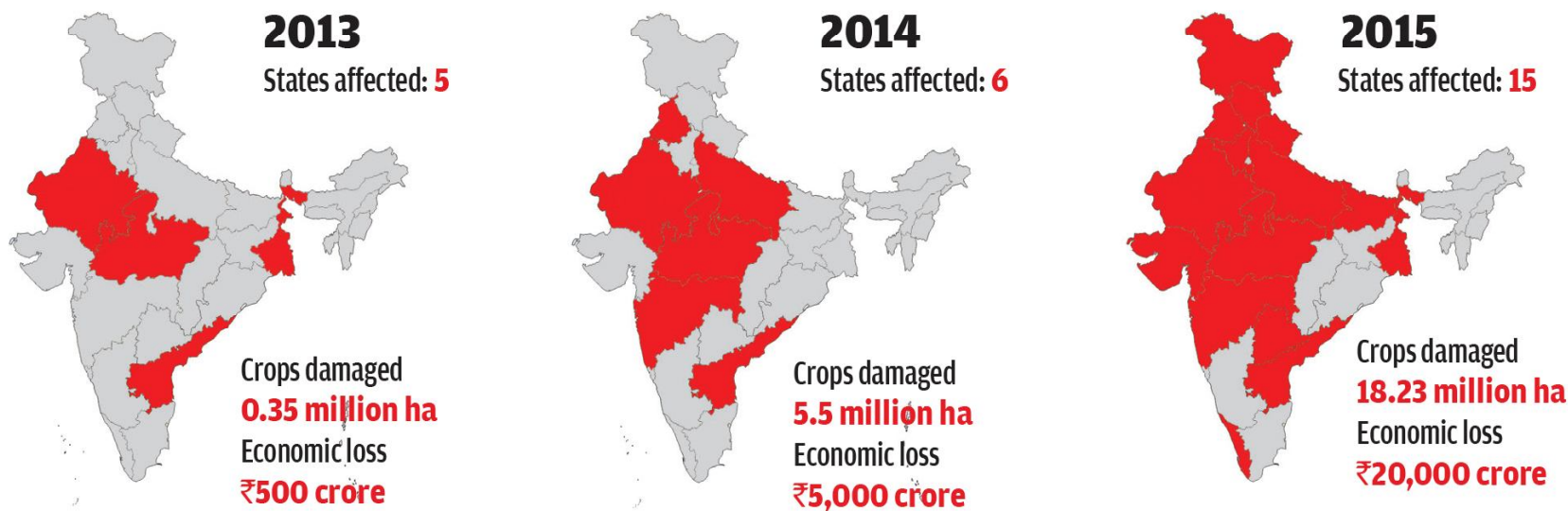


Killing fields: Season of despair for farmers



When freak becomes norm

When hailstorms and unseasonal rains destroyed large swathes of rabi crops in 2013, they were thought to be freak weather events. But they hit again in 2014, and then this year, each time with more intensity, and causing more damage



Source: Based on state estimates

ENV. ISSUES BIGGEST GLOBAL CHALLENGE



- In addition to climate change issues:
- Already serious air and water pollution in vast areas
- Severe health impact that will worsen
- Adverse impact on livelihood and economy

- However, development and sustainability can be balanced
- Controlling pollution from coal-based power is affordable
- RE will not replace coal even in several decades

- **THEREFORE, CONTROLLING COAL'S POLLUTION CRITICAL AND ALSO MOST PRUDENT ALTERNATIVE**