

Black Carbon Emissions

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Context

There is constantly growing concern about the **black carbon emission** in India which needs to be curbed.

About the Black Carbon

- It is a dark sooty material emitted along with other pollutants when biomass and fossil fuels are not fully combusted, contributes to global warming and poses severe risks.
 - It is a part of fine particulate air pollution (PM_{2.5}).
- It has been discovered to have a direct link between exposure to black carbon and a higher risk of heart disease, birth complications, and premature death.

Major Sources of Black Carbon

- Most black carbon emissions in India arise from burning biomass, including cow dung or straw, in traditional cookstoves.
- According to a 2016 survey, the residential region contributes 47% of India's overall black carbon emissions.
- Industries make a contribution a further 22%, diesel motors 17%, open burning 12%, and different sources 2%.

Related Concerns

- **Health Risks:** Exposure to black carbon has been linked to a higher chance of heart disease, birth complications, and premature death.

- Recent estimates have indicated that more than 6.1 lakh deaths per year from indoor exposure to air pollution.
- **Environmental Impact:** Black carbon contributes to global warming and poses intense dangers to the environment.
 - It absorbs solar energy, warms the environment, and when it falls to earth with precipitation, it darkens the surface of snow and ice, decreasing their albedo (the reflecting strength of a surface), warming the snow, and hastening melting.
 - Black carbon deposition on snow contributes up to 39% of general glacier melting and 10% of glacier mass loss because of decreased precipitation as discovered over the Tibetan Plateau.
 - It disrupts hydrological cycles over monsoon structures and accelerates regional warming, specifically over the cryosphere.
 - It fuels the feedback loop driving Arctic amplification, which has broader consequences disrupting the Indian monsoon.
- **Climate Change:** Black carbon is the second one biggest contributor to climate change after CO₂.
 - Unlike CO₂, which can stay in the atmosphere for hundreds to thousands of years, black carbon, because it is a particle, remains in the atmosphere only for days to weeks before it returns to earth with rain or snow.
- **Air Quality:** Black carbon influences air quality, visibility, and harms ecosystems. It also reduces agricultural productivity.
- **Socio-Economic Impact:** The health and environmental effects of black carbon will have vast socio-financial implications, including elevated healthcare expenses and decreased agricultural yields.

Government Initiatives to Curb Black Carbon

- **Pradhan Mantri Ujjwala Yojana (PMUY):** It provides free liquefied petroleum gas (LPG) connections to households under the poverty line.
 - The primary goal of PMUY is to make easy cooking gas available to rural and poor households and reduce their dependence on conventional cooking fuels.
 - It has as a consequence been able to play an essential function in decreasing black carbon emissions, as it offers a cleanser alternative to traditional fuel consumption.
- **Introduction of Cleaner/Alternate Fuels:** The government has added cleaner/trade fuels like gaseous fuel (CNG, LPG and etc.), ethanol blending.
- **Sustainable Alternative Towards Affordable Transportation (SATAT):** It has been released to set up 5000 Compressed Biogas (CBG) production plants and make CBG to be used in the market.
- **Promotion of Agricultural Mechanization:** It is the Central Sector Scheme on 'Promotion of Agricultural Mechanization for in-situ management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi', agricultural systems and gadget for in-situ crop residue control are promoted with 50% subsidy to the person farmers and 80% subsidy for the establishment of Custom Hiring Centres.
- **National Clean Air Programme:** The Central Government is imposing the National Clean Air Programme as a long-term, time-bound, national-level strategy to tackle the air pollution problem across the country in a comprehensive manner with targets to

achieve 40% reduction in particulate matter concentrations by 2025-26.

- **Faster Adoption and Manufacturing of Electric Vehicles (FAME):** FAME phase-2 scheme has been rolled out to promote the adoption of electrical and hybrid vehicles in the country.

Way Forward

- Curbing black carbon emissions in India requires a multi-pronged approach that includes promoting clean cooking fuels, enhancing business procedures, and improving public consciousness about the dangerous consequences of black carbon.
- One potential solution to this difficulty is the local production of compressed biomethane (CBM) fuel with the aid of composting biomass. CBM is a much purifier gasoline with lower black-carbon emissions and funding.
- Panchayats can take the initiative to supply CBM gas locally at the village level, ensuring every rural household can get access to clean cooking fuel.
- India pledged to obtain net-zero emissions by 2070 on the COP26 in Glasgow, positioning itself as a pacesetter within the race to carbon neutrality.

Source: [The Hindu](#)

UPSC Mains Practice Question

Q.What do you understand by Black Carbon? Discuss its impacts on the environment. (150 Words)