

Stubble burning

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Manifest pedagogy: Along with industrial and vehicular pollution, Delhi is choking because of stubble burning. The pollution is not restricted to the capital city but threatens large parts of northern plains. The issue of stubble burning can be addressed through economic incentives and political will. The topic can be asked from mains perspective especially consequences and the ways of addressing it.

In news: Pollution in Delhi has hit record-breaking levels and stubble burning is a major contributor.

Placing it in syllabus: Air pollution

Dimensions:

- What is stubble burning?
- Stubble burning and western disturbances
- Stubble burning and air pollution
- Legislative and administrative measures to control stubble burning
- Way ahead

Content:

What is stubble burning?

Stubble burning is **intentionally setting fire to the straw stubble** that remains after grains, like paddy, wheat have been harvested. Unlike manual harvesting techniques however, combine harvesters leave behind rice stubble.

It is practised in **Punjab, Haryana and Uttar Pradesh** to **clear the fields for the sowing of Rabi Crop from the last week of September to November**. There is only a two to three weeks'

time window between the harvesting of paddy crop and the sowing of the next crop.

Burning crop residue is a **crime under Section 188 of the IPC and under the Air and Pollution Control Act of 1981**. On December 10, 2015, the National Green Tribunal (NGT) had **banned crop residue burning in the states** of Rajasthan, Uttar Pradesh, Haryana and Punjab where the practice is prevalent.

Stubble burning makes both the **soil and air poisonous**. Microorganisms present in the upper layer of the soil as well as its organic quality gets affected. Due to the **loss of 'friendly' pests**, the wrath of 'enemy' pests has increased and as a result, **crops are more prone to disease**.

According to a **study by the Institute for Social and Economic Change, Bengaluru**, estimated that people in rural Punjab spend Rs 7.6 crore every year on treatment for ailments caused by stubble burning.

Stubble burning and western disturbances:

According to the Ministry of Earth Sciences' air quality monitor, SAFAR, an **increase in stubble burning in Haryana and Punjab and calm surface winds** have **increased Delhi's air pollution**. The calm surface wind that prevailed **led to strong surface nocturnal inversion and accumulation of pollutants**.

However, a **fresh western disturbance as a trough ran roughly along the Afghanistan-Pakistan border** and approached northwest India by November, 2019. This helped Delhi and cleaned up the city air substantially. The National Capital's **air quality index (AQI) improved from 'severe plus' to 'poor' at 249**.



The western disturbance **caused rainfall in Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana and Uttarakhand**. In NCR, dusty winds along with thunderstorm were witnessed. The **very**

strong winds helped with the pollution as it resulted in the smoke getting dispersed.



According to **recent CPCB updates**, Delhi's average PM 2.5 levels has been improving and settling just above the safe standards of 60 micrograms per cubic metre.

Stubble burning and air pollution:

A study estimates that crop residue burning released 149.24 million tonnes of **carbon dioxide (CO₂)**, over 9 million tonnes of **carbon monoxide (CO)**, 0.25 million tonnes of **oxides of sulphur (SO_x)**, 1.28 million tonnes of **particulate matter** and 0.07 million tonnes of **black carbon**.

These directly contribute to environmental pollution, and are also responsible for the haze in Delhi and melting of Himalayan glaciers. **Delhi** has seen the worst pollution since 2016 in October, 2019 with some parts of the city experiencing over **150 times the concentration of toxic particles** recommended by the World Health Organization.

This prompted for a public health emergency to be declared. According to **Safar**, the Indian government air quality regulator, **46% of Delhi's pollution this year was caused by stubble burning** in Delhi's neighbouring regions of Punjab and Haryana.

After a petition was submitted by environmental activists, **Supreme court ordered a complete halt to the practice of stubble burning**.

Much of the blame for the worsening pollution problem has been laid on the farmers of Punjab because, in the first week of November, the fire cases have risen in terms of absolute numbers. The **total paddy area cultivation in Punjab is almost double that of Haryana**.

But as the **machinery to manually clear the fields is expensive**, burning the excess crops is the only affordable approach for many poverty stricken farmers and they are likely to ignore the court's ruling. However, the Punjab government said they would step up efforts in the next few days to tackle the fires.

Legislative and administrative measures to control stubble burning:

- The Supreme Court has asked the governments of Punjab, Haryana and Uttar Pradesh **to immediately stop their farmers from stubble burning.**
- It has warned that their **entire administrative and police hierarchy**, from the Chief Secretary to the sarpanch to the local policeman, **will be held responsible** even if one instance of stubble burning occurs in the future.
- SC held **state governments responsible** for stubble burning.
- The court said that instance of stubble burning from now on would be **penalised.**
- It has made the **local and civic bodies as "personally responsible "** as the errant farmer who puts fire to his crop residue.
- The court said the **'Polluter Pays Principle' does apply to the State and the local bodies.**
- It recently ordered that **all farmers be given a Rs 100 per quintal incentive** to prevent them from burning stubble and provide them free machines to get rid of the agriculture residue.

Along with these, the court passed a **slew of directions** meant **to immediately reduce pollution** in Delhi National Capital Region (NCR).

- ban on construction and demolition activities, any violation would cost Rs. 1 lakh in fine).

- banned the burning of garbage in open dumps, non-compliance would mean Rs. 5000 in penalty.
- banned the use of diesel generators in Delhi NCR for the time being, violation by any industry in Delhi NCR would be hauled up for contempt of court.

Way ahead:

- Stubble can be **used in different ways** like cattle feed, compost manure, roofing in rural areas, biomass energy, mushroom cultivation, packing materials, fuel, paper, bio-ethanol and industrial production, etc.
- Farmers can also manage crop residues effectively by **employing agricultural machines like:**
 - Happy Seeder(used for sowing of crop in standing stubble),
 - Rotavator (used for land preparation and incorporation of crop stubble in the soil),
 - Zero till seed drill (used for land preparations directly sowing of seeds in the previous crop stubble),
 - Reaper Binder (used for harvesting paddy stubble and making into bundles)
- The central government with the aim of reducing crop residue burning **provides subsidies to farmers buying the machines.**
- An India born NRI businessman Chiranjeet Kathuria has proposed to set up **1,000 MW biomass energy generating plants in Punjab from the stubble** of both paddy and wheat crops.
- The crop residue would be purchased from the farmers and this would help counter environmental pollution and the **power produced by the plants set up would be fed directly into the main grid.**
- Eminent agricultural scientist **M.S. Swaminathan** has suggested that the Delhi, Haryana and Uttar Pradesh governments could set up **'Rice Bio Parks'**, where farmers

could convert stubble into products including paper, cardboard and animal feed. ((*Recently, the Chennai-based M.S. Swaminathan Research Foundation (MSSRF) established a Rice BioPark at Nay Pyi Taw, Myanmar, funded by the Union Ministry of External Affairs, which was inaugurated by the President of India*)).

- **Naandi Foundation, an NGO** that works with farmers and rural India to eradicate poverty has adopted an **initiative in Delhi's Palla village** where 800MT of paddy residue was purchased from farmers to **turn it into manure**.
- The **odd-even scheme** has been implemented in New Delhi from November 4 to November 15, 2019.

Central Sector Scheme on Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue:

- It is implemented in the State of Punjab, Haryana, Uttar Pradesh & NCT of Delhi which aims to address air pollution by subsidizing machinery required for in-situ management of crop residue for the period 2018-19 to 2019-20.
- **Components of the Scheme:**
 - Establish Farm Machinery Banks for custom hiring of in-situ crop residue management machinery.
 - Financial Assistance to the farmers for Procurement of Agriculture Machinery and Equipment.
 - Information, Education and Communication for awareness on in-situ crop residue management.
 - In-situ Crop Residue Management: The harvested crop stalks/ stubbles are chopped into small pieces and incorporated in-situ into the soil with varying efficiencies depending upon the left over residue.