

## General Studies-3; Topic: Environmental pollution and degradation

### Stubble Burning and Air Pollution

#### Introduction

- People of Delhi, and the Indo- Gangetic plains at large, are living in a “highly-polluted airshed”.
- As winter dawns, the wind slows, temperatures drop, and suspended particulate matter (PM) accumulates.
- Wind coming from the northwest picks up pollutants from Punjab and Haryana and brings them to Delhi, worsening its already polluted air.

#### Why do farmers burn paddy stubble?

- Stubble burning is the **easiest and most cost-effective option**.
- Farmers who are unable to use or sell straw are burning it. Non-basmati straw is not used as animal fodder and hence is burnt.
- Small farmers and tenant farmers are more likely to burn the stubble as they have **fewer resources and risk appetite for using alternative technologies**.

#### Agriculture’s contribution to air pollution

- The Indo-Gangetic plain is one of the world’s largest and rapidly- growing ammonia hotspots.
- Atmospheric ammonia, which comes from fertiliser use, animal husbandry, and other agricultural practices combines with fossil-fuel burning to form fine particles.
- The burning of one tonne of paddy straw releases 3kg particulate matter, 60kg carbon monoxide, 1,460kg carbon dioxide, 199kg ash and 2kg sulphur dioxide.
- The **stubble burning shoots up the carbon dioxide levels in the air** by 70%.
- The concentration of carbon monoxide and nitrogen dioxide also rises by 7% and 2.1% respectively, triggering respiratory and heart problems.
- PM2.5 emitted from stubble burning in just 60 days is 4-5 times what all Delhi vehicles emit in the entire year.

#### Impact of Subsidies

- The irony of agricultural pollution is that taxpayers are essentially paying for it through a system of subsidies.
- Much of the policy attention has focused on how to change the disposal of paddy stubble, but the current system of subsidies is the reason that there is stubble on these fields.
- **Free power** — and consequently, “**free**” water, pumped from the ground — is a big part of what makes **growing rice in Indo- Gangetic plains attractive**.
- **Open-ended procurement of paddy**, despite the bulging stocks of grains with the Food Corporation of India, adds to the incentives.
- Subsidies account for almost 15 per cent of the value of rice being produced in Punjab- Haryana belt.
- **Fertiliser Subsidy**
  - The roots of rising ammonia pollution lie in the way fertiliser is used.
  - Fertiliser, particularly urea in granular form, is highly subsidised.

#### What farm fires cost India

- The **International Food Policy Research Institute (IFPRI)** has estimated economic and health costs of air pollution caused due to stubble burning in North India — which is around \$30 billion or Rs 2 lakh crore per year.
- This is more than thrice the amount the Union government spent in its budget for the health sector.

## Concerns / Challenges

- There has been a ban on burning this agricultural residue, but the State authorities have not been able to entirely stop it.
- The rapid pace of burning of crop residue in Punjab despite being provided a large number of machines under the **crop residue management (CRM)** is a cause of concern for the state government.
- The claims of various district administrations of various village panchayats passing resolutions against stubble burning are falling flat.
- Within a month when paddy stubble burning had started, the field fires have recorded almost threefold increase when compared with previous year.
- Though rentals for machines have been waived off, small farmers are finding it tough to pay for cost of diesel.
- **Happy seeder** costs Rs 1.50 lakh and requires a 65-horsepower tractor. Small farmers cannot afford to buy the machinery, even with a subsidy of 50% at current rates.
- Stubble burning also causes poor visibility due to smoke resulting in accidents at far-off places.

## International Examples

- **China** banned burning crop residue in 1999 and imposed heavy fines.
- Crop residue management (CRM) in China has “in situ” focus which helps balance composition of nitrogen, phosphorus and potassium in the soil.
- In **Australia**, comprehensive guidelines exist to check crop residue burning.
- The **United Kingdom** banned crop residue burning in 1993.

## Way Forward

- **What we need is a solution that is scientific, affordable, and culturally adaptable.**
- We can redesign the Combine Harvester to cut the paddy straw from the plant's base to remove the stem.
- The straw can either be sold or used as mulch in zero tillage agriculture.
- We can even incorporate a baling machine to the Combine to bale the straw, which can then be easily transported and sold.
- Agriculture conservation should be promoted with “low lignocellulosic” crop residues such as rice, wheat and maize.
- The Economic Survey noted that thermal power plants in the vicinity ought to be encouraged to undertake co-firing of crop residues with coal.
- We can replace products made of single-use plastic with stubble.
- Delhi government could impose a “**clean air**” **tax/cess** on the people of Delhi and use the funds to pay the farmers of Punjab/Haryana to abandon burning crop stubble/use an alternate method of disposal.