Menace of Stubble Burning

*This article is based on **"Addressing north India's burning issue sustainably"** which was published in The Indian Express on 22/10/2022. It talks about the issues associated with Stubble burning in India and solutions.*

For Prelims: Stubble Burning, Mechanised Harvesting, Carbon Monoxide (CO), Smog, Delhi's Air Pollution, Climate change, Kharif Crop, Rabi Crop, Pusa Microbe, Happy Seeder.

For Mains: Issues Associated with Stubble Burning in India, Recycling and Reusing Stubble.

The **Green Revolution** transformed the way agriculture was practised in India, **especially in Punjab and Haryana**. The economics of high-yielding varieties of paddy and wheat, supported by a guaranteed buyer (the government) and minimum support prices **led to a crop duopoly, and vitalised the practice of** stubble burning.

According to an **official report,** more than **500 million tonnes of parali (crop residues) is produced annually in the country,** cereal crops (rice, wheat, maize and millets) account for 70% of the total **crop residue.**

Stubble burning begins around **October and peaks in November, coinciding with the withdrawal of** southwest monsoon**.**

The **prevention of stubble burning is not guaranteed by only banning and punishing the farmers.** In order to prevent this from happening in the future, **there needs to be a permanent and effective solution.**

Why is it still Being Practised?

- The Indian farmers have been practising stubble burning for decades now and multiple factors lead to it. Some of them are:
    - One factor is being a **cheaper way to get rid of crop debris.**
    - Another is the boom of **Mechanised Harvesting**, which leaves behind **1- 2ft tall stubble which takes around 1.5 months to decompose on its own.**
        - However, **farmers do not have sufficient time as they need the soil prepared for the next crop,** so instead of waiting for the residue to decompose they burn it.

What are the Issues Associated with Stubble Burning in India?

- **Environmental Degradation:** Stubble burning **emits toxic pollutants** in the atmosphere containing harmful gases like Carbon Monoxide (CO), **methane (CH4), carcinogenic polycyclic**

aromatic hydrocarbons, volatile organic compounds (VOC).
    - These pollutants disperse in the surroundings and **eventually affect air quality and people's health by forming a thick** blanket of smog. This is one of the primary causes of **Delhi's air pollution.**
- **Soil at Risk:** Soil becomes **less fertile, and its nutrients are destroyed** when the husk is burned on the ground. It **generates heat that penetrates into the soil,** causing an increase in erosion, **loss of useful microbes and moisture.**
    - Due to the **loss of 'friendly' pests, the wrath of 'enemy' pests has increased** and as a result, **crops are more prone to disease**. The solubility capacity of the upper layers of soil have also been reduced.
- **Climate Change Induced Stubble Burning:** The **shortened harvesting season due to** climate change has forced the farmers to **rapidly clear their fields between the** kharif and rabi crops, and the quickest of these ways is to burn off the remaining stubble post-harvest.
- **Increased Backing, Increased Burning:** Policy moves in subsequent decades has included the introduction of **subsidies for electricity and** fertilisers, **and ease of access for credit in agriculture** has significantly increased the crop yields and agricultural productivity, that has in turn **cemented the issue of stubble burning.**

What is Chhattisgarh Model of Stubble Utilisation?

- An innovative experiment has been undertaken by the **Chhattisgarh government by setting up gauthans.**
- **A gauthan is a dedicated five-acre plot, held in common by each village,** where all the **unused stubble is collected through parali daan (people's donations)** and is **converted into organic fertiliser** by mixing with cow dung and few natural enzymes.
    - This scheme has also **generated employment among rural youth.**

What should be the Way Forward?

- **Post-Harvest Regulation and Incentivisation:** There is a need to replicate the schemes like the **MGNREGA** for **harvesting and composting of stubble burning,** and **regulate** post-harvest management at ground level.
    - The **government can also provide incentives to farmers** who reuse and recycle their stubble.
- **Using Stubble as a Fodder: Wheat stubble can be used as a** fodder for cattles, the **Tudi,** which is made from wheat stubble, is considered to be the **best dry fodder for cattle** because of its nutritional value.
- **Technical Intervention:**
    - **Microbe Pusa:** Several innovative measures have been developed to reduce stubble burning, **The Indian Agricultural Research Institute developed a** microbe Pusa, that **hastens decomposition and converts stubble to compost** within 25 days, **improving soil quality** as a result.
    - **Happy Seeder:** Instead of burning the stubble, a **tractor-mounted machine called the** Happy Seeder can be used that **"cuts and lifts rice straw, sows wheat into the bare soil, and deposits the straw over the sown area as mulch.**
- **Recycling and Reusing Stubble: Stubble can be recycled** to make products including **paper and cardboard**. Also, it can be used as a manure.
    - For example, in **Palla village outside Delhi,** the **Nandi Foundation purchased 800 MT of paddy residue from farmers to turn it into manure.**
    - Crop residue can also be used for various purposes like charcoal gasification**, power generation, as industrial raw material for production of bio-ethanol.**

Drishti Mains Question:

Highlight the issues associated with stubble burning in India. Also, suggest innovative measures to recycle crop

UPSC Civil Services Examination, Previous Year Question

Prelims:

Q. Consider the following agricultural practices: (2012)

1. Contour bunding
2. Relay cropping
3. Zero tillage

In the context of global climate change, which of the above helps/help in carbon sequestration/storage in the soil?

(a) 1 and 2 only
(b) 3 only
(c) 1, 2 and 3
(d) None of them
Ans: (b)

Mains:

Q. What are the major factors responsible for making the rice-wheat system a success? In spite of this success, how has this system become bane in India? (2020)
