Managing Stubble Burning – Haryana & Punjab

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Haryana government's target is to contain the crop residue burning cases up to 3,000 during the current paddy harvesting season. This year, the paddy cultivation in Haryana was spread across 34.35 lakh acre as basmati was grown in over 18 lakh acres and non-basmati varieties in 16.26 lakh acres. The estimated total quantity of straw being generated is about 70 lakh metric tonnes, officials said, adding that since basmati is harvested manually, the total crop waste to be managed was expected to be around 40 lakh MT. Hence, the agriculture department has set the target to tackle 23 lakh MT stubble with in-situ management (machinery/decomposer) and 13 lakh MT stubble with ex-situ management (in industries).

Punjab had increased by 18% over the last year till November 3, while in Haryana, the farm fires had been brought down by at least 31%.

What is stubble burning?

Stubble burning is the practice of intentionally setting fire to the straw stubble that remains after grains, such as rice and wheat, have been harvested. Farmers resort to the practice due to the limited time they have between the harvesting of kharif paddy and sowing of the rabi wheat. They find it cost-effective and quick.

Why do farmers prefer to burn stubble?

Long term causes

- **Policy issues:** In 2009 the Punjab government made a law that barred farmers from planting paddy before the dates notified. This was done to time plantings to the arrival of the annual monsoon. This enforced delay in planting pushed the date of harvest to November, which meant farmers had to quickly clear their fields to plant wheat. A delay means lower yields. Due to this short window, farmers took to burning the crop residue in larger numbers.
- **Lack of trust on crop residue management machinery:** Farmers fear a decline in productivity if crop residue management machines (happy seeder and super seeder) are used.
- The lack of supply chain constituents like biomass aggregators, processors, and storage facilities have made the existing ex-situ ecosystem a failure.

Immediate causes

- **Cost-related issues:** Rising prices of diesel pushed up the operational cost of using these machines. Fuel accounts for a quarter of the cost of operating these machines.
- **Farmer protest:** Some farmers seem to be putting their fields on fire as a mark of protest.

Impact of Stubble Burning:

- Reduced Lung Function: Pollution from stubble burning has significantly reduced lung function and was particularly harmful to women.
- High PM2.5 levels: The concentrations of PM2.5 (category of unburnt carbon particles considered most harmful to respiratory health) were found to increase more than twice between the two-time frames.

- More Symptoms: During the crop residue burning period, a two to three-fold increase was noted in most of the respiratory symptoms. The highest number of respiratory complaints were reported by the elderly population (>40-60) and the lowest in the younger age group(>10-18).

Government Measures:

- On December 10, 2015, the National Green Tribunal (NGT) had banned crop residue burning in the states of Rajasthan, Uttar Pradesh, Haryana and Punjab. The Supreme Court, in November 2019, had directed the governments of Punjab, Haryana and Uttar Pradesh to pay farmers a financial incentive to curb the practice.
- Ministry of Power has made biomass pellets mandatory in some coal-fired thermal power plants that would utilise the agricultural waste usually burnt by farmers.
- Crop residue management machinery has been supplied to farmers. However, reports suggest low utilisation as farmers perceive the purchase or rent of such machineries to be an additional expense. Farmers prefer ex-situ management of crop residue through equipment such as balers as opposed to in-situ machinery. Under a 100% centrally-funded scheme, in-situ residue management machines are given to individual farmers at 50% subsidy and to CHCs (custom hiring centres) at 80% subsidy.
- In 2020, the Government of Punjab appointed 8000 nodal officers in villages that grow paddy in order to put a check on stubble burning. Already, penalties for stubble burning are imposed on farmers who break the law and resort to burning crop residue.

Potential Solution: Way Forward

- Using machines to incorporate crop residues into the soil, using straw as boiler fuel or for manufacturing packaging materials.
- Scaling up biomass-based power generation to 1,000MW in a year, the problem of stubble burning in northern India can be remedied significantly.
- Discoms should pay a bit extra for biomass-based renewable energy for the sake of clean air.
- Assured government purchase at support prices for pulses like masoor and oilseeds like groundnut.
- Ex-situ management of crop residue can also be explored under the schemes covering products such as bales and pellets for biomass power generation and supplementary feedstock in coal-fired power plants.
- Introduction of a dynamic monitoring system, which maps stubble burning events to beneficiaries of the schemes.

Recently: Delhi government announced that it would spray Pusa bio-decomposer free of cost over 5,000 acres of paddy fields in the city as this would help in controlling stubble burning and air pollution during winter. (September 2022) It is essentially a fungi-based liquid solution that can soften hard stubble to the extent that it can be easily mixed with soil in the field to act as compost. It produce enzymes to digest cellulose, lignin and pectin in paddy straw. It is developed by the Indian Council of Agricultural Research (ICAR) and named after ICAR’s campus at Pusa in Delhi, It rapidly converts crop residues, animal waste, dung and other waste into organic manure. It is an inexpensive and effective technology for agricultural waste and crop residue management.