

# A plan to manage stubble



Providing market avenues for crop residue and legal backing against polluting practices could end farm fires

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TILL A FEW decades ago, crop residue, including stubble, was used as dry fodder for livestock or as fuel for the kitchen or incorporated in-situ in soil. It wasn't burnt, at least not on a large scale. Things started changing in the 1990s. Two factors contributed. One, free or highly subsidised power supply for groundwater extraction. Power supply to the farm sector in Punjab has been free since 1997, while in Haryana, it is subsidised. With access to assured irrigation, paddy acreages in Punjab grew from 50 per cent of the net sown area in the mid-1990s to 75 per cent in recent years. In Haryana, this jumped from 30 per cent to 40 per cent.

As paddy harvesting and threshing are labour-intensive, this pushed up the demand for labour. In the absence of cheap labour, machines like the Combined Harvester appeared on the scene. This machine only picked the plant's top part (panicle) and left the remaining stalk of about 2-3 feet (stubble) standing in the field. Clearing this stalk now required a separate round of harvesting, collection and disposal. The easy solution was to set it on fire. In manual harvesting, stalks are harvested close to the ground. They were later collected at one place and grain was recovered through manual beating. The remaining stalk was piled in a corner of the field where it decomposed slowly. This occupied a small area and farmers did not mind sparing that for storage of paddy straw.

There have been incidences of stubble burning wherever a combined harvester has been used. Such incidents are being reported from paddy fields in central and eastern Indian states as well. There is thus a need to find a solution to farm fires, considering the situation in the entire country. Of course, the situation is very serious in northwest India and critical in the National Capital Territory Region.

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ments have not done anything to alleviate the problem. There have been multiple initiatives including applying a decomposer to encourage in-situ management of stubble or using the direct seeding of rice (DSR) technique. But the problem remains intractable.

It is also believed that finding an alternative to paddy or reducing the duration of the rice crop — early harvest would leave a longer period for the next crop — would address the farm-fire problem. It will mitigate the environmental problem to a small extent. An alternative crop like maize will also produce large amounts of stubble like paddy, and only a small part of that will have demand as dry fodder. Early maturing varieties of paddy will surely give farmers a longer period to dispose of straw but in large areas where paddy matures early, farmers either grow crops like potatoes or continue to burn straw. Only in a small area do farmers go for in-situ incorporation.

We propose two solutions.

One, rethinking the policy of providing free power. This is also needed to avert the over-exploitation of groundwater. However, a simple shift to a metered supply of power will not be acceptable without compensating farmers' income for the cost of power. One possibility is to give a direct cash/benefit transfer (DBT) instead of a power subsidy. By indexing the DBT amount to inflation in power tariffs, this amount can grow annually and remain relevant for farmers. This will make diversification away from paddy feasible.

Two, create a market for paddy straw/stubble. Unless stubble is made valuable for farmers, they will continue to burn it. We need to create an effective market for stubble that at least compensates them for the extra effort and cost involved in its harvest, collection and disposal.

Baling machines (balers) for paddy straw are already in use in Punjab and Haryana, which has made it feasible to put paddy and other crop straws in the value chain. On average, an acre of land generates about 2.5 tonnes of paddy straw. The cost of baling this stubble is anywhere between Rs 1,000 to Rs 1,100 per acre (including the cost of cutting, raking, packaging and stor-

ing bales on land). From our estimates, it appears that a price of Rs 1,000-1,200 per tonne of bale of parali, covers the costs and leaves a small margin for the farmer. Punjab generates about 20 million metric tonnes (MMTs) and Haryana has about half of this. About 85 per cent of it is burnt in the field. Thus, the total cost of procuring the entire parali burnt in the field in Punjab comes to Rs 2,000 crore and, in Haryana, about Rs 1,000 crore.

A small market for paddy straw sold in compact bales has already emerged in both the states for production of biofuel such as BioCNG and ethanol and as direct fuel in brick kilns, furnaces, and thermal plants. Some enterprising farmers have sold parali at Rs 180 per quintal this season — this can be treated as an indicative market value. This market is picking up but at its current pace, it will take many years to match the supply.

Therefore, ways and means need to be put in place for adequate availability of balers and incentives introduced for the use of stubble as a biofuel. Among various options, the use of straw for the production of compressed biogas through methods of anaerobic digestion is best from economic and environmental perspectives. It also produces bio-slurry, which can go back into the soil to replenish soil fertility. It is a matter of supporting the supply chains of paddy straw initially for four to five years. This will set the trend for converting agri waste into wealth and promoting a circular economy in agriculture in the entire country.

Further modifications and subsidised supply of machinery for in-situ use of paddy stubble will also be very helpful in preventing farm fires in some areas.

Once an effective channel for procuring paddy straw is created, a law against the burning of any crop straw should be strictly enforced. With market avenues for crop residue, legal backing against polluting practices and administrative support, the proposed system can work to prevent stubble burning while saving the health of millions of lives and contributing to the economy.

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