

How to end Delhi's pollution

A concerted approach combining better regulation, environmental awareness creation and commercial logic can incentivise farmers to adopt cleaner practices

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The issue of air pollution across northern India, especially in the cities and towns of the Ganges basin, has assumed the magnitude of a national calamity. Over 50 million people in Delhi-NCR are directly affected, with the air quality index plummeting to "severe". With thick smog engulfing the entire region, the administration issued advisories to shut schools and limit outdoor activities. The period from late October to mid-November is particularly severe. Different studies show that the contribution of crop stubble burning to carbon monoxide and atmospheric aerosol, especially of PM_{2.5}, ranges between 20 per cent and 40 per cent.

While the reasons behind stubble burning, including its commercial/economic logic in the context of smallholder farmers, are well-known now, the key questions are: Can this practice be stopped altogether? And in an abrupt manner?

Technically, the answer is "yes". If the governments of Punjab, Haryana and Uttar Pradesh collaborate, bring in tougher laws and penalties against stubble burning, and implement these with seriousness, it is possible to bring about a drastic reduction in the practice. However, there are a number of "ifs" that are unlikely to get resolved in the near future. The most important is a common intent among the political parties in power in these states to rise above vote bank politics and act in concert.

The need of the hour is to follow a comprehensive approach that combines regulation, better awareness (of the environment), commercial logic and a behaviour change among farmers to create a shift towards clean practices.

This article discusses three key interventions that can change the current scenario.

CHANGE IN CROPPING PATTERN

The current rice-wheat cropping system is clearly untenable. Paddy is sown in the monsoon, followed by wheat in the winter. This combination of crops leaves a window of just 10-15 days for farmers to clear the paddy field and sow wheat. Given the shortage of farm labour and the high cost of hiring, stubble burning is the cheapest and quickest way for a large number of smallholder farmers to get their land ready for the next crop. Further, farmers grow paddy in standing water, with the crop requiring around four million litres of water per hectare. An estimated 2.5 million farmers currently cultivate paddy in 2.5 million hectares of land.

Four million litres of water per hectare on four million hectares means a mind-boggling 16 trillion litres of water used in a single crop cycle! A major part of the water is pumped out from deep underground, leading to severe groundwater depletion in the entire region. However, maize, which is one of the traditional crops of the region, requires just about a fifth of the water required by rice. The productivity of maize is equal to or more than paddy, and the crop duration is around 100 days. This leaves a window of at least 30 days for sowing the next crop. Maize stubble is readily used as fodder, or could be preserved for a longer duration through conversion into silage and hay.

The question is: How does the government promote maize in place of rice? Strengthening farmer contact, awareness building and increasing the minimum support price (MSP) for maize would surely help. However, the time has come for the governments of Punjab and Haryana to take the unpopular route of cutting electricity subsidy, taxing irrigation water and refraining from any further increase in



People wear masks amid heavy smog, as the air quality dips to the hazardous 'severe plus' category in Delhi, earlier this month. A thick layer of smog has enveloped the Capital through most of November

paddy MSP. This would curb the rampant practice of flood irrigation and create enough incentives for farmers to reduce the area under rice cultivation.

ADOPTION OF HAPPY SEEDER

This device, mounted on a tractor, has been found to be effective in sowing wheat seeds amid crop residue soon after paddy has been harvested, thus nullifying

the need for stubble burning.

If Punjab and Haryana cut the electricity subsidy, tax irrigation water and stop increasing paddy support prices, farmers will reduce the area under rice

However, the cost of the device is prohibitive for smallholders, and its utility is restricted to just 15 days in a year. To promote the Happy Seeder on a large scale, the government has to increase the subsidy allocation. More importantly, the government has to come up with a revenue model involving many more ecosystem players — such as local agri-entrepreneurs, farmers' organisations, startups and panchayats — to enable farmers to access the services of the Happy Seeder at an affordable price.

CONVERSION OF CROP STUBBLE INTO ORGANIC MANURE

Recent experiments at the Indian Agriculture Research Institute in the conversion of crop residue into organic manure hold out the promise of solu-

tions to the problem. Fixing an attachment to the crop harvester enables the crop to be cut much closer to ground level.

Once the grain is removed, the crop residue can be fully converted into organic manure with the help of a consortium of microbes. The aerobic process of composting is rapid, requiring between 21 and 45 days, and it cancels out methane emissions.

It requires just about 1/300th the area of the main field to accommodate paddy crop residue and convert it into well-balanced organic manure. The remainder of the field can be prepared for the next crop soon after the paddy is harvested. The manure enriches the soil with precious organic carbon that otherwise would have broken down and been released in the atmosphere in the form of toxic carbon monoxide or methane.

Returning to the issue of air pollution and sustainability, is it fair to put the blame only on farmers? After all, who is contributing to the other two-thirds of the pollution? While cutting subsidies on electricity and irrigation water used by farmers is certainly needed, it is also important to reflect on why citizens of Delhi need electricity and water at such low rates. Does it promote responsible behaviour and judicious use of natural resources, and reduce our carbon footprint?

The writer is with PRADAN

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