

Manage stubble to control air pollution: Recycling it can reduce weedicide use by 70% and water use by 40%

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The recent spike in air pollution levels across northern India has raised concerns about the health of hundreds of millions of people living here. A significant proportion of air pollutants arises from burning of crop residue across the agricultural heartland. At its centre is a lack of clarity among farmers about the likely cost versus potential benefits of alternative approaches, as we saw in a pilot that we undertook last year in 19 villages over 16,000 acres of farmland in Punjab, working with over 3,000 farmers.

Our project helped in making 75% of the land stubble burning free – compared to just 3.5% in 2017 – with four of five farmers taking up alternative practices. About 25,000 tonnes of rice straw were recycled back into the soil, saving fine particulate matter being released into the air and adding nutrients to the soil. Immediate tangible benefits realised by farmers included time saved in field preparation and sowing operations by 7 to 10 days, reduction in weedicide application by 50-70% and lower irrigation requirement by 40%. Yield levels in wheat remained comparable with traditional

fields and overall production costs decreased in general.

CIH's experience in the field throws up insights in various policy areas that need to be addressed. A lack of knowledge among farmers is a key deterrent. Farmers require real-time support and handholding for taking actions specific to their terrain, soil conditions, rainfall patterns, crop variety, etc and it is critical to strengthen farmer advisory services to provide the right knowledge inputs at the right time.

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Further, effective communication and outreach to farmers is essential. Farmer cooperatives, farmer-producer organisations, and community platforms such as panchayats can be harnessed for this. Mass awareness drives in focus districts can be carried out by trained government officials and volunteers. Farmers would also benefit greatly from



technical training. In our project, such trainings were organised in partnership with the Punjab Agricultural University, Haryana Agricultural University, district agriculture offices of Department of Agriculture and Farmer Welfare and Krishi Vigyan Kendras. The response from farmers is very encouraging.

Lack of access to farm equipment for in-situ straw management has been a major hindrance. The government launched a scheme for agriculture mechanisation in 2018, providing a subsidy for purchase of required machinery such as Happy Seeders, zero till, mulcher, etc. The subsidy scheme should be extended beyond March 2020 to give it time to build mass use of mechanisation, which will favourably impact agricultural productivity.

Also, this scheme requires to be tweaked in several ways for optimal benefits. To reduce the burden of upfront payment by farmers for machines with subsidy being reimbursed later, the scheme could be integrated with bank and NABARD schemes to facilitate credit linkages.

The subsidy scheme must also include all recommended machines, giving farmers various options depending on the practice they prefer to adopt. For example, our pilot found that a combination of rotavator and seed drill (or Roto Seeder) is quite popular among farmers and equally effective in checking straw burning. The subsidy scheme should also enhance access to tractors of more than 45 hp capacity, a necessity for operating machines such as Happy Seeder.

To avoid partial burning of straw, the scheme can popularise the Super Straw Management System through a strict quality control system. Combine harvester machines when not mounted with Super SMS tend to create large heaps of straw in the field that are usually burnt by farmers in a controlled manner. Government must also encourage machines for ex-situ use of straw. For example, in about 10-15% of farmlands where paddy is alternated with potato or vegetable crops, farmers usually prefer to take the straw out of the fields rather than adopting mulching or incorporation.

Ex-situ straw management includes small scale options as well as large scale industrial use of the residue – which could include uses such as composting, biogas, fodder, fertilisers, fuel, fibre boards. R&D for the entire straw value chain is required and could develop business models for rural entrepreneurs. Actively supported by corporates, government departments, state universities, farmer communities and volunteers, our project is set to make 100,000 acres of farmland stubble-burning free. The air that we breathe is for all and all of us must work collaboratively to ensure that it remains clean and healthy.

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