

Press Release

India Clean Air Summit #ICAS2024

Bengaluru, 29 August 2024

Beyond Burning: Solutions for Sustainable Stubble Management in Punjab

An in-depth study on effective management of stubble in Punjab

Key takeaways

- New CSTEP study provides a regulatory framework to further reduce stubble burning in Punjab
- There is a significant gap in the supporting infrastructure for ex-situ stubble management options
- Study suggests measures for creating a reliable stubble market
- Ex-situ stubble management efforts should primarily target medium- and large-scale farmers
- Building adequate infrastructure and strengthening the supply chain are critical for successful stubble management

B-roll video for TV and digital news desks:

<https://www.youtube.com/watch?v=xTQ55HQ0piA>

As we head into yet another rice harvesting season in Punjab, the search for effective solutions to manage stubble continues. In 2021, over 50% of the rice stubble in the region was burnt, a practice that exacerbates respiratory illnesses, depletes soil fertility, and increases air pollution across neighbouring states.

The Center for Study of Science, Technology and Policy (CSTEP), a research-based think tank, has conducted an in-depth study of stubble management in Punjab to address this complex challenge. The major findings have been compiled in a policy brief titled *Stubble Management: Harnessing Ex-Situ Options and Market Mechanisms*, which was launched during the sixth edition of the [India Clean Air Summit](#) (ICAS), CSTEP's flagship event on air pollution, held in Bengaluru.

Swagata Dey, Policy Specialist at CSTEP and one of the authors of the policy brief, said that 'By devising methods and means to utilise stubble profitably, we are putting a monetary value on a byproduct that would otherwise have a nuisance value. We need to create infrastructure, an

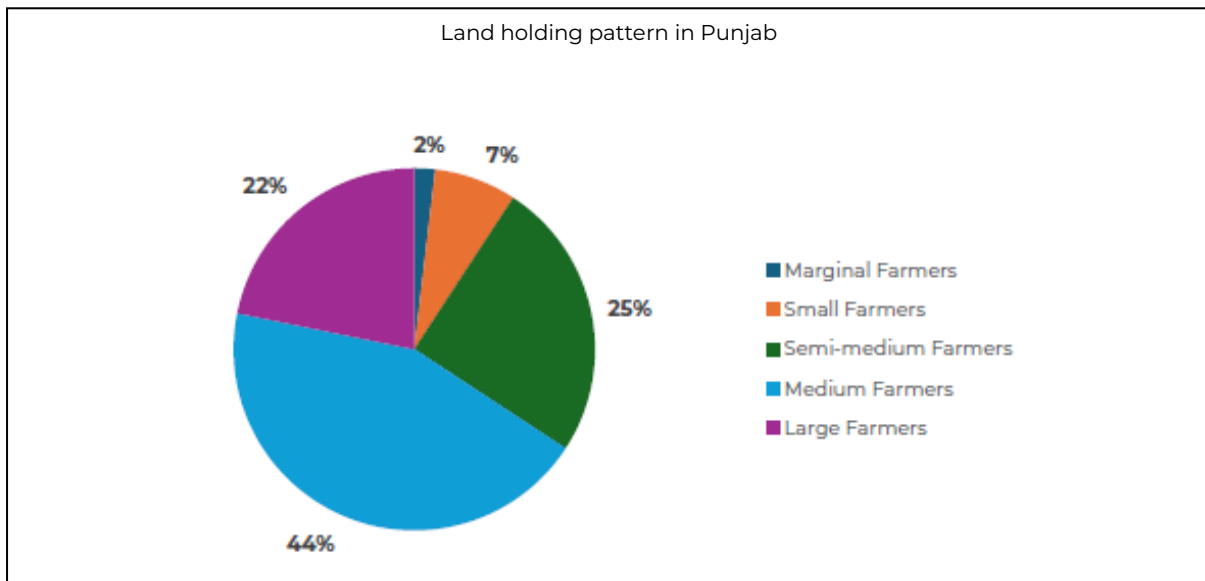
efficient market, and a regulatory framework, which together will help create robust ex-situ mechanisms for utilising stubble. Farmers in Punjab are industrious, so with a little handholding, they will soon be able to adopt these methods instead of resorting to burning stubble’.

The ex-situ management of rice stubble involves the collection of crop residue and transportation to various processing facilities for further use or conversion into pellets or briquettes. A major barrier to the effective use of ex-situ options for stubble management is the absence of an efficient market that connects agricultural stubble from farms with end users. Several critical components, such as ensuring sufficient supply and demand, developing transportation and storage infrastructure, and improving the regulatory framework, need to be combined to develop this market.

The policy brief conceptualises a regulatory framework to enhance the supply of stubble, establish adequate infrastructure for a robust supply chain network, and stimulate demand. This would help generate alternative revenue streams and promote start-ups involved in stubble management.

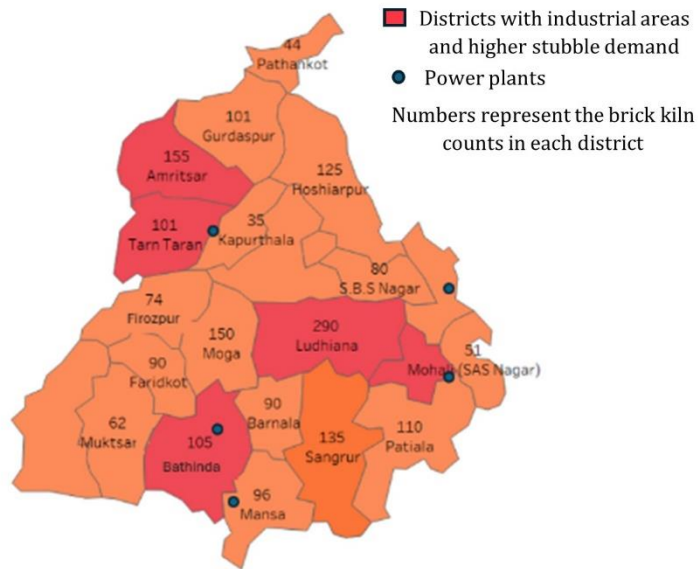
One of the key recommendations suggested in the study is enhancing supply by incentivising farmers. Farmers spend around INR 1,500–1,800 per tonne on cutting, baling (the process of compressing and bundling materials), and transporting straw to straw banks, either directly or through aggregators. Subsidising these costs could reduce the financial burden on farmers, especially if the cost incurred by the farmers to remove stubble from the field is paid upfront.

Targeting farmers with a land area greater than 4 hectares for ex-situ management is another key measure that can leverage economies of scale and maximise resource allocation. Stubble burning tends to be more prevalent among medium- and large-scale farmers than among small-scale farmers. Hence, efforts for ex-situ stubble management should focus on these medium- and large-scale farmers. Large farms are better equipped to invest in and effectively implement these practices.



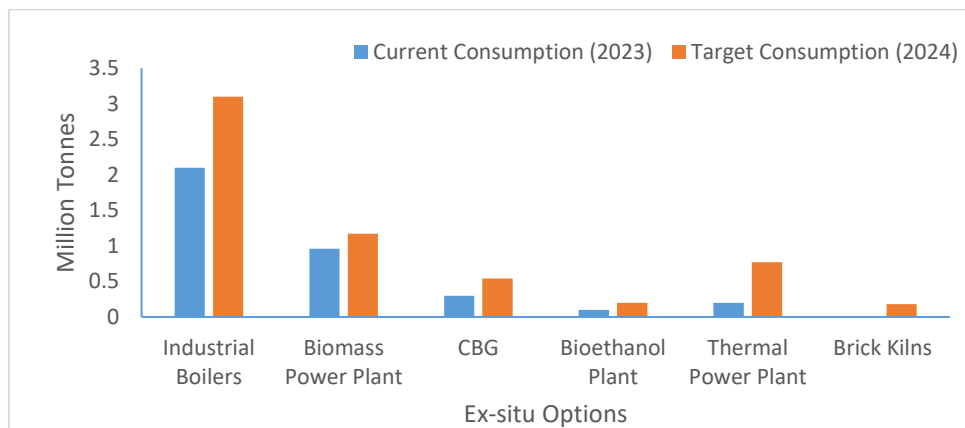
Establishing adequate infrastructure is another critical factor. Key infrastructure components include storage facilities, collection centres, pelletisation units, and machinery. Public–private partnerships should be explored when setting up straw banks. These partnerships can leverage private sector resources and public sector support to build the necessary infrastructure (such as land, power supply, labour, and logistics) for straw collection, storage, and processing.

The government could also prioritise strengthening the supply chain infrastructure in districts with a higher concentration of industrial clusters and brick kilns, such as Patiala, Bathinda, Rupnagar, Mansa, Tarn Taran, Amritsar, and Sangrur, before expanding to other districts.



Key demand areas for pellets

Pelletisation units should be located near the identified clusters. Punjab needs at least 1,320 straw banks (spread across the state) and 165 pelletisation units (primarily located near thermal power plants, brick kilns, and industries) to process the stubble targeted by ex-situ options.



Ex-situ targets for Punjab in 2024

The policy brief also delves into the financial feasibility of different ex-situ stubble management options in Punjab, outlining costs, key factors enabling success, and the maximum feasible stubble consumption for each method. For instance, incorporating stubble pellets in thermal power plants, industrial boilers, and brick kilns does not require significant investment and modifications, unlike capital-intensive alternatives such as compressed biogas or biomass.

Other recommendations include conducting public awareness campaigns, advancing research, simplifying the process of renting machines from custom hiring centres, benchmarking prices for agricultural residue products, and establishing monitoring and enforcement agencies.

At the launch of the policy brief, Prof Adarsh Pal Vig, Chairman of the Punjab Pollution Control Board, said, ‘Farmers who are not burning stubble are the real heroes...We are honouring the farmers who are not burning stubble instead of punishing those who are. So, such a strategic change is also required’.

For more insights and recommendations, you can read the policy brief [here](#).

Media Contact

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About CSTEP: [CSTEP](#) is a not-for-profit research organisation with a mission to enrich policymaking with innovative approaches using science and technology for a sustainable, secure, and inclusive society. Our interdisciplinary research encompasses diverse fields such as energy, urban development, climate, and air pollution.

About CAMS-NET: The [Clean Air Monitoring and Solutions Network](#) (CAMS-Net) is a National Science Foundation-funded project aimed at creating an international ‘network of networks’ that will facilitate the exchange of knowledge, ideas, and data in order to improve the usage and application of low-cost sensor air quality data. Based at Columbia University, in collaboration with Carnegie Mellon University and Washington University at St Louis, CAMS-NET offers a unique platform for South–South–North collaboration on an equal footing.

About ICAS: Since its inception in 2019, the [India Clean Air Summit](#) (ICAS) has emerged as a platform for the community working on improving air quality in India, including



government, academia, civil society organisations, and citizens, to collaborate and discuss important issues around air pollution.

