

CEEW Crop Residue Management Survey - Haryana 2026

Survey Design and Data Quality Check

Srishti Jain, Kurinji Kemanth, Ayushman Saboo and Navjot Singh Sarao

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Council on Energy, Environment and Water

ISID Campus, 4 Vasant Kunj Institutional Area
New Delhi – 110070, India
+91 11 4073 3300

info@ceew.in | ceew.in | [@CEEWIndia](https://www.instagram.com/CEEWIndia) | [ceewindia](https://www.facebook.com/ceewindia)

The authors

Srishti Jain | srishti.jain@ceew.in | [LinkedIn](#)

Srishti is a Research Analyst with CEEW's Clean Air team. Her work focuses on air pollution and circular economy pathways for biomass waste. Srishti holds a master's degree in Environmental Economics from the Madras School of Economics, Chennai.

Kurinji Kemanth | kurinji.selvaraj@ceew.in | [LinkedIn](#)

Kurinji is a Programme Lead with CEEW's Clean Air team. Her research focuses on addressing air pollution and crop residue burning in northern India. She holds a Bachelor's degree in Energy and Environmental Engineering from Tamil Nadu Agricultural University, Coimbatore, and a PG Diploma in Urban Environmental Management and Law from the National Law University and WWF India.

Ayushman Saboo | ayushman.saboo@ceew.in | [LinkedIn](#)

Ayushman is a Research Analyst with CEEW's Clean Air team. His research focuses on air pollution mitigation and waste management. His career focus is on harnessing the power of waste towards a circular economy. He holds an M.Sc. in Corporate Sustainability and Environmental Management from the University of York.

Navjot Singh Sarao | navjot.sarao@ceew.in | [LinkedIn](#)

Navjot is a Consultant with CEEW's Clean Air team. His research focuses on agricultural residue management practices in India and their implications for farming. Navjot holds a postgraduate degree in Plant Breeding and Genetics from Punjab Agricultural University, Ludhiana.

Authors' contribution

Srishti Jain: Led the overall execution of the project, spanning survey and questionnaire design, enumerator training, data monitoring, cleaning, analysis, and research writing.

Kurinji Kemanth: Conceptualised the study's scope, research questions, and overall storyline, and oversaw questionnaire design, data analysis, and research writing.

Ayushman Saboo: Coordinated the enumerator training and contributed to questionnaire design, field-testing, data analysis, and research writing.

Navjot Singh Sarao: Led the focus group discussions and stakeholder consultations following the study, and contributed to questionnaire design, field-testing, and enumerator training

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CEEW Crop Residue Management Survey - Haryana 2026

The Council on Energy, Environment and Water (CEEW) conducted an independent survey of ~1,588¹ farmers in Haryana to study the adoption status of CRM methods in Haryana, across 12 districts between January and March 2026, representing Haryana's farmer population as per the latest agricultural census (2015–16). The 12 districts—Ambala, Fatehabad, Hisar, Jhajjar, Jind, Kaithal, Karnal, Kurukshetra, Panchkula, Rohtak, Sirsa, and Yamuna Nagar—accounted for ~92 per cent of the average kharif fires and about ~81 per cent of the state's average paddy sown area between 2018 and 2024.² The survey was administered to farmers in Punjabi and/or Hindi by a survey agency.

1.1 Sampling framework

As part of the research design, we used a stratified random sampling approach at three levels. The first level of stratification is at the district level. Since the primary objective of the study is to focus on paddy residue, as it is the major crop burnt in the Indo-Gangetic plains, we excluded districts with less than ~10 per cent of their net sown area under paddy, namely Gurugram, Charkhi Dadri, Bhiwani, Nuh, Rewari, and Mahendragarh. We then categorised the remaining 16 districts as high-, medium-, and low-burn, based on the number of kharif farm fires per unit of paddy sown area in acres (also called fire count intensity) from 2018 to 2024 (Annexure). Districts with a fire count intensity in the first tertile (< 33.3 percentile value) were considered low-burn, those in the middle tertile (> 33.3 but < 66.6 percentile value) were considered medium-burn, and those in the top tertile (> 66.6 percentile value) were considered high-burn. We then randomly sampled four districts from each tertile to understand the CRM practices adopted by farmers. However, due to field-level challenges such as the unavailability of paddy-growing farmers in the selected districts, the sample had to be altered to replace Faridabad (low-burn) with Sirsa, a high-burn district. Thus, the final sample contained five districts from the high-burn category, four from medium-burn, and three from low-burn.

After this, we randomly selected 12 villages from each district, totalling 144 villages. For this, we eliminated villages with fewer than 10 per cent of a district's total farmer population to ensure adequate sample density and reduce field-level constraints prior to selection. We then classified the remaining villages into two sub-strata—small and large—based on the district's farmer population distribution, and randomly sampled six villages from each sub-stratum. To ensure that the data are representative at the state level, we selected 11 farmers from each village (five marginal, two small, two semi-medium, one medium, and one large), mirroring the share of cultivators across different landholdings. While small and marginal farmers made up 63.85 per cent³, semi-medium, medium, and large farmers together made up 36.15 per cent of the final sample. All respondents were landowners. While 62 per cent of farmers cultivated exclusively on owned land, 38 per cent cultivated on both owned and leased plots.

¹ We chose a margin of error of 3 per cent, and confidence level of 98 per cent for sample selection.

² Sourced from open fires detected by Suomi NPP-VIIRS satellite; it captures all thermal anomalies, so we used the National Remote Sensing Centre's Land Use Land Cover (250k) to clip the open fires that were reported on crop land.

³ The actual share of the two categories, i.e. small & marginal as the first and semi-medium, medium, & large farmers as the second, is 68.57 and 31.43 per cent in Haryana's total landowning population (Agricultural Census, 2015–16, DESA, Haryana).

At the village level, farmers were interviewed by randomly walking to select the respondents through a quota-based sampling method. We also maintained eight backup villages in each district, four from each of the small and large categories, resulting in a total of around 96 backup villages. This was maintained to ensure that quotas across landholdings were met, since in some villages, farmers were concentrated in the extreme landholding categories.

Figure 1: We employed a multi-stage random sampling technique to understand Haryana's CRM practices.

District-level map with surveyed villages ⁴	Sample details
	12 districts Stratified random sampling based on fire density 144 villages (12 main and 8 backup villages in each district) Fixed villages in each district; district-wise sampling weights used for analysis 1,588 farmers (11 farmers in every village) 7 small and marginal; 4 semi-medium, medium, and large covered using quota-based snowball sampling

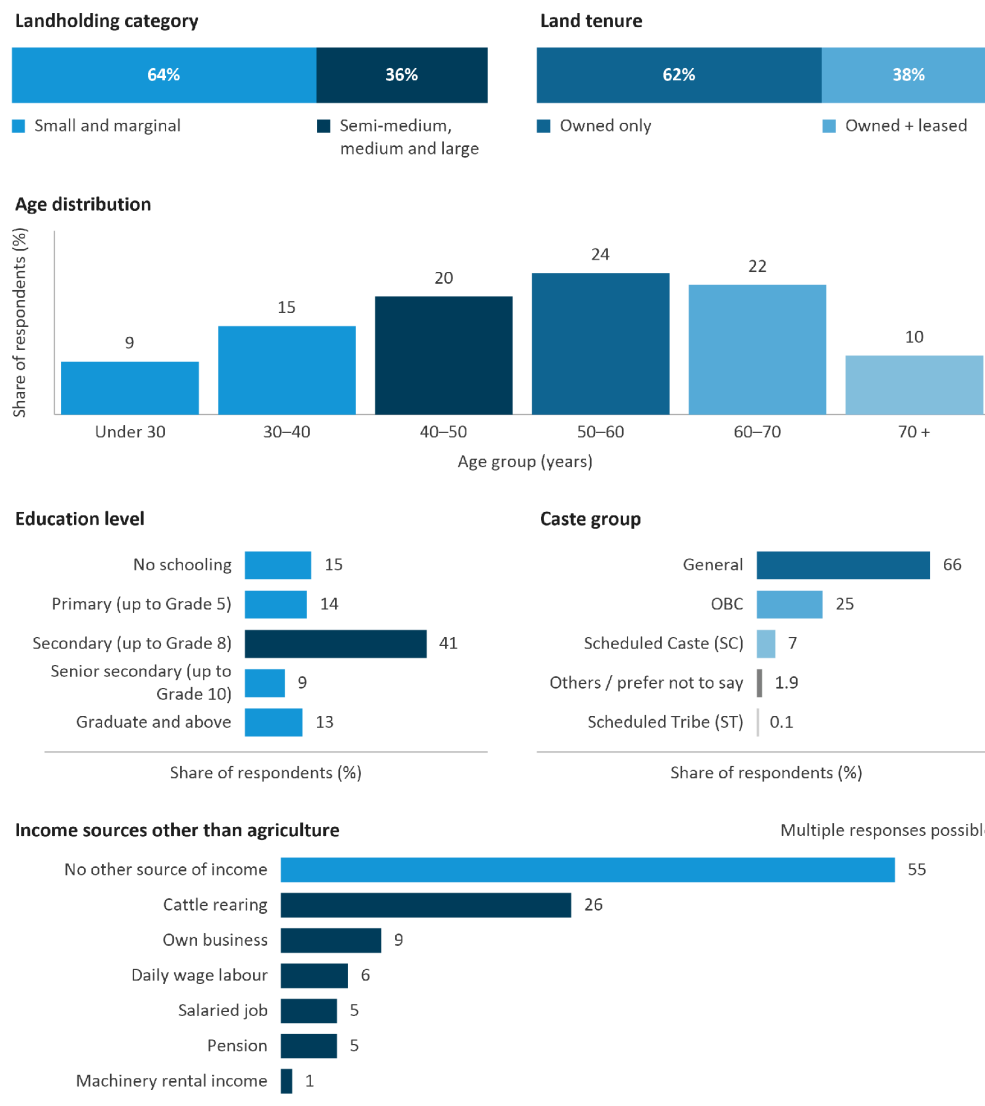
Source: Authors' analysis

1.2 Questionnaire design

As part of the survey, we focused on interviewing paddy-growing farmers on their crop varieties, CRM practices followed, payment ecosystem, awareness of government schemes, and future outlook. Despite not being statistically representative of wheat growers, we also included them in the study to understand wheat residue management and payment pathways. Surveying farmers on both crops helped provide a holistic understanding of the residue management ecosystem in a paddy-wheat-paddy cycle in the state.

⁴ The blue dots represent the sampled villages in the study.

Figure 2: Who were the farmers: Study sample demographics



Source: Authors' analysis

Note: All values are expressed as actual shares (non-weighted). Income-source shares sum to more than 100% as respondents could report multiple sources.

1.3 Qualitative interviews

To understand the current state of CRM practices in Haryana, we undertook field visits from October to December 2025. During these visits, we interviewed officials from the Department of Agriculture and Farmers Welfare (DoAFW), Chaudhary Charan Singh Hisar Agricultural University (CCSHAU), Haryana Renewable Energy Development Agency (HAREDA), APMC officials, and farmers. These initial interactions were important in designing our primary survey questionnaire. After concluding the primary survey, we also conducted focus group discussions (FGDs) in April 2026 in two districts, Hisar and Fatehabad, to validate the key findings derived from the survey analysis.

1.4 Data quality and study limitations

To test the questionnaire and the data collection tool, we conducted pilot surveys in non-sampled villages of Ambala, Fatehabad, Hisar, Jind, Kurukshetra, Kaithal, Panipat, and Sirsa. To accurately code the diverse responses, the enumerators underwent thorough classroom training and mock survey sessions. Data quality protocols included setting lower and upper bounds for numerical inputs, incorporating cross-verification questions to assess consistency, and randomising the order of response options to mitigate positional bias. However, despite these efforts, we recognise that the dataset remains subject to potential limitations—specifically recall, enumerator, and social desirability biases⁵ driving people to respond in a certain manner divorced from actual practices, impacting the validity of responses.

As part of the analysis, we attribute district-wise weights to each surveyed entity, in line with its district farmer population. Such a method helps ensure that we do not oversample or undersample any district, and our values are representative at the state level. Throughout this report, we use weighted percentages while the pertaining totals (in brackets) remain unweighted unless stated otherwise.

We also acknowledge that despite our survey analysing both kharif and rabi residue management practices, our sampling method only considers kharif fires, as it remained the major study focus. However, in the absence of a large-scale survey on wheat residue management practices, this work can act as a critical baseline, laying the groundwork for future, statistically representative rabi studies.

Additionally, we acknowledge that our sample inherently represents landowning cultivators, not the rural population affected by crop residue burning.

⁵ Driving individuals to give responses that look good rather than reflecting their true thoughts.

Annexure

Categorisation of Haryana's districts using farm fires

We calculated the average fire per unit area from 2018 to 2024 and divided the districts into three tertiles, i.e., high, medium, and low burn. Subsequently, we randomly sampled districts from each burn category to examine prevailing residue management practices.

Table A1: Sampled districts in accordance with their burn type

Burn type	District name	Average fires (2018–24)	Average paddy sown area (1,000 hectares) (2018–24)	Selection status
High	Fatehabad	1138.71	132.53	Selected
	Kaithal	742.43	175.21	Selected
	Jind	647.86	157.07	Selected
	Kurukshetra	416	125.07	Selected
	Sirsa	621.29	106.37	Selected
Medium	Ambala	310.43	97.26	Selected
	Hisar	231.43	88.70	Selected
	Karnal	561.71	178.89	Selected
	Yamunanagar	197.71	85.52	Selected
	Rewari	5.71	1.92	Not selected
	Palwal	107.43	38.37	Not selected
	Panipat	148	81.34	Not selected
Low	Jhajjar	37.29	48.10	Selected
	Panchkula	24.86	13.00	Selected
	Rohtak	78.57	69.42	Selected
	Sonipat	113.86	115.94	Not selected
	Charkhi Dadri	3.29	7.91	Not selected
	Nuh	2.43	10.39	Not selected
	Faridabad	27	15.48	Not selected
	Gurugram	7.14	4.93	Not selected
	Bhiwani	26	25.15	Not selected

Source: Authors' analysis

Note: Darker shade indicates the selected survey districts.