

Crop Residue Management (CRM)



Annual Report
2025-26



ICAR-AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE
ZONE-I, PAU CAMPUS, LUDHIANA - 141 004, PUNJAB

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सत्यमेव जयते

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**ICAR-AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE
ZONE-I, PAU CAMPUS, LUDHIANA - 141 004, PUNJAB**



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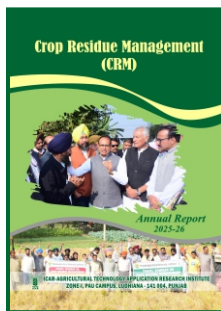
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Crop Residue Management (CRM)

Annual Report 2025-26

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PREFACE

The Annual Report 2025-26 of the Crop Residue Management (CRM) Project presents the concerted efforts undertaken by ICAR-Agricultural Technology Application Research Institute (ATARI), Ludhiana, with the KVK network of Punjab, to address the persistent challenge of crop residue burning and promote sustainable residue-management practices. The year witnessed a further strengthening of interventions aimed at facilitating the adoption of appropriate CRM technologies, improving access to farm machinery, enhancing farmer awareness and capacity, and fostering coordinated action among scientific institutions, extension agencies, farming communities and other stakeholders. The report documents the initiatives, achievements, experiences and lessons emerging from the implementation of the project during 2025-26.

During the reporting period, considerable emphasis was placed on Information, Education and Communication (IEC), capacity building, field demonstrations, strategic learning platforms, farmer-scientist interactions and stakeholder engagement. The KVKs conducted extensive awareness programmes at village, block and district levels, training programmes, Kisan Melas, exposure visits and field/harvest days, while also engaging schools and colleges to create awareness among the younger generation. CRM machinery demonstrations covered 2,986 ha, exceeding the target of 1,950 ha, while demonstrations using KVK-owned CRM machinery covered an additional 930 ha. These activities enabled farmers to observe the performance of residue-management technologies under actual field conditions and strengthened confidence in viable alternatives to residue burning.

The year also witnessed significant progress in demonstrating the agronomic and economic feasibility of in-situ residue management technologies. Strategic Learning Platforms established at KVK farms and farmers' fields provided opportunities for participatory assessment of technologies such as Happy Seeder, Super Seeder, Smart Seeder, Surface Seeder and Zero Till Drill. The demonstrations recorded competitive wheat yields under residue-retained conditions, thereby reinforcing the potential of conservation agriculture-based approaches as practical alternatives to residue burning. Residue burning events in Punjab alone recorded a 94% reduction, from 83,002 events in 2020 to 5,114 events in 2025.

The year 2025-26 also reinforced the importance of systematic review, monitoring, and evidence-based implementation. Regular review meetings emphasized timely fund utilization, standardized reporting, GPS-based documentation of IEC activities, systematic collection of demonstration and yield data, assessment of machinery-bank performance and documentation of peak periods of residue burning. These measures are intended to strengthen accountability, improve the quality of project data and facilitate timely, location-specific interventions. The experience also highlighted the continuing challenges associated with the narrow window between paddy harvesting and wheat sowing, timely availability and maintenance of machinery, shortage of trained operators, machinery utilization and behavioural preference for burning. These lessons provide important directions for strengthening the programme in the coming years.

The achievements presented in this report are the result of sustained collaboration and collective commitment. We gratefully acknowledge the Ministry of Agriculture and Farmers Welfare, Government of India, for its continued support and guidance to the CRM initiative. We sincerely appreciate the guidance and encouragement provided by the leadership of ICAR, viz. Secretary, DARE & Director General, ICAR; Deputy Director General (Extension), and Assistant Directors General (Extension), the Agricultural Extension system and the concerned State Agricultural Universities. We also acknowledge the valuable contributions of the Directors of Extension Education, Heads and scientists of KVKs, State Agriculture Departments, district administrations, Custom Hiring Centres, farmer organizations, media and other partner institutions in advancing the objectives of the project.

Our sincere appreciation is extended to the farmers and farming communities whose participation, experimentation and willingness to adopt alternative residue-management practices remain central to the success of the programme. The active engagement of KVK teams in conducting demonstrations, training programmes, awareness campaigns and field-level interventions has been instrumental in translating scientific knowledge and technological innovations into practical solutions.

We congratulate and sincerely thank the CRM Project Team at ICAR-ATARI, Ludhiana, and all KVK colleagues for their dedicated efforts, commitment and active involvement in implementing the programme during 2025-26. We hope that this report will serve as a useful reference for researchers, extension professionals, policymakers, development agencies and farming communities in furthering the goal of sustainable and residue-free agriculture.

Authors



EXECUTIVE SUMMARY

The Crop Residue Management (CRM) Project during 2025-26 represented a coordinated effort to promote sustainable management of paddy residues and reduce crop-residue burning through technological, extension, institutional and behavioural interventions. Implemented through ICAR-ATARI, Ludhiana and Punjab's KVK network, the programme emphasized large-scale dissemination of viable alternatives to residue burning, strengthening access to CRM machinery, farmer capacity building, field demonstrations, strategic learning platforms, stakeholder engagement, and regular monitoring.

Information, Education and Communication (IEC) activities constituted an important component of the project. During 2025-26, KVKs conducted 184 village-level, 90 block-level and 45 district-level awareness programmes, reaching 26,607 participants. A total of 106 training programmes were conducted for 2,717 participants, while five Kisan Melas attracted 10,335 participants. The programme also focused on the younger generation through 111 school-level programmes involving 19,383 students and 43 college-level programmes involving 8,226 students. Experiential learning was strengthened through 55 exposure visits involving 2,583 participants, 51 field/harvest days involving 4,639 participants and 40 webinars or online lectures reaching 1,480 participants. The mass-media component included 84 print advertisements, 149 articles or columns, 482 hoardings, 712 posters and banners, 875 wall writings, distribution of 75,646 leaflets and pamphlets, and eight television programmes or panel discussions.

Field demonstrations played a central role in demonstrating the technical and economic feasibility of CRM technologies under actual farming conditions. During the year, CRM machinery demonstrations covered 2,986 ha against a target of 1,950 ha, while demonstrations using KVK-owned CRM machinery covered an additional 930 ha. The Strategic Learning Platforms established at KVK farms and farmers' fields provided participatory environments for farmers, scientists and extension personnel to compare residue-management technologies under local conditions. The demonstrations showed that Happy Seeder, Super Seeder, Smart Seeder, Surface Seeder and Zero Till Drill could successfully establish wheat under retained paddy residues while maintaining competitive grain yields. At KVK learning platforms, maximum yields of 60.7 q/ha with Happy Seeder, 59.3 q/ha with Super Seeder, 59.8 q/ha with Smart Seeder, 58.4 q/ha with Surface Seeder and 58.1 q/ha with Zero Till Drill were recorded at different locations. Farmers' field demonstrations further confirmed the adaptability of these technologies, with Happy Seeder recording yields up to 61.9 q/ha in Barnala, Super Seeder 61.8 q/ha in Sangrur and Smart Seeder 61.4 q/ha in Bathinda.

The project also emphasized direct interaction among farmers, scientists, policymakers and other stakeholders. The Chaupal Charcha and awareness-cum-demonstration programme organized at Nurpur Bet, Ludhiana, on 14 October 2025 provided an important platform for direct farmer interaction and demonstrations of SSMS, Smart Seeder and Happy Seeder. The programme emphasized in-situ residue management, conservation agriculture, effective delivery of machinery support and real-time monitoring of residue burning. The Scientist-Farmer Dialogue held at Ludhiana on the same date brought together

scientists, farmers and policymakers and highlighted issues relating to machinery underutilization, access to subsidies and machinery, compliance and the need for community-led approaches. Similarly, the Interstate Travelling Seminar conducted from 24-26 October 2025 across Punjab and Haryana integrated field visits, farmer interactions and live machinery demonstrations and emphasized region-specific machinery requirements, carbon-credit mechanisms, recognition of zero-burning villages and strengthened enforcement.

Regular review and monitoring mechanisms were strengthened during the year to improve implementation, reporting and outcome assessment. Review meetings held at ICAR-ATARI, Ludhiana, focused on timely utilization of funds, comprehensive reporting of extension activities, standardization of documentation, machinery-bank performance and strengthening the evidence base for assessing project outcomes. GPS coordinates were made mandatory for IEC activities, while KVKs were instructed to document peak fire-incidence periods, collect systematic demonstration and yield data, and report machinery-bank performance in a standardized format. Standardization of cost estimation covering labour and machinery costs was also emphasized to enable meaningful comparison of different CRM technologies and their economic viability.

Overall, the CRM Project during 2025-26 demonstrated that large-scale reduction in crop-residue burning is achievable when policy, technology, extension, community participation, economic incentives and enforcement operate together. The sharp reduction in burning events, adoption of zero-burning villages, large-scale in-situ residue management, substantial nutrient and water conservation, economic savings, extensive farmer outreach and successful field validation of CRM technologies constitute major achievements.



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INTRODUCTION

Agriculture forms the very backbone of India's socioeconomic fabric, sustaining the livelihoods of more than half the country's population and contributing close to one-fifth of its GDP. Despite this central role, the sector faces a growing crisis one that is as much environmental as it is agricultural. Across the fertile stretches of the Indo-Gangetic Plains, particularly in Punjab, Haryana, and Uttar Pradesh, the practice of burning crop residue has become alarmingly widespread. Squeezed by rising labour costs and with few affordable alternatives at hand, farmers routinely set fire to paddy and wheat stubble to quickly clear their fields before the next sowing cycle.

The consequences are far-reaching. The smoke from these fires releases hazardous pollutants particulate matter (PM 2.5 and PM 10), nitrogen oxides, carbon monoxide, and sulphur dioxide that choke the air across northern India, pushing cities like Delhi into recurring episodes of toxic smog. Beneath the surface, the damage is equally serious: residue burning strips the soil of organic carbon, wipes out beneficial microbial communities, and pumps greenhouse gases into the atmosphere, compounding the broader challenge of climate change.

The Crop Residue Management (CRM) Scheme

Recognizing the urgency of the situation, the Government of India launched a focused intervention in 2018: the "Promotion of Agricultural Mechanization for In-situ Management of Crop Residue in Punjab, Haryana, Uttar Pradesh and NCT of Delhi", more commonly known as the Crop Residue Management (CRM) Scheme. Anchored within the National Policy for Management of Crop Residues (NPMCR), the scheme seeks to eliminate stubble burning by making mechanized, in-situ residue management both accessible and attractive to farmers. Rather than penalizing burning, the approach focuses on providing credible, affordable alternatives.

The scheme operates through three interconnected pillars:

1. **Subsidized Farm Machinery** - Farmers receive financial assistance to purchase key equipment such as Happy Seeders, Zero-Till Drills, Super Straw Management Systems (SMS), and Rotavators, reducing the financial barrier to adoption.
2. **Custom Hiring Centers (CHCs)** - To ensure that small and marginal farmers are not left behind, CHCs are established as community-level machinery rental hubs, giving everyone access to equipment at affordable rates.
3. **Information, Education, and Communication (IEC)** - Beyond hardware, the scheme invests in people through field demonstrations, training sessions, and awareness campaigns that build knowledge, shift attitudes, and inspire lasting behavioural change.

The Role of Krishi Vigyan Kendras (KVKs)

At the heart of the CRM scheme's IEC efforts are the Krishi Vigyan Kendras (KVKs), a nationwide network of agricultural knowledge and extension centers operating under the Indian Council of Agricultural

Research (ICAR). Functioning as local bridges between science and the field, KVKs translate technical solutions into practical, farmer-friendly interventions tailored to local conditions.

The programme is steered at the national level by ICAR's Division of Agricultural Extension, with zonal oversight provided by Agricultural Technology Application Research Institutes (ATARIs), working alongside State Agricultural Universities (SAUs) and ICAR institutes. Regular SAC meetings, workshops, and planning sessions at both the state and national level ensure that progress is tracked, gaps are identified, and strategies are continuously refined.

The CRM scheme's core objectives are clear:

- To promote the mechanical incorporation of crop residues into the soil as a sustainable alternative to burning.
- To normalize zero-burning practices through on-ground demonstrations and farmer training.
- To build widespread awareness among farming communities and stakeholders through strategic IEC outreach.

KVKs contribute to each of these goals in meaningful ways. They organize live demonstrations of technologies such as Happy Seeder, Super Straw Management Systems, Zero-Till Drills, and microbial bio-decomposers, allowing farmers to witness results first-hand, under the very conditions they farm in. They run training programmes designed for diverse audiences: smallholder farmers, extension workers, and rural youth, covering everything from the practical operation of CRM machinery to the long-term soil health benefits of residue retention and the financial incentives available under the scheme. Beyond training, KVKs actively connect farmers with subsidy programs and CHCs, while forging partnerships with state departments, NGOs, and private sector players to extend the reach of their efforts.

IEC Strategies: Reaching Farmers Where They Are

The IEC component of the CRM scheme is built on a simple but powerful idea: changing deeply ingrained farming behaviour requires more than just information; it requires the right message, delivered through the right channel, at the right time. KVKs employ a diverse and layered mix of communication tools to make this happen:

- **Print & Digital Materials:** Posters, pamphlets, and regional language articles put clear, actionable information in farmers' hands, serving as a ready reference long after a training session ends.
- **Broadcast Media:** Radio talks, television programmes, and farmer success stories extend the scheme's reach to large and geographically dispersed audiences, including those in the most remote corners of the region.
- **Frontline Demonstrations:** Nothing convinces a farmer quite like seeing results in a field that mirrors their own. Hands-on demonstrations of CRM machinery and decomposers build trust and confidence by making the benefits visible and tangible.

- **Social Media & Mobile Platforms:** WhatsApp groups, SMS advisories, and targeted digital campaigns ensure that timely, relevant information reaches farmers directly on their phones, meeting them in the digital spaces they already inhabit.
- **Community Mobilization:** Village-level meetings, student-led awareness drives, and NGO-supported campaigns harness the power of collective action, making residue management a community concern rather than an individual one.
- **Exhibitions & Mobile Vans:** Agricultural fairs and mobile van outreach bring interactive demonstrations to farmers' doorsteps, creating spaces for direct engagement, live questioning, and hands-on learning.

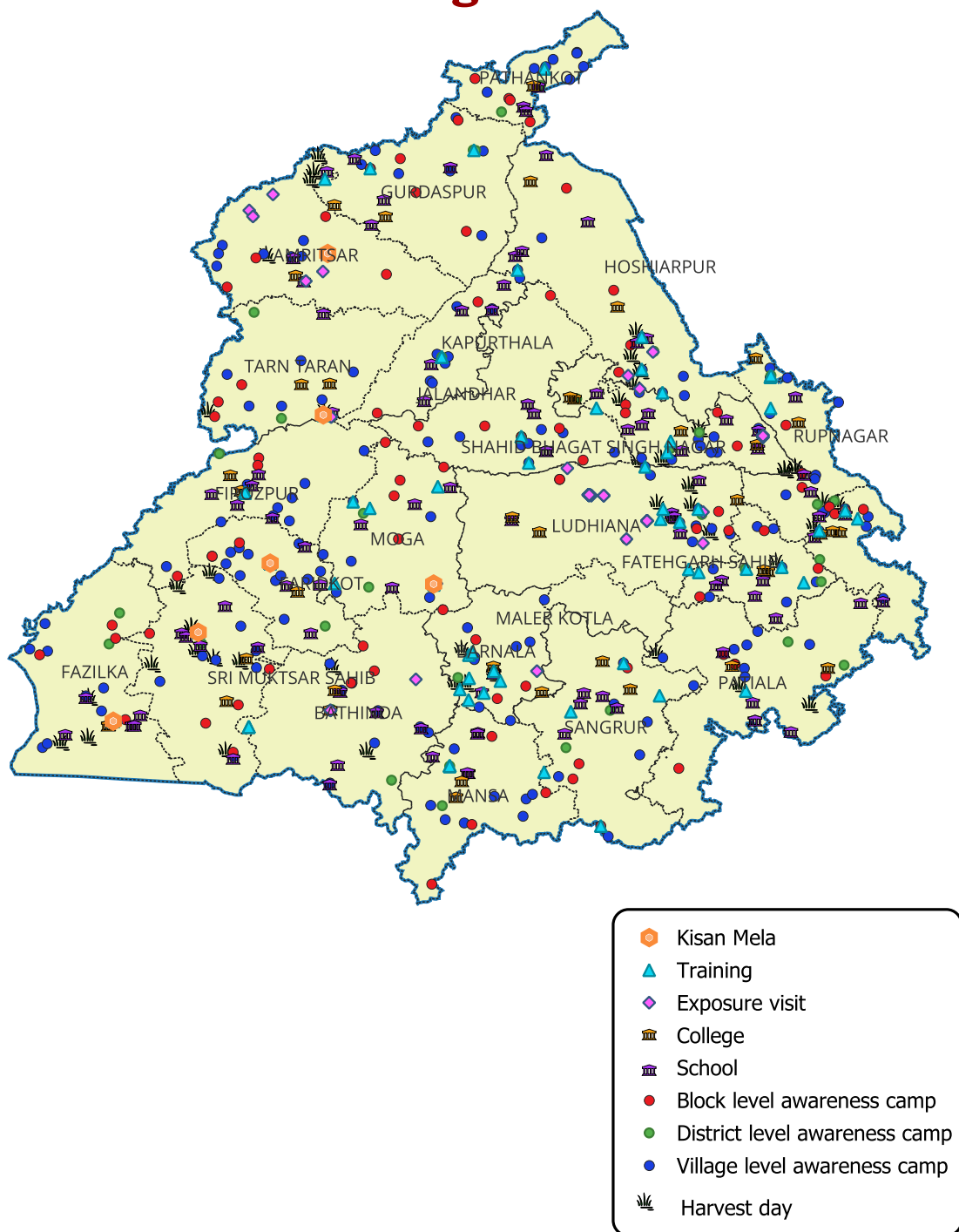
Challenges and the Road Ahead

The CRM scheme has delivered meaningful results. Incidents of stubble burning have declined, soil health is gradually being restored, and there is a growing community of farmers who have made the shift to sustainable residue management, many of them champions of the cause within their own villages. KVKs, through their tireless on-ground work, have been central to this progress.

Yet, the journey is far from complete. The high upfront cost of machinery continues to deter many farmers, particularly those with smaller landholdings. Deep-rooted habits and skepticism toward new practices slow the pace of behavioural change. Logistical bottlenecks in equipment availability and subsidy distribution further dilute the scheme's impact in some areas.

Addressing these challenges will require a concerted push on multiple fronts: scaling up digital extension tools to reach more farmers more efficiently, strengthening private sector partnerships to supplement public resources, and simplifying subsidy mechanisms to ensure that support reaches those who need it most. With sustained commitment from all the stakeholders, viz. government, research institutions, civil society, and the farming community itself, the CRM scheme holds the potential to transform how India manages its crop residues, and in doing so, secure a cleaner, healthier, and more sustainable agricultural future.

IEC Activities organized during 2025-26



INFORMATION, EDUCATION & COMMUNICATION (IEC) ACTIVITIES

Information, Education and Communication (IEC) activities constituted a major component of the Crop Residue Management (CRM) project implemented by ATARI, Ludhiana during 2025-26, reflecting a deep and sustained commitment to sustainable agriculture and environmental stewardship. Through a comprehensive blend of IEC activities spanning skill development, field demonstrations, and digital outreach, KVKs have successfully mobilized farming communities to embrace eco-friendly alternatives to stubble burning.

During the year, ATARI Ludhiana successfully organized 184 village-level, 90 block-level, and 45 district-level awareness programs, benefiting a total of 26,607 participants. A total of 106 training programs were conducted, imparting practical knowledge & skills on CRM technologies to 2,717 participants. In addition, five Kisan Melas were organized, attracting 10,335 participants, which served as an effective platform for demonstrating CRM technologies and disseminating technical information among the farming community.

Special emphasis was also given to sensitizing the younger generation towards environmental conservation and sustainable agricultural practices. Under student mobilization activities, 111 programs were organized in schools, engaging 19,383 students, while 43 programs were conducted in colleges with the participation of 8,226 students. These activities included essay writing, painting competitions, debates, rallies, Prabhat Pheris, Nukkad Nataks and other awareness campaigns, which helped disseminate the message of crop residue management among students and the wider community.

Demonstrations continued to be one of the most important extension approaches for promoting CRM technologies. During the reporting period, CRM machinery demonstrations were conducted over 2,986 ha, substantially exceeding the target of 1,950 ha. In addition, demonstrations using KVK-owned CRM machinery covered 930 ha, benefiting farmers through practical field-level exposure to residue management technologies. To further strengthen experiential learning, 55 exposure visits involving 2,583 participants and 51 field/harvest days involving 4,639 participants were organized across the operational area. Furthermore, 40 webinars and online lectures on CRM were conducted, reaching 1,480 participants.

Mass media and publicity activities played a significant role in extending the outreach of the CRM campaign. During the year, 84 advertisements were published in print media, and 149 articles/columns appeared in newspapers and magazines. A total of 482 hoardings, 712 posters and banners, and 875 wall writings were displayed at strategic public locations to reinforce CRM messages. Additionally, 75,646 leaflets and pamphlets were distributed among farmers and other stakeholders to promote awareness regarding crop residue management technologies and government initiatives. ATARI Ludhiana also facilitated eight television programs and panel discussions through Doordarshan, DD Kisan and other private channels to disseminate technical information to a wider audience.

Overall, the IEC activities undertaken during 2025-26 substantially strengthened awareness generation, technology dissemination and stakeholder participation, thereby supporting the adoption of sustainable crop residue management practices across Punjab.

Table 2.1: Details of IEC activities conducted by KVKs of Punjab during 2025-26

Sr. No.	IEC activities	Targets		Achievements	
		Activities	No. of Participants	Activities	No. of Participants
1	Awareness programs				
i.	Village level	176		184	9545
ii.	Block level	88		90	8733
iii.	District level	44		45	8329
2	Training Programs	111	2775	106	2717
3	Kisan Melas	22		5	10335
4	Mobilization of students				
i.	School	110		111	19383
ii.	College	44		43	8226
5	Demonstrations (Machinery) ha	1950		2986	2685
6	Demonstrations (using KVK Machinery) ha			930	481
7	Demonstrations (Decomposer Technology) ha			3.6	9
8	Exposure visits	110		55	2583
9	Field/ Harvest Days	66		51	4639
10	Webinars/ Lectures	0		40	1480
11	Advertisement in Print media	84		84	
12	Column / Articles in newspapers and magazines etc.	149		149	
13	Hoarding fixed	482		482	
14	Poster/Banner	712		712	
15	Publicity material- leaflets/ pamphlets etc.	75646		75646	
16	Wall writing	875		875	
17	TV programs/ panel discussions Doordarshan/ DD-Kisan and other private channels	8		8	
18	No. of awards for village/Gram Panchayat for achieving zero stubble burning			11	



Sensitizing farmers against burning paddy residue in Amritsar



Travelling Seminar on CRM at KVK, Bathinda



CHC machinery assessment at Kalgidhar Welfare Society, Bharta, Hoshiarpur



CHC questionnaire discussion at KVK Dehat



CHC Survey interaction and data collection at KVK Pilibhit



CHC survey visit to Multipurpose cooperative society, Fazilka district



Field-level interaction during CHC survey, Rupnagar



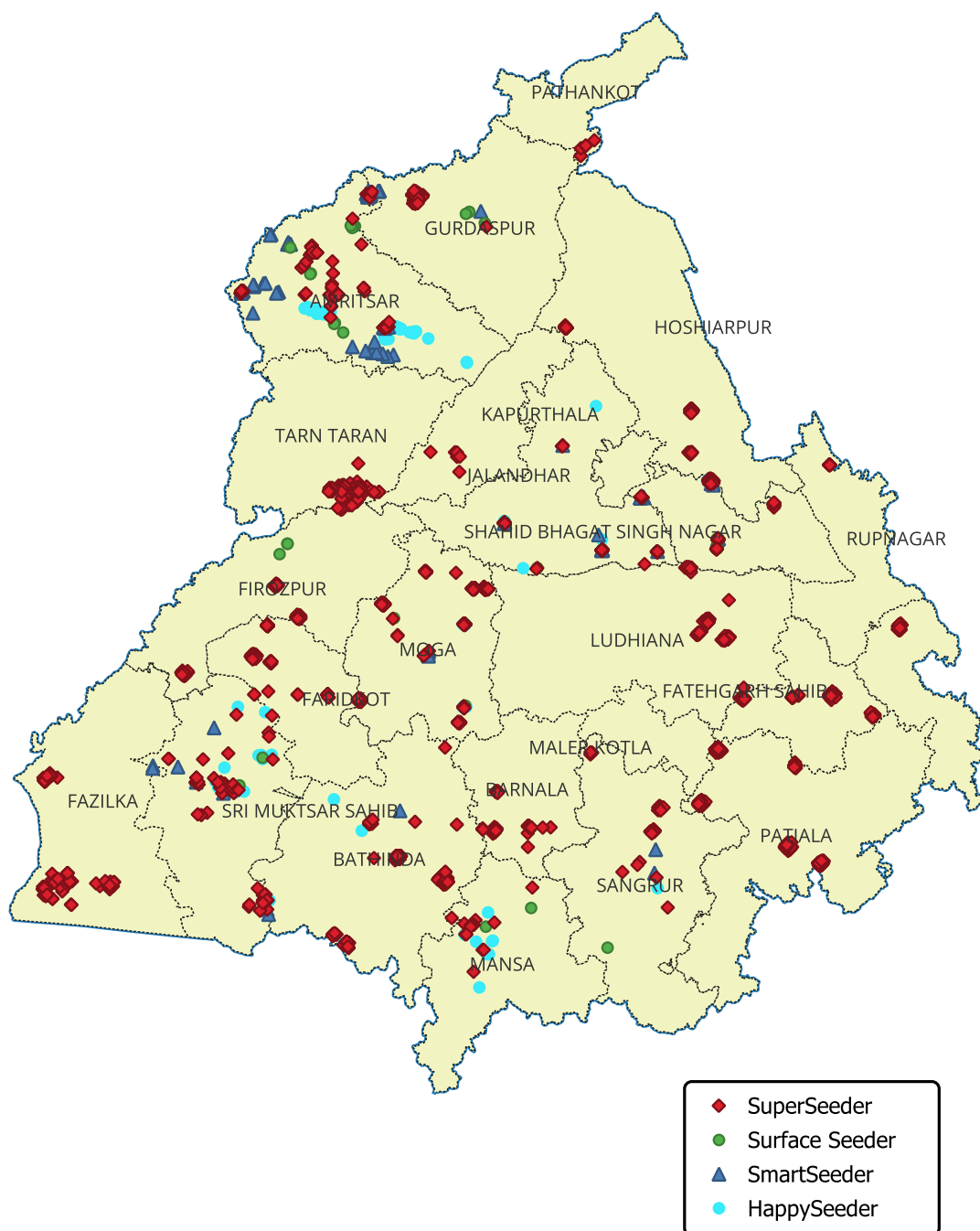
Inspection of CHC equipments at Mehdudan Village Cooperative Society, Ludhiana

Table 2.2: KVK-wise details of IEC activities conducted during 2025-26

KVK	Awareness camp				Training program		Demonstrations (CRM Machinery)		Demonstration (using KVK Machinery)	
	District level		Block level		Village level					
	No.	Farmers	No.	Farmers	No.	Farmers	No.	Trainees	No.	Area (ha)
Amritsar	2	320	4	454	8	407	6	150	105	67
Bathinda	2	411	4	423	9	524	4	100	160	0
Faridkot	2	394	4	416	13	737	8	199	78	83
Fatehgarh Sahib	2	308	4	400	8	328	4	100	118	0
Ferozepur	2	405	4	414	8	412	6	150	153	23
Gurdaspur	2	348	4	407	8	425	3	122	85	0
Hoshiarpur	2	303	4	406	8	412	4	100	105	0
Jalandhar	2	389	4	507	8	429	5	125	103	5
Kapurthala	2	316	4	339	8	426	4	100	94	6
Ludhiana	3	720	4	403	9	456	6	151	171	0
Mansa	2	417	4	402	8	419	6	150	0	133
Moga	2	440	4	444	8	443	5	125	171	0
Muktsar	2	476	4	435	8	542	7	175	171	0
Nawanshahr	2	412	4	378	8	352	3	75	100	0
Pathankot	2	511	4	351	8	415	2	50	85	34
Patiala	2	408	4	368	8	392	1	25	171	0
Ropar	2	213	6	530	9	480	4	100	48	10
Sangrur	2	374	4	327	7	422	5	125	97	40
Barnala	2	329	4	277	8	410	8	203	100	42
Mohali	2	314	4	352	8	370	3	77	61	11
Tarn Taran	2	219	4	393	9	319	6	150	371	27
Fazilka	2	302	4	307	8	425	6	165	138	0
Total	45	8329	90	8733	184	9545	106	2717	2685	481
									2986	930

KVK	Mobilization of School students			Mobilization of College students			Kisan Mela		Exposure visits		Field/Harvest Days	
	No.	Participants		No.	Participants		No.	Participants		No.	Participants	
		No.	Participants		No.	Participants		No.	Participants		No.	Participants
Amritsar	5	1164	2	410	0	0	0	5	250	4	428	
Bathinda	5	945	2	526	0	0	0	0	0	2	222	
Faridkot	5	1109	1	296	1	7362	2	80	0	0	0	
Fatehgarh Sahib	5	500	2	300	0	0	0	35	1	131		
Ferozepur	5	500	2	215	0	0	1	50	0	0		
Gurdaspur	5	1581	2	515	0	0	0	0	0	0		
Hoshiarpur	6	628	2	406	0	0	6	304	4	407		
Jalandhar	5	1205	3	160	0	0	2	87	0	0		
Kapurthala	5	326	2	212	0	0	1	50	0	0		
Ludhiana	5	569	4	636	0	0	5	218	6	613		
Mansa	5	1405	2	500	0	0	0	0	0	0		
Moga	5	1142	0	0	1	619	2	110	0	0		
Muktsar	5	1093	2	548	1	519	5	250	9	1022		
Nawanshahr	5	734	2	487	0	0	2	92	3	168		
Pathankot	5	803	1	256	0	0	0	0	0	0		
Patiala	5	690	2	511	0	0	1	40	3	207		
Ropar	5	544	2	284	0	0	2	86	5	385		
Sangrur	5	1126	2	493	0	0	3	100	0	0		
Barnala	5	918	2	351	0	0	4	179	5	355		
Mohali	5	738	2	482	0	0	5	210	3	143		
Tarn Taran	5	910	2	250	1	800	4	180	3	214		
Fazilka	5	753	2	388	1	1035	5	262	3	344		
Total	111	19383	43	8226	5	10335	55	2583	51	4639		

Demonstrations organized during 2025-26



DEMONSTRATIONS

The Front-Line Demonstrations (FLDs) under the Crop Residue Management (CRM) programme were conducted across different districts of Punjab to evaluate the performance of various in-situ crop residue management technologies under farmers' field conditions. The demonstrations were implemented in conjunction with Information, Education and Communication (IEC) activities, such as farmer training, awareness programmes, field days, farmer-scientist interactions, and mass media campaigns, to promote the adoption of sustainable crop residue management practices. The performance of CRM technologies was evaluated in comparison with the local check, representing the conventional practice of paddy straw burning (straw removal wherever applicable) before wheat sowing.

HAPPY SEEDER

A total of 161 Front Line Demonstrations (FLDs) on Happy Seeder-sown wheat were conducted across 266.90 ha in nine districts of Punjab. Among the demonstration fields, PBW 826 was the predominant wheat variety, followed by PBW 725 and DBW 222. Other recommended wheat varieties, including PBW 872, PBW 766, DBW 303 and DBW 327, were also represented across the demonstration districts.

The Happy Seeder effectively reduced weed infestation over the local check in most of the demonstration districts. The highest reduction in weed infestation was recorded in Bathinda (63.7%), followed by Moga (59.5%), Mansa (51.5%) and Hoshiarpur (43.2%). However, a marginal 8.3 per cent increase in weed infestation was observed in Sangrur. On average, weed infestation was reduced by 30.1 per cent under the demonstrations compared to the local check.

The highest grain yield under the demonstrations was recorded in Bathinda (60.7 q/ha), followed by Sangrur (59.9 q/ha) and Amritsar (55.7 q/ha). The maximum yield increase over the local check was also observed in Bathinda (5.1 q/ha; 9.2%), followed by Hoshiarpur (3.7 q/ha; 7.8%) and Sangrur (3.6 q/ha; 6.4%). On average, the demonstrations produced a grain yield of 53.5 q/ha, recording a yield advantage of 1.2 q/ha (2.3%) over the local check.

Table 3.1: District-wise performance of demonstrations on Happy Seeder-sown wheat

District	FLDs (No.)	Area (ha)	Weed infestation (No./sq m)			Grain yield (q/ha)		Yield increase	
			Check	Demo	% Change	Check	Demo	q/ha	%
Amritsar	50	65.8	22.3	16.7	-24.9	54.9	55.7	0.8	1.5
Bathinda	4	4.0	58.5	21.3	-63.7	55.5	60.7	5.1	9.2
Hoshiarpur	5	5.0	46.7	26.5	-43.2	47.2	50.9	3.7	7.8
Jalandhar	23	23.0	14.6	10.0	-31.0	50.9	53.2	2.3	4.6
Mansa	8	56.0	8.5	4.1	-51.5	50.8	52.1	1.4	2.7
Moga	17	17.0	2.0	0.8	-59.5	49.8	50.5	0.7	1.4
Muktsar	22	22.0	1.6	1.0	-39.4	53.3	53.2	-0.1	-0.2
Sangrur	4	7.4	12.0	13.0	8.3	56.3	59.9	3.6	6.4
Tarntaran	28	66.7	11.4	10.5	-7.8	49.4	50.3	0.8	1.7
Total/Avg	161	266.9	14.9	10.5	-30.1	52.2	53.5	1.2	2.3

District	Economics							
	Demonstration (₹/ha)				Local Check (₹/ha)			
	Cost of cultivation	Gross return	Net return	BCR	Cost of cultivation	Gross return	Net return	BCR
Amritsar	38320	163107	124786	4.26	39731	159379	119648	4.01
Bathinda	33281	156780	123499	4.71	41281	143532	102251	3.48
Hoshiarpur	41705	131577	89872	3.15	46993	122012	75019	2.60
Jalandhar	38923	172512	133589	4.43	40517	169703	129185	4.19
Mansa	44495	134743	90248	3.03	42653	131189	88536	3.08
Moga	37956	130466	92511	3.44	44056	128665	84609	2.92
Muktsar	37924	143854	105930	3.79	43749	144349	100600	3.30
Sangrur	46005	153161	107156	3.33	47150	148974	101824	3.16
Tarntaran	37099	133533	96433	3.60	38949	131338	92389	3.37
Total/Avg	38412	150254	111841	3.91	41156	147455	106299	3.58



Demonstration on CRM machinery in Hoshiarpur



Travel Seminar on CRM at KVK, Jalandhar

The economic analysis showed that the Happy Seeder demonstrations recorded an average cost of cultivation of ₹38,412/ha, gross returns of ₹1,50,254/ha, net returns of ₹1,11,842/ha and a benefit-cost ratio of 3.91, compared with ₹41,156/ha, ₹1,47,455/ha, ₹1,06,299/ha and 3.58, respectively, under the local check. The highest net returns (₹1,33,589/ha) were realized in Jalandhar, while the highest benefit-cost ratio (4.71) was recorded in Bathinda.

SMART SEEDER

A total of 117 Front Line Demonstrations (FLDs) on Smart Seeder-sown wheat were conducted across 147.40 ha in ten districts of Punjab under the Crop Residue Management (CRM) programme. Among the demonstration fields, PBW 826 was the predominant wheat variety, followed by PBW 766, PBW 725 and DBW 327. Other recommended wheat varieties including PBW 872, DBW 303, DBW 187, DBW 186, PBW 677 and DBW 222 were also represented across the demonstration districts.

The Smart Seeder demonstrations recorded encouraging performance in terms of wheat productivity across the participating districts. The highest grain yield under demonstrations was recorded in

Bathinda (60.0 q/ha), followed by Sangrur (59.0 q/ha), Amritsar (55.0 q/ha) and Nawanshahr (54.7 q/ha). The maximum yield increase over the local check was recorded in Hoshiarpur (6.8%), followed by Faridkot (6.4%), Bathinda (6.4%) and Sangrur (5.1%). On an average, the Smart Seeder demonstrations recorded a grain yield of 53.9 q/ha, registering a yield advantage of 1.5 q/ha (2.9%) over the local check.

The economic analysis revealed that the Smart Seeder demonstrations recorded an average cost of cultivation of ₹37,906/ha, gross returns of ₹1,56,705/ha, net returns of ₹1,18,799/ha and a benefit-cost ratio of 4.13, compared with ₹40,628/ha, ₹1,53,433/ha, ₹1,12,805/ha and 3.78, respectively, under the local check. The highest net returns (₹1,30,494/ha) were recorded in Jalandhar, while the highest benefit-cost ratio (5.02) was achieved in Nawanshahr.

Table 3.2: District-wise performance of demonstrations on Smart Seeder-sown wheat

District	FLDs (No.)	Area (ha)	Grain yield		Yield increase (q/ha)	
			Check	Demo	q/ha	%
Amritsar	44	69.4	53.5	55.0	1.4	2.7
Bathinda	1	1.0	56.4	60.0	3.6	6.4
Faridkot	5	2.0	49.7	52.9	3.2	6.4
Gurdaspur	15	15.0	50.7	52.5	1.9	3.7
Hoshiarpur	5	5.0	47.3	50.5	3.2	6.8
Jalandhar	17	17.0	51.6	52.9	1.3	2.5
Moga	4	4.0	52.4	52.8	0.3	0.6
Muktsar	4	4.0	53.3	53.7	0.4	0.8
Nawanshahr	17	17.0	52.5	54.7	2.3	4.3
Sangrur	5	13.0	56.1	59.0	2.9	5.1
Total/Avg	117	147.4	52.4	53.9	1.5	2.9

District	Economics							
	Demonstration (₹/ha)				Local Check (₹/ha)			
	Cost of cultivation	Gross return	Net return	BCR	Cost of cultivation	Gross return	Net return	BCR
Amritsar	38341	162487	124147	4.24	39345	160033	120688	4.07
Bathinda	33450	155100	121650	4.64	42450	152515	110065	3.59
Faridkot	41386	145258	103873	3.51	43759	136678	92919	3.12
Gurdaspur	39607	151884	112277	3.83	41953	149628	107676	3.57
Hoshiarpur	42705	130543	87838	3.06	47198	122271	75073	2.59
Jalandhar	39476	169970	130494	4.31	39804	168572	128768	4.24
Moga	38613	136359	97746	3.53	44051	135544	91493	3.08
Muktsar	37454	145116	107662	3.87	43129	144041	100912	3.34
Nawanshahr	30000	150693	120693	5.02	38750	144549	105799	3.73
Sangrur	45205	145148	99943	3.21	47493	141180	93688	2.97
Total/Avg	37906	156705	118800	4.13	40628	153433	112805	3.78

SUPER SEEDER

A total of 2,343 Front Line Demonstrations (FLDs) on Super Seeder-sown wheat were conducted across 2,697.26 ha in twenty-two districts of Punjab under the Crop Residue Management (CRM) programme. Among the demonstration fields, PBW 826 was the most widely adopted wheat variety, followed by DBW 187, DBW 327, PBW 725, PBW 872, HD 3086, PBW 677 and DBW 222. Other recommended wheat varieties, including DBW 303, DBW 370, DBW 371, DBW 372, HD 2967, PBW 550, PBW 343, PBW 869, PBW 766 and a few varietal combinations, were also grown by farmers according to their preference.

The Super Seeder demonstrations resulted in higher wheat productivity over the local check in almost all the participating districts. The highest grain yield under demonstrations was recorded in Bathinda (57.9 q/ha), followed by Sangrur (57.4 q/ha), Kapurthala (57.0 q/ha), Pathankot (56.7 q/ha) and Ludhiana (55.8 q/ha). The maximum yield increase over the local check was observed in Bathinda (9.6%), followed by Patiala (9.1%), Mohali (7.8%), Fatehgarh Sahib (7.1%), Pathankot (5.1%), Ropar (5.0%) and Ludhiana (4.9%). On average, the Super Seeder demonstrations recorded a grain yield of 52.4 q/ha, registering a yield advantage of 1.7 q/ha (3.4%) over the local check.

Table 3.3: District-wise performance of demonstrations on Super Seeder-sown wheat

District	FLDs (No.)	Area (ha)	Grain yield		Yield increase (q/ha)	
			Check	Demo	q/ha	%
Amritsar	78	84.0	53.5	54.0	0.6	1.1
Barnala	113	136.0	50.8	51.9	1.1	2.2
Bathinda	133	133.0	52.8	57.9	5.1	9.6
Faridkot	81	345.0	46.3	48.2	1.9	4.1
Fatehgarh Sahib	171	171.0	47.2	50.5	3.3	7.0
Fazilka	106	106.0	48.7	49.0	0.3	0.6
Ferozepur	75	87.0	50.2	51.6	1.5	2.9
Gurdaspur	67	67.0	49.8	49.9	0.2	0.3
Hoshiarpur	90	90.0	47.6	47.6	0.0	0.0
Jalandhar	130	130.0	51.1	52.8	1.7	3.3
Kapurthala	94	93.0	56.4	57.0	0.5	1.0
Ludhiana	171	171.0	53.2	55.8	2.6	4.9
Mansa	14	70.9	50.3	51.4	1.1	2.3
Moga	148	148.0	52.2	52.6	0.4	0.8
Mohali	61	50.0	48.2	51.9	3.8	7.8
Muktsar	48	48.0	53.1	53.9	0.8	1.6
Nawanshahr	34	34.0	52.9	53.6	0.7	1.3
Pathankot	85	85.0	54.0	56.7	2.7	5.1
Patiala	171	171.0	46.1	50.3	4.2	9.1
Ropar	27	26.8	43.8	46.0	2.2	5.0
Sangrur	102	106.6	55.7	57.4	1.7	3.1
Tarntaran	344	344.0	48.9	49.7	0.8	1.6
Total/Avg	2343	2697.3	50.5	52.2	1.7	3.4

District	Economics							
	Demonstration (₹/ha)				Local Check (₹/ha)			
	Cost of cultivation	Gross return	Net return	BCR	Cost of cultivation	Gross return	Net return	BCR
Amritsar	38235	163788	125553	4.28	39270	162679	123409	4.14
Barnala	41307	148986	107679	3.61	42138	144729	102591	3.43
Bathinda	40703	149634	108930	3.68	41928	136554	94626	3.26
Faridkot	41878	132657	90779	3.17	43676	127342	83666	2.92
Fatehgarh Sahib	37822	144810	106988	3.83	40310	136191	95881	3.38
Fazilka	39969	126731	86762	3.17	40604	125972	85368	3.10
Ferozepur	40774	133455	92681	3.27	39510	129698	90188	3.28
Gurdaspur	40945	147770	106825	3.61	41875	147272	105397	3.52
Hoshiarpur	42261	123125	80864	2.91	46069	123111	77041	2.67
Jalandhar	38861	169046	130185	4.35	39474	164958	125484	4.18
Kapurthala	35190	147037	111847	4.18	36976	146422	109446	3.96
Ludhiana	45893	144234	98341	3.14	47731	137549	89818	2.88
Mansa	45961	132943	86981	2.89	42517	129989	87471	3.06
Moga	39511	135897	96386	3.44	44480	134866	90386	3.03
Mohali	40248	146195	105946	3.63	41371	135563	94192	3.28
Muktsar	39331	146126	106795	3.72	43481	144263	100782	3.32
Nawanshahr	32206	147439	115234	4.58	38750	145631	106881	3.76
Pathankot	45072	137488	92416	3.05	46393	130855	84462	2.82
Patiala	30843	129556	98713	4.20	32902	118729	85827	3.61
Ropar	37906	133528	95622	3.52	37377	129436	92059	3.46
Sangrur	44900	149116	104215	3.32	46973	143305	96332	3.05
Tarnataran	38136	132063	93927	3.46	38986	130068	91082	3.34
Total/Avg	39480	140961	101481	3.57	41184	136063	94879	3.30

The economic analysis indicated that the Super Seeder demonstrations recorded an average cost of cultivation of ₹39,386/ha, gross returns of ₹1,41,264/ha, net returns of ₹1,01,878/ha and a benefit-cost ratio of 3.59, compared with ₹41,085/ha, ₹1,36,380/ha, ₹95,294/ha and 3.32, respectively, under the local check. The highest net returns (₹1,30,185/ha) were obtained in Jalandhar, while the highest benefit-cost ratio (4.58) was recorded in Nawanshahr.



SURFACE SEEDER

A total of 48 Front Line Demonstrations (FLDs) on Surface Seeder-sown wheat were conducted across 43.20 ha in eleven districts of Punjab under the Crop Residue Management (CRM) programme. Among the demonstration fields, PBW 826 was the predominant wheat variety, followed by PBW 872, PBW 725, DBW 303, PBW 766, DBW 187, DBW 222 and HD 3086. Other recommended wheat varieties were also represented in a limited number of demonstrations based on farmers' preference

The performance of Surface Seeder demonstrations varied across the participating districts. The highest grain yield under demonstrations was recorded in Sangrur (62.5 q/ha), followed by Bathinda (58.5 q/ha), Moga (54.8 q/ha), Amritsar (54.3 q/ha) and Jalandhar (52.4 q/ha). The maximum yield increase over the local check was observed in Sangrur (15.7%), followed by Moga (6.3%), Hoshiarpur (5.6%), Ferozepur (2.7%), Jalandhar (2.4%), Mansa (2.0%) and Bathinda (1.9%). However, marginal reductions in grain yield compared with the local check were recorded in Nawanshahr (-4.9%), Muktsar (-1.7%) and Gurdaspur (-1.7%). On average, the Surface Seeder demonstrations recorded a grain yield of 52.0 q/ha, registering a marginal yield advantage of 0.1 q/ha (0.2%) over the local check.

The economic analysis revealed that the Surface Seeder demonstrations recorded an average cost of cultivation of ₹34,301/ha, gross returns of ₹1,45,150/ha, net returns of ₹1,10,849/ha and a benefit-cost ratio of 4.23, compared with ₹40,796/ha, ₹1,44,661/ha, ₹1,03,865/ha and 3.55, respectively, under the local check. The highest net returns (₹1,29,872/ha) were recorded in Jalandhar, whereas the highest benefit-cost ratio (5.13) was achieved in Bathinda, followed closely by Nawanshahr (5.04).

Table 3.4: District-wise performance of demonstrations on Surface Seeder-sown wheat

District	FLDs (No.)	Area (ha)	Grain yield		Yield increase (q/ha)	
			Check	Demo	q/ha	%
Amritsar	10	4.6	53.8	54.3	0.5	0.9
Bathinda	1	1.0	57.4	58.5	1.1	1.9
Ferozepur	3	3.0	49.7	51.0	1.3	2.7
Gurdaspur	3	3.0	49.8	49.0	-0.8	-1.7
Hoshiarpur	5	5.0	47.4	50.1	2.7	5.6
Jalandhar	4	4.0	51.1	52.4	1.2	2.4
Mansa	2	2.8	50.5	51.5	1.0	2.0
Moga	2	2.0	51.5	54.8	3.3	6.3
Muktsar	3	3.0	53.7	52.8	-0.9	-1.7
Nawanshahr	14	14.0	52.6	50.0	-2.6	-4.9
Sangrur	1	0.8	54.0	62.5	8.5	15.6
Total/Avg	48	43.2	51.9	52.0	0.1	0.2

District	Economics							
	Demonstration (₹/ha)				Local Check (₹/ha)			
	Cost of cultivation	Gross return	Net return	BCR	Cost of cultivation	Gross return	Net return	BCR
Amritsar	33179	159990	126812	4.82	38868	158615	119747	4.08
Bathinda	29500	151223	121723	5.13	42500	148379	105879	3.49
Ferozepur	39250	131835	92585	3.36	39510	128388	88878	3.25
Gurdaspur	38517	145465	106949	3.78	41267	147619	106353	3.58
Hoshiarpur	40461	129379	88918	3.20	45584	122529	76945	2.69
Jalandhar	39915	169788	129872	4.25	41230	161655	120425	3.92
Mansa	42055	133128	91073	3.17	42195	130543	88348	3.09
Moga	36875	141529	104654	3.84	44231	133128	88897	3.01
Muktsar	34922	142857	107935	4.09	43147	145587	102440	3.37
Nawanshahr	27321	137770	110449	5.04	38750	144777	106027	3.74
Sangrur	44785	151441	106656	3.38	47068	130950	83883	2.78
Total/Avg	34301	145150	110848	4.23	40796	144661	103865	3.55

SUMMARY

The Front-Line Demonstrations (FLDs) conducted under the Crop Residue Management (CRM) programme across Punjab successfully demonstrated the effectiveness of in-situ crop residue management technologies under farmers' field conditions. Technologies such as Happy Seeder, Smart Seeder, Super Seeder and Surface Seeder consistently improved wheat productivity, reduced production costs, and enhanced net returns compared to conventional residue burning practices. Among these, Super Seeder accounted for the largest number of demonstrations, while Happy Seeder effectively reduced weed infestation and Surface Seeder recorded the highest benefit-cost ratio. Overall, the demonstrations validated that CRM technologies offer a profitable and sustainable alternative to crop residue burning while supporting higher productivity and environmental conservation.

Key Findings

- **A total of 2,669 Front Line Demonstrations (FLDs)** covering **3,154.76 ha** were conducted on four crop residue management technologies: Happy Seeder (161 FLDs), Smart Seeder (117 FLDs), Super Seeder (2,343 FLDs) and Surface Seeder (48 FLDs).
- **Super Seeder** accounted for the **largest share (87.8%)** of demonstrations (2,343 FLDs), indicating its widespread acceptance and scalability under farmers' conditions.
- All technologies generally **improved wheat productivity and profitability** over the conventional practice (local check), while reducing cultivation costs in most cases.
- **Super Seeder recorded the highest average yield advantage (3.35%; +1.70 q/ha)**, followed by **Smart Seeder (2.9%; +1.5 q/ha)** and **Happy Seeder (2.3%; +1.2 q/ha)**. Surface Seeder showed only a **marginal average yield gain (0.2%; +0.1 q/ha)**.
- **Happy Seeder reduced weed infestation by an average of 30.1%**, demonstrating its significant advantage in weed suppression under retained crop residues.

- **Surface Seeder recorded the highest average Benefit-Cost (B: C) ratio (4.2)** despite its limited yield advantage, mainly because of its **lowest average cultivation cost (₹34,301/ha)** among all technologies.
- **Smart Seeder achieved the highest average net returns (₹1,18,799/ha)**, followed by Happy Seeder (₹1,11,842/ha), Surface Seeder (₹1,10,849/ha) and Super Seeder (₹1,01,878/ha).

CONCLUSION

The Front-Line Demonstrations clearly established the technical and economic feasibility of in-situ crop residue management technologies under farmers' field conditions. All four machines generally outperformed the conventional residue-burning practice by improving wheat productivity and farm profitability. Super Seeder emerged as the most widely adopted and consistently performing technology, while Smart Seeder generated the highest average net returns. Happy Seeder proved particularly effective in suppressing weed infestation, highlighting its agronomic advantage under residue-retained conditions. Surface Seeder, despite limited yield gains, achieved the highest benefit-cost ratio due to its comparatively low cultivation cost.

District-wise variations in performance indicate that local agro-climatic conditions, residue load, and field management practices influence technology effectiveness. The few instances of negative yield response emphasize the need for location-specific recommendations and proper machine operation. Overall, the demonstrations validate that crop residue management technologies provide a sustainable alternative to residue burning by enhancing productivity, profitability, and resource conservation. These findings support wider promotion of CRM machinery through KVKs and targeted extension interventions to accelerate adoption across Punjab.



STRATEGIC LEARNING PLATFORMS ON CRM

The Strategic Learning Platform on Crop Residue Management (CRM) is a participatory extension approach designed to promote knowledge sharing, technology validation, and capacity building for sustainable crop residue management. It serves as a collaborative platform where farmers, scientists, extension professionals, policymakers, and other stakeholders can jointly evaluate CRM technologies and practices.

LEARNING PLATFORM AT KVK FARM

It functions as a centralized learning and demonstration hub where recommended CRM technologies and machinery are established under controlled conditions. It showcases complete residue management solutions, including machinery operation, crop establishment techniques, residue incorporation, mulching, etc. The platform provides hands-on training to farmers, extension personnel, students, and other stakeholders, enabling them to observe the performance of various technologies, compare alternatives, and build confidence before field-level adoption.

Table 4.1: Comparison of Wheat yields sown using different machines at KVKs

District	Conventional	Happy Seeder	Super Seeder	Smart Seeder	Surface Seeder	Zero Till Drill
Amritsar	46.7	49.5	49.1	50.2	50.2	47.5
Bathinda	47.7	52.8	48.6	52.5	50.2	49.9
Faridkot	26.2	53.3	50.3	51.3	49.4	-
Fatehgarh Sahib	50.8	51.5	52.8	53.4	52.2	-
Ferozepur	49.1	51.1	52.2	50.1	50.3	49.2
Gurdaspur	50.2	49.8	51.3	51.8	50.4	-
Hoshiarpur	47.7	51.2	47.7	50.7	50.2	49.7
Jalandhar	51.2	54.6	53.2	53.2	52.4	51.8
Kapurthala	-	57.1	57.2	57.5	53.1	57.5
Ludhiana	55.3	60.7	59.3	59.8	57.1	-
Mansa	47.1	49.2	50.2	48.5	49.5	47.5
Moga	52.1	51.5	51.1	53.1	50.5	
Muktsar	52.9	52.9	54.5	54.2	51.5	50.5
Nawanshahr	52.1	50.8	52.8	54.3	49.1	47.8
Pathankot	51.1	52.5	53.1	-	50.5	51.1
Patiala	56.1	56.8	56.5	55.4	57.4	58.1
Ropar	-	50.9	50.4	52.9	54.4	52.1
Sangrur	-	56.5	57.1	58.5	58.4	-
Tarnataran	-	49.1	45.1	-	42.1	44.1

Happy Seeder

The Happy Seeder emerged as one of the best-performing technologies under the Strategic Learning Platform demonstrations. It recorded the highest grain yield of 60.7 q/ha in Ludhiana, followed by Kapurthala (57.1 q/ha), Patiala (56.8 q/ha) and Sangrur (56.5 q/ha), demonstrating its effectiveness for wheat establishment under paddy residue-retained conditions. A noteworthy intervention was undertaken in Faridkot, where a modified Happy Seeder with furrow openers adjusted to glide over the soil surface instead of penetrating into the soil recorded a grain yield of 54.8 q/ha, highlighting the potential of machine refinement for improving operational performance.

Super Seeder

The Super Seeder also demonstrated encouraging performance across the participating districts. The highest grain yield of 59.3 q/ha was recorded in Ludhiana, followed by Sangrur and Kapurthala (57.1 q/ha each) and Patiala (56.5 q/ha). The technology performed consistently under residue-retained conditions and proved to be an effective alternative to the conventional practice of paddy straw burning before wheat sowing.

Smart Seeder

The Smart Seeder exhibited excellent performance across the demonstrations. The highest grain yield of 59.8 q/ha was recorded in Ludhiana, followed by Sangrur (58.5 q/ha) and Kapurthala (57.5 q/ha). The consistent performance of the Smart Seeder across different districts demonstrated its adaptability and suitability for wheat sowing under in-situ crop residue management.

Surface Seeder

The Surface Seeder recorded promising results under the Strategic Learning Platform, with the highest grain yield of 58.4 q/ha achieved in Sangrur, followed by Patiala (57.4 q/ha) and Ludhiana (57.1 q/ha). The technology established wheat successfully under retained paddy residues and maintained competitive grain yields across the demonstration locations.

Zero Till Drill

The Zero Till Drill also performed satisfactorily across the demonstration districts. The highest grain yield of 58.1 q/ha was recorded in Patiala, followed by Kapurthala (57.5 q/ha) and Ropar (52.1 q/ha). The demonstrations reaffirmed the suitability of Zero till Drill technology for timely wheat sowing under residue-retained conditions.

Other machines

Wheat yield under MB (Mouldboard) Plough was recorded in Bathinda (50.1 q/ha), Ferozepur (51.1 q/ha), Muktsar (54.2 q/ha) and Sangrur (57.5 q/ha), with an average yield of 53.1 q/ha. Learning platforms using Rotavator were available only for Sangrur, where a yield of 57.6 q/ha was recorded. Overall, the available observations indicate good wheat performance under both practices, although the limited number of observations for Rotavator restricts broader comparison.

Overall, the Strategic Learning Platform demonstrations highlighted the potential of CRM technologies for successful wheat establishment under retained paddy residues. The technologies maintained competitive grain yields while providing a sustainable alternative to the conventional practice of residue burning before wheat sowing.

LEARNING PLATFORM AT FARMERS' FIELDS

It extends the learning process to real farming situations by establishing participatory demonstrations on farmers' land. It enables farmers to evaluate CRM technologies under local agro-climatic, soil, and management conditions while fostering peer-to-peer learning. Regular field days, interface meetings, and stakeholder interactions at these sites facilitate the exchange of experiences, strengthen local capacity, and encourage the large-scale adoption of sustainable crop residue management practices across the farming community.

Table 4.2: Comparison of Wheat yields sown using different machines at Farmers' Field

District	Conventional	Happy Seeder	Super Seeder	Smart Seeder	Surface Seeder	Zero Till Drill
Amritsar	46.7	49.5	49.1	50.2	50.2	47.5
Bathinda	47.7	52.8	48.6	52.5	50.2	49.9
Faridkot	26.2	53.3	50.3	51.3	49.4	-
Fatehgarh Sahib	50.8	51.5	52.8	53.4	52.2	-
Ferozepur	49.1	51.1	52.2	50.1	50.3	49.2
Gurdaspur	50.2	49.8	51.3	51.8	50.4	-
Hoshiarpur	47.7	51.2	47.7	50.7	50.2	49.7
Jalandhar	51.2	54.6	53.2	53.2	52.4	51.8
Kapurthala	-	57.1	57.2	57.5	53.1	57.5
Ludhiana	55.3	60.7	59.3	59.8	57.1	-
Mansa	47.1	49.2	50.2	48.5	49.5	47.5
Moga	52.1	51.2	51.5	51.1	53.1	50.5
Muktsar	52.9	52.9	54.5	54.2	51.5	50.5
Nawanshahr	52.1	50.8	52.8	54.3	49.1	47.8
Pathankot	51.1	52.5	53.1	-	50.5	51.1
Patiala	56.1	56.8	56.5	55.4	57.4	58.1
Ropar	-	50.9	50.4	52.9	54.4	52.1
Sangrur	-	56.5	57.1	58.5	58.4	-
Tarntaran	-	49.1	45.1	-	42.1	44.1

Happy Seeder

The Happy Seeder performed remarkably well under farmers' field conditions, recording the highest grain yield of 61.9 q/ha in Barnala, followed by Bathinda (61.7 q/ha) and Sangrur (60.4 q/ha). The demonstrations established the capability of the technology to sustain high wheat productivity while eliminating the need for paddy residue burning.

Super Seeder

The Super Seeder recorded encouraging performance across the farmers' field learning platforms. The highest grain yield of 61.8 q/ha was recorded in Sangrur, followed by Mansa (58.1 q/ha) and Kapurthala (57.1 q/ha). The technology demonstrated reliable performance under residue-retained conditions and proved effective for wheat establishment.

Smart Seeder

The Smart Seeder also emerged as a promising technology, with the highest grain yield of 61.4 q/ha recorded in Bathinda, followed by Sangrur (59.1 q/ha) and Kapurthala (57.5 q/ha). Its consistent performance across different districts indicated its adaptability under diverse field conditions.

Surface Seeder

The Surface Seeder recorded satisfactory performance, with the highest grain yield of 58.3 q/ha recorded in Patiala, followed by Barnala (57.3 q/ha) and Bathinda (56.7 q/ha). The demonstrations indicated that the technology can effectively establish wheat under retained crop residues while maintaining competitive grain yields.

Zero Till Drill

The Zero Till Drill also demonstrated encouraging performance under farmers' field conditions. The highest grain yield of 57.4 q/ha was recorded in Patiala, followed by Kapurthala (57.1 q/ha) and Pathankot (54.1 q/ha), demonstrating the suitability of the technology for residue-retained wheat cultivation.

Other machines

Under MB Plough, wheat yield was recorded in Kapurthala (57.1 q/ha) and Muktsar (53.2 q/ha), with an average yield of 55.1 q/ha. Broadcasting + Rotavator was reported only in Mansa, where a wheat yield of 52.1 q/ha was obtained.

The demonstrations conducted at farmers' field learning platforms clearly demonstrated that CRM technologies can successfully establish wheat under retained paddy residues while sustaining grain productivity. The results reinforce their potential for large-scale adoption as sustainable alternatives to the conventional practice of paddy residue burning before wheat sowing.

SUMMARY

The Strategic Learning Platforms on Crop Residue Management (CRM) established at KVK farms and farmers' fields demonstrated the technical feasibility and effectiveness of in-situ crop residue management technologies for wheat cultivation under retained paddy residues. The platforms provided opportunities for participatory learning, technology validation, and hands-on capacity building, enabling stakeholders to compare the performance of different residue management machinery under both controlled and real farming conditions. Across locations, CRM technologies consistently maintained or improved wheat grain yield compared to conventional practices, confirming their potential as sustainable alternatives to crop residue burning.

KEY FINDINGS

- Happy Seeder emerged as one of the best-performing technologies under both KVK and farmers' field demonstrations, recording the highest yield of 60.7 q/ha at KVK Ludhiana and 61.9 q/ha at farmers' fields in Barnala.
- Super Seeder consistently performed well, recording maximum yields of 59.3 q/ha at KVK Ludhiana and 61.8 q/ha at farmers' fields in Sangrur.
- Smart Seeder demonstrated excellent adaptability across districts, with the highest yields of 59.8 q/ha at KVK Ludhiana and 61.4 q/ha at farmers' fields in Bathinda.
- Surface Seeder produced competitive grain yields, with the highest yields of 58.4 q/ha at KVK Sangrur and 58.3 q/ha at farmers' fields in Patiala.
- Zero Till Drill proved to be an effective technology for timely wheat establishment, recording maximum yields of 58.1 q/ha at KVK Patiala and 57.4 q/ha at farmers' fields in Patiala.
- The modified Happy Seeder evaluated at Faridkot demonstrated the potential of machine refinement by achieving 54.8 q/ha, indicating scope for further technological improvements.





LESSONS LEARNED & WAY FORWARD

The experience of Crop Residue Management (CRM) interventions demonstrates that residue burning is not merely a technological problem but a time-bound, logistical, economic and behavioural challenge requiring coordinated action. The interventions have resulted in substantial reductions in residue burning, improved access to CRM machinery, enhanced farmer awareness and generated measurable economic, environmental and resource-conservation benefits. However, the persistence of burning in specific hotspots, machinery-utilization constraints and the emergence of new geographical hotspots indicate that the next phase must move beyond generalized awareness and asset creation towards precision targeting, efficient utilization, institutional convergence and measurable outcomes.

LESSONS LEARNED

1. The problem is highly time-concentrated

One of the most important lessons is that residue burning is concentrated within a short and predictable period. The analysis in the sample report identifies **23 October to 14 November** as the critical surge period, corresponding to the narrow turnaround between paddy harvesting and wheat sowing. The short 10-15-day window creates intense pressure on farmers to clear fields rapidly, making burning an economically convenient option when machinery or alternative management systems are not immediately available. Therefore, interventions must be concentrated **before and during this critical window rather than being uniformly distributed throughout the season.**

2. Asset creation must shift towards asset utilization

The CRM programme has substantially expanded the machinery base and Custom Hiring Centre (CHC) network. During 2018-19 to 2025-26, more than **3.45 lakh CRM machines** and **43,276 CHCs** were established across the participating states. However, the experience demonstrates that merely increasing the number of machines does not automatically ensure effective residue management. Timely availability, machine maintenance, trained operators, appropriate machine selection, and efficient scheduling are equally important. The key lesson is therefore to move from **"how many machines were distributed?"** to **"how effectively were the machines utilized?"**

3. Hotspot-based intervention is more effective than blanket intervention

The spatial pattern of residue burning has changed substantially. Although the overall number of fire events has declined, the remaining problem is increasingly concentrated in specific areas, while Rajasthan and Madhya Pradesh have emerged as growing hotspots. The sample analysis therefore recommends a dual approach: **intensive intervention in entrenched hotspots such as Punjab and preventive action in emerging hotspots.**

This establishes the need for **district-, block- and village-level hotspot mapping**, followed by differentiated deployment of machinery, manpower and extension resources.

4. KVKs are critical for technology adoption and behavioural change

The experience of KVKs shows that awareness is most effective when combined with **demonstration, skill development and direct farmer interaction**. KVKs have conducted awareness programmes, field demonstrations, exposure visits and field days, while also training farmers, machine operators and CHC managers. This combination enables farmers to see the practical performance of CRM technologies rather than relying only on advisories.

Thus, IEC should increasingly become **evidence-based and outcome-oriented**, with emphasis on actual field performance, economics, soil health, water saving and farmer experiences.

5. Economic benefits are a powerful driver of adoption

CRM should not be presented only as an environmental obligation. The evidence demonstrates a strong economic case for farmers. In Punjab, in-situ management of approximately **11.4 million tonnes of paddy straw** was associated with estimated cultivation-cost savings of more than **₹600 crore**, along with substantial nutrient recycling and water conservation.

The lesson is that future communication should place greater emphasis on "CRM as an economically rational farm practice", supported by simple farm-level cost-benefit demonstrations and comparisons with residue burning and conventional tillage.

6. Community institutions strengthen sustainability

The experience demonstrates that technology adoption becomes more sustainable when supported by community-level institutions, including CHCs, Self-Help Groups and Farmer Interest Groups. Participatory planning, institutional convergence and location-specific interventions helped improve adoption and resilience across diverse agro-ecological conditions.

The CRM programme can therefore benefit from greater involvement of **Gram Panchayats, farmer groups, FPOs, cooperatives, SHGs and village-level institutions** in planning, machinery management, monitoring and social mobilization.



7. Push, Pull and Enforcement must operate together

The reduction in residue burning demonstrates the value of an integrated **Push-Pull-Enforcement** approach. The push component creates awareness and technical capacity; the pull component improves economic viability through machinery access, incentives and residue-based value chains; while enforcement discourages continued burning.

No single component is sufficient. Awareness without machinery access leaves farmers without practical alternatives; machinery without economic viability may remain underutilized; and enforcement without accessible alternatives may create resistance. The three components must therefore be implemented simultaneously.

STRATEGIC WAY FORWARD

1. Precision targeting and cluster-based intervention

The next phase should adopt a **hyper-localized CRM strategy** rather than treating an entire state or district uniformly. High-burning districts should be divided into priority clusters based on historical fire counts, paddy area, harvesting pattern, machine availability and wheat-sowing requirements. Adequate numbers of Happy Seeders, Super Seeders, balers and other suitable machines should then be **pre-positioned in these clusters before the critical harvest period**.

The objective should be to achieve **zero-burning clusters first and subsequently expand them**, thereby creating demonstrable models for neighbouring areas.

2. Mission-mode machinery deployment

Machinery deployment should move from a scattered, ownership-oriented approach to a **demand-driven service-delivery** model. Machines should be pooled at CHCs, cooperatives and other community institutions and deployed according to actual demand and harvesting schedules.

A centralized coordination mechanism should monitor machine availability, demand, field coverage and movement between blocks. Machinery should be shifted from areas where demand has been met to areas where harvesting is progressing, thereby reducing idle time and improving utilization. The sample report specifically recommends dynamic, real-time coordination of machinery in accordance with the harvest trajectory.

3. Strengthen the CHC as the last-mile service provider

CHCs should evolve from simply being repositories of machinery into **professional farm-service centres**. Each CHC should maintain an inventory of functional machines, trained operators, maintenance arrangements and booking mechanisms.

Priority should be given to:

- preventive servicing before the paddy harvest;
- availability of trained operators;
- rapid repair and technical support;
- transparent hiring charges;
- village-level booking and scheduling;
- performance-based monitoring of CHCs; and
- rationalization of machines according to local demand.

This will ensure that farmers perceive CRM machinery as a **reliable service available when required**, rather than as an uncertain alternative to burning.

4. Develop a trained CRM workforce

Machine availability alone cannot guarantee adoption. A trained workforce of **tractor operators, machine operators, mechanics, CHC managers and field-level technical personnel** should be created and

maintained in hotspot areas. KVKs can play a major role in regular skill-development programmes and refresher training. The existing experience shows that capacity building has already created local expertise, but this needs to be institutionalized and linked with the seasonal deployment of machinery.

5. Transform IEC into evidence-based economic communication

Future IEC campaigns should shift from predominantly communicating the adverse consequences of burning towards demonstrating the **economic and agronomic advantages of non-burning practices**.

Each hotspot village should have demonstrations showing:

- cost of cultivation under different CRM options;
- fuel and tillage savings;
- irrigation savings;
- wheat establishment and yield;
- nutrient recycling;
- soil-moisture conservation; and
- farmer-level net economic returns.

Successful farmers should be used as **local champions**, while KVKs should document and communicate field-level evidence. The sample report similarly emphasizes farmer success stories, demonstrations and clear cost-benefit analyses to build confidence in CRM.

6. Strengthen institutional convergence

CRM should be implemented as a **convergent programme rather than an isolated agricultural intervention**. ICAR-KVKs, State Agriculture Departments, local administration, CHCs, Panchayats, FPOs, cooperatives and other stakeholders should work through a common village- and cluster-level action plan.

Convergence with line departments and government programmes can mobilize resources for infrastructure and strengthen community-level implementation.

7. Integrate *in-situ* and *ex-situ* residue management

In-situ management should remain a major pathway, but it should be complemented by viable *ex-situ* utilization wherever field incorporation is unsuitable, or demand for straw collection exists. Residue-based value chains involving **biomass energy, CBG, bioethanol, industrial applications and other value-added products** should be strengthened.

This approach can transform paddy straw from a disposal liability into an economic resource and provide an additional **pull factor** for farmers and rural entrepreneurs.

8. Establish a real-time CRM monitoring and decision-support system

A unified digital monitoring system should integrate:

hotspot mapping → paddy harvesting progress → machine availability → machine booking → field coverage → burning events → intervention → outcome.

Such a system would enable administrators to identify gaps in real time and dynamically redistribute machinery and technical manpower. It would also shift monitoring from reporting activities to measuring **actual outcomes and utilization efficiency**.

9. Prevent the geographical spread of residue burning

While Punjab remains the principal priority, the emergence of Rajasthan and Madhya Pradesh as growing hotspots requires **pre-emptive intervention**. The lesson from Punjab should be applied before residue burning becomes entrenched in these areas.

Early-stage interventions should include baseline assessment, hotspot identification, demonstration of suitable technologies, CHC development, operator training and community mobilization.

10. Adopt a village-level "Zero Burning" mission

The ultimate unit of implementation should be the **village rather than merely the district**. Villages should be classified according to their residue-burning status and provided with a specific action plan. Villages achieving zero burning should be documented as demonstration villages and their successful mechanisms replicated in neighbouring villages.

The CRM experience already provides evidence of this approach: among 1,258 adopted villages, **946 achieved zero crop residue burning**.

CONCLUSION

The experience of the CRM Project demonstrates that **large-scale transformation is possible when policy, technology, extension, community participation and enforcement operate together**. Residue burning across participating states has declined substantially, while Punjab has recorded a particularly sharp reduction; simultaneously, in-situ residue management has generated significant economic, nutrient-recycling and water-conservation benefits.

The next challenge is therefore not to establish whether alternatives to burning exist, but to ensure that these alternatives are **available, affordable, technically reliable and operationally efficient at the exact place and time farmers need them**. The future strategy should consequently focus on **precision targeting, cluster-based machinery pooling, dynamic logistics, trained manpower, strong CHCs, evidence-based IEC, institutional convergence, circular residue utilization and outcome-based monitoring**. The Climate Smart Village experience further demonstrates that such interventions are most sustainable when they combine technology with participatory institutions and location-specific planning.

The central lesson is clear: **the next phase of CRM should move from asset creation to utilization, from generalized awareness to precision communication, and from scattered activities to mission-mode, cluster-based execution**. This transition can consolidate the gains already achieved and move the rice-wheat systems of North-West India towards sustained **zero crop residue burning, improved soil and water health, higher farm profitability and greater climate resilience**.



SPECIAL EVENTS

***Chaupal Charcha* by Union Agriculture Minister at Nurpur Bet (14.10.2025)**

A *Chaupal Charcha*, followed by an awareness-cum-demonstration program on Crop Residue Management (CRM), was organized at Village Nurpur Bet, Ludhiana, Punjab, on October 14, 2025, by ICAR-ATARI, Zone-I, Ludhiana, in collaboration with PAU Krishi Vigyan Kendra, Samrala. The event witnessed the participation of farmers, panchayat members, KVK experts, students, and officials, focusing on promoting sustainable crop residue management for a cleaner environment and improved soil health.

The program was graced by the Hon'ble Union Minister of Agriculture & Farmers' Welfare, Shivraj Singh Chouhan, who interacted directly with farmers during the "*Chaupal Charcha*." He emphasized the





importance of *in-situ* crop residue management and encouraged farmers to adopt conservation agriculture practices. Demonstrations of advanced CRM technologies, including the Super Straw Management System (SSMS), Smart Seeder, and Happy Seeder, were conducted, showcasing effective utilization of paddy straw without burning. A live drone demonstration also highlighted the growing role of precision agriculture and modern technologies in Indian farming.

During his address, Shri Chouhan stressed that subsidies and agricultural machinery support should reach genuine farmers without delay or leakage. He also advocated real-time monitoring of stubble burning through satellite surveillance, hotspot village identification, and stricter enforcement measures. Reinforcing his commitment, he announced that he himself would sow wheat directly after paddy harvesting without burning residue to motivate farmers toward sustainable practices.

The event was attended by several distinguished dignitaries, including Ravneet Singh Bittu, M. L. Jat, Rajbir Singh, S. N. Jha, D. K. Yadav, Satbir Singh Gosal, and Parvender Sheoran, along with Program Coordinators of KVKs and CRM Nodal Officers from Punjab. The Chaupal concluded with a collective commitment toward cleaner air, healthier soils, and sustainable agriculture, inspiring farmers to become active champions of conservation agriculture and environmentally responsible farming practices.

Scientist-Farmer Dialogue on Crop Residue Management (14.10.2025)

The Scientist-Farmer Dialogue on Crop Residue Management was organized on 14 October 2025 at Ludhiana by ICAR-ATARI, bringing together key stakeholders for direct engagement. The program was chaired by Dr. M. L. Jat, Secretary, DARE & DG, ICAR, with Dr. Rajbir Singh and Dr. S. N. Jha as co-chairs. Dr. Parvender Sheoran presented an overview of CRM initiatives. The program emphasized achieving zero stubble burning through awareness, enforcement, and scientific interventions. Dr. Jat stressed the

urgency of combating misleading narratives and ensuring compliance with machinery attachments, while appreciating collective farmer efforts. Dr. Rajbir Singh highlighted the underutilization of subsidized machinery and the need for effective monitoring. Farmers actively shared field-level challenges, particularly regarding access to subsidies and machinery. The dialogue reinforced the importance of community-led approaches and the critical role of KVKs in technology dissemination. Overall, the program strengthened coordination among scientists, farmers, and policymakers, fostering a participatory framework for sustainable crop residue management and environmental conservation.

Stakeholders' Consultation on Crop Residue Management (14.11.2025)

The Stakeholders' Consultation on Crop Residue Management was organized on 14 November 2025 at Ludhiana by ICAR-ATARI with GADVASU and PAU. The program was graced by Dr. M. L. Jat as Chief Guest and Dr. Rajbir Singh as Guest of Honour. Distinguished participants included Dr. J. P. S. Gill, Dr. Parvender Sheoran, and other leading scientists.

The consultation focused on strengthening strategies for sustainable residue management and preventing stubble burning. Dr. Jat emphasized evaluating CHCs for improved efficiency and sustainability, while advocating the concept of Crop Residue Learning Landscapes for participatory demonstration. Dr. Rajbir Singh highlighted the positive environmental outcomes achieved through coordinated extension efforts. Technical discussions addressed challenges in machinery access, service delivery, and institutional convergence. The program concluded with renewed commitment toward collaborative action, highlighting the importance of multi-stakeholder engagement in scaling scientific CRM technologies and ensuring long-term environmental and agricultural sustainability.





Interstate Traveling Seminar on Crop Residue Management (24-26.10.2025)

The Interstate Traveling Seminar on Crop Residue Management (CRM) was conducted from 24-26 October 2025 across Punjab and Haryana under the leadership of Dr. M. L. Jat, with key participation from Dr. Rajbir Singh and Dr. Parvender Sheoran. The program covered major districts including Ludhiana, Sangrur, Barnala, Rohtak, and Fatehabad, integrating field visits, farmer interactions, and live demonstrations of CRM machinery.



Dr. Jat emphasized that residue management is fundamental to long-term soil health, environmental sustainability, and climate resilience, while advocating region-specific policy approaches. A key recommendation was the development of a flexible, agroecology-based list of machinery for CHCs, replacing uniform national norms. Dr. Rajbir Singh stressed that zero stubble burning is essential, promoting large-scale in-situ management. Farmers actively shared constraints related to cost, quality, and access to machinery. The seminar also explored innovative mechanisms such as carbon credits, social recognition for zero-burning villages, and strengthened enforcement strategies. Overall, the initiative effectively bridged policy and practice, fostering participatory, economically viable, and regionally adaptive CRM solutions.



ATARI, Ludhiana-Grow Indigo Partnership for Advancing Carbon Farming (25.11.2025)

ICAR-ATARI, Ludhiana, signed a Memorandum of Understanding (MoU) with Grow Indigo on 25 November 2025 at the Division of Agricultural Extension, ICAR Headquarters, New Delhi. The MoU was formalized between Dr. Parvender Sheoran and Umang Agrawal, in the presence of Dr. Rajbir Singh, Dr. R. R. Burman, Dr. R. K. Singh, and Dr. Anjani Kumar.

This strategic collaboration aims to promote regenerative and climate-smart agricultural practices to reduce greenhouse gas emissions, improve soil health, and enhance farmers' income through carbon credit generation. The initiative will focus on field demonstrations, capacity building, and the strengthening of extension delivery systems across Punjab and other northern states. Notably, the program is voluntary and free for farmers, ensuring a smooth transition towards sustainable practices. The partnership aligns with national priorities on climate resilience and sustainable agriculture.

Stakeholders' Dialogue on Crop Residue Management (27.11.2025)

ICAR-ATARI, Ludhiana, organized a flagship "Stakeholders' Dialogue on Crop Residue Management" on 27 November 2025 at village Ransinh Kalan, Moga, in collaboration with PAU and KVK Moga. The program was graced by Shivraj Singh Chouhan, witnessing the participation of over 1,000 farmers from 17 villages. The Minister visited fields demonstrating in-situ technologies like Happy Seeder and interacted with progressive farmers adopting residue incorporation in wheat, potato, and mustard systems. He highlighted that such practices enhance soil organic carbon, nutrient-use efficiency, and long-term sustainability.



Ransinh Kalan emerged as a model village with 100% residue-burning-free status for six consecutive years, supported by strong community participation and local leadership under S. Inderpreet Singh. Dr. M. L. Jat described Punjab's progress as a milestone in environmental sustainability, emphasizing reduced fertilizer dependency, improved soil health, and lower emissions. Dr. Rajbir Singh and Dr. Parvender Sheoran highlighted the role of KVK-led extension in driving behavioral change. The program reinforced a scalable model for zero stubble burning and sustainable agriculture.



Seminar on "Convergence for Change: Policy, Research and Extension in Crop Residue Management" (31.01.2026)

A seminar on "Convergence for Change: Policy, Research and Extension in Crop Residue Management" was organized on 31 January 2026 at the 6th India Agri Expo, Ludhiana Exhibition Centre, Sahnawal, jointly by ICAR-ATARI and Punjab Agricultural University. The program was graced by Hardeep Singh Mundian as Chief Guest, who emphasized the need for coordinated action among policy, research, extension, industry, and farmers to address stubble burning.

The seminar witnessed participation from policymakers, scientists, KVK experts, industry stakeholders, Custom Hiring Centre operators, and progressive farmers. Technical sessions covered CRM challenges, farm machinery innovations, policy perspectives, remote sensing-based monitoring, and residue-to-

energy pathways. A panel discussion highlighted institutional convergence and stakeholder partnerships for scaling proven technologies. The deliberations concluded with a roadmap to strengthen adoption through integrated extension approaches, collaborative frameworks, and technology-driven solutions, ensuring environmentally sustainable crop residue management across Punjab.



India
AGRIEXPO

Concurrent Event

Indian
DairyEXPO

CONVERGENCE FOR CHANGE :

POLICY, RESEARCH AND EXTENSION IN CROP RESIDUE MANAG





CRM PROJECT REVIEW MEETINGS

Regular review and monitoring are essential for ensuring the effective and timely implementation of the Crop Residue Management (CRM) Project. Given the large number of KVKs, diverse field-level interventions, financial components, and the highly time-sensitive nature of crop residue management, continuous monitoring is necessary to assess progress, identify implementation gaps, and facilitate timely corrective action.

REVIEW MEETING HELD ON 6 AUGUST 2025

A review meeting on the **Crop Residue Management (CRM) Project** was held on **6 August 2025 at ICAR-ATARI, Ludhiana**, with the participation of the Director, CRM Nodal Officer, and Project Team of ICAR-ATARI, Ludhiana, along with Heads/Scientists of KVKs of Punjab. The meeting focused on reviewing the progress of CRM activities, ensuring timely utilization of available funds, improving reporting of extension activities, strengthening awareness among farmers, and preparing KVKs for the proposed Inter-Ministerial Committee (IMC) review.

A major issue discussed was the **timely utilization of funds** available with KVKs. The meeting also recognized that several extension activities conducted by KVKs were not adequately reflected in CRM reporting because they were not explicitly included in the approved Action Plan. In particular, **in-service training programmes for extension functionaries** were being conducted but remained unreported. It was therefore decided that such trainings should be incorporated into the CRM reporting formats to ensure proper documentation and visibility of the extension and capacity-building efforts undertaken by KVKs.

The meeting further emphasized the importance of **large-scale farmer awareness and mobilization** before the residue-management season. The meeting also introduced a more frequent **weekly progress-reporting mechanism**, requiring KVKs to submit progress reports at regular intervals. This was intended to facilitate closer monitoring of activities, identify implementation gaps promptly, and enable ICAR-ATARI to provide necessary guidance during the critical pre-harvest period.

Another important agenda item was preparation for the proposed **Inter-Ministerial Committee (IMC) meeting in Punjab**. All CRM-implementing KVKs were instructed to prepare suitable presentations highlighting the progress and achievements of the project. This reflected the importance of presenting consolidated, evidence-based information on CRM interventions, farmer outreach, machinery deployment, demonstrations and outcomes to higher-level review and decision-making forums.

Overall, the August review meeting established the immediate priorities for the 2025 CRM season such as **timely fund utilization, comprehensive reporting of extension activities, intensified farmer awareness, fortnightly monitoring and systematic preparation of evidence-based progress presentations**. The decisions were particularly relevant because the period preceding paddy harvesting is critical for ensuring that farmers are aware of available alternatives and that implementing agencies are operationally prepared.

REVIEW MEETING HELD ON 6 OCTOBER 2025

A subsequent review meeting on the **Crop Residue Management Project** was held on **6 October 2025 at ICAR-ATARI, Ludhiana**, under the chairmanship of Dr. Parvender Sheoran, Director, ICAR-ATARI, Ludhiana. The meeting was attended by Dr. G.S. Makkar, Senior Scientist and In-Charge, Plant Clinic, PAU, Ludhiana; Dr. Jaswinder Singh, Professor and Head, VAHE, GADVASU and CRM Nodal Officer; the CRM Project Team of ICAR-ATARI; and representatives of KVKs across Punjab. The meeting reviewed progress under CRM with particular emphasis on data reporting, financial sanction and utilization procedures, standardization of documentation, machinery-bank performance and strengthening the evidence base for assessing project outcomes.

A key decision was to strengthen the documentation of **Learning Platforms established at KVKs and farmers' fields**. It was decided that information from these platforms should be presented during subsequent review meetings along with relevant **soil-parameter data**. This would enable assessment of not only the adoption of CRM technologies but also their effects on soil health and resource management. The decision reflects a shift towards documenting measurable outcomes rather than reporting only the number of activities conducted.

The meeting also addressed procedural issues related to the **sanction and utilization of the Annual Action Plan**. It was decided that the complete approved Annual Action Plan of the CRM Project for one year should be sanctioned by the respective Host Universities for all KVKs. Once sanctioned, KVKs would be permitted to utilize funds from the released budget for approved activities. To resolve procedural difficulties associated with the one-time sanction of the complete Action Plan, the Directorate of Extension Education (DEE), PAU, Ludhiana, was directed to organize a meeting involving officers of the DEE and Comptroller Offices and representatives of KVKs. The proceedings and decisions of this meeting were to be communicated to all concerned for immediate necessary action.

A comprehensive KVK-wise Annual CRM Report for 2024-25 was also mandated, with submission by 31 December 2025. The report was required to provide district-wise information on the percentage of paddy-residue area under different management pathways, including **burned area, machine-wise ex-situ management and machine-wise in-situ management through Happy Seeder, Super Seeder, Smart Seeder and other technologies**. The data was to be presented using pie charts to facilitate comparative interpretation. In addition, KVKs were instructed to provide lists of villages adopted under CRM since project inception, and villages declared burning-free.

Particular emphasis was placed on documenting the **performance of machinery banks**. KVKs were required to present machinery-bank performance in a standardized tabular format covering the **name of machinery, area covered, amount generated, and number of farmers benefited**. This requirement was important for assessing whether the machinery infrastructure created under the CRM programme was translating into actual farm-level service delivery and utilization.

The meeting further strengthened the **data-management framework for 2025-26**. GPS coordinates were made mandatory for all IEC activities, including awareness programmes, trainings and demonstrations, thereby enabling spatial verification and mapping of project activities. KVKs were also

advised to organize training programmes for extension personnel such as **Block Technology Managers (BTMs)** to strengthen field-level implementation.

To improve the quality and reliability of outcome data, each KVK was instructed to collect the **complete dataset of demonstrations from at least 20% of participating farmers** and yield data from the remaining **80% of farmers whose fields were covered under demonstrations**. KVKs were additionally required to document the period of maximum fire incidents in their respective districts. This information would help establish the temporal concentration of residue burning and support better planning of machinery, demonstrations, manpower and awareness activities during the critical residue-management window.

The meeting also recognized the need for **uniform cost estimation and reporting** across Punjab. A standardized reporting format for calculating costs, including labour and machinery costs, was to be shared with all KVKs. Such standardization would facilitate meaningful comparison of different CRM technologies and provide a stronger basis for assessing their economic viability at the farmer level.

Financial management was another important component of the review. It was decided that permission for utilizing funds under demonstrations or flexi-funds for **repair of CRM machinery** should be granted in accordance with project guidelines. This provision is particularly relevant for ensuring that machinery remains operational during the narrow paddy harvesting-wheat sowing window, when delays in machine availability can directly affect farmers' ability to adopt non-burning residue-management practices.

The meeting concluded with an emphasis on **stronger coordination among KVKs, Host Universities and ICAR-ATARI**, to streamline CRM implementation, improving data quality, ensuring uniform reporting and facilitating timely utilization of funds. The meeting reaffirmed the collective commitment towards achieving **residue-free and sustainable farming systems across Punjab**.





IMPACT OF THE CROP RESIDUE MANAGEMENT (CRM) PROJECT

Crop residue management has emerged as a critical sustainability challenge in the rice-wheat production system of North-West India, particularly during the narrow period between paddy harvesting and wheat sowing. The Crop Residue Management (CRM) Project represents a large-scale, technology-enabled response to this challenge. Its implementation has combined agricultural mechanization, Custom Hiring Centres (CHCs), field demonstrations, farmer training, Information, Education and Communication (IEC) activities, community mobilization, institutional convergence and regulatory measures.

The impact of the CRM Project extends beyond the reduction of residue burning. The evidence compiled for this chapter demonstrates outcomes in farm economics, machinery access, nutrient recycling, water conservation, soil health, community-level behavioural change, institutional capacity and the development of *ex-situ* residue utilization pathways. The period from 2023-24 to 2025-26 represents an important phase in which the programme moved from awareness and technology promotion towards adoption at scale and measurable system-level outcomes.

Evidence Base and Period of Assessment

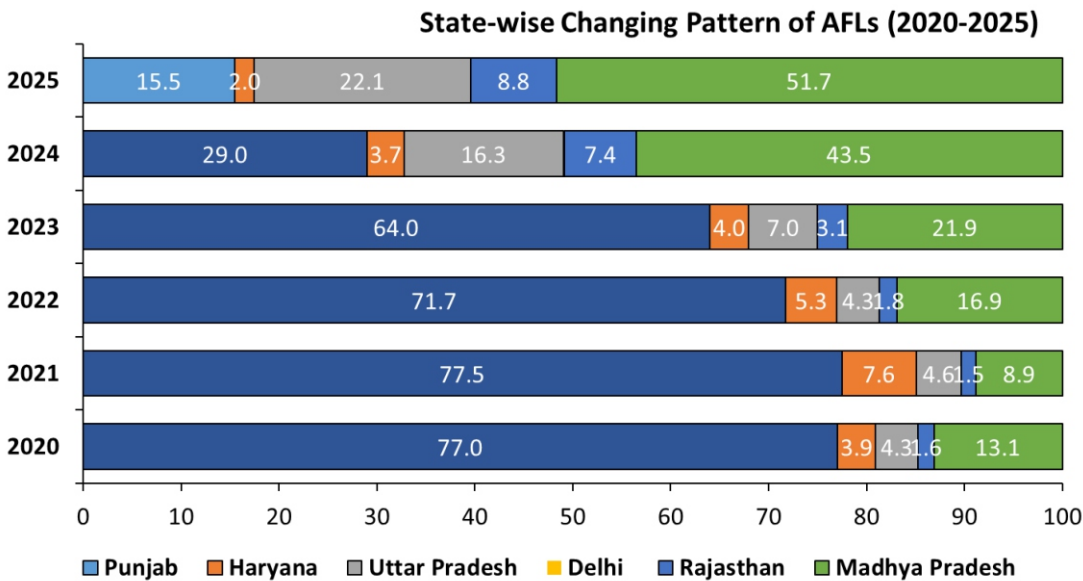
The impact assessment presented in this chapter consolidates the evidence contained in the CRM impact documents prepared by ICAR-ATARI, Ludhiana. The principal outcome periods differ by indicator and are therefore retained separately. Burning-event trends are assessed for 2020-2025; machinery and CHC creation are assessed for 2018-19 to 2025-26; detailed quantified *in-situ* economic, nutrient and water benefits are reported for Punjab for 2025-26; and village-level and Front-Line Demonstration evidence is presented for the periods reported in the source material.

Reduction in Crop-Residue Burning

One of the most visible and measurable outcomes of the CRM Project has been the sustained reduction in agricultural fire locations/crop-residue burning events. Across Punjab, Haryana, Uttar Pradesh, Delhi, Rajasthan and Madhya Pradesh, total reported residue-burning events declined from 107,748 in 2020 to 33,028 in 2025, representing an approximate 69% reduction.

Year	Punjab	Haryana	Uttar Pradesh	Delhi	Rajasthan	Madhya Pradesh	Total
2020	83,002	4,202	4,631	9	1,756	14,148	107,748
2021	71,304	6,987	4,242	4	1,350	8,160	92,047
2022	49,922	3,661	3,017	10	1,268	11,737	69,615
2023	36,663	2,303	3,996	5	1,775	12,580	57,322
2024	10,909	1,406	6,142	13	2,772	16,360	37,602
2025	5,114	662	7,290	5	2,890	17,067	33,028

Punjab recorded the most pronounced improvement, with burning events declining from 83,002 in 2020 to 5,114 in 2025, an approximately 94% reduction. Haryana recorded a reduction of approximately 84%, from 4,202 events in 2020 to 662 in 2025.



State-wise shifting trend of crop residue burning events 2020-2025

The data also reveal an important emerging dimension: the geographical distribution of residue burning has changed. Punjab's share of the reported agricultural fire locations declined from approximately 77% in 2020 to 15.5% in 2025, while Madhya Pradesh emerged as the largest contributor in 2025. This indicates that future CRM interventions need to remain geographically adaptive and increasingly focused on persistent and emerging hotspots.

Expansion of Mechanization and Farmer Access

The CRM Project created a substantial mechanization base to enable timely in-situ residue management. Between 2018-19 and 2025-26, a total of 3,45,789 CRM machines were distributed across the participating states. Punjab accounted for 1,57,926 machines, Haryana 1,07,882, Uttar Pradesh 79,734 and Delhi 247.

Financial year	Punjab	Haryana	Uttar Pradesh	Delhi	Total
2018-19	27,747	10,627	23,306	0	61,680
2019-20	23,068	14,078	7,054	111	44,311
2020-21	25,811	29,020	13,651	51	68,533
2021-22	13,796	19,052	14,057	85	46,990
2022-23	27,250	7,641	7,681	0	42,572
2023-24	13,179	10,620	6,227	0	30,026
2024-25	16,817	9,844	2,572	0	29,233
2025-26	10,258	7,000	5,186	0	22,444
Total	1,57,926	1,07,882	79,734	247	3,45,789

The peak annual distribution was 68,533 machines in 2020-21. The scale of mechanization substantially expanded farmers' access to residue-management technologies, particularly where individual ownership of specialized equipment would otherwise have been difficult.

Custom Hiring Centres as a Decentralized Service Infrastructure

The programme simultaneously established a decentralized machinery-service network through Custom Hiring Centres. A cumulative 43,276 CHCs were established across Punjab, Haryana and Uttar Pradesh during 2018-19 to 2025-26. Punjab alone accounted for 26,725 CHCs.

Financial year	Punjab	Haryana	Uttar Pradesh	Total CHCs
2018-19	3,888	1,194	2,300	7,382
2019-20	5,140	1,685	1,650	8,475
2020-21	10,808	1,345	1,652	13,805
2021-22	3,073	2,551	1,904	7,528
2022-23	883	0	1,006	1,889
2023-24	944	0	561	1,505
2024-25	1,181	0	203	1,384
2025-26	808	211	289	1,308
Total	26,725	6,986	9,565	43,276

The CHC model represents an important shift from machine ownership towards machinery-as-a-service. By creating local access points for specialized equipment, CHCs help address the narrow operational window between paddy harvesting and wheat sowing. The source material also identifies machinery availability, maintenance, operator skills, and effective utilization as continuing areas requiring attention.

Field Demonstrations and Farm-Level Economic Performance

Front-Line Demonstrations provided field-level evidence of the agronomic and economic performance of CRM technologies under farmer conditions. A total of 2,669 FLDs covering 3,154.76 ha were conducted during 2025-26 on Happy Seeder, Smart Seeder, Super Seeder and Surface Seeder technologies.

Technology	FLDs	Area (ha)	Yield advantage	Cost of cultivation (₹/ha)	Net returns (₹/ha)	B: C ratio
Happy Seeder	161	266.9	+1.22 q/ha (2.34%)	38,412	1,11,842	3.91
Smart Seeder	117	147.4	+1.52 q/ha (2.90%)	37,906	1,18,799	4.13
Super Seeder	2,343	2,697.3	+1.70 q/ha (3.35%)	39,386	1,01,878	3.59
Surface Seeder	48	43.2	+0.08 q/ha (0.15%)	34,301	1,10,849	4.23

Among the technologies, Super Seeder demonstrations recorded the highest average yield advantage at 3.35%. Smart Seeder recorded the highest average net returns at ₹1,18,799/ha, while Surface Seeder recorded the highest B: C ratio of 4.23.

The reported examples further demonstrate the economic potential of CRM technologies. Under Super Seeder demonstrations, cultivation cost declined from ₹41,085/ha to ₹39,386/ha, gross returns increased from ₹1,36,380 to ₹1,41,264/ha, and net returns increased from ₹95,294 to ₹1,01,878/ha. Under Happy

Seeder demonstrations, average cultivation cost declined from ₹41,156/ha to ₹38,412/ha, while net returns increased from ₹1,06,299 to ₹1,11,842/ha.

Economic Impact of *In-Situ* Residue Management

The most detailed quantified economic assessment in the source material relates to Punjab during 2025-26. Approximately 11.4 million tonnes of paddy straw were managed *in situ*. This generated estimated savings of more than ₹600 crore in cultivation costs, primarily through reduced tillage operations, lower fuel consumption, and savings in irrigation and other inputs.

Component	Quantified impact
Paddy straw managed <i>in situ</i>	11.4 million tonnes
Estimated cultivation-cost savings	> ₹600 crore
Nitrogen recycled	62,700 tonnes
Phosphorus recycled	26,220 tonnes
Potassium recycled	2,85,000 tonnes
Fertilizer-value savings at subsidized prices	₹1,681 crore
Fertilizer-value savings at market/unsubsidized prices	₹2,448 crore
Water conserved	~571 million m ³

The fertilizer-value estimates reflect the replacement value of nutrients recycled through residue management. The source assessment estimates ₹1,681 crore at subsidized fertilizer prices and up to ₹2,448 crore at market prices. These figures should be interpreted as estimated fertilizer-value savings rather than direct cash payments or income received by farmers.

Nutrient Recycling and Soil-Health Benefits

Scientific management of approximately 11.4 million tonnes of paddy straw in Punjab facilitated substantial recycling of plant nutrients. Approximately 62,700 tonnes of nitrogen, 26,220 tonnes of phosphorus and 2,85,000 tonnes of potassium were returned to the soil.

The source material associates residue incorporation and retention with improved soil organic carbon, soil structure and nutrient-use efficiency. The nutrient-recycling effect also reduces the dependence on externally supplied fertilizer nutrients to the extent that recycled nutrients become agronomically available.

Water Conservation Impact

Residue retention on the soil surface improves moisture conservation and reduces evaporation losses. The source assessment estimates water conservation of approximately 571 million m³, equivalent to at least one irrigation cycle in the Punjab context. This is particularly relevant to Punjab's groundwater-stressed rice-wheat production system and adds a water-resource dimension to the environmental benefits of CRM.

Environmental and Climate Impact

The reduction in open residue burning has produced a major environmental benefit by reducing the scale of agricultural fires during the peak post-paddy-harvest season. The source documents identify associated improvements in air-quality conditions, lower greenhouse-gas emissions and improved environmental sustainability.

At the broader agricultural-system level, residue retention, nutrient recycling and reduced burning strengthen the climate resilience of the rice-wheat production system. The promotion of residue utilization also supports a circular agricultural economy by converting a disposal liability into an input for energy, industry, fodder and other value chains.

Social and Community-Level Behavioural Impact

The CRM Project has progressively shifted from individual technology promotion to community-level behavioural change. A total of 1,258 villages were adopted under the project at ICAR level, of which 946 achieved zero crop-residue burning. In Punjab, KVK-led interventions expanded to 563 villages, of which 347 achieved zero crop-residue burning.

Indicator	Outcome
Villages adopted at ICAR level	1,258
Zero-burning villages at ICAR level	946
Punjab villages covered through KVK interventions	563
Punjab villages achieving zero burning	347

KVKs supported this transition through awareness programmes, demonstrations, exposure visits, field days and training of farmers, machine operators and CHC managers. These activities created local capacity for operation and maintenance of CRM machinery and strengthened coordination among KVKs, state departments and local stakeholders. Mobilization of students and community institutions further supported grassroots awareness and behavioural change.

Ex-Situ Utilization and Circular Economy

The CRM impact extends to the utilization of residue outside the field. In 2025, Punjab generated approximately 19.32 million tonnes of paddy straw. Of this, approximately 11.4 million tonnes were managed in situ and 7.06 million tonnes through ex-situ pathways.

Ex-situ pathway	Approximate quantity (million tonnes)
Industrial boilers	4.10
Biomass/thermal power	1.97 (combined as reported)
Compressed biogas (CBG)	0.50
Bioethanol	0.20
Brick kilns	0.22
Fodder	0.86
Total ex-situ pathways	7.06

These pathways demonstrate the emergence of a circular-economy approach in which crop residue can be converted into energy, industrial inputs, fodder and other value-chain products. The source documents identify potential income and rural employment opportunities from this transition, although the available material does not quantify employment generated or additional farmer income from these pathways.

Institutional and Extension-System Impact

The CRM Project has strengthened the agricultural extension system by positioning Krishi Vigyan Kendras (KVKs) as a primary interface between CRM technologies and farmers. KVKs supported technology dissemination through awareness programmes, on-field demonstrations, training, exposure visits, field days and community mobilization.

- KVKs facilitated technology demonstrations that enabled farmers to observe alternatives to residue burning under field conditions.
- Training programmes created a local support base of farmers, machine operators and CHC managers.
- Coordination among KVKs, state agriculture departments, CHCs and other local stakeholders improved delivery of CRM interventions.
- Hotspot-based awareness and demonstration activities enabled more targeted responses to areas with persistent residue burning.
- The programme strengthened the institutional ecosystem required for sustained adoption beyond one-time machine distribution.

Integrated Push-Pull-Enforcement Approach

The source documents identify an integrated Push-Pull-Enforcement framework as an important strategic response to the technological and behavioural dimensions of residue burning.

Component	Core interventions	Expected/observed contribution
Push	Awareness, hotspot mapping, demonstrations, capacity building	Improves knowledge, confidence and technical ability to adopt alternatives
Pull	Strengthened CHCs, circular agriculture, residue value chains and incentives	Improves economic viability and access to services
Enforcement	Monitoring, regulatory measures, penalties and mandatory straw-management systems	Strengthens compliance and discourages open burning

The integrated approach is significant because residue burning is not solely a technological problem. The narrow operational window, machinery availability, operator skills, economics, convenience of burning and regional behaviour all influence farmer decisions. Combining technological feasibility, economic incentives and compliance measures therefore provides a more comprehensive pathway to sustained adoption.

Key Challenges and Lessons Emerging from Implementation

Challenge	Implication	Lesson for future implementation
Narrow window between paddy harvest and wheat sowing	Residue management must be completed rapidly	Prioritize timely, locally available machinery and service scheduling
Machinery maintenance and operational issues	Can reduce effective utilization	Strengthen CHC management, maintenance and technical support
Skill gaps in advanced machinery operation	Can limit performance and farmer confidence	Continue operator and farmer training

Challenge	Implication	Lesson for future implementation
Behavioural preference for burning	Burning remains an easy and immediate disposal option	Combine demonstrations, economic incentives, community action and enforcement
Regional variation in adoption	Uniform interventions may not perform equally	Use location-specific strategies and hotspot mapping
Geographical shift in burning	New hotspots may emerge as traditional hotspots decline	Continuously update monitoring and target interventions geographically

Overall Impact of the CRM Project

The consolidated evidence demonstrates that the CRM Project has generated impact across multiple dimensions of agricultural sustainability. The programme has reduced residue burning at a scale visible in annual fire counts; created a large machinery and CHC infrastructure; demonstrated economic viability of major CRM technologies; generated substantial estimated cultivation and fertilizer-value savings; recycled plant nutrients; conserved water; supported community-level behavioural change; and created *ex-situ* pathways for converting residue into productive resources.

Impact dimension	Headline evidence
Residue burning	107,748 events in 2020 to 33,028 in 2025; ~69% reduction
Punjab burning	83,002 in 2020 to 5,114 in 2025; ~94% reduction
Mechanization	3,45,789 CRM machines distributed, 2018-19 to 2025-26
Service infrastructure	43,276 CHCs established
Village transformation	1,258 villages adopted; 946 zero-burning villages
Punjab village transformation	563 villages covered; 347 zero-burning villages
<i>In-situ</i> residue management	11.4 million tonnes of paddy straw in Punjab in 2025-26
Cultivation-cost savings	> ₹600 crore in Punjab in 2025-26
Fertilizer-value savings	₹1,681 crore subsidized basis; ₹2,448 crore market basis
Nutrient recycling	62,700 t N; 26,220 t P; 2,85,000 t K
Water conservation	~571 million m ³
Field demonstrations	2,669 FLDs covering 3,154.76 ha
<i>Ex-situ</i> utilization	7.06 million tonnes in Punjab in 2025

Way Forward

The evidence suggests that the next stage of CRM implementation should focus on strengthening the quality, utilization and sustainability of the system created through the programme. The emphasis should progressively move from asset creation alone towards reliable machinery services, demand-driven deployment, local capacity, circular-economy linkages and rigorous measurement of outcomes.

- Strengthen utilization and service efficiency of existing CRM machinery and CHCs, with emphasis on timely availability, operator support, maintenance and calibration.
- Use hotspot mapping and state- and district-specific evidence to target interventions where residue burning remains persistent or is emerging.

- Continue KVK-led demonstrations, farmer training and community mobilization to reinforce behavioural change.
- Strengthen the economic pull for sustainable residue management through viable machinery-service models and residue-based value chains.
- Integrate in-situ and ex-situ residue management according to local agronomic, logistical and market conditions.
- Develop stronger monitoring systems for machinery utilization, cultivation-cost savings, residue quantities managed, emissions avoided, soil-health indicators and water savings.
- Document successful zero-burning village models and replicate their community-level approaches in persistent hotspots.
- Strengthen convergence among KVKs, state agriculture departments, local institutions, CHCs, industry and other stakeholders.

Conclusion

The Crop Residue Management Project has demonstrated that the residue-burning challenge can be addressed through a coordinated combination of technology, service delivery, extension, economic incentives, community participation and enforcement. The reported reduction in burning events is accompanied by measurable benefits at farm, village, institutional and environmental levels.

The most significant achievement is therefore not only the reduction of crop-residue burning but the creation of an enabling ecosystem for sustainable residue management. The scale of mechanization, expansion of CHCs, field-level evidence of improved economics, nutrient recycling, water conservation, zero-burning villages and emerging ex-situ value chains collectively indicate a transition from residue disposal towards residue management and resource recovery.

At the same time, the changing geography of residue burning and the continuing operational and behavioural constraints underline the need for adaptive, utilization-focused and evidence-driven implementation. Sustained impact will depend on strengthening the service ecosystem already created and ensuring that technology, economics, institutional capacity and community action continue to operate together.

References

1. Sheoran, P., et al. (2026). Do the adoption of crop residue management technologies have favorable economic and environmental outcomes? Some insights from Indo-Gangetic Plains of India. *European Journal of Agronomy*, 172, 127825.
2. Kumar, A.; Rana, R.K.; Murai, A.S.; Meena, H.N.; Singh, R.; Dubey, S.K.; Mishra, J.P.; Sheoran, P.; Singh, R.K.; Gautam, U.S. (2023). Information, Education & Communication (IEC) Activities under Crop Residue Management (CRM) Project under ICAR through KVKs (A Roadmap for 2023-24). ICAR-ATARI, Ludhiana.

3. Kumar, A.; Rana, R.K.; Murai, A.S.; Sheoran, P. (2023). Proceedings of Review Workshop on Crop Residue Management (KVKs of Punjab, Haryana, Delhi and Uttar Pradesh). ICAR-ATARI, Ludhiana.
4. Kumar, A.; Rana, R.K.; Murai, A.S.; Sharma, M.; Buttar, G.S.; Meena, H.N.; Singh, R.; Dubey, S.K.; Mishra, J.P.; Sheoran, P.; Singh, R.K.; Gautam, U.S. (2023). Proceedings: Stakeholders' Consultation Meet on Crop Residue Management (September 29, 2023). ICAR-ATARI, Ludhiana.
5. Sheoran, P.; Murai, A.S.; Bola, S.S.; Singh, R.; Meena, H.N.; Mishra, J.P.; Dubey, S.K.; Kumar, A.; Singh, R.K.; Singh, R. (2025). Mechanized Solutions for Sustainable Residue Utilization: IEC Initiatives & Way Forward. ICAR, New Delhi.
6. Sheoran, P.; Murai, A.S.; Rana, R.K.; Mangai, P.; Rampal, V.; Singh, G.; Brar, N.S. (2025). Proceedings of Farmer-Scientist Dialogue on Crop Residue Management. ICAR-ATARI, Ludhiana.
7. Murai, A.S.; Bola, S.S.; Kaur, S.; Singh, N.; Grewal, R.S.; Sheoran, P. (2025). Transforming Residue into Resilience: Stakeholders' Consultation Meet on Crop Residue Management. ICAR-ATARI, Ludhiana.
8. Murai, A.S.; Singh, M.; Singh, A.; Kumar, S.; Sangwan, M.; Kumar, N.; Sheoran, P.; Singh, R. (2025). Stubble to Sustainability: Interstate Travelling Seminar on Crop Residue Management. ICAR-ATARI, Ludhiana.
9. Singh, M.; Goyal, R.; Apoorv, P.; Goel, N.; Dixit, A.K.; Murai, A.S.; Narang, M.K.; Sheoran, P. (2024). PAU Smart Seeder: A Sustainable Path Forward to Curb Residue Burning for Cleaner Environment. ICAR-ATARI, Ludhiana.
10. Gill, J.S.; Bhullar, M.S.; Brar, A.S.; Singh, J.; Murai, A.S.; Sheoran, P. (2024). Surface Seeding-cum-Mulching: An Economic & Sustainable Solution for Paddy Straw Management & Wheat Sowing. ICAR-ATARI, Ludhiana.
11. Sheoran, P.; Kumar, S.; Prajapat, K.; Vibhute, S.D.; Pathan, A.D.; Murai, A.S.; Mishra, J.P.; Yadav, R.K. (2024). Proceedings: National Dialogue on Paddy Straw Management towards Achieving Mission Zero Burning. ICAR-ATARI, Ludhiana.
12. Murai, A.S.; Meena, H.N.; Singh, R.; Dubey, S.K.; Mishra, J.P.; Sheoran, P.; Singh, R.K.; Gautam, U.S. (2024). Proceedings: Planning Workshop on Crop Residue Management: KVK Initiatives and Way Forward. ICAR-ATARI, Ludhiana.



APPROVED ACTION PLAN

Annexure-I

Introduction

Crop residue burning is a major environmental concern in India, particularly in states like Punjab, Haryana, Uttar Pradesh, Rajasthan, Uttarakhand and Madhya Pradesh. This practice contributes to severe atmospheric pollution, causing nutrient loss and soil degradation. Burning one ton of paddy straw releases approximately 3 kg of particulate matter (PM), 60 kg of carbon monoxide (CO), 1460 kg of carbon dioxide (CO₂), 199 kg of ash, and 2 kg of sulfur dioxide (SO₂). These pollutants deteriorate air quality, leading to adverse health effects such as respiratory diseases and cardiovascular problems. Addressing this issue requires sustainable management practices and effective policy interventions.

Given the short interval between rice harvesting and wheat sowing, it is imperative to develop appropriate strategies for in-situ crop residue management to prevent burning. In this context, Krishi Vigyan Kendras (KVKs) have demonstrated their competence in imparting necessary skills to farmers, custom hiring operators, and machine operators. KVKs have also successfully motivated many farmers to adopt the Super Straw Management System (Super SMS) and Happy Seeder technology by demonstrating these technologies at strategic locations to facilitate their widespread adoption. Therefore, the KVKs can be effectively utilized for the implementation of in-situ crop residue management in Punjab, Haryana, Uttar Pradesh, NCT of Delhi, Uttarakhand, Rajasthan and Madhya Pradesh

The state-wise list of KVKs and the list of new villages implementing crop residue management interventions during 2025-26 are provided in Annexure VII. The ATARI-wise proposed budget, amounting to ₹ 1499.23 lakh, is detailed in Annexures I to VI.

Objectives

- Promoting In-situ Management of Crop Residue by retention and incorporation into the soil through the use of appropriate machines and equipment;
- Motivating farmers for zero burning through demonstrations and capacity building activities; and
- Creating awareness among all stakeholders through intensive campaign by information, education and communication (IEC) strategies.

Fund flow Procedure

In case of fund flow and submission of the action plan of the project, the state-wise consolidated proposed action plan for the project has been prepared indicating the required budget. For smooth implementation of this project, the funds to the KVKs may be routed through ICAR. The sanctioned budget may be released to ICAR for further release to Directors of ATARIs (Ludhiana, Jodhpur and Kanpur) who shall further release the sanctioned amount to respective KVK's host organizations. After receiving the UCs and AUCs from the KVKs and their host organizations through Directors of ATARIs, the Agricultural Extension Division of ICAR will submit the same to the Department of Agriculture and Farmers Welfare. The Nodal institute (ICAR-ATARI, Ludhiana) shall facilitate Agricultural Extension Division, ICAR in all matters including preparation of Action Plan, reporting, etc.

Flexibility of interchange of activities from KVK to KVK and state to state

Experiences indicate that sometimes all KVKs could not achieve targets proposed under annual action plan due unforeseen event and problems. Therefore, flexibility of at least 20% proposed activities may be re-allocated from one KVK to other KVK by respective Director of ATARI. Similarly, 20% proposed activities may be interchanged between states by Director of Nodal ATARI so that overall target can be achieved.


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Monitoring and Evaluation of Progress

The project is being implemented under the overall guidance of Deputy Director General (Agricultural Extension) and one Nodal Assistant Director General (Agricultural Extension) at ICAR headquarters. At Zonal level, the project formulated, implemented, monitored and evaluated by the Directors of ATARIs and their core team of scientists. Further the technical backstopping is being provided by State Agricultural Universities (SAUs) and ICAR Institutes. The physical and financial progress also reviewed in Scientific Advisory Committee (SAC) meetings of KVKs, monthly and periodical reports and Annual State and National Level Action Plan Meetings and Review Workshops, etc. The detailed annual final report containing physical and financial progress of the project shall be prepared and submitted to DA&FW by the Division of Agricultural Extension, ICAR Hqrs.

Use of flexi fund for innovative initiative, reporting case studies & success stories and documentations, etc.

The various provisions are incorporated under this proposal for effective implementation, monitoring and overall management of the project. Further, ATARI Directors may also be allowed for re-appropriation of at least 25 per cent of flexi funds under different heads as per need of the of the project.

I) Innovative initiatives

As per provisions under the scheme, it is proposed to take an innovative initiative of developing Farmer Change Agent (FCA) for improving the efficiency within the overall objectives of the scheme. For successful implementation of the project at KVKs, it is proposed to provide FCA to help in conducting various activities in the district. As burning crop residues is a not just agricultural, environmental and health related problem but also a social issue, so there is need to train and retain FCA who can help in sustaining the crop residue management (CRM) activities in villages after completion of the project activities. Further, the efforts of KVK shall also be only possible when someone from the farming community itself approaches fellow farmers to convince about crop residue management technologies. FCA who is already involved in CRM will be very effective and efficient in convincing other farmers for its rapid adoption.

Therefore, it is proposed to identify and groom progressive young farmers (Semi-Skilled Workers) with requisite qualification (Senior Secondary/High School) & experience in farming. These young farmers (Semi-Skilled Worker) would normally be the ones who have been accepted by other farmers as achiever farmers for their success in adoption of CRM technologies and other allied sectors and possess required oral and written communication skills so that he/she may lead by example. The FCAs will have up-graded skills in residue management technology and would be available in the cluster of villages to advice farmers. The FCAs will be provided special opportunity for up-gradation of skills through regular trainings, study tours and visits to SAUs/ ICAR institutes during the crop season. An amount of Rs 12,000/ per month per FCA will be provided as remuneration to meet their contingency expenditure towards discharge of duties including incidental expenses incurred on acquisition of knowledge/training study visit, etc. (Annexure IV). Since FCA will provide a vital link between KVK, state line departments and demonstrating farmers and other farmers at village level, it is essential to select experienced but young, progressive and practicing farmers who are not looking forward to this assignment as sole employment/job. Number of FCA will depend on the volume of work at KVK, availability of funds and time. Involvement of FCA shall accelerate and foster Research-Extension-Farmer linkages including organization of Farmer-Scientist Interface at village level, field visits by scientists, Kisan Melas, etc. for large scale technology adoption.



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II) Requirement of critical contractual human resource

As crop residue burning resulted into multiple ill effects and has certain impact on soil, animal and human health. Therefore, it is desirable to document the impact of the project and capturing emerging success/failure stories. The learning experiences from various districts so emerged need to be properly and scientifically recorded which will be useful for sharing between the districts and states in subsequent years.

ICAR-ATARIs and Division of Agricultural SMD are having very limited human resources and involved in various existing mandated activities and other projects. In order to effectively implement and manage this project, provision of a core team of critical contractual staff may kindly be made under flexi fund. As documenting impact of various interventions and periodic report submission is a continuous process which requires human resource competent enough to perform requisite duties. Number of SRFs/YPs/DEOs will depend on the volume of work, availability of funds and time. This hired manpower in the form of SRFs/YPs/DEOs will be required from the month of April 2025 as this project is already going on.

This contractual staff will assist the Directors, ICAR-ATARIs, and DEEs of SAUs and the core team of scientists for implementing, monitoring, documenting, etc. of the project in a systematic way. Details of proposed contractual manpower and their remuneration are given in Annexure-V.

III) IT, equipment, TA, Office contingency, secretariat assistance, etc.:

For smooth and effective execution of the project, it is proposed to provide need-based facilities such as Information Technology (IT) for purchase of tablets, smart mobiles (for real time data collection, Survey, reporting, etc.), computers, laptops, printers, photo-copier machines, cameras, GPSs, soil moisture meter, infiltrometers, parshall flume, infra-red temp recorders soil sampling tools, etc. furniture for sitting arrangements and travelling allowance (TA) for field visits. The funds needed under this head may be allowed from flexi fund of this project (Annexure V).

IV) Workshops and Stakeholders Meet on crop residue management

It is proposed to organize review and state workshops under this scheme during 2025-26. Expenditure for this purpose is proposed under flexi fund of this project and details are also given in Annexure V.



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DETAILED ANNUAL ACTION PLAN FOR KVKs OF PUNJAB, HARYANA, UTTAR PRADESH, AND NCT OF DELHI, UTTARAKHAND, RAJASTHAN AND MADHYA PRADESH (2025-26)

(As per format provided in operational guidelines of Central Sector Scheme on Crop Residue Management)

A) Component 1: Established Farm Machinery Banks or Custom Hiring Centres on In-situ Crop Residue Management Machinery: **NIL**

B) Component 2: Procurement of Agricultural Machinery and Equipment for In-situ Crop Residue Management Machinery:

S. No.	Name of machines*	No. of machines required	Estimated cost (₹ in Lakh)	Central Share
1.	Smart Seeder	20	46.0	100%
2.	Tractor	2	18.0	100%
Total cost (B)		22	64.0	100%

*Details of machines required for different KVKs are given in **Annexure-I**

C) Component No.3: Information, Education and Communication (IEC) activities for awareness on crop residue management

S No.	Component	Approved pattern of assistance	Estimated cost (₹ in Lakh)
(A) Demonstrations			
1.	Total number of demonstrations proposed to be conducted are 9595 for 58 districts [Annexure-II(a)]	₹ 6000 per ha	245.10
2.	Total number of demonstrations (decomposer technology) proposed to be conducted are 1235 for 36 districts [Annexure-II(b)]	₹ 1000 per ha Estimated cost	12.35
(B) Training			
1.	219 courses to be conducted for 5475 trainees [Annexure-III]	₹ 6000 per trainee per week (5 days)	328.50
2.	Awareness camps, <i>kisan melas</i> , Exposure visits, Field/harvest days, Mobilization of school and college students and Advertisement and Publicity [Annexure-IV (a), (b), (c)]		707.05
(C) Total cost (A+B)			1293.00
(D) Flexi fund (Annexure-VI)		Approx. 10% of the approved outlay	129.30
(E) Management/administrative cost (< 1%)			12.93
Total Cost (C+D+E)			1435.23

Total Budget: 64.0+ 1435.23= ₹ 1499.23 lakh


11/7/25

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No. of Agricultural Machinery and Equipment Proposed for Crop Residue Management for KVKs during 2025-26

S. No.	Name of KVK	Smart Seeder	Tractor
A	PUNJAB		
1	Amritsar	0	1
2	Bathinda	0	0
3	Faridkot	1	0
4	Fatehgarh Sahib	1	0
5	Ferozepur	1	0
6	Gurdaspur	1	0
7	Hoshiarpur	1	0
8	Jalandhar	1	0
9	Kapurthala	1	0
10	Ludhiana	1	0
11	Mansa	1	0
12	Moga	1	0
13	Muktsar	1	0
14	Nawanshahr	1	0
15	Pathankot	1	0
16	Patiala	1	0
17	Ropar	1	1
18	Sangrur	1	0
19	Barnala	1	0
20	Mohali	1	0
21	Tarn Taran	1	0
22	Fazilka	1	1
	Total	20	3

No. of Agricultural Machinery and Equipment Proposed for Crop Residue Management for KVKs during 2025-26

S. No.	Name of KVK	Detail of machinery & equipment (number)	
		Smart Seeder	Tractor
1	Punjab	20	2
	Total	20	2

Total cost of Agricultural Machinery and Equipment Proposed for Crop Residue Management for KVKs during 2025-26

S. No.	Name of the KVK	Detail of cost of machinery & equipment (in ₹ Lakh)		Total (in ₹ Lakh)
		Smart Seeder	Tractor	
	Rate/unit	2.3	9.0	
1	Punjab	46.0	18.0	64.0
	Total cost	46.0	18.0	64.0



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Annexure-II (a)

Details of demonstrations (using farm Machinery) proposed to be conducted on crop residue management by KVKs and estimated cost during 2025-26

S. No.	Name of KVK	No. of Demos (One ha each)	Approved pattern of assistance (₹/ha)	Estimated cost (₹ in Lakhs)
(A)	PUNJAB			
1	Amritsar	100	6000	6.0
2	Bathinda	100	6000	6.0
3	Faridkot	100	6000	6.0
4	Fatehgarh Sahib	100	6000	6.0
5	Ferozepur	100	6000	6.0
6	Gurdaspur	50	6000	3.0
7	Hoshiarpur	100	6000	6.0
8	Jalandhar	100	6000	6.0
9	Kapurthala	100	6000	6.0
10	Ludhiana	100	6000	6.0
11	Mansa	100	6000	6.0
12	Moga	100	6000	6.0
13	Muktsar	100	6000	6.0
14	Nawanshahr	50	6000	3.0
15	Pathankot	50	6000	3.0
16	Patiala	100	6000	6.0
17	Ropar	50	6000	3.0
18	Sangrur	100	6000	6.0
19	Barnala	100	6000	6.0
20	Mohali	50	6000	3.0
21	Tarn Taran	100	6000	6.0
22	Fazilka	100	6000	6.0
	Total	1950	-	117.0
(B)	HARYANA & DELHI			
1	Ambala	100	6000	6.0
2	Bhiwani	30	6000	1.8
3	Delhi	30	6000	1.8
4	Fatehabad	100	6000	6.0
5	Hisar	25	6000	1.5
6	Jhajjar	75	6000	4.5
7	Jind	100	6000	6.0
8	Kaithal	100	6000	6.0
9	Karnal	100	6000	6.0
10	Kurukshetra	100	6000	6.0
11	Panipat	100	6000	6.0
12	Rohtak	50	6000	3.0
13	Sonapat	50	6000	3.0
14	Sirsa	100	6000	6.0
15	Yamunagar	75	6000	4.5
	Total	1135	-	68.1
(C)	Uttar Pradesh			
1	Azamgarh-II	50	6000	3.0
2	Bahraich-I	50	6000	3.0
3	Bahraich-II	50	6000	3.0
4	Barabanki	25	6000	1.5
5	Bareilly	50	6000	3.0
6	Bijnor	50	6000	3.0
7	Bulandshahr	50	6000	3.0
8	Chandauli	50	6000	3.0
9	Etah	50	6000	3.0
10	Etawah	50	6000	3.0
11	Hardoi-II	25	6000	1.5
12	Jaunpur - I	50	6000	3.0
13	Jaunpur - II	50	6000	3.0
14	Kanpur Dehat	50	6000	3.0
15	Maharajganj	50	6000	3.0
16	Mathura	50	6000	3.0
17	Muzaffarnagar-II	50	6000	3.0
18	Pilibhit	25	6000	1.5
19	Raebareli-I	50	6000	3.0
20	Shahjahanpur	50	6000	3.0
21	Saharanpur	25	6000	1.5

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S. No.	Name of KVK	No. of Demos (One ha each)	Approved pattern of assistance (₹/ha)	Estimated cost (₹ in Lakhs)
22	Siddharthnagar	25	6000	1.5
23	Varanasi	25	6000	1.5
	Total	1000	-	60

Details of demonstrations (using farm Machinery) and estimated cost for conducting demonstrations on crop residue management by KVKS during 2025-26

S. No.	Name of States	No. of Demos (One ha each)	Estimated cost (₹ in Lakhs)
1	Punjab	1950	117.0
2	Haryana & Delhi	1135	68.1
3	Uttar Pradesh	1000	60.0
	Total	4085	245.1



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Annexure-II (b)

Details of demonstrations (decomposer technology) proposed to be conducted on crop residue management by KVKs during 2025-26

S. No.	Name of KVK	No. of Demos (One ha each)	Approved pattern of assistance (₹/ha)	Estimated cost (₹ in Lakhs)
(A) Punjab				
1	Amritsar	0	1000	0
2	Bathinda	0	1000	0
3	Faridkot	0	1000	0
4	Fatehgarh Sahib	0	1000	0
5	Ferozepur	0	1000	0
6	Gurdaspur	0	1000	0
7	Hoshiarpur	0	1000	0
8	Jalandhar	0	1000	0
9	Kapurthala	0	1000	0
10	Ludhiana	0	1000	0
11	Mansa	0	1000	0
12	Moga	0	1000	0
13	Muktsar	0	1000	0
14	Nawanshahar	0	1000	0
15	Pathankot	0	1000	0
16	Patiala	0	1000	0
17	Ropar	0	1000	0
18	Sangrur	0	1000	0
19	Barnala	0	1000	0
20	Mohali	0	1000	0
21	Tarn Taran	0	1000	0
22	Fazilka	0	1000	0
Total		0	-	0
(B) Haryana & Delhi				
1	Ambala	5	1000	0.05
2	Bhiwani	5	1000	0.05
3	Delhi	5	1000	0.05
4	Fatehabad	5	1000	0.05
5	Hisar	5	1000	0.05
6	Jhajjar	5	1000	0.05
7	Jind	5	1000	0.05
8	Kaithal	5	1000	0.05
9	Karnal	5	1000	0.05
10	Kurukshetra	5	1000	0.05
11	Panipat	5	1000	0.05
12	Rohtak	5	1000	0.05
13	Sonapat	5	1000	0.05
14	Sirsa	5	1000	0.05
15	Yamunanagar	5	1000	0.05
Total		75	-	0.75
(C) Uttar Pradesh				
1	Azamgarh-II	40	1000	0.40
2	Bahraich-I	40	1000	0.40
3	Bahraich-II	40	1000	0.40
4	Barabanki	40	1000	0.40
5	Bareilly	40	1000	0.40
6	Bijnor	80	1000	0.80
7	Bulandshahr	40	1000	0.40
8	Chandauli	40	1000	0.40
9	Etah	40	1000	0.40
10	Etawah	40	1000	0.40
11	Hardoi-II	80	1000	0.80
12	Jaunpur - I	40	1000	0.40
13	Jaunpur - II	40	1000	0.40
14	Kanpur Dehat	40	1000	0.40
15	Maharajganj	80	1000	0.80
16	Mathura	40	1000	0.40
17	Muzaffarnagar-II	80	1000	0.80
18	Pilibhit	40	1000	0.40
19	Raebareli-I	80	1000	0.80
20	Shahjahanpur	40	1000	0.40

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S. No.	Name of KVK	No. of Demos (One ha each)	Approved pattern of assistance (₹/ha)	Estimated cost (₹ in Lakhs)
21	Saharanpur	80	1000	0.80
22	Siddharthnagar	40	1000	0.40
23	Varanasi	40	1000	0.40
	Total	1160	-	11.6

Details of demonstrations (decomposer technology) and estimated cost for conducting demonstrations on crop residue management by KVKs during 2025-26

S. No.	Name of States	No. of Demos (One ha each)	Estimated cost (₹ in Lakhs)
1	Punjab	0	0.0
2	Haryana & Delhi	75	0.75
3	Uttar Pradesh	1160	11.60
	Total	1235	12.35

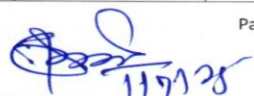


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Details of trainings proposed to be organized on Crop Residue Management by KVKs during 2025-26

S. No.	Name of KVK	No. of Courses (5 days each)	Tentative Months	No. of trainees in each course	Total number of trainees	Approved pattern of Assistance (₹ per trainee/ week)	Estimated cost (₹ in Lakhs)
(A) PUNJAB							
1	Amritsar	6	May-Oct	25	150	6000	9.0
2	Bathinda	6	May-Oct	25	150	6000	9.0
3	Faridkot	6	May-Oct	25	150	6000	9.0
4	Fatehgarh Sahib	4	May-Oct	25	100	6000	6.0
5	Ferozepur	6	May-Oct	25	150	6000	9.0
6	Gurdaspur	4	May-Oct	25	100	6000	6.0
7	Hoshiarpur	4	May-Oct	25	100	6000	6.0
8	Jalandhar	5	May-Oct	25	125	6000	7.5
9	Kapurthala	4	May-Oct	25	100	6000	6.0
10	Ludhiana	6	May-Oct	25	150	6000	9.0
11	Mansa	6	May-Oct	25	150	6000	9.0
12	Moga	6	May-Oct	25	150	6000	9.0
13	Muktsar	6	May-Oct	25	150	6000	9.0
14	Nawanshahr	3	May-Oct	25	75	6000	4.5
15	Pathankot	2	May-Oct	25	50	6000	3.0
16	Patiala	6	May-Oct	25	150	6000	9.0
17	Ropar	4	May-Oct	25	100	6000	6.0
18	Sangrur	6	May-Oct	25	150	6000	9.0
19	Barnala	6	May-Oct	25	150	6000	9.0
20	Mohali	3	May-Oct	25	75	6000	4.5
21	Tarn Taran	6	May-Oct	25	150	6000	9.0
22	Fazilka	6	May-Oct	25	150	6000	9.0
Total		111	-	-	2775	-	166.5
(B) HARYANA & DELHI							
1	Ambala	3	May-Oct	25	75	6000	4.5
2	Bhiwani	3	May-Oct	25	75	6000	4.5
3	Delhi	3	May-Oct	25	75	6000	4.5
4	Fatehabad	4	May-Oct	25	100	6000	6
5	Hisar	3	May-Oct	25	75	6000	4.5
6	Jhajjar	3	May-Oct	25	75	6000	4.5
7	Jind	3	May-Oct	25	75	6000	4.5
8	Kaithal	4	May-Oct	25	100	6000	6
9	Karnal	4	May-Oct	25	100	6000	6
10	Kurukshetra	4	May-Oct	25	100	6000	6
11	Panipat	3	May-Oct	25	75	6000	4.5
12	Rohtak	3	May-Oct	25	75	6000	4.5
13	Sonapat	3	May-Oct	25	75	6000	4.5
14	Sirsa	3	May-Oct	25	75	6000	4.5
15	Yamunangar	3	May-Oct	25	75	6000	4.5
Total		49	-	-	1225	-	73.5
(C) UTTAR PRADESH							
1	Azamgarh-II	2	May-Oct	25	50	6000	3.0
2	Bahraich-I	3	May-Oct	25	75	6000	4.5
3	Bahraich-II	2	May-Oct	25	50	6000	3.0
4	Barabanki	2	May-Oct	25	50	6000	3.0
5	Bareilly	2	May-Oct	25	50	6000	3.0
6	Bijnor	3	May-Oct	25	75	6000	4.5
7	Bulandshahr	2	May-Oct	25	50	6000	3.0
8	Chandauli	2	May-Oct	25	50	6000	3.0
9	Etah	1	May-Oct	25	25	6000	1.5
10	Etawah	2	May-Oct	25	50	6000	3.0
11	Hardoi-II	3	May-Oct	25	75	6000	4.5
12	Jaunpur - I	3	May-Oct	25	75	6000	4.5
13	Jaunpur - II	3	May-Oct	25	75	6000	4.5
14	Kanpur Dehat	3	May-Oct	25	75	6000	4.5
15	Maharajganj	3	May-Oct	25	75	6000	4.5
16	Mathura	3	May-Oct	25	75	6000	4.5
17	Muzaffarnagar-II	2	May-Oct	25	50	6000	3.0
18	Pilibhit	3	May-Oct	25	75	6000	4.5
19	Raebareilly-I	3	May-Oct	25	75	6000	4.5
20	Shahjahanpur	3	May-Oct	25	75	6000	4.5
21	Saharanpur	3	May-Oct	25	75	6000	4.5


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S. No.	Name of KVK	No. of Courses (5 days each)	Tentative Months	No. of trainees in each course	Total number of trainees	Approved pattern of Assistance (₹ per trainee/ week)	Estimated cost (₹ in Lakhs)
22	Siddharthnagar	3	May-Oct	25	75	6000	4.5
23	Varanasi	3	May-Oct	25	75	6000	4.5
	Total	59	-	-	1475	-	88.5

Details of trainings and estimated cost for conducting trainings on Crop Residue Management by KVKs during 2025-26

S. No.	Name of States	No. of Courses (5 days each)	Total no. of trainees	Estimated cost (₹ in Lakhs)
1	Punjab	111	2775	166.5
2	Haryana & Delhi	49	1225	73.5
3	Uttar Pradesh	59	1475	88.5
	Total	219	5475	328.5



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Annexure-IV (a)

Details of Kisan Melas, awareness camps, exposure visit, and field/harvest day on Crop Residue Management to be conducted by KVKs at village, block and district level during 2025-26

S. No.	Name of KVK	Kisa n Mela	Awareness Camps			Exposur e Visit	Field/ Harvest Day
			Village Level	Block Level	District Level		
(A)	PUNJAB						
1	Amritsar	1	8	4	2	5	3
2	Bathinda	1	8	4	2	5	3
3	Faridkot	1	8	4	2	5	3
4	Fatehgarh Sahib	1	8	4	2	5	3
5	Ferozepur	1	8	4	2	5	3
6	Gurdaspur	1	8	4	2	5	3
7	Hoshiarpur	1	8	4	2	5	3
8	Jalandhar	1	8	4	2	5	3
9	Kapurthala	1	8	4	2	5	3
10	Ludhiana	1	8	4	2	5	3
11	Mansa	1	8	4	2	5	3
12	Moga	1	8	4	2	5	3
13	Muktsar	1	8	4	2	5	3
14	Nawanshahr	1	8	4	2	5	3
15	Pathankot	1	8	4	2	5	3
16	Patiala	1	8	4	2	5	3
17	Ropar	1	8	4	2	5	3
18	Sangrur	1	8	4	2	5	3
19	Barnala	1	8	4	2	5	3
20	Mohali	1	8	4	2	5	3
21	Tarn Taran	1	8	4	2	5	3
22	Fazilka	1	8	4	2	5	3
	Total	22	176	88	44	110	66
(B)	HARYANA & DELHI						
1	Ambala	1	6	3	2	4	3
2	Bhiwani	1	6	3	2	4	3
3	Delhi	1	6	3	2	4	3
4	Fatehabad	1	6	3	2	4	3
5	Hisar	1	6	3	2	4	3
6	Jhajjar	1	6	3	2	4	3
7	Jind	1	6	3	2	4	3
8	Kaithal	1	6	3	2	4	3
9	Karnal	1	6	3	2	4	3
10	Kurukshetra	1	6	3	2	4	3
11	Panipat	1	6	3	2	4	3
12	Rohtak	1	6	3	2	4	3
13	Sonipat	1	6	3	2	4	3
14	Sirsa	1	6	3	2	4	3
15	Yamunanagar	1	6	3	2	4	3
	Total	15	90	45	30	60	45
(C)	UTTAR PRADESH						
1	Azamgarh-II	1	5	3	2	4	3
2	Bahraich-I	1	5	3	2	4	3
3	Bahraich-II	1	5	3	2	4	3
4	Barabanki	1	5	3	2	4	3
5	Bareilly	1	5	3	2	4	3
6	Bijnor	1	5	3	2	4	3
7	Bulandshahr	1	5	3	2	4	3
8	Chandauli	1	5	3	2	4	3
9	Etah	1	5	3	2	4	3
10	Etawah	1	5	3	2	4	3

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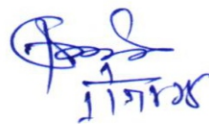
S. No.	Name of KVK	Kisan Mela	Awareness Camps			Exposure Visit	Field/ Harvest Day
			Village Level	Block Level	District Level		
11	Hardoi-II	1	5	3	2	4	3
12	Jaunpur - I	1	5	3	2	4	3
13	Jaunpur - II	1	5	3	2	4	3
14	Kanpur Dehat	1	5	3	2	4	3
15	Maharajganj	1	5	3	2	4	3
16	Mathura	1	5	3	2	4	3
17	Muzaffarnagar-II	1	5	3	2	4	3
18	Pilibhit	1	5	3	2	4	3
19	Raebareli-I	1	5	3	2	4	3
20	Shahjahanpur	1	5	3	2	4	3
21	Saharanpur	1	5	3	2	4	3
22	Siddharthnagar	1	5	3	2	4	3
23	Varanasi	1	5	3	2	4	3
Total		23	115	69	46	92	69

Details of Kisan Melas, awareness camps, exposure visit, and field/harvest day on Crop Residue Management to be conducted by KVKs at village, block and district level during 2025-26

S. No.	Name of State/UT	Kisan Mela	Awareness Camps			Exposure Visit	Field/ Harvest Day
			Village Level	Block Level	District Level		
1	Punjab	22	176	88	44	110	66
2	Haryana & Delhi	15	90	45	30	60	45
3	Uttar Pradesh	23	115	69	46	92	69
Total		60	381	202	120	262	180

Estimated cost for organizing Kisan Melas, awareness camps, exposure visit, and field/harvest day on Crop Residue Management to be conducted by KVKs at village, block and district level during 2025-26

S. No.	Name of State/UT	Kisan Mela @ ₹3.0 lakh	Awareness Camps			Exposure Visit @ ₹0.25 lakh/visit	Field/ Harvest Day @ ₹0.4 lakh/day	Total Cost (₹ in lakh)
			Village Level @ ₹0.1 lakh/camp	Block Level @ ₹0.25 lakh/camp	District Level @ ₹0.5 lakh/camp			
1	Punjab	66.0	17.6	22.0	22.0	27.5	26.4	181.5
2	Haryana & Delhi	45.0	9.0	11.3	15.0	15.0	18.0	113.3
3	Uttar Pradesh	69.0	11.5	17.3	23.0	23.0	27.6	171.4
Total		180.0	38.1	50.5	60.0	65.5	72.0	466.1



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Asstt. Director General (Agril. Extn.)
भारतीय कृषि अनुसंधान परिषद / I.C.A.R.
कृषि अनुसंधान भवन-I, पुला, नई दिल्ली-110012
KAB-I, Pusa, New Delhi-110012

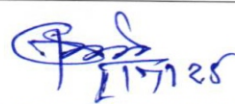
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Annexure-IV (b)

Mobilization of school and college students through essay competition, painting, debate, Prabhat Pheris, Nukkar Natak, rallies, etc. for creating awareness by KVKs at village, block and district level during 2025-26

S. No.	Name of KVK	No. of School to be covered	No. of Colleges to be covered
(A) PUNJAB			
1	Amritsar	5	2
2	Bathinda	5	2
3	Faridkot	5	2
4	Fatehgarh Sahib	5	2
5	Ferozepur	5	2
6	Gurdaspur	5	2
7	Hoshiarpur	5	2
8	Jalandhar	5	2
9	Kapurthala	5	2
10	Ludhiana	5	2
11	Mansa	5	2
12	Moga	5	2
13	Muktsar	5	2
14	Nawanshahr	5	2
15	Pathankot	5	2
16	Patiala	5	2
17	Ropar	5	2
18	Sangrur	5	2
19	Barnala	5	2
20	Mohali	5	2
21	Tarn Taran	5	2
22	Fazilka	5	2
Total		110	44
(B) HARYANA & DELHI			
1	Ambala	4	3
2	Bhiwani	2	3
3	Delhi	5	3
4	Fatehabad	4	3
5	Hisar	3	3
6	Jhajjar	3	3
7	Jind	4	3
8	Kaithal	4	3
9	Karnal	4	3
10	Kurukshetra	4	3
11	Panipat	4	3
12	Rohtak	3	3
13	Sonapat	4	3
14	Sirsa	3	3
15	Yamunanagar	3	3
Total		54	45
(C) UTTAR PRADESH			
1	Azamgarh-II	2	2
2	Bahraich-I	2	2
3	Bahraich-II	2	2
4	Barabanki	2	2
5	Bareilly	4	2
6	Bijnor	3	2
7	Bulandshahr	2	1
8	Chandauli	2	1
9	Etah	1	1
10	Etawah	2	1
11	Hardoi-II	3	4
12	Jaunpur - I	2	2
13	Jaunpur - II	5	4
14	Kanpur Dehat	4	2

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कृषि अनुसंधान भवन-I, पटना, नई दिल्ली-110012

S. No.	Name of KVK	No. of School to be covered	No. of Colleges to be covered
15	Maharajganj	3	2
16	Mathura	6	4
17	Muzaffarnagar-II	2	2
18	Pilibhit	3	2
19	Raebareli-I	5	2
20	Shahjahanpur	4	2
21	Saharanpur	2	1
22	Siddharthnagar	4	2
23	Varanasi	3	3
	Total	68	48

Mobilization of school and college students for creating awareness by KVKs during 2025-26

S. No.	Name of State/UT	No. of School to be covered	No. of Colleges to be covered
1	Punjab	110	44
2	Haryana & Delhi	54	45
3	Uttar Pradesh	68	48
	Total	232	137

Estimated cost for mobilization of school and college students creating awareness by KVKs during 2025-26

S. No.	Name of State/UT	No. of School to be covered @ ₹0.25 lakh/school	No. of Colleges to be covered @ ₹0.4 lakh/college	Total Cost (₹ in lakh)
1	Punjab	27.5	17.6	45.1
2	Haryana & Delhi	13.5	18.0	31.5
3	Uttar Pradesh	17.0	19.2	36.2
	Total	58.0	54.8	112.8



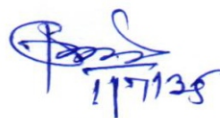
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Asstt. Director General (Agril. Extn.)
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KAB-I, Pusa, New Delhi-110012

Annexure-IV(c)

Estimated cost for advertisement and publicity materials to be prepared/developed on Crop Residue Management during 2025-26 (leaflets, pamphlets, short video films, documentary films, extension literature, publicity in local newspaper, radio, TV, etc. by KVKs and ATARIs)

S. No.	Name of States	No. of KVKs	Estimated Cost @ ₹2.0 lakh per KVK	Documentary film to be developed by each ATARI @ ₹6 lakh	Preparation of Extension publication, project report, etc by each ATARI @ ₹2.0 lakh per ATARI	Total Cost (₹ in lakh)
1	Punjab	22	44.0	2.0	2.15	48.2
2	Haryana & Delhi	15	30.0	1.0	1.00	32.0
3	Uttar Pradesh	23	46.0	1.0	1.00	48.0
	Total	60	120.00	4.00	4.15	128.15



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 KAB-I, Pusa, New Delhi-110012

Annexure-V

Utilization of the flexi fund under the project as per details given below:

A) Human resources proposed

S. No.	Type of human resource proposed	Duration (Months)	Number	Estimated cost (₹ in Lakh)
1	Farmer change agent to KVKs @ ₹10000/- per month	7	60	42.00
2	Young Professionals (YP-I) at ATARIs & ICAR Hq @ ₹ 30000/- per month (as per ICAR norms)	12	3	10.80
3	SRF @ ₹ 42000/- plus HRA/ YP-II @ ₹ 42000/month at 3 ATARIs (as per ICAR norms)	12	3	18.00
4	DEO @ ₹30000/- one each at ATARI, Ludhiana & Jodhpur & ICAR Hq	12	3	10.80
Total				81.60

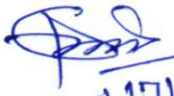
B) Details of funds required for creating basic facilities and TA

S. No.	Items proposed	ATARIs	DEE/KVKs	Total amount (₹ in lakh)
1	TA	2.75	12.00	14.75
2	Office contingency	7.00	15.00	22.00
3	IT/Equipment/Furniture, etc.	5.45	0.00	5.45
Total		15.20	27.00	42.20

C) Details of funds required for organizing different activities by ATARIs

S. No.	Name of activity	Number	Estimated cost (₹ in lakh)
1	Review workshop/Farmers conference by Nodal ATARI	1	4.00
2	Workshop at State level	4	1.50
Total			5.50

Total (A+B+C): 81.60 + 42.20 + 5.50 = ₹ 129.3 lakh


11/11/25

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Annexure-VI

ATARI-wise allocation of funds under different heads

(Amount in ₹ Lakh)

S No.	Component	Ludhiana	Jodhpur	Kanpur	Total
1	Machinery & equipment (Annexure-I)	64.00	0.00	0.00	64.00
2	i) Demonstrations by using CRM machinery (Annexure-II (a))	117.00	68.10	60.00	245.10
	ii) Demonstrations (through Decomposer technology) (Annexure-II (b))	0.00	0.75	11.60	12.35
3	Training (Annexure-III)	166.50	73.50	88.50	328.50
4	Awareness camps, kisan melas, Exposure visits, Field/harvest days, Mobilization of school and college students and Advertisement and Publicity (Annexure-IV (a, b, c))	274.75	176.75	255.55	707.05
	Total of IEC activities (2 to 4)	558.25	319.10	415.65	1293.00
5	Flexi fund (10% of total IEC activities)				129.30
6	Administrative cost (1% of total IEC activities)				12.70
	Total (1 to 6)	558.25	319.10	415.65	1435.00
A)	Details of allocation of Flexi Funds to ATARIs at S. No. 5)				
i)	Young Professionals-I (YP-I 2: Two at ATARI Ludhiana and Kanpur)	3.60	0.00	3.60	7.20
ii)	Senior Research Fellow (SRF 3: Three at ATARIs)	5.40	6.00	6.00	17.40
iii)	Data Entry Operator (DEO2: Two at ATARIs)	1.07	3.60	0.00	4.67
iv)	TA	5.60	1.00	1.00	7.60
v)	Office Contingency	13.60	1.00	1.00	15.60
vi)	IT/Equipment/Furniture, etc.	3.28	1.00	1.00	5.28
vii)	Review workshop/Farmers conference by Nodal ATARI	1.05	0.00	0.00	1.05
viii)	Workshop at ATARI level	0.50	0.50	0.50	1.50
B)	Details of allocations of Flexi Funds to KVKs (at S. No. 5)				
i)	Change agent (@ ₹ 0.1 for 7 months: one to each KVK)	15.40	10.50	16.10	42.00
ii)	TA (@ ₹ 0.2 lakh/ KVK)	4.40	3.00	4.60	12.00
iii)	Office Contingency (@ ₹ 0.25 lakh/ KVK)	5.50	3.75	5.75	15.00
	Total (A+B)	59.40	30.35	39.55	129.30
C)	Details of allocation of Administrative Cost to ATARIs (at S. No. 6)				
i)	Administrative Cost (Annexure-VI)	8.70	2.00	2.00	12.70
	Total (A+B+C)	68.10	32.35	41.55	142.00



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KAB-I, Pusa, New Delhi-110012

AUC (OLD MODULE)

Annexure-II

GFR 12-A
[(See Rule 238 (1))]

FORM OF UTILIZATION CERTIFICATE FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANISATION

AUDIT UTILIZATION CERTIFICATE FOR THE YEAR **2025-26** in respect of recurring/non-recurring
GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

- Name of the scheme: **Crop Residue Management (CRM) (Old Module) for ICAR-ATARI, Ludhiana**
- Whether recurring or non-recurring grants : Recurring
- Grants position at the beginning of the Financial year:
 - Cash in Bank **Rs. 39,179/-**
 - Unadjusted advances **-**
 - Total **Rs. 39,179/- (Opening Balance)**
- Details of grants received, expenditure incurred and closing balances:(Actuals)

Unspent Balance s of Grants received years [figure as at Sl. No. 3 (iii)] (openin g Balance)	Interes t Earned thereo n	Interest deposited back to the Governmen t	Grant received during the year			Total Availabl e funds (1+2- 3+4)	Expenditur e incurred	Closing Balance s (5-6)
1	2	3	4			5	6	7
-	-	-	Sanction No.(i)	Date (ii)	Amoun t (iii)	-	-	-
39,179	953	39,764	Refund from PAU, Ludhiana	30.09.202 5	16,743	19,089	18,721	368
			Refund from GADVASU , Ludhiana	28.08.2025	1,978			

Component wise utilization of grants:

Grant-in-General (Recurring)	Grant-in-aid- salary	Grant-in-aid-creation of capital assets (non-recurring)	Total
18721	0	0	18721

Details of grants position at the end of the year

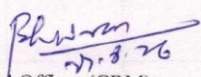
- Cash in Bank **Rs. 368/-**
- Unadjusted Advances **-**
- Total** **Rs. 368/-**

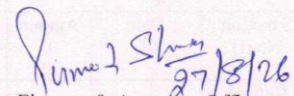
Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

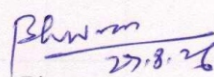
- i. The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- ii. There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- iii. To the best of our knowledge and belief, no transactions have been entered that are in violations of relevant Act/Rules/Standing instructions and scheme guidelines.
- iv. The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- v. The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- vi. The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- vii. It has been ensured that the physical and financial performance under **Crop Residue Management (CRM) (Old Module) Project** for the year **2025-26** has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.
- viii. The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- ix. Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries are enclosed at Annexure-II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Kinds of checks:

1. Vouchers, Annual Account 2025-26


Nodal Officer (CRM)
ICAR-ATARI, Ludhiana


Finance & Accounts Officer
ICAR-ATARI, Ludhiana


Director
ICAR-ATARI, Ludhiana

प्रमोद शर्मा / PERMOD SHARMA
वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research
कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
Agricultural Technology Application Research Institute
क्षेत्र-1, पं.कृ.वि. परिसर, लुधियाना-141004
Zone-1, PAU Campus, Ludhiana-141004

निदेशक / Director
भा.क.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

AUC (CSNA MODULE)

Annexure-III

GFR 12-A
[[See Rule 238 (1)]]

FORM OF UTILIZATION CERTIFICATE FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANISATION

AUDIT UTILIZATION CERTIFICATE FOR THE YEAR **2025-26** in respect of recurring/non-recurring
GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

- Name of the scheme: **Crop Residue Management (CRM) (CSNA Module) for ICAR-ATARI, Ludhiana**
- Whether recurring or non-recurring grants : **Both** (Recurring/ Non-recurring/ Both)
- Grants position at the beginning of the Financial year : 2025-26
 - Cash in Bank Rs. 0/-
 - Unadjusted advances -
 - Total Rs. 0/- (Opening Balance)
- Details of grants received , expenditure incurred and closing balances:(Actuals)

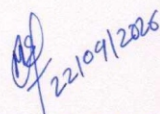
Unspent Balances of Grants received years [figure as at Sl. No. 3 (iii)] (opening Balance)	Interest Earned thereon	Interest deposited back to the Government	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
1	2	3	4			5	6	7
-	-	-	Sanction No.(i)	Date (ii)	Amount (iii)	-	-	-
0	0	0	File No. 3-3/2018-M&T	31.07.2025	923741	923741	923741	0

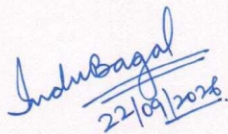
Component-wise utilization of grants:

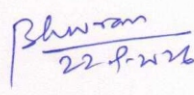
Grant-in-General (Recurring)	Grant-in-aid-salary	Grant-in-aid-creation of capital assets (non-recurring)	Total
923741	0	0	923741

Details of grants position at the end of the year

- Cash in Bank Rs. 0/-
- Unadjusted Advances -
- Total Rs. 0/-


22/09/2026
ASHISH SANTOSH MURA
Scientist (AE)
Indian Council of Agricultural Research
Agricultural Technology Application
Research Institute, Zone-1
PAU Campus, Ludhiana-141004


22/09/2026
इंदु बागल/INDU BAGAL
सहायक वित्त एवं लेखा अधिकारी
Assistant Finance & Accounts Officer
भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research
कृषि प्रौद्योगिकी अनुसंधान अनुसंधान संस्थान
Agricultural Technology Application Research Institute
क्षेत्र-1, पं.क.वि. परिसर, लुधियाना-141004
Zone-1, PAU Campus, Ludhiana-141004


22.8.2026
निदेशक/Director
भा.क.अनु.प.-कृषि प्रौद्योगिकी अनुसंधान अनुसंधान संस्थान
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- To the best of our knowledge and belief, no transactions have been entered that are in violations of relevant Act/Rules/Standing instructions and scheme guidelines.
- The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- It has been ensured that the physical and financial performance under **Crop Residue Management (CRM) Project (CSNA Module)** for the year **2025-26** has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.
- The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries are enclosed at Annexure-II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Kinds of checks:

- Vouchers

22/09/2026
Nodal Officer (CRM)
ICAR-ATARI, Ludhiana
ASHISH SANTOSH MURA
Scientist (AE)
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Agricultural Technology Application
Research Institute, Zone-1
PAU Campus, Ludhiana-141004

Indu Bagal
22/9/2026
Asst. Finance & Accounts
Officer
ICAR-ATARI, Ludhiana

इंदु बागल/INDU BAGAL
सहायक वित्त एवं लेखा अधिकारी
Assistant Finance & Accounts Officer
भारतीय कृषि अनुसंधान परिषद
Indian Council of Agricultural Research
कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
Agricultural Technology Application Research Institute
क्षेत्र-1, पं. कृ. वि. परिसर, लुधियाना-141004
Zone-1, PAU Campus, Ludhiana-141004

Director
ICAR-ATARI, Ludhiana

Bhushan
22.9.2026
निदेशक/Director
भा.क.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

ICAR-Agricultural Technology Application Research Institute, Ludhiana

Crop Residue Management Project 2025-26 (CSNA Module)

(Amount in Rupees)

Name of Institute	RE 2025-26			Release 2025-26			Expenditure 2025-26			Balance as on 31.03.2026		
	IEC	Machinery	Total	IEC	Machinery	Total	IEC	Machinery	Total	IEC	Machinery	Total
ICAR-ATARI, Ludhiana	4280000	0	4280000	923741	0	923741	923741	0	923741	0	0	0

Nodal Officer (CRM)
ICAR-ATARI, Ludhiana

ASHISH SANTOSH MURA
Scientist (AE)
Indian Council of Agricultural Research
Agricultural Technology Application
Research Institute, Zone-1
PAU Campus, Ludhiana-141004

Asst. Finance & Accounts
Officer
ICAR-ATARI, Ludhiana

Director
ICAR-ATARI, Ludhiana

इंदु बागल/INDU BAGAL
सहायक वित्त एवं लेखा अधिकारी
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भा.क.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

AUC (TSA MODULE)

Annexure-IV

GFR 12-A
[(See Rule 238 (1))]

FORM OF UTILIZATION CERTIFICATE FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANISATION

AUDIT UTILIZATION CERTIFICATE FOR THE YEAR **2025-26** in respect of recurring/non-recurring
GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

- Name of the scheme: **Crop Residue Management (CRM) (TSA Module) for ICAR-ATARI, Ludhiana**
- Whether recurring or non-recurring grants : **Both** (Recurring/ Non-recurring/ Both)
- Grants position at the beginning of the Financial year : 2025-26
 - Cash in Bank Rs. 0/-
 - Unadjusted advances -
 - Total Rs. 0/- (Opening Balance)
- Details of grants received, expenditure incurred and closing balances:(Actuals)

Unspent Balances of Grants received years [figure as at Sl. No. 3 (iii)] (opening Balance)	Interest Earned thereon	Interest deposited back to the Government	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
1	2	3	4			5	6	7
-	-	-	Sanction No.(i)	Date (ii)	Amount (iii)	-	-	-
0	0	0	File No. 3-3/2018-M&T	06.10.2025	71700000	71700000	50967618	20732382 - 20732382 (lapsed) =0

(An amount of ₹2,07,32,382/- lapsed under the TSA module; accordingly, the closing balance is ₹0/-.)

Component-wise utilization of grants:

Grant-in-General (Recurring)	Grant-in-aid- salary	Grant-in-aid-creation of capital assets (non-recurring)	Total
44497618	0	6470000	50967618

Details of grants position at the end of the year

- Cash in Bank Rs. 0/-
- Unadjusted Advances -
- Total Rs. 0/-

AD 22/09/2026
ASHISH SANTOSH MURAI
Scientist (AE)
Indian Council of Agricultural Research
Agricultural Technology Application
Research Institute, Zone-1
PAU Campus, Ludhiana-141004

Indu Bagal 22/09/2026
इंदु बगल INDU BAGAL
सहायक वित्त एवं लेखा अधिकारी
Assistant Finance & Accounts Officer
भारतीय कृषि अनुसंधान परिषद
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कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
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क्षेत्र-1, पं.क.वि. परिसर, लुधियाना-141004
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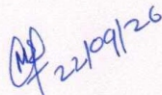
Bharon 22.9.2026
निदेशक/Director
भा.क.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- To the best of our knowledge and belief, no transactions have been entered that are in violations of relevant Act/Rules/Standing instructions and scheme guidelines.
- The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- It has been ensured that the physical and financial performance under Crop Residue Management (CRM) Project (TSA Module) for the year 2025-26 has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.
- The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries are enclosed at Annexure-II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Kinds of checks:

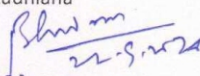
- Vouchers
- AUCs of KVKs


Nodal Officer (CRM)
ICAR-ATARI, Ludhiana
ASHISH SANTOSH MURA
Scientist (AE)
Indian Council of Agricultural Research
Agricultural Technology Application
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Asst. Finance & Accounts
Officer
ICAR-ATARI, Ludhiana

इंदु बागल INDU BAGAL
सहायक वित्त एवं लेखा अधिकारी
Assistant Finance & Accounts Officer
भारतीय कृषि अनुसंधान परिषद
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Zone-1, PAU Campus, Ludhiana-141004

Director
ICAR-ATARI, Ludhiana


निदेशक/Director
भा.कृ.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
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Zone-1, PAU Campus, Ludhiana-141004, Punjab

ICAR-Agricultural Technology Application Research Institute, Ludhiana
Crop Residue Management Project 2025-26 (TSA Module)

Name of KVK	RE 2025-26		Release 2025-26		Expenditure 2025-26		Balance as on 31.03.2026		(Amount in Rupees)	
	IEC	Machinery	IEC	Machinery	IEC	Machinery	IEC	Machinery	Lapsed in TSA	Net balance
Barnala	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Mohali	2095000	230000	2095000	230000	2095000	230000	2095000	230000	0	0
Taranataran	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Fazilka	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Amritsar	2845000	900000	2845000	900000	2845000	900000	2845000	900000	0	0
Bathinda	2845000	0	2845000	0	2845000	0	2845000	0	0	0
Faridkot	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Fatehgarh	2545000	230000	2545000	230000	2545000	230000	2545000	230000	0	0
Sahib	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Ferozepur	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Gurdaspur	2545000	230000	2545000	230000	2545000	230000	2545000	230000	0	0
Hoshiarpur	2545000	230000	2545000	230000	2545000	230000	2545000	230000	0	0
Jalandhar	2695000	230000	2695000	230000	2695000	230000	2695000	230000	0	0
Kapurthala	2545000	230000	2545000	230000	2545000	230000	2545000	230000	0	0
Ludhiana	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Mansa	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Moga	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Muktsar	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Navanshahr	2095000	230000	2095000	230000	2095000	230000	2095000	230000	0	0
Pathankot	1945000	230000	1945000	230000	1945000	230000	1945000	230000	0	0
Patiala	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Ropar	2245000	1130000	2245000	1130000	2245000	1130000	2245000	1130000	0	0
Sangrur	2845000	230000	2845000	230000	2845000	230000	2845000	230000	0	0
Total KVKs	57940000	6400000	57940000	6400000	57940000	6400000	57940000	6400000	0	0
ICAR-ATARI, Ludhiana	4280000	0	4280000	0	4280000	0	4280000	0	4285588	4285588
Total KVKs + ATARI	62220000	6400000	63220000	6400000	62220000	6400000	63220000	6400000	20732382	20732382

OF 22/03/26
Nodal Officer (CRM)

ASHISH ANANDHIMARA
Scientist (AE)
Indian Council of Agricultural Research,
Agricultural Technology Application
Research Institute, Zone-1
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Ludhiana 22/03/26
Asst. Finance & Accounts Officer

ICAR-ATARI, Ludhiana
Assistant Finance & Accounts Officer
Indian Council of Agricultural Research
Agricultural Technology Application Research
Institute, Zone-1
PAU Campus, Ludhiana-141004

Sharma 22/03/26
Director

ICAR-ATARI, Ludhiana
Director
Indian Council of Agricultural Research
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