

Saanjh Punjab

Listening to Farmers on CRM Machinery

Saanjh Punjab, established in 2025, is a coalition of leading organizations working towards climate-resilient agriculture in Punjab.

With a reach of over 300,000 farmers, the initiative amplifies farmer voices, provides technical expertise, and shapes policies for systemic transformation.

This report has been developed collectively under the Saanjh Punjab platform, bringing together multiple organizations to pool their knowledge, field experience, and research in order to present evidence-based insights and recommendations on crop residue management and agricultural diversification in the state.

Executive Summary

Over six months of field research across 10 districts of Punjab, we conducted 200 listening exercises involving nearly 2,000 farmers, societies, and agriculture officers. The study mapped 51,813 machines across 13 types, emphasising actual utilisation rather than mere distribution. The findings reveal stark imbalances: half of all machines are concentrated in just a few districts.

Custom Hiring Centres (CHCs) play a key role in providing access to crop residue management (CRM) machines, but they face their own operational challenges and limitations in service delivery.

Key barriers affecting farmers include non-availability of machines at the right time (81%), high rental costs (76%), and lack of awareness or training (57%), while 67% of farmers prefer the Super Seeder. Crop residue burning continues to pose a serious public health crisis, with nine in ten farmers reporting respiratory problems, highlighting CRM as both an economic and health imperative.

As per the reply by the Minister of Agriculture and Farmers' Welfare in the Rajya Sabha, a total of 1,37,407 Crop Residue Management (CRM) machines have been supplied to farmers and Custom Hiring Centres (CHCs), and 25,417 CHCs have been established

Custom Hiring Centres (CHCs) possess a significant portion of Punjab's crop residue management (CRM) machines, yet only a small fraction of farmers actually use them, highlighting low utilisation.

CRM Machinery in Punjab

Total distribution: Over 1.37 lakh CRM machines distributed since 2018.

Recent allocation: 15,000 machines sanctioned this year (Super Seeder most popular with 14,493 applications).

DISTRICT-LEVEL INITIATIVES 2025:



Ludhiana : Individual farmers receive 50% subsidy; groups/ cooperatives get 80%. Over 600 CRM machines approved so far.



Patiala: Geo-tagging and booking through the Unnat Kisan App.



Sangrur: 18-day awareness campaign; machinery booking via I-Khet App.

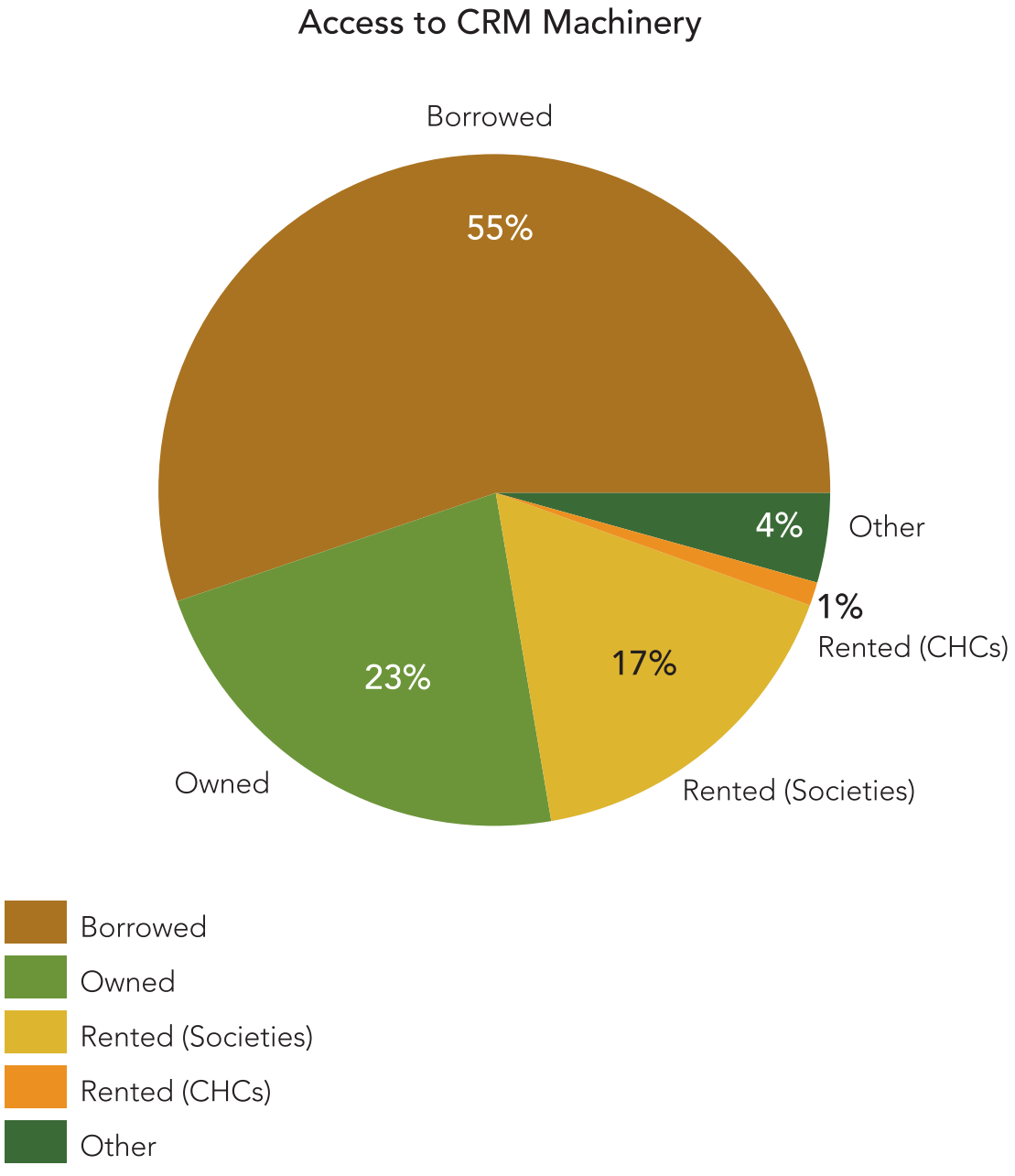


Amritsar: District-level task force at DC office; round-the-clock support for farmers.

KEY GAPS: Despite machine availability, timely access, CHC efficiency, and farmer adoption remain challenges

Access to CRM Machinery

Findings from the listening exercise indicate limited direct ownership of CRM machinery among farmers. A majority (55%) accessed machines through borrowing arrangements, while 23% reported ownership. Societies accounted for 17% of access, whereas Custom Hiring Centres (CHCs) were used by only 1% of farmers. The remaining 4% relied on alternative channels.



Most Preferred Machinery

A survey of farmers revealed their preferences for crop residue management machinery:

Super Seeder	**Most preferred by 67% of farmers**
Rotavator	**Preferred by 15%**
Happy Seeder	**Preferred by 7%**
Mulcher	**Preferred by 2%**
Baler	**Preferred by 2%**

Remaining farmers still rely on traditional methods.



Mapping CRM Machine use through Farmer Listening Exercises

SUMMARY

Conducted by our team across **10 districts** in Punjab.

Approximately **51,813** machines mapped, spanning **13** different types.

DISTRIBUTION ANALYSIS

Machinery concentrated in few districts, holding 60% of total inventory.

Bathinda:
10,022 machines (19.34%)

Ludhiana:
9,075 machines (17.51%)

Tarn Taran:
5,390 machines (10.40%)

Fazilka:
6,693 machines (12.92%)

STRATEGIC IMPERATIVE

Need for balanced regional distribution of machinery to improve coverage and utilisation.

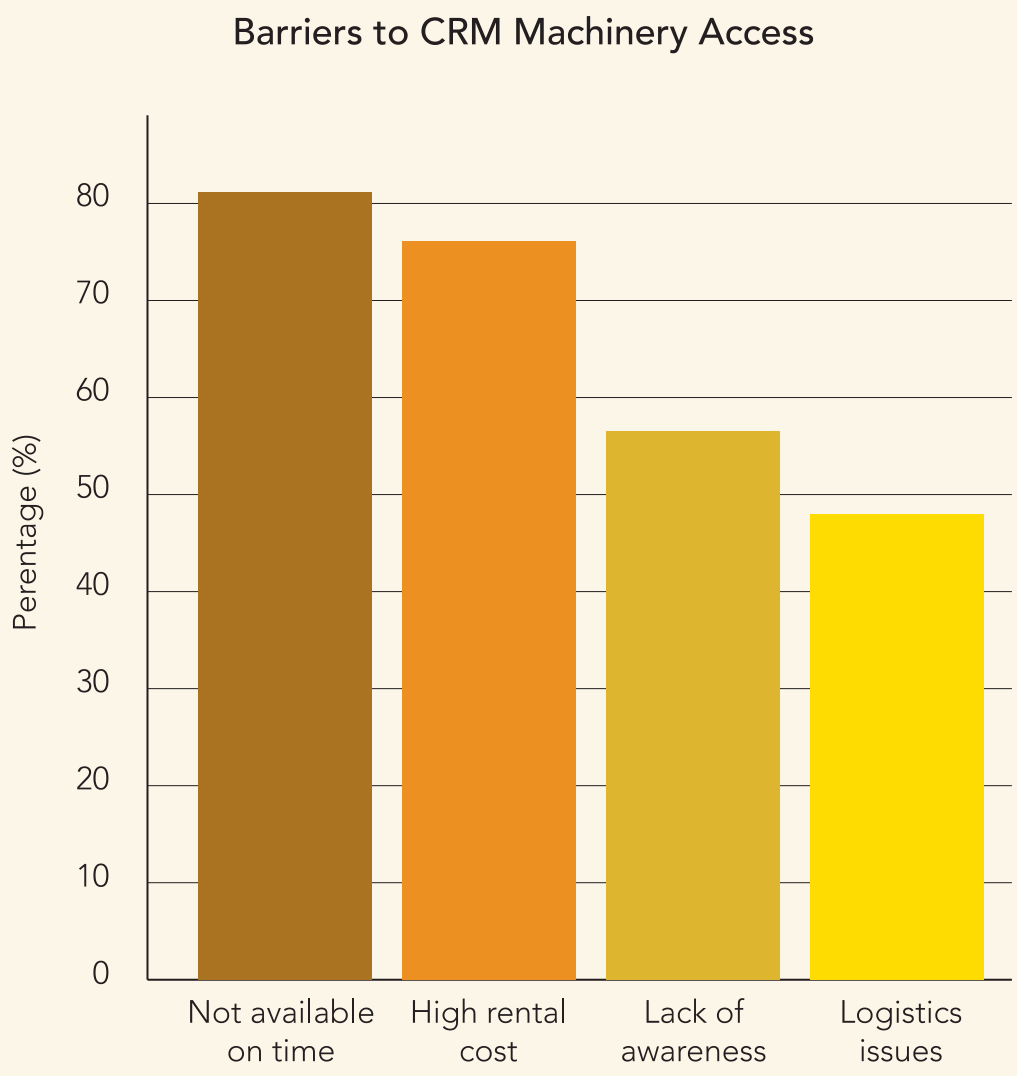
Smaller districts require targeted machinery deployment programmes.



Barriers to CRM Machinery Access

Farmers face significant challenges in accessing CRM machinery when needed. The most common barrier is non-availability of machines on time (81%), followed closely by high rental costs (76%). In addition, 57% of farmers highlighted lack of awareness about proper usage, while 49% reported logistical difficulties such as transport and coordination issues.

These findings underline the need for better planning, affordable rental systems, and awareness programmes to ensure timely and effective access to CRM machinery.



Farmer Preferred machinery district wise

MACHINERY TYPE	DISTRICTS
Mulcher, Plough	Amritsar, Patiala, Jalandhar and Fatehgarh Sahib
Super Seeder + Rotavator	Ludhiana, Sangrur, Patiala, Amritsar, Tarn Taran, Bathinda and Moga
Zero Till Drill	Patiala, Amritsar, Bathinda and Gurdaspur
Baler	Patiala, Fatehgarh, Sangrur, Gurdaspur, Jalandhar
Smart Seeder/Happy Seeders	No longer in demand among farmers but eligible for subsidies



Machinery Exists, But Utilisation is the Challenge

WHY CURRENT MACHINES REMAIN UNDERUSED

Poor maintenance and broken equipment

Inefficient distribution and scheduling

High operational costs

Weak incentives for use

Shortage of trained operators

Administrative delays and unclear rental policies

Limited farmer awareness

WHY ADDING MORE MACHINES ISN'T THE ANSWER

Priority should be repairing, maintaining, and rotating existing stock

Unchecked procurement only adds to the "junkyard" problem

THE WAY FORWARD

Repair, refurbish, or responsibly decommission old machines

Train operators and strengthen maintenance support

Improve scheduling and promote cooperative sharing models

Introduce effective incentives for proper use

Monitor utilisation systematically



Baling Alone Is Not Enough: Towards an Integrated Approach

LIMITATIONS OF BALING

Many subsidised balers operate outside the state or in areas with low paddy cultivation, reducing local benefit

High storage and transport costs create logistical hurdles

Reliance on external markets restricts availability

POLICY SUGGESTION

Align machinery allocation with local crop and infrastructure needs

Reallocate balers from low-demand areas to regions with higher paddy production and ex-situ potential

INTEGRATED WAY FORWARD

Prioritise In-Situ Solutions: Deploy Super Seeders, Rotavators, Mulchers, MB Ploughs, Surface Seeders, and Smart Seeders

Ensure Compatibility: Pair Super Seeders with SMS and complementary on-field practices for maximum efficiency Maximise Existing

Machinery: Repair, maintain, and rotate current machines to improve utilisation

Selective Ex-Situ Baling: Apply only where viable, supported by local processing for fodder, pellets, and bioenergy

Build a Local Biomass Economy: Convert bales into energy, fodder, and other value-added products through policy and market support



Health Burden of Stubble Burning

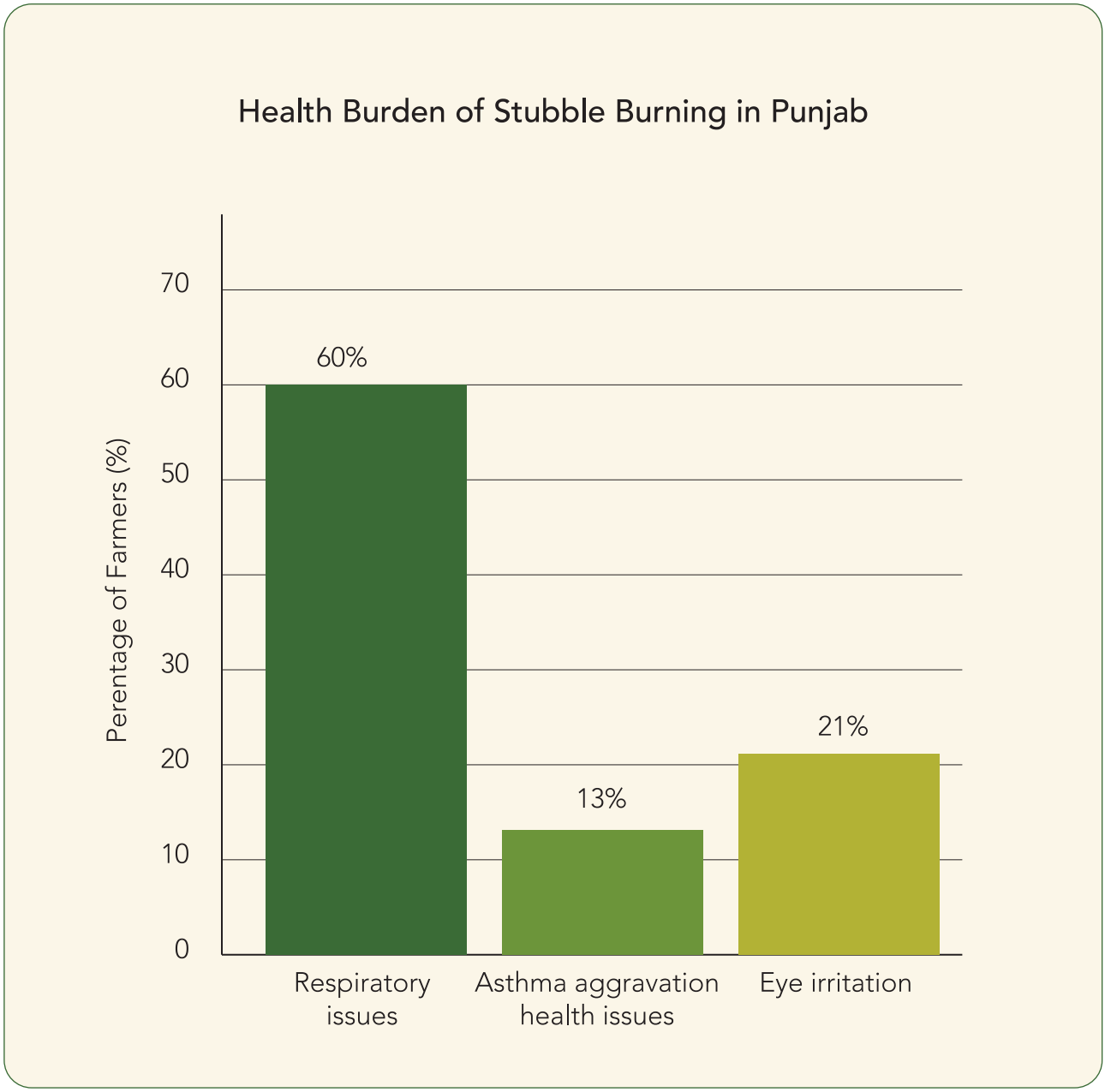
Stubble burning in Punjab is directly harming farmer and community health.

9 in 10 farmers reported respiratory problems.

RESPONSES ON ILLNESSES ARE AS FOLLOWS:

Respiratory issues (60%); asthma aggravation (13%), Eye Irritation (21%).

CRM adoption is not just about soil and yield - it is a public health imperative.



The Need for Diversification

Punjab's agriculture is heavily dependent on long-duration paddy, which creates multiple challenges:

High stubble generation leading to residue burning.

Delayed wheat sowing, affecting yields.

Environmental stress, including groundwater depletion and air pollution.

High residue management costs, with small farmers facing limited access to machinery.

Why Farmers Need Diversification

Reduce stubble burning by promoting crops that generate less residue.

Improve soil health and make better use of water and farm inputs.

Enhance farmer incomes through high-value crops with better returns.

Promote climate resilience with crop choices that can withstand weather fluctuations and resource constraints.



The Need for Diversification

The Biggest Challenge

Despite the need and willingness among farmers, the absence of assured markets for alternative crops makes diversification risky.

Farmers are reluctant to move away from paddy without guaranteed buyers and price stability.



Opportunities by Region

Gurdaspur & Amritsar Expansion of Basmati rice and fruit cultivation.

Sangrur, Bathinda, Moga Scope for short-duration paddy, maize, pulses, and oilseeds.

Patiala, Ludhiana, Jalandhar Strong potential for vegetables, horticulture, and cash crops.

Agroforestry across districts Poplar, bamboo, Eucalyptus and fruit trees can improve soil quality and offer long-term income sources.





District-Level Gaps in Crop Residue Management and Suggested Actions

DISTRICT	MACHINERY/ TECHNOLOGY	MACHINERY/ TECHNOLOGY	MACHINERY/ TECHNOLOGY
Amritsar	Integrated Super Seeder +Super SMS Mulcher / Plough)	High rental cost; small farmers excluded; Super SMS expensive to buy individually	Promote cooperative/CHC ownership; subsidised local rental schemes; organise training and demo sessions; implement digital booking platforms; provide financial incentives, Strengthen local CHCs;
Tarn Taran	Integrated Super Seeder + Super SMS/ Zero Till Drill	Delayed machine availability; high cost of Super SMS limits small farmer adoption	Strengthen local CHCs; implement advance booking systems; organise training and demo sessions; promote digital booking platforms.
Gurdaspur	Integrated Combine Harvester + Super SMS + Zero Till Drill / Baler	Lack of storage for bailing; non-availability of machines on time; Super SMS is expensive	Develop straw markets, promote cooperative ownership of machines; organise training and demo sessions. Strengthen local CHCs;
Ludhiana	Integrated Super Seeder + Super SMS / Rotavator	Uneven access; low awareness; high cost of Super SMS restricts adoption	Farmer demonstrations; peer-to-peer training; promote local cooperatives; Strengthen local CHCs;
Smart Seeder/ Happy Seeders	No longer in demand among farmers but eligible for subsidies	No longer in demand among farmers but eligible for subsidies	No longer in demand among farmers but eligible for subsidies

District-Level Gaps in Crop Residue Management and Suggested Actions

DISTRICT	MACHINERY/ TECHNOLOGY	MACHINERY/ TECHNOLOGY	MACHINERY/ TECHNOLOGY
Sangrur	Baler	Stubble load of PUSA 44 is very high; long-duration variety limits sowing window	Promote short-duration paddy varieties; expand CHCs; digital booking platforms; facilitate timely machine availability
Patiala	Mulcher / Plough / Baler / Super Seeder + Integrated Super SMS	Balers often move out of district because of low local demand; high cost of integrated machinery	Incentivise local use; promote CHC/cooperative ownership; organize training and demo sessions; implement digital booking platforms
Gurdaspur	Integrated Combine Harvester + Super SMS + Zero Till Drill / Baler	Lack of storage for bailing; non-availability of machines on time; Super SMS is expensive	Develop straw markets, promote cooperative ownership of machines; organise training and demo sessions. Strengthen local CHCs;
Moga	Super Seeder + Integrated Super SMS / Baler	No processing plant nearby; long-duration variety needs to be stopped	Promote short-duration varieties; establish CHC-based access to machinery; organise training and demo sessions
Jalandhar	Mulcher / Baler / Plough	Low awareness; scattered adoption	Village-level training camps; demonstration plots
Bathinda	Baler + Super Seeder (Integrated Super SMS)	Baler stubble load of PUSA 44 is very high; long-duration variety limits sowing window	Promote short-duration paddy varieties; expand CHCs; digital booking platforms; facilitate timely machine availability

Key Insight on Super SMS Financial Implications:

Farmers hesitate to adopt Super-SMS systems due to the high upfront costs, which pose a considerable financial burden.

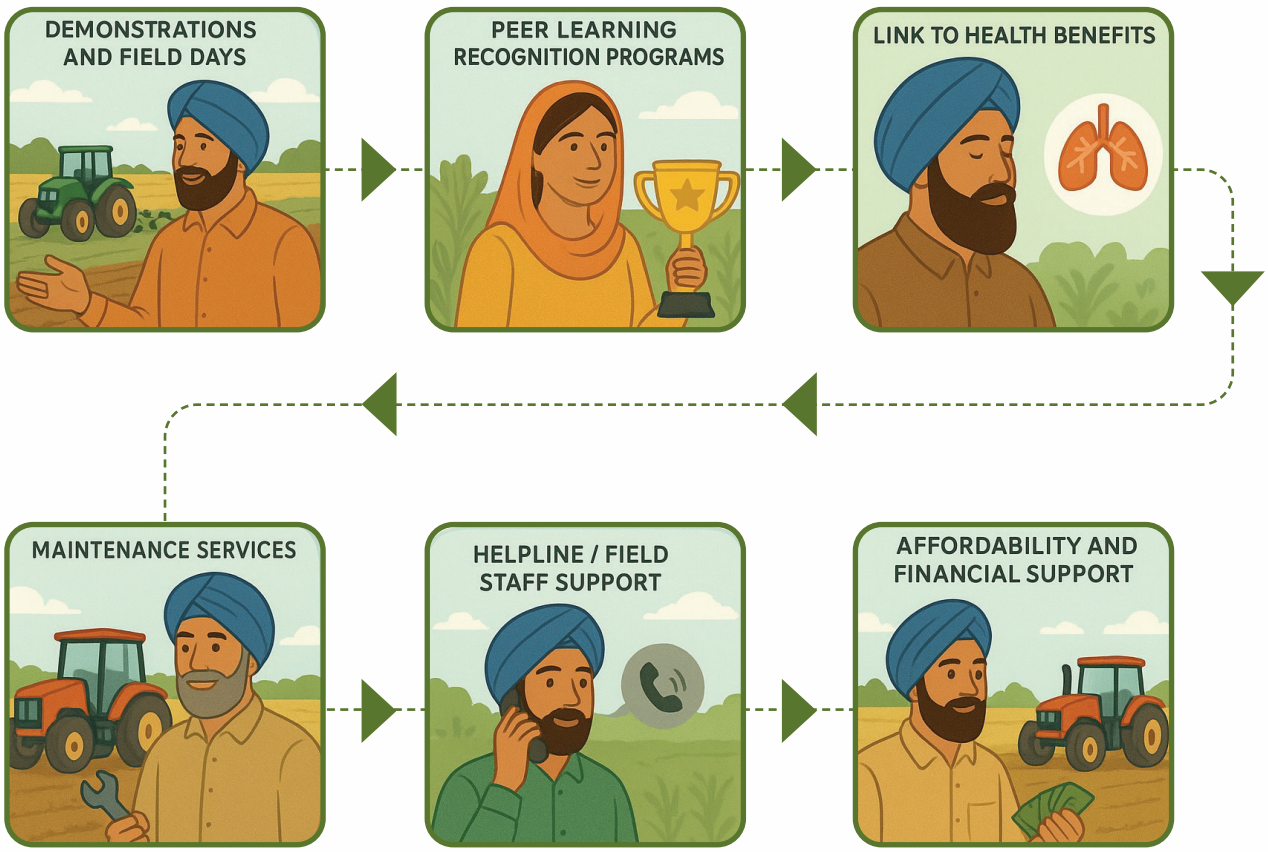


What Should Be Done?

ISSUE	BARRIER	SOLUTION
Machine deployment	More machines ≠ less burning	Strategic deployment; monitoring dashboards; multi-crop use
Farmer training	Hesitancy & misuse	Field demos; peer champions; helpline & WhatsApp support
Crop timing	Long-duration varieties; tight harvest-sowing window	Short-duration paddy; crop diversification; align service windows
Access & ownership	Fragmented holdings; high costs; delayed availability	Strengthen CHCs; aggregator-type apps; group/co-op ownership
Behaviour	Convenience; misinformation; strategic burning	Reward zero-burning villages; awareness campaigns; balanced penalties
Machinery sustainability	Obsolete machines; lack of spares	End-of-life management; ensure spare availability & maintenance
CHC capacity	Limited reach & farmer support	Promote CHCs as local hubs for training, maintenance & advisory services



From Fields to Future: Learning & Adopting CRM MachineryS



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– Sanam Sutirath Wazir

