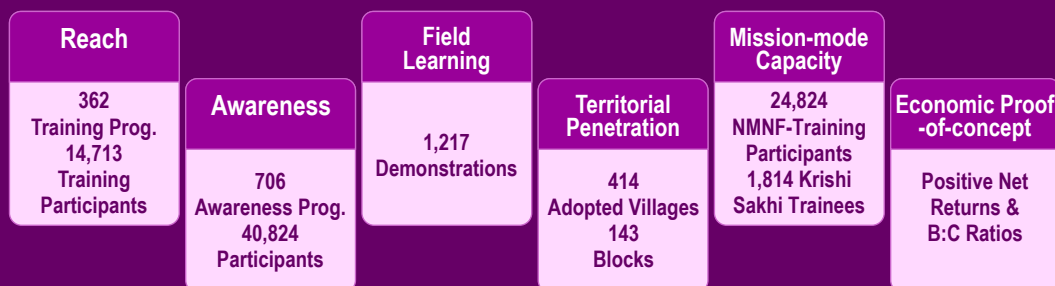


NATURAL FARMING: GROWING A SUSTAINABLE FUTURE

From Knowledge to Practice | From Farms to Communities | From Innovation to Impact



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1. The Challenge: Why Natural Farming Needed an Impact Pathway

In North-West India, promoting Natural Farming required more than introducing an alternative cultivation practice. It required changing how farmers learn, experiment, adopt and scale new practices. Rising cultivation costs, dependence on external inputs, and differences in local resources, knowledge and skills across agro-ecologies made this challenge particularly important.

The challenge was to make Natural Farming practical, visible, locally adaptable and economically credible, moving beyond one-time awareness towards repeated field engagement, hands-on learning and demonstrated results.

The Innovation-to-Impact approach addressed this by converting knowledge into practice and practice into community action. Locally available resources were promoted for natural inputs and resource recycling, while demonstrations, farmer-scientist interaction, training and mentoring built confidence and skills. Crop- and agroecology-specific approaches enabled adaptation across diverse plains, hills and dry temperate conditions. Adopted-village pathways and peer learning further supported farmer-to-farmer diffusion, while the next phase focuses on farmer institutions, aggregation, certification, traceability and market linkages for sustained adoption and better economic returns.

The challenge was not simply to promote a farming practice. It was to enable farmers and communities to adopt a sustainable farming system. This transformed Natural Farming from a programme activity into a field-based learning and adoption process, laying the foundation for sustainable farming communities across North-West India.

2. The Innovation: A Coordinated Farmer-Centric Model

The major innovation is the conversion of extension from a predominantly activity-oriented approach into a connected pathway in which each stage prepares the ground for the next.



Innovation component	Distinctive feature	Expected pathway to impact
Demonstration-led extension	Natural Farming practices are made visible under real field conditions.	Observation → confidence → trial → adoption.
Agroecology-specific adaptation	Plains to dry temperate areas are treated as different production environments.	Local fit → lower uncertainty → stronger replication potential.
Field-based capacity building	Training is linked to practical learning, demonstrations and farmer-scientist interaction.	Knowledge → capability → practice.
Distributed KVK network	KVKs function as last-mile catalysts within a coordinated ATARI architecture.	Science → local translation → village reach.
Community diffusion	The model encourages movement from individual farmers to groups and village institutions.	Peer learning → social acceptance → wider diffusion.
Convergence	ICAR/ATARI, KVKs, State/UT systems, universities and farmer institutions are linked.	Resources and expertise → continuity and scale.
Impact orientation	Reach is connected with field evidence, economics and future MRV.	Activities → outcomes → measurable impact.

3. ICAR-ATARI Ludhiana: The Coordination Engine

ICAR-ATARI Ludhiana functioned as the strategic bridge between scientific knowledge and field-level impact, aligning ICAR research, the KVK network, State/UT systems and farming communities around a common Natural Farming agenda. ICAR-ATARI added value by connecting, coordinating and accelerating the innovation-to-impact journey through:



- Strategic planning and common direction across the KVK network.
- Convergence with ICAR institutes, agricultural universities, State/UT departments and other stakeholders.
- Translation of scientific recommendations into locally understandable and demonstrable field solutions.
- Monitoring, review and knowledge sharing across agroecological settings.
- Identification of promising crop–practice combinations for further validation and scaling.
- Creation of a feedback loop in which farmer experience informs refinement and future demonstrations.

The Feedback Loop

Research → ATARI → KVKs → Farmers → Feedback → Refinement → Demonstration → Scaling

4. Scaling the Innovation: From Activity Footprint to Impact Footprint

The Natural Farming initiative scaled across five diverse State/UTs of Zone-I, creating a broad platform for farmer outreach, field demonstrations and village-level engagement. The KVK network reached 414 adopted villages across 143 blocks, supported by 362 training programmes, 706 awareness programmes and 1,217 demonstrations during 2022-26. This wide outreach was further strengthened under the National Mission on Natural Farming (NMNF) through mission-mode capacity building, reaching 24,824 farmer-training participants, 1,814 Krishi Sakhis and 22,555 awareness participants. Together, these efforts established a strong foundation for moving Natural Farming from awareness and demonstration towards skills, adoption and community-level diffusion.

STATE/UT-WISE SCALING FOOTPRINT OF NMNF

State/UT	Adopted villages	Blocks	Training programmes	Training participants	Awareness participants	Demonstrations
Himachal Pradesh	128	43	107	4,210	6,425	724
Jammu & Kashmir	80	29	94	3,832	18,875	174
Ladakh	40	16	37	1,669	3,415	73
Punjab	46	20	38	1,535	2,926	55
Uttarakhand	120	35	86	3,467	9,183	191
Zone-I	414	143	362	14,713	40,824	1,217

MISSION-MODE HUMAN-CAPITAL EXPANSION UNDER NMNF

State/UT	NMNF farmer training participants	Krishi Sakhi participants	NMNF awareness participants
Himachal Pradesh	916	829	3,152
Jammu & Kashmir	15,948	403	11,803
Ladakh	777	18	1,990
Punjab	5,378	139	2,167
Uttarakhand	1,805	425	3,443
Zone-I	24,824	1,814	22,555

5. From Training Hall to Farm: Demonstration as the Conversion Mechanism

The strongest impact feature was the shift from telling farmers about Natural Farming to enabling them to observe, practise and evaluate it under their own field conditions. Demonstrations became a bridge between scientific knowledge and farmer confidence. The field-learning platform combined on-farm demonstrations, hands-on natural-input preparation, farmer–scientist interaction, field visits, exposure programmes and follow-up support. Farmers could observe crop performance, pest and disease management, labour requirements and yield outcomes under real field conditions—making Natural Farming more practical, credible and locally relevant.

The portfolio covered five distinct agroecological zones, demonstrating that

Agroecology	Illustrative Crops	Strategic Focus
Plains	Wheat, chickpea, lentil, onion, gobhi sarson	Field crops, pulses, oilseeds and vegetables
Low Hills	Green pea, onion, garlic, cauliflower, radish, potato, kiwi	Vegetables, potato and horticulture
Mid Hills	Apricot, kiwi, peach, plum, vegetables	High-value fruits and vegetables
High Hills	Green pea, onion, garlic, turnip, radish, spinach, carrot, cauliflower, cabbage, kiwi	Resilient vegetables and niche horticulture
Dry Temperate	Green pea, Chinese cabbage, Swiss chard, spinach	Premium, locally adapted vegetables and high-value crops

Natural Farming was approached through locally adapted crop–practice combinations rather than a one-size-fits-all model.

The innovation was not simply demonstrating Natural Farming. It was demonstrating how Natural Farming can be adapted, tested and adopted across diverse farming environments.



6. Visible Farm-Level Economic Potential

Field demonstrations indicate positive economic potential across all five agroecological zones, with particularly strong returns emerging from selected fruits, vegetables and niche crops. These results provide an important proof-of-concept for the economic credibility of Natural Farming. The results highlight the potential of location-specific, high-value crop systems under Natural Farming.

Agroecology	Crop observations	Mean gross returns (₹/acre)	Mean cost (₹/acre)	Mean net returns (₹/acre)	Mean B:C
Plains	5	48,324	23,179	25,145	2.20
Low hills	11	84,400	28,306	56,094	2.83
Mid hills	11	100,600	29,355	71,245	3.29
High hills	15	106,774	33,500	73,275	3.03
Dry temperate	4	161,856	35,830	126,026	4.54

Selected demonstrations recorded particularly strong B:C ratios. These examples point to promising opportunities for strengthening Natural Farming through high-value crop selection, local adaptation and market-oriented production.

Crop	Agroecology	Gross returns (₹/acre)	Cost (₹/acre)	Net returns (₹/acre)	B:C
Potato	Low hills	117,880	24,790	93,090	4.76
Plum	Mid hills	138,820	27,190	111,630	5.11
Kiwi	Mid hills	188,645	49,120	139,525	3.84
Cauliflower	High hills	194,570	48,150	146,420	4.04
Cabbage	High hills	189,930	46,460	143,470	4.09
Chinese cabbage	Dry temperate	195,980	43,070	152,910	4.55
Swiss chard	Dry temperate	153,846	29,532	124,314	5.21
Green pea	High hills	111,770	30,733	81,037	3.64

Note: These are demonstration-level results and should not be interpreted as causal estimates of average farmer income.

This evidence identifies high-value crops and agro-ecologies with strong economic potential. The next step is to validate these results across seasons and farms and connect production with aggregation, quality assurance and markets to translate demonstrated potential into sustained farmer income.

7. From Individual Farmer to Community Transformation

Natural Farming creates lasting impact when individual learning becomes collective capability and community action. The initiative has established the foundation through farmer outreach, demonstrations, adopted villages, Krishi Sakhis and local resource mechanisms. The next step is to translate this foundation into sustained adoption, stronger institutions and measurable farm and community outcomes.

The community transformation pathway was supported by 40,824 awareness participants, 14,713 training participants, 414 adopted villages across 143 blocks, and 1,814 Krishi Sakhis under NMNF. Women's participation, local natural-input preparation and the emerging FPO/FPC pathway further strengthen the potential for community-led scaling.

The initiative has created the institutional and human-capital foundation for change. Its longer-term success will be demonstrated when this foundation translates into sustained farmer adoption, collective action, improved farm economics, resource efficiency and resilient Natural Farming communities.

Community impact dimension	Evidence / mechanism available	Next outcome to measure
Farmer mobilisation	40,824 awareness participants; 14,713 training participants	Conversion of exposure into sustained practice
Local capability	Trained farmers, KVKs and 1,814 Krishi Sakhis	Peer learning and continued technical support
Village adoption	414 villages across 143 blocks	Multi-season adoption and village-level clusters
Women's participation	8,697 women among NMNF training participants	Participation in knowledge, support and enterprises
Local resource ecosystem	Natural-input preparation; proposed Bio-Input Resource Centres	Reliable, quality and affordable local inputs
Collective enterprise	FPO/FPC pathway identified	Aggregation, branding, market access and price realisation

REACH → CAPABILITY → ADOPTION → COLLECTIVE ACTION → FARM OUTCOMES → COMMUNITY IMPACT → SUSTAINED TRANSFORMATION

8. Policy Imperatives and Way Forward

The experience of Natural Farming promotion across Zone-I demonstrates that the next frontier is not outreach, but conversion of outreach into sustained adoption, measurable outcomes and scalable rural enterprises. The policy focus should therefore shift from activity-based implementation to an integrated Innovation-to-Impact system.

1. Shift from Awareness to Sustained Adoption

Move beyond counting trainings and demonstrations to measuring how many farmers continue the practice, on how much area and for how many seasons. Establish multi-season adoption clusters in selected villages and track farmer-level adoption, practice intensity and continuity over 3–5 years.

2. Institutionalise Demonstration-to-Adoption Pathways

Demonstrations should become entry points for adoption, not end points of extension. Link every major demonstration with hands-on training, farmer mentoring, follow-up visits, peer learning and adoption tracking.

3. Promote Agroecology-Specific Natural Farming Models

Avoid a uniform Natural Farming package across diverse farming environments. Develop and validate crop-agroecology-specific packages for plains, low hills, mid hills, high hills and dry temperate regions, supported by comparative field evidence.

4. Build a Local Bio-Input Ecosystem

Reliable access to quality, affordable natural inputs is essential for sustained adoption. Strengthen village/cluster-level Bio-Input Resource Centres, farmer skills and quality protocols to promote local production, availability and resource recycling.

5. Make Farmer Institutions the Engine of Scale

Individual farmers alone cannot deliver sustained collective impact. Promote FPO/FPCs, SHGs and farmer groups as platforms for knowledge sharing, input access, aggregation, quality management and collective action.

6. Connect Natural Farming with Markets

Production gains must translate into realised farmer income. Develop aggregation, grading, branding, certification/traceability, institutional procurement and direct/digital marketing channels for Natural Farming produce.

7. Establish a Credible Impact Measurement System

Future investment should be guided by measured outcomes, not activity numbers alone. Establish standardised baseline and endline systems covering adoption, cost, input use, yield, net returns, labour, soil health and resource conservation, supported wherever feasible by comparable conventional plots.

8. Build Natural Farming as a Knowledge Network

Successful innovations should not remain isolated demonstrations. Create a Zonal Natural Farming Knowledge Repository capturing validated crop practices, economics, farmer experiences, lessons and replication protocols for comparable agroecologies.

9. Strengthen Convergence and Institutional Coordination

Scaling requires convergence beyond the KVK system. Institutionalise coordination among ICAR institutes, ATARI, KVKs, SAUs, State/UT departments, farmer institutions, development agencies and market partners around common impact goals.

10. Position ICAR–ATARI as the Innovation-to-Impact Catalyst

ICAR–ATARI Ludhiana can provide the critical coordination layer that connects science, extension, farmers, institutions and markets. Its role should progressively evolve from coordinating activities to curating evidence, accelerating validated innovations, enabling convergence and guiding replication across comparable agroecologies.

THE WAY FORWARD: FROM PROGRAMME TO IMPACT SYSTEM

“The change should build on the substantial outreach and demonstration foundation already created and move towards a measurable, farmer-led and market-connected Natural Farming ecosystem.”

THE POLICY MESSAGE

“The next phase of Natural Farming should not be defined by how widely the message travels, but by how deeply the practice is adopted, how strongly communities sustain it, and how convincingly farm, ecological and economic outcomes can be demonstrated.”

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