A Beneficiary milking livestock

Impact Assessment Report

DAIRY VALUE CHAIN DEVELOPMENT PROJECT FOCUSING ON DAIRY LIVELIHOOD ENHANCEMENT

Supported by HCL Foundation

FY 21-22 to FY 23-24

SGS

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Table of Contents

1. Disclaimer....02
2. Acknowledgments....03
3. Table of Contents....04
4. Executive Summary....06
5. SDGs Covered....08
6. Introduction and Context setting....09
7. Implementation Model....10
8. About the Organizations....11
9. Approach and Methodology....13
10. Stakeholders Involved....15
11. Assessment - Deep Dive....16
12. Assessment Findings and Analysis....18
13. Social Return on Investment....24
14. Key Learnings and Recommendations....25
15. Case Study....26

Executive Summary

Dairy remains a primary livelihood source for smallholder households in Hardoi district, yet productivity has long been constrained by low breed quality, delayed access to artificial insemination (AI) services, limited preventive animal healthcare, and weak last-mile service delivery. These structural gaps directly suppress milk yield, inflate avoidable veterinary costs, and limit household income potential.

Against this backdrop, the HCL Foundation-supported Dairy Development Intervention was implemented in selected blocks of Hardoi district, Uttar Pradesh. The intervention aimed to strengthen smallholder dairy livelihoods by focusing on breed improvement, organising farmer training, deploying trained AI technicians and village volunteers, and facilitating access to markets and aggregation systems.

Key insights:

The impact assessment adopted a mixed-methods approach aligned to OECD-DAC criteria, integrating document review, quantitative survey analysis (n=152), and qualitative validation. Findings indicate that the programme addressed a clear livelihood gap, with measurable gains in income, cost efficiency, and market access across project villages in Hardoi.

Many households had prior exposure to dairy activities but were engaged largely in subsistence-level production. The intervention helped convert these practices into higher-yield income-generating work, with a large majority of beneficiary households reporting that the programme addressed their income and livelihood needs. Training completion rates were high, with 96% of farmers completing modern dairy management training.

> **High training completion and skill cultivation translated into regular earnings, improved household wellbeing, and greater confidence among dairy farming households.**

This reflects both the relevance of the skills offered and the accessibility of training centres located close to farmers' homes. A significant proportion of beneficiaries reported applying their skills for income generation, indicating that training translated into practical livelihood outcomes. Farmer confidence in continuing improved practices independently was consistently high.

The programme's impact extended beyond income. Most households reported earning regular monthly incomes during the programme support period, and a large majority stated that these earnings contributed positively to household wellbeing. 81% reported changes in their family well-being - managing children's education and medical expenses, meeting personal needs, and contributing to daily household costs. These changes were accompanied by increased confidence and greater recognition within the household. Beneficiaries strongly attributed these improvements to the programme, indicating that similar changes would have been unlikely in its absence. Field findings indicate strong satisfaction with the village-level Banas Dairy collection system, which reduced milk transaction time from a full day to approximately 30 minutes.

A Social Return on Investment analysis was conducted to estimate the social value generated by the programme. Using conservative assumptions and government-aligned proxies over the project period, the analysis estimates that the programme generated approximately ₹15.9 of social value for every ₹1 invested. The assessment indicates that the Dairy Development Programme has made a clear contribution to improving household income and livelihood stability in Hardoi district.

Impact at Glace

Programme has made a meaningful contribution to strengthening rural dairy livelihoods in Hardoi district. By improving breed quality through AI services, reducing transaction friction via decentralised milk aggregation, and building farmer capacity in scientific dairy management, the initiative has positioned households for sustained productivity and income growth - embedding improvements within existing systems rather than creating parallel structures.

Median Monthly Dairy Income

₹21,500

median monthly dairy income recorded post-intervention among surveyed households, reflecting a significant shift from dairy as a supplementary activity to a stable, higher-yield income stream.

Monthly Veterinary Cost Saving

₹1,000

median monthly reduction in veterinary expenditure for households that adopted preventive animal health practices, reducing recurring treatment costs and financial strain on families.

Median Monthly Income Increase

₹14,500

median monthly increase in dairy income for beneficiary households post-intervention, indicating strong income gains driven by improved practices, AI uptake, and better market linkages.

Programme SROI

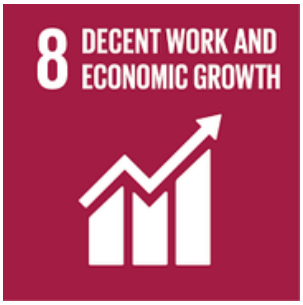
15.9 : 1

For every ₹1 invested, the programme generated ₹15.9 of social value (programme-adjusted). Based on household income gains, veterinary savings, transaction time efficiency, and breed improvement value - using conservative assumptions.

Way Forward

Looking ahead, the assessment highlights emergency animal healthcare access as a critical vulnerability - particularly due to transport constraints for large animals requiring treatment. Beneficiaries reported livestock losses linked to delayed treatment, and animal sickness was consistently associated with reduced milk production.
Expanding AI technician deployment, diversifying milk aggregation channels, and aligning production more closely with demand could help stabilise and grow earnings. Continued farmer skill upgradation in breed management and scientific dairy practices will further embed long-term behavioural change. Scale-adjusted SROI indicates strong economic return potential when extended across the full programme footprint, with further gains expected as breed improvement outcomes compound over time as calves from improved breeds mature into productive animals.

SDG Mapping and Alignment

SDG	Target & Focus	Contribution Pathways
	Target 1.2 - Reduce proportion of men, women and children living in poverty in all its dimensions	• Increased milk yield • Higher saleable surplus • Incremental monthly income • Improved financial resilience and reduced livelihood vulnerability
	Target 2.3 - Double agricultural productivity and incomes of smallscale food producers	• Genetic improvement + improved herd management • Higher productivity per animal • Improved milk availability and income • Strengthened household nutrition and food security
	Target 5.a - Enhance women's access to economic resources	• Reduced time spent on milk sales + increased dairy income • Greater economic agency within household • Strengthened participation in livelihood decisions
	Target 8.3 - Promote productive activities and support entrepreneurship	• Local skill creation • Rural employment generation (AI technicians, volunteers) • Strengthened service ecosystem and income diversification

SDG Mapping and Alignment

SDG	Target & Focus	Contribution Pathways
	Target 9.1 - Develop quality, reliable infrastructure to support economic development	• Improved service accessibility • Reduced transaction cost and time • Increased efficiency of dairy value chain participation
	Target 12.2 - Sustainable management and efficient use of natural resources	• Better herd management • Reduced avoidable morbidity • Improved resource efficiency per litre of milk produced
	Target 17.17 - Encourage effective public, public-private and civil society partnerships	• Institutional coordination • Embedded service delivery model • Strengthened ecosystemlevel impact and sustainability

INTRODUCTION AND PROGRAMMATIC REVIEW

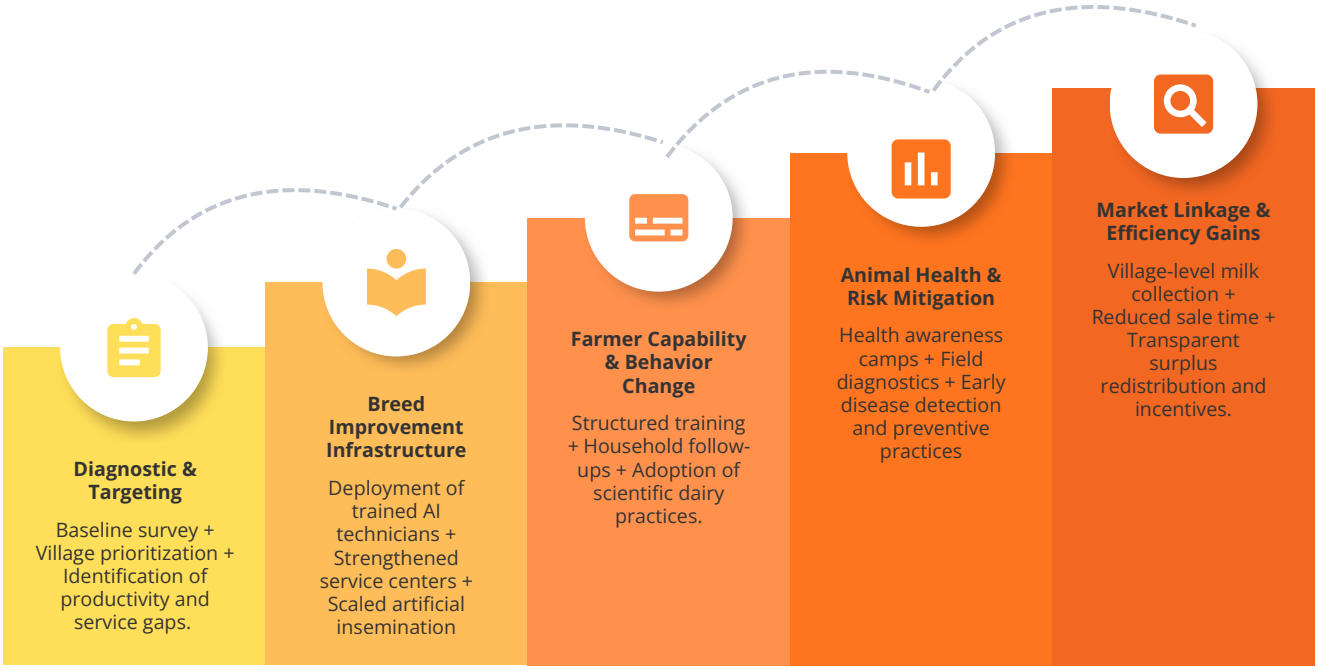
The Dairy Development Intervention was conceptualised as a community-anchored intervention designed to address acute undernutrition and its underlying drivers among smallholder farming households in Hardoi district, Uttar Pradesh. Rather than operating as a parallel service, the model focused on last-mile strengthening of AI services, strengthening early identification, caregiver practices, and continuity of care within existing public health and dairy ecosystems.

Implementation Model

The Initiative was implemented through a structured five-step model addressing constraints sequentially - from diagnostic assessment to sustained institutional integration - ensuring that gains were not episodic but embedded within local systems.

The first stage focused on evidence-led planning. A baseline survey and geographic prioritisation exercise identified productivity gaps, breed composition patterns, and service access constraints, ensuring interventions were targeted to actual bottlenecks rather than uniformly deployed. The second stage strengthened last-mile technical services - trained AI technicians were deployed, service points operationalised, and breed improvement scaled through systematic artificial insemination procedures, reducing access barriers and improving genetic potential within the herd base.

The third stage concentrated on farmer capability enhancement. Large-scale training sessions, reinforced through village-level volunteer outreach and household visits, promoted adoption of scientific dairy practices - shifting emphasis from awareness generation to sustained behavioural adoption. The fourth stage integrated animal health outreach and diagnostic support through camps and field-level engagement addressing early disease detection, preventive practices, and treatment awareness. The fifth stage strengthened market linkage efficiency. Village-level milk collection reduced transaction time from a full day to approximately 30 minutes per sale, enabling time reallocation toward other productive activities. Surplus from litre-to-gram conversion was transparently redistributed to beneficiaries, reinforcing system credibility. Together, these five stages formed a closed-loop model linking productivity, service access, behavioural adoption, health risk mitigation, and market efficiency.



About the Organizations

HCL Foundation

CL Foundation (HCLF) was established in 2011 as the corporate social responsibility arm of HCL Tech in India. It is a value-driven, not-for-profit organization that thrives in contributing toward national and international development goals, impacting the lives of people and communities through long-term sustainable programs. The foundation aims to alleviate poverty and achieve inclusive growth and development through a life cycle-based integrated community development approach, with thematic focus on education, health, livelihoods & skilling, environment and disaster risk reduction & response. Child protective strategies, inclusion, and gender transformative approaches remain central in all initiatives of the HCL Foundation, thus ensuring comprehensive development.

About Samuday

Samuday is an outcome of HCL's commitment to uplift rural India. Established in 2015, Samuday intends to develop a sustainable, scalable, and replicable model – a source code for the economic and social development of rural areas in partnership with central and State Governments, local communities, NGOs, knowledge institutions, and allied partners. HCL Foundation do this through optimal interventions across Agriculture, Education, Health, Infrastructure, Livelihood, and WASH (Water, Sanitation & Hygiene) in selected villages. The programme is designed to help the local people identify their problems, co-create solutions, and then implement the same on their own with professional support from team Samuday, thereby, lending the dimension of sustainability and ownership to the whole vision of development. Currently implemented in 11 blocks of Hardoi in Uttar Pradesh, Samuday is operational in more than 1900+ villages from 524 Gram Panchayats, impacting 3.16 million people.

APPROACH & METHODOLOGY

Approach & Methodology

The impact assessment of the HCL Foundation-supported Dairy Development Intervention was designed using a consultative and evidence-led approach aligned with the OECD-DAC evaluation criteria. SGS adopted a mixed-methods framework integrating review of project documentation, primary interactions with beneficiaries, and analysis of household survey data.

The methodology assessed relevance, effectiveness, efficiency, impact, and sustainability - with specific focus on breed improvement outcomes, AI service access, animal health practices, milk production changes, income effects, and market access efficiency.

Findings were triangulated across quantitative indicators and qualitative insights from field staff, lead farmers, and programme representatives to ensure analytical rigour and contextual validity.

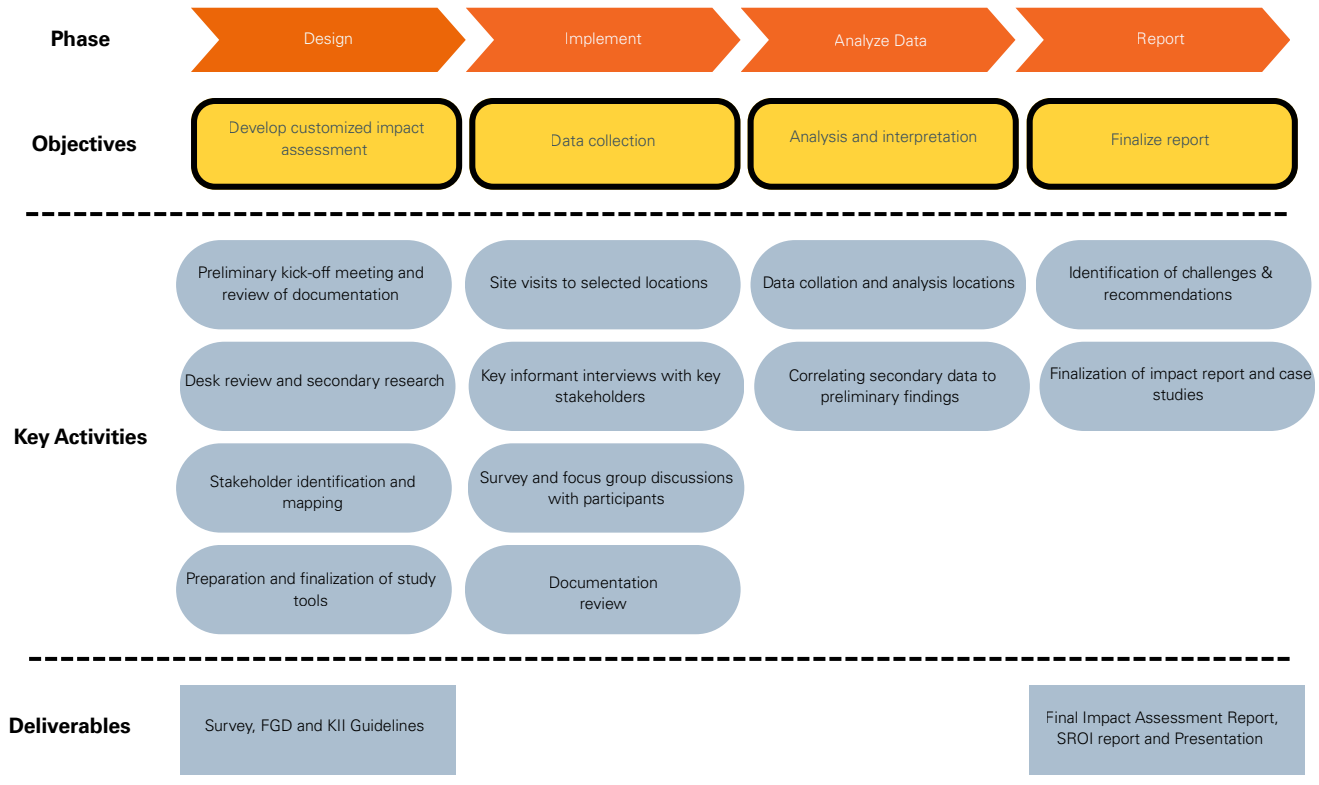
The scope of the assessment covered HCL dairy intervention geographies in Hardoi district, Uttar Pradesh, including multiple blocks and Gram Panchayats, and examined the alignment of training and AI extension outputs with farmer needs.

The assessment further synthesised implementation learnings related to baseline-led targeting, last-mile AI service strengthening, and efficiency gains from village-level milk collection systems to inform future programme refinement.

Knowledge, practices, and decision-making impact - and the extent to which learning and adoption are likely to be sustained - were assessed beyond the direct project engagement period.

Overview of study design

The engagement had the following major components:



Theory of Change

The Dairy Development Intervention was anchored in the premise that low dairy incomes in Hardoi are not solely a function of livestock ownership, but of constrained productivity, inconsistent access to breed improvement services, limited preventive animal healthcare, and transaction inefficiencies in milk marketing.

The theory of change operated across four linked levels - inputs, activities, outputs, outcomes, and impact - ensuring that investments translated into durable livelihood gains rather than episodic improvements. The intervention assumes that sustained service accessibility, continued behavioural reinforcement, and institutional anchoring of AI and outreach systems are critical to maintaining productivity gains.

It explicitly recognises that long-term genetic improvement and district-level transformation require multi-year continuity beyond the current assessment horizon to support scalable dairy livelihood models in rural contexts.

Inputs

- Financial support from HCL Foundation
- Technical expertise from implementing partners (End Poverty / BISLD)
- Trained Artificial Insemination (AI) technicians and villagelevel volunteers
- Monitoring systems, reporting frameworks, and governance structures
- Training curriculum, diagnostic tools, and AI consumables

Activities

- Baseline survey and geographic prioritisation of dairy-intensive villages
- Deployment of AI technicians and strengthening of lastmile AI services
- Conduct of artificial insemination procedures using improved semen
- Large-scale farmer training on scientific dairy management practices

Outputs

- Farmers trained in modern dairy management practices
- AI procedures conducted and breed improvement initiated
- Households reached through follow-up visits and advisory support
- Increased awareness of preventive animal healthcare practices

Outcomes

- Improved adoption of scientific herd management practices
- Enhanced access to breed improvement services
- Reduced productivity losses linked to animal sickness
- Improved milk yield per animal (selfreported)

Impact

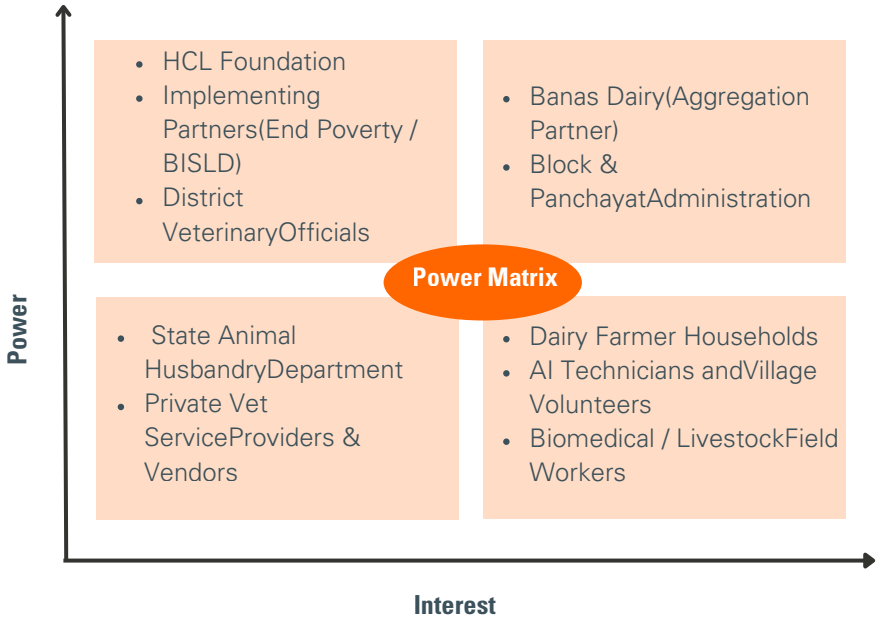
- Incremental increase in dairy-derived household income
- Improved livelihood resilience among dairydependent households
- Strengthened positioning of dairy as a reliable and efficient supplementary income stream within rural economies

Stakeholders Involved

The Dairy Development Programme involved a range of stakeholders working at different levels - from dairy households at the community level to institutional and market actors at the block and district level. Each stakeholder played a specific role in supporting breed improvement, service delivery, market access, and programme oversight. The model relies on coordinated action among dairy farmers, trained AI technicians, village volunteers, implementing NGOs (End Poverty / BISLD), milk collection institutions, and local veterinary ecosystems. For clarity, stakeholders have been grouped into micro, meso, and macro levels based on their closeness to beneficiaries and their role in programme implementation and oversight.

Stakeholder Mapping

STAKEHOLDER GROUP	LEVEL	ROLE
Dairy Farmers / Beneficiary Households	Micro	Adopt scientific dairy practices; utilise AI services; participate in village-level milk aggregation
AI Technicians & Village Volunteers		Deliver last-mile AI procedures, household visits, and behavioural outreach support
Implementing Partners (End Poverty / BISLD)	Meso	Manage implementation, technician deployment, training delivery, monitoring and reporting
Milk Collection Institutions (Banas Dairy)		Provide decentralised aggregation; reduce transaction costs; ensure payment mechanisms
Local Veterinary Ecosystem (Govt / Private)	Macro	Provide treatment and advanced animal healthcare; support long-term health continuity
HCL Foundation		Provide financial support, oversight, and programme direction; ensure compliance and sustainability



The Power–Interest Matrix was used to understand the level of influence and engagement of different stakeholders in the programme. Stakeholders with high power and high interest, such as HCL Foundation and the implementing partners (End Poverty / BISLD), played a key role in strategic decision-making, programme direction, and accountability structures.

Stakeholders with high interest but relatively lower power, such as dairy farming households and AI technicians, were closely involved in day-to-day implementation and directly experienced outcomes. Their participation was central to validating service delivery realities, particularly around AI uptake, animal health constraints, and aggregation efficiency.

This mapping helped clarify roles, manage expectations, and strengthen coordination across different levels of the program - ensuring that high-power actors remained accountable to the needs and priorities of frontline beneficiaries throughout the intervention period.

Assessment - Deep Dive

Stakeholder Coverage and Methods Used

STAKEHOLDER GROUP	PURPOSE OF ENGAGEMENTEL	METHOD USED	SAMPLE / COVERAGE
Dairy Beneficiary Households	Capture milk productivity, income change, veterinary expenditure, adoption of practices, and time efficiency in milk marketing	Surveys	152
Dairy Beneficiaries (FGDs)	Understand perceptions of AI access, training, animal health services, and aggregation systems; explore behavioural shifts	Focused Group Discussions	Selected groups
Implementing Partners (End Poverty / BISLD)	Access service delivery reliability, AI uptake, operational bottlenecks, and monitoring mechanisms	Key Informant Interviews	1
Veterinary Stakeholders (Govt / Private)	Gather views on animal health access, transport constraints, and morbidity patterns	Key Informant Interviews	Selected
HCL Foundation Team - Programme Manager	Capture programme oversight, scale-up vision, and strategic direction	Key Informant Interviews	1
Milk Collection Institution (Banas Dairy)	Reviewing aggregation efficiency, payment mechanisms, and beneficiary engagement	Observations	1

To gain a deeper understanding of how the Dairy Development Intervention was implemented on the ground, the assessment adopted a focused field-based approach combining beneficiary surveys, focus group discussions, field observations, and key informant interviews to capture real-time experiences and implementation quality across intervention blocks in Hardoi.

The assessment emphasised direct interaction with dairy households, AI technicians, and programme teams to validate reported outcomes. Particular attention was given to understanding barriers - including transport constraints for large animals and variation in AI uptake - to ensure findings reflected ground-level constraints alongside reported improvements.

Beneficiaries were selected from active intervention villages at the time of field data collection. This ensured real-time feedback from dairy households who were currently engaged with AI services, training, and milk aggregation systems - reducing recall bias, capturing recurring implementation experiences, and improving validity of reported productivity and income changes.

Limitations of the study

- Self-Reported Productivity and Income Data: Milk yield changes, income increases, veterinary savings, and expenditure shifts are based on self-reported data. Although triangulated through qualitative inputs, these figures may be subject to recall bias, rounding effects, or perception-based estimation rather than ledger-based verification.

- Absence of a Counterfactual Group: The assessment does not include a control group of non-intervention dairy households. As a result, attribution is framed as contribution rather than causal proof. External factors such as seasonal variation, feed price fluctuations, market demand shifts, or parallel livestock programmes may have influenced observed changes.

- Short-Term Observation Window: Breed improvement and genetic gains from artificial insemination are inherently multi-year processes. The current assessment captures early to mid-term productivity and behavioural shifts but does not measure long-term herd composition transformation or inter-generational yield improvement.

- Variability in Service Exposure : Households experienced differing levels of exposure to training, AI services, animal health outreach, and volunteer follow-ups. Outcome intensity may therefore vary based on depth of engagement, limiting uniform inference across all sampled respondents.

- Animal Health Access Constraints Beyond Project Scope : Reported livestock morbidity and loss due to delayed treatment reflect systemic veterinary infrastructure gaps. While highlighted through the assessment, these constraints extend beyond the direct operational control of the intervention.

- Financial Record Verification: Income and savings data were not independently validated through transaction records or dairy procurement logs. Analysis relies on declared responses within the locked dataset.

- External Market Dynamics : Milk prices and input costs (feed, medicines) are influenced by broader market forces. Efficiency gains from decentralised milk collection (e.g., reduced time spent in market travel) were validated qualitatively; however, net profitability remains partially exposed to external price volatility.

Despite these limitations, triangulation across survey data, qualitative stakeholder inputs, and programme documentation provides a coherent and internally consistent picture of productivity enhancement, efficiency gains, and emerging livelihood resilience within the intervention footprint.

ASSESSMENT FINDINGS & ANALYSIS

This section presents the key findings of the impact assessment and analyses how the HCL Foundation Dairy Development Programme influenced the lives and livelihoods of dairy-farming households.

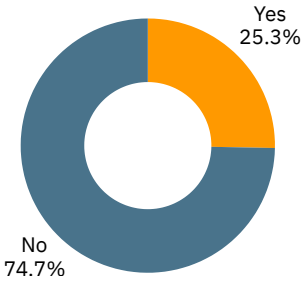
The analysis is organised around the OECD-DAC evaluation dimensions, drawing data from beneficiary surveys, group discussions, centre visits, and stakeholder interviews. Together, these provide an integrated understanding of programme outcomes, implementation quality, and the nature of changes experienced by beneficiaries.

Demographic Profile

The SGS team engaged with 155 respondents across primary and secondary stakeholder groups (152 primary and 3 secondary) through in-person field interactions and structured online engagements spanning direct beneficiaries and ecosystem stakeholders.

The beneficiary group is predominantly from Hardoi district in Uttar Pradesh, with the majority being smallholder dairy farmers in the early-to-mid years of their productive working lives - the period when access to improved breed services and livelihood opportunities has the most lasting economic impact.

Pre-Intervention AI Access (%)



Pre-intervention AI service availability (%)

Only 25.3% of respondents had access to AI services before the intervention, confirming a significant breeding service gap across the programme area.

Relevance

The Dairy Development Intervention is strongly aligned with the structural realities of smallholder dairy households in Hardoi district. Baseline income levels indicate that dairy functioned as a low-to-moderate earning supplementary activity rather than a productivity-optimised enterprise. Median pre-intervention dairy income stood at ₹7,000 per month, signalling constrained yield, limited breed optimisation, and inefficient value chain participation.

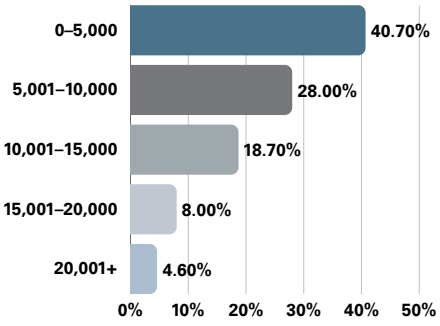
The intervention design directly addressed three binding constraints:

- Limited access to breed improvement services
- Sub-optimal herd management and preventive care practices
- High transaction burden in milk marketing

The aggregation model addressed a time poverty dimension often under-recognised in livelihood interventions. Beneficiaries reported that milk sale, previously requiring a full-day market visit, now takes approximately 30 minutes due to village-level collection.

Veterinary access barriers - especially transport constraints for large animals - remain a systemic challenge. Expressed demand for additional health camps reinforces the continued relevance of decentralised animal healthcare.

Baseline Dairy Income Distribution



Median income stood at ₹7,000, concentrated in lower income bands - validating the intervention's strategic emphasis on productivity enhancement rather than market expansion.

₹7,000

Median pre-intervention monthly dairy income

Dairy was operating below productivity potential for most households due to limited breed quality, weak market linkages, and high transaction burden.

> "Earlier dairy was just a side income for us. We had animals, but we didn't know how to increase production properly. Now we understand what to change and why."

Farmer Perspective, Hardoi District

The intervention directly addressed existing livelihood gaps in the project area. Respondents reported that no similar breed improvement opportunity was available in their area before the programme began. Among those who indicated the presence of some options, such options were often irregular, seasonal, or poorly structured - not comparable to organised service delivery.

The programme built upon the existing institutional structures - AI services were delivered through trained technicians embedded within the local ecosystem, and milk aggregation strengthened existing channels rather than establishing independent procurement mechanisms.

The Government of India supports dairy development through NHDP and CHCDS, which promote cluster-based development combining skills, production support, and market linkages to improve incomes.

The programme connected trained farmers with organised market systems, requiring them to move into unfamiliar roles - participating in exhibitions, engaging with buyers, understanding pricing, and contributing to household income generation or clinical treatment.

The findings suggest that a programme resonated well with farmers' needs and aspirations. A total of 98% of respondents rated the project 4 or 5 out of 5 when asked whether it met their personal and farming requirements - confirming strong perceived relevance.

98%

Rated programme relevance 4–5 out of 5

Beneficiaries confirmed the programme directly addressed their livelihood constraints and created new income opportunities where few previously existed.

Coherence

The intervention demonstrates strong internal coherence between problem diagnosis and activity design. AI utilisation, adoption of improved feeding and health practices, and reported income movement collectively indicate that activities were structured along a clear productivity-to-income pathway - not fragmented.

The model avoided parallel service creation. AI services were delivered through trained technicians embedded within the local ecosystem. Milk aggregation strengthened existing institutional channels rather than establishing independent procurement mechanisms - reinforcing systemic coherence by integrating with, rather than displacing, established structures.

Internal Coherence Signals

- Strong alignment between identified constraints and intervention components
- Institutional embedding within existing service and aggregation systems
- Complementarity with public veterinary structures
- Logical progression from breed improvement to income strengthening
- Output-to-outcome linkage visible in income movement data

Financially and operationally, project outputs - AI procedures conducted, farmers trained, and household outreach completed - correspond with the scope articulated in the signed MoUs. No evidence of objective drift or expansion beyond the contractual framework.

The primary coherence risk lies not in design fragmentation but in the incomplete integration of emergency animal healthcare within the strengthened productivity framework - an area requiring further systemic convergence.

~4,000

AI procedures conducted across programme period

Corresponding with ~4,000 farmers trained - outputs fully aligned with MoU scope and programme objectives.

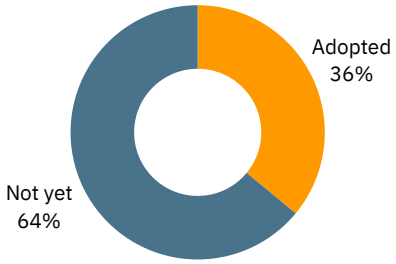
"Earlier, if the animal fell sick, we had to spend a lot. Now with vaccination and deworming, treatment costs have reduced."

Farmer Perspective, Hardoi District

Effectiveness

Effectiveness is assessed across income enhancement, service uptake, and behavioural adoption. Post-intervention, median monthly dairy income increased to ₹21,500 among valid respondents (n=150), indicating material strengthening of dairy earnings at household level.
Veterinary expenditure savings show a median reduction of ₹1,000 per month (n=34 valid responses), reflecting early success in preventive health practices - though coverage remains uneven.

AI Adoption Rate Post-Training



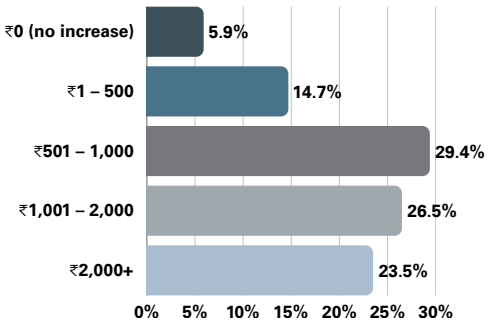
AI adoption rate post-training (%)

Uptake indicates behavioural transition toward scientific breeding. Genetic improvements require multiple reproductive cycles - AI utilisation is a leading indicator of long-term productivity potential.

Income Enhancement

Adoption signals are also evident in reported improvements in animal feeding practices, vaccination support, deworming routines, and reproductive management. While milk yield reporting contains variability, income data demonstrates consistent directional change across the sample.

Monthly Dairy Income — Post Intervention



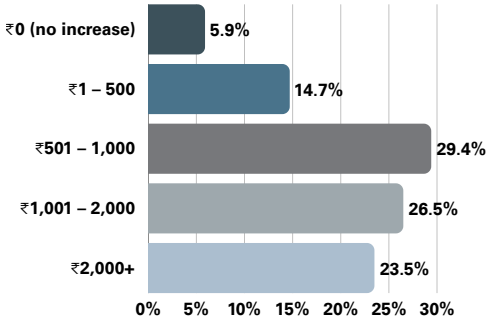
Income increases are distributed across multiple brackets — gains are structural, not confined to extreme outliers.

₹21,500

Median monthly dairy income post-intervention

Up from ₹7,000 - a ₹14,500 median monthly increase, signalling material household-level livelihood strengthening.

Veterinary Cost Reduction — Distribution



Over 70% report quantifiable veterinary savings; median reduction exceeds ₹4,500 - indicative of reduced disease incidence through preventive practices.

> "After improving feeding practices, I can see the difference. The animals look healthier, and milk quantity has improved."

Farmer Perspective, Hardoi District

Taken together, the findings suggest that the programme was effective not only in increasing dairy income but also in enabling farmers to use what they learned. The combination of local milk collection, supportive learning environments, relevant skills, and clear pathways from participation to practice helped farmers move from participation to income generation. In a rural context where programme attendance often competes with farm work and caregiving responsibilities, this programme was designed in a way that farmers could realistically attend and continue.

Efficiency

Efficiency in this assessment refers to how smoothly the programme's systems and processes functioned on the ground, and how effectively resources, time, and support mechanisms were used to enable productive milk market access. This section examines the ease with which farmers were able to participate in production activities, the effectiveness of coordination and communication systems, and the role of implementing partners in facilitating market linkages and operational flow.

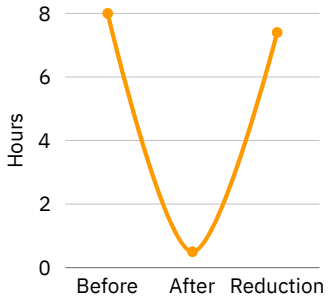
Model and Coordination Flow of Work

The efficiency of the programme is reflected in the way production and market processes were organised and communicated at the cluster level. Field interactions with beneficiaries, centre managers, and NGO supervisors further clarified how this support translated into day-to-day operations. Orders were typically communicated to centre managers via WhatsApp groups, following which centre-level meetings were held to discuss product assortments, quantities, and timelines. Once a plan was finalised, orders were transported to the collection centre through dedicated auto arrangement - a simple but structured system that enabled clear communication, reduced confusion around timelines, and ensured timely movement of goods without placing additional burden on individual artisans.

> "Before, selling milk meant losing the whole day at the market. Now it takes half an hour."

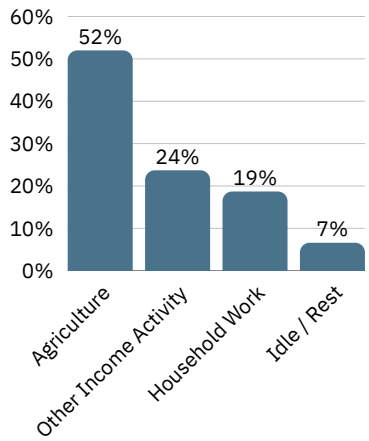
Farmer Perspective, Hardoi District

Median Time Spent on Milk Sale — Before vs After



The compression from a full-day market visit to approximately 30 minutes represents a substantial transaction efficiency gain. Economic effect derives from reduced opportunity cost, not price distortion.

Allocation of Saved Time (%)



Beneficiaries redeployed saved time primarily toward agriculture and productive activities — confirming efficiency gains translated into livelihood strengthening rather than idle time.

93%

Reduction in milk sale transaction time

From 8 hours to 30 minutes - the economic gain derives from reduced opportunity cost, not market price distortion.

The programme demonstrated operational efficiency through simple, locally adaptive systems for communication, coordination, and logistics. Clear order flows, collective decision-making, and NGO-led market facilitation reduced transaction burdens on individual farmers and enabled them to focus on production. At the same time, evidence of emerging innovation within centres suggests that efficiency was not achieved at the cost of learning or creativity but supported both.

Responsiveness and Innovation

An interesting outcome of this organised production flow was the space it created for creativity and innovation. Farmers began experimenting with product variations and additions beyond basic designs - indicating growing confidence and ownership over the production process.

Responsiveness at the Centre Level

The use of familiar communication tools and local transport arrangements helped streamline coordination and made the production cycle predictable and manageable for farmers. This approach helped ensure consistency and reduced the risk of underproduction - even when individual understanding of costing remained limited. By arranging collective production and sales, this arrangement allowed production and sales to continue smoothly while giving farmers gradual exposure to pricing concepts through discussion and participation.

Veterinary cost savings among a subset of respondents further indicate improved cost efficiency through preventive practices. However, unresolved emergency care gaps reduce full system efficiency and represent the key area for programme strengthening going forward.

> "One day, we thought about how to make our milk yield better. That's how we started experimenting with feeding and management changes."

Farmer Perspective, Hardoi District

The programme demonstrated operational efficiency through simple, locally adaptive systems for communication, coordination, and logistics. Clear order flows, collective decision-making, and NGO-led market facilitation reduced transaction burdens on individual farmers and enabled them to focus on production.

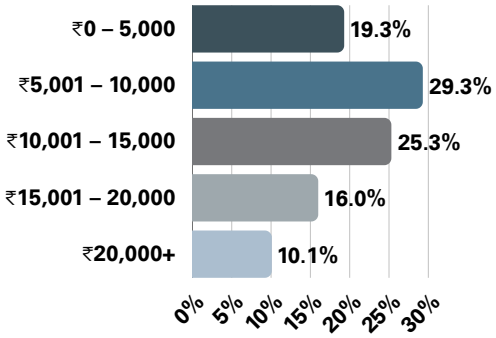
Impact

The impact of the programme goes beyond the introduction of an additional source of income. For many dairy farmers, participation in the initiative enabled them to contribute meaningfully to their households, make personal choices, and be recognised within their families. The changes observed reflect both economic and social dimensions, shaped by regular cash income, increased confidence, and a greater sense of independence.

Shifts in Income and Economic Participation

Following participation in the programme, most respondents reported earning regular monthly income from dairy-related activities. The largest share of respondents now earn between ₹10,000 and ₹19,999 per month range, while 19% report earnings in the ₹4,000–₹9,999 range. In the rural context where household earnings are often irregular and dependent on seasonal work, these figures represent a steady and self-managed income stream.

Additional Income Earned - Distribution (₹ Bands)



Income gains visible across multiple brackets - confirming broader-based livelihood strengthening rather than narrow, skewed gains concentrated among outliers.

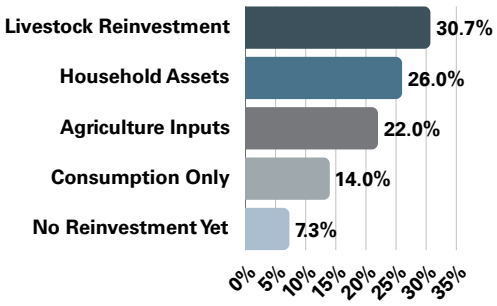
81%

Beneficiaries reported changes in their family well-being

During group discussions, farmers spoke about using their income for personal upkeep, buying clothes, household items, or saving small amounts without having to depend entirely on others.

Many also shared that they now contribute directly to children's education expenses, medical costs, and day-to-day household needs. This ability to manage certain expenses independently was described as a source of confidence. Some farmers described changes in how they are perceived within their families, mentioning increased respect from their husbands as they began sharing responsibility for household finances.

Investment Behaviour Post-Income Increase (%)



Over 78% of households report productive reinvestment — dairy income contributing to asset-building and welfare improvement beyond routine consumption.

> We have changed our routine. These are not new ideas anymore - they are part of daily work."

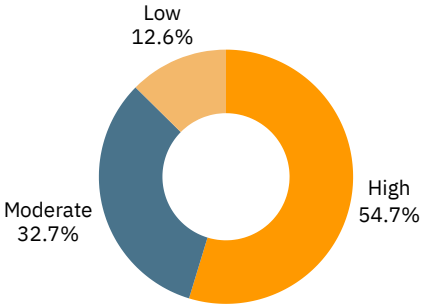
Farmer Perspective, Hardoi District

Sustainability

Sustainability is contingent on continuity of service infrastructure, behavioural embedding, and institutional integration. AI service availability and technician deployment provide the structural backbone for long-term genetic improvement. Behavioural sustainability appears moderately strong - respondents reported confidence in continuing improved practices independently.

Milk aggregation efficiency is institutionally embedded and therefore structurally more sustainable than project-dependent assets. The primary sustainability risk lies in veterinary service access - particularly emergency treatment for large animals. Without strengthening mobile veterinary response or expanding health camp frequency, productivity gains may remain exposed to episodic shocks.

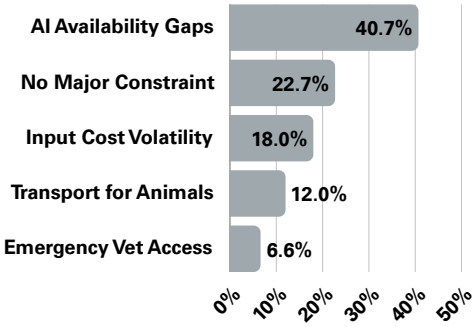
Confidence in Continuing Improved Practices (%)



Confidence in continuing practices (%)

High confidence levels indicate that knowledge transfer and behavioural adoption have moved beyond one-time exposure toward embedded practice - a critical indicator of sustainability.

Reported Constraints to Sustained Productivity (%)



Sustainability risks are systemic infrastructure gaps, not behavioural deficiencies. AI availability and veterinary access are the primary structural constraints.

> "Even if the project team reduces visits, I can continue these practices on my own."

Farmer Perspective, Hardoi District

Key learnings & Reccomendations

Breed Improvement & AI Services

AI uptake improved post-training; however, productivity gains require multi-cycle continuity. Service access reliability is critical for long-term genetic improvement. Ensure uninterrupted AI technician deployment; introduce performance tracking of conception rates; consider mobile AI units for remote clusters.

Veterinary Cost Efficiency

Reported reduction in veterinary expenditure among a subset of households suggests early preventive health impact, but coverage remains uneven. Expand preventive health package coverage; integrate vaccination and deworming schedules into routine village calendars.

Programme Coherence & Integration

Intervention avoided parallel systems and embedded services within existing institutions. However, emergency animal healthcare integration remains incomplete. Strengthen convergence with government veterinary departments; formalise referral pathways for emergency livestock treatment.

Income Enhancement

Median dairy income increased substantially; income data is more reliable than milk yield reporting. Gains are distributed across households, not limited to outliers. Institutionalise income tracking through periodic monitoring; introduce simple record-keeping tools for farmers to strengthen income validation and planning.

Milk Aggregation Efficiency

Decentralised milk collection reduced transaction time significantly. Efficiency gains, rather than price differences, drove economic benefit. Strengthen aggregation consistency and payment transparency; explore digital payment integration to further reduce transaction friction.

Behavioural Adoption & Training

Farmers reported confidence in continuing improved practices; however, reinforcement remains important to prevent regression. Introduce refresher trainings annually; develop peer-led farmer learning groups for sustained behavioural reinforcement.

Monitoring & Data Integrity

Income signals are strong; milk yield reporting shows variability and data quality gaps. Improve structured data capture tools; introduce periodic verification audits for key productivity indicators.

Sustainability & Scale

Economic returns are scale-driven; long-term impact depends on service continuity rather than one-time training exposure. Secure multi-year implementation horizon; integrate dairy strengthening into block-level rural development planning frameworks.

Animal Health Access

Preventive awareness improved, but curative access gaps persist. Transport barriers for large animals remain a structural constraint. Reported livestock loss due to delayed treatment indicates systemic vulnerability. Increase frequency of animal health camps; explore mobile veterinary response mechanisms; co-develop transport facilitation models with local stakeholders.

Social Return on Investment

Outcome Assessment Period: FY 2021–22 to FY 2023–24

The Social Return on Investment (SROI) analysis for the HCL Foundation-supported Dairy Development Intervention assesses the monetisable household-level economic value generated through incremental dairy income, reduction in veterinary expenditure, and transaction time savings from decentralised milk aggregation - relative to programme investment incurred.
Unlike infrastructure-heavy dairy asset schemes, this intervention operated through breed improvement, behavioural adoption, AI access strengthening, and operational efficiency gains. Accordingly, the SROI framework monetises only direct, evidenced, short-term economic outcomes reflected in the beneficiary dataset (n=152).

> Excluded from valuation: Long-term genetic gain multipliers · Lifetime herd productivity modelling · Macro-market price projections · Inter-generational income extrapolation. Valuation is limited to observable and attributable household-level economic signals within FY 2021–22 to FY 2023–24.

Programme Scope & Stakeholders

STAKEHOLDER	ROLE IN INTERVENTION	TREATMENT
Dairy Beneficiary Households	AI utilisation, adoption of improved practices, milk aggregation participation	Monetised
Implementing Partners (End Poverty / BISLD)	Programme implementation	Not monetised
Milk Collection Institutions	Aggregation infrastructure	Not monetised
HCL Foundation	Programme funder	Not monetised

Only household-level economic effects are monetised. System-level productivity gains are excluded.

Primary Outcomes Valued for SROI

1. Incremental Monthly Dairy Income

Median income increased from ₹7,000 to ₹21,500 per month. To avoid inflation bias, only 50% of the median increase (₹7,250/month) is valued.
Annual value per household: ₹87,000 (₹7,250 × 12 months)

2. Veterinary Expenditure Reduction

Median monthly saving of ₹1,000 among valid reporting households following improved preventive health practices.
Annual value per household: ₹12,000 (₹1,000 × 12 months)

3. Transaction Time Savings from Milk Aggregation

Milk sale time reduced from a full-day market visit to approximately 30 minutes. Conservatively assuming 1 full day saved per week and valued at MNREGA wage proxy.
Annual value per household: ₹13,000 (52 days × ₹250 MNREGA wage proxy)

Gross Annual Benefit per Household

Incremental dairy income (50% of median)	**₹87,000**
Veterinary expenditure reduction	**₹12,000**
Transaction time savings	**₹13,000**
Total Gross Annual Benefit	**₹1,12,000**

> No valuation assigned to: Calf survival improvement · Conception rate improvement · Mortality reduction · Asset reward incentives · Behavioural empowerment - all excluded to preserve conservative estimation.

Financial Proxies & Data Sources

PARAMETER	PROXY USED	SOURCE
Rural wage proxy	₹250 per day	MNREGA benchmark
Incremental income valuation	50% of median increase	Survey dataset
Veterinary savings	Self-reported median ₹1,000/month	Survey dataset
Discount rate	Not applied	One-year valuation / savings

All proxies intentionally conservative. Benefits valued on an annual basis without compounding, with one unit of benefit per household per year, even where multiple positive signals were reported.

Programme Investment

PROGRAMME	INVESTMENT (₹)	BENEFICIARIES
HCL Foundation Dairy Development Intervention	₹250 per day	~4,000

Approximately 4,000 farmers trained and ~4,000 AI procedures conducted under the programme across the assessment period.

Measurement Safeguards

- Median values used (not mean) to avoid outlier distortion
- One unit of benefit per household per year
- No compounding of income growth across years
- No multi-year productivity scaling
- Conservative wage proxies applied throughout
- Explicit deadweight and attribution adjustments applied

Social Return on Investment

Valuation, Adjustments & SROI Calculation

Key Assumptions & Adjustments

To maintain analytical discipline, the following adjustments are applied to the gross benefit figure before calculating programme-level social value:

- Deadweight: 40%

Recognising natural recovery, household effort, and public service availability. 60% of the gross benefit is retained as attributable to the programme.

- Attribution: 50%

Accounting for programme influence alongside other contributing factors including market trends, NGO programme influences, and household initiative.

- Displacement: 0%

No evidence of negative substitution — benefits accruing to one household are not at the expense of another.

- Drop-off: 20% annually

Reflecting declining attention without refresher engagement and the compounding nature of benefit reduction across programme years.

Adjusted Annual Value per Household

Gross annual benefit	₹1,12,000
Post-deadweight (40% deducted → 60% retained)	₹67,200
Post-attribution (50% deducted → 50% retained)	₹33,600

Survey-anchored per-household value (cumulative FY 2021–24, after all adjustments and drop-off): ₹1,650 (rounded, short-term monetisable effects only).

Quantification of Social Value

Applying the adjusted annual value per household (₹33,600) across the full programme footprint of approximately 4,000 farmers trained and supported:

₹33,600

Adjusted value per household / year

After deadweight & attribution

~4,000

Total programme reach

Farmers trained & supported

Base-Year Social Value (FY 2021–22)

₹13.44 Crore

₹33,600 × 4,000 households = ₹13,44,00,000

Applying 20% annual drop-off across 3 years:

YEAR	SOCIAL VALUE (₹ CRORE)
FY 2021–22 (Base year)	13.44
FY 2022–23 (20% drop-off)	10.75
FY 2023–24 (further 20% drop-off)	8.60
Cumulative Programme Value (3 years)	₹32.79 Crore

Investment Considered

The SROI denominator includes total addressable programme expenditure across all implementation years as per financial records. This includes community-level service delivery, training, mobilisation and engagement activities, facilitation and coordination activities, and programme administrative expenses

₹2,05,76,860

Total verified programme investment - HCL Foundation Dairy Development Intervention, FY 2021–22 to FY 2023–24.

SROI Calculation

Programme-Adjusted SROI Ratio

~15.9 : 1

SROI = Total Social Value ÷ Total Investment
₹32.79 Crore ÷ ₹2.0577 Crore = 15.9 : 1

For every ₹1 invested, approximately ₹15.9 of monetised household-level economic value was generated across the full programme footprint of ~4,000 farmers.

Conservative safeguards applied throughout: 40% deadweight · 50% attribution · 20% annual drop-off · No compounding · No long-term genetic projections · No system-level spillover effects · No asset rewards or behavioural empowerment impacts.

Interpretation

The programme-adjusted SROI reflects scale-driven livelihood strengthening under disciplined valuation assumptions - not aggressive projection modelling. The ratio excludes long-term productivity multipliers, system-level spillover effects, and therefore understates the full social value generated by the intervention.

CASE STUDIES

Case Study: Omprakash

Omprakash, a smallholder dairy farmer from the intervention geography in Hardoi district, previously treated dairy as a supplementary income activity. While he owned livestock, productivity was modest and income from milk sales remained unstable. Limited understanding of scientific feeding practices and inconsistent access to artificial insemination constrained yield improvement.

Following participation in the Dairy Development Intervention, Omprakash attended structured training sessions on herd management, balanced feeding, preventive healthcare, and reproductive practices. With improved awareness and access to AI services, he began applying systematic feeding schedules and monitoring animal health more proactively. Over time, milk production stabilised and household-level dairy income increased.

A significant turning point came with improved market access. The decentralised milk collection system reduced his time spent selling milk from a full day at the market to approximately 30 minutes within the village. This operational efficiency allowed Omprakash to redirect time toward agriculture and planning additional income activities.

The incremental dairy income created financial breathing space. Instead of absorbing the additional earnings into consumption alone, Omprakash chose to reinvest. Recognising unmet demand for local flour grinding services, he invested in a solar-powered atta chakki (flour mill), leveraging renewable energy to reduce operating costs and ensure consistent functioning despite electricity fluctuations.

Today, the solar atta chakki generates an additional income stream alongside dairy. The diversification has reduced his vulnerability to livestock-related income shocks and strengthened overall household financial stability.

Reflecting on the journey, Omprakash shares:

"Earlier, dairy income was uncertain. Now it is steady enough that I could take the risk of starting something new. The atta chakki is running well, and both activities support each other."

Omprakash's trajectory illustrates the layered impact pathway of the Dairy Development Intervention — productivity enhancement leading to income strengthening, followed by enterprise diversification and improved livelihood resilience.

When you need to be sure

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